VILLAGE OF NORTH PALM BEACH
REGULAR SESSION AGENDA

VILLAGE HALL COUNCIL CHAMBERS
501 U.S. HIGHWAY 1

THURSDAY, FEBRUARY 12, 2026
6:00 PM

Deborah Searcy	Lisa Interlandi	Vacant	Susan Bickel	Orlando Puyol
Mayor	Vice Mayor	President Pro Tem	Councilmember	Councilmember

Chuck Huff	Leonard G. Rubin	Jessica Green
Village Manager	Village Attorney	Village Clerk

INSTRUCTIONS FOR "WATCH LIVE" MEETING

To watch the meeting live please go to our website page (link provided below) and click the "Watch Live" link provided on the webpage:

https://www.village-npb.org/995/16543/Watch-Meetings-Live?activeLiveTab=widgets

ROLL CALL

PLEDGE OF ALLEGIANCE

ADDITIONS, DELETIONS, AND MODIFICATIONS TO THE AGENDA

AWARDS AND RECOGNITION

1. Proclamation - 211 Awareness Month

APPROVAL OF MINUTES

2. Minutes of the Regular Session held January 22, 2026

COUNCIL BUSINESS MATTERS

STATEMENTS FROM THE PUBLIC, PETITIONS AND COMMUNICATIONS

Members of the public may address the Council concerning items on the Consent Agenda or any non agenda item under Statements from the Public. **Time Limit: 3 minutes**

Members of the public who wish to speak on any item listed on the Regular Session or Workshop Session Agenda will be called on when the issue comes up for discussion. **Time Limit: 3 minutes**

Anyone wishing to speak should complete a Public Comment Card (on the table at back of Council Chambers) and submit it to the Village Clerk prior to the beginning of the meeting.

REPORTS (SPECIAL COMMITTEES AND ADVISORY BOARDS)

CONSENT AGENDA

The Consent Agenda is for the purpose of expediting issues of a routine or pro-forma nature. Councilmembers may remove any item from the Consent Agenda, which would automatically convey that item to the Regular Agenda for separate discussion and vote.

3. **RESOLUTION** – Approving an Interlocal Agreement with Seacoast Utility Authority for Joint Participation and Project Funding for the Buoy Road Infrastructure Improvements at a total project cost estimated to be $398,660 with the Village's cost responsibility estimated to be $196,527.62; and authorizing execution of the Agreement.
4. Receive for file Minutes of the Waterways Advisory Board meeting held 9/23/25.
5. Receive for file Minutes of the Business Advisory Board meeting held 10/21/25.
6. Receive for file Minutes of the General Employees' Pension Board meeting held 11/20/25.
7. Receive for file Minutes of the Recreation Advisory Board meeting held 12/9/25.
8. Receive for file Minutes of the Environmental Committee meeting held 1/5/26.

DECLARATION OF EX PARTE COMMUNICATIONS

PUBLIC HEARINGS AND QUASI-JUDICIAL MATTERS

9. **1ST READING OF ORDINANCE 2026-03 – CODE AMENDMENT – OVERNIGHT ANCHORING OR MOORING LIMITATION** Consider a motion to adopt on first reading Ordinance 2026-03 amending Article I, "In General," of Chapter 5, "Boat Docks and Waterways," of the Village Code of Ordinances by adopting a new section 5-26, "Overnight Anchoring or Mooring Limitation."
10. **1ST READING OF ORDINANCE 2026-04 – CODE AMEDMENT – LIMITED USE OF ARTIFICAL TURF** Consider a motion to adopt on first reading Ordinance 2026-04 amending Appendix C (Chapter 45) "Zoning," of the Village Code of Ordinances by amending Article III, "District Regulations," Section 45-36, "General Provisions," to Allow for the Limited Use of Artificial Turf for Industrial, Commercial, Mixed-Use and Multi-Family Residential Projects.

OTHER VILLAGE BUSINESS MATTERS

11. **RESOLUTION – LIBRARY HVAC REPLACMENT** Consider a motion to adopt a resolution accepting a proposal from S&R Engineering Group, LLC d/b/a Air Changes Mechanical for the replacement of the Village Library HVAC Equipment at a total cost not to exceed $180,692.00; and authorizing execution of the Contract.

COUNCIL AND ADMINISTRATION MATTERS

MAYOR AND COUNCIL MATTERS/REPORTS

VILLAGE MANAGER MATTERS/REPORTS

12. Country Club FAQ Demo

ADJOURNMENT

If a person decides to appeal any decision by the Village Council with respect to any matter considered at the Village Council meeting, he will need a record of the proceedings, and for such purpose he may need to ensure that a verbatim record of the proceedings is made, which record includes the testimony and evidence upon which the appeal is to be based (F.S. 286.0105).

In accordance with the Americans with Disabilities Act, any person who may require special accommodation to participate in this meeting should contact the Village Clerk's office at 841-3355 at least 72 hours prior to the meeting date.

This agenda represents the tentative agenda for the scheduled meeting of the Village Council. Due to the nature of governmental duties and responsibilities, the Village Council reserves the right to make additions to, or deletions from, the items contained in this agenda.

DRAFT MINUTES OF THE REGULAR SESSION
VILLAGE COUNCIL OF NORTH PALM BEACH, FLORIDA
JANUARY 22, 2026

Present:	Deborah Searcy, Mayor Lisa Interlandi, Vice Mayor Orlando Puyol, Councilmember Chuck Huff, Village Manager Len Rubin, Village Attorney Jessica Green, Village Clerk
Absent:	Susan Bickel, Councilmember

ROLL CALL

Mayor Searcy called the meeting to order at 6:00 p.m. All members of Council were present except for Councilmember Bickel who was out of town. All members of staff were present.

PLEDGE OF ALLEGIANCE

Vice Mayor Interlandi led the public in the Pledge.

ADDITIONS, DELETIONS AND MODIFICATIONS TO THE AGENDA

Mayor Searcy announced that Item #4 Resolution – Appointing Interim Councilmember and Item #15 Discussion – Country Club 2024 Financials were removed from the agenda.

Mayor Searcy explained that although there were many well qualified prospects for the Interim Councilmember position, none of those prospects were able to currently step into the role. Mayor Searcy stated that since there were only a handful of Council meetings until the Special Election takes place and there were no controversial or items of great importance scheduled to come before the Council, the four remaining Councilmembers would suffice until the Group 4 Council seat was filled.

Mayor Searcy explained that the Country Club Financials item would be heard at a later date after the Audit Committee and Country Club Advisory Board had a chance to review the item first.

AWARDS AND RECOGNITION

Director of Parks and Recreation Ashley Shipman explained the purpose and mission of The Miracle League of Palm Beach County. Ms. Shipman explained that the Village of North Palm Beach had worked in collaboration with the City of Palm Beach Gardens and The Miracle League of Palm Beach County to allow use of North Palm Beach facilities in order to host the 2025 All

AWARDS AND RECOGNITION *continued*

Star Weekend event. Ms. Shipman introduced the founders of The Miracle League of Palm Beach County Jeff and Julia Kadel. Jeff and Julia Kadel thanked the Village for their help and support and discussed the purpose of their organization and upcoming events.

Ms. Shipman stated that the Kadels presented the Village with a trophy.

Mayor and Council thanked the Kadels for the trophy.

Mayor Searcy asked Ms. Shipman to give an update on upcoming Recreation Department events.

Ms. Shipman announced the upcoming "Hot Cars and Chili" event on Saturday, January 24th at Anchorage Park. Ms. Shipman gave an update on additional upcoming events.

APPROVAL OF MINUTES

The Minutes of the Special Session held December 30, 2025 and the Minutes of the Regular Session held January 8, 2026 were approved as written.

STATEMENTS FROM THE PUBLIC

Chris Ryder, 118 Dory Road S., expressed his concern that the Country Club 2024 Financials were pulled from the agenda. Mr. Ryder expressed his concerns regarding the proposed shift from Ad Valorem taxes to Non-Ad Valorem taxes. Mr. Ryder expressed concern regarding the receding shore line at Lakeside Park. Mr. Ryder expressed concern regarding the Planning, Zoning and Adjustment Board appointments and that Tim Hullihan was not reappointed to the board.

Mary Phillips, 525 Ebbtide Drive, announced the Annual Library Book sale taking place the following week and gave details regarding the event.

John Samadi, 512 Marlin Road, expressed his concerns regarding issues he and his wife have had with noise at an Airbnb on the 500 block of Lighthouse Drive. Mr. Samadi expressed his concerns with landscaping maintenance of Village owned properties.

Kendra Zellner, 604 Laurel Court, announced her candidacy to run for Village Council Group 4.

Mayor Searcy asked Chief Coliskey to look into the complaints regarding the Airbnb on the 500 block of Lighthouse Drive.

Vice Mayor Interlandi addressed Mr. Ryder's comments about the $350,000 spent for Food and Beverage at the Country Club stating that the funds were spent to terminate the lease with Farmer's Table Restaurant. Vice Mayor Interlandi also addressed Mr. Ryder's comments regarding Lakeside Park's receding water line and the Environmental Committee's duties and responsibilities.

INTRODUCTION OF APPLICANTS TO PLANNING, ZONING AND ADJUSTMENT BOARD

The following applicants were introduced to the Village Council:

Marshall Gillespie
Brian Grove
R. Marty Minor

INTRODUCTION OF APPLICANTS TO PLANNING, ZONING AND ADJUSTMENT BOARD
continued

The following applicant was not able to attend the meeting:

James Hackman

RESOLUTION 2026-01– APPOINTING ONE RESIDENT MEMBER TO THE PLANNING, ZONING AND ADJUSTMENT BOARD

By written ballots, the originals of which are attached to the minutes of record, the Council appointed Marshall Gillespie to the Planning, Zoning and Adjustment Board.

A motion was made by Vice Mayor Interlandi and seconded by Councilmember Puyol to adopt Resolution 2026-01 entitled:

A RESOLUTION OF THE VILLAGE COUNCIL OF THE VILLAGE OF NORTH PALM BEACH, FLORIDA, APPOINTING A MEMBER TO THE PLANNING, ZONING & ADJUSTMENT BOARD; AND PROVIDING FOR AN EFFECTIVE DATE.

Mayor Searcy congratulated Mr. Gillespie and expressed her thanks and appreciation to all those who applied and were willing to serve on the Village's Planning, Zoning and Adjustment Board.

Thereafter, the motion to adopt Resolution 2026-01 passed with all present voting aye.

CONSENT AGENDA APPROVED

Vice Mayor Interlandi moved to approve the Consent Agenda. Councilmember Puyol seconded the motion, which passed with all present voting aye. The following items were approved:

Receive for file Minutes of the Country Club Advisory Board meeting held 10/13/25.

Receive for file Minutes of the Audit Committee meeting held 11/3/25.

Receive for file Minutes of the Environmental Committee meeting held 12/1/25.

Receive for file Minutes of the Planning, Zoning, and Adjustment Board meeting held 12/2/25.

PUBLIC HEARINGS AND QUASI-JUDICIAL MATTERS

PUBLIC HEARING AND SECOND READING OF ORDINANCE 2026-01 – CODE AMENDMENT – BUILDING HEIGHT REGULATIONS

A motion was made by Councilmember Puyol and seconded by Vice Mayor Interlandi to adopt and enact on second reading Ordinance 2026-01 entitled:

AN ORDINANCE OF THE VILLAGE COUNCIL OF THE VILLAGE OF NORTH PALM BEACH, FLORIDA, AMENDING APPENDIX C (CHAPTER 45), "ZONING," OF THE VILLAGE CODE OF ORDINANCES; AMENDING ARTICLE I, "IN GENERAL," BY AMENDING SECTION 45-2 TO INCLUDE A DEFINITION FOR HEIGHT OF BUILDING; AMENDING ARTICLE III, "DISTRICT REGULATIONS," BY AMENDING SECTION 45-27,

PUBLIC HEARING AND SECOND READING OF ORDINANCE 2026-01 – CODE AMENDMENT – BUILDING HEIGHT REGULATIONS *continued*

"R-1 SINGLE-FAMILY DISTRICT," TO CLARIFY THAT THE HEIGHT MEASUREMENT APPLIES TO THE HIGHEST ROOF LINES, SECTION 45-28, "R-2 MULTIPLE-FAMILY DWELLING DISTRICT," TO INCORPORATE THE HEIGHT MEASUREMENT REGULATIONS FROM THE R-1 ZONING DISTRICT, AND SECTION 45-36, "GENERAL PROVISIONS," TO CLARIFY THE SETBACKS AND REQUIREMENTS FOR DETACHED AUTOMOBILE GARAGES IN THE R-1 AND R-2 ZONING DISTRICTS; PROVIDING FOR CODIFICATION; PROVIDING FOR SEVERABILITY; PROVIDING FOR CONFLICTS; AND PROVIDING FOR AN EFFECTIVE DATE.

Mr. Rubin explained that the purpose of the ordinance was to amend the Village Code to provide a definition for height. The proposed ordinance provides a general building height definition, mirrors the R-1 Zoning District regulations for height in the R-2 Zoning District, and clarifies setbacks for automobile garages. Mr. Rubin further explained that based on Council's request at the first reading of the ordinance, the ordinance clarifies that all detached garages in the R-1 and R-2 zoning district provide a driveway to allow vehicular access. Further, the ordinance was amended to require a durable surface driveway connecting the garage to an adjacent vehicular right-of-way and revised the proposed definition for "height of building" to remove language referencing rooftop equipment enclosed within the roofline.

Elizabeth Murray, 100 Paradise Harbor Boulevard, expressed her concerns regarding the proposed ordinance and revisions to the code and other concerns regarding items on the agenda.

John Samadi, 512 Marlin Road, expressed his concerns regarding the proposed ordinance and revisions to the code.

Councilmembers and Mr. Rubin discussed Mr. Samadi's comments and the proposed ordinance.

Council came to consensus to incorporate the same language in the housing code into the proposed ordinance which states "all off street parking spaces and driveways shall be asphalt, concrete, block, stone, brick or similar smooth durable surface or durable surface as approved by the Community Development Director."

Thereafter, the motion to adopt and enact on second reading Ordinance 2026-01 as amended passed with all present voting aye.

PUBLIC HEARING AND SECOND READING OF ORDINANCE 2026-02 – CODE AMENDMENT – REORGANIZATION AND DIVISION OF THE COMMUNITY DEVELOPMENT DEPARTMENT

A motion was made by Councilmember Puyol and seconded by Vice Mayor Interlandi to adopt and enact on second reading Ordinance 2026-02 entitled:

AN ORDINANCE OF THE VILLAGE COUNCIL OF THE VILLAGE OF NORTH PALM BEACH, FLORIDA, AMENDING THE VILLAGE CODE OF ORDINANCES TO RECOGNIZE THE REORGANIZATION AND DIVISION OF THE COMMUNITY

PUBLIC HEARING AND SECOND READING OF ORDINANCE 2026-02 – CODE AMENDMENT – REORGANIZATION AND DIVISION OF THE COMMUNITY DEVELOPMENT DEPARTMENT *continued*

DEVELOPMENT DEPARTMENT AND CLARIFY THE DUTIES OF EACH DIRECTOR; AMENDING ARTICLE III, "ADMINISTRATIVE CODE," OF CHAPTER 2, "ADMINISTRATION" BY AMENDING SECTIONS 2-40 AND 2-111; AMENDING ARTICLE III, "CONSTRUCTION REQUIREMENTS," OF CHAPTER 5, "BOATS, DOCKS AND WATERWAYS," BY AMENDING SECTION 5-72; AMENDING ARTICLE III, "APPEARANCE CODE," ARTICLE IV, "ABATEMENT OF UNSAFE OR UNSANITARY BUILDINGS," ARTICLE V, "SIGNS AND OUTDOOR DISPLAYS," AND ARTICLE VI, "IMPACT FEES," OF CHAPTER 6, "BUILDINGS AND BUILDING REGULATIONS," BY AMENDING SECTIONS 6-56, 6-59, 6-60, 6-61, 6-74, 6-75, 6-76, 6-79, 6-80, 6-82, 6-83, 6-84, 6-85, 6-111, 6-117, AND 6-124; AMENDING ARTICLE II, "FILLING PERMIT," OF CHAPTER 7, "FILL PERMIT," BY AMENDING SECTIONS 7-18 AND 7-20; AMENDING ARTICLE I, "ADMINISTRATION," OF CHAPTER 12.5, "FLOOD DAMAGE PROTECTION," BY AMENDING SECTION 12.5-3; AMENDING ARTICLE II, "GARBAGE, TRASH AND REFUSE," AND ARTICLE IV, "ABATEMENT OF PUBLIC NUISANCES ON PRIVATE PROPERTY," OF CHAPTER 14, "HEALTH AND SANITATION," BY AMENDING SECTIONS 14-27, 14-81, 14-82, AND 14-83; AMENDING ARTICLE I, "PROPERTY MAINTENANCE STANDARDS," AND ARTICLE II, "ABANDONED REAL PROPERTY," OF CHAPTER 15, "HOUSING," BY AMENDING SECTIONS 15-3 AND 15-14; AMENDING ARTICLE VII, "PEDDLERS AND SOLICITORS," OF CHAPTER 17, "LICENSES AND MISCELLANEOUS BUSINESS REGULATIONS," BY AMENDING SECTIONS 17-84, 17-85, 17-88, 17-92, AND 17-93; AMENDING ARTICLE I, "IN GENERAL," ARTICLE IV, "CONCURRENCY MANAGEMENT," AND ARTICLE V, "STORMWATER MANAGEMENT," OF CHAPTER 21, "PLANNING AND DEVELOPMENT," BY AMENDING SECTIONS 21-3, 21-44, 21-47, 21-70, AND 21-104; AMENDING ARTICLE II, "WORK PERFORMED WITHIN RIGHTS-OF-WAY," OF CHAPTER 24, "STREETS, SIDEWALKS AND PUBLIC PLACES," BY AMENDING SECTION 24-22; AMENDING ARTICLE II, "GENERALLY," ARTICLE III, "DISTRICT REGULATIONS," ARTICLE VI, "REZONINGS; VARIANCES; WAIVERS; ADMINISTRATIVE APPEALS," AND ARTICLE VIII, "LANDSCAPING," OF APPENDIX C (CHAPTER 45), "ZONING," BY AMENDING SECTIONS 45-16.1, 45-16.2, 45-20, 45-25, 45-27, 45-34.1, 45-35.1, 45-36, 45-37, 45-38, 45-50, 45-51, AND 45-82; AMENDING APPENDIX A, "APPEARANCE PLAN," BY AMENDING SECTION I, "BASIS FOR APPEARANCE PLAN;" AMENDING THE VILLAGE CODE TO CHANGE ALL CODE REFERENCES FROM THE PLANNING COMMISSION TO THE PLANNING, ZONING AND ADJUSTMENT BOARD; PROVIDING FOR CODIFICATION; PROVIDING FOR SEVERABILITY; PROVIDING FOR CONFLICTS; PROVIDING FOR AN EFFECTIVE DATE; AND FOR OTHER PURPOSES.

Mr. Rubin explained that the revised ordinance recognizes the structure of the Community Development Department, with the Planning and Economic Development Director overseeing all planning and zoning and code compliance functions and the Building Director overseeing all planning, building permitting and inspection functions. It further amends the code to assign almost all of the duties of the former Community Development Director position to the new Director of Planning and Economic Development position.

PUBLIC HEARING AND SECOND READING OF ORDINANCE 2026-02 – CODE AMENDMENT – REORGANIZATION AND DIVISION OF THE COMMUNITY DEVELOPMENT DEPARTMENT *continued*

Lastly, while all references to the Planning Commission were changed to the Planning, Zoning and Adjustment Board through the adoption of Ordinance No. 2023-18, this change was not codified by Municode. Therefore, Section 25 of the proposed Ordinance reaffirms this change without modifying each and every reference (to that the provision was not otherwise amended).

Thereafter, the motion to adopt and enact on second reading Ordinance 2026-02 passed with all present voting aye.

DECLARATION OF EX-PARTE COMMUNICATION

There was no ex-parte communication by Council for the following item:

RESOLUTION 2026-02 – MINOR PUD AMENDMENT TO THE BENJAMIN SCHOOL

A motion was made by Councilmember Puyol and seconded by Vice Mayor Interlandi to adopt Resolution 2026-02 entitled:

A RESOLUTION OF THE VILLAGE COUNCIL OF THE VILLAGE OF NORTH PALM BEACH, FLORIDA, APPROVING A MINOR AMENDMENT TO THE BENJAMIN SCHOOL PLANNED UNIT DEVELOPMENT FOR THE INSTALLATION OF FOUR PLAYGROUND SHADE STRUCTURES AND THE REPLACEMENT OF AN EXISTING MONUMENT SIGN; PROVIDING FOR CONFLICTS; AND PROVIDING FOR AN EFFECTIVE DATE.

Village Planner Alondra Lopez-Mojica gave a presentation explaining the Minor PUD Amendment request to The Benjamin School. The request was to install a new 72" by 109" internally illuminated aluminum monument sign on the southeast corner of the former bank property at 11011 U.S. Highway 1 and to install four shade structures for existing playgrounds. Ms. Lopez-Mojica showed the proposed site plan for the proposed signage and the proposed shade sails showing the locations for each. Ms. Lopez-Mojica showed an image of the current monument sign and a drafted image of what the proposed signage would look like stating that the total sign area would be 54.5 square feet. Ms. Lopez-Mojica reviewed and explained the applicable codes regarding the proposed signage and the proposed shade sails. Ms. Lopez-Mojica concluded her presentation stating that Village Staff was recommending approval of the minor amendment to The Benjamin School Planned Unit Development for the installation of four playground shade structures and the replacement of an existing monument sign with a new sign.

Mayor Searcy asked for clarification on shade sails or structures counting toward surface coverage.

Mr. Rubin explained that per the Village code, shade sails were classified as structures.

Thereafter, the motion to adopt Resolution 2026-02 passed with all present voting aye.

RESOLUTION 2026-03 – EAST ALLEY WALL REPLACEMENT PROJECT

A motion was made by Vice Mayor Interlandi seconded by Councilmember Puyol to adopt Resolution 2026-03 entitled:

RESOLUTION 2026-03 – EAST ALLEY WALL REPLACEMENT PROJECT *continued*

A RESOLUTION OF THE VILLAGE COUNCIL OF THE VILLAGE OF NORTH PALM BEACH, FLORIDA, ACCEPTING A BID PROPOSAL FROM LOX CONSTRUCTION, LLC FOR THE EAST ALLEY WALL REPLACEMENT PROJECT AND AUTHORIZING THE MAYOR AND VILLAGE CLERK TO EXECUTE A CONTRACT FOR SUCH SERVICES; AND PROVIDING FOR AN EFFECTIVE DATE.

Public Works Director Chad Girard explained that the Village solicited bids from qualified contractors and that Lox Construction, LLC submitted the lowest responsive and responsible bid in the amount of $1,189,331.68 and Village Staff was recommending a project contingency of 20% amounting to $238,000. The total project budget request would therefore be $1,427,331.68. Mr. Girard discussed and explained the scope, process and timeframe of the work to be done on the project.

John Samadi, 512 Marlin Road, expressed his concerns regarding the proposed project.

Discussion ensued between Councilmembers regarding the proposed project.

Mr. Huff indicated that surtax funds were being used to fund the project.

Discussion ensued between Mr. Girard and Councilmembers regarding the timing and public outreach of the project.

Thereafter, the motion to adopt Resolution 2026-03 passed with all present voting aye.

MAYOR AND COUNCIL MATTERS/REPORTS

Councilmember Puyol spoke about attending a Palm Beach County League of Cities meeting the day before and how former Councilmember Kristin Garrison was missed and that many people came up to him and expressed their condolences.

Councilmember Puyol stated that he received the Read for the Record book at the Palm Beach County League of Cities meeting and passed it along to Mayor Searcy and encouraged everyone to participate in the event.

Councilmember Puyol stated that he heard a presentation regarding artificial intelligence and Waymo cars. Councilmember Puyol recommended that Village staff be aware of the possible cybersecurity threats that may occur with the new and upcoming technologies.

Councilmember Puyol stated that his remarks at the last meeting regarding Lakeside Park was not intended to exclude anyone and was only to address the concerns regarding Lakeside Park. Councilmember Puyol apologized for any remarks he made that may have offended anyone.

Councilmember Puyol stated that he attended Palm Beach County Day in Tallahassee and that it was an eye opening experience. Councilmember Puyol discussed his experience and time there with other municipalities that attended. Councilmember Puyol discussed the topics that were discussed at the event and passed out tokens he received to Councilmembers and Village Clerk Jessica Green. Councilmember Puyol encouraged Council to attend next year's event.

MAYOR AND COUNCIL MATTERS/REPORTS *continued*

Vice Mayor Interlandi stated that the Country Club 2024 Financials item that was removed from the agenda and postponed to the next meeting should not just include financials from 2024 but should be focused on 2026 and the story of the Country Club. The item should just be about Country Club Financials.

Mayor Searcy stated that the Read for the Record event lasts until February 24th. Mayor Searcy encouraged volunteers to participate and read to students.

VILLAGE MANAGER MATTERS/REPORTS

Mr. Huff thanked Village staff for their work over the last three months since it has been a very busy time.

Mr. Huff congratulated Ms. Lopez-Mojica as the new Village Planner.

Ms. Lopez-Mojica thanked Mr. Huff and Council.

ADJOURNMENT

There being no further business to come before the Council, the meeting was adjourned at 7:28 p.m.

_____

Jessica Green, MMC, Village Clerk

VILLAGE OF NORTH PALM BEACH
PUBLIC WORKS DEPARTMENT

TO: Honorable Mayor and Council

THRU: Chuck Huff, Village Manager

FROM: Jamie Mount, P.E., Assistant Director of Public Works

DATE: February 12, 2026

SUBJECT: **RESOLUTION – Approval of an Interlocal Agreement with Seacoast Utility Authority for Joint Participation and Project Funding for the Buoy Road Infrastructure Improvement Project**

Background & Project Scope:

The Buoy Road Infrastructure Improvement Project is a critical infrastructure initiative aimed primarily at alleviating persistent flooding issues in the area through significant drainage upgrades. The project scope accounts for successful interagency coordination to include necessary water main replacements by the Seacoast Utility Authority ("SUA"), leveraging the efficiencies of a unified construction effort. Prior to procurement of contractor services for this project, review and approval of the Joint Project Agreement is required to finalize construction costs responsibilities between the Village and SUA.

Project improvements include:

Village of North Palm Beach Project Scope:
- Milling & resurfacing of the existing roadway.
- Installation of new drainage infrastructure (More than 400 LF of new pipe and 7 new inlets)
- Pavement striping

SUA Project Scope:
- Installation of over 900 LF of new water main facilities

Shared Project Scope:
- Maintenance of Traffic
- Construction Staking & Record Drawings
- Excavation
- Sidewalk & Driveway Aprons
- Swale Regrading & Sodding (in select areas)

Project Costs & Anticipated Procurement:

The overall total project cost is estimated to be $398,660.00, which includes both the Village and the SUA improvements. Of this total amount, the Village's project cost responsibility has been estimated at $196,257.62 for the roadway and drainage improvement scope of work, while SUA's cost responsibility has been estimated at $202,402.38.

Should Village Council approve this Joint Project Agreement (JPA), Village Staff will proceed with procurement efforts for the Project.

The attached Resolution and Joint Project Agreement have been prepared and/or reviewed for legal sufficiency by the Village Attorney and will allow SUA to reimburse the Village for its anticipated project costs.

Account Information:

Fund	Department / Division	Account Number	Account Description	Amount
Stormwater Utility	Streets & Grounds	H7321-66210	Constr. & Major Renovation	$398,660.00

Recommendation:

Village Staff requests Council consideration and approval of the attached Resolution approving an Interlocal Agreement between the Village and the Seacoast Utility Authority for Joint Participation and Funding for the Buoy Road Infrastructure Improvement Project at a total estimated project cost of $398,660.00 (of which the Village's share is estimated to be $196,257.62) and authorizing the Mayor and Village Clerk to execute the Interlocal Agreement in accordance with Village policies and procedures.

RESOLUTION 2026-____

A RESOLUTION OF THE VILLAGE COUNCIL OF THE VILLAGE OF NORTH PALM BEACH, FLORIDA, APPROVING AN INTERLOCAL AGREEMENT WITH SEACOAST UTILITY AUTHORITY FOR JOINT PARTICIPATION AND PROJECT FUNDING FOR THE BUOY ROAD INFRASTRUCTURE IMPROVEMENTS AND AUTHORIZING THE MAYOR AND VILLAGE CLERK TO EXECUTE THE AGREEMENT; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Village Staff recommended executing an Interlocal Agreement with Seacoast Utility Authority ("SUA") for joint participation and project funding for the Buoy Road Infrastructure Improvement Project; and

WHEREAS, the Village will oversee and manage the construction project, with: (1) the Village paying the cost for milling and resurfacing the existing roadway, installation of drainage infrastructure, and pavement striping; (2) SUA reimbursing the Village for cost of the installation of new water and sewer main facilities; and (3) the Village and SUA sharing the costs for maintenance of traffic, excavation, sidewalks, driveway aprons, and swale regrading and sodding; and

WHEREAS, the Village Council determines that the execution of an Interlocal Agreement with SUA to facilitate the Buoy Road Infrastructure Improvement Project is in the best interests of the Village and its residents.

NOW, THEREFORE, BE IT RESOLVED BY THE VILLAGE COUNCIL OF THE VILLAGE OF NORTH PALM BEACH, FLORIDA, as follows:

Section 1. The foregoing recitals are ratified and are incorporated herein.

Section 2. The Village Council hereby approves an Interlocal Agreement with Seacoast Utility Authority for Joint Participation and Project Funding for the Buoy Road Infrastructure Improvement Project, a copy of which is attached hereto and incorporated herein, and authorizes the Mayor and Village Clerk to execute the Interlocal Agreement on behalf of the Village. The total cost of the Project is estimated to be $398,660.00, with the Village's cost responsibility estimated to be $196,527.62, with funds expended from Stormwater Utility Account No. H7321-66210 (Streets and Grounds – Construction and Major Renovation).

Section 3. This Resolution shall become effective immediately upon adoption.

PASSED AND ADOPTED THIS _____ DAY OF _____, 2026.

(Village Seal)

_____
MAYOR

ATTEST:

_____
VILLAGE CLERK

INTERLOCAL AGREEMENT BETWEEN
SEACOAST UTILITY AUTHORITY
AND
THE VILLAGE OF NORTH PALM BEACH
FOR JOINT PARTICIPATION AND PROJECT FUNDING
FOR
BOUY ROAD INFRASTRUCTURE IMPROVEMENTS

THIS INTERLOCAL AGREEMENT (hereinafter "Agreement") is made as of the day of _____, 2026, by and between Seacoast Utility Authority, a government regional utility, 4200 Hood Road, Palm Beach Gardens, Florida 33410 (hereinafter "AUTHORITY") and the Village of North Palm Beach, a municipal corporation organized and existing under the laws of the State of Florida, 501 U.S. Highway One, North Palm Beach, Florida 33408 (hereinafter "VILLAGE"), each one constituting a public agency defined in Part I of Chapter 163, Florida Statutes.

WHEREAS, Section 163.01, Florida Statutes, known as the "Florida Interlocal Cooperation Act of 1969", authorizes local governments to make the most efficient use of their powers by enabling them to cooperate with other localities on a basis of mutual advantage, thereby providing services and facilities that will harmonize geographic, economic, population, and other factors influencing the needs and development of local communities, and

WHEREAS, Part I of Chapter 163, Florida Statutes, permits public agencies as defined therein to enter into Interlocal Agreements with each other to jointly exercise any power, privilege, or authority which such agencies share in common and which each might exercise separately; and

WHEREAS, the VILLAGE proposes certain roadway and drainage improvements along Bouy Road; and

WHEREAS, the AUTHORITY owns a 6-inch cement composite water main and an 8-inch clay gravity sewer main along Bouy Road that must be replaced within the next few years ("Project"); and

WHEREAS, the AUTHORITY and the VILLAGE desire to jointly participate in the Bouy Road Infrastructure Improvement Project ("Project") and related improvements within Project area; and

WHEREAS, both the AUTHORITY and the VILLAGE declare that it is in the public interest to complete the above-described Project; and

NOW, THEREFORE, in consideration of the mutual covenants, promises, and representations contained herein, the parties agree as follows:

Section 1. Recitals:

The above recitals are true and correct and are incorporated herein.

Section 2. Project and Work to be completed by the VILLAGE:

The VILLAGE shall provide oversight and administrative services for the Project that include both the VILLAGE's and the AUTHORITY's portions of the work to be performed. The total cost of the Project is estimated to be $398,660.00.

Section 3. Responsibilities and Duties:

A. The AUTHORITY shall reimburse VILLAGE for the AUTHORITY's portion of the Project, estimated to be $157,245.00. The schedule of values with the AUTHORITY'S and VILLAGE'S portions of the total Project cost is attached as Exhibit A and incorporated herein by reference.

B. Costs shall be based upon actual costs incurred by the VILLAGE, as set forth in written documentation of the Project work estimated to be $398,660.00. The VILLAGE shall allocate the percentage of costs and unit costs attributable to the AUTHORITY and shall provide the AUTHORITY with proof of same.

C. The VILLAGE shall obtain written approval from the AUTHORITY in advance of any revisions to the Project, including any costs associated with the AUTHORITY'S failure to approve revisions in a timely manner, which increase the cost attributable to the VILLAGE'S portion of the Project.

D. The VILLAGE shall secure all necessary easements and permits required to perform the Project, and the VILLAGE shall administer and inspect all work performed on the Project. The AUTHOITY will provide inspection of its portion of the project and advise the VILLAGE of results of its inspections.

E. The Project scope includes restoration that will be administered and inspected by the VILLAGE.

Section 4. Payments/Invoicing and Reimbursement:

A. The VILLAGE shall invoice the AUTHORITY on a periodic basis during construction of the Project. The AUTHORITY agrees to reimburse the VILLAGE for all documented costs of the AUTHORITY'S portion of the Project in the amount established in Section 3.A. Upon the VILLAGE'S submission of acceptable documents needed to substantiate its costs for the Project, the AUTHORITY shall provide said funds to the VILLAGE on a reimbursement basis within thirty (30) days of receipt of all required documents. The VILLAGE shall submit all invoices to the AUTHORITY, identifying the Work, including the VILLAGE'S total expenditure

for the Project and identifying the amount attributable to the AUTHORITY'S portion of the Work. The VILLAGE shall supply any further documentation, such as copies of paid receipts, canceled checks, invoices, and other documents deemed reasonably necessary by the AUTHORITY, within seven (7) calendar days of request by the AUTHORITY. Invoices and documentation received from the VILLAGE shall be reviewed and approved by the AUTHORITY only to the extent necessary to document that the VILLAGE's expenditures have been made in conformity with the Agreement. Invoices shall be paid within thirty (30) days following approval. In no event shall the AUTHORITY provide advance funding to the VILLAGE, unless otherwise as mutually agreed upon.

B. The Project will be administered by the VILLAGE. Only those costs incurred by the VILLAGE relating to the AUTHORITY'S portion of the Work are eligible for reimbursement by the AUTHORITY pursuant to the terms and conditions hereof. In the event the VILLAGE ceases or suspends the Project or the Work for any reason, the AUTHORITY shall reimburse the VILLAGE for the Work completed as of the date the VILLAGE uses to suspend the Work. Any remaining unpaid portion of this Agreement shall be retained by the AUTHORITY, and the AUTHORITY shall have no further obligation to honor reimbursement requests submitted by the VILLAGE.

Section 5. Repayment:

The VILLAGE shall repay the AUTHORITY for all unauthorized, illegal, or unlawful expenditures of funds, including those it may discover after the termination of this Agreement.

Section 6. Access and Audits:

The VILLAGE and the AUTHORITY shall maintain books, records, and documents to justify all charges, expenses and costs incurred under this Agreement for the Project, in accordance with Generally Accepted Accounting Principles (GAAP), as promulgated by the Government Finance Officers Association from time to time. The VILLAGE and the AUTHORITY shall have access to all books, records, and documents as required in this Agreement, and for at least three (3) years after completion of the Project. In the event any work is subcontracted by the VILLAGE, the VILLAGE shall similarly require each Contractor and/or subcontractor to maintain and allow access to such records for audit purposes.

Section 7. Independent Contractor:

The AUTHORITY and the VILLAGE are and shall be, in the performance of all work, services, and activities for the Project pursuant to the Agreement, independent contractors and not employees, agents, or servants of the other party. All VILLAGE employees engaged in the work or services performed as part of the Project pursuant to this Agreement shall at all times, and in all places be subject to the VILLAGE'S sole direction, supervision, and control. All AUTHORITY employees engaged in the work or services performed for the Project pursuant to this Agreement shall at all times, and in all places, be subject to the AUTHORITY'S sole direction, supervision, and

control. The Parties shall exercise control over the means and manner in which it and its employees perform the work.

B. The VILLAGE does not have the power or authority to bind the AUTHORITY in any promise, agreement, or representation, except as specifically authorized in this Agreement.

Section 8. Personnel:

A. VILLAGE represents that it has, or will secure at its own expense, all necessary personnel required to perform the Work and complete the Project. Such personnel shall not be employees of or have any contractual relationship with the AUTHORITY.

B. All work and services required herein as part of the Project shall be performed by the contractor or the VILLAGE, and personnel engaged in performing the services shall be fully qualified and, if required, authorized, or permitted under state and local law to perform such services.

C. All of the VILLAGE'S personnel, contractors, and all subcontractors while on the premises shall conduct themselves in an acceptable manner and follow acceptable safety and security procedures.

Section 9. Indemnification:

A. The VILLAGE and the AUTHORITY recognize they could incur liability for certain tortious acts of its agents, officers, employees and invitees to the extent and limits provided in Section 768.28, Florida Statutes. To the extent permitted by law, the VILLAGE and AUTHORITY shall indemnify, defend, and hold the other harmless against any actions, claims and damages arising out of its own negligence in connection with the Work and the Project and the use of the funds provided under this Agreement. The foregoing indemnification shall not constitute a waiver of sovereign immunity beyond the limits set forth in Section 768.28, Florida Statues, nor shall the same be construed to constitute an Agreement by the VILLAGE or the AUTHORITY to indemnify each other for sole negligence, or willful or intentional acts of the other. The foregoing indemnification shall survive termination of the Agreement.

B. No provision of the Agreement is intended to, or shall be construed to, create any third-party beneficiary or to provide any rights to any person or entity not a party to this Agreement, including but not limited to any citizen or employees of the AUTHORITY and/or the VILLAGE.

Section 10. Annual Appropriation:

All provisions of this Agreement calling for the expenditure of ad valorem tax money by either the AUTHORITY or the VILLAGE are subject to annual budgetary funding and should either Party involuntarily fail to fund any of their respective obligations pursuant to the Agreement, this Agreement may be terminated.

Section 11. Breach and Opportunity to Cure:

The parties expressly covenant and agree that in the event either party is in default of its obligations under this Agreement, each party shall have thirty (30) days' written notice before exercising any of its rights.

Section 12. Enforcement Costs:

Any cost or expenses (including reasonable attorney's fees) associated with the enforcement of the terms and conditions of this Agreement shall be borne by the respective parties.

Section 13. Notice:

All notices required to be given under this Agreement shall be in writing, and deemed sufficient to each party when sent by United States Mail, postage prepaid, to the following:

All notices to the AUTHORITY shall be sent to:

Rim Bishop, Executive Director
Seacoast Utility Authority
4200 Hood Road
Palm Beach Gardens, FL 33410

All notices to the VILLAGE shall be sent to:

Chuck Huff, Village Manager
Village of North Palm Beach
501 U.S. Highway One
North Palm Beach, FL 33408

Section 14. Modification and Amendment:

Except as expressly permitted herein to the contrary, no modification, amendment or alteration in the terms and conditions contained herein shall be effective unless contained in a written document executed with the same formality and equality of dignity herewith.

Section 15. Remedies:

This Agreement shall be governed by and in accordance with the laws of the State of Florida. Any legal action necessary to enforce this Agreement shall be held in Palm Beach County. No remedy herein conferred upon any party is intended to be exclusive of any other remedy, and each and every such remedy shall be cumulative and shall be in addition to every other remedy given hereunder or now or hereafter existing at law or in equity by statute or otherwise.

No single or partial exercise by any party of any right, power or remedy hereunder shall preclude any other or further exercise thereof.

Section 16. No Waiver:

Any waiver by either Party of its right with respect to a default under this Agreement, or with respect to any other matters arising in connection with this Agreement, shall not be deemed a waiver with respect to any subsequent default or other matter. The failure of either Party to enforce strict performance by the other Party of any of the provisions of this Agreement or to exercise any rights under this Agreement shall not be construed as a waiver or relinquishment to any extent of such Party's right to assert or rely upon any such provisions or rights in that or any other instance.

Section 17. Joint Preparation:

The preparation of this Agreement has been a joint effort of the parties, and the resulting document shall not, solely as a matter of judicial constraint, be construed more severely against one of the parties than the other.

Section 18. Non-Discrimination:

The VILLAGE and the AUTHORITY agree that both parties shall not conduct business with nor appropriate any funds for any organization or entity that practices discrimination on the basis of race, color, national origin, religion, ancestry, sex, age, familial status, marital status, sexual orientation, gender identity and expression, disability, or genetic information. The VILLAGE will ensure that all contracts let for the Project pursuant to the terms of this Agreement will contain a similar non-discrimination clause.

Section 19. Execution:

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

Section 20. Filing:

A copy of this Agreement shall be filed with the Clerk of the Circuit Court in and for Palm Beach County, Florida.

Section 21. Termination:

This Agreement may be terminated by either party to this Agreement upon sixty (60) days' written notice to the other party, except as otherwise addressed in this Agreement. However, once the Project has commenced, it shall be pursued to completion, and this Agreement shall be binding upon the parties and neither party shall have the right to terminate the subject Agreement.

Section 22. Compliance with Codes and Laws:

The AUTHORITY and the VILLAGE shall abide by all applicable federal, state, and local laws, orders, rules, and regulations when performing under this Agreement. The AUTHORITY and the VILLAGE further agree to include this provision in all subcontracts issued as a result of this Agreement.

Section 23. Office of the Inspector General:

Palm Beach County has established the Office of the Inspector General in Palm Beach County Code Sections 2-421 to 2-440, as may be amended. The Inspector General's authority includes but is not limited to the power to review past present and proposed AUTHORITY contracts, transactions, accounts, and records, to require the production of records, and audit, investigate, monitor, and inspect the activities of the contractor, its officers, agents, employees, and lobbyists in order to ensure compliance with contract specifications and detect corruption and fraud. All contractors and parties doing business with the AUTHORITY and receiving AUTHORITY funds shall fully cooperate with the Inspector General, including receiving access to records relating to Bid or any resulting contract.

Section 24. Public Entity Crime and Scrutinized Companies Certification:

As provided in Section 287.132-133, Florida Statutes, as may be amended from time to time, by entering into this Agreement or performing any work in furtherance hereof, the VILLAGE shall have its contractors certify that their affiliates, suppliers, subcontractors, and consultants who will perform hereunder, have not been placed on the convicted vendor list maintained by the State of Florida Department of Management Services within thirty-six (36) months immediately preceding the date hereof. This notice is required by Section 287.133 (3)(a), Florida Statutes. Additionally, the VILLAGE shall have its contractors certify that they are not on the Scrutinized Companies or Other Entities that Boycott Israel List, as required by Section 287.135(2)(a), Florida Statutes.

Section 25. Severability:

If any section, paragraph, sentence, clause, or provision of this Agreement is for any reason held by a court of competent jurisdiction to be unconstitutional, inoperative, or void, such holding shall not affect the remaining portions of this Agreement.

Section 26. Entirety of Agreement:

The AUTHORITY and the VILLAGE agree that this Agreement sets forth the entire Agreement between the parties, and there are not promises or understandings other than those stated herein.

Section 27. Survival:

The obligations, rights, and remedies of the Parties hereunder, which by their nature survive the

termination of this Agreement or the completion of the Project, shall survive such termination or Project completion and inure to the benefit of the Parties.

IN WITNESS WHEREOF, the undersigned parties have executed this Agreement on the day and year first written above.

SEACOAST UTILITY AUTHORITY	VILLAGE OF NORTH PALM BEACH
BY:_____ Robert Weisman, Authority Chair	BY:_____ Deborah Searcy, Mayor
ATTEST:	ATTEST:
JESSICA MOORE, AUTHORITY CLERK	JESSICA GREEN, VILLAGE CLERK
BY: _____ (Date)	BY: _____ (Date)
APPROVED AS TO FORM AND LEGAL SUFFICIENCY	APPROVED AS TO FORM AND LEGAL SUFFICIENCY
BY: _____ Nathan Nason, Authority Attorney	BY: _____ Leonard G. Rubin, Village Attorney

EXHIBIT A

Calculations of Cost Share for AUTHORITY and VILLAGE

Total Project Value:	$398,660.00
Work Specific to the AUTHORITY (Group 1 Items):	$157,245.00
Items shared by AUTHORITY and VILLAGE (Group 2 Items):	$88,945.00
Work Specific to the VILLAGE (Group 3 Items):	$152,470.00
Percentage Split of Shared Work Items By Cost:	
V% = V$/(A$+V$)	49.23%
VILLAGE Portion of the Shared Items:	$43,787.62
Total Cost for the VILLAGE:	$196,257.62
Total Cost for the AUTHORITY:	$202,402.38

EXHIBIT A

This will be a modified Schedule of Values to reflect complete bid for the purpose of payment.

Group 1 – Seacoast Utility Authority Items					
Item #	**Description**	**Unit**	**Quantity**	**Unit Cost***	**Total**
1	Grout Existing Water Main	LF	455	$25.00	$11,375.00
2	Remove Hydrant	EA	1	$400.00	$400.00
3	Remove 8" Clay sewer	LF	63	$20.00	$1,260.00
4	8" PVC Sewer main	LF	63	$110.00	$6,930.00
5	6" DIP Watermain	LF	469	$120.00	$56,280.00
6	Fittings	LS	1	$5,000.00	$5,000.00
7	Sample Point	EA	3	$500.00	$1,500.00
8	Fire hydrant	EA	1	$2,500.00	$2,500.00
9	6" Gate Valve	EA	6	$2,500.00	$15,000.00
10	Jumper	EA	1	$1,000.00	$1,000.00
11	6"x6" Tee	EA	3	$500.00	$1,500.00
12	Thrust block and transition sleeve	EA	4	$2,500.00	$10,000.00
13	Watermain connection to the Existing	EA	4	$1,500.00	$6,000.00
14	Testing	LS	1	$3,500.00	$3,500.00
15	Single Water Meter connection	EA	2	$3,000.00	$6,000.00
16	Dual Water Meter connection	EA	3	$4,000.00	$12,000.00
17	Cleanout	EA	4	$500.00	$2,000.00
18	Dewatering	LS	1	$15,000.00	$15,000.00
				Group 1 - Subtotal	**$157,245.00**

Group 2 – Shared Items (Seacoast Utility Authority and Village of North Palm Beach)					
Item #	**Description**	**Unit**	**Quantity**	**Unit Cost***	**Total**
1	Maintenance of Traffic	LS	1	$8,000.00	$8,000.00
2	Construction Staking and Record Drawings	LS	1	$5,000.00	$5,000.00
3	Excavation	CY	107	$35.00	$3,745.00
4	4" Concrete Sidewalk	LF	136	$90.00	$12,240.00
5	6" Concrete Driveway	SY	210	$100.00	$21,000.00
6	Swale Grading and Re-sodding	SY	664	$15.00	$9,960.00
				Group 2 - Subtotal	**$59,945.00**

Group 3 –Village of North Palm Beach Items					
Item #	**Description**	**Unit**	**Quantity**	**Unit Cost***	**Total**
1	2" Type SP-9.5 Asphaltic Concrete	SY	110	$22.00	$2,420.00
2	1" Type SP-9.5 Milling and Resurfacing	SY	1,920	$20.00	$38,400.00
3	16" Baserock w/ Prime coat	SY	110	$25.00	$2,750.00
4	12" Compacted Subgrade	SY	110	$4.00	$440.00
5	Inlets, DT Bot, Type C, <10'	EA	7	$5,000.00	$35,000.00
6	Manhole	EA	1	$6,000.00	$6,000.00
7	12" Slotted RCP Pipe	LF	271	$160.00	$43,360.00
8	12" RCP Pipe	LF	171	$100.00	$17,100.00
9	Pavement Markings	LS	1	$5,000.00	$5,000.00
10	Detectable Warning (FDOT Index #522-002)	EA	1	$2,000.00	$2,000.00
				Group 3 - Subtotal	**$152,470.00**

Items Not Included					
Item #	**Description**	**Unit**	**Quantity**	**Unit Cost***	**Total**
1	Mobilization/ Demobilization/ General Conditions	LS	1	$29,000.00	$29,000.00
				Items Not Included - Subtotal	**$29,000.00**

Total Job Price	**$398,660.00**

Village of North Palm Beach
Waterways Advisory Board
MINUTES

Tuesday, September 23, 2025 at 5:30 pm
Village Hall Council Chambers

1. Roll Call- Members Present

Marty Domenech, Chair
George Algar, Vice-Chair
Bruce Crawford, Member
Dave Terrana, Member
Scott Bielecky, Member
Councilmember Lisa Interlandi
Village Staff, Robyn Lehoux

Members Not Present
Mark Michels, MD., Member
Ed Crawford, Member

2. Deletions, Additions or Modifications to the Agenda- Make adjustment to an item 'Mapping Waterways" to identify shoaling issues'.

3. Public Comment for Non-Agenda Items

A. Chris Ryder, 118 Dory Rd. South: Shared an excerpt of the mission of the Advisory board. Questioned why the Board was not offered a chance to review the increase of fees and present an Advisory report or opinion for the increase on dry storage. Personal opinion is that the matter should have come before the board, which in turn the Board would have issued a report or advisory opinion to Council before being voted into place. Another concern is the waitlist; some residents have been on a waitlist for 20 years.

One of the members' recalls reviewing the fees and making recommendations, however we were unable to locate any agenda or discussion items from the past year to review.

Chris Ryder, recommends that the plats be stitched to together. Garmin devices can share data. Would be more successful at gathering information than having one boat trying to collect it. The mean sea level changes / varies throughout the waterways. An employee with the Village should be able to access this and review.

4. Approval of Minutes

A. July 22, 2025: Approved as written

5. New Business

A. ENVIRONMENTAL RESTORATION:

Concerns regarding dredging around Peanut Island, with materials to be filled on the south side of Old Port Cove. It has been identified that it's not a 'sea-grass' area. This item is for discussion and for advisement to keep up to date on this project. There is a link from the Army Corps on the North Palm Beach Village Website.

B. Fishing Tournament: Member Algar makes a motion to recommend scheduling a fishing tournament; all in favor.

Old Business

A. Oyster Event: Member Algar has reached out to various organizations to participate, though the date has yet to be secured with Parks & Recreation. Fishing tournaments to be included. There is a liaison, Francesca, in Parks and Recreation, who will work with the Environmental Committee in addition to the Waterways Board in creating a plan for the event. Chair recommends that an event committee be created, which will take minutes to bring forth to the Waterways meeting. A focus on the most beneficial placements of vlogs needs further discussion.

B. Mapping of Waterways: One of the members is to attend a Council meeting to propose the purchase of a device and/or to make a recommendation that an employee and/or consultant review the current data utilizing the Garmin and GIS data.

6. Commission Member Comments - NONE

7. Staff Updates – NONE

Adjournment: 6:23 PM

All members of the public are invited to appear at the public hearing, which may be continued from time to time, and be heard with respect to this matter.

If a person decides to appeal any decision made with respect to any matter considered at the subject meeting, he or she will need to ensure that a verbatim record of the proceedings is made, which shall include the testimony and evidence upon which the appeal is to be based (F.S. 286.0105). In accordance with the Americans with Disabilities Act, any person who may require special accommodation to participate in this meeting should contact the Village Clerk's Office at 841-3355 at least 72 hours prior to the meeting date.

This agenda represents the tentative agenda for the scheduled meeting of the Waterways Advisory Board. Due to the nature of governmental duties and responsibilities, the Waterways Advisory Board reserves the right to make additions to, or deletions from, the items contained in this agenda.

Concerns regarding dredging around Peanut Island, with materials to be filled on the south side of Old Port Cove. It has been identified that it's not a 'sea-grass' area. This item is for discussion and for advisement to keep up to date on this project. There is a link from the Army Corps on the North Palm Beach Village Website.

Village of North Palm Beach
Business Advisory Board
MINUTES
Tuesday, October 21, 2025 at 5:30 pm
Village Hall Council Chambers

Roll Call

Nina Balgar- Present
Chip Sebree- Present
Norma Mirsky- Present
Ronald Lantz- Present
David Talley -present
Brenda Robinson- Absent
Mimi McAndrews- Absent
Robyn Lehoux, Executive Assistant- present
Village Council Member- Orlando Puyol, Councilmember, present

I. Deletions, Additions or Modifications to the Agenda- NONE

II. Public Comment for Non-Agenda Items- NONE

III. Approval of Minutes

1. September 23, 2025, APPROVED as written

IV. New Business

1. Business of the Season applications –

a) Present Certificate to Safe Harbor: The Board presented the award, photo taken and Safe Harbor scheduled to appear at the Council for plaque receipt.

b) Review application submission for the next season for New Day Adult Care Center: Application voted to be reviewed at next meeting, unable to confirm if applicant meets the criteria.

Member Talley nominates 'Hobo's restaurant, application to be submitted for next meeting.

V. Old Business

1. Business Showcase

a) View page on Village website and interest form – form is approved across the board. The application deadline is January 31, 2026.

VI. Commission Member Comments- NONE

VII. Staff Updates- NONE

***VIII.* Adjournment 6:30 PM**

All members of the public are invited to appear at the public hearing, which may be continued from time to time, and be heard with respect to this matter. If a person decides to appeal any decision made with respect to any matter considered at the subject meeting, he or she will need to ensure that a verbatim record of the proceedings is made, which shall include the testimony and evidence upon which the appeal is to be based (F.S. 286.0105). In accordance with the Americans with Disabilities Act, any person who may require special accommodation to participate in this meeting should contact the Village Clerk's Office at 841-3355 at least 72 hours prior to the meeting date.

This agenda represents the tentative agenda for the scheduled meeting of the Business Advisory Board. Due to the nature of governmental duties and responsibilities, the Business Advisory Board reserves the right to make additions to, or deletions from, the items contained in this agenda.

VILLAGE OF NORTH PALM BEACH GENERAL EMPLOYEES' RETIREMENT SYSTEM

MINUTES: NOVEMBER 20, 2025

1. Francine Mantyh called North Palm Beach General Pension of the Board to order at 9:05 AM and called roll. Those persons present included:

TRUSTEES	OTHERS
Mark Albers, Trustee	Amanda Kish, Administrator (Resource Centers)
Francine Mantyh, Chairperson	Blake Myton, Investment Consultant (SunTrust)
Karen Roberts, Trustee	Bonni Jensen, Attorney (Klausner Kaufman Jensen & Levinson)
Myrna Williams	

2. APPROVAL OF MINUTES

The Board reviewed the minutes of August 5 and August 21st. The Board amended the August 5th meeting minutes stating that the under-attorney report there was a missing sentence and missing information on Stanley versus Sanford.

Motion: Karen Roberts made a motion to approve August 5th , 2025 minutes. The motion received a second from Mark Albers and was approved by the Trustees 3-0.

3. REPORTS

Investment Consultant: Sterling (Blake Myton)

Mr. Myton reviewed the firm's acquisition of Guardian Capital. He provided information regarding the acquisition and briefly reviewed the letter of agreement with the agreement of consent.

Mr. Myton reviewed the market environment and portfolio performance for the quarter ending September 30, 2025. He reviewed the market environment and top contributors. Mr. Myton stated that international investments had strong performance this quarter. The Board held a brief discussion regarding how artificial intelligence would affect the job market.

Mr. Myton stated total plan assets stood at $21,694,808.93 as of September 30, 2025. The return for the quarter was 4.24%, compared to the benchmark return of 5.46%. The fiscal year return was 10.36%, versus the benchmark return of 11.44%. Mr. Myton reviewed the asset allocation of the portfolio and the individual managers within the portfolio.

The Board questioned the performance of the small-cap blend manager. Mr. Myton reviewed the underperformance and stated that large value is on watch, but small-cap blend is not on watch at this time. Mr. Myton reviewed the historical benchmark performance going back to 1995. He stated that the portfolio experienced some impact due to not holding artificial intelligence-related investments.

Motion: Mark Albers made a motion to approve the Assignment and Agreement for the acquisition of Guardian Capital. The motion received a second from Karen Roberts and was approved by the Trustees 4-0.

ATTORNEY REPORT

Mrs. Jensen reviewed Section 112.662 filing compliance. She informed the Board how the compliance is filed with the State and what documents are provided to the State.

Mrs. Jensen presented the Travel Expense Policy to the Board. She reviewed the policy in detail, including per diem guidelines. She stated that most plans establish their own food per diem. The Board held a discussion regarding hotel rates and conference locations. The Board also discussed conference approval and the need to create a budget and plan each year. This item will be added to the next agenda.

ADMINSTRATOR

Mrs. Kish presented the 2026 Conference List. The Board held a discussion regarding attendance, and Mrs. Kish explained the process for registration and approvals.

Mrs. Kish provided an update regarding the Truist to Principal transition.

4. PLAN FINANCIALS

The Board reviewed the Warrant dated November 4, 2025.

Motion: Trustee Francine Mantyh moved to approve the Warrant dated August 5, 2025. The motion received a second from Myrna Williams and was approved by the Trustees 3-0.

Mrs. Kish presented the Board with the 2025 Cost of Living Adjustments.

Motion: Mark Albers made a motion to approve the Cost-of-Living Adjustment for 2025. The motion received a second from Karen Roberts and was approved by the Trustees 4-0.

5. OTHER BUSINESS

The Board \requested an on boarding type of packet for trustees. Mrs. Jensen informed the board of an email that she provides to each new retiree.

PUBLIC COMMENTS

No members of the public had any comment

6. ADJOURNMENT

Francine Mantyh made a motion to adjourn the meeting at 9:50 AM. The motion received a second from Myrna Williams, approved by the Trustees 4-0.

Respectfully submitted,

Myrna Williams, Secretary

Village of North Palm Beach
Recreation Advisory Board Meeting
MINUTES
December 9, 2025 at 6:00 pm
Village Hall Council Chambers

- **Call to Order:** Chair Rita Budnyk
- **Roll Call:**

Rita Budnyk, Chair	Jennifer Gold Dumas, Vice Chair
~~Brigid Misselhorn, Secretary~~	~~Village Council Representative~~
Jonathan Sorensen	Francesca Wernisch, Recreation Manager
Emily Bales	Ashley Shipman, Director of Parks & Rec
Stephen Heiman	

- **Approval of Minutes:**
  - October 14, 2025
  - Motion made by Stephen Heiman and seconded by Jennifer Gold Dumas; all approved

- **Public Comments:**
  None

- **Director's Report:**
  - Special Events
  - Athletic Programs
  - Project Updates
    - **i.** Fitness Equipment
      1. Emily Bales: likes all equipment in one section; leaves rest of the park nicer looking
      2. Rita Budnyk – likes all equipment in one section, like the Community Center; likes that it's away from the playground
      3. Stephen Heiman – does it have to be fitness equipment? Is there something that would serve a broader group and still meet the requirements of the grant, such as a zipline? Staff explained that the grant was approved because of specific elements. The fitness equipment cannot be replaced.
      4. Jonathan Sorensen – likes all equipment consolidated; requested dip station or parallel bars
      5. Ashley Shipman – noted that we will resume discussion at January meeting for final input from the board on the specific fitness pieces.

- **New Business:**

- Assess need for fencing for Anchorage Park south volleyball courts on southside of the walkway to prevent volleyballs from rolling onto the grass "bowl" area
    - Rita Budnyk – does not think this is necessary

- **Old Business:**
    - NPB Community Center Renovation – conceptual ideas and community engagement discussion
        - All present in agreement that Option C is best path to pursue
    - Anchorage Park Playground Fencing Survey Update
        - Everyone was happy with this and looking forward to feedback
        - Option 2 re-wording – remove beginning of drawbacks sentence and leave "Offers less comprehensive protection"

- **Member Comments:**
    - Rita Budnyk – walking path on east side of Community Center is very dark when field lights are off; What can staff do to help keep the pathway lit?
    - Brigid Misselhorn / Rita Budnyk – will waitlist be posted anytime soon? Why are there so many empty spaces? Ashley Shipman provided an update on the moving list and inspections. The goal is to get the waitlist back on the website, while being ADA compliant.

- **Staff Comments:**

- **Board Comments/Recommendations to be presented to Council**

- **Adjournment:**
    - Stephen Heiman – motion to adjourn
    - Rita Budnyk - adjourned

FYI – January 13, 2026 meeting location – Village Hall Conference Room

Environmental Committee Meeting

MINUTES

Anchorage Park

Monday, Jan 5, 2026
6:00pm

1. Call to Order: Karen Marcus called the meeting to order at 6:07pm.

2. Roll Call:
   Present: Karen Marcus, Kendra Zellner, Mary Phillips, Ellen Allen, Brian Bartels, Juliette Desfeux and Elizabeth Rivera
   Absent:
   Also Present: Julie Morrell Village Staff, Councilmember Lisa Interlandi

3. The Minutes of the Dec 1, 2025, regular meeting was approved.

4. Public Comments –

   a.

5. Community Garden Update- President of the Community Garden advised that the garden cleanup is the 2nd Saturday of the month. Feb 7th at 6:30 is the Movie In The Garden. The movie is Enchanted. They welcome a discussion with MANG to explore options for growing mangroves. They have a waiting list for beds with one person on the list.

6. Golf Course Pesticides- Kendra connected Andrew from Seaweed Greens with Allan from the Golf course to test sargassum on the golf course.

7. Dry Storage Landscaping- Ellen will review the site plan and provide her insights.

8. Bat Houses- Julie reached out to Ashley regarding removing the old Bat Houses. Karen is requesting a schedule and to find out if Ashley needs our assistance.

9. Earth Day at Bird Village- Kendra provided an update on Earth Day. April 25th at 11 am. She is requesting volunteers. Kendra will email Ashley and Julie to follow up on the project status.

10. Code Enforcement for Environmental Concerns- Kendra advised that we recorded a video about the tree permit and we should see it get posted soon. Kendra recommended that we send a letter to local tree businesses advising them of our new code, along with letter to residents. Kendra will write a letter and send it to the committee for review.

11. Environmental Report at Anchorage Park- no update.

12. Volunteer board request- Julie said we have new volunteer requests. Mary requested that we communicate this volunteer board to residents.

13. Oyster Project- CCA will be picking up their supplies on Wednesday. Kendra advised that we still need to knock on doors to plan where we will install the next batch. Karen is recommending that Julie gets an inventory list of all the supplies. Karen advised that a condo is interested in the VOGs. The committee is planning to do the next build day on May 2nd.

14. Lakeside Park erosion and Mangrove Seeding- No update at this time.

15. Wind and heat vulnerability assessment- Karen is working with the resiliency office for Palm Beach County to get information and ensure communities are in sync.

16. Tree Preservation Permit- Karen will reach out to Chuck for next steps on code enforcement.

17. Residential Landscape Code- No update at this time.

18. Lead By Example- Juliette provided a recommendation list for consumables. Karen will schedule a meeting with Chuck.

19. Environmental Letter to Businesses- Julie advised that this would go to the Business Advisory Board.

20. Speaker Series: The Green Hour at the Clubhouse- The next speaker should be Loggerhead. Karen will contact Loggerhead to schedule for October 10th.

21. Previous newsletter was about recycling basics. The next newsletter will be about Tree Preservation.

22. Member Comment-
    a. Karen advised that it's possible to use the NET money to install trees in the swale on Lighthouse.
23. Staff Comment-
    a.
24. Next meeting- The next meeting will be on Feb 2nd, 2025 at 6:00 pm at Anchorage Park.

25. Adjournment- the meeting adjourned at 7:06pm.

VILLAGE OF NORTH PALM BEACH
VILLAGE ATTORNEY'S OFFICE

TO: Honorable Mayor and Council

THRU: Chuck Huff, Village Manager

FROM: Leonard G. Rubin, Village Attorney

DATE: February 12, 2026

SUBJECT: **ORDINANCE 1st Reading** – Amending Chapter 5 of the Village Code to adopt overnight anchoring or mooring limitations as authorized by Florida Statutes

During the 2025 legislative session, the Florida Legislature enacted Chapter 2025-39, Laws of Florida, which amended Section 327.60(2)(f), Florida Statutes, to authorize counties with a population of more than 1,500,000, including municipalities within those counties, to regulate overnight anchoring or mooring within the waters of their jurisdiction.

The attached Ordinance implements the authority granted by Section 327.60(f)3, Florida Statutes, by prohibiting any boat or vessel from anchoring or mooring overnight within the jurisdictional waters of the Village for a period of one (1) hour or more between one-half hour after sunset and one-half hour before sunrise for more than thirty (30) days within any consecutive six (6) month period. The limitation shall not apply to:

- Rowboats, kayaks, canoes, or other non-motorized small craft;
- Vessels lawfully anchored or moored overnight for the purpose of completing permitted maritime construction, installation of maintenance work authorized by applicable state or federal permits;
- Vessels anchored or moored at a marina, private dock, or permitted mooring buoy meeting all applicable federal, state, and local requirements; and
- Vessels rendered immobile by emergency, mechanical failure, or hazardous weather conditions provided that the operator takes all steps to remove the vessel as soon as safely possible. In cases of emergency, the Police Chief or designee may authorize temporary anchoring or mooring of otherwise prohibited vessels for such time as reasonably necessary to correct the emergency condition or relocate the vessel to a lawful mooring location.

The Village shall provide notice that a vessel is in violation of this prohibition by providing written notice directly to the vessel owner, occupant, or operator of the vessel. If the notice is refused or the vessel is unoccupied, the written notice shall be affixed to the vessel. Additionally, the Village shall mail written notice by certified mail, return receipt requested, to the registered owner and any lienholder provided that the owner and/or lienholder can be identified.

The Ordinance may be enforced through all available means, including code enforcement proceedings before the Village's Special Magistrate. The fines for a violation of this section are $250.00 per day for a first violation and up to $500.00 per day for each subsequent violation. If the Special Magistrate enters an Order finding violation and no party appeals (or the appeal is decided in favor of the Village), the vessel may be removed, towed, and impounded by the Village pursuant to the provisions of Chapter 5.

If the vessel owner or lienholder fails to retrieve the vessel, the Village may sell or otherwise dispose of the vessel in accordance with current Code provisions or as otherwise authorized by law.

There is no fiscal impact.

The attached Ordinance has been prepared by this Office and reviewed for legal sufficiency.

Recommendation:

Village Staff requests Council consideration and approval on first reading of the attached Ordinance amending Chapter 5 of the Village Code of Ordinances to impose overnight anchoring or mooring restrictions as authorized by Florida Statute and provide for enforcement in accordance with Village policies and procedures.

ORDINANCE NO. 2026-____

AN ORDINANCE OF THE VILLAGE COUNCIL OF THE VILLAGE OF NORTH PALM BEACH, FLORIDA, AMENDING ARTICLE I, "IN GENERAL," OF CHAPTER 5, "BOATS, DOCKS AND WATERWAYS," OF THE VILLAGE CODE OF ORDINANCES BY ADOPTING A NEW SECTION 5-26, "OVERNIGHT ANCHORING OR MOORING LIMITATION;" PROVIDING FOR EXEMPTIONS; PROVIDING FOR ENFORCEMENT AND FINES; PROVIDING FOR REMOVAL, TOWING AND DISPOSAL; PROVIDING FOR CODIFICATION; PROVIDING FOR SEVERABILITY; PROVIDING FOR CONFLICTS; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the Village of North Palm Beach is a duly constituted municipality having such power and authority conferred upon it by the Florida Constitution and Chapter 166, Florida Statutes; and

WHEREAS, during the 2025 Florida Legislative Session, the Florida Legislature enacted (and the Governor signed into law) Chapter 2025-39, Laws of Florida, which amended Section 327.60(2)(f), Florida Statutes, to authorize counties with a population of more than 1,500,000, including municipalities within those counties, to regulate overnight anchoring within the waters of their jurisdiction; and

WHEREAS, the Village Council finds that: (1) improperly anchored or moored vessels can damage water bottoms and seagrass beds, which are vital habitats for fish, shellfish, and manatees and are essential to the health of the Lake Worth Lagoon and surrounding waters; (2) extended or repeated anchoring causes anchor scarring, sediment disruption, and water quality degradation; and (3) limiting long-term overnight anchoring reduces environmental impacts and protects natural resources; and

WHEREAS, the Village Council further finds that vessels anchored in the same location for extended periods of time can obstruct navigational channels, can interfere with access to private marinas, private docks, and public waterways, and can create hazards during storm events when poorly maintained vessels may break loose; and

WHEREAS, the Village Council determines that this Ordinance complies with Chapter 327, Florida Statutes, by regulating extended overnight anchoring or mooring while preserving the rights of vessels in navigation, as well as vessels involved in permitted maritime construction, installation, or maintenance work, and is in the interests of the public health, safety, and welfare.

NOW, THEREFORE, BE IT ORDAINED BY THE VILLAGE COUNCIL OF THE VILLAGE OF NORTH PALM BEACH, FLORIDA as follows:

Section 1. The foregoing recitals are ratified as true and correct and are incorporated herein.

Section 2. The Village Council hereby amends Article I, "In General," of Chapter 5, "Boats, Docks and Waterways," of the Village Code of Ordinances as follows (additional language is underlined):

Chapter 5

BOATS, DOCKS AND WATERWAYS

ARTICLE I. IN GENERAL

* * *

Sec. 5-17. Authority of village to board boats violating chapter.

Any member of the police department shall have authority to board any boat in violation of this chapter, or which becomes a menace to navigation, and move or cause it to be moved to another location and he or she shall have the right to hold such boat for the payment of costs incurred in its removal or storage.

* * *

Sec. 5-19. Unlawfully anchored or moored vessels—Department of law enforcement to impound.

The police department of the village is authorized and directed to take into custody and impound any vessel or floating structure unlawfully anchored or moored and any such vessel or floating structure taken into custody and impounded under the authority of the police department shall not be released therefrom until the charges for towing such vessel or floating structure and storage charges have been paid. The charge for towing or removal of any such vessel or floating structure and storage charges shall be the customary charges prevailing in the village for such services.

Sec. 5-20. Same—Owner to be notified upon impoundment.

Whenever any vessel or floating structure is taken into custody and impounded by the authority of the police department as authorized herein, and the name and address of the owner of such vessel or floating structure can be ascertained by the police department, it shall within forty-eight (48) hours give in writing or cause to be given notice in writing to such owner of the fact of such removal and the reason therefor and the place to which such vessel or floating structure has been removed.

Sec. 5-21. Same—Procedure in event owner cannot be found.

Whenever the police department authorizes the removal of such vessel or floating structure as authorized herein and the police department does not know and is not reasonably able to ascertain the name and address of the owner of such vessel or floating structure or for any reason is unable to give the notice to the owner, and in the event the vessel or floating structure is not returned to the owner within a period of three (3) days after same has been taken into custody and impounded, the police department shall immediately send or cause to be sent a written notice of such impoundment by mail to the division of marine resources of the department of natural resources, and shall file a copy of such notice with the person who has been authorized to have custody of the impounded vessel or floating structure for

the purpose of storage. Such notice shall include a complete description of the vessel or floating structure, the date, time and place from which it was removed, the reason for such removal, and the name of the storage facility or place where the vessel or floating structure is stored.

Sec. 5-22. Same—Unclaimed vessel to be sold; certification of sale.

(a) If the owner fails to claim the vessel or floating structure within twenty-one (21) days after the police department has sent its notice to the division of marine resources, such vessel or floating structure shall be sold to the highest bidder at public auction by the police department at some place within the village; but, prior to the sale, a notice shall be published once a week for two (2) consecutive weeks in a local newspaper published in the county and circulated in the village. Publication shall be at least ten (10) day[s] prior the date of sale. Such notice shall give the time and place of sale and describe the vessel or floating structure to be sold. A copy of such notice shall be mailed to the owner if his or her name and address be known at least ten (10) days before the date of such sale. The village shall not guarantee title to such vessel or floating structure or to deliver a title of ownership; but shall furnish the purchaser a certificate in substantially the following form:

Certificate Number: _____

CERTIFICATE OF SALE

VILLAGE OF NORTH PALM BEACH,
DEPARTMENT OF PUBLIC SAFETY, FLORIDA

Certificate Number: _____

CERTIFICATE OF SALE

VILLAGE OF NORTH PALM BEACH, FLORIDA
POLICE DEPARTMENT

THIS IS TO CERTIFY that the following described vessel/floating structure was impounded and placed in the custody of the Police Department , where it was held for twenty-five (25) days, after which time the Police Department made every reasonable effort to find the owner of the same or if found, such owner failed to repossess same, this vessel/floating structure was sold to the highest bidder at public auction after legal advertisement.

This Certificate of Sale is therefor issued to: _____, residing at _____.

Description of vessel:

Dated at Village of North Palm Beach, Florida, this _____ day of _____, 20__.

_____
Name and Title of Officer

(b) This form shall be in duplicate. The original shall be given to the purchaser and the duplicate bound in a book of record for the purposes intended.

Sec. 5-23. Same—Claiming of vessel of floating structure by owner; payment of costs.

The owner of such impounded vessel or floating structure may take possession of such vessel or floating structure at any time prior to the time of sale provided herein, but such owner shall reimburse the village for all reasonable expenses for removal, storage, advertising and other expenses incurred as a result of the impoundment of such vessel or floating structure.

Sec. 5-24. Same—Reclamation of owner after sale.

The proceeds from the sale of any impounded vessel or floating structure shall not be expended or disbursed for ninety (90) days after the date of such sale. At any time during such period, the owner, upon providing proof of such ownership of such vessel or floating structure, evidenced by documentary written evidence, may recover back the proceeds of the sale, less all of the expenses incurred in regard to removal, storage, advertising and a commission of five (5) percent on the gross sales price of such vessel or floating structure for the cost of making such sale. If the owner fails to provide proof of ownership and recover back the proceeds of the sale in the time frame set forth herein, the proceeds of sale shall be forfeited to the village.

Sec. 5-25. Occupancy of live aboard boats, floating structure or vessels in village waterways.

It shall be unlawful of any person to occupy a live aboard boat, floating structure or vessel in any waterway except as specifically authorized by this article.

Sec. 5-26. Overnight anchoring or mooring limitation.

(a) *Prohibition.* No boat or vessel shall anchor or moor overnight within the jurisdictional waters of the village for a period of one (1) hour or more between one-half hour after sunset and one-half hour before sunrise for more than thirty (30) days within any consecutive six (6) month period.

(b) *Exemptions.* This section shall not apply to:

(1) Rowboats, kayaks, canoes, or other non-motorized small craft;

(2) Vessels lawfully anchored or moored overnight for the purpose of completing permitted marine construction, installation, or maintenance work authorized by applicable state or federal permits;

(3) Vessels anchored or moored at a marina, private dock or permitted mooring buoy meeting all applicable federal, state, and local requirements; and

(4) Vessels rendered immobile by emergency, mechanical failure, or hazardous weather conditions provided that the operator takes all steps to remove the vessel as soon as safely possible. In cases of emergency, the Police Chief or designee may authorize temporary anchoring or mooring of otherwise prohibited vessels for such time as reasonably necessary to correct the emergency condition or relocate the vessel to a lawful mooring location.

(c) *Notice of Violation.* Notice that a vessel is in violation of the prohibition on overnight anchoring or mooring established in this section shall be provided to the vessel owner, occupant, or operator as follows:

(1) If the vessel is occupied, written notice shall be provided directly to the vessel owner, occupant, or operator, unless such person refuses to accept the written notice, in which case the notice may be affixed to the vessel; or

(2) If the vessel is unoccupied or if occupancy cannot be determined, written notice shall be affixed to the vessel; and

(3) In addition to the provision of notice pursuant to subsection (1) or (2) above, written notice shall be sent by certified mail, return receipt requested, to registered owner and any lienholder of the vessel, irrespective of whether the vessel is occupied or unoccupied. The requirements of this subsection shall be deemed satisfied upon mailing of the notice. If no owner or lienholder can be identified after reasonable effort to ascertain such names and addresses, then this subjection (c)(3) shall not apply.

(d) *Enforcement and fines*.

(1) *Enforcement*. The provisions of this section may be enforced through all means available for enforcement of the village code including, but not limited to, the initiation of code enforcement proceedings pursuant to article IV, chapter 2 of this Code; removal, towing, impoundment, and disposal pursuant to the provisions of this article; and the initiation of appropriate legal action in a court of competent jurisdiction.

(2) *Fines*. The owner, occupant, and/or operator of a vessel found to be in violation of this section shall be subject to a fine of $250.00 a day for a first violation and a fine of up to $500.00 a day for each subsequent violation.

(e) *Removal, towing, and disposal*. If no cited party timely appeals a final order of violation entered by the code enforcement special magistrate pursuant to this section or if an appeal is taken and the magistrate's order is affirmed, the vessel may be removed, towed, and impounded by the village pursuant to the provisions of this article. If the vessel owner or lienholder has failed to retrieve the vessel from the impoundment facility, the village may dispose of the vessel in accordance with the provisions of this chapter or as otherwise authorized by law.

Section 3. The provisions of this Ordinance shall become and be made a part of the Code of the Village of North Palm Beach, Florida.

Section 4. If any section, paragraph, sentence, clause, phrase, or word of this Ordinance is for any reason held by a court of competent jurisdiction to be unconstitutional, inoperative, or void, such holding shall not affect the remainder of this Ordinance.

Section 5. All ordinances or parts of ordinances and resolutions or parts of resolutions in conflict herewith are hereby repealed to the extent of such conflict.

Section 6. This Ordinance shall take effect immediately upon adoption.

PLACED ON FIRST READING THIS _____ DAY OF _____, 2026.

PLACED ON SECOND, FINAL READING AND PASSED THIS _____ DAY OF _____, 2026.

(Village Seal)

_____
MAYOR

ATTEST:

_____
VILLAGE CLERK

APPROVED AS TO FORM AND
LEGAL SUFFICIENCY:

_____
VILLAGE ATTORNEY

VILLAGE OF NORTH PALM BEACH
OFFICE OF THE VILLAGE ATTORNEY

TO: Honorable Mayor and Council

THRU: Chuck Huff, Village Manager

FROM: Leonard G. Rubin, Village Attorney

DATE: February 12, 2026

SUBJECT: **ORDINANCE 1st Reading – Amending the Village's Zoning Code to Allow for the Limited Use of Artificial Turf for Industrial, Commercial, Mixed-Use, and Multi-Family Residential Projects**

Section 45-29 of the Village Code of Ordinances currently limits the use of artificial turf (or synthetic grass) to lots improved with a single-family or two-family dwelling. The Planning, Zoning and Adjustment Board previously considered a request by Austin Republic to install artificial turf in an outdoor seating area but was prevented from considering the request based on the current Code language. The Village Council subsequently discussed the issue and directed Staff to draft an Ordinance allowing the limited use of artificial turf for non-residential, mixed-use, and multi-family projects.

The attached Ordinance amends Section 45-36 of the Village Code to allow both the Village Council (when considering Planned Unit Development applications) and this Board (when considering Site Plan and Appearance Review applications) to approve the use of artificial turf for industrial, commercial, mixed-use, and multi-family projects subject to the following additional requirements:

- The use of artificial turf shall be limited to accessory use areas, including, but not limited to, putting greens, outdoor seating areas, playgrounds, and recreation areas.
- Artificial turf shall not be used as a substitute for any required landscaping and shall not be placed in rights-of-way, off-street parking areas, or perimeter buffers.
- Artificial turf shall simulate the color, appearance, and height of natural grass. The turf shall be anchored, with all seams nailed and glued.
- Drainage shall be provided to prevent excess runoff or pooling of water.
- Artificial turf shall be maintained in a green, fadeless condition free of dirt, mud, stains, weeds, tears, etc.

If an existing project within the Village wishes to incorporate artificial turf, the property owner is required to apply for a Site Plan amendment or Planned Unit Development amendment, as applicable.

The Ordinance was considered by the Planning, Zoning, and Adjustment Board at a public hearing held on January 6, 2026. The Board voted to recommend approval of the Ordinance by a vote of five to one, with the condition that applicants seeking to install artificial turf provide a description of the proposed materials, the product specifications and data sheets, and the installation details, including the treatment of transitions from existing hardscape and landscape

materials. This language has been added to the proposed Ordinance as subsection (4) (highlighted).

The attached Ordinance has been prepared by this office and reviewed for legal sufficiency.

There is no fiscal impact.

Recommendation:

Village Staff requests Council consideration on first reading of the attached Ordinance amending Section 45-36 of the Village Code to allow for the limited use of artificial turf for industrial, commercial, mixed-use and multi-family residential projects subject to various conditions in accordance with Village policies and procedures.

ORDINANCE NO. 2026-___

AN ORDINANCE OF THE VILLAGE COUNCIL OF THE VILLAGE OF NORTH PALM BEACH, FLORIDA, AMENDING APPENDIX C (CHAPTER 45), "ZONING," OF THE VILLAGE CODE OF ORDINANCES BY AMENDING ARTICLE III, "DISTRICT REGULATIONS," SECTION 45-36, "GENERAL PROVISIONS," TO ALLOW FOR THE LIMITED USE OF ARTIFICIAL TURF FOR INDUSTRIAL, COMMERCIAL, MIXED-USE, AND MULTI-FAMILY RESIDENTIAL PROJECTS; PROVIDING FOR CODIFICATION; PROVIDING FOR SEVERABILITY; PROVIDING FOR CONFLICTS; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the Village Code of Ordinance currently limits the use of artificial turf (also known as synthetic grass) to lots improved with single-family or two-family dwellings; and

WHEREAS, the Village Council wishes to allow the limited accessory use of artificial turf in industrial, commercial, mixed-use, and multi-family residential projects, subject to additional requirements; and

WHEREAS, the Planning, Zoning and Adjustment Board held a public hearing on this Ordinance and provided its recommendation to the Village Council; and

WHEREAS, the Village Council determines that the adoption of this Ordinance is in the best interests of the public health, safety, and welfare.

NOW, THEREFORE, BE IT ORDAINED BY THE VILLAGE COUNCIL OF THE VILLAGE OF NORTH PALM BEACH, FLORIDA as follows:

Section 1. The foregoing recitals are ratified as true and correct and are incorporated herein.

Section 2. The Village Council hereby amends Article III, "District Regulations," of Appendix C (Chapter 45) of the Village Code of Ordinances by amending Section 45-36 to read as follows (additional language is underlined):

ARTICLE III. – DISTRICT REGULATIONS

* * *

Sec. 45-36. – General provisions.

* * *

W. *Use of artificial turf/synthetic grass in industrial, commercial, mixed-use, and multi-family residential projects.*

(1) Notwithstanding any other provision of this chapter, the planning, zoning and adjustment board, when considering site plan and appearance review applications, and the village council, when considering planned unit development applications, may allow the use of artificial turf (also referred to a synthetic grass) for industrial, commercial, mixed-use, and multi-family residential projects subject to the requirements of this subsection.

(2) The use of artificial turf shall be limited to accessory use areas, including but not limited to:

a. putting greens;

b. outdoor seating areas;

c. playgrounds; and

d. recreation areas.

(3) Artificial turf shall not be used as a substitute for any landscape requirement of this chapter and shall not be placed in rights-of-way, off-street parking areas, or perimeter buffers.

(4) All applications for the installation of artificial turf pursuant to this section shall be accompanied by a description of the proposed material, the product specifications and data sheets, and the installation details, including the treatment of transitions from existing hardscape and landscape materials.

(5) All artificial turf shall simulate the color, appearance, and height of natural turf, grass, or sod and shall be anchored to ensure that the turf withstands the effects of wind. All seams shall be nailed and glued, and edges shall be trimmed to fit against all regular and irregular edges. Proper drainage shall be provided for all artificial turf installations to prevent excess runoff or the pooling of water.

(6) All artificial turf shall be maintained in a green, fadeless condition free of dirt, mud, stains, weeds, debris, tears, holes, and impressions. Maintenance shall include, but not be limited to, cleaning, brushing and debris removal; repairing depressions and ruts to maintain a visually-level surface; and eliminating odors, flat or matted areas, weeds, and evasive roots.

(7) Any existing industrial, commercial, mixed-use, or multi-family residential project seeking to incorporate artificial turf pursuant to

this subsection shall apply for a site plan amendment or planned unit development amendment, as applicable.

* * *

Section 3. The provisions of this Ordinance shall become and be made a part of the Code of the Village of North Palm Beach, Florida.

Section 4. If any section, paragraph, sentence, clause, phrase, or word of this Ordinance is for any reason held by a court of competent jurisdiction to be unconstitutional, inoperative, or void, such holding shall not affect the remainder of this Ordinance.

Section 5. All ordinances or parts of ordinances and resolutions or parts of resolutions in conflict herewith are hereby repealed to the extent of such conflict.

Section 6. This Ordinance shall take effect immediately upon adoption.

PLACED ON FIRST READING THIS ____ DAY OF _____, 2026.

PLACED ON SECOND, FINAL READING AND PASSED THIS___ DAY OF _____ _____, 2026.

(Village Seal) _____
MAYOR

ATTEST:

_____
VILLAGE CLERK

APPROVED AS TO FORM AND
LEGAL SUFFICIENCY:

_____
VILLAGE ATTORNEY

VILLAGE OF NORTH PALM BEACH
PUBLIC WORKS DEPARTMENT

TO: Honorable Mayor and Council

THRU: Chuck Huff, Village Manager

FROM: James Anthony, Facilities Manager/Public Works

DATE: February 12, 2026

SUBJECT: **RESOLUTION** – Approving a Contract with S&R Engineering Group, LLC d/b/a Air Changes Mechanical for replacement of the Village Library HVAC equipment (RFP-2026-PW-02).

Village Staff seeks Council approval for the attached Resolution accepting a proposal from S&R Engineering Group, LLC d/b/a Air Changes Mechanical to purchase and install a new HVAC system at the Village Library and authorizing the execution a Contract for such services.

Background:

The current HVAC equipment was originally installed in 1969. Approximately three (3) months ago, this equipment failed. Due to its age and the inability to source parts, replacement became the only reasonable course of action. At this time, the HVAC needs of the library are being met by the use of a temporary unit placed on the southwest side of the building.

The Village issued a Request for Proposals (RFP-2026-PW-02). The Evaluation Committee, consisting of the Assistant Director of Public Works, the Mechanical Systems Coordinator, and the Facilities Manager), reviewed each of the submitted bid proposals on January 23, 2026 and scored them in five categories, with each of the following categories worth 20 points (for a maximum score of 100):

1. Proposal Pricing
2. Personnel Qualifications
3. Project Management Plan
4. Past Performance/Client References
5. Workload and Contract Litigation

Cost and scoring were as follows:

VENDOR	COST	SCORE
AIR CHANGES MECHANICAL	$180,692.00	83
PRECISION AIR	$227,780.00	68
ADVANCED ROOFING	$211,270.00	66
JACARANDA AIR	$346,167.00	46
KER CONSTRUCTION	$324,000.00	20

Purchasing:

The proposal by Air Changes Mechanical scored the highest of all submissions during our evaluation. The new air handlers will be corrosion resistant and contain non-proprietary parts. Although the equipment involved is very straight forward, the actual installation will be somewhat complicated. This is due to the fact that four (4) substantially sized units must be installed inside different ceiling level spaces. Village Staff is requesting a 20% project contingency:

Description	Amount
Equipment & Installation	$180,692.00
20% Contingency	$36,138.00
Total w/ Contingency	**$216,830.00**

Account Information:

Fund	Department	Account Number	Account Description	Total (including contingency)
Infrastructure Surtax	Library	I7927-66210	Construction & Major Renovation	$216,830.00

The attached Resolution and Contract have been prepared and/or reviewed for legal sufficiency by the Village Attorney.

Recommendation:

Village Staff requests Council consideration and approval of the attached Resolution approving the purchase of a new HVAC system for the NPB Library from S&R Engineering Group, LLC d/b/a Air Changes Mechanical at a total cost not to exceed $180,692.00 (with a total project budget of $216,830.00 including contingency), with funds expended from Infrastructure Surtax Account No. I7927-66210 (Library – Construction & Major Renovation) and authorizing the Mayor and Village Clerk to execute a Contract for this purchase in accordance with Village policies and procedures.

RESOLUTION 2026-____

A RESOLUTION OF THE VILLAGE COUNCIL OF THE VILLAGE OF NORTH PALM BEACH, FLORIDA ACCEPTING A PROPOSAL FROM S&R ENGINEERING GROUP, LLC D/B/A AIR CHANGES MECHANICAL FOR THE REPLACEMENT OF THE VILLAGE LIBRARY HVAC EQUIPMENT AND AUTHORIZING THE MAYOR AND VILLAGE CLERK TO EXECUTE A CONTRACT FOR SUCH SERVICES; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Village Staff issued a Request for Proposals (RFP-2026-PW-02) for the replacement of HVAC equipment at the Village Library; and

WHEREAS, Village Staff recommended accepting the highest-ranked proposal submitted by S&R Engineering Group, LLC d/b/a Air Changes Mechanical; and

WHEREAS, the Village Council determines that the adoption of this Resolution is in the best interests of the Village and its residents.

NOW, THEREFORE, BE IT RESOLVED BY THE VILLAGE COUNCIL OF THE VILLAGE OF NORTH PALM BEACH, FLORIDA as follows:

Section 1. The foregoing recitals are ratified as true and incorporated herein.

Section 2. The Village Council hereby accepts the proposal submitted by S&R Engineering Group, LLC d/b/a Air Changes Mechanical for the replacement of the HVAC equipment at the Village Library at a cost not to exceed $180,692.00, with funds expended from Infrastructure Surtax Account No. I7927-66210 (Library – Construction and Major Renovation). Including contingency, the total project budget shall be $216,830.00. The Village Council authorizes the Mayor and Village Clerk to execute a Contract for such services, a copy of which is attached hereto and incorporated herein.

Section 3. This Resolution shall take effect immediately upon its adoption.

PASSED AND ADOPTED THIS ____ DAY OF _____, 2026.

(Village Seal)

_____
MAYOR

ATTEST:

_____
VILLAGE CLERK

CONTRACT

This Contract is made as of the _____day of _____, 2026, by and between the VILLAGE OF NORTH PALM BEACH, a municipal corporation organized and existing under the laws of the State of Florida, hereinafter referred to as the VILLAGE, and S&R ENGINEERING GROUP, LLC, a Florida limited liability company, d/b/a Air Changes Mechanical, hereinafter referred to as the VENDOR.

In consideration of the promises and mutual covenants herein contained and other good and valuable consideration, the receipt and sufficiency of which is acknowledged by both parties, the VILLAGE and VENDOR hereby agree as follows:

SECTION 1: SCOPE OF SERVICES OF THE VENDOR.

The Scope of Work is for the replacement of the Village Library HVAC System in accordance with the Request for Proposals issued by the Village (RFP-2026-PW-02), and VENDOR's Bid Proposal submitted in response to the Request for Proposals and its Response to the Request for Information, both of which are incorporated herein by reference.

SECTION 2: TERM OF CONTRACT.

A. The term of this Contract shall commence upon the VILLAGE's issuance of a Notice to Proceed and shall remain in effect until all goods are delivered and all services performed, unless earlier terminated in accordance with Section 7. Delivery and installation shall be coordinated by the VILLAGE and VENDOR, provided, however, that all services shall be completed within ninety (90) days of the issuance of a Notice to Proceed.

B. VENDOR shall not be entitled to an increase in the agreed to compensation resulting from this Contract or payment or compensation of any kind from the VILLAGE for direct, indirect, consequential, impact or other costs, expenses, or damages.

SECTION 3: VILLAGE'S REPRESENTATIVE.

Unless otherwise specified by the VILLAGE, the VILLAGE's representative shall be the VILLAGE's Facilities Manager. The Village Manager or the Village Representative shall have the right at all reasonable times during the term of this Contract to inspect or otherwise evaluate the work being performed thereunder and the premises on which it is being performed.

SECTION 4: COMPENSATION AND METHOD OF PAYMENT**.**

A. The VILLAGE agrees to compensate the VENDOR for providing the required services to replace the Village Library HVAC System and for which Purchase Orders are issued in accordance with VENDOR's Bid Proposal, which is attached hereto and incorporated herein by reference.

B. In order for both parties herein to close their books and records, VENDOR will clearly state "final invoice" on the VENDOR's final/last billing to the VILLAGE. This certifies that all goods and services have been properly performed and all charges have been invoiced to

the VILLAGE. Since this account will thereupon be closed, any additional charges if not properly included in this final invoice are waived by the VENDOR. The VILLAGE will not be liable for any invoice from the VENDOR submitted thirty (30) days after the provision of all goods and services.

SECTION 5: INDEMNIFICATION.

A. The VENDOR shall indemnify and save harmless and defend the VILLAGE, its agents, servants, and employees from and against any and all claims, liability, losses, and/or cause of action which may arise from any negligent act or omission of the VENDOR, its agents, servants, or employees in the performance of services under this Contract.

B. The VENDOR further agrees to indemnify, save harmless and defend the VILLAGE, its agents, servants, and employees from and against any claim, demand, or cause of action of whatsoever kind or nature arising out of any conduct or misconduct of the VENDOR its agents, servants, or employees not included in the paragraph above and for which the VILLAGE, its agents, servants, or employees are alleged to be liable.

C. Nothing contained in this Contract shall create a contractual relationship with or a cause of action in favor of a third party against either the VILLAGE or VENDOR, nor shall this Contract be construed a waiver of sovereign immunity beyond the waiver provided in §768.28, Florida Statutes.

SECTION 6: PERSONNEL.

A. The VENDOR represents that it has, or will secure at its own expense, all necessary personnel required to perform the services under this Contract.

B. All of the services required hereunder shall be performed by the VENDOR or under its supervision, and all personnel engaged in performing the services shall be fully qualified and, if required, authorized, or permitted under state and local law to perform such services.

C. All of the VENDOR's personnel (and all sub-contractors OR sub-consultants) while on VILLAGE premises, will comply with all VILLAGE requirements governing conduct, safety, and security.

SECTION 7: TERMINATION.

This Contract may be cancelled by the VENDOR upon thirty (30) days prior written notice to the VILLAGE's representative in the event of substantial failure by the VILLAGE to perform in accordance with the terms of this Contract through no fault of the VENDOR. It may also be terminated, in whole or in part, by the VILLAGE without cause upon thirty (30) days written notice to the VENDOR. The VILLAGE may also terminate this Contract with written notice of cause to the VENDOR, who fails to cure such cause within ten (10) days of the receipt of the VILLAGE's notice. Unless the VENDOR is in breach of this Contract, the VENDOR shall be paid for services rendered to the VILLAGE's satisfaction through the date of termination. After receipt of a Termination Notice and except as otherwise directed by the VILLAGE, the VENDOR

shall:

A. Stop work on the date and to the extent specified;

B. Terminate and settle all orders and subcontracts relating to the performance of the terminated work;

C. Transfer all work in progress, completed work, and other materials related to the terminated work to the VILLAGE; and

D. Continue and complete all parts of the work that have not been terminated.

SECTION 8: FEDERAL AND STATE TAX.

The VILLAGE is exempt from payment of Florida State Sales and Use Tax. Unless purchased directly by the VILLAGE, the VENDOR shall not be exempted from paying sales tax to its suppliers for materials used to fill contractual obligations with the VILLAGE, nor is the VENDOR authorized to use the VILLAGE's Tax Exemption Number in securing such materials.

SECTION 9: INSURANCE.

A. Prior to commencing any work, the VENDOR shall provide certificates evidencing insurance coverage as required in the Request of Proposals. All insurance policies shall be issued by companies authorized to do business under the laws of the State of Florida. The Certificates shall clearly indicate that the VENDOR has obtained insurance of the type, amount, and classification as required for strict compliance with this Section and that no material change or cancellation of the insurance shall be effective without thirty (30) days' prior written notice to the VILLAGE's representative. Failure to comply with the foregoing requirements shall not relieve the VENDOR of its liability and obligations under this Contract.

B. The parties to this Contract shall carry Workers' Compensation Insurance and Employer's Liability Insurance for all employees as required by Florida Statutes. In the event that a party does not carry Workers' Compensation Insurance and chooses not to obtain same, then such party shall in accordance with Section 440.05, Florida Statutes, apply for and obtain an exemption authorized by the Department of Insurance and shall provide a copy of such exemption to the VILLAGE.

C. All insurance, other than Worker's Compensation, to be maintained by the VENDOR shall specifically include the VILLAGE as an Additional Insured.

SECTION 10: SUCCESSORS AND ASSIGNS.

The VILLAGE and the VENDOR each binds itself and its partners, successors, executors, administrators and assigns to the other party of this Contract and to the partners, successors, executors, administrators and assigns of such other party, in respect to all covenants of this Contract. Except as above, neither the VILLAGE nor the VENDOR shall assign, sublet,

convey, or transfer its interest in this Contract without the written consent of the other. Nothing herein shall be construed as creating any personal liability on the part of any officer or agent of the VILLAGE which may be a party hereto, nor shall it be construed as giving any rights or benefits hereunder to anyone other than the VILLAGE and the VENDOR.

SECTION 11: DISPUTE RESOLUTION, LAW, VENUE AND REMEDIES.

This Contract shall be governed by the laws of the State of Florida. Any and all legal action necessary to enforce the Contract will be held in Palm Beach County. No remedy herein conferred upon any party is intended to be exclusive of any other remedy, and each and every such remedy shall be cumulative and shall be in addition to every other remedy given hereunder or now or hereafter existing at law or in equity or by statute or otherwise. No single or partial exercise by any party of any right, power, or remedy hereunder shall preclude any other or further exercise thereof. The VILLAGE and the VENDOR **knowingly, voluntarily, and intentionally waive any right they may have to trial by jury with respect to any litigation arising out of or in connection with this Contract.**

SECTION 12: INDEPENDENT CONTRACTOR RELATIONSHIP.

The VENDOR is, and shall be, in the performance of all Services under this Contract, an Independent Contractor, and not an employee, agent, or servant of the VILLAGE. All persons engaged in any of the Services performed pursuant to this Contract shall at all times, and in all places, be subject to the VENDOR'S sole direction, supervision, and control. The VENDOR shall exercise control over the means and manner in which it and its employees perform the Services.

SECTION 13: ACCESS AND AUDITS.

The VENDOR shall maintain adequate records to justify all charges, expenses and costs incurred in estimating and performing the Services for at least three (3) years after completion of this Contract. The VILLAGE shall have access to such books, records and documents as required in this section for the purpose of inspection or audit during normal business hours, at the VENDOR's place of business. In no circumstances will VENDOR be required to disclose any confidential or proprietary information regarding its products and service costs.

SECTION 14: NONDISCRIMINATION.

The VENDOR warrants and represents that all of its employees are treated equally during employment without regard to race, color, religion, disability, sex, age, national origin, ancestry, marital status, or sexual orientation.

SECTION 15: ENFORCEMENT COSTS.

If any legal action or other proceeding is brought for the enforcement of this Contract, or because of an alleged dispute, breach, default or misrepresentation in connection with any provisions of this Contract, the successful or prevailing party or parties shall be entitled to recover reasonable attorney's fees, court costs and all expenses (including taxes) even if not taxable as court

awarded costs (including, without limitation, all such fees, costs and expenses incident to appeals), incurred in that action or proceeding, in addition to any other relief to which such party or parties may be entitled.

SECTION 16: SEVERABILITY.

If any term or provision of this Contract, or the application thereof to any person or circumstances shall, to any extent, be held invalid or unenforceable, to remainder of this Contract, or the application of such terms or provision, to persons or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected, and every other term and provision of this Contract shall be deemed valid and enforceable to the extent permitted by law.

SECTION 17: MODIFICATIONS OF WORK.

A. The VILLAGE reserves the right to make changes in the work, including alterations, reductions therein or additions thereto. Upon receipt by the VENDOR of the VILLAGE's notification of a contemplated change, the VENDOR shall, in writing: (1) provide a detailed estimate for the increase or decrease in cost due to the contemplated change, (2) notify the VILLAGE of any estimated change in the completion date, and (3) advise the VILLAGE if the contemplated change shall affect the VENDOR's ability to meet the completion dates or schedules of this Contract.

B. If the VILLAGE so instructs in writing, the VENDOR shall suspend work on that portion of the work affected by the contemplated change, pending the VILLAGE's decision to proceed with the change.

C. If the VILLAGE elects to make the change, the VILLAGE shall initiate a Change to the Purchase Order and the VENDOR shall not commence work on any such change until such revised Purchase Order is received.

SECTION 18: PUBLIC ENTITY CRIMES.

VENDOR acknowledges and agrees that a person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals or replies on leases of real property to a public entity; may not be awarded or perform work as a VENDOR, supplier, sub-VENDOR or VENDOR under a contract with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, Florida Statues, for CATEGORY TWO for a period of thirty-six (36) months following the date of being placed on the convicted vendor list. The VENDOR will advise the VILLAGE immediately if it becomes aware of any violation of this statute.

SECTION 19: PROTECTION OF WORK AND PROPERTY.

A. The VENDOR shall continuously maintain adequate protection of all work from

damage and shall protect the VILLAGE's property from injury or loss arising in connection with the Contract. Except for any such damage, injury, or loss, except that which may be directly due to errors caused by the VILLAGE or employees of the VILLAGE, the VENDOR shall provide any necessary materials to maintain such protection.

B. The VENDOR will also take every necessary precaution to ensure the safety of the VILLAGE, public and other guests and invitees thereof at or near the areas where work is being accomplished during and throughout the completion of all work.

SECTION 20: WARRANTY/GUARANTY.

VENDOR warrants that its goods and services under this Contract will be free of defects in materials and workmanship for a period of one (1) year following the provision of said goods and services.

SECTION 21: COMPLIANCE WITH LAWS.

VENDOR shall, in performing the services contemplated by this Contract, faithfully observe and comply with all federal, state, and local laws, ordinances and regulations that are applicable to the services to be rendered under this Contract.

SECTION 22: NOTICE.

All notices required in this Contract shall be sent by certified mail, return receipt requested and if sent to the VILLAGE shall be mailed to:

Village of North Palm Beach
Village Manager
501 U.S. Highway One
North Palm Beach, FL 33408

and if sent to the VENDOR shall be mailed to:

S&R Engineering Group, LLC d/b/a Air Changes Mechanical
Ricardo Ardila, Managing Partner
1365 N.W. 98th Court, Unit 4
Doral, FL 33172

SECTION 23: ENTIRETY OF CONTRACTUAL AGREEMENT.

The VILLAGE and the VENDOR agree that this Contract sets forth the entire agreement between the parties, and that there are no promises or understandings other than those stated herein. None of the provisions, terms and conditions contained in this Contract may be added to, modified, superseded, or otherwise altered, except by written instrument executed by the parties hereto. In the event of a conflict between this Contract and the VILLAGE's Request for Proposals and the VENDOR's Proposal, this Contract shall take precedence with the VILLAGE's Request for

Qualifications taking precedence over the VENDOR's proposal. All such documents shall be read in a manner so as to avoid a conflict.

SECTION 24: WAIVER.

Failure of a party to enforce or exercise any of its right(s) under this Contract shall not be deemed a waiver of that parties' right to enforce or exercise said right(s) at any time thereafter.

SECTION 25: PREPARATION.

This Contract shall not be construed more strongly against either party regardless of who was more responsible for its preparation.

SECTION 26: SURVIVABILITY.

Any provision of this Contract which is of a continuing nature or imposes an obligation which extends beyond the term of this Contract shall survive its expiration or earlier termination.

SECTION 27: WAIVER OF SUBROGATION.

VENDOR hereby waives any and all rights to Subrogation against the VILLAGE, its officers, employees, and agents for each required policy. When required by the insurer, or should a policy condition not permit an insured to enter into a pre-loss agreement to waive subrogation without an endorsement, then VENDOR shall agree to notify the insurer and request the policy be endorsed with a Waiver of Transfer of Rights of Recovery Against Others, or its equivalent.

This Waiver of Subrogation requirement shall not apply to any policy, which a condition to the policy specifically prohibits such an endorsement, or voids coverage should VENDOR enter into such an agreement on a pre-loss basis.

SECTION 28: INSPECTOR GENERAL.

VENDOR is aware that the Inspector General of Palm Beach County has the authority to investigate and audit matters relating to the negotiation and performance of this Contract and in furtherance thereof, may demand and obtain records and testimony from VENDOR. VENDOR understands and agrees that in addition to all other remedies and consequences provided by law, the failure of VENDOR to fully cooperate with the Inspector General when requested may be deemed by the VILLAGE to be a material breach of this Contract justifying its termination.

SECTION 29: INVOICING AND PAYMENT:

Payment for any and all invoice(s) that may arise as a result of a Contract or Purchase Order issued pursuant to this Request for Qualifications shall minimally meet the following conditions to be considered as a valid payment request:

A. A timely submission of a properly certified invoice(s) in strict accordance with the price(s) and delivery elements as stipulated in the Contract or Purchase Order document, and submitted to:

Village of North Palm Beach
501 U.S. Highway One
North Palm Beach, Florida 33408
ATTN: Accounts Payable

B. All invoices submitted shall consist of an "original" invoice which clearly references the subject Contract or Purchase Order Number; provide a sufficient salient description to identify the good(s) and/or service(s) for which payment is requested; include and be clearly marked as "partial," "complete" or "final invoice."

C. The invoice shall contain the Proposer's Federal Employer Identification Number.

D. All payments made by the Village pursuant to the Contract Documents shall be in accordance with Florida's Prompt Payment Act (for non-construction).

SECTION 30: ADDITIONAL SERVICES;

If during the contractual period covered by the agreement, additional services are needed, VENDOR may, at the option of the VILLAGE, be engaged to perform these services under the terms of this Contract.

SECTION 31: PUBLIC RECORDS.

IF VENDOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO VENDOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE VILLAGE'S CUSTODIAN OF PUBLIC RECORDS AT: (561) 841-3355; NPBCLERK@VILLAGE-NPB.ORG; OR 501 U.S. HIGHWAY ONE, NORTH PALM BEACH, FL 33408.

In performing services pursuant to this Contract, VENDOR shall comply with all relevant provisions of Chapter 119, Florida Statutes. As required by Section 119.0701, Florida Statutes, VENDOR shall:

1. Keep and maintain public records required by the VILLAGE to perform the service.

2. Upon request from the VILLAGE's custodian of public records, provide the VILLAGE with a copy the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes, or as otherwise provided by law.

3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the

Contract term and following completion of the Contract if the VENDOR does not transfer the records to the VILLAGE.

4. Upon completion of the Contract, transfer, at no cost, to the VILLAGE all public records in possession of VENDOR or keep and maintain public records required by the VILLAGE to perform the services. If VENDOR transfers all public records to the VILLAGE upon completion of the Contract, VENDOR shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If VENDOR keeps and maintains public records upon completion of the Contract, VENDOR shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the VILLAGE, upon request from the VILLAGE's custodian of public records, in a format that is compatible with the information technology systems of the VILLAGE.

SECTION 32. PROHIBITION AGAINST CONTINGENT FEES.

VENDOR warrants that it has not employed or retained any company or person, other than a bona fide employee working solely for VENDOR, to solicit or secure this Contract and that VENDOR has not paid, or agreed to pay, any person, company, corporation, individual or firm, other than a bona fide employee working solely for VENDOR, any fee, commission, percentage, gift, or other consideration contingent upon, or resulting from, aware or making of the Contract. For the breach or violation of this provision, the VILLAGE shall have the right to terminate this Contract and its sole discretion, without liability, and to deduct from the Contract price, or otherwise recover, the full amount of such fee, commission, percentage, or consideration.

SECTION 33. E-VERIFY.

Pursuant to Section 448.095(5), Florida Statutes, VENDOR shall:

A. Register with and use the E-Verify system to verify the work authorization status of all newly hired employees pursuant to Section 448.095(2), Florida Statutes, and require all subcontractors do the same;

B. Secure an affidavit from all subcontractors stating that the subcontractor does not employ, contract with, or subcontract with an "unauthorized alien" as defined in Section 448.095(1)(f), Florida Statutes;

C. Maintain copies of all subcontractor affidavits for the duration of this Contract and provide the same to the VILLAGE upon request;

D. Comply fully, and ensure all subcontractors comply fully, with Section 448.095, Florida Statutes;

E. Be aware that a violation of Section 448.09(1), Florida Statutes (Unauthorized aliens; employment prohibited), shall be grounds for termination of this Contract;

F. Be aware that a violation of Section 448.095(5) by a subcontractor, and not VENDOR, shall be grounds for the VILLAGE to order VENDOR immediately terminate the contract

with the subcontractor; and

G. Be aware that if the VILLAGE terminates this Contract under Section 448.095(5)(c), Florida Statues, VENDOR may not be awarded a contract for at least one year after the date on which the Contract is terminated and will be liable for any additional costs incurred by the VILLAGE as a result of the termination of the Contract.

IN WITNESS WHEREOF, the VILLAGE and VENDOR hereto have made and executed this Contract as of the day and year first above written.

S&R ENGINEERING GROUP, LLC
D/B/A AIR CHANGES MECHANICAL

By: _____

Print Name: _____

Position: _____

VILLAGE OF NORTH PALM BEACH

BY: _____
MAYOR

ATTEST:

BY: _____
VILLAGE CLERK

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:

BY: _____
VILLAGE ATTORNEY

REQUEST FOR PROPOSALS
RFP-2026-PW-02

Library HVAC Replacement

Village of North Palm Beach
501 US Highway One
North Palm Beach, Florida 33408-4906

November 7, 2025

Village of North Palm Beach

REQUEST FOR PROPOSALS
RFP-2026-PW-02

Library HVAC Replacement

The Village of North Palm Beach is seeking Proposals from qualified firms to provide services for the replacement of the Village Library HVAC system.

Request for Proposal documents are available on the Village of North Palm Beach website at http://www.village-npb.org/bids.aspx , www.demandstar.com, NPB Palm Beach County, FL Legal Notices or by contacting the Village Public Work's office at (561) 561-691-3440.

Sealed Proposals must be clearly marked **"RFP-2026-PW-02, "Library HVAC Replacement"** and delivered to the Village Clerk at 501 U.S. Highway One, North Palm Beach, Florida, 33408. The deadline for submission of Proposals is **Monday, December 15, 2025 at 3:00 p.m. local time.** Proposals submitted after the established deadline will not be accepted and will be returned to the sender unopened.

There will be a mandatory Pre-Proposal meeting on Tuesday, November 18, 2025 at 8:00 a.m. local time at the NPB Library, 303 Anchorage Drive, North Palm Beach, FL 33408. Failure to attend this meeting may result in your submission being deemed ineligible.

It is the responsibility of the Proposer to ensure all pages are included in the submission. All Proposers are advised to closely examine the request for qualification documents. Any questions regarding the completeness or substance of the request for proposal documents or the scope of services must be submitted in writing via email to James Anthony, Facilities Manager, janthony@village-npb.org

The Village reserves the right to accept or reject any or all Proposal, in whole or in part, with or without cause, to waive any irregularities and/or technicalities, and to select the Proposer that it deems will best serve the interests of the Village.

VILLAGE OF NORTH PALM BEACH, FLORIDA
Chuck Huff, Village Manager

Publish: Palm Beach County Legal Notices Website
Date: 11/7/25

Publish: DemandStar
Date: 11/7/25

Publish: Village of NPB Website
Date: 11/7/25

1 INSTRUCTIONS TO PROPOSERS - RFP

1.1 GENERAL INFORMATION, PURPOSE, & SCOPE

The Request for Proposals ("RFP") Documents consist of:

Instructions to Proposers and Terms and Conditions
Scope of Work/Specifications
Drug Free Workplace Certification;
Sworn Statement on Public Entity Crimes;
Scrutinized Vendor Certification
Proposal Form;
Standard Contract for Services;
Any Addenda issued prior to the date designated for receipt of proposal.

Complete sets of the RFP Documents shall be used in preparing the submitted Proposal. The Village of North Palm Beach ("Village") does not assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets. **The Proposal Form is to be filled in, signed, and all required documents are to be placed in a sealed envelope bearing the words "RFP-2026-PW-02, Library HVAC Replacement" on the outside and mailed or hand-delivered to the Village Clerk on or before the specified time and date.** Each Proposer shall submit one (1) original, five (5) copies, and (1) digital copy of its Proposal.

It is the Proposer's sole responsibility to ensure that its Proposal is received by the Village Clerk on or before the closing date and time. The Village shall in no way be responsible for delays caused by any other occurrence. Proposals submitted by e-mail, telephone, telegram, or facsimile will not be accepted.

The Proposal opening time shall be scrupulously observed. Under no circumstances shall Proposals delivered after the time specified be considered. Such Proposals shall be returned unopened.

All responses to this RFP (hereinafter referred to as "Proposals") must be typewritten or filled in with pen and ink. Proposals by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed or the signature attested to by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.

Proposals by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.

All corrections made to the Proposal price must be initialed.

Proposers shall not be allowed to modify their Proposals after the opening time and date.

Pursuant to Section 119.071(1)(b)2, Florida Statutes, sealed Proposals remain exempt from public disclosure until such time as the Village provides notice of its intended decision to accept a Proposal or for thirty (30) days after opening, whichever is earlier.

The submission of a Proposal shall constitute an incontrovertible representation by the Proposer that the RFP Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the requested services.

1.2 CONTACT PERSON

For information concerning this RFP, please contact:

Via Mail: James Anthony
Facilities Manager
Village of North Palm Beach, 501 US Highway 1
North Palm Beach, FL 33408
Via E-Mail: janthony@village-npb.org

CONTACT WITH THE VILLAGE'S ELECTED OFFICIALS OR VILLAGE PERSONNEL OTHER THAN THE CONTACT PERSON REGARDING THIS REQUEST FOR PROPOSALS SHALL BE GROUNDS FOR DISQUALIFICATION AND ELIMINATION FROM THE SELECTION PROCESS.

1.3 ACCEPTANCE/REJECTION

The Village reserves the right to accept or to reject any or all Proposals in whole or in part, with or without cause, to waive any informalities and technicalities and to make the award to the Proposer, who in the sole opinion of the Village, is the lowest responsive, responsible Proposer and whose Proposal will be most advantageous to the Village. The Village reserves the right to reject the Proposal of any Proposer who has previously failed in the proper performance of an award or to deliver on time contracts of a similar nature or who is not in a position to perform properly under this award. The Village reserves the right to re-issue the Request for Proposals.

1.4 ADDITIONAL TERMS AND CONDITIONS

No additional terms and conditions included with the Proposal shall be evaluated or considered and any and all such additional terms and conditions shall have no force and effect and are inapplicable to this RFP, whether submitted either purposely through intent or design or inadvertently appearing separately in transmittal letters, specifications, literature, price lists, or warranties. It is understood and agreed that the terms and conditions in this RFP are the only conditions applicable to the Proposal and the Proposer's authorized signature affixed to the Proposer acknowledgment form attests to this.

1.5 INTERPRETATIONS, CLARIFICATIONS AND ADDENDA

No oral interpretations will be made to any Proposer as to the meaning of the RFP Documents.

Any inquiry or request for interpretation received seven (7) or more days prior to the date fixed for opening of Proposals will be given consideration. All such changes and interpretations will be made in writing in the form of an addendum and, if issued, will be mailed or sent by available means to all known prospective Proposers prior to the established Proposal opening date. Submission of a Proposal constitutes acknowledgment by the Proposer of the receipt of addenda. All addenda are a part of the RFP Documents, and each Proposer will be bound by such addenda, whether or not received by him/her. It is the responsibility of each Proposer to verify that he/she received all addenda issued before Proposals are opened. Village personnel lack authorization to interpret or give information as to Proposal requirements in addition to that which is contained in the written RFP Documents and addenda.

1.6 PUBLIC RECORDS

Any material submitted in response to this RFP will become a public record and shall be subject to public disclosure consistent with the Florida Public Records Law (Part 119, Florida Statutes), except as may be provided by the Public Records Law or other applicable state or federal law. If a Proposer contends that part of its Proposal is not subject to disclosure, the Proposer shall identify specifically any information contained in the Proposal that the Proposer considers confidential or otherwise exempt from disclosure under the Public Records Law, and the Proposer shall cite the specific section of the law creating the exemption for such information. The Village reserves its right to make all determinations concerning the applicability of the Florida Public Records Law to any documents submitted in response to this RFP. The Village shall have no liability to a Proposer for the public disclosure of any material submitted to the Village in response to this RFP, and the Proposer shall defend, indemnify, and hold harmless the Village and the Village's officers, employees, and agents, against any loss or damages incurred by any person or entity as a result of the Village's treatment of records as public records.

1.7 COST OF PROPOSAL PREPARATION

Proposers assume all risks and expenses associated with the preparation and submittal of Proposals in response to this RFP. The Village shall not be liable for any expenses incurred by Proposers when responding to this RFP, including but not limited to the cost of making presentations to the Village.

1.8 PROPERTY OF THE VILLAGE

All materials submitted in response to this RFP become the property of the Village. The Village has the right to use any or all ideas presented in any response to this RFP, whether amended or not, and disqualification or rejection of a Proposal does not affect this right.

1.9 LITIGATION CONCERNING THE RFP

By submitting a Proposal, a Proposer agrees that (a) any and all legal actions necessary to interpret or enforce this RFP shall be governed by the laws of the State of Florida; and (b) the exclusive venue for any litigation concerning this RFP shall be the state and federal courts in and for Palm Beach County, Florida.

1.10 CONTRACTUAL AGREEMENT

The resulting Contract shall be in substantially the same form as the Standard Contract attached to this RFP. If a Proposer has any objections to any of the terms and conditions of the Standard Contract, the Proposer shall list those objections as an attachment to its Proposal. Otherwise, by submitting its Proposal, Proposer is agreeing to enter into the Contract if selected and the terms and conditions will be non-negotiable unless otherwise agreed to in writing by the Village

The order of contract precedence shall be the Contract and then RFP Documents and then Proposal. Any and all legal action necessary to enforce the Contract will be held in Palm Beach County and the Contract will be interpreted according to the laws of Florida.

1.11 FEDERAL AND STATE TAX

The Village is exempt from Federal and State taxes for tangible personal property. However, vendors or contractors doing business with the Village shall not be authorized to use the Village's Tax Exemption Number in securing materials for performance of the work associated with this Project.

1.12 PUBLIC ENTITY CRIMES

A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a proposal on a contract to provide any goods or services to a public entity, may not submit a proposal on a contract with a public entity for the construction or repair of a public building or public work, may not submit proposals on leases or real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list.

1.13 VARIANCES

The Proposer shall be responsible for reading very carefully, and understanding completely, the requirements and the specifications for the Contract being proposed. For purposes of Proposal evaluation, Proposers must indicate any variances to the specifications, terms and conditions, no matter how slight. If variations are not stated in the Proposal, the Village shall construe the Proposal to fully comply with the specifications, terms, and conditions as prescribed herein.

1.14 AWARD

The Village reserves the right to hold all Proposals for a period not to exceed sixty (60) days after the date of Proposal opening stated in the Request for Proposal.

1.15 PROPOSAL WITHDRAWAL

Any Proposal may be withdrawn up until the time set for opening of the Proposals. Any Proposals not so withdrawn shall, upon opening, constitute an irrevocable offer to sell to the Village the

goods or services set forth in the attached specifications until one or more of the Proposals have been duly accepted by the Village.

If, within twenty-four (24) hours after Proposals are opened, any Proposer files a duly signed written notice with the Village and promptly demonstrates to the reasonable satisfaction of the Village that there was a material and substantial mistake in the preparation of his/her Proposal, that Proposer may withdraw his/her Proposal. Thereafter, that Proposer will be disqualified from further proposals on the work.

1.16 CERTIFICATION

When applicable, Proposer must hold Certificate of Competency issued by the State of Florida or the Palm Beach County Construction Industry Licensing Board and a current Business Tax Receipt. Copies of such Certificate and Receipt must be submitted with the Proposal and must be in the name of the Proposer shown on the Proposal page.

1.17 NON-APPROPRIATIONS

The obligations of the Village to select a Proposal and execute a Contract under the terms of this RFP are contingent upon funds lawfully appropriated for this purpose. Should funds not be appropriated for this purpose, the Village, at its sole discretion, shall have the right to reject all Proposals.

1.18 INSURANCE REQUIREMENTS

The selected Proposer, at its sole expense, shall be required to carry and maintain the following insurance coverages through the time it furnishes all required goods and services to the Village and completes its obligations under the contract. The required insurance coverage must be issued by an insurance company authorized, licensed, and registered to do business in the State of Florida, with the minimum rating of B+ or better, in accordance with the latest edition of A.M. Best's Insurance Guide. This insurance shall be documented in certificates of insurance which provides that the Village of North Palm Beach shall be notified at least thirty (30) days in advance of cancellation, non-renewal, or adverse change. The receipt of certificates or other documentation of insurance or policies or copies of policies by the Village or by any of its representatives, which indicate less coverage than is required, does not constitute a waiver of the awarded Bidder's obligation to fulfill the insurance requirements herein. Prior to commencement of services, the Proposer shall provide to the Village Certificates of Insurance evidencing the insurance coverage specified below.

A. The Proposer shall maintain Comprehensive General Liability Insurance with minimum coverage limits of $1,000,000 combined single limit of insurance per occurrence and $2,000,000 in the general aggregate for bodily injury and property damage and $2,000,000 in the general aggregate for products/completed operations. Comprehensive General Liability Insurance shall include endorsements for property damage, personal injury, contract liability, product liability, and independent contractor coverage.

B. The Proposer shall maintain Comprehensive Automobile Liability Insurance in the minimum amount of $1,000,000 combined single limit for bodily injury and property damages

liability to protect against claims which may arise from the ownership, use, or maintenance of owned and non-owned automobiles, including rented automobiles whether such operations be by the Proposer or by anyone directly or indirectly employed by the Proposer.

C. The Proposer shall carry Workers' Compensation Insurance and Employer's Liability Insurance for all employees as required by Florida Statutes.

D. All insurance, other than Worker's Compensation, to be maintained by the Proposer shall specifically include the "Village of North Palm Beach, its elected officials, employees, and agents "as an Additional Insured. The Proposer shall be responsible for any deductibles related to said insurance.

E. The Proposer shall agree to a Waiver of Subrogation for each required policy. When required by the insurer or should a policy condition not permit an insured to enter into a pre-loss contract to waive subrogation without an endorsement then the selected firm shall agree to notify the insurer and request the policy be endorsed with a Waiver of Transfer of Rights of Recovery Against Others, or its equivalent. This Waiver of Subrogation requirement shall not apply to any policy where a condition to the policy specifically prohibits such an endorsement, or voids coverage should the firm enter into such a contract on a pre-loss basis.

F. It shall be the responsibility of the Proposer to ensure that all independent consultants and/or sub-consultants comply with the same insurance requirements herein.

1.19 TERM OF CONTRACT

The term of this contract shall commence upon execution by both parties and shall continue until the completion of all task deliverables outlined in the Scope of Work section of this RFP.

1.20 CONE OF SILENCE

This RFP is expressly subject to the Cone of Silence provisions of Section 2- 355 of the Palm Beach County Code of Ordinances. Any contract entered into in violation of the cone of silence provisions shall render the transaction voidable.

1.21 NON-COLLUSION

By submitting a Proposal, each Proposer affirmatively represents that neither the Proposer nor any of its officers, partners, owners, agents, representatives, or employees have in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other Proposer to submit a collusive or sham Proposal or have in any manner directly or indirectly sought by agreement or collusion to fix the prices of the Proposal or to secure through any agreement or collusion any advantage. The prices quoted in the Proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Proposer or any of its agents, representatives, owners, or employees.

1.22 SOCIAL, POLITICAL, OR IDEOLOGICAL INTERESTS

Pursuant to section 287.05701, Florida Statutes, the Village may not request documentation of or consider a proposer's social, political, or ideological interests when determining if the proposer is responsible. Further, the Village may not give a preference to a proposer based on the proposer's social, political, or ideological interests.

1.19 RFP SELECTION SCHEDULE

A summary schedule of the major activities associated with this RFP is presented below. The Village, in its sole discretion, may modify the schedule as the Village deems appropriate.

Issuance of RFP:	Fri.	11/7/25	
Mandatory Pre-Bid Meeting:	Mon.	11/18/25	8:00 am
Deadline for Written Questions:	Fri.	12/5/25	3:00 pm
Deadline for Bid Submission:	Mon.	12/15/25	3:00 pm
RFP Proposal Opening Date:	Mon.	12/22/25	3:00 pm
Evaluation Committee Meeting:	Tues.	12/23/25	2:00 pm
Consideration/Award by Village Council:	Thurs.	01/8/26	

2 PROPOSAL SUBMISSION REQUIREMENTS

2.1 PROPOSAL FORMS

In filling out proposal forms, Proposers shall be governed by the following provisions.

A. Proposals must be made on the blanks provided herewith.

B. Proposal amount shall be shown in words and figures.

C. Any Proposal that fails to conform to the condition of the published notice may be rejected.

D. Proposals must be signed in ink by the Proposer with the signature in full.

E. Proposals that contain any omission, erasure, alteration, addition, or item not called for, or that show irregularities of any kind, will be considered as informal or irregular. This will constitute cause for the rejection of the Proposal.

F. If a Proposer wishes to change prices, they shall strike the price and add the changes in the appropriate space. Changes shall be initialed by the person submitting the Proposal. Any changes or alteration of prices in the Proposal must be initialed. Failure to initial these changes or illegible entries or corrections or prices will be cause for the rejection of the Proposal as informal or irregular.

2.2 QUALIFICATION OF PROPOSERS

This proposal shall be awarded only to a responsible Proposer, qualified by experience to provide the services specified. Each Proposer shall submit the following information with its Proposal:

A. A list of at least three (3) client references providing the client name, address, project representative, and telephone number for clients served within the past three (2) years. Include a brief description of the services performed for each client.

B. List of equipment, and/or facilities available to do the work.

C. Evidence of valid state, county and local licenses and receipts proving authority to conduct business in the jurisdiction of the work.

D. List of experience and personnel requirements as set forth in Section 3.3 below.

Failure to submit the above requested information may be cause for rejection of the Proposal.

2.3 REGULATIONS, PERMITS AND FEES

The selected Proposer will be required to obtain at its own expense all licenses required to provide the required services to the Village. The permit and plan review fees for this project shall be based on the Village's Building Permit Fee Schedule, a copy of which is attached to this RFP. The selected Proposer must comply with all Federal, State, and local laws and regulations that may apply, including, but not limited to, those specifically referenced in the RFP Documents.

3 EVALUATION & CRITERIA PROCEDURES

3.1 VENDOR INFORMATION

Proposals are evaluated as per the Evaluation Criteria. The Village reserves the right to obtain additional information from Proposers.

Vendors have a continuing obligation to provide the Village with any material changes to the information requested.

3.2 EVALUATION RATING CATEGORIES

Points for each of the Evaluation Criteria are identified below:

20 Maximum Points Proposal Pricing
20 Maximum Points Personnel Qualifications
20 Maximum Points Project Management Plan/Technical Approach
20 Maximum Points Past Performance/Client References
20 Maximum Points Workload and Contract Litigation

100 Maximum Points Total

3.3 PROPOSAL REQUIRED INFORMATION (to be included in Qualification Statement)

A. Proposal Pricing: (20 Point Maximum)
Provide pricing on the Proposal Form supplied with this RFP.

B. Personnel Qualifications: (20 Point Maximum)
Provide the qualifications and experience of key personnel that are intended to be assigned to this project. List key members of proposed team, including project manager and primary support staff, describe their relevant experience and the role they will play in the project.

Provide a brief resume for each employee who will furnish professional/technical support expertise on this contract. This should include, at a minimum, the following:

Function(s) in the company.
Title and number of years of service with the company.
Previous relevant project experience

C. Project Management Plan: (20 Point Maximum)
Detail how you intend to manage and develop all Vulnerability Assessment tasks.

D. Past Performance: (20 Point Maximum)
Client References – Provide the names and contact information of persons whom the Village may contact for references regarding the company's past performance, on similar contracts. Provide a minimum of three (3) and maximum of five (5) client references.

Identify each client reference:

Name of Client.
Client contact information including email address
Project description, award date, and expiration date of contract
Annual dollar value of contract.

E. Workload and Contract Litigation: (20 Point Maximum)
Project List – Provide a list of relevant contracts to which your company is currently committed or that your company will be committed from December 2025 to June 2026. The individual project details shall include:

Name of Contract Client
Brief Project Scope
Contract Budget
Contract Duration (Award Date – Expiration Date)

F. Litigation – Provide a list of all ligation cases during the past three (3) years in which the proposing company has been a named party. Provide case number, case venue, and brief description of facts.

Provide all items listed in the above Proposal Pricing, Personnel Qualifications, Project Management Plan, Past Performance (Client References), and Workload and Contract Litigation sections as part of your RFP response. These items are the expected deliverables to be evaluated for award of contract.

The Village expressly reserves the right to modify the procedures set forth herein for the selection/evaluation process.

3.4 EVALUATION SCORING SCALE AND DEFINITIONS

20 Point Scale
Superior Response: (16 - 20 Points)
Good Response: (10 - 15 Points)
Fair Response: (5 - 9 Points)
Failed Response: (0 - 4 Points)

Evaluation Scoring Scale Definitions:

Superior Response: Comprehensively meets the requirements and intent for the RFP. Information was clearly presented and complete. Response demonstrated a thorough understanding of the RFP scope and requirements. Evaluation demonstrates a mastery of the evaluation category. Response demonstrates Proposer's selection would be both a considerable value and benefit to the RFP project goals.

Good Response: Meets the majority of the requirements and intent for the RFP. Information was clearly presented and complete with minimal deficiencies. Response demonstrated a good understanding of the RFP scope and requirements. Evaluation demonstrates a considerable knowledge of the evaluation category. Response demonstrates Proposer's selection would be both a value and benefit to the RFP project goals.

Fair Response: Minimally meets the requirements and intent for the RFP. Information was presented with some deficiencies. Response demonstrated an average understanding of the RFP scope and requirements. Evaluation demonstrates a minimal knowledge of the evaluation category.

Failed Response: Does not meet the requirements and intent for the RFP. Information was presented with excessive deficiencies. Response demonstrated an insufficient understanding of the RFP scope and requirements. Evaluation demonstrates an insufficient knowledge of the evaluation category.

3.5 RANKING OF PROPOSALS AND CONTRACT NEGOTIATION

An evaluation committee will independently evaluate each Proposal based on the rating categories for the evaluation process. Points will be awarded from zero (0) to the maximum points allowed for the category. Points are not awarded in a winner-takes-all format. Proposers may tie in individual category and cumulative point awards. Following award of points by the evaluation committee to all Proposers, the Village Clerk will combine and average points awarded to each firm for each category. The evaluation committee may recommend the top ranked firms for oral presentations/interviews.

The evaluation committee's rankings shall be presented to the Village Council for ratification. Upon the Village Council's ratification, the Village will commence contract negotiations with the proposer scoring the highest rating, based on the evaluation process scoring, and continue negotiations in order of ranking, if required.

3.6 MODIFICATION OF PROCEDURES

The Village expressly reserves the right to modify the procedures set forth herein for the selection/evaluation process.

4 SCOPE OF WORK

4.1 INTRODUCTION

The Village is requesting proposals from qualified contractors to replace the HVAC system in the North Palm Beach Library.

4.2 SCOPE OF WORK

Scope of work includes the replacement of existing HVAC units at the NPB Library Building located at 303 Anchorage Drive, North Palm Beach, FL 33408. Proposer shall use the construction plans prepared by REG Architects dated 10/23/2025.

5. DISCLOSURE AND DISCLAIMER

The information contained herein is provided solely for the convenience of responding firms. It is the responsibility of a firm to assure itself that information contained herein is accurate and complete. Neither the Village, nor its advisors provide any assurances as to the accuracy of any information in this RFP. Any reliance on the contents of this RFP, or on any communications with Village representatives or advisors, shall be at each firm's own risk. Firms should rely exclusively on their own investigations, interpretations, and analyses in connection with this matter. The RFP is being provided by the Village without any warranty or representation, express or implied, as to its content, accuracy, or completeness and no firm or other party shall have recourse to the Village if any information herein contained shall be inaccurate or incomplete. No warranty or representation is made by the Village that any qualifications conforming to these requirements will be selected for consideration, negotiation, or approval.

In its sole discretion, the Village may withdraw this RFP either before or after receiving Proposals, may accept or reject any or all Proposals, may accept Proposals which deviate from the non-material provisions of this RFP, and may postpone the Proposals due date and time. The Village may waive any minor irregularity which is defined as a variation from the terms and conditions of this solicitation that does not give the firm an unfair competitive advantage over other firms or adversely impact the interests of the Village. In its sole discretion, the Village may determine the qualifications and acceptability of any firm or firms submitting Proposals in response to this RFP. Following submission of Proposals, the firm agrees to promptly deliver such further details, information, and assurances, including, but not limited to, financial and disclosure data, relating to the Proposals and/or the firm, including the firm's affiliates, officers, directors, shareholders, partners, and employees, as requested by the Village. Any action taken by the Village in response to Proposals made pursuant to this RFP or in making any award or failure or refusal to make any award pursuant to such Proposals, or in any cancellation of award, or in any withdrawal, postponement, or cancellation of this RFP, either before or after issuance of an award, shall be without any expense, liability, or obligation on the part of the Village, or its advisors. Any Proposal which does not meet the requirements of this RFP may be considered non-responsive, and the Proposal may be rejected.

Any recipient of this RFP who responds hereto fully acknowledges all the provisions of this Disclosure and Disclaimer and agrees to be bound by the terms hereof. Any Proposal submitted pursuant to this RFP is at the sole risk and responsibility of the firm submitting such Proposal.

PROPOSER'S ACKNOWLEDGEMENT AND PROPOSAL FORM

SUBMIT ONE (1) ORIGINAL, FIVE (5) COPIES AND ONE (1) ELECTRONIC COPY OF YOUR PROPOSAL TO:

Village of North Palm Beach
Village Clerk's Office
501 U.S. Highway One,
North Palm Beach, FL 33408

RFP TITLE:

Proposal must be received **PRIOR TO 3:00 P.M. on MONDAY, DECEMBER 15, 2025. Bid proposals will be opened MONDAY, DECEMBER 22, 2025 at 3:00 P.M.**

Proposer's Name:_____
(Please specify if a corporation, partnership, other entity or individual)

Fed. ID# or SSN:_____

Address:_____

Fax Number:_____

Telephone No.:_____

E-mail Address: _____

Contact representative:_____

The undersigned authorized representative of the Proposer agrees to all terms and conditions stated in the RFP, to supply Tree Trimming, Management, and Maintenance Services meeting all specifications, and proposes and agrees that if this proposal is accepted by the Village, the Proposer will in good faith enter into contract negotiations with the Village utilizing the standard Village Contract in accordance with the terms and conditions of this RFP. No proposal may be withdrawn for a period of ninety (90) days following the opening of the proposals. The Proposer further acknowledges and affirms the certifications set forth in Section 8 of the RFP.

PROPOSER REPRESENTATIVE WITH AUTHORITY TO BIND PROPOSER

_____ _____
Authorized Representative's Signature Date

_____ _____
Name Position

CORPORATE SEAL

Attest By: _____
Secretary

Signature: _____ **Date:** _____

In accordance with the terms and conditions stated in the Request for Proposals (RFP) requesting all goods and services for the replacement of the Village Library HVAC system, the entity identified above proposes the following to the Village of North Palm Beach:

_____ (Proposer's legal name) certifies that it is licensed to perform the requested services in the State of Florida and Palm Beach County. Proposer agrees to provide the required goods and services stated in the RFP for an amount not to exceed the following sum:

_____

Written Dollar Amount

($_____)

DRUG FREE WORKPLACE

Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids or proposals which are equal with respect to price, quality, and service are received by any political subdivision for the procurement of commodities or contractual services, a bid or proposal received from a business that certifies that it has implemented a drug-free workplace program shall be given preference in the award process. In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.

3. Give each employee engaged in providing the commodities or contractual services that are under bid or proposal a copy of the statement specified in subsection (1).

4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid or proposal, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.

5. Impose a sanction on or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.

6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.

_____

Proposer's Signature

PUBLIC ENTITY CRIMES STATEMENT
UNDER § 287.133, FLORIDA STATUTES

1. This sworn statement is submitted to the Village of North Palm Beach, Florida

by _____
(print individual's name and title)
for _____
(print name of entity submitting sworn statement)

whose business address is_____
_____

and (if applicable) its Federal Employer Identification Number (FEIN) is: _____

(If the entity has no FEIN, include the Social Security Number of the Individual signing this sworn statement:_____)

2. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), **Florida Statutes**, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or of the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision or any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy or material misrepresentation.

3. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), **Florida Statutes**, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

4. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), **Florida Statutes**, means:

a. A predecessor or successor of a person convicted of a public entity crime; or

b. An entity under the control any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term “affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

5. I understand that a "person" as defined in Paragraph 287.133(1)(e), **Florida Statutes**, means any natural person or entity organized under the laws of any state or of the United States with the legal power

to enter into binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

6. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. **(indicate which statement applies.)**

_____Neither the entity submitting this sworn statement, nor any of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding before a Hearing Officer of the State of Florida, Division of Administrative Hearings and the Final Order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. **(attach a copy of the final order)**

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND, THAT HIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES FOR CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

_____

(Signature)

The foregoing document was sworn and subscribed before me this ____ day of 20___, by _____ who is personally known to me or produced _____ as identification.

_____

Notary Public

My Commission Expires:

SCRUTINIZED VENDOR CERTIFICATION
PURSUANT TO SECTION 287.135, FLORIDA STATUTES

This sworn statement is submitted to the Village of North Palm Beach, Florida

by _____
(print individual's name and title)
for _____
(print name of entity submitting sworn statement)

whose business address is_____
_____

and (if applicable) its Federal Employer Identification Number (FEIN) is: _____

(If the entity has no FEIN, include the Social Security Number of the Individual signing this sworn statement: _____)

1. I hereby certify that the above-named entity:

   A. Does not participate in the boycott of Israel; and

   B. Is not on the Scrutinized Companies that Boycott Israel List.

2. If the Contract for goods and services is for more than $1,000,000, I hereby certify that the above-named entity:

   A. Is not on the Scrutinized Companies with Activities in Sudan List; and

   B. Is not on the Scrutinized Companies with Activities in the Iran Terrorism Sector List; and

   C. Has not engaged in business operations in Cuba or Syria.

Section 287.135, Florida Statutes, prohibits the Village from: (1) contracting with companies for goods or services in any amount if at the time of bidding on, submitting a proposal for, or entering into or renewing a contract if the company is on the Scrutinized Companies that Boycott Israel List, created pursuant to Section 215.4725, Florida Statutes, or is engaged in a boycott of Israel; and (2) contracting with companies, for goods or services over $1,000,000 that are on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Terrorism Sector List created pursuant to Section 215.473, Florida Statutes or is engaged in business operations in Cuba or Syria.

As the person authorized to sign on behalf of the above-named entity, I hereby certify that the statements set forth above are true and that pursuant to Section 287.135, Florida Statutes, the submission of a false certification may subject the company to civil penalties, attorney's fees and/or costs. I further understand that any contract with the Village for goods or services may be terminated at the option of the Village if the company has been found to have submitted a false certification.

_____

(Signature)

The foregoing document was sworn and subscribed before me this _____ day of _____, 20__ by _____, who is personally known to me or produced _____ as identification.

_____

Notary Public

My Commission Expires:

STANDARD VILLAGE CONTRACT

This Contract is made as of the _____day of _____, 20___, by and between the VILLAGE OF NORTH PALM BEACH, a municipal corporation organized and existing under the laws of the State of Florida, hereinafter referred to as the VILLAGE, and _____, an individual or corporation authorized to do business in the State of Florida, hereinafter referred to as the VENDOR.

In consideration of the promises and mutual covenants herein contained and other good and valuable consideration, the receipt and sufficiency of which is acknowledged by both parties, the VILLAGE and VENDOR hereby agree as follows:

SECTION 1: SCOPE OF SERVICES OF THE VENDOR.

The Scope of Work is for the replacement of the Village Library HVAC System in accordance with the Request for Proposals issued by the Village, and VENDOR's Proposal submitted in response to the Request for Proposals, which are incorporated herein by reference.

SECTION 2: TERM OF CONTRACT.

The term of this Contract shall commence upon the VILLAGE's issuance of a Notie to Proceed and shall remain in effect until all goods are delivered and all services performed, unless earlier terminated in accordance with Section 7. Delivery and installation shall be coordinated by the VILLAGE and VENDOR, provide, however, that all services shall be completed within ninety (90) days of the issuance of a Notice to Proceed.

B. VENDOR shall not be entitled to an increase in the agreed to compensation resulting from this Contract or payment or compensation of any kind from the VILLAGE for direct, indirect, consequential, impact or other costs, expenses, or damages.

SECTION 3: VILLAGE'S REPRESENTATIVE.

Unless otherwise specified by the VILLAGE, the VILLAGE's representative shall be _____. The Village Manager or Village Representative shall have the right at all reasonable times during the term of this Contract to inspect or otherwise evaluate the work being performed thereunder and the premises in which it is being performed.

SECTION 4: COMPENSATION AND METHOD OF PAYMENT**.**

A. The VILLAGE agrees to compensate the VENDOR for providing the required services to replace the Village Library HVAC System and for which Purchase Orders are issued in accordance with VENDOR's Proposal, which is attached hereto and incorporated herein by reference.

B. In order for both parties herein to close their books and records, VENDOR will clearly state "final invoice" on the VENDOR's final/last billing to the VILLAGE. This certifies that all goods and services have been properly performed and all charges have been invoiced to the VILLAGE. Since this account will thereupon be closed, any additional charges if not

properly included in this final invoice are waived by the VENDOR. The VILLAGE will not be liable for any invoice from the VENDOR submitted thirty (30) days after the provision of all goods and services.

SECTION 5: INDEMNIFICATION.

A. The VENDOR shall indemnify and save harmless and defend the VILLAGE, its agents, servants, and employees from and against any and all claims, liability, losses, and/or cause of action which may arise from any negligent act or omission of the VENDOR, its agents, servants, or employees in the performance of services under this Contract.

B. The VENDOR further agrees to indemnify, save harmless and defend the VILLAGE, its agents, servants, and employees from and against any claim, demand, or cause of action of whatsoever kind or nature arising out of any conduct or misconduct of the VENDOR its agents, servants, or employees not included in the paragraph above and for which the VILLAGE, its agents, servants, or employees are alleged to be liable.

C. Nothing contained in this Contract shall create a contractual relationship with or a cause of action in favor of a third party against either the VILLAGE or VENDOR, nor shall this Contract be construed a waiver of sovereign immunity beyond the waiver provided in §768.28, Florida Statutes.

SECTION 6: PERSONNEL**.**

A. The VENDOR represents that it has, or will secure at its own expense, all necessary personnel required to perform the services under this Contract.

B. All of the services required hereunder shall be performed by the VENDOR or under its supervision, and all personnel engaged in performing the services shall be fully qualified and, if required, authorized, or permitted under state and local law to perform such services.

C. All of the VENDOR's personnel (and all sub-contractors OR sub-consultants) while on VILLAGE premises, will comply with all VILLAGE requirements governing conduct, safety, and security.

SECTION 7: TERMINATION.

This Contract may be cancelled by the VENDOR upon thirty (30) days prior written notice to the VILLAGE's representative in the event of substantial failure by the VILLAGE to perform in accordance with the terms of this Contract through no fault of the VENDOR. It may also be terminated, in whole or in part, by the VILLAGE without cause upon thirty (30) days written notice to the VENDOR. The VILLAGE may also terminate this Contract with written notice of cause to the VENDOR, who fails to cure such cause within ten (10) days of the receipt of the VILLAGE's notice. Unless the VENDOR is in breach of this Contract, the VENDOR shall be paid for services rendered to the VILLAGE's satisfaction through the date of termination. After receipt of a Termination Notice and except as otherwise directed by the VILLAGE, the VENDOR shall:

A. Stop work on the date and to the extent specified;

B. Terminate and settle all orders and subcontracts relating to the performance of the terminated work;

C. Transfer all work in progress, completed work, and other materials related to the terminated work to the VILLAGE; and

D. Continue and complete all parts of the work that have not been terminated.

SECTION 8: FEDERAL AND STATE TAX.

The VILLAGE is exempt from payment of Florida State Sales and Use Tax. Unless purchased directly by the VILLAGE, the VENDOR shall not be exempted from paying sales tax to its suppliers for materials used to fill contractual obligations with the VILLAGE, nor is the VENDOR authorized to use the VILLAGE's Tax Exemption Number in securing such materials.

SECTION 9: INSURANCE.

A. Prior to commencing any work, the VENDOR shall provide certificates evidencing insurance coverage as required in the Request of Proposals. All insurance policies shall be issued by companies authorized to do business under the laws of the State of Florida. The Certificates shall clearly indicate that the VENDOR has obtained insurance of the type, amount, and classification as required for strict compliance with this Section and that no material change or cancellation of the insurance shall be effective without thirty (30) days' prior written notice to the VILLAGE's representative. Failure to comply with the foregoing requirements shall not relieve the VENDOR of its liability and obligations under this Contract.

B. The parties to this Contract shall carry Workers' Compensation Insurance and Employer's Liability Insurance for all employees as required by Florida Statutes. In the event that a party does not carry Workers' Compensation Insurance and chooses not to obtain same, then such party shall in accordance with Section 440.05, Florida Statutes, apply for and obtain an exemption authorized by the Department of Insurance and shall provide a copy of such exemption to the VILLAGE.

C. All insurance, other than Worker's Compensation, to be maintained by the VENDOR shall specifically include the VILLAGE as an Additional Insured.

SECTION 10: SUCCESSORS AND ASSIGNS.

The VILLAGE and the VENDOR each binds itself and its partners, successors, executors, administrators and assigns to the other party of this Contract and to the partners, successors, executors, administrators and assigns of such other party, in respect to all covenants of this Contract. Except as above, neither the VILLAGE nor the VENDOR shall assign, sublet, convey, or transfer its interest in this Contract without the written consent of the other. Nothing herein shall be construed as creating any personal liability on the part of any officer or agent of

the VILLAGE which may be a party hereto, nor shall it be construed as giving any rights or benefits hereunder to anyone other than the VILLAGE and the VENDOR.

SECTION 11: DISPUTE RESOLUTION, LAW, VENUE AND REMEDIES.

This Contract shall be governed by the laws of the State of Florida. Any and all legal action necessary to enforce the Contract will be held in Palm Beach County. No remedy herein conferred upon any party is intended to be exclusive of any other remedy, and each and every such remedy shall be cumulative and shall be in addition to every other remedy given hereunder or now or hereafter existing at law or in equity or by statute or otherwise. No single or partial exercise by any party of any right, power, or remedy hereunder shall preclude any other or further exercise thereof. The VILLAGE and the VENDOR **knowingly, voluntarily, and intentionally waive any right they may have to trial by jury with respect to any litigation arising out of or in connection with this Contract.**

SECTION 12: INDEPENDENT CONTRACTOR RELATIONSHIP.

The VENDOR is, and shall be, in the performance of all Services under this Contract, an Independent Contractor, and not an employee, agent, or servant of the VILLAGE. All persons engaged in any of the Services performed pursuant to this Contract shall at all times, and in all places, be subject to the VENDOR'S sole direction, supervision, and control. The VENDOR shall exercise control over the means and manner in which it and its employees perform the Services.

SECTION 13: ACCESS AND AUDITS.

The VENDOR shall maintain adequate records to justify all charges, expenses and costs incurred in estimating and performing the Services for at least three (3) years after completion of this Contract. The VILLAGE shall have access to such books, records and documents as required in this section for the purpose of inspection or audit during normal business hours, at the VENDOR's place of business. In no circumstances will VENDOR be required to disclose any confidential or proprietary information regarding its products and service costs.

SECTION 14: NONDISCRIMINATION.

The VENDOR warrants and represents that all of its employees are treated equally during employment without regard to race, color, religion, disability, sex, age, national origin, ancestry, marital status, or sexual orientation.

SECTION 15: ENFORCEMENT COSTS.

If any legal action or other proceeding is brought for the enforcement of this Contract, or because of an alleged dispute, breach, default or misrepresentation in connection with any provisions of this Contract, the successful or prevailing party or parties shall be entitled to recover reasonable attorney's fees, court costs and all expenses (including taxes) even if not taxable as court awarded costs (including, without limitation, all such fees, costs and expenses incident to appeals), incurred in that action or proceeding, in addition to any other relief to which such party or parties may be entitled.

SECTION 16: SEVERABILITY.

If any term or provision of this Contract, or the application thereof to any person or circumstances shall, to any extent, be held invalid or unenforceable, to remainder of this Contract, or the application of such terms or provision, to persons or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected, and every other term and provision of this Contract shall be deemed valid and enforceable to the extent permitted by law.

SECTION 17: MODIFICATIONS OF WORK.

A. The VILLAGE reserves the right to make changes in the work, including alterations, reductions therein or additions thereto. Upon receipt by the VENDOR of the VILLAGE's notification of a contemplated change, the VENDOR shall, in writing: (1) provide a detailed estimate for the increase or decrease in cost due to the contemplated change, (2) notify the VILLAGE of any estimated change in the completion date, and (3) advise the VILLAGE if the contemplated change shall affect the VENDOR's ability to meet the completion dates or schedules of this Contract.

B. If the VILLAGE so instructs in writing, the VENDOR shall suspend work on that portion of the work affected by the contemplated change, pending the VILLAGE's decision to proceed with the change.

C. If the VILLAGE elects to make the change, the VILLAGE shall initiate a Change to the Purchase Order and the VENDOR shall not commence work on any such change until such revised Purchase Order is received.

SECTION 18: PUBLIC ENTITY CRIMES.

VENDOR acknowledges and agrees that a person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals or replies on leases of real property to a public entity; may not be awarded or perform work as a VENDOR, supplier, sub-VENDOR or VENDOR under a contract with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, Florida Statues, for CATEGORY TWO for a period of thirty-six (36) months following the date of being placed on the convicted vendor list. The VENDOR will advise the VILLAGE immediately if it becomes aware of any violation of this statute.

SECTION 19: PROTECTION OF WORK AND PROPERTY.

A. The VENDOR shall continuously maintain adequate protection of all work from damage and shall protect the VILLAGE's property from injury or loss arising in connection with the Contract. Except for any such damage, injury, or loss, except that which may be directly due to errors caused by the VILLAGE or employees of the VILLAGE, the VENDOR shall provide any necessary materials to maintain such protection.

B. The VENDOR will also take every necessary precaution to ensure the safety of the VILLAGE, public and other guests and invitees thereof at or near the areas where work is being accomplished during and throughout the completion of all work.

SECTION 20: WARRANTY/GUARANTY.

VENDOR warrants that its goods and services under this Contract will be free of defects in materials and workmanship for a period of one (1) year following the provision of said goods and services.

SECTION 21: COMPLIANCE WITH LAWS.

VENDOR shall, in performing the services contemplated by this Contract, faithfully observe and comply with all federal, state, and local laws, ordinances and regulations that are applicable to the services to be rendered under this Contract.

SECTION 22: NOTICE.

All notices required in this Contract shall be sent by certified mail, return receipt requested and if sent to the VILLAGE shall be mailed to:

Village of North Palm Beach
Village Manager
501 U.S. Highway One
North Palm Beach, FL 33408

and if sent to the VENDOR shall be mailed to:

SECTION 23: ENTIRETY OF CONTRACTUAL AGREEMENT.

The VILLAGE and the VENDOR agree that this Contract sets forth the entire agreement between the parties, and that there are no promises or understandings other than those stated herein. None of the provisions, terms and conditions contained in this Contract may be added to, modified, superseded, or otherwise altered, except by written instrument executed by the parties hereto. In the event of a conflict between this Contract and the VILLAGE's Request for Proposals and the VENDOR's Proposal, this Contract shall take precedence with the VILLAGE's Request for Qualifications taking precedence over the VENDOR's proposal. All such documents shall be read in a manner so as to avoid a conflict.

SECTION 24: WAIVER.

Failure of a party to enforce or exercise any of its right(s) under this Contract shall not be

deemed a waiver of that parties' right to enforce or exercise said right(s) at any time thereafter.

SECTION 25: PREPARATION.

This Contract shall not be construed more strongly against either party regardless of who was more responsible for its preparation.

SECTION 26: SURVIVABILITY.

Any provision of this Contract which is of a continuing nature or imposes an obligation which extends beyond the term of this Contract shall survive its expiration or earlier termination.

SECTION 27: WAIVER OF SUBROGATION.

VENDOR hereby waives any and all rights to Subrogation against the VILLAGE, its officers, employees, and agents for each required policy. When required by the insurer, or should a policy condition not permit an insured to enter into a pre-loss agreement to waive subrogation without an endorsement, then VENDOR shall agree to notify the insurer and request the policy be endorsed with a Waiver of Transfer of Rights of Recovery Against Others, or its equivalent.

This Waiver of Subrogation requirement shall not apply to any policy, which a condition to the policy specifically prohibits such an endorsement, or voids coverage should VENDOR enter into such an agreement on a pre-loss basis.

SECTION 28: INSPECTOR GENERAL.

VENDOR is aware that the Inspector General of Palm Beach County has the authority to investigate and audit matters relating to the negotiation and performance of this Contract and in furtherance thereof, may demand and obtain records and testimony from VENDOR. VENDOR understands and agrees that in addition to all other remedies and consequences provided by law, the failure of VENDOR to fully cooperate with the Inspector General when requested may be deemed by the VILLAGE to be a material breach of this Contract justifying its termination.

SECTION 29: INVOICING AND PAYMENT:

Payment for any and all invoice(s) that may arise as a result of a Contract or Purchase Order issued pursuant to this Request for Qualifications shall minimally meet the following conditions to be considered as a valid payment request:

A. A timely submission of a properly certified invoice(s) in strict accordance with the price(s) and delivery elements as stipulated in the Contract or Purchase Order document, and submitted to:

Village of North Palm Beach
501 U.S. Highway One
North Palm Beach, Florida 33408
ATTN: Accounts Payable

B. All invoices submitted shall consist of an "original" invoice which clearly references the subject Contract or Purchase Order Number; provide a sufficient salient description to identify the good(s) and/or service(s) for which payment is requested; include and be clearly marked as "partial," "complete" or "final invoice."

C. The invoice shall contain the Proposer's Federal Employer Identification Number.

D. All payments made by the Village pursuant to the Contract Documents shall be in accordance with Florida's Prompt Payment Act (for non-construction).

SECTION 30: ADDITIONAL SERVICES;

If during the contractual period covered by the agreement, additional services are needed, VENDOR may, at the option of the VILLAGE, be engaged to perform these services under the terms of this Contract.

SECTION 31: PUBLIC RECORDS.

IF VENDOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO VENDOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE VILLAGE'S CUSTODIAN OF PUBLIC RECORDS AT: (561) 841-3355; NPBCLERK@VILLAGE-NPB.ORG; OR 501 U.S. HIGHWAY ONE, NORTH PALM BEACH, FL 33408.

In performing services pursuant to this Contract, VENDOR shall comply with all relevant provisions of Chapter 119, Florida Statutes. As required by Section 119.0701, Florida Statutes, VENDOR shall:

1. Keep and maintain public records required by the VILLAGE to perform the service.

2. Upon request from the VILLAGE's custodian of public records, provide the VILLAGE with a copy the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes, or as otherwise provided by law.

3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the Contract term and following completion of the Contract if the VENDOR does not transfer the records to the VILLAGE.

4. Upon completion of the Contract, transfer, at no cost, to the VILLAGE all public records in possession of VENDOR or keep and maintain public records required by the VILLAGE to perform the services. If VENDOR transfers all public records to the VILLAGE upon completion of the Contract, VENDOR shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If VENDOR keeps and maintains public records upon completion of the Contract, VENDOR shall meet

all applicable requirements for retaining public records. All records stored electronically must be provided to the VILLAGE, upon request from the VILLAGE's custodian of public records, in a format that is compatible with the information technology systems of the VILLAGE.

SECTION 32. PROHIBITION AGAINST CONTINGENT FEES.

VENDOR warrants that it has not employed or retained any company or person, other than a bona fide employee working solely for VENDOR, to solicit or secure this Contract and that VENDOR has not paid, or agreed to pay, any person, company, corporation, individual or firm, other than a bona fide employee working solely for VENDOR, any fee, commission, percentage, gift, or other consideration contingent upon, or resulting from, aware or making of the Contract. For the breach or violation of this provision, the VILLAGE shall have the right to terminate this Contract and its sole discretion, without liability, and to deduct from the Contract price, or otherwise recover, the full amount of such fee, commission, percentage, fit or consideration.

SECTION 33. E-VERIFY.

Pursuant to Section 448.095(5), Florida Statutes, VENDOR shall:

A. Register with and use the E-Verify system to verify the work authorization status of all newly hired employees pursuant to Section 448.095(2), Florida Statutes, and require all subcontractors do the same;

B. Secure an affidavit from all subcontractors stating that the subcontractor does not employ, contract with, or subcontract with an "unauthorized alien" as defined in Section 448.095(1)(f), Florida Statutes;

C. Maintain copies of all subcontractor affidavits for the duration of this Contract and provide the same to the VILLAGE upon request;

D. Comply fully, and ensure all subcontractors comply fully, with Section 448.095, Florida Statutes;

E. Be aware that a violation of Section 448.09(1), Florida Statutes (Unauthorized aliens; employment prohibited), shall be grounds for termination of this Contract;

F. Be aware that a violation of Section 448.095(5) by a subcontractor, and not VENDOR, shall be grounds for the VILLAGE to order VENDOR immediately terminate the contract with the subcontractor; and

G. Be aware that if the VILLAGE terminates this Contract under Section 448.095(5)(c), Florida Statues, VENDOR may not be awarded a contract for at least one year after the date on which the Contract is terminated and will be liable for any additional costs incurred by the VILLAGE as a result of the termination of the Contract.

IN WITNESS WHEREOF, the VILLAGE and VENDOR hereto have made and executed this Contract as of the day and year first above written.

VENDOR

By: _____

Print Name:_____

Position:_____

VILLAGE OF NORTH PALM BEACH

BY:_____
MAYOR

ATTEST:

BY:_____
VILLAGE CLERK

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:

BY: _____
VILLAGE ATTORNEY

AFFIDAVIT

1. I am over 18 years of age and otherwise competent to affirm the matters set forth in this Affidavit, which are based on my personal knowledge.

2. I am an officer or authorized representative of _____.

3. _____ does not use coercion for labor or services as defined in Section 787.06, Florida Statutes.

Under the penalties of perjury, I declare that I have read the foregoing affidavit and that the facts stated in it are true.

By: _____
Print Name:
Title:

Village of North Palm Beach
Library HVAC Replacement

REQUEST FOR INFORMATION 1
RFP-2026-PW-02

Submission Deadline January 20TH 2026 3PM

Dear Proponent,

We have received your proposal and it is still under consideration. We are issuing this Request for Information (RFI) to further clarify your submission.

Five vendors submitted proposals that met initial criteria for consideration. Unfortunately, all five vendors did not sufficiently address section three (3) of the evaluation criteria- Project Management Plan/Technical Approach.

In the interest of fairness we have decided that rather than re-issuing an RFP we would issue an RFI specifically for this section to give each vendor the opportunity to elaborate on their initial proposal. To this end we have broken it down to showcase the exact information most important for us to make a final determination.

To streamline and standardize this process we are providing the key details needed to objectively determine the best value for the Village.

1. List specifically the type, make and model of the equipment being proposed. A cut sheet would be highly useful.
2. What type of coils and coatings are being proposed?
   Note, no microchannel type units will be used and a hail guard will be present.
3. What is the procurement lead time for delivery of this equipment?
4. What is your organizations' proposed scheduled duration for project completion (calendar days)? Provide a timeline/sequence of events.
5. What is your proposed library access plan to achieve construction completion while maintaining library access? E.g.-Will the entire library need to be closed? Will just the upstairs need to be closed? Would phased construction be proposed/requested?
6. Please detail the type of service access being provided for the 5 ton units.
7. What type of floor protection will be provided (carpet is new)?

Thank you for your time in addressing these questions. We are looking forward to your response and the award of this contract.

THE INFORMATION REQUESTED ABOVE MAY BE RETURNED IN PERSON TO NPB PUBLIC WORKS, OR ELECTRONICALLY, NO LATER THAN TUESDAY, JANUARY 20RD 2026 3:00PM TO:

James Anthony
North Palm Beach Public Works
645 Prosperity Farms Rd.
North Palm Beach, FL 33408
janthony@village-npb.org

Please make sure submission is clearly marked in subject line or on envelope:

REQUEST FOR INFORMATION 1
RFP-2026-PW-02

HVAC GENERAL NOTES

1. HVAC DRAWINGS ARE DIAGRAMMATICAL IN NATURE AND REPRESENT EXISTING CONDITIONS BASED ON DRAWINGS AND SITE OBSERVATIONS. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL ACTUAL CONDITIONS INCLUDING, DUCTWORK AND PIPING LOCATIONS AND SIZES.
2. DUE TO DRAWINGS BEING DIAGRAMMATICAL IN NATURE RISERS AND DROPS ARE NOT SHOWN - CONTRACTOR SHALL INCLUDE THESE IN THE BID - WHERE POSSIBLE ALL RISERS AND DROPS SHALL BE CONSTRUCTED USING 45 DEGREE OR LONG RADIUS ELBOWS.
3. PROVIDE AND INSTALL NECESSARY DUCTWORK TRANSITIONS AND PIPING INCREASERS/REDUCERS AS REQUIRED FOR EQUIPMENT CONNECTIONS. CONSULT MANUFACTURER'S DATA FOR ACTUAL DUCTWORK AND PIPING CONNECTIONS SIZES, INCLUDING, BUT NOT LIMITED TO THOSE SHOWN.
4. 4 AIR CONDITIONING CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO BID AND VERIFY ALL CONDITIONS, LOCATIONS, DIMENSIONS, MATERIALS, ELEVATIONS AND COUNTS AS SHOWN AND/OR NOTED ON THE DRAWINGS AND INCLUDE IN THE BID ANY AND ALL FABRICATION REQUIRED PRIOR TO INSTALLATION. THE CONTRACTOR SHALL VERIFY SIZE, ELEVATION, AND PRESENT STATE OF ALL EXISTING UTILITIES.
5. THE ENGINEER SHALL BE IMMEDIATELY NOTIFIED OF ANY AND ALL EXISTING FIELD CONDITIONS WHICH DEVIATE FROM WHAT WAS SHOWN ON THE PLANS. CONTRACTOR IS RESPONSIBLE TO PROVIDE PRICING FOR A COMPLETE INSTALLATION INCLUDING ANY COSTS ASSOCIATED WITH FIELD CONDITIONS AT THE TIME OF BIDDING.
6. IT SHALL BE THE RESPONSIBILITY OF THE AIR CONDITIONING CONTRACTOR FOR THE ADVANCED ORDERING OF LONG LEAD ITEMS SO THAT DELIVERY WILL NOT INTERFERE WITH THE PRODUCTION OF OTHER TRADES RESULTING IN ANY DOWN OR LAG TIME.
7. IT SHALL BE THE RESPONSIBILITY OF THE AIR CONDITIONING CONTRACTOR TO PROVIDE ALL LABOR, MATERIALS, AND SUPERVISION NECESSARY TO ACCOMPLISH THE WORK SHOWN AND/OR NOTED ON THE DRAWINGS.
8. ALL DIMENSIONS ARE IN PHYSICAL UNITS OF INCHES UNLESS OTHERWISE NOTED.
9. ALL DUCT SIZES ARE CLEAR INSIDE DIMENSIONS. CONTRACTOR SHALL NOTIFY ENGINEER IF DUCT SIZE CHANGES ARE REQUIRED BECAUSE OF EXISTING CONDITIONS.
10. CONTRACTOR SHALL PAY FOR ALL PERMITS, FEES, INSPECTIONS, TESTS, AND ALL REQUIRED INSURANCE FOR PROTECTION AGAINST PUBLIC LIABILITY AND PROPERTY DAMAGE FOR THE DURATION OF THE WORK.
11. AFTER BID SELECTION AND PRIOR TO COMMENCEMENT OF WORK, THE AIR CONDITIONING CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL DUCT WORK, EXHAUST FANS, AIR DEVICES, AND EQUIPMENT AS STATED ON SCHEDULES AND OR NOTES. AHRI CERTIFICATES FOR ALL EQUIPMENT SHALL BE INCLUDED IN THE SUBMITTAL PACKAGE. IF THE CONTRACTOR PROPOSES TO USE ANY ARTICLE, DEVICE, PRODUCT, OR MATERIAL WHICH IS NOT AS SPECIFIED, THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVE TO THE ENGINEER THAT THE PROPOSED SUBSTITUTION IS EQUAL AND WILL FIT ALLOCATED SPACE.
12. LOCATION OF AIR CONDITIONING DUCTS AND AIR DEVICES MAY CHANGE. VERIFY EXACT LOCATION WITH ARCHITECT/ENGINEER PRIOR TO INSTALLATION. DRAWINGS ARE DIAGRAMMATIC, DO NOT SCALE FOR THE EXACT LOCATION OF DUCTS, DIFFUSERS, GRILLES, REGISTERS, PIPING, EQUIPMENT, ETC. SEE ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF AIR DEVICES.
13. PROVIDE MANUAL VOLUME DAMPERS AT ALL LOW PRESSURE BRANCH DUCTS TO INDIVIDUAL DIFFUSERS AND GRILLES AND TO ALL LOW PRESSURE BRANCH DUCTS TO REHEAT COILS. PROVIDE DAMPERS AS CLOSE AS POSSIBLE TO BRANCH CONNECTION TO MAIN. SEE DIFFUSER AND GRILLE SCHEDULE AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
14. NO PIPING, DUCTWORK, OR CONDUIT SHALL BE INSTALLED UNTIL IT IS COORDINATED WITH ALL OTHER TRADES AFFECTED. PROVIDE ALL OFFSETS REQUIRED TO AVOID INTERFERENCE WITH OTHER TRADES; EXISTING CONDITIONS AND WITH THE STRUCTURE, INCLUDING, BUT NOT LIMITED TO THOSE SHOWN.
15. SCHEDULE NEW CONSTRUCTION WORK WITH THE OWNER WELL IN ADVANCE. CONSTRUCTION WORK AND DEMOLITION SHALL BE PERFORMED OR REPLACED TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST TO THE OWNER.
16. ALL FINISHES AND SURFACES TO REMAIN WHICH ARE DAMAGED DURING CONSTRUCTION WORK SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST TO THE OWNER.
17. DO NOT BLOCK TUBE PULL OR SERVICE SPACE ON EQUIPMENT WITH PIPING, DUCTWORK, ETC.. (FLANGED OR REMOVABLE SECTIONS MAY BE USED IN SOME INSTANCES WHERE TIGHT CLEARANCES EXISTS).
18. IF NO SIZE IS SHOWN FOR DUCT SERVING DIFFUSER OR GRILLES, USE SIZE SHOWN ON DIFFUSER AND GRILLE SCHEDULE.
19. DUCTWORK ROUTED PARALLEL TO A WALL, RATED OR CORRIDOR SHALL BE INSTALLED WITH MINIMUM 6" CLEARANCE TO ALLOW FOR INSPECTION OF WALL PENETRATIONS. CONTRACTOR SHALL PROVIDE 12" CLEARANCE WHERE POSSIBLE, COORDINATE.
20. REFER TO DETAIL SHEETS AND SPECIFICATIONS FOR ADDITIONAL INSTALLATION REQUIREMENTS.
21. CONTRACTOR SHALL SUBMIT A COMPLETE LIST OF EQUIPMENT AND ITEMS TO BE REMOVED TO THE OWNER. ALL ITEMS THAT THE OWNER WISHES TO RETAIN SHALL BE TURNED OVER TO OWNER AND THE REMAINDER SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A PROPER MANNER BY CONTRACTOR.
22. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM ALL WORK NECESSARY TO PREPARE THE STRUCTURE FOR THE INSTALLATION AND/OR DEMOLITION WORK OF THE MECHANICAL SYSTEMS. ALL HOLES, OPENINGS AND ANY DAMAGED MATERIALS OR SURFACES SHALL BE REPAIRED AND FINISHED TO MATCH EXISTING.
23. ALL DEMOLITION WORK SHALL COMPLY WITH NFPA 241 AND THE REQUIREMENTS OF THE OWNER.
24. PROVIDE TEMPORARY FILTERS ON ALL RETURN AIR GRILLES AND TRANSFER OPENINGS IN THE WORK AREA.
25. EXISTING SYSTEMS SHOWN ON THE DRAWINGS ARE BASED ON AVAILABLE RECORD DRAWINGS. THIS INFORMATION IS ONLY PARTIALLY VERIFIED. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY AND INVESTIGATE ALL CONDITIONS THAT AFFECTS THE WORK PRIOR TO SUBMITTING THE BID.
26. INSTALL AHU CONTROL PANELS TO PROVIDE FOR 3'-0" MIN. CLEARANCE IN FRONT OF PANEL.
27. UNLESS OTHERWISE NOTED ON PLANS, LOW RETURN AIR GRILLES AND LOW EXHAUST GRILLES SHALL BE 6" TO 8" A.F.F. TO BOTTOM OF GRILLE.
28. ALL DIFFUSERS IN SAME SPACE SHALL HAVE THE SAME FULL FACE SIZE USING LARGEST SIZE REQUIRED FROM DIFFUSER AND GRILLE SCHEDULE.
29. PROVIDE CLEAR ACCESS TO FIRE DAMPERS, SMOKE DAMPERS, AND VALVES.
30. ALL WORK SHALL BE PERFORMED BY A LICENSED AIR CONDITIONING CONTRACTOR IN A FIRST CLASS WORKMANLIKE MANNER. ALL WORKMANSHIP AND MATERIALS SHALL BE IN STRICT ACCORDANCE WITH APPLICABLE NATIONAL, STATE AND LOCAL CODES AND ORDINANCES.
31. CORRECTION OF ANY DEFECTS SHALL BE COMPLETED WITHOUT ADDITIONAL CHARGE AND SHALL INCLUDE REPLACEMENT OR REPAIR OF ANY OTHER PHASE OF THE INSTALLATION WHICH MAY HAVE BEEN DAMAGED THEREBY.
32. THE PLUMBING CONTRACTOR SHALL RUN ALL CONDENSATE DRAINS PER PLUMBING SPECIFICATIONS. (SEE PLUMBING SHEETS)
33. COMBUSTIBLE PIPING IS NOT PERMITTED IN RETURN AIR PLENUMS OR CEILING SPACES USED FOR RETURN AIR.
34. THE AIR CONDITIONING CONTRACTOR SHALL USE RADIUS TURNS WITH A 1.5 CENTERLINE TO WIDTH RATIO (1.5 R/W), VANED ELBOWS, SPLITTER DAMPERS WHERE INDICATED, VOLUME CONTROLS IN ALL BRANCH LINES AND SUPPLY AND RETURN AIR DEVICES (UNLESS OTHERWISE NOTED IN AIR DEVICE SCHEDULE).
35. THE AIR CONDITIONING CONTRACTOR SHALL SEAL ALL DUCTS IN AN APPROVED MANNER TO INSURE AGAINST LEAKAGE.
36. ALL WORK SHALL BE COORDINATED WITH OTHER TRADES TO AVOID ANY CONFLICTS IN LOCATIONS FOR DUCTS, DIFFUSERS, GRILLES, REGISTERS, PIPING, EQUIPMENT, ETC., IN ORDER TO NOT INTERFERE WITH THE PROGRESS OF CONSTRUCTION.
37. THE AIR CONDITIONING CONTRACTOR SHALL PROVIDE FLEXIBLE DUCT CONNECTIONS TO ALL FANS, A/C UNITS, OR MECHANICAL EQUIPMENT, EXCEPT FOR EXHAUST HOODS.
38. UNLESS NOTED AS EXISTING TO BE REUSED (E) OR RELOCATED (RE), ALL EQUIPMENT, PIPING, DUCTS, REGISTERS, ETC., SHALL BE NEW.
39. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND SHALL BEAR UNDERWRITERS LABEL (UL) WHERE APPLICABLE.
40. THE AIR CONDITIONING CONTRACTOR SHALL PROVIDE ALL CONTACTORS, STARTERS, VFDs, RELAYS, AND THERMOSTATS. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL SWITCHES, DISCONNECTS, POWER WIRING AND CONTROL WIRING, UNLESS NOTED OTHERWISE. VFDs SHALL HAVE A MAINTENANCE BYPASS.
41. THE AIR CONDITIONING CONTRACTOR SHALL PROVIDE 1" THICK MERV 13 (THROW-AWAY TYPE) FILTERS WITH EACH A/C UNIT (UON).
42. ALL PENETRATIONS OF FIRE-RATED WALLS, FLOORS OR CEILINGS SHALL BE FIREPROOFED BY A SEALING METHOD AND RATING AS SPECIFIED ON THE DRAWINGS OR AS REQUIRED BY THE LOCAL OR STATE CODES.
43. AIR HANDLING DEVICES IN EXCESS OF 2000 CFM WILL HAVE A DUCT SMOKE DETECTOR TO STOP THE FAN AND ACTIVATE A HORN AND STROBE LIGHT. ALL EQUIPMENT SHALL BE INTERLOCKED AS REQUIRED BY LOCAL CODES OR FIRE SAFETY OFFICIALS.
44. ALL WORK SHALL COMPLY WITH BASE BUILDING LIFE SAFETY/SMOKE CONTROL SYSTEM REQUIREMENTS. PROVIDE ALL NECESSARY WIRING, CONTACTORS, RELAYS, ETC., AS REQUIRED FOR INTERFACE WITH BASE BUILDING SYSTEM.
45. THE AIR CONDITIONING CONTRACTOR SHALL KEEP ALL AREAS IN WHICH WORK IS BEING PERFORMED, FREE FROM DEBRIS AT ALL TIMES AND SAID AREAS SHALL BE LEFT BROOM CLEAN AT THE END OF EACH WORKING DAY.
46. THE AIR CONDITIONING CONTRACTOR SHALL PROVIDE A COMPLETE SET OF AS BUILT DRAWINGS TO THE ENGINEER UPON COMPLETION OF INSTALLATION. IF FIELD CHANGES ARE MADE WHICH DEVIATE FROM ENGINEERING DRAWINGS TO THE EXTENT THAT THE BUILDING DEPARTMENT REQUIRES THESE CHANGES BE INCORPORATED PRIOR TO INSPECTION, THE CONTRACTOR SHALL PROVIDE SKETCHES TO THE ENGINEER FOR INCORPORATION INTO THE BUILDING PLANS. ENGINEERING EXPENSES THAT ARE INCURRED DUE TO REVISIONS OR SUBSTITUTIONS REQUESTED BY THE CONTRACTOR SHALL BE PAID FOR BY THAT CONTRACTOR.
47. AIR CONDITIONING CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND WORKMANSHIP TO BE FREE FROM DEFECTS FOR A PERIOD OF NOT LESS THAN (1) YEAR FROM DATE OF ACCEPTANCE, AND ALL GUARANTEES AND WARRANTIES SHALL BE DELIVERED TO THE OWNER. COMPRESSORS SHALL HAVE EXTENDED FIVE YEAR WARRANTIES.
48. PRIOR TO INSTALLATION, THE CONTRACTOR SHALL COORDINATE THE EXACT LOCATION OF ALL EQUIPMENT WITH THE OWNER'S REPRESENTATIVE AND THE ACTUAL EQUIPMENT BEING FURNISHED.
49. PRESENT AIR CONDITIONING EQUIPMENT WHERE INDICATED ON THE DRAWINGS IS FOR INFORMATION ONLY AND THE CONTRACTOR SHALL INCLUDE THE INSTALLATION OF CONDUIT AND WIRE AS REQUIRED. THE INSTALLATION OF NEW EQUIPMENT THAT INTERFERES WITH EXISTING SHALL BE REMOVED, RELOCATED, OR RE-ROUTED TO PERMIT COMPLETION OF SUCH WORK.
50. SALVAGED MATERIALS, EQUIPMENT, AND DIFFUSERS SHALL BE DELIVERED TO THE OWNER AT HIS PROPERTY AND STORED WITHIN THE BUILDING WHERE DIRECTED. ANY REMOVED MATERIALS OR EQUIPMENT WHICH THE OWNER DOES NOT WISH TO KEEP SHALL BE DISPOSED OF BY THE CONTRACTOR, WITHOUT ADDITIONAL COST TO THE OWNER.
51. THE AIR CONDITIONING CONTRACTOR SHALL DETERMINE THE EXTENT TO WHICH EXISTING DUCTWORK AND PIPING WILL HAVE TO BE RE-ROUTED, RELOCATED, OR RECONNECTED, AND THE AMOUNT OF ADDITIONAL WORK WHICH MAY BE REQUIRED DUE TO THE PHYSICAL CONDITIONS OF THE DUCTWORK & PIPING SHALL BE PERFORMED UNDER THIS CONTRACT WITHOUT ADDITIONAL CHARGES TO THE OWNER.
52. INTERRUPTION OF EXISTING FACILITIES OR SERVICES SHALL BE KEPT TO A MINIMUM AND THE CONTRACTOR SHALL FURNISH ALL MATERIALS AND LABOR REQUIRED WHENEVER TEMPORARY CONDITIONS ARE NECESSARY TO MAINTAIN CONTINUITY OF SERVICE. INTERRUPTION OF SERVICES, THE INSTALLATION OF TEMPORARY FACILITIES, AND THE WORK OF MAKING FINAL CONNECTIONS TO NEW WORK SHALL BE DONE ONLY AT SUCH TIMES AS PERMITTED AND SCHEDULED BY THE OWNER WITHOUT ADDITIONAL COST. THE AIR CONDITIONING CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE THE SERVICE INTERRUPTIONS WITH THE OWNER & GENERAL CONTRACTOR.
53. ALL ROOF MOUNTED EQUIPMENT SHALL BE HVHZ WIND-LOAD RATED WITH SIGNED AND SEALED DOCUMENTS / DRAWINGS FROM AN INDEPENDENT LICENCED FLORIDA PROFESSIONAL ENGINEER.
54. ALL ROOF MOUNTED EQUIPMENT SHALL BE MOUNTED ON CURBS OR STANDS. CURBS AND STANDS SHALL BE FLORIDA PRODUCT APPROVED OR MIAMI DADE PRODUCT APPROVED AND HAVE CURRENT NOTICE OF ACCEPTANCE (NOA). CURBS AND STANDS SHALL BE ATTACHED TO THE ROOF STRUCTURE AND THE EQUIPMENT SHALL BE ATTACHED TO THE CURB OR STAND IN ACCORDANCE WITH THE NOA DOCUMENTS.
55. IF ANY CONFLICTS OR DISCREPANCIES APPEAR IN THESE DOCUMENTS, THE MORE STRINGENT OF THE REQUIREMENTS ARE TO BE TAKEN.

FLOOD PLAIN NOTES

1. ALL CONSTRUCTION BELOW FLOOD ELEVATION SHALL BE FLOOD RESISTANT IN ACCORDANCE WITH FEMA TECHNICAL BULLETIN 2-2008 (I.E. WALLS, FINISHES, DOORS, FRAMES, BASE BOARD FOR GARAGE, STORAGE AREAS).
2. ALL BUILDING OPENINGS FOR AIR INTAKE OR EXHAUST SHALL BE ABOVE THE BASE FLOOD ELEVATION (BFE) PER FEMA RECORD AT TIME OF PERMIT APPROVAL.
3. ALL UTILITIES AND EQUIPMENTS AND ACCESSORIES (ELECTRICAL, MECHANICAL AND PLUMBING) SERVICING THE BUILDING SHALL BE INSTALLED ABOVE THE BFE. (ASCE 24-14 CH. 7.0).

HVAC LEGEND

DUCTWORK

- SUPPLY DUCTWORK
- RETURN OR EXHAUST DUCTWORK
- SUPPLY DIFFUSER (HATCH INDICATE 1-WAY, 2-WAY, OR 3-WAY. NO HATCH INDICATES 4-WAY.) (SQUARE, SLOT, BAR)
- RETURN GRILLE
- EXHAUST GRILLE
- DUCT MOUNTED OR SIDEWALL DIFFUSER/GRILLE
- RETURN GRILLE DUCT MOUNTED OR SIDEWALL
- CONICAL TEE CONN.
- BELLMOUTH CONN.
- 45° THROAT TAP BRANCH CONNECTION
- RADIUS ELBOW R/W=1.5
- TURNING VANES IN ELBOW
- DUCT - WIDTH / DEPTH
- HIDDEN DUCT - WIDTH / DEPTH
- FLEX DUCT - DIAMETER
- RISE IN DUCTWORK
- DROP IN DUCTWORK

SYMBOLS

- POINT OF CONNECTION
- CEILING EXHAUST FAN
- INLINE EXHAUST FAN
- REMOTE ALARM TEST STATION
- SMOKE DUCT DETECTOR
- FIRE DAMPER
- SMOKE DAMPER
- COMBINATION FIRE & SMOKE DAMPER
- THERMOSTAT
- REMOTE THERMOSTAT SENSOR
- THERMOSTAT CONTROL FOR REMOTE THERMOSTAT
- HUMIDISTAT
- ELECTRIC DUCT HEATER
- DIFFUSER TYPE, CFM OR SIZE — RETURN/EXHAUST/SUPPLY
- TRANSITION
- ROOF TOP UNIT
- ROOF FAN
- VENTILATOR ON ROOF
- AIR HANDLER UNIT
- CONDENSING UNIT

ABREVIATIONS

A.F.F.	ABOVE FINISHED FLOOR
R.A.	RETURN AIR
R.C.	ROOF CAP
W.C.	WALL CAP
O/A	OUTSIDE AIR
S.A.D.	SUPPLY AIR DUCT
R.A.D.	RETURN AIR DUCT
R.A.G.	RETURN AIR GRILLE
E.A.G.	EXHAUST AIR GRILLE
T.E.D	TOILET EXHAUST DUCT
AVD	AUTOMATED VOLUME DAMPER
V.D.	MANUAL VOL. DAMPER
FHP	FLORIDA HEAT PUMP
WCU	WINE CONDENSING UNIT
WRU	WINE REFRIGERATION UNIT
V.F.D.	VARIABLE FREQUENCY DRIVE
A.D.	ACCESS DOOR
(N)	NEW
(E2R)	EXISTING TO REMAIN
(D)	EXISTING TO BE DEMOLISHED
(RE)	EXISTING TO BE REPLACED
(RP)	EXISTING TO BE RELOCATED
(W.M.S.)	WIRE MESH SCREEN
UP DN	SUPPLY DUCT (UP & DOWN)
UP DN	RETURN DUCT (UP & DOWN)
UP DN	EXHAUST DUCT (UP & DOWN)
UP DN	O/A DUCT (UP & DOWN)

PIPING

- L/S REFRIGERANT PIPING (SINGLE LINE REPRESENTS BOTH L & S LINES)

NOTE: ALL ITEMS MAY NOT BE APPLICABLE.

CONTRACTOR GENERAL CONDITIONS NOTES

1. RFI'S: CONTRACTOR SHALL SUBMIT RFI'S WITH HIS PROPOSED SOLUTION IN A TIMELY MANNER. CONTRACTOR RECOGNIZES THE CONSULTANT SHALL REQUIRE UP TO 5 WORKING DAYS TO RESPOND.
2. SUBMITTALS AND PRODUCT DATA: CONTRACTOR SHALL PREPARE A SUBMITTAL SCHEDULE FOR APPROVAL BY THE A/E. CONTRACTOR RECOGNIZES THE CONSULTANT SHALL REQUIRE UP TO 10 WORKING DAYS TO REVIEW SUBMISSIONS. ALL SUBMITTALS, PRODUCT DATA, SHALL BE CLEARLY STAMPED AND INDICATED APPROVED BY THE CONTRACTOR PRIOR TO SUBMISSION TO THE CONSULTANT.
3. SHOP DRAWINGS: CONTRACTOR SHALL PREPARE A SHOP DRAWING SCHEDULE FOR APPROVAL BY THE A/E. CONTRACTOR RECOGNIZES THE CONSULTANT SHALL REQUIRE UP TO 10 WORKING DAYS TO REVIEW SHOP DRAWINGS. ALL SHOP DRAWINGS, SHALL BE CLEARLY STAMPED AND INDICATED APPROVED BY THE CONTRACTOR PRIOR TO SUBMISSION TO THE CONSULTANT.
4. LAYOUT AND COORDINATION DRAWINGS: CONTRACTOR SHALL PREPARE SCALED COMPREHENSIVE COORDINATED LAYOUT DRAWINGS. PROVIDE SECTIONS, GENERAL ARRANGEMENTS, ELEVATIONS INCLUDING ALL DISCIPLINES FOR HIS PROPOSED LAYOUT AND ROUTING PRIOR TO FABRICATION. SUBMIT TO OWNER AND A/E FOR REVIEW AND GENERAL CONFORMANCE. PROVIDE DRAWINGS THAT DEMONSTRATE VIA COORDINATED ELEMENTS AND SYSTEMS WITH STRUCTURE THAT CLEARLY INDICATE PROPOSED SYSTEMS WILL FIT, FUNCTION AS INTENDED, BE FREE OF INTERFERENCES AND CONFORM TO REQUIRED CODE AND MANUFACTURER WORKING AND MAINTENANCE CLEARANCES.
5. DEVIATIONS FROM BASIS FOR DESIGN SYSTEMS SHALL BE CLEARLY IDENTIFIED ON ALL SUBMISSIONS.
6. SUBSTITUTIONS:
   - A. CONTRACTOR SHALL PREPARE REQUESTS WITH COMPLETE COORDINATION INFORMATION, INCLUDE ALL CHANGES REQUIRED IN OTHER ELEMENTS OF THE WORK TO ACCOMMODATE THE SUBSTITUTION INCLUDING WORK PERFORMED BY THE OWNER AND THE SEPARATE CONTRACTORS.
   - B. PROVIDE COMPLETE SUPPORTING DATA QUALIFYING THE SUBSTITUTION COMPARED TO THE BASIS OF DESIGN SYSTEM. PROVIDE A DETAILED LIST OF ANY VARIANCES, PHYSICAL OR SPATIAL LAYOUTS, ELEVATIONS, ETC. TO THE BASIS OF DESIGN.
   - C. PROVIDE A STATEMENT INDICATING THE EFFECT THE SUBSTITUTION WILL HAVE ON THE WORK SCHEDULE IN COMPARISON TO THE SCHEDULE WITHOUT APPROVAL OF THE PROPOSED SUBSTITUTION, INCLUDE INFORMATION REGARDING THE EFFECT OF THE PROPOSED SUBSTITUTION ON THE CONTRACT TIME.
   - D. PROVIDE CERTIFICATION BY THE CONTRACTOR TO THE EFFECT THAT, IN THE CONTRACTOR'S OPINION, AFTER THOROUGH EVALUATION, THE PROPOSED SUBSTITUTION WILL RESULT IN WORK THAT IN EVERY SIGNIFICANT RESPECT IS EQUAL TO OR BETTER THAN THE WORK REQUIRED BY THE CONTRACT DOCUMENTS AND THAT IT WILL PERFORM ADEQUATELY IN THE APPLICATION INDICATED.
   - E. CONSULTANT'S EXPENSES THAT ARE INCURRED DUE TO REVISIONS OR SUBSTITUTIONS REQUESTED BY THE CONTRACTOR OR APPROVED BY THE OWNER SHALL BE COMPENSATED TO THE CONSULTANT BY THE CONTRACTOR.
7. AS-BUILT DRAWINGS: THE CONTRACTOR SHALL MAINTAIN AND PREPARE A COMPLETE AND ACCURATE SET OF AS-BUILTS DURING THE PROJECT AND ISSUE TO THE A/E AND OWNER AT PROJECT CLOSEOUT. DURING THE COURSE OF THE PROJECT, THE CONTRACTOR SHALL ISSUE SKETCHES OR SCALED DRAWINGS FOR FIELD CHANGES THAT ARE PROPOSED OR MADE WHICH VARY FROM THE BASIS OF DESIGN. CONSULTANT EXPENSES THAT ARE INCURRED DUE TO SERVICES OR REVISIONS REQUIRED BY BUILDING DEPARTMENT, OWNER, CONTRACTOR, AND MANUFACTURER SHALL BE COMPENSABLE TO THE CONSULTANT BY THE CONTRACTOR.
8. INSTALLATION, TESTING AND BALANCING, START UP, COMMISSIONING AND PERFORMANCE TROUBLESHOOTING OF SYSTEMS- CONTRACTOR RECOGNIZES HE IS SOLELY RESPONSIBLE FOR PERFORMANCE AND COMPLETION OF THESE SERVICES AS PART OF THE PROJECT REQUIREMENTS. DURING THE COURSE OF THE PROJECT, THE CONTRACTOR SHALL DOCUMENT THE SERVICES COMPLETED TO THE OWNER AND A/E. CONSULTANT EXPENSES THAT ARE INCURRED DUE TO SUPPORTING SERVICES OR REVISIONS REQUIRED BY BUILDING DEPARTMENT, OWNER, CONTRACTOR, AND MANUFACTURER SHALL BE COMPENSABLE TO THE CONSULTANT BY THE CONTRACTOR.
9. CONTRACTOR/DELEGATED/SUCCESSOR ENGINEER - CONTRACTOR IS ASSIGNED TO PROVIDE DESIGN/BUILD SERVICED FOR SELECTED SYSTEMS. CONTRACTOR'S ENGINEER SHALL COMPLY WITH ALL FAC 61G15 REQUIREMENTS. DELEGATED/SUCCESSOR ENGINEER SHALL SUBMIT SIGNED/SEALED DRAWINGS TO A/E, TO AGENCIES, RESPOND TO ALL RFI'S, AGENCY COMMENTS, AND BECOME THE DESIGNATED SYSTEM ENGINEER OF RECORD.

DESIGN CRITERIA

WALL INSULATION	R-5 (EXISTING)
ROOF INSULATION	R-19 (EXISTING)
WINDOW U-VALUE	0.65 (EXISTING
WINDOW SHGC	0.50 (EXISTING)

THERMAL PERFORMANCE IS BASED ON ENGINEERING JUDGEMENT AND DOCUMENTATION AVAILABLE AT TIME OF DESIGN. IF MORE ACCURATE DATA BECOME AVAILABLE IT SHALL BE PRESENTED TO THE AOR AND EOR FOR EVALUATION.

HVAC DESIGN REQUIRES

	YES	NO
DUCT SMOKE DETECTOR(S)	X	
FIRE DAMPER(S)		X
SMOKE DAMPER(S)		X
FIRE RATED ENCLOSURE		X
FIRE RATED ROOF/FLOOR CEILING ASSEMBLY		X
FIRE STOPPING (SEE ARCH.)		X
SMOKE CONTROL		X

MECHANICAL SHEET INDEX

SHEET#	DESCRIPTION
M0.1	MECHANICAL NOTES, LEGEND AND SHEET INDEX
M0.2	MECHANICAL CALCS, AND SCHEDULES
M1.1	REFRIGERANT PIPING PLAN
M1.2	LIBRARY MECHANICAL PLAN
M5.1	MECHANICAL DETAILS
M5.2	MECHANICAL MEZZANINE/SOFFIT DETAILS
M6.1	MECHANICAL SPECIFICATIONS

SCOPE OF WORK

1. EXISTING LIBRARY TO BE CONDITIONED AND MECHANICALLY VENTILATED WITH MECHANICAL SYSTEMS AS SCHEDULED AND DRAWN. AHU's SHALL BE LOCATED ON THE MEZZANINE AND DUCTED DOWN TO THE EXISTING LIBRARY SPACE. EXISTING AHUS IN MECHANICAL MEZZANINE TO BE DEMOLISHED.

FLORIDA BUILDING CODE 2023 CONFORMANCE

1. CONTRACTOR TO PROVIDE ALL LABOR AND MATERIAL TO CONFORM TO FBC 2023 7TH EDITION, RELATED SECTIONS, AND STANDARDS.
2. OWNER SHALL PROVIDE SERVICES OF AN INDEPENDENT COMISSION AGENT (CxA) TO PREPARE FUNCTIONAL TEST PROCEDURES, AS REQUIRED BY FBC.
3. CONTRACTOR SHALL PROVIDE SERVICES TO TEST, BALANCE, AND COMISSION THE SYSTEM VIA AN INDEPENDENT AGENT.
4. CONTRACTOR TO PROVIDE COMPLETE CERTIFICATIONS AND CHECKLISTS AS REQUIRED BY FBC FOR HIS WORK RESPONSIBILITIES.

LIFE SAFETY NOTE

1. CONTRACTOR IS CAUTIONED TO REFER TO ARCHITECT'S LIFE SAFETY DRAWINGS FOR RATED WALLS, CONSTRUCTION.
2. PROVIDE COMPLETE REQUIRED FIRE DAMPERS, FIRE/SMOKE DAMPERS, RELEASING F.A. SMOKE DETECTORS, HVAC INTERLOCKING ETC. TO MEET AHJ/PERMIT/C.O.O. REQUIREMENTS.
3. COORDINATE WITH ALL PROJECT DRAWINGS.

SCCR NOTE

CONTRACTOR AND MANUFACTURER SHALL PROVIDE ALL ELECTRICAL SYSTEMS FOR ALL EQUIPMENT, INCLUDING MECHANICAL AND PLUMBING EQUIPMENT WITH INTEGRAL DISCONNECTS, INTEGRAL BREAKERS, INTEGRAL MOTOR STARTERS, VFDS, CHILLER PANELS, PACKAGED UNIT PANELS, ETC., AS RATED WITH A SHORT CIRCUIT CURRENT RATING AT LEAST EQUAL TO THE IMMEDIATE UPSTREAM ELECTRIC OVERCURRENT PROTECTIVE DEVICE SHORT CIRCUIT CURRENT RATING.

ADA NOTES

CONTRACTOR SHALL HAVE KNOWLEDGE OF ALL LATEST A.D.A. ACCESSIBILITY CLEARANCE REQUIREMENTS WHILE COORDINATING FIELD ADAPTATIONS AND SHOP DRAWINGS. MAINTAIN 7'-0" CLEAR ABOVE ALL PEDESTRIAN AND VEHICLE PATHWAYS.

STRUCTURAL NOTES

STRUCTURAL OPENINGS SHALL BE AT LEAST 1.5"-2" BIGGER THAN MEP SYSTEM REQUIRED FINISHED DIMENSIONS FOR THE ENTIRE ASSEMBLY. STRUCTURAL ENGINEER / ARCHITECT SHALL CONFIRM OPENINGS ON THEIR DRAWINGS. STRUCTURAL ENGINEER SHALL DIMENSION OPENINGS ON THEIR DRAWINGS.

REFRIGERANT L/S NOTE

A/C CONTRACTOR PRIOR TO ORDERING PIPING SHALL MEASURE AND COORDINATE WITH EQUIPMENT REP ROUTING OF EACH L/S LINE TO ENSURE PROPER SYSTEM PRESSURES. ONCE EXACT ROUTING IS DETERMINED CONTACT ENGINEER SO THE SELECTION CAN BE RE-RUN TO MAKE SURE SYSTEM IS WITHIN PROPER OPERATING LIMITS.

REFRIGERANT ISOLATION NOTE

PROVIDE REFRIGERANT ISOLATION VALVES AND COUPLINGS AT EACH UNIT CONNECTION TO ALLOW REMOVAL OF AIR HANDLING UNIT WITHOUT AFFECTING REST OF SYSTEM AND REQUIRING PUMPING DOWN SYSTEM.

PIPING NOTE

CONTRACTOR TO COORDINATE WITH MANUFACTURERS SPECIFICATIONS AND RECOMMENDATIONS ON PROVIDING ALL MATERIALS, VALVES, SUPPORTS, ETC. FOR L/S LINE PIPING NETWORK.

REG ARCHITECTS since 1988

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NORTH PALM BEACH LIBRARY HVAC

303 Anchorage Dr
North Palm Beach, FL 33408

NO.	DATE	DESCRIPTION

DATE	10/23/25
MODELED	AK/SV
CHECKED	BJ/SR
PROJECT #	24176

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MECHANICAL LEGEND, NOTES, AND INDEX

PERMIT SET: 10/23/25

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AIR HANDLING UNIT SCHEDULE

MANUFACTURER	CONDENSING UNIT				AIR HANDLER UNIT				CAPACITY (BTU/H)	SENSIBLE (BTU/H)	HEATING CAPACITY (KW)	ESP(WG)	SEER 2 / (IEER)	SUPPLY AIR	ELECTRICAL				
	UNIT TAG	MODEL NO.	DIMENSIONS	WEIGHT	UNIT TAG	MODEL NO.	DIMENSIONS	WEIGHT							V/P/Hz	CONDENSING UNIT		AIR HANDLER UNIT	
			LxWxH (IN)	(LBS)			LxWxH (IN)	(LBS)								MCA	MOCP	MCA	MOCP
TRANE	CU-1,CU-2	TWA090KA	40x35x39	262.5	AHU-1,2	TWE0909KA	54x47x25	382	94,000	81,000	15	0.8	(14.1)	3000	208/3/60	38	60	88	90
TRANE	CU-3,CU-4	5TTR4060A	34x37x37	276	AHU-3,4	5TEM4D07AC51SA	23x26x54	197	60,000	51,000	10	0.5	14.8	2000	208/1/60	30	50	35	60

A/C EQUIPMENT NOTES:

1. VERIFY ALL A/C ELECTRICAL REQUIREMENTS WITH MANUFACTURERS SPEC. PRIOR TO INSTALLATION.
2. PROVIDE R-454B REFRIGERANT
3. PROVIDE DISCONNECTING MEANS AT AHUs.
4. PROVIDE 7 DAY DIGITAL PROGRAMMABLE T-STAT WITH NIGHT SET-BACK, THERMOSTAT OR EQUAL
5. COOLING CAPACITY BASED ON 75°F DB, 63°F WB.
6. CONTRACTOR TO PROVIDE QUOTES FOR EQUIVALENT EQUIPMENT.
7. PROVIDE UL 508 LISTED FLOAT SWITCH IN DRAIN PAN TO PREVENT CONDENSATE OVERFLOW.
8. PROVIDE COASTAL CORROSION PROTECTIVE COATING EQUAL TO MODINE 'E-FIN PRO SHIELD 10' FOR ALL EVAPORATOR COILS, CONDENSER COILS, AND HOUSING EXPOSED TO OUTDOORS.
9. PROVIDE ENGINEER OF RECORD EQUIPMENT STATE UP DOCUMENTATION AND TEST AND BALANCING REPORT TO DOCUMENT PERFORMANCE AT PROJECT COMPLETION.
10. CONTRACTOR SHALL CONFIRM REQUIRED PIPE SIZES WITH MANUFACTURER AND REPLACE EXISTING REFRIGERANT PIPING.
11. PROVIDE DUCT SMOKE DETECTOR TO SHUT DOWN EQUIPMENT UPON DETCTION OF SMOKE AND THE OWNER'S LICENSED FIRE ALARM INSTALLER SHALL INTERGRATE WITH THE EXISTING FIRE ALARM SYSTEM IF REQUIRED BY THE LOCAL FIRE MARSHAL AHJ.
12. COPPER IS THE PREFERRED MATERIAL FOR TUBING AND FINS. SHOULD COPPER MATERIAL BE UNAVAILABLE, OR IMPRACTICAL DUE TO EQUIPMENT SPACE ALLOCATION, SUBSTITUTED MATERIALS MUST BE COATED WITH A PROTECTIVE TREATMENT. REFER TO NOTE 8 FOR BASIS OF DESIGN COATING.

OUTDOOR AIR CALCULATIONS

SYSTEM	SPACE NAME	SPACE CATEGORY	SPACE TYPE	AREA (SQFT)	OCCUPANCY DENSITY PER 1000 SQFT	OCCUPANCY	VENTILATION RATE CFM/PERSON	VENTILATION RATE CFM/SQFT	MINIMUM OUTDOOR AIR REQUIRED (CFM)	OUTDOOR AIR PROVIDED (CFM)	TOTAL OUTDOOR AIR PROVIDED (CFM)
AHU-1,2,3,4	MAIN LIBRARY FLOOR	OFFICES	OFFICE SPACES	7,224	5	37	5	0.06	619	620	800
			TOTALS	7,224					619	620	800

NOTES:

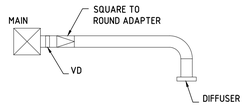
1. OCCUPANT DENSITIES AND VENTILATION RATES BASED ON TABLE 403.3.1.1 OF THE 2023 FLORIDA MECHANICAL CODE. ACTUAL OCCUPANCY BASED ON INFORMATION PROVIDED BY OWNER AND/OR ARCHITECT.
2. ALL DUCTWORK SHALL BE KEPT SEALED TO PREVENT CONTAMINATION BY DUST OR OTHER DEBRIS DURING CONSTRUCTION. SEAL THE END OF DUCTWORK WITH PLASTIC SHEETING AND DUCT TAPE. PROTECT ALL DUCTWORK STORED ON-SITE PRIOR TO FABRICATION AND INSTALLATION IN A SIMILAR FASHION.
3. ALL EQUIPMENT SHALL BE SUPPLIED AND INSTALLED WITH PROVISIONS FOR IN-PLACE CLEANING AND MAINTENANCE TASKS IN ACCORDANCE WITH THE REQUIREMENTS OF ASHRAE STANDARD 62.1
4. CHANGE IN SPACE USE, CONTAMINANTS, OR OPERATION MAY REQUIRE A RE-EVALUATION OF THE DESIGN AND IMPLEMENTATION OF NEEDED CHANGES.

AIR DEVICE SCHEDULE

UNIT TAG	MFGR & MODEL	CFM RANGE	FACE SIZE	FRAME	THROW	REMARKS
RA	PRICE 630FF	0 - 2,000	48x24 / 50x26	SEE RETURN DUCT DETAILS	SURFACE	-
RB	PRICE 630	0 - 6,000	36x60 / 38x62	SEE RETURN DUCT DETAILS	SURFACE	(NO DAMPER)

AIR TERMINAL NOTES:

1. AIR DEVICE SIZES & SCHEDULE AIRFLOW ARE AT THIS SCHEDULE UNLESS OTHERWISE NOTED ON HVAC FLOOR PLANS.
2. BRANCH & OPTIONAL BRANCH DUCT SIZES ARE AT THIS SCHEDULE UNLESS OTHERWISE NOTED ON HVAC FLOOR PLANS. PROVIDE INCREASER OR REDUCER FITTING AS REQUIRED.
3. ALL AIR DEVICES INSTALLED IN INACCESSIBLE AND/OR DRYWALL CEILINGS SHALL BE PROVIDED WITH MANUAL OPPOSED BLADE DAMPERS.
4. ALL AIR DEVICES INSTALLED IN LAY-IN CEILING SHALL HAVE MANUAL VOLUME DAMPER INSTALLED IN THE BRANCH TAKE-OFF.
5. MAXIMUM PRESSURE DROP FOR ALL AIR DEVICES SHALL NOT EXCEED 0.10 IN. W.C.
6. ALL AIR DEVICES SHALL BE WHITE UNLESS OTHERWISE NOTICED. COORDINATE WITH ARCHITECT.
7. MAXIMUM NC FOR ALL DEVICES SHALL NOT EXCEED 25.
8. ALL AIR DEVICES SHALL BE ALUMINUM CONSTRUCTION UNLESS OTHERWISE NOTICED.
9. THROW VALUES ARE GIVEN FOR TERMINALS VELOCITIES OF 150, 100 & 50 FPM RESPECTIVELY.
10. UNLESS INDICATED OTHERWISE, LAY-IN TYPE REGISTERS & DIFFUSERS INSTALLED IN GYPSUM BOARD CEILINGS SHALL BE PROVIDED WITH RAPID MOUNT FRAME, MODEL TITUS TRM OR EQUAL.



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NORTH PALM BEACH LIBRARY HVAC

303 Anchorage Dr
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NO.	DATE	DESCRIPTION

DATE	10/23/25
MODELED	AK/SV
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PROJECT #	24176

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ELECTRICAL SCHEDULES

PERMIT SET: 10/23/25

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Designed By: AK/SV PM: DE P/N 24176

LICENSED PROFESSIONAL ENGINEER No. 86100 STATE OF FLORIDA

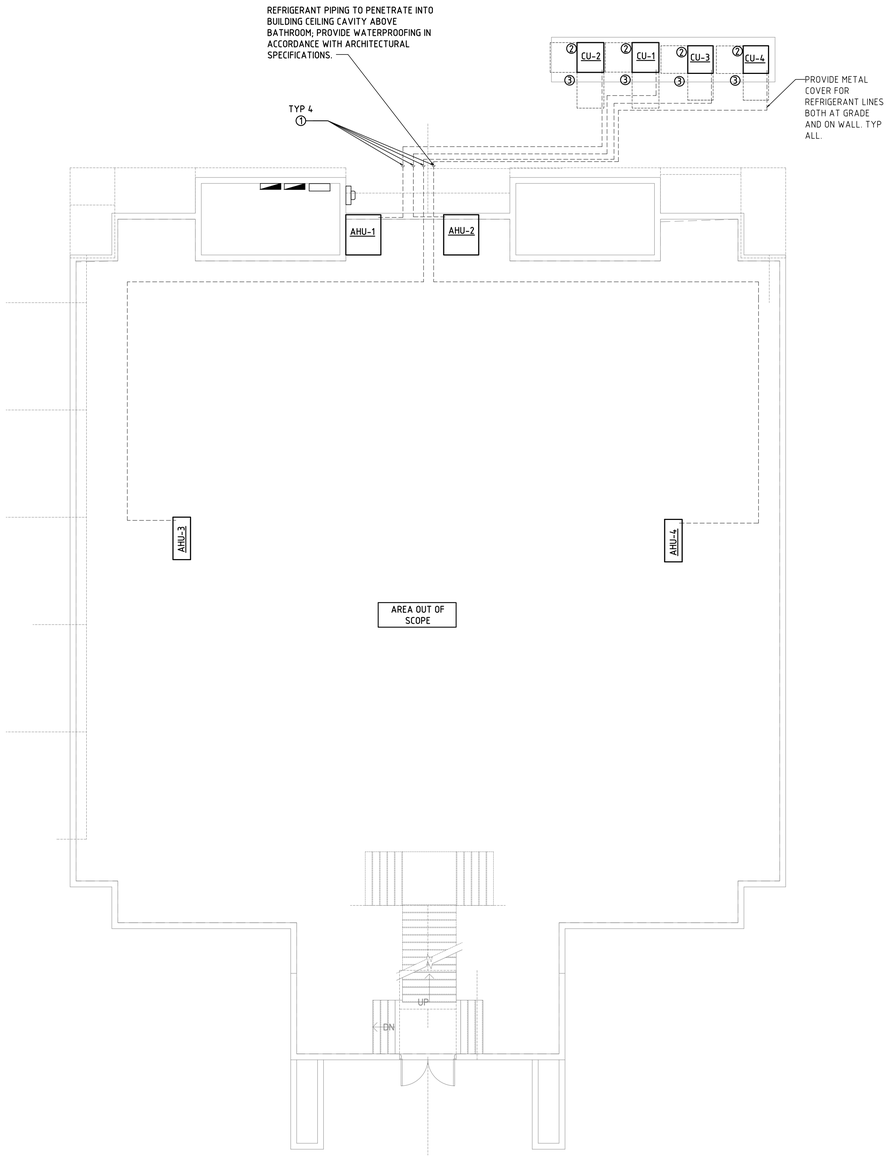
Digitally signed by Benjamin J Jadds, P.E. #86100
Date: 2025.10.23 11:35:02-04'00'

This item has been digitally signed and sealed on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

FIRE SAFETY FLORIDA STATUTES: TO THE BEST OF THE ENGINEER'S KNOWLEDGE, THE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODES AND THE APPLICABLE FIRE-SAFETY STANDARDS AS DETERMINED BY THE LOCAL AUTHORITY IN ACCORDANCE WITH F.B.C. 2023 SECTION 110.8.4.4 AND CHAPTER 633, FLORIDA STATUTES.

PRIOR TO SUBMITTING THE BID, THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND INFORM THE ARCHITECT AND THE ENGINEER OF ANY DISCREPANCY BETWEEN THESE DOCUMENTS AND THE EXISTING CONDITIONS AND SHALL INCLUDE IN THE BID TO CORRECT THE SAME AS DIRECTED. THE ENGINEER AND THE ARCHITECT, ARE NOT RESPONSIBLE FOR ANY ADDITIONAL COSTS RESULTING FROM VERIFIABLE EXISTING CONDITIONS DISCOVERED AFTER CONTRACT HAS BEEN AWARDED. NO CHANGES SHALL BE MADE TO THESE PLANS WITHOUT PRIOR APPROVAL FROM THE ENGINEER OF RECORD. ALL CHANGES SHALL BE SUBMITTED FOR REVIEW PRIOR TO INSTALLATION. NOT FOR BID UNTIL PERMIT HAS BEEN ISSUED.



1 Refrigerant Piping Plan
M1.1 SCALE: 1/8" = 1'-0"

NORTH

HVAC REFRIGERANT PIPING DESIGN DETAIL



REFRIGERANT LINE ROUTING ON EXTERIOR WALL TO ENTER BUILDING AT CEILING SPACE BELOW MECHANICAL MEZZANINE; SEAL WALL PENETRATION WATER -TIGHT IN ACCORDANCE WITH ARCHITECTURAL SPECIFICATIONS.

KEY NOTES:

1. REFRIGERANT LINES UP TO SECOND FLOOR UPTO LIBRARY SPACE ADJACENT TO EXTERIOR WALL.
2. CONDENSING UNITS TO BE MOUNTED ON 4" CONCRETE HOUSEKEEPING PAD. MAINTAIN ALL MANUFACTURER RECOMMENDED CLEARANCES.
3. DEMO EXISTING CONDENSING UNITS AND REPLACE PER PLANS

GENERAL NOTE:

1. CONFIRM WITH EOR AND OWNERS PRIOR TO INSTALLING OR RELOCATING THERMOSTATS.
2. DUCTWORK TO BE INSTALLED AS HIGH AS POSSIBLE AND/OR THROUGH THE WEB OF THE JOIST WHERE POSSIBLE. SEE ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHTS.
3. CONTRACTOR SHALL FIELD VERIFY EXHAUST FANS ARE IN WORKING CONDITION. OTHERWISE CONTACT EOR
4. THE CONTRACTOR SHALL FIELD VERFY LOCATIONS OF ALL LIGHT FIXTURES, FIRE SPRNKLER HEADS AND OTHER ELEMENTS IN CEILING AREA TO COORDINATE FINAL LOCATION OF DUCTWORK AND AIR TERMINALS. CEILING CASSETTE AHUS SHALL NOT BE LOCATED DIRECTLY NEXT TO LIGHT FIXTURES.
5. THE CONTRACTOR SHALL FIELD VERIFY ALL BUILDING WALL OR ROOF OPENINGS ARE SEALED AIR TIGHT FOR AIR-CONDITIONED SPACES.
6. ALL LINE SETS FROM NEW CONDENSING UNITS WILL BE RUN OVER CONCRETE SLABS AND FINISHED WITH A METAL COVER TO PROTECT LINE SETS.

ESTIMATED REFRIGERANT PIPING LENGTH:

AHU-1: 42.0 FT

AHU-2: 46.0FT

AHU-3: 118.0 FT

AHU-4:132.0 FT

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West Palm Beach, FL 33401
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REFRIGERANT PIPING PLAN

PERMIT SET: 10/23/25

FAE CONSULTING
300 Lock Road, Suite #302
Deerfield Beach, FL 33442
TEL: (561)391-9292 FAX: (561)391-9
Certificate of Authorization no. 28107
Ursula Iafrate, P.E. License #73122
Benjamin J. Jadoo, P.E. License #86100
Stephen F. Rollin, P.E. License #36428
E-mail: info@faeconsulting.com
Designed By: AK/SV PM: DE P/N 24176

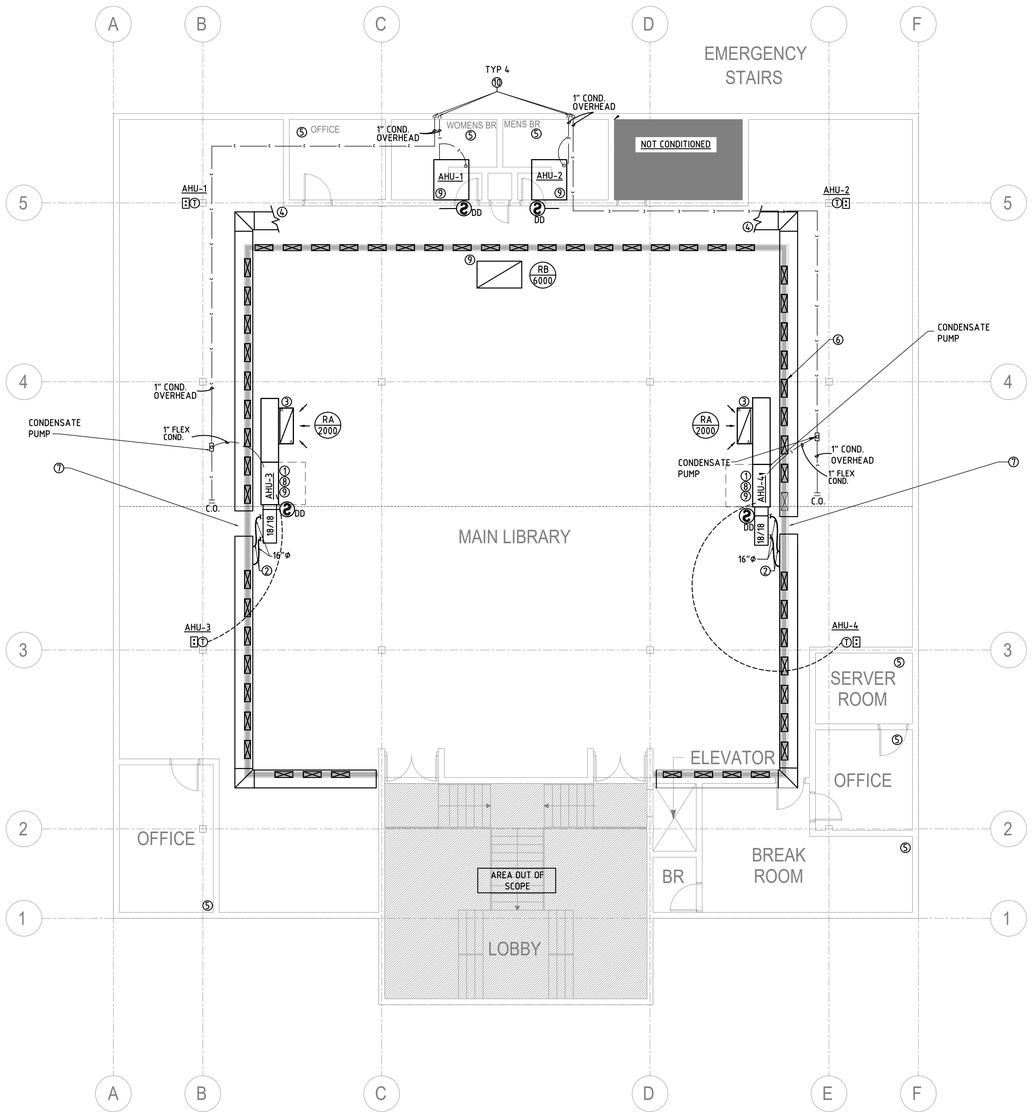
BENJAMIN JOSEPH JADOO LICENSE NO. 86100 STATE OF FLORIDA PROFESSIONAL ENGINEER

Digitally signed by Benjamin J Jadoo PE PE86100 I agree to the terms and conditions of this document. Date: 2025.10.23 11:35:01-04'00'

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PRIOR TO SUBMITTING THE BID, THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND INFORM THE ARCHITECT AND THE ENGINEER OF ANY DISCREPANCY BETWEEN THESE DOCUMENTS AND THE EXISTING CONDITIONS AND SHALL INCLUDE IN THE BID TO CORRECT THE SAME AS DIRECTED. THE ENGINEER AND THE ARCHITECT, ARE NOT RESPONSIBLE FOR ANY ADDITIONAL COSTS RESULTING FROM VERIFIABLE EXISTING CONDITIONS DISCOVERED AFTER CONTRACT HAS BEEN AWARDED. NO CHANGES SHALL BE MADE TO THESE PLANS WITHOUT PRIOR APPROVAL FROM THE ENGINEER OF RECORD. ALL CHANGES SHALL BE SUBMITTED FOR REVIEW PRIOR TO INSTALLATION. NOT FOR BID UNTIL PERMIT HAS BEEN ISSUED.



1 Library Mechanical Plan
M1.2 SCALE: 1/8" = 1'-0"

NORTH

KEY NOTES:

1. EQUIPMENT TO BE INSTALLED IN CEILING SOFFIT. RETURN GRILLE TO BE LOCATED AT 12' AFF. CONTRACTOR SHALL VERIFY OWNER APPROVAL FOR PROPOSED LOCATION OF EQUIPMENT PRIOR TO INSTALLATION TO VERIFY NO CONFLICT WITH OWNERS INTENT AND TO MAINTAIN SERVICE ACCESS
2. SUPPLY DUCTWORK FOR AHU-3 & 4 TO BE TAP INTO EXISTING SUPPLY DUCT MAIN.
3. RETURN GRILLES ARE TO BE CONNECTED TO RETURN DUCTS FROM AHU ACCORDING TO MECHANICAL DETAILS ON SHEET M5.2
4. EXISTING SUPPLY DUCTWORK TO BE CONNECTED TO EQUIPMENT IN MEZZANINE AS SHOWN ON MECHANICAL SHEET M5.2
5. AREA TO NOT IN SCOPE.
6. REFER TO SHEET M5.2 TO COORDINATE WITH EXISTING SUPPLY PENETRATIONS TO SUPPLY PLENUM BOXES TYP ALL.
7. RETROFIT EXISTING SUPPLY DUCT MAIN WITH BAFFLE IN APPROXIMATELY THIS LOCATION. TO ISOLATE 5-TON DUCT SYSTEM FROM 7.5 TON DUCT SYSTEM.
8. MINIMUM ACCESS PANEL SIZE 60"x 30" TO REMOVE THE AHU.
9. SEE DETAIL M5.2
10. 1" CONDENSATE DISCHARGE. TERMINATE +6" ABOVE GRADE AND +12" FROM EXTERIOR WALL. CONTRACTOR SHALL FIELD-VERIFY EXACT PIPE ROUTING AND LOCATION OF WALL PENETRATION AND CONDENSATE DISCHARGE FOR OWNER APPROVAL PRIOR TO INSTALLATION.

GENERAL NOTE:

1. CONFIRM WITH EOR AND OWNERS PRIOR TO INSTALLING OR RELOCATING THERMOSTATS.
2. DUCTWORK TO BE INSTALLED AS HIGH AS POSSIBLE AND/OR THROUGH THE WEB OF THE JOIST WHERE POSSIBLE. SEE ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHTS.
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5. THE CONTRACTOR SHALL FIELD VERIFY ALL BUILDING WALL OR ROOF OPENINGS ARE SEALED AIR TIGHT FOR AIR-CONDITIONED SPACES.
6. PROVIDE ALL CONDENSATE PIPING AS SCHEDULE 40 PVC WITH APPROVED GLUE JOINT AND SUPPORTS TO MAINTAIN MINIMUM 1/8-INCH PER FOOT PITCH. PROVIDE 1/2-INCH ARMAFLEX INSULATION AND SEAL JOINTS WITH APPROVED MASTIC.

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LEVEL 2 MECHANICAL PLAN

PERMIT SET: 10/23/25

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Certificate of authorization no. 28107
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Designed By: AK/SV PM: DE P/N 24176

BENJAMIN J. JADDS LICENSE No. 86100 STATE OF FLORIDA PROFESSIONAL ENGINEER

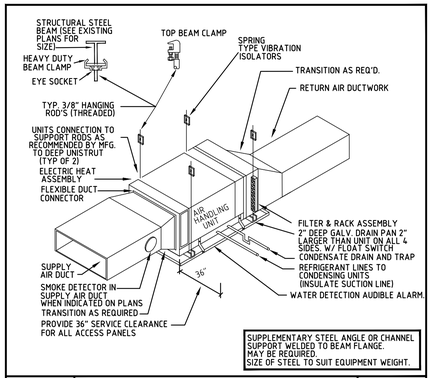
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Location: I agree to the terms specified in the placement of my signature on this document.
Email: bjadds@faeconsulting.com
Date: 2025.10.23 11:35:01-04'00'

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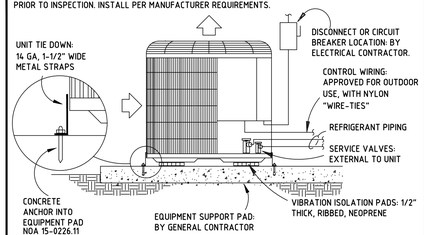
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SUPPLEMENTARY STEEL ANGLE OR CHANNEL SUPPORT WELDED TO BEAM FLANGE. MAY BE REQUIRED. SIZE OF STEEL TO SUIT EQUIPMENT WEIGHT.

DETAIL NO. 1	AIR HANDLER DETAIL	NOT TO SCALE

PROVIDE CONDENSING UNIT TIE DOWN KITS ENGINEERED FOR CURRENT WIND LOADING REQUIREMENTS PER FBC MECH 301.15. SEE MIAMI TECH FOR CURRENT STRUCTURAL ENGINEERING DATA. SUBMIT WIND LOAD ENGINEERING TO BUILDING DEPARTMENT PRIOR TO INSPECTION. INSTALL PER MANUFACTURER REQUIREMENTS.

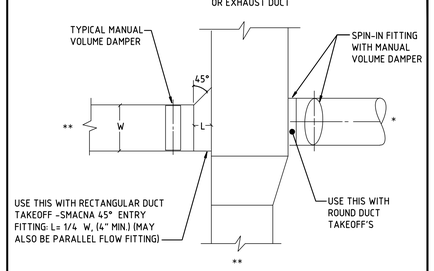


NOTES
1. CUs ARE TO BE LOCATED ON 4" THICK PADS ABOVE THE AREA FLOODPLAIN. CONTRACTOR SHALL VERIFY REQUIRED ELEVATIONS WITH MUNICIPALITY OFFICIAL. MAINTAIN MANUFACTURERS RECOMMENDED CLEARANCES AROUND UNIT.

2. REFRIGERANT SERVICE PORTS SHALL HAVE TAMPER PROOF CAPS.

COMPLY WITH FBC MECH . 301.15

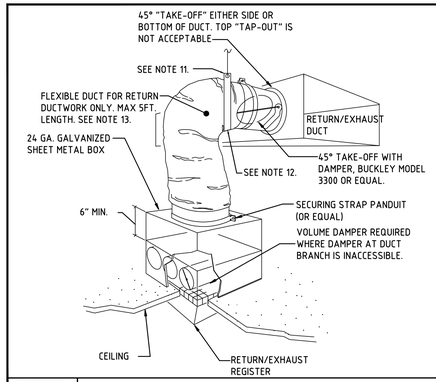
DETAIL NO. 2	CONDENSER MOUNTING DETAIL	NOT TO SCALE



* = BRANCH TO INDIVIDUAL DIFFUSER OR GRILLE

** = SUBMAIN, BRANCHMAIN , OR BRANCH.

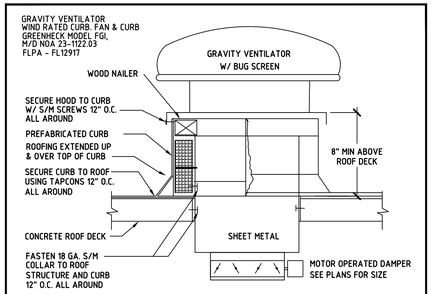
DETAIL NO. 3	LOW PRESSURE DUCT VOLUME DAMPER REQ. DETAIL	NOT TO SCALE



NOTES:

1. SHEET METAL DUCTS SHALL BE FABRICATED & INSTALLED PER THE LATEST EDITION OF SMACNA, AND THE FLORIDA ENERGY CONSERVATION CODE
2. ALTERNATE INTERPRETATIONS OF SMACNA DUCT MATERIAL, HANGERS AND REINFORCEMENTS ARE SUBJECT TO ENGINEER APPROVAL, AND REQUIRE SEPARATE SUBMITTAL OF THE ALTERNATES.
3. FLEXIBLE DUCT CONNECTORS SHALL BE PROVIDED AT CONNECTIONS TO ALL EQUIPMENT.
4. RECTANGULAR ELBOWS SHALL BE SQUARE NECK (SAME IN & OUT DIMENSIONS) WITH 2" DOUBLE THICKNESS TURNING VANES.
5. OFFSETS SHALL NOT REDUCE THE FREE AREA, AND SHALL NOT EXCEED 30° UNLESS OTHERWISE SPECIFIED.
6. TRANSITIONS SHALL NOT EXCEED 1:3 RATIO (4" TRANSITION PER FOOT SINGLE SIDED TRANSITION, AND 8" PER FOOT DOUBLE SIDED TRANSITION).
7. ROUND DUCT CONNECTIONS SHALL BE 45° TAKE-OFF, WITH DAMPER AND HANDLE. SPRAY PAINT OR TIE RED RIBBONS TO MARK LOCATIONS OF HANDLES.
8. FLEXIBLE DUCT SHALL INCLUDE AN INNER POLYETHYLENE LINER, A SPRING HELIX, 1-1/2" BLANKET INSULATION WITH A MINIMUM INSTALLED R-VALUE OF 6.0, A FOIL OUTER VAPOR BARRIER, AND BE UL-181 APPROVED.
9. ALL TAPE SHALL BE FASSON 0810, SMACNA APPROVED.
10. COMPLETELY SEAL ALL SUPPLY, RETURN AND OUTSIDE AIR DUCTS WITH RCD #6 MASTIC OR "HARDCAST" MASTIC TAPE.
11. HANGER WIRE OR STRAPS 5'-0" MAX DISTANCE BETWEEN SUPPORTS. MAX SAG 1/2" PER FOOT OF SUPPORT SPACING. SUPPORTS SHALL BE PROVIDED WITHIN 18" OF INTERMEDIATE FITTING AND BETWEEN INTERMEDIATE FITTINGS AND BENDS.
12. 1-1/2" GALV STEEL BAND CLAMP TO MATCH DUCT.
13. NO FLEXIBLE DUCT ALLOWED FOR EXHAUST GRILLE/REGISTER. USE RIGID SHEET METAL DUCT FOR EXHAUST GRILLE/REGISTER.

DETAIL NO. 4	DUCTWORK CONNECTION TO RETURN GRILL (FLEX DUCT) DETAIL	NOT TO SCALE

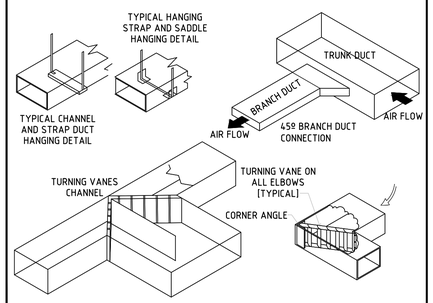


CONTRACTOR SHALL VERIFY WITH QUALIFIED ROOFER TO MAINTAIN THE ROOF MEMBRANE WARRANTY

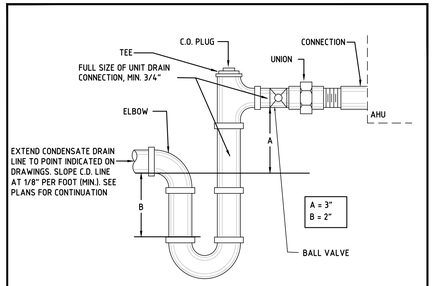
DETAIL NO. 5	ROOF MOUNTED GRAVITY INTAKE HOOD	NOT TO SCALE

SEE DUCTWORK AND ACCESSORIES NOTES FOR SPECIFICATION OF DUCT MATERIALS, FASTENING SYSTEM, AND SEALING METHODS.

NOTE: ALL STRAP SHALL BE A MINIMUM OF 1-1/2,26 GA GALVANIZED STEEL. WITH A 6 FT MAXIMUM SPACING.

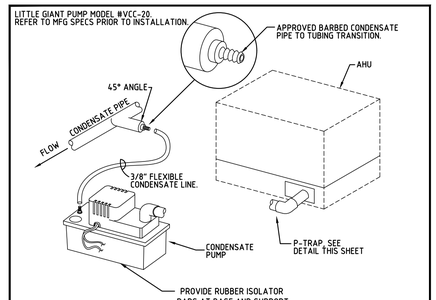


DETAIL NO. 6	METHODS OF HANGING RIGID DUCT DETAIL	NOT TO SCALE



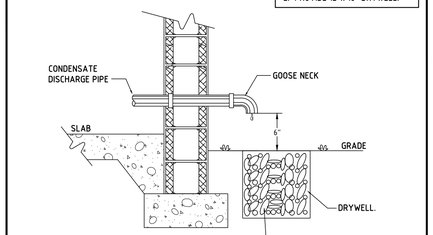
ALL PIPING SHALL BE INSULATED WITH 1/2" ARMAFLEX AND SEALED JOINTS.

DETAIL NO. 7	CONDENSATE DRAIN TRAP	NOT TO SCALE

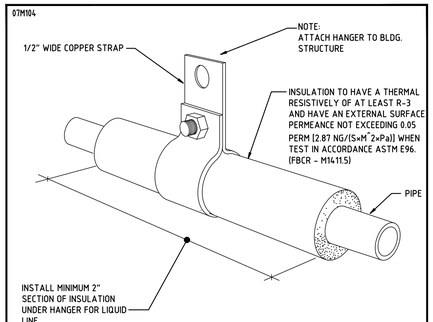


DETAIL NO. 8	CONDENSATE PUMP DISCHARGE	NOT TO SCALE

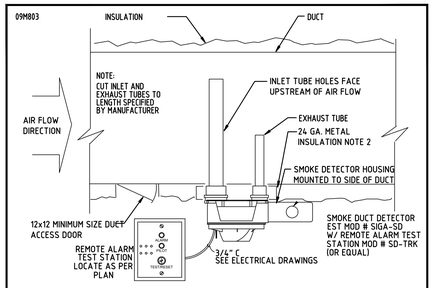
NOTES:
1. EXTEND PIPE DISCHARGE TO MINIMUM OF 12 INCHES FROM BUILDING'S EXTERIOR WALL.
2. PROVIDE 12"x 18" DRYWELL.



DETAIL NO. 9	CONDENSATE DISCHARGE DETAIL	NOT TO SCALE



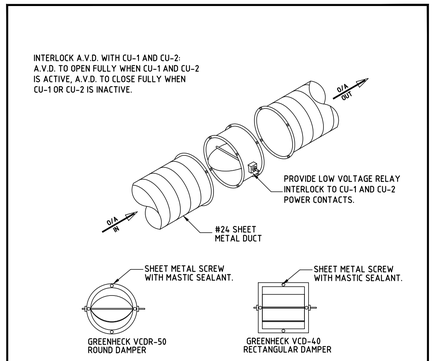
DETAIL NO. 10	REFRIGERANT PIPING DETAIL	NOT TO SCALE



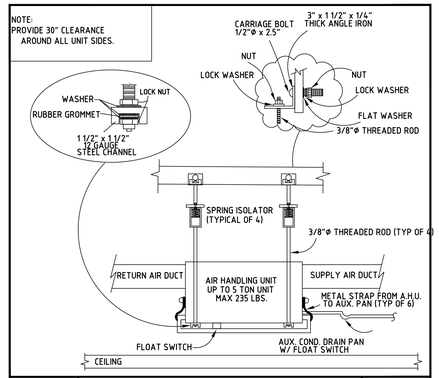
NOTES:

1. DETAIL SHOWS GENERAL INSTALLATION METHODS. REFER TO INDIVIDUAL MANUFACTURER FOR THEIR SPECIFIC INSTALLATION AND LOCATION INSTRUCTIONS.
2. STANDOFF BRACKET NOT REQUIRED ON NON-INSULATED DUCT.
3. CONNECT DUCT DETECTOR TO BUILDINGS FIRE ALARM SYSTEM IN ACCORDANCE WITH FBC-M 606.4.1

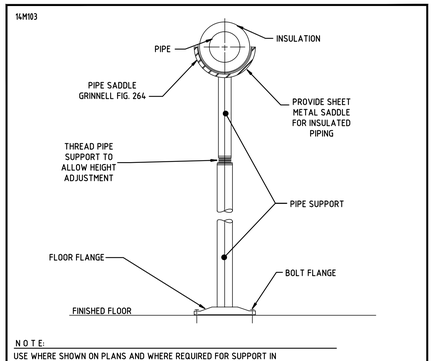
DETAIL NO. 11	DUCT MOUNTED SMOKE DETECTOR DETAIL	NOT TO SCALE



DETAIL NO. 12	AUTOMATIC VOLUME DAMPER (A.V.D) DETAIL	NOT TO SCALE



DETAIL NO. 13	AIR HANDLER DETAIL	NOT TO SCALE



NOTE:
USE WHERE SHOWN ON PLANS AND WHERE REQUIRED FOR SUPPORT IN ADDITION TO PIPE HANGERS. EQUIPMENT SHALL BEAR NO WEIGHT OF PIPING.

DETAIL NO. 14	FLOOR MOUNTED PIPE STAND DETAIL	NOT TO SCALE

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MECHANICAL DETAILS

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Stephen F. Rollin, P.E. License #36428
E-mail: info@faeconsulting.com
Designed By: AK/SV PM: DE P/N 24176

Digitally signed by Benjamin J Jadds
DN: c=US, o=FAE Consulting, cn=Benjamin J Jadds, email=info@faeconsulting.com
Reason: I agree to the terms defined by the placement of my signature on this document.
Date: 2025.10.23 11:35:00-04'00'

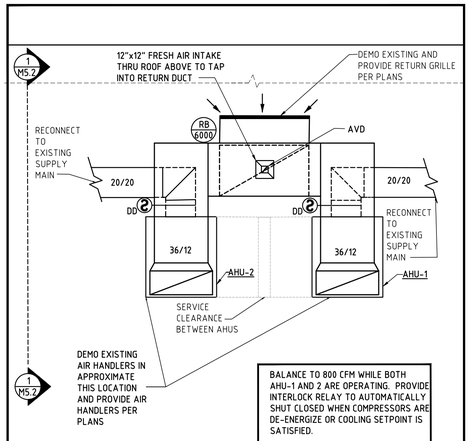
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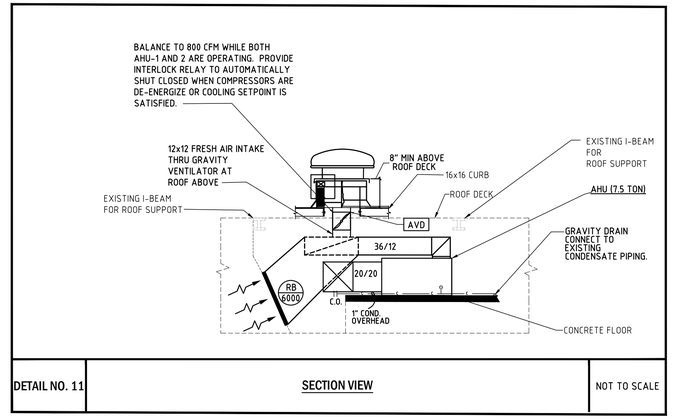
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7.5-TON CONFIGURATION

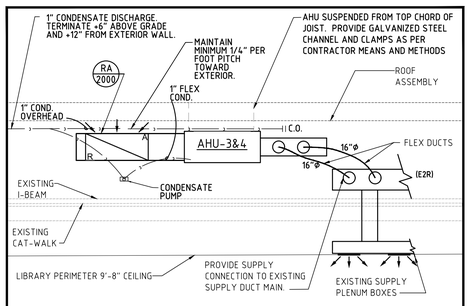


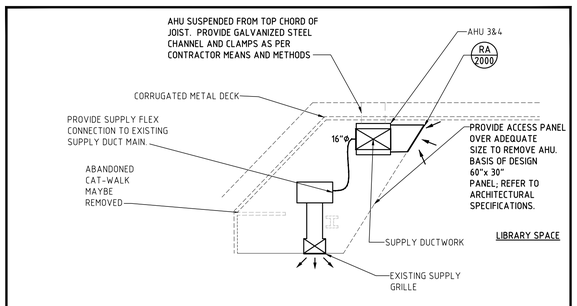


MECHANICAL MEZZANINE DETAILS

SCALE: 1/8" = 1'-0"

5-TON CONFIGURATION





MECHANICAL SOFFIT DETAILS

SCALE: 1/8" = 1'-0"

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FIRE SAFETY FLORIDA STATUTES: TO THE BEST OF THE ENGINEER'S KNOWLEDGE, THE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODES AND THE APPLICABLE FIRE-SAFETY STANDARDS AS DETERMINED BY THE LOCAL AUTHORITY IN ACCORDANCE WITH F.B.C. 2023 SECTION 110.8.4.4 AND CHAPTER 633, FLORIDA STATUTES.

PRIOR TO SUBMITTING THE BID, THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND INFORM THE ARCHITECT AND THE ENGINEER OF ANY DISCREPANCY BETWEEN THESE DOCUMENTS AND THE EXISTING CONDITIONS AND SHALL INCLUDE IN THE BID TO CORRECT THE SAME AS DIRECTED. THE ENGINEER AND THE ARCHITECT, ARE NOT RESPONSIBLE FOR ANY ADDITIONAL COSTS RESULTING FROM VERIFIABLE EXISTING CONDITIONS DISCOVERED AFTER CONTRACT HAS BEEN AWARDED. NO CHANGES SHALL BE MADE TO THESE PLANS WITHOUT PRIOR APPROVAL FROM THE ENGINEER OF RECORD. ALL CHANGES SHALL BE SUBMITTED FOR REVIEW PRIOR TO INSTALLATION. NOT FOR BID UNTIL PERMIT HAS BEEN ISSUED.

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PROJECT #	24176

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MECHANICAL DETAILS

15010 - BASIC MECHANICAL REQUIREMENTS

A. CODES & REFERENCES

1. FLORIDA BUILDING CODE 2023 (WITH AMENDMENTS)
2. SMACNA
3. NFPA 101
4. NFPA 90A
5. NFPA 99

B. SCOPE OF WORK

1. PROVIDE ALL REQUIRED PERMITS, LABOR, MATERIAL AND EQUIPMENT REQUIRED TO COMPLETE THE SCOPE OF THE PROJECT SHOWN ON THE DRAWINGS AND READY FOR OCCUPANCY AND USE BY OWNER. THE WORK SHALL INCLUDE BUT IS NOT LIMITED TO:
    a. REMOVAL, RELOCATION AND RE-INSTALLATION OF EXISTING EQUIPMENT AND SYSTEM
    b. CONNECTIONS TO EXISTING OR NEW EQUIPMENT AND SYSTEMS
    c. MODIFICATION OF EXISTING CHILLED OR HOT WATER SYSTEMS, STEAM SYSTEMS, CONDENSATE DRAINAGE, DUCTWORK, TEMPERATURE CONTROLS AND LIFE-SAFETY SYSTEMS
    d. CUTTING AND PATCHING TO REMOVE EXISTING OR INSTALL NEW WORK
    e. CLEANING AND TESTING
    f. INSTRUCTION TO OWNER'S PERSONNEL
2. ALL REMOVAL WORK AND DISRUPTIONS OF EXISTING SERVICES SHALL BE COORDINATED AND SCHEDULED IN ADVANCE WITH OWNER'S REPRESENTATIVES.
3. PROVIDE ALL BUILDING PENETRATIONS REQUIRED TO COMPLETE PROJECT. ALL PENETRATIONS TO BE PATCHED AND SEALED TO BE WATERTIGHT. MAINTAIN FIRE RATINGS OF EXISTING STRUCTURE.
4. PROVIDE ALL NECESSARY DUCT, EQUIPMENT AND PIPE SUPPORTS AND MATERIALS REQUIRED FOR INSTALLATION. PER THE REQUIREMENTS OF LOCAL, STATE OR FEDERAL CODES.
5. NOT ALL COMPONENTS REQUIRED ARE INDICATED ON THESE DRAWINGS. REFER TO MANUFACTURERS INSTRUCTIONS FOR ADDITIONAL REQUIREMENTS INCLUDING CONNECTION LOCATIONS, TYPES AND SIZES. PROVIDE ISOLATING VALVES AND UNIONS AT ALL EQUIPMENT CONNECTIONS.

C. REQUIRED SHOP DRAWINGS:

1. INSULATION
2. AIR DEVICES
3. DUCTWORK COORDINATION DRAWINGS
4. CONTROLS
5. ROOFTOP EQUIPMENT
6. THERMOSTATS
7. FANS
8. FILTERS
9. DX SPLIT SYSTEMS DAMPERS

D. MAINTENANCE MANUALS

1. PROVIDE MAINTENANCE MANUALS TO OWNER(S) FOR ALL NEW EQUIPMENT CONTAINING ALL OPERATING AND MAINTENANCE DATA, SUBMITTALS, WARRANTEES, DIAGRAMS, AHRI CERTIFICATES, INSPECTION REPORTS AND VALVE LISTS IN A 3 RING BINDER WITH POCKETS FOR DRAWINGS. PROVIDE OWNER WITH 2 COPIES.
2. PROVIDE AN INDEX INSIDE THE BINDER COVER WITH A LIST OF EACH EQUIPMENT ITEM. EACH ITEM SHALL BE INDIVIDUALLY TABBED.
3. PROVIDE A LIST OF ALL REQUIRED REGULAR MAINTENANCE ACTIONS.
4. MAINTENANCE LIST SHALL REFERENCE TABULATED ITEM AND SHALL INCLUDE THE TITLE OR PUBLICATION NUMBER FOR THE OPERATION AND MAINTENANCE MANUAL FOR THAT PARTICULAR MODEL AND TYPE OF PRODUCT.

E. AS-BUILT DRAWINGS

1. THE CONTRACTOR SHALL MAINTAIN AN ACCURATE RECORD OF ALL CHANGES MADE TO THE CONTRACT DOCUMENTS (AS-BUILT).
2. THE CONTRACTOR SHALL PROVIDE THE ENGINEER 2 SETS OF COMPLETED AS-BUILT DRAWINGS.
3. THE PROJECT WILL NOT BE CONSIDERED COMPLETE UNTIL ACCURATE AS-BUILTS ARE DELIVERED.

F. SUBSTITUTIONS

1. EQUIPMENT AND DESIGN OF SYSTEMS INDICATED ON THE DESIGN DRAWINGS AND WITHIN THESE SPECIFICATIONS SHALL BE CONSIDERED AS "SPECIFIED STANDARD" OF QUALITY. NO SUBSTITUTIONS SHALL BE MADE WITHOUT PRIOR WRITTEN APPROVAL OF THE ENGINEER 10 DAYS PRIOR TO BID DATE.
2. ANY DEVIATION FROM SPECIFIED EQUIPMENT THAT AFFECTS THE ELECTRICAL REQUIREMENTS SHALL BE COORDINATED BY THE MECHANICAL CONTRACTOR AND EQUIPMENT VENDOR WITH THE ELECTRICAL CONTRACTOR PRIOR TO SUBMITTING BIDS.

G. WIND LOADS

1. ALL EQUIPMENT TO BE MOUNTED OUTSIDE SHALL BE FURNISHED WITH A NOA (NOTICE OF ACCEPTANCE) FOR WINDSTORM OR BE FURNISHED WITH AN ENGINEERED DETAIL GOOD FOR THE LOCAL WIND RATE.

15050 - BASIC MATERIALS AND METHODS

A. ACCESS PANELS - FURNISHED BY MECHANICAL CONTRACTOR, INSTALLED BY GENERAL CONTRACTOR.

1. PROVIDE FOR ACCESS TO ALL SERVICEABLE EQUIPMENT IN WALLS AND CEILINGS
2. MICOR STYLE M FOR DRYWALL
3. MICOR STYLE K FOR PLASTER
4. MINIMUM SIZE 16"x16"
5. NYSTROM, KARP, J.L. INDUSTRIES OR WILLIAMS PAINT

B. LABELING

1. PROVIDE RIGID PLASTIC EMBOSSED EQUIPMENT NAMETAGS FOR ALL NEW EQUIPMENT AND DISCONNECTS. SETON NAMEPLATE CORPORATION.
2. PAINT ALL MECHANICAL PIPING IN EQUIPMENT ROOMS, BOILER ROOMS AND WHERE EXPOSED OR OUTDOORS. MATCH EXISTING COLOR CODES USED ON SIMILAR SYSTEMS.
3. PROVIDE VALVE TAGS ON ALL NEW AND RELOCATED VALVES. VALVE TAGS SHALL MATCH TAGS USED AT THE EXISTING FACILITY. TAGS TO BE SECURED TO VALVES WITH BRASS CHAINS. PROVIDE UPDATED INFORMATION ON ALL NEW VALVES TO THE EXISTING VALVE CHART.
4. PROVIDE PIPE LABELS ON ALL NEW PIPING. PIPE LABELS TO MATCH SIZE, COLOR AND TYPE USED AT THE EXISTING FACILITY AND COMPLY WITH ANSI A1 3.1. LABELS SHALL BE APPLIED CLOSE TO VALVES, CHANGES IN PIPE DIRECTIONS, BRANCHES, PIPES PASSING THRU WALLS OR FLOORS AND EVERY 20 FEET IN STRAIGHT RUNS OF PIPING AND AT LEAST ONE TIME PER ROOM.

C. FLASHING AND COUNTER FLASHING

1. FURNISH MATERIALS AND COORDINATE INSTALLATION FOR ALL PENETRATIONS OF ROOF BY ALL DUCT AND PIPE
2. SHEET METAL - 24ga. ASTM A525
3. SHEET LEAD 6 lbs. PER SQ. FT. (WHERE ALLOWED)
4. STAINLESS STEEL 20 ga.
5. SHEET COPPER 24 oz. PER SQ. FT.

D. MECHANICAL SYSTEMS CLEANING

1. CLEAN AND TOUCH UP ALL FACTORY FINISHES
2. FLUSH ALL HVAC SYSTEMS BEFORE CONNECTION TO EQUIPMENT
3. CLEAN ALL CLOSED HVAC SYSTEMS WITH ALKALINE CLEANER CIRCULATED FOR 72 HOURS
4. PRESSURE TEST ALL MECHNICAL PIPING SYSTEMS
    a. STEAM SYSTEMS 150 psi FOR SIX HOURS
    b. WATER SYSTEMS 150 psi FOR SIX HOURS

E. CLEANING TESTING AND ADJUSTING

1. THE MECHANICAL CONTRACTOR, AT HIS EXPENSE, SHALL CLEAN, REPAIR, ADJUST, CHECK, BALANCE AND PLACE IN SERVICE THE VARIOUS SYSTEMS HEREIN SPECIFIED WITH THEIR RESPECTIVE EQUIPMENT, ACCESSORIES AND PIPING. HE/SHE SHALL FURNISH ALL LABOR, MATERIALS, EQUIPMENT AND TOOLS REQUIRED TO PERFORM TESTS REQUIRED BY THESE SPECIFICATIONS AND BY THE GOVERNING AUTHORITIES.
2. NO WORK SHALL BE COVERED OR CONCEALED UNTIL PROPERLY INSPECTED AND TESTED.

F. HANGERS AND SUPPORTS

1. PROVIDE ALL NECESSARY DUCTWORK, PIPE SUPPORTS, HANGERS, RODS, CLAMPS AND ATTACHMENTS TO PROPERLY INSTALL AND SUPPORT DUCTWORK, PIPING AND EQUIPMENT FROM THE BUILDING STRUCTURE.
2. PROVIDE ANY ANGLE IRON OR UNISTRUT AND SUSPENSION RODS REQUIRED TO INSTALL EQUIPMENT, PIPING AND DUCTWORK.
3. ALL SUPPORTS EXPOSED TO OUTDOORS SHALL BE CLEANED, PRIMED AND PAINTED TO PREVENT RUSTING. FINISH COLOR AS SELECTED BY OWNER.
4. THE USE OF BALING WIRE OR PERFORATED METAL STRAPPING IS NOT PERMITTED FOR SUPPORTS.

G. WARRANTY/GUARANTEE

1. THE CONTRACTOR SHALL WARRANTY/GUARANTEE AND MAINTAIN THE STABILITY OF WORK AND MATERIALS AND KEEP SAME IN PERFECT REPAIR AND CONDITION OF THE PERIOD OF ONE YEAR.
2. DEFECTS OF ANY KIND DUE TO THE FAULTY WORK OR MATERIALS APPEARING DURING THE ABOVE MENTIONED PERIOD MUST BE IMMEDIATELY MADE GOOD BY THE CONTRACTOR AT HIS OWN EXPENSE TO THE ENTIRE SATISFACTION OF THE OWNER AND ENGINEER. SUCH RECONSTRUCTION AND REPAIRS SHALL INCLUDE DAMAGE TO THE FINISH OR FURNISHING OF THE BUILDING RESULTING FROM THE ORIGINAL DEFECT OR REPAIR THERETO.

15242 - VIBRATION ISOLATION

A. ACCEPTABLE MANUFACTURERS:

1. MASON INDUSTRIES
2. KINETICS NOISE CONTROL
3. KORFUND
4. AMBER BOOTH

B. MASON TYPE SLF CONTROL AIR COMPRESSOR, AHU'S (UNLESS INTERNAL), CENTRIFUGAL FANS
C. MASON SUPER W RUBBER PAD HVAC PUMPS, CHILLERS, AHU'S (IF INTERNAL)
D. MASON TYPE HS CEILING SUSPENDED FANS AND AHU'S
E. MASON PC30N CLOSEST 2 HANGERS TO AHU'S, PIPING WITHIN 20 PIPE DIAMETERS TO PUMPS
F. INERTIA BASES WHERE SCHEDULED OR SHOWN

15250 - INSULATION

A. INSULATION, ADHESIVES, COATINGS, SEALERS, TAPES, ETC. SHALL HAVE A FLAME SPREAD OF 25 OR LESS AND SMOKE DEVELOPMENT OF 50 OR LESS IN ACCORDANCE WITH ASTM E-84, NFPA 225, UL 723 AND MEET THE REQUIREMENTS OF NFPA 90A. ALL INSULATING R-VALUES TO MEET THE REQUIREMENTS OF THE FLORIDA ENERGY CODE.

B. FLEXIBLE ELASTOMERIC INSULATION, ARMSTRONG "AP ARMAFLEX", MITCHEL, RUBATEX:

1. CONDENSATE DRAINS - 3/4 " THICK
2. REFRIGERATION MACHINE EVAPORATOR - 2 LAYERS - 3/4 " THICK
3. REFRIGERATION SUCTION LINES: 3/4 " THICK
4. ALL OUTDOOR EXPOSED PIPING INSULATION SHALL BE PAINTED WITH TWO COATS OF ARMAFLEX STANDARD WHITE WB FINISH. PRIOR TO APPLYING THE FINISH, THE INSULATION SHALL BE WIPED CLEAN WITH DENATURED ALCOHOL. THE FINISH SHALL NOT BE TINTED.
5. ALL OUTDOOR EXPOSED PIPING SHALL HAVE THE SEAMS LOCATED ON THE LOWER HALF OF THE PIPE.
6. CONTACT MANUFACTURER FOR ALTERNATIVE PRODUCTS.

C. BLANKET TYPE DUCT INSULATION, JOHNS MANVILLE, CERTAINTEED, KNAUF, OWENS CORNING, MINIMUM R=6.0, FOIL FACED KRAFT VAPOR BARRIER:

1. ALL SUPPLY, OUTSIDE AIR AND RETURN WHERE CONCEALED FROM VIEW, R-6

D. SEMI RIGID BOARD TYPE DUCT INSULATION 1.5lb DENSITY, CERTAINTEED 1B-300, JOHNS MANVILLE, KNAUF, OWENS CORNING:

1. ALL SUPPLY, RETURN AND OUTSIDE AIR WHERE EXPOSED
2. MINIMUM DUCT INSULATION THICKNESS AND R VALUES ARE AS FOLLOWS:
    a. SUPPLY AND RETURN AIR IN UNCONDITIONED SPACE: 2" (R-6 MIN.)
    b. SUPPLY AND RETURN AIR IN CONDITIONED INTERIOR SPACE: 1.5" (R-4.2 MIN.)
    c. OUTSIDE AIR: 2" (R-6 MIN.)
    d. SUPPLY AIR IN CEILING RETURN AIR PLENUM: 1.5" (R-4.2 MIN.)
    e. RETURN AIR IN CEILING RETURN AIR PLENUM: NOT REQUIRED
    f. DUCTWORK OUTSIDE OF BUILDING: 3" (R-8 MIN.)

15870 - FIBERGLASS DUCTWORK (SUPPLY AND RETURN DUCTWORK):

A. ALL DUCTWORK OPERATING AT OR BELOW 1.5" W.G. STATIC PRESSURE, 1500 FPM VELOCITY AND 250°F AIR TEMPERATURE CAN BE CONSTRUCTED OF 1 1/2" THICK (R-6) FIBROUS GLASS DUCT BOARD MEETING THE REQUIREMENTS OF THE LATEST EDITION OF THE SMACNA FIBROUS GLASS DUCT CONSTRUCTION STANDARD. ALL DUCTWORK LOCATED WITHIN CONDITIONED SPACE AT OR BELOW 1.5" W.G. STATIC PRESSURE, 1500 FPM VELOCITY AND 250°F AIR TEMPERATURE CAN BE CONSTRUCTED OF 1" THICK (R-4.2) FIBROUS GLASS DUCT BOARD MEETING THE REQUIREMENTS OF THE LATEST EDITION OF THE SMACNA FIBROUS GLASS DUCT CONSTRUCTION STANDARD. ALL FLEX DUCT SHALL BE RATED CLASS 1, UL-181 LISTED WITH METALIZED INNER AND OUTER FOIL LINERS.

B. FABRICATION AND INSTALLATION OF DUCT AND FITTINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE SMACNA FIBROUS GLASS DUCT CONSTRUCTION STANDARD. FURTHERMORE, CLOSURE SYSTEMS FOR LONGITUDINAL SEAMS AND TRANSVERSE JOINTS SHALL BE IN ACCORDANCE WITH PROCEDURES NECESSARY TO COMPLY WITH SECTION III, CLOSURES.

15890 - SHEETMETAL DUCTWORK (OUTSIDE AIR DUCTWORK):

A. ALL DUCT TO BE INSTALLED ACCORDING TO LATEST SMACNA STANDARDS
B. ALL SYSTEMS TO BE LEAKAGE TESTED

15910 - SHEETMETAL ACCESSORIES

A. AIR INLETS AND OUTLET

1. REFER TO SCHEDULE
2. ALL ALUMINUM CONSTRUCTION
3. ACCEPTABLE MANUFACTURERS: TITUS, PRICE, METAL-AIRE, CARNES, ANEMOSTAT, NAILOR

B. FLEXIBLE INSULATED DUCT FOR SUPPLY AND RETURN AIR.

1. FLEXIBLE DUCT: UL 181, CLASS 1, MULTIPLE LAYERS OF ALUMINUM LAMINATE SUPPORTED BY HELICALLY WOUND, SPRING-STEEL WIRE; FIBROUS-GLASS INSULATION; POLYETHYLENE OR ALUMINIZED VAPOR-BARRIER FILM. FLEXMASTER, MASTERDUCT TYPE 5M LOW PRESSURE INSULATED OR EQUAL.
    a. PRESSURE RATING: 10-INCH WG POSITIVE AND 1.0-INCH WG NEGATIVE
    b. MAXIMUM AIR VELOCITY: 4000 FPM
    c. TEMPERATURE RANGE: MINUS 20 TO PLUS 210 DEG F
    d. INSULATION R-VALUE: COMPLY WITH ASHRAE/IESNA 90.1, R-6 MINIMUM
    e. FLAME SPREAD: LESS THAN 25
    f. SMOKE DEVELOPED: LESS THAN 50
2. CONNECT FLEXIBLE DUCTS TO METAL DUCTS, DIFFUSERS, OR TAKE-OFFS WITH DRAW BANDS AND PRESSURE SENSITIVE TAPE.
3. COMPLY WITH FMC SECTION 603, DUCT CONSTRUCTION AND INSTALLATION.
4. SPLICING OF TWO OR MORE SECTIONS SHALL NOT BE PERMITTED. DO NOT EXCEED CENTERLINE BEND RADIUS OF 1.5 X DIAMETER. TRIM DUCTS TO PROPER LENGTHS AND DO NOT ALLOW DUCTS TO SAG.
5. DUCTS SHALL BE SUPPORTED WITH APPROVED HANGERS IN ACCORDANCE WITH THE REQUIREMENTS OF FMC SECTIONS 603.10.1 THROUGH 603.10.3, OR BY OTHER APPROVED DUCT SUPPORT SYSTEMS DESIGNED IN ACCORDANCE WITH THE FLORIDA BUILDING CODE. FLEXIBLE DUCTS SHALL BE CONFIGURED AND SUPPORTED SO AS TO PREVENT THE USE OF EXCESS DUCT MATERIAL, PREVENT DUCT DISLOCATION OR DAMAGE, AND PREVENT CONSTRICTION OF THE DUCT BELOW THE RATED DUCT DIAMETER IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:
    a. DUCTS SHALL BE INSTALLED FULLY EXTENDED. THE TOTAL EXTENDED LENGTH OF DUCT MATERIAL SHALL NOT EXCEED 5 PERCENT OF THE MINIMUM REQUIRED LENGTH FOR THAT RUN.
    b. BENDS SHALL MAINTAIN A CENTER LINE RADIUS OF NOT LESS THAN ONE DUCT DIAMETER.
    c. TERMINAL DEVICES SHALL BE SUPPORTED INDEPENDENTLY OF THE FLEXIBLE DUCT.
    d. HORIZONTAL DUCT SHALL BE SUPPORTED AT INTERVALS NOT GREATER THAN 5 FEET. DUCT SAG BETWEEN SUPPORTS SHALL NOT EXCEED 1/2 INCH (12.7 MM) PER FOOT OF LENGTH. SUPPORTS SHALL BE PROVIDED WITHIN 1-1/2 FEET OF INTERMEDIATE FITTINGS AND BETWEEN INTERMEDIATE FITTINGS AND BENDS. CEILING JOISTS AND RIGID DUCT OR EQUIPMENT MAY BE CONSIDERED TO BE SUPPORTS.
    e. VERTICAL DUCT SHALL BE STABILIZED WITH SUPPORT STRAPS AT INTERVALS NOT GREATER THAN 6 FEET.
    f. HANGERS, SADDLES AND OTHER SUPPORTS SHALL MEET THE DUCT MANUFACTURER'S RECOMMENDATIONS AND SHALL BE OF SUFFICIENT WIDTH TO PREVENT RESTRICTION OF THE INTERNAL DUCT DIAMETER. IN NO CASE SHALL THE MATERIAL SUPPORTING FLEXIBLE DUCT THAT IS IN DIRECT CONTACT WITH IT BE LESS THAN 1-1/2 INCHES WIDE.

C. BALANCING DAMPERS

1. GENERAL - IN ALL DUCTWORK SYSTEMS, PROVIDE DAMPERS FOR PROPER CONTROL AND BALANCING OF AIR QUANTITIES. CONCEALED DAMPERS TO HAVE CONCEALED DAMPER REGULATOR. ALL COMPONENTS FOR PROPER OPERATION; (i.e. GEARS, LINKAGES, CABLE, ETC.) SHALL BE INCLUDED.
2. TYPE: OPPOSED BLADE.
3. MATERIAL: STEEL, 3V TYPE BLADES MOUNTED IN STEEL CHANNEL FRAME.
4. SHAFT: 1/2 " SQUARE ROD OPERATOR WITH END BEARINGS AND GASKET SEAL AT DUCT PENETRATIONS. TERMINATE SHAFT IN DAMPER FRAME WITH BUSHINGS.
5. OPERATOR: LOCKING QUADRANT HANDLE WITH DAMPER POSITION INDICATOR AND INSULATION STAND OFF MOUNTING BRACKET FOR EXTERNALLY INSULATED DUCTWORK.

E. ACCESS DOORS

1. ACCEPTABLE MANUFACTURERS: RUSKIN, VENCO, NAILOR.
2. SIZE ACCESS DOOR AS FOLLOWS:
    a. DUCT SIZES UNDER 12": DOOR SIZED SUFFICIENT TO EQUIPMENT OR REPLACE FUSIBLE LINK.
    b. DUCT SIZES 12" TO 20": 12"x12" DOOR
    c. DUCT SIZES 20" TO 36": 18"x18" DOOR
    d. DUCT SIZES 36" AND ABOVE: 24"x24" DOOR
3. USE DOUBLE PANEL CONSTRUCTION, TWO SHEETS OF AT LEAST 24 GAUGE GALVANIZED STEEL WITH 1" THICK INSULATION BETWEEN PANELS.
4. MOUNT DOORS IN A RIGID FRAME OF AT LEAST 22 GAUGE FORMED GALVANIZED STEEL OR ALUMINUM.
5. PROVIDE LATCHES THAT PERMIT EASY REMOVAL OF ACCESS DOOR WHILE MAINTAINING POSITIVE CLOSING AND MINIMUM LEAKAGE.
6. PROVIDE SPONGE RUBBER GASKETS FOR ALL DOORS.
7. IN ACCORDANCE WITH NFPA 90A, IDENTIFY EACH ACCESS DOOR WITH 1/2" HIGH STENCILED LETTERS AS 'FIRE DAMPER', 'SMOKE DAMPER', OR 'COMBINATION FIRE/SMOKE DAMPER'.

15990 - TEST AND BALANCE

A. PROVIDE COMPLETE TEST AND BALANCE OF ALL AIR SYSTEMS IN ACCORDANCE WITH NEBB (NATIONAL ENVIRONMENTAL BALANCING BUREAU) OR AABC (ASSOCIATED AIR BALANCE COUNCIL) STANDARDS.
B. TEST AND BALANCE FIRM TO BE:

1. CERTIFIED TEST & BALANCE - (561) 961-5068, OR (954) 532-4772.
2. DADE TEST AND BALANCE, INC. - (954) 791-3194.
3. TOTAL DYNAMIC BALANCE - (954) 425-0764.
4. EARL HAGOOD, INC. - (305) 266-7070.
5. OR APPROVED EQUAL.

C. CONTRACTOR SHALL:

1. VISIT SITE AT START OF PROJECT AND COORDINATE REQUIRED BALANCING EQUIPMENT AND DAMPERS WITH MECHANICAL CONTRACTOR.
2. AIR SYSTEMS:
    a. MAKE CHANGES TO BELTS, PULLEYS, DAMPERS, VOLUME BOXES, ETC. TO OBTAIN DESIGN CONDITIONS AS REQUIRED BY TAB PROCEDURES.
    b. BALANCE SUPPLY, RETURN AND EXHAUST AIR OUTLETS WITHIN 10% OF DESIGN WHILE MAINTAINING REQUIRED PRESSURE RELATIONSHIPS. RECORD DESIGN AND ACTUAL TOTALS.
    c. MEASURE AND REPORT FAN RPM, FAN SUCTION PRESSURE, FAN DISCHARGE PRESSURE, FAN TOTAL PRESSURE AND PRESSURE DROP ACROSS COMPONENTS. DESIGN AND ACTUAL SUPPLY, RETURN, OUTSIDE AND EXHAUST AIR.
    d. ACTUAL AND DESIGN NAMEPLATE AMPERAGE ON FAN MOTORS.
    e. PRESSURE DIFFERENTIAL ACROSS DUCT SMOKE DETECTORS.
    f. ADJUST FANS FOR LOWEST STATIC PRESSURE REQUIRED TO DELIVER TO OUTLETS AS NOTED IN NEBB OR AABC PROCEDURES.
    g. MEASURE SUPPLY AND RETURN ENTERING AND LEAVING TEMPERATURES (DB/WB) ACROSS EACH COIL AND AT EACH SUPPLY DISCHARGE AND RETURN INLET AT UNIT.

SPLIT SYSTEM A/C UNITS

ACCEPTABLE MANUFACTURERS

C. TRANE
D. CARRIER
E. DAIKIN

A. OUTDOOR UNIT:

1. REFRIGERANT: R-454B.
2. HOUSING: STEEL, PAINTED WITH COASTAL CORROSION PROTECTION.
3. COMPRESSOR: HERMETIC WITH VIBRATION ISOLATION.
4. SERVICE VALVES: SOLID BRASS FOR LIQUID AND SUCTION LINES LOCATED OUTSIDE OF UNIT.
5. CONTROLS: FACTORY WIRED WITH THERMAL AND CURRENT OVERLOAD SENSORS.
6. COIL: ALUMINUM FINS, NON-FERROUS TUBING.
7. FAN: DIRECT DRIVE, PROPELLER TYPE, UPBLAST.
8. ACCESSORIES: PRECHARGED TUBING PACKAGE.

B. INDOOR UNIT:

1. REFRIGERANT: R-454B.
2. CASE: 20 GAUGE STEEL. ENAMEL PAINT.
3. FAN: FORWARD CURVE CENTRIFUGAL, STATICALLY AND DYNAMICALLY BALANCED. RESILIENTLY MOUNTED. THERMAL OVERLOAD PROTECTION.
4. COIL: ALUMINUM FINS. NON FERROUS TUBING. PRECHARGED WITH SUFFICIENT REFRIGERANT FOR SYSTEM.
5. CONTROLS: 24 VOLT TRANSFORMER AND FAN RELAY.
6. FILTER: THROWAWAY FILTER AND MOUNTING FRAME (MINIMUM MERV 8).
7. HEATER: U.L. LISTED. FACTORY INSTALLED AND WIRED.

NOTE TO CONTRACTOR

CONTRACTOR TO VISIT SITE PRIOR TO CONSTRUCTION AND VERIFY EXISTING CONDITIONS. NOTIFY ARCHITECT/ENGINEER OF ANY SIGNIFICANT DEVIATION FROM PLANS. CONTRACTOR TO COORDINATE ALL MECHANICAL, ELECTRICAL, PLUMBING, STRUCTURAL AND FIRE SPRINKLER WITH EXISTING CONDITIONS.

NOTE:
PER 2023 FBC ENERGY CONSERVATION CH. 4, SECTION 403.2.4.3: PROVIDE MOTORIZED SHUTOFF CONTROL DAMPERS ON ALL OUTSIDE AIR INTAKES.

REG ARCHITECTS
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NORTH PALM BEACH LIBRARY HVAC

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MECHANICAL SPECIFICATIONS

PERMIT SET: 10/23/25

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LICENSE No. 86100 STATE OF FLORIDA PROFESSIONAL ENGINEER

Digitally signed by Benjamin J Jadds, P.E., PE #86100
Date: 2025.10.23 11:34:58-04'00'

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FIRE SAFETY FLORIDA STATUTES: TO THE BEST OF THE ENGINEER'S KNOWLEDGE, THE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODES AND THE APPLICABLE FIRE-SAFETY STANDARDS AS DETERMINED BY THE LOCAL AUTHORITY IN ACCORDANCE WITH F.B.C. 2023 SECTION 110.8.4.4 AND CHAPTER 633, FLORIDA STATUTES.

PRIOR TO SUBMITTING THE BID, THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND INFORM THE ARCHITECT AND THE ENGINEER OF ANY DISCREPANCY BETWEEN THESE DOCUMENTS AND THE EXISTING CONDITIONS AND SHALL INCLUDE IN THE BID TO CORRECT THE SAME AS DIRECTED. THE ENGINEER AND THE ARCHITECT, ARE NOT RESPONSIBLE FOR ANY ADDITIONAL COSTS RESULTING FROM VERIFIABLE EXISTING CONDITIONS DISCOVERED AFTER CONTRACT HAS BEEN AWARDED. NO CHANGES SHALL BE MADE TO THESE PLANS WITHOUT PRIOR APPROVAL FROM THE ENGINEER OF RECORD. ALL CHANGES SHALL BE SUBMITTED FOR REVIEW PRIOR TO INSTALLATION. NOT FOR BID UNTIL PERMIT HAS BEEN ISSUED.

CONTRACTOR BIDDING SUPPLEMENTAL NOTES:

CONTRACTOR SHALL ISSUE AN RFI FOR ANY MISSING CIRCUITS IN APPROPRIATE TIME FOR FAE TO RESPOND. IF NO RESPONSE IS PROVIDED, CONTRACTOR SHALL PROVIDE A CIRCUIT AND BREAKER FOR ANY DEVICE THAT IS NOT CIRCUITED ON THE FAE DRAWINGS.

CONTRACTOR SHALL REVIEW ALL EQUIPMENT AND PROVIDE A LOCAL CIRCUIT BREAKER, OSHA REQUIRED SAFETIES AND INTERLOCKING, IF NOT INTEGRATED WITH THE EQUIPMENT. CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIAL TO INSTALL SUCH SYSTEMS IF NOT INDICATED ON THE FAE DRAWINGS.

CONTRACTOR SHALL PROVIDE CIRCUIT BREAKERS AND UL LISTED AND LABELED BREAKER LOCK OUT DEVICES FOR ALL CIRCUITS SERVING EQUIPMENT.

COORDINATION NOTES

CONTRACTOR TO COORDINATE ALL FINAL LOCATIONS, ANY TYPES OF ALL DEVICES, AND EQUIPMENT WITH ARCHITECT PRIOR TO BID AND ROUGH-IN.

CONTRACTOR TO COORDINATE VARIOUS TRADES TO AVOID ABOVE CEILING CONFLICTS.

CONTRACTOR GENERAL CONDITIONS NOTES

1. RFI'S: CONTRACTOR SHALL SUBMIT RFI'S WITH HIS PROPOSED SOLUTION IN A TIMELY MANNER. CONTRACTOR RECOGNIZES THE CONSULTANT SHALL REQUIRE UP TO 5 WORKING DAYS TO RESPOND.
2. SUBMITTALS AND PRODUCT DATA: CONTRACTOR SHALL PREPARE A SUBMITTAL SCHEDULE FOR APPROVAL BY THE A/E. CONTRACTOR RECOGNIZES THE CONSULTANT SHALL REQUIRE UP TO 10 WORKING DAYS TO REVIEW SUBMISSIONS. ALL SUBMITTALS, PRODUCT DATA, SHALL BE CLEARLY STAMPED AND INDICATED APPROVED BY THE CONTRACTOR PRIOR TO SUBMISSION TO THE CONSULTANT.
3. SHOP DRAWINGS: CONTRACTOR SHALL PREPARE A SHOP DRAWING SCHEDULE FOR APPROVAL BY THE A/E. CONTRACTOR RECOGNIZES THE CONSULTANT SHALL REQUIRE UP TO 10 WORKING DAYS TO REVIEW SHOP DRAWINGS. ALL SHOP DRAWINGS, SHALL BE CLEARLY STAMPED AND INDICATED APPROVED BY THE CONTRACTOR PRIOR TO SUBMISSION TO THE CONSULTANT.
4. LAYOUT AND COORDINATION DRAWINGS: CONTRACTOR SHALL PREPARE SCALED COMPREHENSIVE COORDINATED LAYOUT DRAWINGS. PROVIDE SECTIONS, GENERAL ARRANGEMENTS, ELEVATIONS INCLUDING ALL DISCIPLINES FOR HIS PROPOSED LAYOUT AND ROUTING PRIOR TO FABRICATION. SUBMIT TO OWNER AND A/E FOR REVIEW AND GENERAL CONFORMANCE. PROVIDE DRAWINGS THAT DEMONSTRATE VIA COORDINATED ELEMENTS AND SYSTEMS WITH STRUCTURE THAT CLEARLY INDICATE PROPOSED SYSTEMS WILL FIT, FUNCTION AS INTENDED, BE FREE OF INTERFERENCES AND CONFORM TO REQUIRED CODE AND MANUFACTURER WORKING AND MAINTENANCE CLEARANCES.
5. DEVIATIONS FROM BASIS FOR DESIGN SYSTEMS SHALL BE CLEARLY IDENTIFIED ON ALL SUBMISSIONS.
6. SUBSTITUTIONS:
   - A. CONTRACTOR SHALL PREPARE REQUESTS WITH COMPLETE COORDINATION INFORMATION, INCLUDE ALL CHANGES REQUIRED IN OTHER ELEMENTS OF THE WORK TO ACCOMMODATE THE SUBSTITUTION INCLUDING WORK PERFORMED BY THE OWNER AND THE SEPARATE CONTRACTORS.
   - B. PROVIDE COMPLETE SUPPORTING DATA QUALIFYING THE SUBSTITUTION COMPARED TO THE BASIS OF DESIGN SYSTEM. PROVIDE A DETAILED LIST OF ANY VARIANCES, PHYSICAL OR SPATIAL LAYOUTS, ELEVATIONS, ETC. TO THE BASIS OF DESIGN.
   - C. PROVIDE A STATEMENT INDICATING THE EFFECT THE SUBSTITUTION WILL HAVE ON THE WORK SCHEDULE IN COMPARISON TO THE SCHEDULE WITHOUT APPROVAL OF THE PROPOSED SUBSTITUTION, INCLUDE INFORMATION REGARDING THE EFFECT OF THE PROPOSED SUBSTITUTION ON THE CONTRACT TIME.
   - D. PROVIDE CERTIFICATION BY THE CONTRACTOR TO THE EFFECT THAT, IN THE CONTRACTOR'S OPINION, AFTER THOROUGH EVALUATION, THE PROPOSED SUBSTITUTION WILL RESULT IN WORK THAT IN EVERY SIGNIFICANT RESPECT IS EQUAL TO OR BETTER THAN THE WORK REQUIRED BY THE CONTRACT DOCUMENTS AND THAT IT WILL PERFORM ADEQUATELY IN THE APPLICATION INDICATED.
   - E. CONSULTANT'S EXPENSES THAT ARE INCURRED DUE TO REVISIONS OR SUBSTITUTIONS REQUESTED BY THE CONTRACTOR OR APPROVED BY THE OWNER SHALL BE COMPENSATED TO THE CONSULTANT BY THE CONTRACTOR.
7. AS-BUILT DRAWINGS: THE CONTRACTOR SHALL MAINTAIN AND PREPARE A COMPLETE AND ACCURATE SET OF AS-BUILTS DURING THE PROJECT AND ISSUE TO THE A/E AND OWNER AT PROJECT CLOSEOUT. DURING THE COURSE OF THE PROJECT, THE CONTRACTOR SHALL ISSUE SKETCHES OR SCALED DRAWINGS FOR FIELD CHANGES THAT ARE PROPOSED OR MADE WHICH VARY FROM THE BASIS OF DESIGN. CONSULTANT EXPENSES THAT ARE INCURRED DUE TO SERVICES OR REVISIONS REQUIRED BY BUILDING DEPARTMENT, OWNER, CONTRACTOR, AND MANUFACTURER SHALL BE COMPENSABLE TO THE CONSULTANT BY THE CONTRACTOR.
8. INSTALLATION, TESTING AND BALANCING, START UP, COMMISSIONING AND PERFORMANCE TROUBLESHOOTING OF SYSTEMS- CONTRACTOR RECOGNIZES HE IS SOLELY RESPONSIBLE FOR PERFORMANCE AND COMPLETION OF THESE SERVICES AS PART OF THE PROJECT REQUIREMENTS. DURING THE COURSE OF THE PROJECT, THE CONTRACTOR SHALL DOCUMENT THE SERVICES COMPLETED TO THE OWNER AND A/E. CONSULTANT EXPENSES THAT ARE INCURRED DUE TO SUPPORTING SERVICES OR REVISIONS REQUIRED BY BUILDING DEPARTMENT, OWNER, CONTRACTOR, AND MANUFACTURER SHALL BE COMPENSABLE TO THE CONSULTANT BY THE CONTRACTOR.
9. CONTRACTOR/DELEGATED/SUCCESSOR ENGINEER – CONTRACTOR IS ASSIGNED TO PROVIDE DESIGN/BUILD SERVICED FOR SELECTED SYSTEMS. CONTRACTOR'S ENGINEER SHALL COMPLY WITH ALL FAC 61G15 REQUIREMENTS. DELEGATED/SUCCESSOR ENGINEER SHALL SUBMIT SIGNED/SEALED DRAWINGS TO A/E, TO AGENCIES, RESPOND TO ALL RFI'S, AGENCY COMMENTS, AND BECOME THE DESIGNATED SOLE SYSTEM ENGINEER OF RECORD FOR DISCIPLINE RESPONSIBILITY/LIABILITY.

ELECTRICAL SYMBOL LEGEND

110V RECEPTACLE	FUSE DISCONNECT
QUAD-PLEX RECEPTACLE	ELECTRICAL CIRCUIT BREAKER
110V SWITCHED RECEPTACLE	COMBINATION STARTER/BREAKER
WP WATER PROOF WITH WR TYPE RECEPTACLE	FACTORY INSTALLED DISCONNECT
GFI GROUND FAULT CIRCUIT INTERRUPTER	ELECTRICAL PANEL
RECEPTACLE MOUNTED ABOVE COUNTER VERIFY MOUNTING HEIGHT WITH OWNER/ARCHITECT PRIOR TO ROUGH IN	ELECTRICAL METER
SPECIAL PURPOSE OUTLET (VERIFY)	LIGHTING CONTROL TIME CLOCK/PANEL
FLOOR RECEPTACLE WITH COVER PLATE, FLUSH WITH FLOOR	TELEPHONE BOARD
CEILING RECEPTACLE	SWITCH
FLOOR RECEPTACLE/TELE/FAX/DATA WITH COVER PLATE, FLUSH WITH FLOOR	3-WAY SWITCH
FLOOR TELE/FAX/DATA PORT WITH COVER PLATE, FLUSH WITH FLOOR ✱✱	4-WAY SWITCH
TELE/FAX/DATA PORT ✱✱	DIMMER SWITCH
CEILING TELE/FAX/DATA PORT ✱✱	MANUAL MOTOR STARTER
TELEVISION JACK ✱✱	PUSH BUTTON
JUNCTION BOX	SENSOR DOOR OPENER/CARD READER BY OTHERS ✱✱
POWER POLE	ALARM BY OTHERS ✱✱
RECESSED JUNCTION BOX FOR SYSTEM FURNITURE POWER	ISOLATED GROUND
RECESSED JUNCTION BOX FOR SYSTEM FURNITURE TELEPHONE/DATA	ASW ABOVE SHOW WINDOW
EXHAUST FAN	CM CEILING MOUNTED
THERMOSTAT	AC ABOVE COUNTER
REMOTE ALARM TEST STATION	UC UNDER COUNTER
SMOKE DUCT DETECTOR	AFF ABOVE FINISHED FLOOR
STEP DOWN TRANSFORMER	VIF VERIFY IN FIELD
CENTRAL CONTROL PANEL	TGB TELEPHONE GROUND BAR
CIRCUITING LEGEND:	(E) EXISTING – COORDINATE REPLACING COVER PLATES W/ OWNER/ARCH
GENERAL BRANCH CIRCUIT	(RE) RELOCATED EXISTING – COORDINATE REPLACING COVER PLATES W/ OWNER/ARCH
COLLECTOR CIRCUITING – UNSWITCHED	NO SYMBOL NEW
LOW VOLTAGE	
SINGLE HOMERUN	
DOUBLE HOMERUN	
THREE PHASE HOMERUN	

✱ NOTE: ALL SYMBOLS MAY NOT BE USED FOR THIS PROJECT

✱✱ PROVIDE 1"C WITH PULL WIRE UNLESS OTHERWISE NOTED. STUB UP 6" ABOVE CEILING.

NOTES:
RECEPTACLES ARE TO BE MOUNTED AT 18" ABOVE FINISHED FLOOR, UNLESS OTHERWISE NOTED.
SWITCHES ARE TO BE MOUNTED AT 48" ABOVE FINISHED FLOOR, UNLESS OTHERWISE NOTED.

VOLTAGE DROP NOTE

THE CONTRACTOR, AS PART OF HIS PRICING AND BIDDING, SHALL INCLUDE ALL LABOR, MATERIAL, EQUIPMENT AND TERMINATIONS, INCLUDING FPL AND UTILITY REQUIREMENTS AND APPROVALS FOR ALL CONDUCTORING AND TERMINATIONS, TO SATISFY THE PROJECT REQUIREMENTS. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO VERIFY AND INCLUDE ALL HIS BRANCH CIRCUIT, FEEDER, AND SERVICE CONDUCTOR CONDUITING AND WIRING LENGTHS AND ROUTING BASED ON HIS PROPOSED INSTALLATION MEANS AND METHODS. WIRING LENGTHS, SHOWN AS THE BASIS OF DESIGN LENGTHS, ARE MERELY AN APPROXIMATION BY THE CONSULTANT. THE CONTRACTOR SHALL USE THOSE BASIS OF DESIGN CONDUCTOR LENGTHS AND WIRING SIZES AS THE, MINIMUM, NOT LIMITED TO, REQUIREMENTS FOR THE PROJECT BIDDING. THE CONTRACTOR, PRIOR TO BIDDING, SHALL CONFIRM ALL HIS PROPOSED LENGTHS, MAKE ANY AND ALL ADJUSTMENTS AS MAY IMPACT THE ELECTRICAL SYSTEMS AND EQUIPMENT FOR CODE COMPLIANCE AND CONSTRUCTABILITY, AND DOCUMENT ALL PROPOSED CHANGES AND ADJUSTMENTS TO THE ARCHITECT AS PART OF HIS BID RESPONSE. THE CONTRACTOR SHALL SUBMIT COMPLETE SCALED PROPOSED ROUTINGS FOR SERVICES AND FEEDERS, QUANTITIES AND CONDUCTORING, SECTIONS THRU BUILDING FOR RACKING, DUCTBANK CROSS SECTIONS FOR CLEARANCES AND COORDINATED AS FREE OF ALL INTERFERENCES, ETC. CONTRACTOR SHALL SUBMIT ALL DOCUMENTATION TO THE ARCHITECT FOR REVIEW NO LATER THAN 3 WEEKS AFTER NOTICE TO PROCEED.

GENERAL ELECTRICAL NOTES

1. DO NOT SCALE THE ELECTRICAL DRAWING. REFER TO THE ARCHITECTURAL PLAN AND ELEVATIONS FOR EXACT LOCATION OF ALL EQUIPMENT AND CONFIRM WITH OWNERS REPRESENTATIVES. CONTRACTOR SHALL REFER TO THE ENTIRE SET OF CONTRACT DOCUMENTS FOR PROJECT COORDINATION.
2. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE EDITIONS CURRENTLY ADOPTED BY THE LOCAL AUTHORITIES HAVING JURISDICTION OF THE FOLLOWING: THE NATIONAL ELECTRICAL CODE (NFPA 70), NFPA 72, NFPA 75, THE FIRE PREVENTION CODE INCLUDING NFPA 1 & NFPA 101, NFPA 110, AND THE FBC, AND THE FFPC.
3. UNLESS OTHERWISE NOTED, ALL CONDUCTORS SHALL BE COPPER, WITH "THHN" INSULATION FOR SIZE #10 AND SMALLER. CONDUCTORS LARGER THAN #10 SHALL HAVE "THWN" INSULATION. ALL CONDUCTORS IN WET LOCATIONS MUST HAVE "THWN" INSULATION. ALL CONDUCTORS #10 AND SMALLER MAY BE SOLID. ALL CONDUCTORS #8 AND LARGER SHALL BE STRANDED. ALL CONDUCTORS MUST COMPLY WITH ARTICLE 310 OF THE N.E.C.
4. OUTLET BOXES SHALL BE PRESSED STEEL IN DRY LOCATIONS, CAST ALLOY WITH THREADED HUBS IN WET LOCATIONS AND SPECIAL ENCLOSURES FOR OTHER CLASSIFIED AREAS.
5. DISCONNECT SWITCHES SHALL BE H.P. RATED, HEAVY DUTY, QUICK MAKE, QUICK BREAK, WITH ENCLOSURES AS REQUIRED BY EXPOSURE.
6. THESE PLANS DO NOT SHOW EVERY MINOR DETAIL OF CONSTRUCTION, THE CONTRACTOR IS EXPECTED TO FURNISH AND INSTALL ALL ITEMS FOR A COMPLETE ELECTRICAL SYSTEM AND MEET ALL REQUIREMENTS NECESSARY FOR EQUIPMENT TO BE PLACED IN PROPER WORKING ORDER.
7. THE ELECTRICAL SYSTEM SHALL BE COMPLETELY AND EFFECTIVELY GROUNDED AS REQUIRED IN ARTICLE 250, NATIONAL ELECTRICAL CODE. THE GROUNDING SYSTEM SHALL BE TESTED AND SHALL BE PROVIDED TO MEASURE A MAXIMUM OF 5 OHMS. PROVIDE A COPY OF THE TEST REPORT TO ENGINEER.
8. ALL MATERIALS SHALL BE NEW AND SHALL BEAR U.L. LABELS WHERE APPLICABLE.
9. ALL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICAL CONTRACTOR IN A FIRST CLASS WORKMANSHIP MANNER. THE COMPLETE SYSTEM SHALL BE FULLY OPERATIVE AND ACCEPTANCE BY ENGINEER/ARCHITECT MUST BE A CONDITION OF THE SUBCONTRACTOR.
10. THE ELECTRICAL INSTALLATION SHALL MEET ALL STANDARD REQUIREMENTS OF POWER, LIGHT COMPANY, TELEPHONE COMPANY, AND BROADBAND PROVIDER.
11. CIRCUITS SHOWN ON PLANS ARE TO DETERMINE LOAD DATA AND PANEL SIZE. THE CONTRACTOR SHALL PROVIDE CIRCUITS TO SUIT JOB CONDITIONS, BALANCE LOADS ON EACH PHASE.
12. SEE NOTES ON PLANS FOR OTHER REQUIREMENTS.
13. FURNISH AND INSTALL LIGHTING FIXTURES AND LAMPS AS CALLED FOR ON PLANS, OR AS SELECTED BY OWNER.
14. ALL WORK SHALL BE COORDINATED WITH OTHER TRADES TO AVOID INTERFERENCE WITH THE PROCESS OF CONSTRUCTION.
15. CORRECTION OF ANY DEFECTS SHALL BE COMPLETED WITHOUT ADDITIONAL CHARGE AND SHALL INCLUDE REPLACEMENT OR REPAIR OF ANY PHASE OF THE INSTALLATION WHICH MAY BE DAMAGED.
16. ALL REQUIRED INSURANCE SHALL BE PROVIDED FOR PROTECTION AGAINST PUBLIC LIABILITY OF PROPERTY DAMAGE FOR THE DURATION OF THE WORK.
17. CHECK ALL EQUIPMENT FOR PROPER VOLTAGE, PHASE, AND CURRENT BEFORE CONNECTION TO CIRCUITS AND START UP.
18. ELECTRICAL CONTRACTOR SHALL CHECK AND VERIFY EQUIPMENT FURNISHED AGAINST THOSE SPECIFIED OR INTENDED AND REVISE BRANCH CIRCUITS AS MAY BE REQUIRED WITH PRIOR APPROVAL OF ENGINEER/ARCHITECT.
19. ALL SYSTEMS AND ROUGH-IN SHALL BE CONCEALED IN FINISHED AREAS. COORDINATE WITH ARCHITECT.
20. THE ELECTRICAL PORTION OF THE CONTRACT DOCUMENTS ARE COORDINATED WITH THE BASIS OF DESIGN EQUIPMENT SPECIFIED BY DIVISION 16 AND OTHER DIVISIONS. WHERE THE CONTRACTOR ELECTS TO SUBSTITUTE A PRODUCT IN LIEU OF PROVIDING THE DESIGN BASIS, AND SAID SUBSTITUTION IS ACCEPTED BY THE A/E AND OWNER, THE CONTRACTOR SHALL MAKE ALL CORRECTIONS TO THE ELECTRICAL SYSTEM NECESSARY IN ORDER TO ENSURE A COMPLETE AND OPERATIONAL INSTALLATION OF THE EQUIPMENT AT NO ADDITIONAL COSTS. WHERE THE CONTRACTOR'S DECISION TO SUBSTITUTE PRODUCTS OR MODIFY DESIGN REQUIRING A/E SERVICES, THE A/E RESERVES THE RIGHT TO REQUEST COMPENSATION FROM THE CONTRACTOR FOR SAID SERVICES.
21. CONTRACTOR SHALL PROVIDE A CONTROLS TRADE SUBCONTRACTOR TO DESIGN AND INSTALL ALL CONTROLS TO MEET THE PROJECT REQUIREMENTS.
22. GFCI DEVICES MUST BE READILY ACCESSIBLE. NEC 210. NO SHARED NEUTRALS ON GROUND FAULT OR ARC FAULT CIRCUITS ARE PERMITTED.
23. ALL ROOFTOP EQUIPMENT AND SUPPORT SHALL BE SECURE TO THE STRUCTURE IN COMPLIANCE WITH THE PROVISION OF FBC CHAPTER 16 (HIGH-VELOCITY HURRICANE ZONES) FBC BUILDING 1522.2.

AIR CONDITIONING EQUIPMENT AND CONTROLS SPECIFICATION

1. ELECTRICAL CONTRACTOR SHALL INSTALL ALL CONTROL RACEWAY (CONDUIT), WIRE INSTALLATION, CONNECTIONS ETC. IN ACCORDANCE WITH WIRING DIAGRAMS ON AIR EQUIPMENT.
2. A/C / ELECTRICAL PLANS OR DIAGRAMS FURNISHED BY MANUFACTURER OF THE EQUIPMENT.
3. ALL POWER WIRING FOR THE AIR CONDITIONING EQUIPMENT SHALL BE FURNISHED, INSTALLED AND CONNECTED UNDER THIS SECTION OF THE SPECIFICATION.
4. MECHANICAL CONTRACTOR SHALL PROVIDE MOTOR STARTERS FOR ALL AIR CONDITIONING EQUIPMENT. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL CONNECTIONS TO AIR CONDITIONING EQUIPMENT PER MANUFACTURERS SPECIFICATIONS.
5. AIR CONDITIONING EQUIPMENT INCLUDES CONDENSER, COMPRESSOR AND FAN, FAN COIL UNITS, ELECTRICAL STRIP HEATER, THERMOSTAT, ETC.

GENERAL DEMOLITION NOTES

1. CONTRACTOR TO EXERCISE EXTREME CAUTION WHEN RELOCATING WIRING DEVICES, EQUIPMENT AND LIGHTING FIXTURES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSURE THAT OTHER WIRING DEVICES, EQUIPMENT, AND LIGHTING FIXTURES THAT MAY BE CONNECTED ON THE SAME CIRCUIT REMAIN OPERATIONAL AND ACTIVE.
2. INFORMATION SHOWN ON THESE DOCUMENTS ARE DIAGRAMMATIC IN NATURE. CONTRACTOR TO FIELD VERIFY ELECTRICAL CIRCUIT HOME RUNS TO ALL ELECTRICAL ITEMS SCHEDULED FOR DEMOLITION AND PERFORM THE WORK AS INTENDED AND DEPICTED ON THE DRAWINGS.
3. UPDATE ALL ELECTRICAL PANEL BOARD DIRECTORIES THAT ARE AFFECTED BY THE DEMOLITION AND/OR RENOVATIONS. DIRECTORIES SHALL BE TYPED.
4. STORE ITEMS INDICATED TO BE RETURNED TO THE OWNER IN A DRY, CLEAN, AND PROTECTED AREA. NOTIFY OWNER WHEN ITEMS ARE READY TO BE REMOVED.
5. COORDINATE ANY ALTERATION AND CHANGES TO THE ELECTRICAL SERVICE WITH THE LOCAL UTILITY COMPANY.
6. PRE SCHEDULE ALL POWER INTERRUPTIONS WITH OWNER. GIVE OWNER 48 HOURS NOTICE PRIOR TO DISCONNECTING POWER TO ANY PORTION OF THE BUILDING AND MAKE ARRANGEMENTS TO MAINTAIN POWER TO ALL CRITICAL EQUIPMENT AS NEEDED AND REQUESTED BY OWNER.
7. CONTRACTOR IS RESPONSIBLE OF BECOMING FULLY INFORMED AS TO EXISTING CONDITIONS AT THE SITE. NEITHER THE OWNER NOR THE A/E MAKES ANY REPRESENTATION WARRANTY AS TO SITE CONDITIONS.
8. CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH THE NATURE AND EXTENT OF THE WORK TO BE PERFORMED AND LOCAL CONDITIONS THAT MAY AFFECT THE WORK.
9. DUE TO REMOVAL OR CORRECTION TO ANY WALLS OR OTHER CONSTRUCTION NECESSITATING CAPPING OF EXISTING ELECTRICAL WIRING DEVICES OR ANY OTHER ELECTRICAL EQUIPMENT INCLUDING RECONNECT OF SUCH EXISTING ITEMS IS CONSIDERED TO BE PART OF THE WORK UNDER THIS CONTRACT. ALL EXISTING OUTLETS SHOWN TO REMAIN WILL REMAIN ACTIVE. THE REWIRING SHALL BE INCLUDED UNDER THIS CONTRACT WITHOUT ADDITIONAL COST TO OWNER.
10. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING CODES:
    NATIONAL ELECTRICAL CODE (NEC)
    NATIONAL FIRE PROTECTION AGENCY (NFPA)
    FLORIDA BUILDING CODE
11. WHERE CONDUIT IS INACCESSIBLE, REMOVE CONDUCTORS AND CUT BACK CONDUIT FLUSH WITH SLAB OR WALL. PATCH OPENING TO MATCH EXISTING FINISH. WHERE EXISTING WIRING EXTENDS OUTSIDE OF THE AREA BY NATURE OF THE ORIGINAL INSTALLATION, CONTRACTOR SHALL MODIFY EXISTING WIRING AS REQUIRED TO MAINTAIN CONTINUITY OF EXISTING CIRCUITRY SUCH THAT NO EQUIPMENT TO REMAIN IS LEFT WITHOUT SERVICE.
12. THE CONTRACTOR IS TO GIVE THE OWNER AN OPPORTUNITY TO ACCEPT ANY ELECTRICAL ITEMS THAT WERE REMOVED FOR THEIR USE. SALVAGED MATERIALS, AND EQUIPMENT THE OWNER DOES NOT WISH TO KEEP SHALL BECOME THE PROPERTY OF THE CONTRACTOR, AND SHALL BE DISPOSED OF BY THE CONTRACTOR, WITHOUT ADDITIONAL COST TO THE OWNER.
13. CONTRACTOR SHALL PROVIDE TEMPORARY POWER AND LIGHTING WHERE REQUIRED DURING DEMOLITION AND CONSTRUCTION SCOPE OF WORK.
14. THE EXISTING CONDITIONS SHOWN ON THESE DRAWINGS ARE TAKEN FROM ORIGINAL DRAWINGS PROVIDED BY THE OWNER AND FIELD INVESTIGATION. THE ACTUAL CONDITIONS MAY VARY, ALL EXISTING CONDITIONS MUST BE VERIFIED PRIOR TO BID. THE CONDITIONS SHOWN ARE INTENDED TO SHOW THE LOCATIONS OF THE EXISTING EQUIPMENT, AND IN NO WAY RELIEVES THE CONTRACTOR FROM PROVIDING ANY AND ALL COORDINATION REQUIRED TO COMPLETE THE NEW WORK. FIELD CONDITIONS SHALL GOVERN.
15. THE DEMOLITION PLAN IS NOT INCLUSIVE OF ALL ELECTRICAL DEVICES WITHIN THE PROJECT AREA. IT IS INTENDED TO PROVIDE THE CONTRACTOR WITH A GENERAL KNOWLEDGE OF THE EXISTING CONDITIONS WITHIN THE PROJECT AREA. ANY DISCREPANCIES OR CONDITIONS NOT SHOWN ON THIS PLAN SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR ALL REQUIRED DEMOLITION WHETHER SHOWN ON THE PLANS OR NOT.
16. ALL CONDUITS SERVING OTHER SPACES OR FLOORS, THAT RUN THROUGH THE PROJECT AREA SHALL REMAIN ACTIVE DURING CONSTRUCTION, SO AS NOT TO CAUSE ANY DISRUPTION TO THESE OTHER SPACES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSURE THAT ALL CONDUITS, NEW OR EXISTING WITHIN THE PROJECT AREA ARE PROPERLY SUPPORTED AND PROVIDED WITH BONDING BUSHINGS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.
17. THE CONTRACTOR SHALL PHASE DEMOLITION WORK AS REQUIRED OR DIRECTED BY THE OWNER.
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING OR PATCHING ANY DAMAGE WHICH MAY OCCUR DURING DEMOLITION ACTIVITIES. REPAIRS TO BE DONE TO LOGICAL EDGES OF SURFACES AFFECTED, AND SHALL MATCH IMMEDIATE ADJACENT AREAS IN CONSTRUCTION, MATERIAL, FIRE RATING, FINISH AND COLOR.
19. ALL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICAL CONTRACTOR AND SHALL BE COORDINATED WITH OTHER TRADES.

UL LISTING AND NRTL CERTIFICATIONS NOTE

CONTRACTOR/MANUFACTURER SHALL PROVIDE COMPLETE DOCUMENTATION AND CERTIFICATIONS FOR ANY EQUIPMENT THAT HE PROPOSES WITH A NRTL (NATIONALLY RECOGNIZED TESTING LAB) LISTING AND LABELING EQUIVALENT TO THE BASIS OF DESIGN UL LISTING.
IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM ACCEPTABILITY BY THE LOCAL AHJ AND AGENCIES FOR THE NRTL LISTING AND CERTIFICATION FOR THE PRODUCTS HE PROPOSES AND DEMONSTRATE SUCH AS PART OF THE PRODUCT DATA SUBMISSION AND INSTALLATION.

SPECIAL PURPOSE OUTLET NOTES

1. CONTRACTOR IS CAUTIONED TO OBTAIN COMPLETE EQUIPMENT PRODUCT DATA FROM ARCHITECT, PRIOR TO BIDDING AND ROUGH-IN.
2. CONTRACTOR SHALL PROVIDE NEMA OUTLET TO MEET PROJECT AND EQUIPMENT REQUIREMENTS.
3. CONTRACTOR TO PROVIDE MATCHING NEMA CAP/CORD AS REQUIRED.

WIRING NOTES

1. ABSOLUTELY NO FLEXIBLE CONDUIT IS PERMITTED IN DEMISING WALLS. FLEXIBLE CONDUIT IS PERMITTED FOR SHORT, FINAL CONNECTIONS ONLY (6'-0" OR LESS). ALL HOME RUNS IN EMT.
2. CABLE TYPES AC AND NM CABLES ARE NOT ACCEPTABLE. TYPE MC CABLE, ELECTRIC METALLIC TUBING (EMT) AND RIGID GALVANIZED CONDUIT ARE PERMITTED. FLEXIBLE CONDUIT IS NOT PERMITTED WITHIN DEMISING WALLS.
3. CONDUIT CONNECTIONS TO TRANSFORMERS, VIBRATING AND/OR ROTATING EQUIPMENT, SHALL BE MADE WITH FLEXIBLE METAL CONDUIT OR "SEALTIGHT."
4. TWO OR THREE CONDUCTORS SHARING THE SAME NEUTRAL SHALL HAVE PROTECTION DEVICES WITH TIES. DISCONNECTION SHALL BE ACCOMPLISHED BY A SINGLE MOVEMENT.

ELECTRICAL SHEET INDEX

SHEET #	DESCRIPTION
E0.1	ELECTRICAL NOTES, LEGEND & SHEET INDEX
E1.1	LEVEL 1 ELECTRICAL PLAN
E1.2	LEVEL 2 ELECTRICAL PLAN
E3.1	ELECTRICAL RISER & CALCULATIONS
E4.1	ELECTRICAL PANEL SCHEDULES

FIRE RATING NOTE

ALL DEVICES PENETRATING FIRE RATED WALLS SHALL BE PROVIDED WITH U.L. APPROVED FIRE RATED ASSEMBLIES. (EQUAL TO WALL FIRE RATING – SEE ARCHITECTURAL DRAWINGS)

SEALING NOTE

SEAL ALL CONDUITS EXTERNALLY WITH APPROVED SEALANTS PER ARCHITECTS SPECIFICATIONS, AND INTERNALLY WITH POLYWATER FST PER NEC 225.27, 300.5G, 300.7A, 505.15(B)-2.

FLORIDA BUILDING CODE 2023 CONFORMANCE

1. CONTRACTOR TO PROVIDE ALL LABOR AND MATERIAL TO CONFORM TO FBC 2023, ENERGY COMPLIANCE, RELATED SECTIONS, AND STANDARDS.
2. OWNER SHALL PROVIDE SERVICES OF AN INDEPENDENT COMMISSIONING AGENT(CxA) TO PREPARE FUNCTIONAL TEST PROCEDURES (DOCUMENT SYSTEMS PERFORMANCE, WITNESS CONTRACTOR TESTING), AS REQUIRED BY FBC FOR LIGHTING AND HVAC SYSTEMS.
3. CONTRACTOR SHALL PROVIDE SERVICES TO TEST, BALANCE AND COMMISSION THE SYSTEM VIA AN INDEPENDENT AGENT FOR THE MECHANICAL SYSTEMS ENERGY PERFORMANCE.
4. CONTRACTOR TO PROVIDE COMPLETE CERTIFICATIONS AND CHECKLISTS AS REQUIRED BY FBC FOR HIS WORK RESPONSIBILITIES.

FBC NOTE

1. CONTRACTOR SHALL COMPLY WITH FBC (C408.2.5.1). PROVIDE OWNER WITH A RECORD SET DRAWING OF COMPLETE INSTALLATION DRAWINGS.
2. CONTRACTOR SHALL COMPLY WITH FBC (C408.2.5.2). PROVIDE OWNER WITH OPERATIONAL MANUALS AND MAINTENANCE MANUALS.
3. CONTRACTOR SHALL PREPARE AND PRODUCE ALL BUILDING OPERATIONS AND MAINTENANCE INFORMATION PER FBC (C408.1.1).
4. CONTRACTOR SHALL PREPARE AND PRODUCE ALL DATA, DRAWINGS, MANUALS, REPORTS AND INFORMATION REQUIRED PER FBC (C408.3) SECTIONS.

CLEARANCE NOTE

ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED WITH NEC REQUIRED WORKING CLEARANCES. TYPICAL FOR ENTIRE PROJECT.

SCCR AND POWER STUDY NOTE

CONTRACTOR AND MANUFACTURER SHALL PROVIDE ALL ELECTRICAL SYSTEMS FOR ALL EQUIPMENT, INCLUDING MECHANICAL AND PLUMBING EQUIPMENT WITH INTEGRAL DISCONNECTS, INTEGRAL BREAKERS,INTEGRAL MOTOR STARTERS, VFDs, CHILLER PANELS, PACKAGED UNIT PANELS, ETC., SHALL BE RATED WITH A SHORT CIRCUIT CURRENT RATING AT LEAST EQUAL TO THE IMMEDIATE UPSTREAM ELECTRIC OVERCURRENT PROTECTIVE DEVICE SHORT CIRCUIT RATING. IF SERIES OR INTEGRATED EQUIPMENT RATINGS ARE USED BY CONTRACTOR, CONTRACTOR/ MANUFACTURER SHALL SUBMIT CERTIFICATION AND CALCULATIONS VERIFYING ALL EQUIPMENT MEETS THE COORDINATION SELECTED. THE CONTRACTOR SHALL PREPARE A COMPLETE POWER STUDY INCLUDING FAULT/COORDINATION AND ARC FLASH REPORTS AS EVIDENCE THE EQUIPMENT HE PROPOSES SHALL MEET CODE AND POWER STUDY RECOMMENDATIONS. CONTRACTOR SHALL ENGAGE HIS OWN DELEGATED ENGINEER TO PROVIDE THE STUDIES AND REPORTS.

EQUIPMENT/FEEDER REMOVAL NOTES

SALVAGED MATERIALS, EQUIPMENT, AND FEEDERS SHALL BE DELIVERED TO THE OWNER AT HIS PROPERTY AND STORED WITHIN THE BUILDING WHERE DIRECTED. ANY REMOVED MATERIALS OR EQUIPMENT WHICH THE OWNER DOES NOT WISH TO KEEP SHALL BE DISPOSED OF BY THE CONTRACTOR, WITHOUT ADDITIONAL COST TO THE OWNER.

SCOPE OF WORK

THE PROJECT CONSISTS OF A TENANT IMPROVEMENT WITHIN AN EXISTING BUILDING. UPGRADING ELECTRICAL SYSTEMS TO PROVIDE POWER FOR NEW AND REPLACED HVAC EQUIPMENT ONLY. FIRE ALARM AND LIGHTING DESIGN ARE EXCLUDED FROM FAE SCOPE OF WORK.

CODE COMPLIANCE

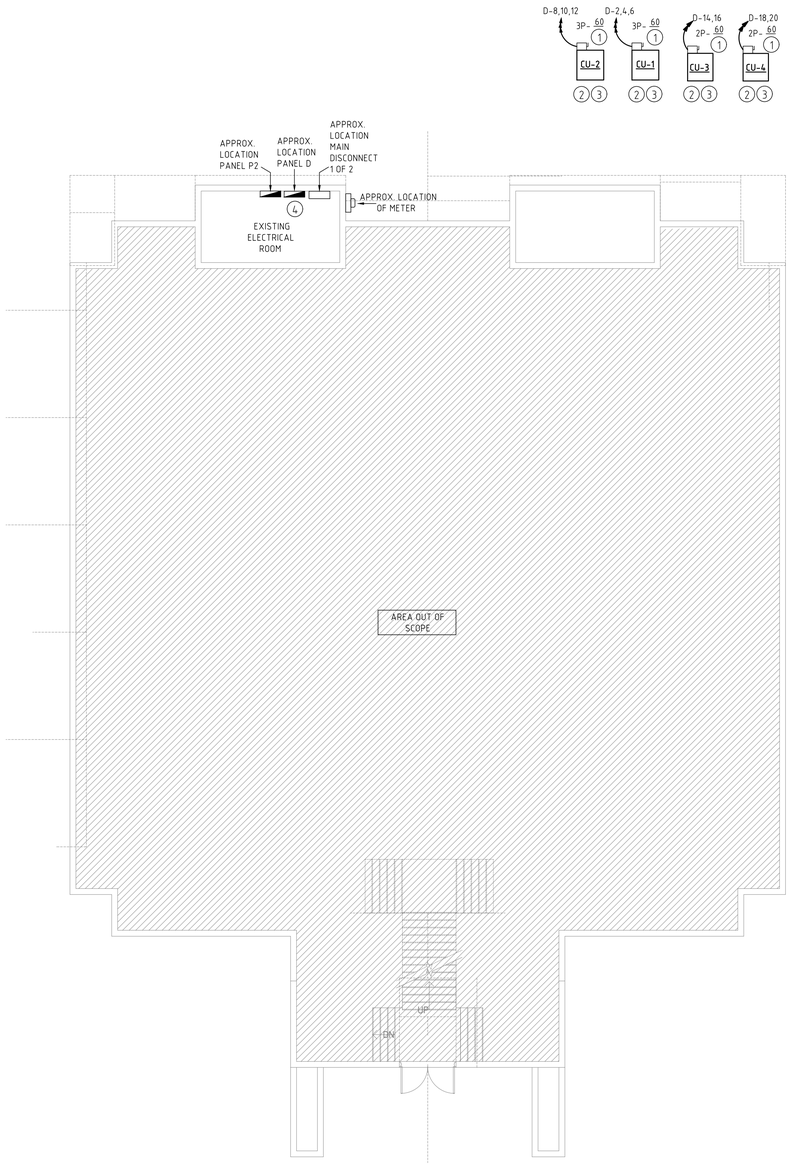
FLORIDA BUILDING CODE, 8th EDITION, 2023.

NATIONAL ELECTRICAL CODE, 2020.

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West Palm Beach, FL 33401
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NORTH PALM BEACH LIBRARY HVAC



1 Level 1 Electrical Plan
E1.1 SCALE: 1/8" = 1'-0"

NORTH

SEE ELECTRICAL NOTES & LEGEND ON SHEET E0.1

ELECTRICAL PLAN KEY NOTES

1. NOT USED ON THIS SHEET.
2. PROVIDE GFI RATED BREAKER IN PANEL.
3. CONTRACTOR TO VERIFY AN OPERATIONAL CODE COMPLIANT RECEPTACLE IS LOCATED WITHIN 25' OF HVAC EQUIPMENT. IF NOT, CONTRACTOR TO PROVIDE A WP/GFI RECEPTACLE NEAR EQUIPMENT AND CONNECT TO EXISTING RECEPTACLE BRANCH CIRCUIT IN AREA.
4. CONTRACTOR TO REPLACE EXISTING PANEL D WITH NEW IN THE SAME LOCATION. SEE ELECTRICAL RISER DIAGRAM ON SHEET E3.1 FOR MORE INFORMATION.
5. NOT USED ON THIS SHEET.

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NORTH PALM BEACH LIBRARY HVAC

303 Anchorage Dr
North Palm Beach, FL 33408

NO.	DATE	DESCRIPTION

DATE	10/23/25
MODELED	AK/SV
CHECKED	BJ/SR
PROJECT #	24176

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LEVEL 1 ELECTRICAL PLAN

PERMIT SET: 10/23/25

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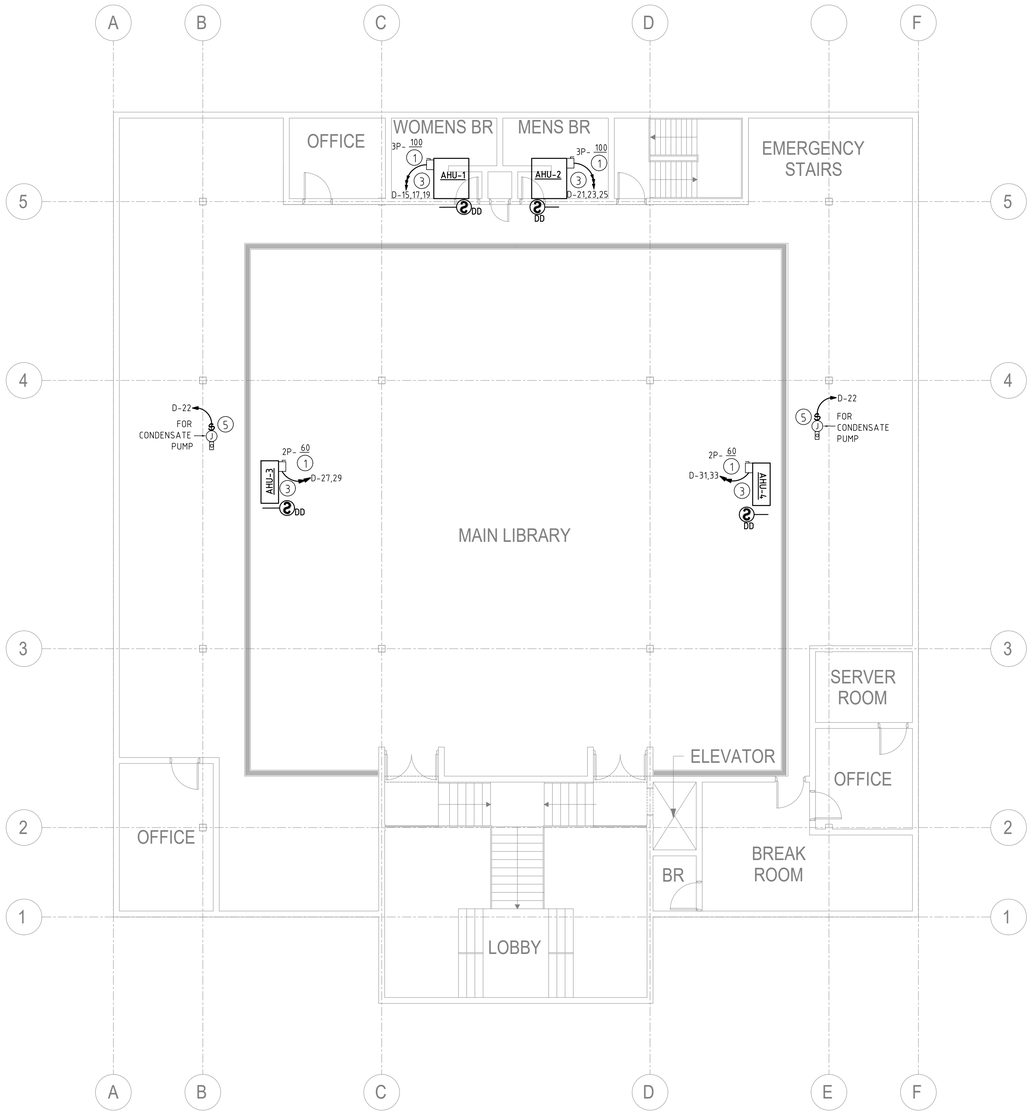
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300 Lock Road, Suite #302
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TEL: (561) 391-9292 FAX: (561) 391-9
Certificate of authorization no. 28107
Ursula Iafrate, P.E. License #73122
Benjamin J. Jacobs, P.E. License #86100
Stephen F. Rollin, P.E. License #36428
E-mail: info@faeconsulting.com
Designed By: AK/SV PM: DE P/N 24176

STEPHEN F. ROLLIN No. 36428 STATE OF FLORIDA PROFESSIONAL ENGINEER

Digitally signed by Stephen Rollin
DN: cn=PE #36428, o=, ou=, email=srollin@faeconsulting.com, c=US
Date: 2025.10.23 11:48:04-04'00'



1 Level 2 Electrical Plan
E1.2 SCALE: 1/8" = 1'-0"

NORTH

SEE ELECTRICAL NOTES & LEGEND ON SHEET E0.1

ELECTRICAL PLAN KEY NOTES

1. PROVIDE FUSES PER MANUFACTURER'S RECOMMENDATIONS.
2. NOT USED ON THIS SHEET.
3. CONTRACTOR TO VERIFY AN OPERATIONAL CODE COMPLIANT RECEPTACLE IS LOCATED WITHIN 25' OF HVAC EQUIPMENT. IF NOT, CONTRACTOR TO PROVIDE A WP/GFI RECEPTACLE NEAR EQUIPMENT AND CONNECT TO EXISTING RECEPTACLE BRANCH CIRCUIT IN AREA.
4. NOT USED ON THIS SHEET.
5. CONTRACTOR TO COORDINATE MOUNTING IN FIELD.

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NORTH PALM BEACH LIBRARY HVAC

303 Anchorage Dr
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LEVEL 2 ELECTRICAL PLAN

PERMIT SET: 10/23/25

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E-mail: info@faeconsulting.com
Designed By: AK/SV PM: DE P/N 24176

STEPHEN F. ROLLIN LICENSE No. 36428 STATE OF FLORIDA PROFESSIONAL ENGINEER

Digitally signed by Stephen Rollin
DN: cn=Stephen Rollin, o=FAE, ou=PE #36428, email=srollin@faeconsulting.com, c=US
Reason: I agree to the terms described by the placement of this signature on this document.
Location:
srollin@faeconsulting.com
Date: 2025.10.23 11:48:03-04'00'

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July 23, 2025

Susana Valenzano
300 Lock Road | Suite #302
Deerfield Beach, FL 33442

Re: Available Fault Current for 303 Anchorage Dr, North Palm Beach, FL 33408

Dear Susana Valenzano:

Thank you for contacting FPL about the available fault current at 303 Anchorage Dr, North Palm Beach, FL 33408. Based on the plans you have provided dated July 23 2025, the maximum available fault current at the transformer secondary terminals is estimated to be 12322 symmetrical amperes at 120/208 volts. The protective device on the line side of the transformer currently in place or to be installed and serving your property located at the subject location is a 15 amp type Bayonet fuse. The primary service voltage is 13.2kV L-L. This calculated symmetrical fault current is not intended for use as the basis for motor starting calculations and does not include:

- Consideration for any motor contribution or
- Fault current asymmetry.

The FPL equipment currently serving or planned to serve your facility may change over time as a result of any number of factors, including but not limited to transformer replacements due to load growth, electrical grid changes or emergencies. As a result, although we are providing you with this information for the sole purpose of assisting you in the completion of your study, you and your client should not design, install or operate your system in reliance upon any expectation that the specific size and type of equipment currently in place will remain so. If and when the size and type of the equipment changes, our employees are not always in a position to immediately notify customers.

As the construction project progresses, any questions or information you may need can be communicated through me.

Sincerely,

Kimberley Calixte
Associate Engineer

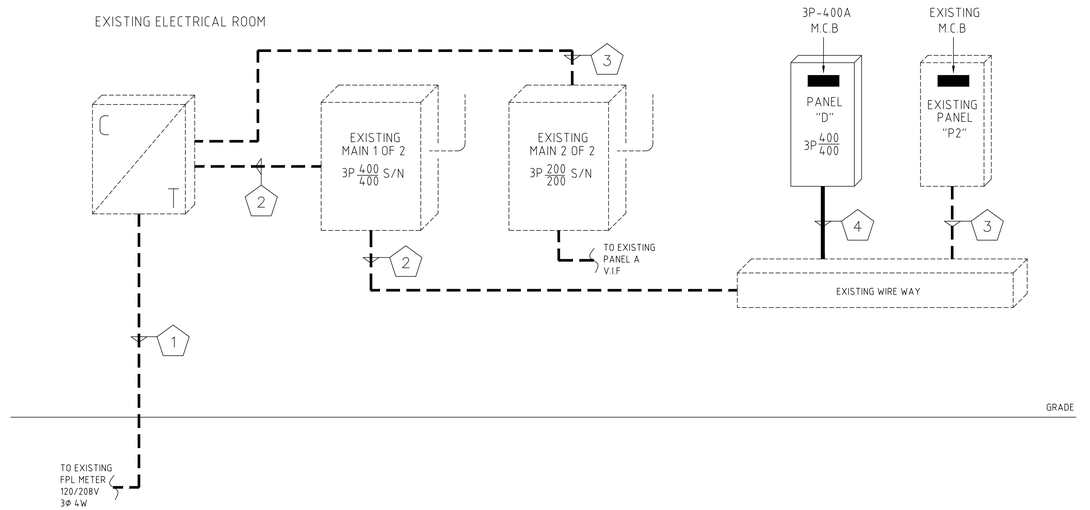
SHORT CIRCUIT FAULT CURRENT CALCULATION			
VOLTAGE (V):			120/208 3PH
ESTIMATED UPSTREAM TRANSFORMER (KVA):			
AVAILABLE SHORT CIRCUIT AMPS BASED ON FPL LETTER SYMMETRICAL (A RMS):			12,322
ASYMMETRY FACTOR (FPL FAULT x 1.6) =	19,715.2	A.I.C.	
MOTOR CONTRIBUTION (+ 2000A) =	2,000.0	A.I.C.	21,715
WIRE SIZE (AWG,MCM):			300
NUMBER OF CONDUCTORS PER PHASE:			2
CONDUCTOR LENGTH (ft):			40
CONDUCTOR C VALUE:			20,868
$f = \frac{2 \times L \times I}{C \times V}$ =	0.11567		
$M = \frac{1}{1+f}$ =	0.89632		
I,SCA = AVAILABLE FROM UTILITY X M =	19,464	A RMS AT BUILDING MAIN	
MINIMUM BREAKER A.I.C. RATING =	42,000	A.I.C.	
L = LENGTH (ft) OF CIRCUIT TO FAULT			
C = CONSTANT VALUE FOR CONDUCTOR (S) - FOR PARALLEL RUNS MULTIPLY "C" VALUE BY NUMBER OF CONDUCTORS PER PHASE			
I = AVAILABLE SHORT CURRENT IN AMPERES AT BEGINNING OF CIRCUIT			
CONTRACTOR MUST CONTACT FPL AND COORDINATE ALL UTILITY REQUIREMENTS, FEES, DESIGN AND INSTALLATION CONFORMANCE.			

CONDUCTOR SIZE KEY NOTES

1. EXISTING 600A FEEDERS. (2) RUNS OF: 4# 300, 1 # 1 GND, THWN CU EACH IN 3" CONDUITS. VERIFY IN FIELD.
2. EXISTING 400A FEEDERS. VERIFY IN FIELD.
3. EXISTING 200A FEEDERS. VERIFY IN FIELD.
4. (2) RUNS OF: 4 # 3/0, 1 # 3 GND, THWN CU EACH IN 2" CONDUIT.

LEGEND

- - - EXISTING



RISER NO. 1	PARTIAL ELECTRICAL POWER RISER	NOT TO SCALE

EXISTING SERVICE DEMAND LOAD CALCULATIONS

DESCRIPTION		LOAD (KVA)
PEAK 12-MONTH UTILITY DEMAND READING (KWD @ 0.9 POWER FACTOR)		61.1
-OR- PEAK 30-DAY METERING DEMAND READING		
25% DEMAND PREMIUM PER N.E.C. 220.87		15.3
	EXISTING DEMAND	76.4
ADDED/EXPANSION ELECTRICAL DEMAND *		
AHU-1 (KW @ 125%)		31.6
AHU-2		25.3
AHU-3		5.8
AHU-4		5.8
	TOTAL DEMAND	144.9
DEMAND AMPACITY AT 120/208 VOLTS 3-PH 4-W		403 A
EXISTING SERVICE AMPACITY AT 120/208 VOLTS 3-PH 4-W		600 A

11 MONTH DEMAND HISTORY FOR NPB LIBRARY 303 ANCHORAGE DRIVE NORTH PALM BEACH, FL

BILLING MONTH	KWD
AUG. 2024	54
SEPT. 2024	50
OCT. 2024	55
NOV. 2024	41
DEC. 2024	40
JAN. 2025	34
FEB. 2025	42
MAR. 2025	41
APR. 2025	44
MAY. 2025	46
JUNE. 2025	48

DEMAND DATA PROVIDED BY FPL

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NORTH PALM BEACH LIBRARY HVAC

303 Anchorage Dr
North Palm Beach, FL 33408

NO.	DATE	DESCRIPTION

DATE	10/23/25
MODELED	AK/SV
CHECKED	BJ/SR
PROJECT #	24176

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ELECTRICAL RISER & CALCULATIONS

PERMIT SET: 10/23/25

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Benjamin J. Jadds, P.E. License #86100
Stephen F. Rollin, P.E. License #36428
E-mail: info@faeconsulting.com
Designed By: AK/SV PM: DE P/N 24176

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STEPHEN F. ROLLIN LICENSE No. 36428 STATE OF FLORIDA PROFESSIONAL ENGINEER

Digitally signed by Stephen F. Rollin, P.E. #36428
Date: 2025.10.23 11:48:02-04'00'

MFG	SQUARE 'D' OR EQUAL								TYPE	NQ	KEY NOTES: 1, 2					PANEL RATING	400	AMPS	
VOLTS	120/208V 3Φ4W								PANEL	"D"									
BUS A (KVA)	BUS B (KVA)	BUS C (KVA)	LOAD	KEY NOTES	COND	WIRE SIZE	GND	AMPS	CKT	CKT	AMPS	GND	WIRE SIZE	COND	KEY NOTES	LOAD	BUS A (KVA)	BUS B (KVA)	BUS C (KVA)
1.0									1	2							(3.6)		
	1.0		AHU ROOM 105	6	1/2"	12	12	20	3	4	60	10	6	1"	3,4	CU-1 (FOR MAIN FLR)		(3.6)	
		1.0							5	6									(3.6)
2.5			AHU#2, CU#2	6	1"	6	10	60	7	8							(3.6)		
	2.5								9	10	60	10	6	1"	3,4	CU-2 (FOR MAIN FLR)		(3.6)	
		2.8	AIR COMPRESS. LOBBY	6	1"	6	10	60	11	12									(3.6)
2.8									13	14	50	10	8	3/4"	3,4	CU-3 (FOR MAIN FLR)	(2.5)		
	8.4								15	16								(2.5)	
		8.4	AHU-1 (MAIN FLR)	4	1-1/4"	3	8	90	17	18	50	10	8	3/4"	3,4	CU-4 (FOR MAIN FLR)			(2.5)
8.4									19	20							(2.5)		
	8.4								21	22	20	12	12	1/2"		CONDENSATE PUMPS		1.0	
		8.4	AHU-2 (MAIN FLR)	4	1-1/4"	3	8	90	23	24	-	-	-	-		SPACE			-
8.4									25	26	-	-	-	-		SPACE	-		
	2.9		AHU-3 (MAIN FLR)	4	1"	6	10	60	27	28	-	-	-	-		SPACE		-	
		2.9							29	30	-	-	-	-		SPACE			-
2.9			AHU-4 (MAIN FLR)	4	1"	6	10	60	31	32	-	-	-	-		SPACE	-		
	2.9								33	34	-	-	-	-		SPACE		-	
		-	SPACE		-	-	-	-	35	36	-	-	-	-		SPACE			-
-			SPACE		-	-	-	-	37	38							-		
	-		SPACE		-	-	-	-	39	40	-	-	-	-	5	SPD		-	
		-	SPACE		-	-	-	-	41	42									-

	TOTALS	
KVA ΦA	KVA ΦB	KVA ΦC
26.0	27.1	23.5

LOAD CALCULATIONS PER NEC 220

1ST 10KVA OF RECEPS.	0.0	AT 100%	0.0
REMAINDER OF RECEPS.	0.0	AT 50%	0.0
LIGHTING	0.0	AT 125%	0.0
LARGEST MOTOR	25.2	AT 125%	31.5
WATER HEATER	0.0	AT 125%	0.0
KITCHEN EQUIPMENT	0.0	AT 65%	0.0
REMAINDER OF LOADS		AT 100%	51.4
ELECTRIC VEHICLE	0.0	AT 100%	0.0
		TOTAL KVA	82.9
		TOTAL AMPS	230.1

REMARKS & KEY NOTES

1. PROVIDE 3P-400A M.C.B. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ACCURATE PER-FIELD CONDITIONS AND A TYPED-UP PANEL SCHEDULE UPON COMPLETION OF THE PROJECT. THE MAIN LUGS PANEL SHALL HAVE AN IN-SIGHT DISCONNECT, OTHERWISE, A LOCKABLE DISCONNECT SHALL BE PLACED UPSTREAM OF THE PANEL. THE LOCATION OF THIS DISCONNECT SHALL BE FIELD-MARKED ON THE PANEL.
2. VERIFY ELECTRICAL REQUIREMENTS OF ALL EQUIPMENT PRIOR TO CONSTRUCTION; ALL EQUIPMENT'S ELECTRICAL REQUIREMENTS SHALL BE CONFIRMED WITH MFG SPECS. VERIFY VOLTAGE, AMPERAGE, AND BREAKER SIZES.
3. NON-CONCURRENT LOAD. PROVIDE "HACR" RATED BREAKER.
4. PROVIDE "GFCI" RATED CIRCUIT BREAKER.
5. INSTALL SPD PER MANUFACTURER'S RECOMMENDATIONS.
6. CONTRACTOR TO RELOCATE EXISTING BREAKER TO NEW POSITION IN NEW PANEL AS INDICATED. INTERCEPT AND EXTEND FEEDERS AS NEEDED FOR NORMAL OPERATION.

*FED FROM EXISTING WIREWAY/3P-400A DISCONNECT (VERIFY IN FIELD)

MOUNT SURFACE MIN A.I.C. 42,000 AMPS

PANEL FEEDER NOTE

THE ELECTRICAL CONTRACTOR SHALL VERIFY THE LENGTH OF ALL BRANCH CIRCUITS IN FIELD AND SHALL MAINTAIN LESS THAN 3% VOLTAGE DROP FOR FEEDERS AND 2% VOLTAGE DROP FOR BRANCH CIRCUITS. CONTRACTOR SHALL INCREASE WIRE SIZES AND CONDUIT AS REQUIRED TO MEET NEC.

PANEL SCHEDULE INDEX

D	

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ELECTRICAL PANEL SCHEDULES

PERMIT SET: 10/23/25

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PROJECT # 24176

North Palm Beach Library
303 Anchorage Drive,
North Palm Beach, FL 33408

CONTENTS:

Energy Calculations

DATE:
10/23/2025

Prepared by:

FAE CONSULTING
300 Lock Road, Ste. #302
Deerfield Beach, FL 33442
561-391-9292

Florida Building Code, 8th Edition (2023) - Energy Conservation

EnergyGauge Summit® Fla/Com-2023, Effective Date: Dec 31, 2023

C407: FBC Total Building Performance Compliance Option

Compliance applying the requirements of Sections C402.5, C403.2, C404,C405.2, C405.4, C405.5, C407 and C408. The building energy cost shall be equal to or less than 85 percent of the standard reference design building.

Check List

Applications for compliance with the Florida Building Code, Energy Conservation shall include:

- ☐ The full compliance report generated by the software that contains the project summary, compliance summary, certifications and detailed component compliance reports.
- ☐ The compliance report must include the full input report generated by the software as contigous part of the compliance report.
- ☐ Boxes appropriately checked in the Mandatory Section of the complaince report.

PROJECT SUMMARY

Short Desc:	24176	**Description:**	Village of North Palm Beach Lit
Owner:	Enter Owner's name here		
Address1:	303 Anchorage Drive	**City:**	North Palm Beach
Address2:	Enter Address here	**State:**	FL
		Zip:	33408
Type:	Library	**Class:**	Renovation to existing building
Jurisdiction:	NORTH PALM BEACH, PALM BEACH COUNTY , FL (603500)		
Conditioned Area:	7224 SF	**Conditioned & UnConditioned Area:**	7224 SF
No of Stories:	2	**Area entered from Plans**	7224 SF
Permit No:	0	**Max Tonnage**	7.8
		If different, write in:	_____

Compliance Summary

Component	Design	Criteria	Result
Gross Energy Cost (in $)	7368.00	9220.00	**PASSED**
LIGHTING CONTROLS			**PASSES**
EXTERNAL LIGHTING			**No Entry**
HVAC SYSTEM			**PASSES**
PLANT			**No Entry**
WATER HEATING SYSTEMS			**No Entry**
PIPING SYSTEMS			**No Entry**
Met all required compliance from Check List?			**Yes/No/NA**

IMPORTANT MESSAGE
Info 5009 -- -- -- An input report of this design building must be submitted along with this Compliance Report

CERTIFICATIONS

I hereby certify that the plans and specifications covered by this calculation are in compliance with the Florida Energy Code

Prepared By: Benjamin J. Jados

Date: 

Building Official: _____

Date: _____

I certify that this building is in compliance with the FLorida Energy Efficiency Code

Owner Agent: _____ Date: _____

If Required by Florida law, I hereby certify (*) that the system design is in compliance with the Florida Energy Efficiency Code

Architect: _____ Reg No: _____ Signature_____

Electrical Designer: Stephen Rollin Reg No: 36428 Signature_____

Lighting Designer: Stephen Rollin Reg No: 36428 Signature_____

Mechanical Designer: Benjamin J. Jados Reg No: 86100 Signature_____

Plumbing Designer: Benjamin J. Jados Reg No: 86100 Signature_____

(*) Signature is required where Florida Law requires design to be performed by registered design professionals per C103.1.1.1.2

Project: 24176
Title: Village of North Palm Beach Library-HVAC System
Type: Library
(WEA File: FL_WEST_PALM_BEACH_INTL_ARPT.tm3)

Building End Uses

	1) Proposed	2) Baseline
Total	*456.40*	*675.70*
	$7,368	*$10,847*
ELECTRICITY(MBtu/kWh/$)	456.40	675.70
	133712	197943
	$7,368	*$10,847*
AREA LIGHTS	20.90	46.10
	6125	13495
	$337	*$740*
MISC EQUIPMT	108.40	108.40
	31752	31752
	$1,750	*$1,740*
PUMPS & MISC	0.10	0.10
	43	26
	$2	*$1*
SPACE COOL	199.10	247.10
	58326	72387
	$3,214	*$3,967*
SPACE HEAT	38.10	18.50
	11154	5410
	$615	*$296*
VENT FANS	89.80	255.50
	26312	74873
	$1,450	*$4,103*

Credits Applied: None
Passing Criteria = 9220
Design (including any credits) = 7368
Passing requires Proposed Building cost to be at most 85% of Baseline cost. This Proposed Building is at 67.9%

PASSES

External Lighting Compliance

Description	Category	Tradable?	Allowance (W/Unit)	Area or Length or No. of Units (Sqft or ft)	ELPA (W)	CLP (W)
					None	

Lighting Controls Compliance

Acronym	ID	Description	Area (sq.ft)	Compliance
MAIN LIBRARY A	**16**	**MAIN LIBRARY AHU-1 (Office - Open Plan)**	**1,806**	COMPLIANCE: PASSES REQUIRED: All of |1|; one of |3|; one of |8|9| CONTROLS IN SPACE: 1-Manual (Local Control) 3-Occupant Sensor (50%) 4-Light Reduction (30%-70%) 8-Occupant Sensor Auto Full OFF
MAIN LIBRARY A	**16**	**MAIN LIBRARY AHU-2 (Office - Open Plan)**	**1,806**	COMPLIANCE: PASSES REQUIRED: All of |1|; one of |3|; one of |8|9| CONTROLS IN SPACE: 1-Manual (Local Control) 3-Occupant Sensor (50%) 4-Light Reduction (30%-70%) 8-Occupant Sensor Auto Full OFF
MAIN LIBRARY A	**16**	**MAIN LIBRARY AHU-3 (Office - Open Plan)**	**1,806**	COMPLIANCE: PASSES REQUIRED: All of |1|; one of |3|; one of |8|9| CONTROLS IN SPACE: 1-Manual (Local Control) 2-Occupancy Sensor - Manual ON only 3-Occupant Sensor (50%) 4-Light Reduction (30%-70%) 8-Occupant Sensor Auto Full OFF
MAIN LIBRARY A	**16**	**MAIN LIBRARY AHU-4 (Office - Open Plan)**	**1,806**	COMPLIANCE: PASSES REQUIRED: All of |1|; one of |3|; one of |8|9| CONTROLS IN SPACE: 1-Manual (Local Control) 2-Occupancy Sensor - Manual ON only 3-Occupant Sensor (50%) 4-Light Reduction (30%-70%) 8-Occupant Sensor Auto Full OFF

PASSES

Project: 24176
Title: Village of North Palm Beach Library-HVAC System
Type: Library
(WEA File: FL_WEST_PALM_BEACH_INTL_ARPT.tm3)

System Report Compliance

AHU-1 **AHU-1** **Constant Volume Packaged System** **No. of Units 1**

Component	Category	Capacity	Eff Design	Eff Criteria	Integrated Eff-Design	Integrated Eff-Criteria	Compliance
Cooling System	Air Conditioners Air Cooled 65000 - 135000 Btu/h Cooling Capacity	94000	14.80	11.20	14.80	14.80	**PASSES**
Heating System	Electric Furnace	52218	1.00	1.00			**PASSES**
Air Handling System -Supply	Air Handler (Supply) - Constant Volume	3000	0.28	0.82			**PASSES**

AHU-2 **AHU-2** **Constant Volume Packaged System** **No. of Units 1**

Component	Category	Capacity	Eff Design	Eff Criteria	Integrated Eff-Design	Integrated Eff-Criteria	Compliance
Cooling System	Air Conditioners Air Cooled 65000 - 135000 Btu/h Cooling Capacity	94000	14.80	11.20	14.80	14.80	**PASSES**
Heating System	Electric Furnace	52218	1.00	1.00			**PASSES**
Air Handling System -Supply	Air Handler (Supply) - Constant Volume	3000	0.28	0.82			**PASSES**

AHU-3 **AHU-3** **Constant Volume Air Cooled Split System < 65000 Btu/hr** **No. of Units 1**

Component	Category	Capacity	Eff Design	Eff Criteria	Integrated Eff-Design	Integrated Eff-Criteria	Compliance
Cooling System	Air Conditioners Air Cooled Split System 45000 - 65000 Btu/h Cooling Capacity	60000	14.80	13.80			**PASSES**
Heating System	Electric Furnace	34812	1.00	1.00			**PASSES**
Air Handling System -Supply	Air Handler (Supply) - Constant Volume	2000	0.25	0.82			**PASSES**

AHU-4	AHU-4	Constant Volume Air Cooled Split System < 65000 Btu/hr	No. of Units 1

Component	Category	Capacity	Eff Design	Eff Criteria	Integrated Eff-Design	Integrated Eff-Criteria	Comp-liance
Cooling System	Air Conditioners Air Cooled Split System 45000 - 65000 Btu/h Cooling Capacity	60000	14.80	13.80			**PASSES**
Heating System	Electric Furnace	34812	1.00	1.00			**PASSES**
Air Handling System -Supply	Air Handler (Supply) - Constant Volume	2000	0.25	0.82			**PASSES**

PASSES

Plant Compliance

Description	Installed No	Size	Design Eff	Min Eff	Design IPLV	Min IPLV	Category	Comp liance

None

Water Heater Compliance

Description	Type	Category	Design Eff	Min Eff	Design Loss	Max Loss	Comp liance

None

Piping System Compliance

Category	Pipe Dia [inches]	Is Runout?	Operating Temp [F]	Ins Cond [Btu-in/hr .SF.F]	Ins Thick [in]	Req Ins Thick [in]	Compl-iance
None							

Mandatory Requirements (as applicable)

Requirements compiled by US Department of Energy and Pacific Northwest National Laboratory. Adopted for FBC with permission. Not all may be applicable

Topic	Section	Component	Description	Yes	N/A	Exempt
1. To be checked by Designer or Engineer						
6037 Post Construction	C401.3	Envelope	A thermal envelope certificate will be supplied and completed by an approved third party.	☐	☐	☐
6031 Fenestration	C402.4.1	Envelope	The vertical fenestration area <= 30 percent of the gross above-grade wall area.	☐	☐	☐
6033 Fenestration	C402.4.1	Envelope	The skylight area <= 3 percent of the gross roof area.	☐	☐	☐
6036 Fenestration	C402.4.1.1	Envelope	Vertical Fenestration Area Allowance: A maximum of 40 percent of gross above-grade wall area is permitted to be vertical fenestration area provided in buildings not greater than two stories above grade, >= 50 percent of the conditioned floor area is within a daylight zone, in buildings three or more stories above grade, not less than 25 percent of the net floor area is within a daylight zone, daylight responsive controls are installed, and glazing assemblies within the scope of NFRC 200 have visible transmittance >= 1.1 times SHGC.	☐	☐	☐
6038 Fenestration	C402.4.1.2	Envelope	A maximum of 6 percent of roof area is permitted to be skylight area provided daylight responsive controls are installed in daylight zones under skylights.	☐	☐	☐

6039 Fenestration	C402.4.2	Envelope	In enclosed spaces > 2,500 ft2 directly under a roof with ceiling heights > 15 ft. and used as an office, lobby, atrium, concourse, corridor, storage, gymnasium/exercise center, convention center, automotive service, manufacturing, non-refrigerated warehouse, retail store, distribution/sorting area, transportation, or workshop, the following requirements apply: (a) the daylight zone under skylights is <= half the floor area; (b) the skylight area to daylight zone is >= 3 percent with a skylight VT >= 0.40; or a minimum skylight effective aperture >= 1 percent. []- Exception 1:C402.4.2: Buildings in climate zones 6 through 8. []- Exception 2:C402.4.2: Spaces where the proposed general lighting power densities < 0.5 W/ft2. []- Exception 3:C402.4.2: Areas with obstructions that block direct beam sunlight on >= 1/2 of the roof over the enclosed area for more than 1,500 daytime hours per year between 8 am and 4 pm. []- Exception 4:C402.4.2: Spaces where the daylight zone under rooftop monitors is > 50 percent of the enclosed space floor area. []- Exception 5:C402.4.2: Spaces where the total area net of daylight zones adjacent to vertical fenestration < 2,500 s.f. and where the lighting is controlled. []- Exception 6:C402.4.2: Requirement does not apply.	☐	☐	☐
6032 Fenestration	C402.4.3	Envelope	Vertical fenestration Maximum U-factor and SHGC value.	☐	☐	☐
6034 Fenestration	C402.4.3	Envelope	Skylight SHGC value.	☐	☐	☐
6040 Fenestration	C402.4.5	Envelope	U-factor of opaque swinging and nonswinging doors associated with the building thermal envelope meets requirements.	☐	☐	☐
6046 Post Construction	C402.5.11	Envelope	Operable openings > 40 ft2 will be interlocked with heating and cooling systems to setback setpoint temperatures within 10 minutes of opening. []- Exception 1:C402.5.11: Separately zoned areas. []- Exception 2:C402.5.11: Warehouses with overhead doors for occupancy. []- Exception 3:C402.5.11: Entrance doors located in exterior wall as part of a vestibule.	☐	☐	☐
6056 HVAC	C403.2.1	Mechanical	HVAC systems and equipment design loads calculated in accordance with ANSI/ASHRAE/ACCA Standard 183 or by an approved equivalent computational procedure []- Exception 1:C403.2.1: Mechanical systems are designed by a registered engineer	☐	☐	☐

6096 HVAC	C403.2.12.1	Mechanical	HVAC fan systems at design conditions do not exceed allowable fan system motor nameplate hp or fan system bhp. []- Exception 1:C403.2.12.1: Hospital and laboratory systems that utilize flow control devices on exhaust and/or return. []- Exception 2:C403.2.12.1: Individual exhaust fans with motor nameplate horsepower less than or equal 1 hp. []- Exception 3:C403.2.12.1: Requirement does not apply.	☐ ☐ ☐
6055 HVAC	C403.2.12.2	Mechanical	HVAC fan motors not oversized beyond allowable limits. []- Exception 1:C403.2.12.2: Fans equipped with electronic speed control devices []- Exception 2:C403.2.12.2: Fans with fan nameplate electrical input power < 0.89 kW []- Exception 3:C403.2.12.2: Fan system complying with Section C403.2.12.1 motor nameplate hp (Option 1). []- Exception 4:C403.2.12.2: Fans with motor nameplate horsepower < 1 hp (746 W). []- Exception 5:C403.2.12.2: Requirement does not apply.	☐ ☐ ☐
6141 SYSTEM_SPECIF	C403.2.12.3	Mechanical	Fans have a fan energy index (FEI) >= 1.00. Variable volume fans will have an FEI >= 0.95 at the design point of operation. []- Exception 1:C403.2.12.3: Single not embedded fans with motor nameplate horsepower of less than 1 hp (0.89 kW). []- Exception 2:C403.2.12.3: Embedded fans with motor nameplate horsepower exceeding 5 hp (4.1 kW). []- Exception 3:C403.2.12.3: Multiple fans in series or parallel have a combined motor nameplate horsepower of less or equal 5 hp and are operated functionally as a single fan. []- Exception 4:C403.2.12.3: Fans integral to equipment listed under Section C403.2.3. []- Exception 5:C403.2.12.3: Fans included in equipment having certified seal for air or energy performance of the equipment package. []- Exception 6:C403.2.12.3: Ceiling fans. []- Exception 7:C403.2.12.3: Fans for gases at temperatures above 425F. []- Exception 8:C403.2.12.3: Fans for operation in explosive atmospheres. []- Exception 9:C403.2.12.3: Reversible fans for tunnel ventilation. []- Exception 10:C403.2.12.3: Fans not covered by AMCA 208. []- Exception 11:C403.2.12.3: Fans intended to operate only during emergency conditions.	☐ ☐ ☐

6057 HVAC	C403.2.2	Mechanical	HVAC systems and equipment capacity does not exceed calculated loads. []- Exception 1:C403.2.2: Required standby equipment with proper controls per code. []- Exception 2:C403.2.2: Multiple units of the same type of equipment with sequencing controls. []- Exception 3:C403.2.2: Living spaces in commercial buildings shall be sized in accordance with Section R403.7.1.1 and its exceptions	☐ ☐ ☐
6087 HVAC	C403.2.7	Mechanical	Exhaust air energy recovery on systems meeting Table C403.7.4(1) and C403.7.4(2). []- Exception 1:C403.2.7: Where energy recovery systems are prohibited by the Florida Building Code, Mechanical []- Exception 2:C403.2.7: Laboratory fume hood systems []- Exception 3:C403.2.7: Systems serving spaces that are heated to less than 60°F (15.5°C) and are not cooled []- Exception 4:C403.2.7: Where more than 60 percent of the outdoor heating energy is provided from site-recovered or site solar energy []- Exception 5:C403.2.7: Heating energy recovery in Climate Zones 1 and 2 []- Exception 6:C403.2.7: Cooling energy recovery in Climate Zones 3C, 4C, 5B, 5C, 6B, 7 and 8 []- Exception 7:C403.2.7: Systems requiring dehumidification that employ energy recovery in series with the cooling coil []- Exception 8:C403.2.7: Where the largest source of air exhausted at a single location at the building exterior is less than 75 percent of the design outdoor air flow rate. []- Exception 9:C403.2.7: Systems expected to operate less than 20 hours per week at the outdoor air percentage covered by Table C403.2.7(1). []- Exception 10:C403.2.7: Systems exhausting toxic, flammable, paint or corrosive fumes or dust. []- Exception 11:C403.2.7: Commercial kitchen hoods used for collecting and removing grease vapors and smoke	☐ ☐ ☐
6047 HVAC	C403.3.2	Mechanical	Economizer operation will not increase heating energy use during normal operation. []- Exception 1:C403.3.2: Economizers on VAV systems.	☐ ☐ ☐

6093 HVAC	C403.3.3, C403.3.3.1, C403.3.3.2, C403.3.3.3, C403.3.3.4, C403.3.3.5	Mechanical	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation. []- Exception 1:C403.3_C403.3.2: Buildings located in Climate Zones 1A and 1B. []- Exception 2:C403.3_C403.3.2: Individual DX fan cooling units have a capacity is < 54 KBtu/h (15.8 kW) or total chilled water system capacity < minimum specified in Table C403.3(1). []- Exception 3:C403.3_C403.3.2: Where more than 25 % of the air supplied to spaces that are designed to be humidified above 35°F (1.7°C) dewpoint temperature to satisfy process needs []- Exception 4:C403.3_C403.3.2: Systems that serve residential spaces where the system capacity is < 270 kBtu/h []- Exception 5:C403.3_C403.3.2: Systems expected to operate less than 20 hours per week []- Exception 6:C403.3_C403.3.2: System serves supermarket areas with open refrigerated casework. []- Exception 7:C403.3_C403.3.2: Where the minimum code required cooling efficiency of the HVAC unit rated with an IPLV, IEER or SEER is increased by at least 17 %. []- Exception 8:C403.3_C403.3.2: Chilled-water cooling systems that are passive (without a fan) capacity is < the minimum specified in Table C403.3(1). []- Exception 9:C403.3_C403.3.2: Systems that include a heat recovery system in accordance with Section C403.4.5 []- Exception 10:C403.3_C403.3.2: Economizers on VAV systems cause zone-level heating to increase due to a reduction in supply air temperature.	☐	☐	☐
6042 HVAC	C403.3.4, C403.3.4.1, C403.3.4.2, C403.3.1	Mechanical	Water economizers provided where required, meet the requirements for design capacity, maximum pressure drop and integrated economizer control. []- Exception 1:C403.2.12.5_C403.2.12.5.1_C403.2.12.5.2: Modulating fan control not required for chilled water and evaporative cooling units with fan motors of < 1 hp where the units are not used to provide ventilation air and the indoor fan cycles with the load. []- Exception 2:C403.2.12.5_C403.2.12.5.1_C403.2.12.5.2: Requirement does not apply.	☐	☐	☐
6053 HVAC	C403.4.2.3.1	Mechanical	Hydronic heat pump systems connected to a common water loop meet heat rejection and heat addition requirements. []- Exception 1:C403.4.2.3.1: A deadband of less than 20°F is allowed where a temperature optimization controller is used.	☐	☐	☐

6144 Mandatory Additior	C406.6	Project	Dedicate outdoor air system efficiency energy credit - Building equipped with independent ventilation system designed to provide 100-percent outdoor air to each individual occupied space, as specified by the IMC. The ventilation system is capable of total energy recovery and includes HVAC system controls that manage temperature resets at least 25 percent of delta design supply-air / room-air temp.	☐ ☐ ☐

2. To be checked by Plan Reviewer

6004 Plan Review	C103.2	Mechanical	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical and service water heating systems and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks. Hot water system sized per manufacturer's sizing guide.	☐ ☐ ☐
6011 Plan Review	C103.2	Interior Lighting	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. The information provided should include lighting controls per sections C405.2 and C405.3.	☐ ☐ ☐
6023 Plan Review	C103.2	Exterior Lighting	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the exterior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. The information provided should include Exterior lighting power requirements (Mandatory) per section C405.4.	☐ ☐ ☐
6001 Plan Review	C103.2, C103.2.1	Envelope	Plans and/or specifications provide all information with which compliance can be determined for the building envelope and document where exceptions to the standard are claimed.	☐ ☐ ☐
6081 HVAC	C402.2.6	Mechanical	Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-3.5. []- Exception 1:C402.2.6: Heated slabs on grade insulated in accordance with Section C402.2.5 []- Exception 2:C402.2.6: Requirement does not apply.	☐ ☐ ☐
6100 HVAC	C403.2.13	Mechanical	Systems that heat outside the building envelope are radiant heat systems controlled by an occupancy sensing device or timer switch. []- Exception 1:C403.12.1: Requirement does not apply.	☐ ☐ ☐
6068 HVAC	C403.2.4.1.3	Mechanical	Reset static pressure setpoint for DDC controlled VAV boxes reporting to central controller based on the zones requiring the most pressure. []- Exception 1:C403.4.1.3: Requirement does not apply.	☐ ☐ ☐

6107 HVAC	C403.2.4.2	Mechanical	Each zone equipped with setback controls using automatic time clock or programmable control system. []- Exception 1:C403.2.4.2: Zones operated continuously. []- Exception 2:C403.2.4.2: Zones have a full HVAC load demand not exceeding 6,800 Btu/h (2 kW) and having a readily accessible manual shutoff switch. []- Exception 3:C403.2.4.2: Requirement does not apply.	☐ ☐ ☐
6123 HVAC	C403.2.4.4	Mechanical	Zone isolation devices and controls installed where applicable. []- Exception 1:C403.2.4.4: Exhaust and outdoor air connections having fan systems 5000 cfm or smaller. []- Exception 2:C403.2.4.4: Exhaust airflow less than 10% of design. []- Exception 3:C403.2.4.4: Zones and systems intended to operate continuously or are inoperative when all other zones are inoperative. []- Exception 4:C403.2.4.4: Requirement does not apply.	☐ ☐ ☐
6124 HVAC	C403.2.4.7	Mechanical	Fault detection and diagnostics installed with air-cooled unitary DX units or VRF units having economizers. []- Exception 1:C403.2.4.7: Requirement does not apply.	☐ ☐ ☐
6125 HVAC	C403.2.5	Mechanical	Hot water boilers supplying heat via one- or two-pipe systems include outdoor setback control. []- Exception 1:C403.2.5: Requirement does not apply.	☐ ☐ ☐
6089 HVAC	C403.2.6	Mechanical	Natural or mechanical ventilation is provided in accordance with International Mechanical Code Chapter 4. Mechanical ventilation has capability to reduce outdoor air supply to minimum per IMC Chapter 4. []- Exception 1:C403.2.2: Requirement does not apply.	☐ ☐ ☐
6090 HVAC	C403.2.6.1	Mechanical	Demand control ventilation provided for spaces >500 ft2 and >=25 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm. []- Exception 1:C403.2.6.1: Systems with energy recovery complying with Section C403.2.7. []- Exception 2:C403.2.6.1: Multiple-zone systems without DDC. []- Exception 3:C403.2.6.1: Multiple-zone systems with design outdoor air of less than 1200 cfm. []- Exception 4:C403.2.6.1: Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is < 1,200 cfm []- Exception 5:C403.2.6.1: Ventilation provided for process loads only []- Exception 6:C403.2.6.1: Requirement does not apply.	☐ ☐ ☐

6098 HVAC	C403.4.2	Mechanical	The heating of fluids in hydronic systems that have been previously mechanically cooled, and the cooling of fluids that have been previously mechanically heated are limited in accordance with Sections C403.4.2.1-C403.4.2.3. Single boiler systems >500 kBtu/h have multistaged or modulating burner. []- Exception 1:C403.4.2: Requirement does not apply.	☐ ☐ ☐
6142 HVAC	C403.4.2.3.2	Mechanical	Closed-circuit cooling tower within heat pump loop have either automatic bypass valve or lower leakage positive closure dampers. Open-circuit tower within heat pump loop have automatic valve to bypass all heat pump water flow around the tower. Open- or closed-circuit cooling towers used in conjunction with a separate heat exchanger have heat loss by shutting down the circulation pump on the cooling tower loop. Open- or closed circuit cooling towers have a separate heat exchanger to isolate the cooling tower from the heat pump loop, and heat loss is controlled by shutting down the circulation pump on the cooling tower loop. []- Exception 1:C403.4.2.3.2: Heat pump system must reject heat throughout the year. []- Exception 2:C403.4.2.3.2: Requirement does not apply.	☐ ☐ ☐
6116 HVAC	C403.4.2.5	Mechanical	System turndown requirement met through multiple single-input boilers, one or more modulating boilers, or a combination of single-input and modulating boilers. Boiler shall comply with the turndown ratio specified in Table C403.4.2.5.	☐ ☐ ☐
6071 HVAC	C403.4.2.6	Mechanical	Chilled water plants with multiple chillers have capability to reduce flow automatically through the chiller plant when a chiller is shut down. Boiler plants with multiple boilers have the capability to reduce flow automatically through the boiler plant when a boiler is shut down.	☐ ☐ ☐
6099 HVAC	C403.4.3.1	Mechanical	Fan systems with total system motor capacity >=5 hp associated with heat rejection equipment configured to automatically modulate the fan speed to control the leaving fluid temperature or condensing temp/pressure of heat rejection device. []- Exception 1:C403.4.3.1: Fans serve multiple refrigerant or fluid cooling circuits. []- Exception 2:C403.4.3.1: Condenser fans serve flooded condensers. []- Exception 3:C403.4.3.1: Requirement does not apply.	☐ ☐ ☐
6120 HVAC	C403.4.3.4	Mechanical	Open-circuit cooling towers having water cooled chiller systems and multiple or variable speed condenser pumps, are designed so that tower cells can run in parallel with larger of flow criteria. []- Exception 1:C403.4.3.4: Requirement does not apply.	☐ ☐ ☐

6103 HVAC	C403.6.1	Mechanical	Hydronic and multizone HVAC system controls are VAV fans driven by mechanical or electrical variable speed drive per Table C403.4.1.1. []- Exception 1:C403.4.4: Zones or supply air systems where >= 75 % of the energy for reheating or for providing warm air in mixing systems is provided from a site-recovered or site-solar energy source []- Exception 2:C403.4.4: Zones where special humidity levels are required to satisfy process needs []- Exception 3:C403.4.4: Zones with a peak supply air of <= 300 cfm (142 L/s) and where the flow rate is < 10 % of the total fan system supply airflow rate. []- Exception 4:C403.4.4: Zones where the volume of air to be reheated, recooled or mixed is <= the minimum ventilation requirements of Chapter 4 of the Florida Building Code, Mechanical []- Exception 5:C403.4.4: Zones or supply air systems with thermostatic and humidistatic controls capable of preventing reheating, recooling, mixing or simultaneous supply of air that has been previously cooled []- Exception 6:C403.4.4: Requirement does not apply.	☐ ☐ ☐
6122 HVAC	C404.2.1	Mechanical	Gas-fired water-heating equipment installed in new buildings: where a singular piece of water-heating equipment >= 1,000 kBtu/h serves the entire building, thermal efficiency <= 92 Et. Where multiple pieces of water-heating equipment serve the building with combined rating <= 1,000 kBtu/h, the combined input-capacity-weighted-average thermal efficiency <= 90 Et. Exclude input rating of equipment in individual dwelling units and equipment <= 100 kBtu/h []- Exception 1:C404.2.1: 25 percent or more of the annual service water heating requirement is provided by on-site renewable energy or site-recovered energy. []- Exception 2:C404.2.1: Water heaters installed in individual dwelling units shall not be required to be included in the total input rating of service waterheating equipment []- Exception 3:C404.2.1: Water heaters with an input rating of <= 100,000 Btu/h (29.3 kW) not required to be included in the total input rating of service water-heating equipment []- Exception 4:C404.2.1: Requirement does not apply.	☐ ☐ ☐
6114 HVAC	C404.4	Mechanical	All piping insulated in accordance with section details and Table C403.12.3. []- Exception 1:C404.4: Requirement does not apply.	☐ ☐ ☐
6019 HVAC	C404.5, C404.5.1, C404.5.2	Mechanical	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details. []- Exception 1:C404.5_C404.5.1_C404.5.2: Requirement does not apply.	☐ ☐ ☐

6022 HVAC	C404.6.3	Mechanical	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle. []- Exception 1:C404.6.3: Requirement does not apply.	☐ ☐ ☐
6026 HVAC	C404.7	Mechanical	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F. []- Exception 1:C404.7: Requirement does not apply.	☐ ☐ ☐
6048 Plan Review	C405.5.2	Project	Group R-2 dwelling units have separate electrical meters. []- Exception 1:C405.5.2: Requirement does not apply.	☐ ☐ ☐
6030 Plan Review	C406	Project	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the additional energy efficiency package options.	☐ ☐ ☐
6084 HVAC	C408.2.2.2	Mechanical	HVAC hydronic heating and cooling coils have means to balance and have pressure test connections. []- Exception 1:C408.2.2.2: Pumps with pump motors of 5 hp (3.7 kW) or less. []- Exception 2:C408.2.2.2: Where throttling results in no greater than 5 percent of the nameplate horsepower draw above that required if the impeller were trimmed.	☐ ☐ ☐

3. To be checked by Inspector

6016 Insulation	C104	Envelope	Installed above-grade wall insulation type and R-value consistent with insulation specifications reported in plans.	☐ ☐ ☐
6006 Insulation	C104, C303.1.1	Envelope	Installed roof insulation type and R-value consistent with insulation specifications reported in plans. For some ceiling systems, verification may need to occur during Framing Inspection.	☐ ☐ ☐
6008 Insulation	C104.2.1	Envelope	Installed slab-on-grade insulation type and R-value consistent with insulation specifications reported in plans.	☐ ☐ ☐
6007 Insulation	C303.1, C303.1.1	Envelope	Roof insulation installed per manufacturer's instructions and is labeled with R-value or insulation certificate providing R-value and other relevant data. Blown or poured loose-fill insulation is installed only where the roof slope is > 3 in 12.	☐ ☐ ☐
6035 Fenestration	C303.1.3	Envelope	Fenestration products rated in accordance with NFRC certified and as to performance labels or certificates provided. []- Exception 1:C303.1.3: Default values are used.	☐ ☐ ☐
6020 Insulation	C303.2	Envelope	Above-grade wall insulation installed per manufacturer's instructions.	☐ ☐ ☐
6005 Insulation	C303.2, C303.2.1	Envelope	Below-grade wall insulation installed per manufacturer's instructions.	☐ ☐ ☐

6013 Insulation	C303.2, C303.2.1	Envelope	Slab edge insulation installed per manufacturer's instructions and the Florida Building Code, Building.	☐ ☐ ☐
6027 Insulation	C303.2, C402.2.4	Envelope	Floor insulation installed per manufacturer's instructions. Cavity or structural slab insulation installed in permanent contact with underside of decking or structural slabs. []- Exception 1:C303.2_C402.2.4: All perimeter framing fully insulated at metal or wood framed prescriptive levels. []- Exception 2:C303.2_C402.2.4: Concrete floor slab insulation turns up and contacts underside of floor under wall assembly. []- Exception 3:C303.2_C402.2.4: Requirement does not apply.	☐ ☐ ☐
6015 Insulation	C303.2.1	Envelope	Exterior insulation protected against damage, sunlight, moisture, wind, landscaping and equipment maintenance activities.	☐ ☐ ☐
6002 Insulation	C402.1.3	Envelope	Installed below-grade wall insulation type and R-value consistent with insulation specifications reported in plans.	☐ ☐ ☐
6061 Insulation	C402.1.3	Envelope	Non-swinging opaque doors have R-4.75 insulation. []- Exception 1:C402.1.3: Requirement does not apply.	☐ ☐ ☐
6012 Insulation	C402.2.2	Envelope	Skylight curbs are insulated to the level of roofs with insulation above deck or R-5, whichever is less. []- Exception 1:C402.2.1.5: Unit skylight curbs included as a component of a skylight listed and labeled per NFRC 100. []- Exception 2:C402.2.1.5: Requirement does not apply.	☐ ☐ ☐
6064 Insulation	C402.2.2	Envelope	Roof assembly meets minimal thermal resistance installed between roof framing or in a continuous fashion on the roof assembly as stipulated in Table C402.1.3. Requirements for above deck insulation, minimum thickness, suspended ceilings, staggered joints and skylight curbs will be met. []- Exception 1:C402.2.1: Requirement does not apply.	☐ ☐ ☐
6024 Insulation	C402.2.3	Envelope	Installed floor insulation type and R-value consistent with insulation specifications reported in plans.	☐ ☐ ☐
6021 Insulation	C402.2.5, C402.2.5.1	Envelope	Slab edge insulation depth/length. Slab insulation extending away from building is covered by pavement or >= 10 inches of soil. []- Exception 1:C402.2.5_C402.2.5.1: Requirement does not apply.	☐ ☐ ☐
6051 Insulation	C402.2.6	Envelope	Radiant panels and associated components, designed for heat transfer from the panel surfaces to the occupants or indoor space are insulated with a minimum of R-3.5. []- Exception 1:C402.2.6: Heated slab-on-grade. []- Exception 2:C402.2.6: Requirement does not apply.	☐ ☐ ☐

6014 Insulation	C402.3	Envelope	High-albedo roofs satisfy one of the following: 3-year-aged solar reflectance >= 0.55 (0.63 for Climate Zone 1A) and thermal emittance >= 0.75 or 3-year-aged solar reflectance index >= 64.0 (75 for Climate Zone 1A). []- Exception 1:C402.3: Roof Over Conditioned Space With No Cooling. []- Exception 2:C402.3: Ballasted Roof. []- Exception 3:C402.3: Vegetated Roof (75% coverage). []- Exception 4:C402.3: Shaded or Covered Roof (75% coverage). []- Exception 5:C402.3: Asphaltic Membrane Roof. []- Exception 6:C402.3: Steep Sloped Roof.	☐ ☐ ☐
6028 Fenestration	C402.4.3	Envelope	Installed skylight U-factor and SHGC consistent with label specifications and as reported in plans.	☐ ☐ ☐
6025 Fenestration	C402.4.3, C402.4.3.4	Envelope	Installed vertical fenestration U-factor and SHGC consistent with label specifications and as reported in plans.	☐ ☐ ☐
6043 Air Leakage	C402.5	Envelope	Building envelope contains a continuous air barrier that has been tested and deemed to limit air leakage <= 0.40 cfm/ft2 of the building thermal envelope area at a pressure differential of 0.3 inch water gauge (75 Pa).	☐ ☐ ☐
6044 Air Leakage	C402.5.1	Envelope	The building envelope contains a continuous air barrier that is sealed in an approved manner and either constructed or tested in an approved manner. Air barrier penetrations are sealed in an approved manner. []- Exception 1:C402.5.1: Requirement does not apply.	☐ ☐ ☐
6003 Air Leakage	C402.5.1.1	Envelope	All sources of air leakage in the building thermal envelope are sealed, caulked, gasketed, weather stripped or wrapped with moisture vapor-permeable wrapping material to minimize air leakage.	☐ ☐ ☐
6062 Air Leakage	C402.5.1.2.1	Envelope	The building envelope contains a continuous air barrier that is sealed in an approved manner and material permeability <= 0.004 dfm/ft2. Air barrier penetrations are sealed in an approved manner. []- Exception 1:C402.5.1.2.1: Requirement does not apply.	☐ ☐ ☐
6065 Air Leakage	C402.5.1.2.2	Envelope	The building envelope contains a continuous air barrier that is sealed in an approved manner and average assembly air leakage <= 0.04 cfm/ft2. Air barrier penetrations are sealed in an approved manner. []- Exception 1:C402.5.1.2.2: Requirement does not apply.	☐ ☐ ☐

6052 Air Leakage	C402.5.4	Envelope	Factory-built fenestration and doors are labeled as meeting air leakage requirements. []- Exception 1:C402.5.4: Field fabricated fenestration assemblies. []- Exception 2:C402.5.4: Fenestration in buildings that comply with air leakage requirements with a whole building air leakage test. []- Exception 3:C402.5.4: Doors that comply with special International Building Code requirements.	☐	☐	☐
6009 Air Leakage	C402.5.5, C402.5.11, 403.6	Envelope	Stair and elevator shaft vents have motorized dampers that automatically close. Reference section C403.6 for operational details.	☐	☐	☐
6049 Air Leakage	C402.5.6	Envelope	Weatherseals installed on all loading dock cargo door openings and provide direct contact along the top and sides of vehicles parked in the doorway. []- Exception 1:C402.5.6: Requirement does not apply.	☐	☐	☐
6050 Air Leakage	C402.5.7	Envelope	Vestibules are installed on all building entrances. Doors have self-closing devices. []- Exception 1:C402.5.7: Building entrances with revolving doors. []- Exception 2:C402.5.7: Doors not intended to be used as a building entrance. []- Exception 3:C402.5.7: Doors opening directly from a sleeping unit or dwelling unit. []- Exception 4:C402.5.7: Doors that open directly from a space <=3000 ft2. []- Exception 5:C402.5.7: Doors with air curtain. []- Exception 6:C402.5.7: Existing door is being replaced and existing vestibules not removed. []- Exception 7:C402.5.7: Requirement does not apply.	☐	☐	☐
6045 Air Leakage	C402.5.8	Envelope	Recessed luminaires in thermal envelope to limit infiltration and be IC rated and labeled. Seal between interior finish and luminaire housing. []- Exception 1:C402.5.10: Requirement does not apply.	☐	☐	☐
6086 HVAC	C403.2	Mechanical	HVAC equipment efficiency verified.	☐	☐	☐

6092 HVAC	C403.2.10	Mechanical	HVAC piping insulation insulated in accordance with Table C403.2.10. Insulation exposed to weather is protected from damage and is provided with shielding from solar radiation. []- Exception 1:C403.2.10: Factory-installed piping within HVAC equipment []- Exception 2:C403.2.10: Factory-installed piping within room fan-coils and unit ventilators tested under AHRI 440. []- Exception 3:C403.2.10: Piping that conveys fluids that have a design operating temperature range between 60 and 105°F. []- Exception 4:C403.2.10: Fluid not heated or cooled. []- Exception 5:C403.2.10: Strainers and valves associated with 1 inch or smaller piping. []- Exception 6:C403.2.10: Underground piping with fluids no hotter than 60ºF. []- Exception 7:C403.2.10: Piping design for radiant heating systems []- Exception 8:C403.2.10: Requirement does not apply.	☐ ☐ ☐
6171 HVAC	C403.2.12.4	Mechanical	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed for either balancing or remote control. []- Exception 1:C403.2.12.4: Motors in the airstream within fan coils and terminal units only provide heating to the space served. []- Exception 2:C403.2.12.4: Motors in space-conditioning equipment that comply with Section C403.2.3 or C403.2.12. []- Exception 3:C403.2.12.4: Motors that comply with Section C405.7. []- Exception 4:C403.2.12.4: Requirement does not apply.	☐ ☐ ☐
6173 HVAC	C403.2.12.5.1	Mechanical	Each DX cooling system >= 65 kBtu and chiller water/evaporative cooling system with fans >= 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section. []- Exception 1:C403.2.12.5.1: Modulating fan control is not required for chilled water and evaporative cooling units with fan motors of less than 1 hp where the units are not used to provide ventilation air and the indoor fan cycles with the load. []- Exception 2:C403.2.12.5.1: Where the volume of outdoor air required to comply with the ventilation requirements of the IMC at low speed exceeds the air that would be delivered per Section C403.2.12.5 []- Exception 3:C403.2.12.5.1: Requirement does not apply.	☐ ☐ ☐

6097 HVAC	C403.2.12.5.2	Mechanical	VAV fans have static pressure sensors located so controller setpoint <=1.2 w.c.. []- Exception 1:C403.2.12.5.2: Requirement does not apply.	☐ ☐ ☐
6168 HVAC	C403.2.12.5.2	Mechanical	Static pressure sensors used to control VAV fans located such that the controller setpoint is <= 1.2 inches w.c.. Where this results in one or more sensors being located downstream of major duct splits, not less than one sensor located on each major branch. []- Exception 1:C403.2.12.5.2: Requirement does not apply.	☐ ☐ ☐
6167 HVAC	C403.2.12.5.3	Mechanical	Systems with DDC of individual zones reporting to the central control panel configured to reset the static pressure setpoint based on zone requiring the most pressure. The DDC is capable of monitoring zone damper positions or have an alternative method of indicating the need for static pressure. See section for details. []- Exception 1:C403.2.12.5.3: Requirement does not apply.	☐ ☐ ☐
6178 HVAC	C403.2.12.6	Mechanical	Large diameter fans where installed shall be tested and labeled in accordance with AMCA 230. []- Exception 1:C403.2.12.6: Requirement does not apply.	☐ ☐ ☐
6155 HVAC	C403.2.14, C403.2.14.1, C403.2.14.2	Mechanical	Refrigeration equipment performance shall be determined in accordance with sections C403.2.14.1 and C403.2.14.2 for commercial refrigerators, freezers, refrigerator-freezers, walk-in coolers, walk-in freezers and refrigeration equipment. []- Exception 1:C403.5: Systems have working fluid in the refrigeration cycle that goes through both subcritical and supercritical states (transcritical). []- Exception 2:C403.5: Systems use ammonia refrigerant. []- Exception 3:C403.5: Requirement does not apply.	☐ ☐ ☐
6102 HVAC	C403.2.3	Mechanical	PTAC and PTHP with sleeves 16 in. by 42 in. labeled for replacement only as per Footnote b to Tables C403.2.3(1) and C403.2.3(2). []- Exception 1:C403.3: Requirement does not apply.	☐ ☐ ☐
6058 HVAC	C403.2.4.1	Mechanical	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system. []- Exception 1:C403.2.4.1: TRUE	☐ ☐ ☐
6059 HVAC	C403.2.4.1.1	Mechanical	Heat pump controls prevent supplemental electric resistance heat from coming on when not needed. []- Exception 1:C403.2.4.1.1: Requirement does not apply.	☐ ☐ ☐
6060 HVAC	C403.2.4.1.2	Mechanical	Thermostatic controls have a 5 °F deadband. []- Exception 1:C403.2.4.1.2: Manual changeover thermostats. []- Exception 2:C403.2.4.1.2: Precision indoor temperature control required.	☐ ☐ ☐

6085 HVAC	C403.2.4.1.3	Mechanical	Temperature controls have setpoint overlap restrictions. []- Exception 1:C403.2.4.1.3: Requirement does not apply.	☐	☐	☐
6108 HVAC	C403.2.4.2.1, C403.2.4.2.2	Mechanical	Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup []- Exception 1:C403.2.4.2.1_C403.2.4.2.2: Requirement does not apply.	☐	☐	☐
6110 HVAC	C403.2.4.2.3	Mechanical	Systems include optimum start controls. []- Exception 1:C403.2.4.2.3: Requirement does not apply.	☐	☐	☐
6088 Air Leakage	C403.2.4.3	Mechanical	Outdoor air and exhaust systems have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Check gravity dampers where allowed. Reference section language for operational details. []- Exception 1:C403.2.4.3: Gravity dampers acceptable in buildings less than 3 stories. []- Exception 2:C403.2.4.3: Gravity dampers acceptable for exhaust and relief dampers in climate zones 0, 1, 2, or 3. []- Exception 3:C403.2.4.3: Gravity dampers acceptable in systems with outside or exhaust air flow rates less than or equal to 300 cfm. []- Exception 4:C403.2.4.3: Dampers no larger than 24 inches in any dimension are to have a leakage rate of 40 cfm/ft2 at 1.0 inch water gauge when tested with AMCA 500D. []- Exception 5:C403.2.4.3: Requirement does not apply.	☐	☐	☐
6029 HVAC	C403.2.4.5	Mechanical	Snow/ice melting system and freeze protection systems have sensors and controls configured to limit service for pavement temperature above 50°F and outdoor temperature above 40°F. []- Exception 1:C403.12.2_C403.12.3: Requirement does not apply.	☐	☐	☐
6170 HVAC	C403.2.4.8	Mechanical	HVAC systems serving guestrooms in Group R-1 buildings with < 50 guestrooms: Each guestroom is provided with controls that automatically manage temperature setpoint and ventilation (see sections C403.2.4.8.1 and C403.2.4.8.2). []- Exception 1:C403.2.4.8: Requirement does not apply.	☐	☐	☐
6128 HVAC	C403.2.6.2	Mechanical	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity. []- Exception 1:C403.2.6.2: Garages with no mechanical cooling or heating that have exhaust capacity < 8,000 cfm. []- Exception 2:C403.2.6.2: Garages with no mechanical cooling or heating that have a ratio of garage area ventilation to ventilation system motor nameplate hp exceed 1125 cfm/hp. []- Exception 3:C403.2.6.2: Requirement does not apply.	☐	☐	☐

6169 HVAC	C403.2.7	Mechanical	Units that provide ventilation air to multiple zones and operate in combination with zone heating and cooling systems do not use heating or heat recovery to warm supply air to a temperature greater than 60°F when representative building loads or outdoor air temperatures indicate that the majority of zones require cooling. []- Exception 1:C403.7.3: Requirement does not apply.	☐	☐	☐
6129 HVAC	C403.2.8	Mechanical	Kitchen exhaust systems comply with replacement air and conditioned supply air limitations, and satisfy hood rating requirements and maximum exhaust rate criteria. []- Exception 1:C403.2.8: Requirement does not apply.	☐	☐	☐
6091 HVAC	C403.2.9	Mechanical	HVAC ducts and plenums insulated in accordance with C403.2.9.1 and constructed in accordance with C403.2.9.2, Sealed in accordance with C403.2.9.3. verification may need to occur during Foundation Inspection. []- Exception 1:C403.2.9_C403.2.9.1: Factory-installed as part of HVAC equipment. []- Exception 2:C403.2.9_C403.2.9.1: Where the design temperature difference between the inside and outside of the duct or plenum is less than 15ºF. []- Exception 3:C403.2.9_C403.2.9.1: Runouts less than 10 feet (3048 mm) in length to air terminals or air outlets, the rated R-value of insulation need not exceed R-5. []- Exception 4:C403.2.9_C403.2.9.1: Backs of air outlets and outlet plenums exposed to unconditioned spaces need not exceed R-2. []- Exception 5:C403.2.9_C403.2.9.1: Return air ducts meeting all the requirements for building cavities that will be used as return air plenums []- Exception 6:C403.2.9_C403.2.9.1: Requirement does not apply.	☐	☐	☐
6174 SYSTEM_SPECIF	C403.3.2	Mechanical	Equipment minimum efficiency:	☐	☐	☐
6175 SYSTEM_SPECIF	C403.3.2	Mechanical	Equipment minimum efficiency:	☐	☐	☐
6157 HVAC	C403.3.3.3	Mechanical	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.3.3.3 for applicable device types and climate zones. []- Exception 1:C403.3.3.3: Requirement does not apply.	☐	☐	☐
6158 HVAC	C403.3.3.4	Mechanical	System capable of relieving excess outdoor air during air economizer operation to prevent over pressurizing the building. The relief air outlet located to avoid recirculation into the building. []- Exception 1:C403.3.3.4: Requirement does not apply.	☐	☐	☐

6159 HVAC	C403.3.3.5	Mechanical	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.2.4.3 for details. []- Exception 1:C403.3.3.5: Requirement does not apply.	☐	☐	☐
6094 HVAC	C403.4.1.4	Mechanical	Heating for vestibules and air curtains with integral heating include automatic controls that shut off the heating system when outdoor air temperatures < 45F. Vestibule heating and cooling systems controlled by a thermostat in the vestibule with heating setpoint <= 60F and cooling setpoint <= 80F. []- Exception 1:C402.5.7: Buildings in Climate Zones 1 and 2. []- Exception 2:C402.5.7: Requirement does not apply.	☐	☐	☐
6082 HVAC	C403.4.2.1	Mechanical	Three-pipe hydronic systems using a common return for hot and chilled water are not used.	☐	☐	☐
6095 HVAC	C403.4.2.2	Mechanical	Two-pipe hydronic systems using a common distribution system have controls to allow a deadband >=15 °F, allow operation in one mode for at least 4 hrs before changeover, and have rest controls to limit heating and cooling supply temperature to <=30 °F.	☐	☐	☐
6072 HVAC	C403.4.2.3.3	Mechanical	Two-position automatic valve interlocked to shut off water flow when hydronic heat pump with pumping system > 10 hp is off.	☐	☐	☐
6172 HVAC	C403.4.3.2	Mechanical	Multiple-cell heat rejection equipment with variable speed fan drives are controlled to operate the maximum number of fans allowed and so that all fans operate at the same fan speed required for the instantaneous cooling duty. The minimum fan speed will be the minimum allowable speed of the fan drive system in accordance with the manufacturer's recommendations. []- Exception 1:C403.4.3.2: Requirement does not apply.	☐	☐	☐
6118 SYSTEM_SPECIFI	C403.4.3.3	Mechanical	Centrifugal fan open-circuit cooling towers having combined rated capacity >= 1100 gpm meets minimum efficiency requirement: >=40.2 gpm/hp. []- Exception 1:C403.4.3.3: Centrifugal open-circuit cooling towers with external sound attenuation or that have ducted inlet or discharge. []- Exception 2:C403.4.3.3: Requirement does not apply.	☐	☐	☐
6160 HVAC	C403.4.4	Mechanical	Supply air systems serving multiple zones have VAV systems with controls configured to reduce the volume of air that is reheated, recooled or mixed in each zone. See section for details. []- Exception 1:C403.6.1: Zones or systems with at least 75% of energy used for heating or warming air Systems that prevent reconditioning, mixing or simultaneous supply of air that has previously been mechanically cooled (including via economizers) or heated. []- Exception 2:C403.6.1: Requirement does not apply.	☐	☐	☐

6161 HVAC	C403.4.4.1	Mechanical	Single-duct VAV systems use terminal devices configured to reduce the supply of primary supply air before reheating or recooling takes place. []- Exception 1:C403.4.4.1: Requirement does not apply.	☐	☐	☐
6162 HVAC	C403.4.4.2	Mechanical	Systems that have 1 warm air duct and 1 cool air duct use terminal devices configured to reduce the flow from one duct to a minimum before mixing of air from the other duct takes place. []- Exception 1:C403.4.4.1: Requirement does not apply.	☐	☐	☐
6163 HVAC	C403.4.4.3	Mechanical	Individual dual-duct or mixing heating and cooling systems with a single fan and with total capacities > 90,000 Btu/h not equipped with air economizers. []- Exception 1:C403.4.4.1: Requirement does not apply.	☐	☐	☐
6164 HVAC	C403.4.4.5	Mechanical	Multiple zone HVAC systems have supply air temperature reset controls based on building loads or outside temperatures. []- Exception 1:C403.4.4.5: Systems that prevent re-heating, re-cooling, or mixing of heated and cooled supply air. []- Exception 2:C403.4.4.5: Systems in which at least 75% of the energy for reheating is from site recovered or site solar energy resources. []- Exception 3:C403.4.4.5: Zones in climate zones 1A and 3A with less than 300 cfm design outside air. []- Exception 4:C403.4.4.5: Zones in climate zone 2A with with less than 10,000 cfm of design outside air. []- Exception 5:C403.4.4.5: Zones in climate zones 1A, 2A, and 3A with >= 80% outside air and employing exhaust air energy recovery. []- Exception 6:C403.4.4.5: Requirement does not apply.	☐	☐	☐
6165 HVAC	C403.4.4.6	Mechanical	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls. []- Exception 1:C403.4.4.6: VAV systems that recirculate air from other zones without directly mixing it with outdoor air or dual-duct dual-fan VAV systems, or VAV systems with fan-powered terminal units. []- Exception 2:C403.4.4.6: Systems where the design exhaust airflow is more than 70% of design outdoor air intake flow. []- Exception 3:C403.4.4.6: Requirement does not apply.	☐	☐	☐

6166 HVAC	C403.4.4.7	Mechanical	Parallel-flow fan-powered VAV air terminals have automatic controls configured to 1) turn off the terminal fan except when space heating is required or where required for ventilation, 2) turn on the terminal fan as the first stage of heating before the heating coil is activated, and 3) during heating for warmup or setback temperature control, either operate the terminal fan and heating coil without primary air or, reverse the terminal damper logic and provide heating from the central air handler by primary air. []- Exception 1:C403.4.4.7: Requirement does not apply.	☐	☐	☐
6076 HVAC	C403.4.5	Mechanical	Condenser heat recovery system that can heat water to 85 ºF or provide 60% of peak heat rejection is installed for preheating of service hot water. []- Exception 1:C403.4.5: Facility operates < 24/7. []- Exception 2:C403.4.5: Total installed heat capacity of water cooled systems <= 6 MMBtu/h of heat rejection. []- Exception 3:C403.4.5: Design SWH load <= 1 MMBtu/h. []- Exception 4:C403.4.5: Facilities using condenser heat recovery for space heating with heat recovery exceeding 30% of the peak water-cooled condenser load. []- Exception 5:C403.4.5: Facilities providing 60% of their service water heating from site-solar, site-recovered, or other energy sources.	☐	☐	☐
6080 HVAC	C403.4.6	Mechanical	Hot gas bypass limited to: <=240 kBtu/h – 50%; <240 kBtu/h – 25%	☐	☐	☐
6101 HVAC	C404.2	Mechanical	Service water heating equipment meets efficiency requirements.	☐	☐	☐
6113 HVAC	C404.3	Mechanical	Heat traps installed on supply and discharge piping of non-circulating systems. []- Exception 1:C404.3: Tank inlets/outlets associated with solar water heating systems. []- Exception 2:C404.3: Requirement does not apply.	☐	☐	☐
6115 HVAC	C404.6.1	Mechanical	Controls are installed that limit the operation of a recirculation pump installed to maintain temperature of a storage tank. System return pipe is a dedicated return pipe or a cold water supply pipe. []- Exception 1:C404.6.1: Requirement does not apply.	☐	☐	☐
6010 HVAC	C404.6.1, C404.6.2	Mechanical	Automatic time switches installed to automatically switch off the recirculating hot-water system or heat trace.	☐	☐	☐
6126 HVAC	C404.9.1	Mechanical	Pool heaters are equipped with on/off switch and no continuously burning pilot light.	☐	☐	☐

6127 HVAC	C404.9.2	Mechanical	Time switches are installed on all pool heaters and pumps. []- Exception 1:C404.9.2: Where 24-hr pump operation required for public health. []- Exception 2:C404.9.2: Solar and waste heat recovery pool heating pumps. []- Exception 3:C404.9.2: Requirement does not apply.	☐ ☐ ☐
6130 HVAC	C404.9.3	Mechanical	Vapor retardant pool covers are provided for heated pools and permanently installed spas. []- Exception 1:C404.9.3: Pools deriving > 75% of the energy for heating (of not fewer than 3 months) from heat pump or site-recovered energy. []- Exception 2:C404.9.3: Requirement does not apply.	☐ ☐ ☐
6054 Controls	C405.2.1, C405.2.1.1	Interior Lighting	Occupancy sensors installed in classrooms/lecture/training rooms, conference/meeting/multipurpose rooms, copy/print rooms, lounges/breakrooms, enclosed offices, open plan office areas, restrooms, storage rooms, locker rooms, corridors, warehouse storage areas, and other spaces <= 300 sqft that are enclosed by floor-to-ceiling height partitions. Reference section language C405.2.1.2 for control function in warehouses and section C405.2.1.3 for open plan office spaces. []- Exception 1:C405.2.1_C405.2.1.1: Automatic-on controls are allowed in corridors, stairways, restrooms, primary building entrance areas and lobbies, and areas where manual-on controls could impact safety or security. []- Exception 2:C405.2.1_C405.2.1.1: Areas such as security or emergency areas that need continuous lighting. []- Exception 3:C405.2.1_C405.2.1.1: Emergency egress lighting. []- Exception 4:C405.2.1_C405.2.1.1: Lighting that is related to means of egress in stairways, ramps, corridors. []- Exception 5:C405.2.1_C405.2.1.1: Requirement does not apply.	☐ ☐ ☐
6063 Controls	C405.2.1.2	Interior Lighting	Occupancy sensors control function in warehouses: In warehouses, the lighting in aisleways and open areas is controlled with occupant sensors that automatically reduce lighting power by 50% or more within 20 minutes of when the areas are unoccupied. The occupant sensors control lighting in each aisleway independently and do not control lighting beyond the aisleway being controlled by the sensor. Lights not turned off by occupant sensors is done so by time-switch. []- Exception 1:C402.5.1.2: Requirement does not apply.	☐ ☐ ☐

6066 Controls	C405.2.1.3	Interior Lighting	Occupant sensor control function in open plan office areas: Occupant sensor controls in open office spaces >= 300 sq.ft. have controls 1) configured so that general lighting can be controlled separately in control zones with floor areas <= 600 sq.ft. within the space, 2) general lighting in each zone permitted to turn on upon occupancy in control zone, 3) automatically turn off general lighting in all control zones within 20 minutes after all occupants have left the space, 4) are configured so that general lighting power in each control zone is reduced by <= 80% of the full zone general lighting power within 20 minutes of all occupants leaving that control zone. []- Exception 1:C405.2.1.3: Requirement does not apply.	☐ ☐ ☐
6067 Controls	C405.2.2, C405.2.2.1	Interior Lighting	Each area not served by occupancy sensors (per C405.2.1.1) have time-switch controls and functions detailed in sections C405.2.2.1. []- Exception 1:C405.2.2_C405.2.2.1: Luminaires requiring specific controls in accordance with C405.2.4. []- Exception 2:C405.2.2_C405.2.2.1: Spaces with patient care. []- Exception 3:C405.2.2_C405.2.2.1: Areas such as security or emergency areas that need continuous lighting. []- Exception 4:C405.2.2_C405.2.2.1: Lighting that is related to means of egress in stairways, ramps, corridors, or emergency routes. []- Exception 5:C405.2.2_C405.2.2.1: Shop and laboratory classrooms.	☐ ☐ ☐
6069 Controls	C405.2.3.1	Interior Lighting	Spaces required to have light-reduction controls have a manual control that allows the occupant to reduce the connected lighting load in a reasonably uniform illumination pattern using one of the following or another approved method: (1) Continuous dimming of all luminaires from full output to less than 20 percent of full power, (2) Switching all luminaires to a reduced output of not less than 30 percent and not more than 70 percent of full power, or (3) Switching alternate luminaires or alternate rows of luminaires to achieve a reduced output of not less than 30 percent and not more than 70 percent of full power. []- Exception 1:C405.2: Areas designated as security or emergency areas that are required to be continuously lighted. []- Exception 2:C405.2: Interior exit stairways, interior exit ramps, and exit passageways. []- Exception 3:C405.2: Emergency egress lighting that is normally off.	☐ ☐ ☐

6070 Controls	C405.2.4, C405.2.4.1, C405.2.4.2	Interior Lighting	Daylight zones provided with individual controls that control the lights independent of general area lighting. See code section C405.2.3 Daylight-responsive controls for applicable spaces, C405.2.3.1 Daylight responsive control function and section C405.2.3.2 Sidelit zone. []- Exception 1:C405.2.4: Spaces where health patient care is directly provided. []- Exception 2:C405.2.4: Lighting required to have specific application controls. []- Exception 3:C405.2.4: Sidelit zones on first floor in Group A-2 and M occupancies. []- Exception 4:C405.2.4: New buildings having total connected lighting power <= the adjusted interior lighting powered allowance (LPA adj, refer to section details and formula). []- Exception 5:C405.2.4: Requirement does not apply.	☐	☐	☐
6074 Wattage	C405.2.5	Interior Lighting	Additional interior lighting power allowed for special functions per the approved lighting plans and is automatically controlled and separated from general lighting. []- Exception 1:C405.7: Air-over electric motors. []- Exception 2:C405.7: Component sets of an electric motor. []- Exception 3:C405.7: Liquid-cooled electric motors. []- Exception 4:C405.7: Submersible electric motors. []- Exception 5:C405.7: Inverter-only electric motors. []- Exception 6:C405.7: Requirement does not apply.	☐	☐	☐
6077 Controls	C405.2.7	Exterior Lighting	Automatic lighting controls for exterior lighting installed. Controls will be daylight controlled, set based on business operation time-of-day, or reduce connected lighting > 50%. []- Exception 1:C405.2.7: Lighting for covered vehicle entrances and exits from buildings and parking structures where required for eye adaptation []- Exception 2:C405.2.7: Lighting controlled from within dwelling units []- Exception 3:C405.2.7: Requirement does not apply.	☐	☐	☐
6131 Wattage	C405.4.1	Exterior Lighting	Exterior lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	☐	☐	☐
6132 Mandatory Additior	C406.10	Project	Energy Monitoring - the building is equipped with an energy management system to monitor, record, and report energy consumption for electrical energy, by end-use category, contain meters, a data acquisition system and employ graphical reports.	☐	☐	☐

6133 Mandatory Additior	C406.11	Project	Fault Detection and Diagnostics - a fault detection and diagnostics system installed to monitor the HVAC operation and performance. Includes monitoring sensors and devices, sampling every 15 minutes, automatically report faults and provide recommendations for repair, and transmit recommendations to local authorized personnel.	☐	☐	☐
6134 Mandatory Additior	C406.12	Project	Efficient Kitchen Equipment - the commercial kitchen has at least one fryer with all fryers, dishwashers, steam cookers and ovens complying with performance requirements of Tables C406.12(1) through C406.12(4).	☐	☐	☐
6185 Mandatory Additior	C406.2	Project	Equipment shall exceed the minimum efficiency requirements listed in Tables C403.2.3(1) through C403.2.3(7) by 10 %, in addition to the requirements of Section C403	☐	☐	☐
6135 Mandatory Additior	C406.2.1	Project	5% heating efficiency improvement - all HVAC and Plant heating equipment is 5% more efficient than required by 2021 IECC.	☐	☐	☐
6136 Mandatory Additior	C406.2.2	Project	5% cooling efficiency improvement - all HVAC and Plant cooling equipment is 5% more efficient than required by 2021 IECC.	☐	☐	☐
6137 Mandatory Additior	C406.2.3	Project	10% heating efficiency improvement - all HVAC and Plant heating equipment is 10% more efficient than required by 2021 IECC.	☐	☐	☐
6138 Mandatory Additior	C406.2.4	Project	10% cooling efficiency improvement - all HVAC and Plant cooling equipment is 10% more efficient than required by 2021 IECC.	☐	☐	☐
6139 Mandatory Additior	C406.3	Project	Reduced lighting power - this credit specifies that the connected lighting power is <= 10% more efficient than 2021 IECC requirements.	☐	☐	☐
6140 Mandatory Additior	C406.4	Project	Enhanced Digital Lighting Controls - Interior lighting has the following enhanced lighting controls in accordance with Sections C405.2.1 through C405.2.3, Luminaires capable of continuous dimming and being addressed individually, at least 8 luminaires controlled in combination in a daylight zone, digital control system for fixtures with load shedding or occupancy sensors, Sequence of Operations documentation, and functional testing per Section C408.	☐	☐	☐
6143 Mandatory Additior	C406.5	Project	On-site renewable energy credits - on-site renewable energy system supplies at least 1.71 Btuh or 0.5 watts per square foot of conditioned floor area OR provides at least 2 percent of the energy used within the building for mechanical and service water heating equipment and lighting regulated in Chapter 4.	☐	☐	☐
6145 Mandatory Additior	C406.7.1	Project	Reduced energy use in service water heating - the hot water system contains waste heat recovery from service hot water, heat-recovery chillers, building equipment or process equipment or on-site renewable energy for water heating.	☐	☐	☐
6146 Mandatory Additior	C406.7.3	Project	Reduced energy use in service water heating - the hot water heating system shall have a capacity weighted average fossil fuel water heating efficiency at least 95 thermal efficiency or 0.95 EF.	☐	☐	☐

6147 Mandatory Additior	C406.7.4	Project	Reduced energy use in service water heating - the hot water system is served by heat pump water heaters with a minimum Energy Factor of 3.0. The heat pump does not draw conditioned air from within the building.	☐	☐	☐
6148 Mandatory Additior	C406.8	Project	Enhanced envelope performance - the building thermal envelope UA value is >= 15% better than the total UA of the envelope specified by Section C402.1.5.	☐	☐	☐
6149 Mandatory Additior	C406.9	Project	Reduced air infiltration energy - the measured air-leakage rate of the building envelope is lower than 0.25 cfm/ft2. Comprehensive report documentation will be submitted to the code official and the building owner. []- Exception 1:C406.9: Building is greater than 250,000 square feet.	☐	☐	☐
6083 HVAC	C408.2.2.1	Mechanical	Air outlets and zone terminal devices have means for air balancing. []- Exception 1:C408.2.2.1: Fans with fan motors of 1 hp (0.74 kW) or less. []- Exception 2:C408.2.2.1: Where throttling results in no greater than 1/3 hp fan horsepower draw above that required if the fan speed were adjusted []- Exception 3:C408.2.2.1: Requirement does not apply.	☐	☐	☐
6153 Testing	C408.2.3.2	Mechanical	HVAC and service water heating control systems have been tested to ensure proper operation, calibration and adjustment of controls.	☐	☐	☐
6104 SYSTEM_SPECIF	Table_C403.2.3b	Mechanical	Heat Rejection Equipment - Propeller or Axial Fan Open-Circuit Cooling Tower: Minimum Efficiency Requirement >=40.2 gpm/hp .	☐	☐	☐
6105 SYSTEM_SPECIF	Table_C403.2.3b	Mechanical	Heat Rejection Equipment - Centrifugal Fan Open-Circuit Cooling Tower: Minimum Efficiency Requirement >=20.0 gpm/hp.	☐	☐	☐
6106 SYSTEM_SPECIF	Table_C403.2.3c	Mechanical	Heat Rejection Equipment - Propeller or Axial Fan Closed-Circuit Cooling Tower: Minimum Efficiency Requirement >=16.1 gpm/hp.	☐	☐	☐
6109 SYSTEM_SPECIF	Table_C403.2.3c	Mechanical	Heat Rejection Equipment - Centrifugal Fan Closed-Circuit Cooling Tower: Minimum Efficiency Requirement >=7.0 gpm/hp	☐	☐	☐
6186 SYSTEM_SPECIF	Table_C403.2.3d	Mechanical	Heat Rejection Equipment - Propeller or Axial Fan Dry Coolers (air-cooled fluid coolers): Minimum Efficiency Requirement >= 4.5 gpm/hp	☐	☐	☐
6111 SYSTEM_SPECIFI	Table_C403.2.3h	Mechanical	Heat Rejection Equipment - Propeller or Axial Evaporative Condenser: Minimum Efficiency Requirement >=134 kBtu/h-hp w/ Ammonia test fluid.	☐	☐	☐
6112 SYSTEM_SPECIFI	Table_C403.2.3h	Mechanical	Heat Rejection Equipment - Centrifugal Evaporative Condenser: Minimum Efficiency Requirement >=110 kBtu/h-hp w/ Ammonia test fluid.	☐	☐	☐
6117 SYSTEM_SPECIFI	Table_C403.2.3h	Mechanical	Heat Rejection Equipment - Propeller or Axial Evaporative Condenser: Minimum Efficiency Requirement >=160 kBtu/h-hp w/ R-448A test fluid.	☐	☐	☐

6119 SYSTEM_SPECIFI	Table_C403.2.3h	Mechanical	Heat Rejection Equipment - Centrifugal Evaporative Condenser: Minimum Efficiency Requirement >=137 kBtu/h-hp w/ R-448A test fluid.	☐ ☐ ☐
6121 SYSTEM_SPECIF	Table_C403.2.3h	Mechanical	Heat Rejection Equipment - Air-Cooled Condensers: Minimum Efficiency Requirement >=176 kBtu/h-hp	☐ ☐ ☐

4. To be checked by Inspector at Project Completion and Prior to Issuance of Certificate of Occupancy

6041 Fenestration	C402.4.2.2	Envelope	Skylights in office, storage, automotive service, manufacturing, non-refrigerated warehouse, retail store, and distribution/sorting area have a measured haze value < 90 percent tested per ASTM D1003 unless designed to exclude direct sunlight. []- Exception 1:C402.4.2.2: Skylights designed to exclude direct sunlight entering the occupied space by the use of fixed or automated baffles, geometry of skylight and well, or optical diffusers. []- Exception 2:C402.4.2.2: Requirement does not apply.	☐ ☐ ☐
6179 Post Construction	C405.1	Project	At least 90% of dwelling unit permanently installed lighting shall have lamp efficacy <= 65 lm/W or luminaires with efficacy <= 45 lm/W or comply with C405.2.4 or C405.3. []- Exception 1:C405.1: Requirement does not apply.	☐ ☐ ☐
6180 Post Construction	C405.11, C405.11.1	Project	50% of 15/20 amp receptacles installed in enclosed offices, conference rooms, copy rooms, break rooms, classrooms and workstations and < 25% of branch circuit feeders for modular furniture will have automatic receptacle control in accordance with C405.11.1. []- Exception 1:C405.11_C405.11.1: Requirement does not apply.	☐ ☐ ☐
6181 Post Construction	C405.12	Project	Buildings with gross conditioned floor area >= 25,000 ft2 will be equipped with a energy monitoring system in compliance with C405.12.1 through C405.12.5. []- Exception 1:C405.12: Requirement does not apply.	☐ ☐ ☐
6079 Post Construction	C405.5.3	Project	Total voltage drop across the combination of feeders and branch circuits <= 5%. []- Exception 1:C405.5.3: Requirement does not apply.	☐ ☐ ☐

6073 Post Construction	C405.6	Project	Low-voltage dry-type distribution electric transformers meet the minimum efficiency requirements of Table C405.6. []- Exception 1:C405.6: Transformers meet the Energy Policy Act of 2005 special purposes exclusions. []- Exception 2:C405.6: Transformers meet the Energy Policy Act of 2005 non-general purpose exclusions. []- Exception 3:C405.6: Transformers meet the Energy Policy Act of 2005 exclusions with multiple voltage taps where the highest tap is >= 20% more than the lowest tap. []- Exception 4:C405.6: Drive transformers. []- Exception 5:C405.6: Rectifier transformers. []- Exception 6:C405.6: Auto-transformers. []- Exception 7:C405.6: Uninterruptible power system transformers. []- Exception 8:C405.6: Impedance transformers. []- Exception 9:C405.6: Regulating transformers. []- Exception 10:C405.6: Sealed and nonventilating transformers. []- Exception 11:C405.6: Machine tool transformers. []- Exception 12:C405.6: Welding transformers. []- Exception 13:C405.6: Grounding transformers. []- Exception 14:C405.6: Testing transformers. []- Exception 15:C405.6: Requirement does not apply.	☐ ☐ ☐
6075 Post Construction	C405.7	Project	Electric motors meet the minimum efficiency requirements of Tables C405.7(1) through C405.7(4). Efficiency verified through certification under an approved certification program or the equipment efficiency ratings shall be provided by motor manufacturer (where certification programs do not exist).	☐ ☐ ☐
6078 Post Construction	C405.8.1, C405.8.2	Project	Escalators and moving walks comply with ASME A17.1/CSA B44 and have automatic controls configured to reduce speed to the minimum permitted speed in accordance with ASME A17.1/CSA B44 or applicable local code when not conveying passengers. []- Exception 1:C405.8.1_C405.8.2: A variable voltage drive system that reduces operating voltage in response to light loading is installed. []- Exception 2:C405.9.1_C405.9.2: Requirement does not apply.	☐ ☐ ☐
6150 Post Construction	C408.1.1	Project	Building operations and maintenance documents will be provided to the owner. Documents will cover manufacturers' information, specifications, programming procedures and means of illustrating to owner how building, equipment and systems are intended to be installed, maintained, and operated.	☐ ☐ ☐

6151 Post Construction	C408.2.1	Mechanical	Commissioning plan developed by registered design professional or approved agency.	☐ ☐ ☐
6152 Post Construction	C408.2.3.1	Mechanical	HVAC equipment, systems and system-to-system relationships have been tested to ensure proper operation. []- Exception 1:C408.2.3.1: Unitary or packaged HVAC equipment without supply air economizers.	☐ ☐ ☐
6154 Post Construction	C408.2.3.3	Mechanical	Economizers have been tested to ensure proper operation.	☐ ☐ ☐
6156 Post Construction	C408.2.4	Mechanical	Preliminary commissioning report completed and certified by registered design professional or approved agency.	☐ ☐ ☐
6176 Post Construction	C408.2.5	Mechanical	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	☐ ☐ ☐
6018 Post Construction	C408.2.5.2	Mechanical	Furnished Operation and Maintenance manuals for HVAC systems within 90 days of system acceptance.	☐ ☐ ☐
6182 Post Construction	C408.2.5.3	Mechanical	An air and/or hydronic system balancing report is provided for HVAC systems.	☐ ☐ ☐
6183 Post Construction	C408.2.5.4	Mechanical	Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy.	☐ ☐ ☐
6184 Post Construction	C408.3	Interior Lighting	Lighting systems have been tested to ensure proper calibration, adjustment, programming, and operation.	☐ ☐ ☐
6177 Post Construction	C408.3.2	Interior Lighting	Furnished as-built drawings for electric power systems within 90 days of system acceptance.	☐ ☐ ☐
6017 Post Construction	C408.3.2.2	Interior Lighting	Furnished operation and maintenance manual for lighting equipment and lighting controls provided to the building owner or designated representative.	☐ ☐ ☐

Input Data Report

Project Information

Project Name: 24176 **Project Title:** Village of North Palm Beach Library-HVAC System

Address: 303 Anchorage Drive **State:** FL **Zip:** 33408

Owner: Enter Owner's name here

Building Type: Library **Building Classification:** Renovation to existing building

No.of Stories: 2 **GrossArea (SF):** 7,224

Bldg. Rotation: None

Zones

No	Acronym	Description	Type	Area [sf]	Multi	Total Area [sf]	
1	AHU-1	AHU-1	CONDITIONED	1806.0	1	1806.0	☐
2	AHU-2	AHU-2	CONDITIONED	1806.0	1	1806.0	☐
3	AHU-3	AHU-3	CONDITIONED	1806.0	1	1806.0	☐
4	AHU-4	AHU-4	CONDITIONED	1806.0	1	1806.0	☐

Spaces

No	Acronym	Description	Type	Depth [ft]	Width [ft]	Height [ft]	Mult	Total Area [sf]	Total Vol[cf]	
In Zone: AHU-1										
1	MAIN LIBRARY	MAIN LIBRARY AHU-1	Office - Open Plan	180.60	10.00	14.00	1	1806.0	25284.0	☐
In Zone: AHU-2										
1	MAIN LIBRARY	MAIN LIBRARY AHU-2	Office - Open Plan	180.60	10.00	14.00	1	1806.0	25284.0	☐
In Zone: AHU-3										
1	MAIN LIBRARY	MAIN LIBRARY AHU-3	Office - Open Plan	180.60	10.00	14.00	1	1806.0	25284.0	☐
In Zone: AHU-4										
1	MAIN LIBRARY	MAIN LIBRARY AHU-4	Office - Open Plan	180.60	10.00	14.00	1	1806.0	25284.0	☐

Lighting

No	Type	Category	No. of Luminaires	Watts per Luminaire	Power [W]	Control Type	
In Zone:	**AHU-1**						
In Space:	**MAIN LIBRARY AHU-1**						
1	LED	General Lighting	1	500	500	Manual (Local Control)-Manual (Local Control) Occupant Sensor (50%)-Occupant Sensor (50%) Light Reduction (30%-70%)-Light Reduction (30%-70%) Occupant Sensor Auto Full OFF-Occupant Sensor Auto Full OFF	☐
In Zone:	**AHU-2**						
In Space:	**MAIN LIBRARY AHU-2**						
1	LED	General Lighting	1	500	500	Manual (Local Control)-Manual (Local Control) Occupant Sensor (50%)-Occupant Sensor (50%) Light Reduction (30%-70%)-Light Reduction (30%-70%) Occupant Sensor Auto Full OFF-Occupant Sensor Auto Full OFF	☐
In Zone:	**AHU-3**						
In Space:	**MAIN LIBRARY AHU-3**						
1	LED	General Lighting	1	500	500	Manual (Local Control)-Manual (Local Control) Occupancy Sensor - Manual ON only-Occupancy Sensor - Manual ON only Occupant Sensor (50%)-Occupant Sensor (50%) Light Reduction (30%-70%)-Light Reduction (30%-70%) Occupant Sensor Auto Full OFF-Occupant Sensor Auto Full OFF	☐
In Zone:	**AHU-4**						
In Space:	**MAIN LIBRARY AHU-4**						

1	LED	General Lighting	1	500	500	Manual (Local Control)-Manual (Local Control) Occupancy Sensor - Manual ON only-Occupancy Sensor - Manual ON only Occupant Sensor (50%)-Occupant Sensor (50%) Light Reduction (30%-70%)-Light Reduction (30%-70%) Occupant Sensor Auto Full OFF-Occupant Sensor Auto Full OFF	☐

Walls (Walls will be rotated clockwise by building rotation value)

No	Description	Type	Width [ft]	H (Effec) [ft]	Multiplier	Area [sf]	Orientation	Conductance [Btu/h.sf.F]	Heat Capacity [Btu/sf.F]	Dens. [lb/cf]	R-Value [h.sf.F/Btu]	
In Zone:	**AHU-1**											
1	SOUTH EXTERIOR AHU-1	EXTERIOR WALL	50.00	14.00	1	700.0	South	0.1265	8.932	48.99	7.9	☐
2	WEST EXTERIOR WALL	EXTERIOR WALL	45.00	14.00	1	630.0	West	0.1265	8.932	48.99	7.9	☐
In Zone:	**AHU-2**											
1	NORTH EXTERIOR WALL	EXTERIOR WALL	50.00	14.00	1	700.0	North	0.1265	8.932	48.99	7.9	☐
2	WEST EXTERIOR WALL	EXTERIOR WALL	45.00	14.00	1	630.0	West	0.1265	8.932	48.99	7.9	☐
In Zone:	**AHU-3**											
1	SOUTH EXTERIOR AHU-1	EXTERIOR WALL	50.00	14.00	1	700.0	South	0.1265	8.932	48.99	7.9	☐
In Zone:	**AHU-4**											
1	NORTH EXTERIOR WALL	EXTERIOR WALL	50.00	14.00	1	700.0	North	0.1265	8.932	48.99	7.9	☐

Windows (Windows will be rotated clockwise by building rotation value)

No	Description	Orientation	Shaded	U [Btu/hr sf F]	SHGC	Vis.Tra	W [ft]	H (Effec) [ft]	Multi plier	Total Area [sf]	
In Zone: AHU-1											
In Wall: SOUTH EXTERIOR AHU-1											
1	Smaller Window	South	No	0.5000	0.65	0.76	6.00	4.00	3	72.0	
2	Longer Window	South	Yes	0.5000	0.65	0.76	7.00	1.50	7	73.5	
In Wall: WEST EXTERIOR WALL											
1	Longer Window	West	No	0.5000	0.65	0.76	7.00	1.50	3	31.5	
2	Smaller Window	West	No	0.5000	0.65	0.76	5.00	4.00	2	40.0	
In Zone: AHU-2											
In Wall: NORTH EXTERIOR WALL											
1	Smaller Window	North	No	0.5000	0.65	0.76	5.00	4.00	3	60.0	
2	Longer Window	North	No	0.5000	0.65	0.76	7.00	1.50	7	73.5	
In Wall: WEST EXTERIOR WALL											
1	Smaller Window	West	No	0.5000	0.65	0.76	5.00	4.00	2	40.0	
2	Longer Window	West	No	0.5000	0.65	0.76	7.00	1.50	3	31.5	
In Zone: AHU-3											
In Wall: SOUTH EXTERIOR AHU-1											
1	Smaller Window	South	No	0.5000	0.65	0.76	5.00	4.00	3	60.0	
2	Longer Window	South	No	0.5000	0.65	0.76	7.00	1.50	7	73.5	
In Zone: AHU-4											
In Wall: NORTH EXTERIOR WALL											
1	Smaller Window	North	No	0.5000	0.65	0.76	5.00	4.00	3	60.0	
2	Longer Window	North	No	0.5000	0.65	0.76	7.00	1.50	7	73.5	

Doors

No	Description	Type	Shade?	Width [ft]	H (Effec) [ft]	Multi plier	Area [sf]	Cond. [Btu/h.sf.F]	Dens. [lb/cf]	Ht Cap. [Btu/sf. F]	R [h.sf.F/ Btu]	
In Zone:												
In Wall:												

Roofs

No	Description	Type	Width [ft]	H (Effec) [ft]	Multi plier	Area [sf]	Tilt [deg]	Cond. [Btu/h.Sf. F]	Heat Cap [Btu/sf. F]	Dens. [lb/cf]	R-Value [h.sf.F/Btu	
In Zone: AHU-1												
1	ROOF	EXTERIOR ROOF	1806.00	20.00	1	36120.0	0.00	0.0491	1.03	10.46	20.4	☐
In Zone: AHU-2												
1	ROOF	EXTERIOR ROOF	1806.00	20.00	1	36120.0	0.00	0.0491	1.03	10.46	20.4	☐
In Zone: AHU-3												
1	ROOF	EXTERIOR ROOF	1806.00	20.00	1	36120.0	0.00	0.0491	1.03	10.46	20.4	☐
In Zone: AHU-4												
1	ROOF	EXTERIOR ROOF	1806.00	20.00	1	36120.0	0.00	0.0491	1.03	10.46	20.4	☐

Skylights

No	Description	Type	U [Btu/hr sf F]	SHGC	Vis.Trans	W [ft]	H (Effec) [ft]	Multi-plier	Area [Sf]	Total Area [Sf]	
In Zone:											
In Roof:											☐

Floors

No	Description	Type	Width [ft]	H (Effec) [ft]	Multi plier	Area [sf]	Cond. [Btu/h.sf.F	Heat Cap. [Btu/sf. F]	Dens. [lb/cf]	R-Value [h.sf.F/Btu	
In Zone:											☐

Systems

AHU-1	**AHU-1**	**Constant Volume Packaged System**	**No. Of Units** 1

Component	Category	Capacity	Efficiency	IPLV	
1	Cooling System	94000.00	14.80	14.80	☐
2	Heating System	52218.00	1.00		☐
3	Air Handling System -Supply	3000.00	0.28		☐

AHU-2	**AHU-2**	**Constant Volume Packaged System**	**No. Of Units** 1

Component	Category	Capacity	Efficiency	IPLV	
1	Cooling System	94000.00	14.80	14.80	☐
2	Heating System	52218.00	1.00		☐
3	Air Handling System -Supply	3000.00	0.28		☐

AHU-3	**AHU-3**	**Constant Volume Air Cooled Split System < 65000 Btu/hr**	**No. Of Units** 1

Component	Category	Capacity	Efficiency	IPLV	
1	Cooling System	60000.00	14.80		☐
2	Heating System	34812.00	1.00		☐
3	Air Handling System -Supply	2000.00	0.25		☐

AHU-4	**AHU-4**	**Constant Volume Air Cooled Split System < 65000 Btu/hr**	**No. Of Units** 1

Component	Category	Capacity	Efficiency	IPLV	
1	Cooling System	60000.00	14.80		☐
2	Heating System	34812.00	1.00		☐
3	Air Handling System -Supply	2000.00	0.25		☐

Plant

Equipment	Category	Size	Inst.NoEff.	IPLV

Water Heaters

W-Heater Description	Capacity	Cap.Unit	I/P Rt.	Efficiency	Loss

Ext-Lighting

Description	Category	No. of Lumin-aires	Watts per Lumin-aire	Area/Len/No [sf/ft/No]	Control Type	Wattage [W]

Piping

No	Type	Operating Temp [F]	Insulation Conductivity [Btu-in/h.sf.F]	Nomonal pipe Diameter [in]	Insulation Thickness [in]	Is Runout?

Fenestration Used

Name	Glass Type	No. of Panes	Glass Conductance [Btu/h.sf.F]	SHGC	VLT
Library Window	User Defined	1	0.5000	0.6500	0.7600

Materials Used

Mat No	Acronym	Description	Only R-Value Used	RValue [h.sf.F/Btu]	Thick [ft]	Cond-uctivity [Btu/h.ft.F	Density [lb/cf]	Sp. Heat [Btu/lb.F]	
4	Matl4	Steel siding	No	0.0002	0.0050	26.0000	480.00	0.1000	☐
94	Matl94	BUILT-UP ROOFING, 3/8IN	No	0.3366	0.0313	0.0930	70.00	0.3500	☐
407	Matl407	R-19 Generic Insulation	No	19.0000	0.4147	0.0218	0.30	0.2000	☐
1001	ApLbMat1001	1 in. Stucco	No	0.2082	0.0833	0.4000	16.00	0.2000	☐
1002	ApLbMat1002	8 in. Heavyweight concrete block	No	1.1117	0.6670	0.6000	61.00	0.2000	☐
1003	ApLbMat1003	Outside surface resistance	Yes	0.3300					☐
1004	ApLbMat1004	GYP OR PLAS BOARD,5/8IN	No	0.5663	0.0521	0.0920	50.00	0.2000	☐
1005	ApLbMat1005	R-5 Generic Insulation	No	5.0000	0.1091	0.0218	0.30	0.2000	☐
1006	ApLbMat1006	Inside surface resistance	Yes	0.6900					☐

Constructs Used

No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Cap [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]	
1060	EXTERIOR WALL	No	No	0.13	8.93	48.99	7.9	☐

Layer	Material No.	Material	Thickness [ft]	Framing Factor	
1	1006	Inside surface resistance		0.000	☐
2	1004	GYP OR PLAS BOARD,5/8IN	0.0521	0.000	☐
3	1005	R-5 Generic Insulation	0.1091	0.000	☐
4	1002	8 in. Heavyweight concrete block	0.6670	0.000	☐
5	1001	1 in. Stucco	0.0833	0.000	☐
6	1003	Outside surface resistance		0.000	☐

No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Cap [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]	
1061	EXTERIOR ROOF	No	No	0.05	1.03	10.46	20.4	☐

Layer	Material No.	Material	Thickness [ft]	Framing Factor	
1	1006	Inside surface resistance		0.000	☐
2	4	Steel siding	0.0050	0.000	☐
3	407	R-19 Generic Insulation	0.4147	0.000	☐
4	94	BUILT-UP ROOFING, 3/8IN	0.0313	0.000	☐
5	1003	Outside surface resistance		0.000	☐

PROJECT # 24176

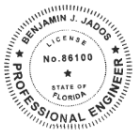
North Palm Beach Library
303 Anchorage Drive,
North Palm Beach, FL 33408

CONTENTS:

Load Calculations for the Following Units

AHU/CU-1, AHU/CU-2, AHU/CU-3 & AHU/CU-4

DATE:
10/23/2025



Digitally signed by Benjamin J Jados
Reason: I agree to the terms defined by the placement of my signature in this document
Location: P.E. #86100
Date: 2025-10-23 11:33-04:00

Prepared by:

FAE CONSULTING
300 Lock Road, Ste. #302
Deerfield Beach, FL 33442
561-391-9292

Air System Sizing Summary for AHU-1,2,3,4

Project Name: 24176_Village of North Palm Beach Library- 08/29/2025
Prepared by: FAE 09:18AM

Air System Information

Air System Name:	**AHU-1,2,3,4**	Number of zones:	**1**
Air System Type:	**Single Zone CAV**	Floor Area:	**7224.0** sqft
		Location:	**West Palm Beach, Florida**

Sizing Calculation Information

Calculation Months:	**Jan to Dec**	Calculation method:	**Transfer Function Method**

Central Cooling Coil Sizing Data

Total coil load:	**23.9**	Tons	Load occurs at:	**Jul 1300**	
Total coil load:	**286.6**	MBH	OA DB / WB:	**89.6/77.6**	F
Sensible coil load:	**235.2**	MBH	Entering DB / WB:	**76.2/63.2**	F
Coil airflow:	**9967**	CFM	Leaving DB / WB:	**54.4/53.2**	F
Sensible heat ratio:	**0.820**		Coil ADP:	**51.9**	F
Area per unit load:	**302.4**	sqft/Ton	Bypass Factor:	**0.100**	
Load per unit area:	**39.7**	BTU/(hr-sqft)	Resulting RH:	**47**	%
			Design supply temp:	**55.0**	F

Central Heating Coil Sizing Data

Max coil load:	**58.2**	MBH	Load occurs at:	**Des Htg**	
Coil airflow:	**9967**	CFM	Ent DB / Lvg DB:	**68.0/73.4**	F
Load per unit area:	**8.1**	BTU/(hr-sqft)			

Supply Fan Sizing Data

Actual max airflow:	**9967**	CFM	Fan motor BHP:	**2.90**	BHP
Standard airflow:	**9960**	CFM	Fan motor kW:	**2.17**	kW
Actual max airflow per unit area:	**1.38**	CFM/sqft	Fan static:	**1.00**	in wg

Outdoor Ventilation Air Data

Design airflow:	**800**	CFM	Airflow per person:	**20.00**	CFM/person
Airflow per unit floor area:	**0.11**	CFM/sqft			

Space Sizing Data

Space Name	Maximum Cooling Sensible MBH	Design Airflow CFM	Time of Peak Load	Maximum Heating Load MBH	Space Floor Area sqft	Space CFM/sqft
MAIN LIBRARY FLOOR	215.1	9967	Aug 1400	40.0	7224.0	1.38

Village of North Palm Beach Bid Summary Sheet

Open: 3:02 pm
Close: 3:09 pm

Proposal for: RFP-2026-PW-02 Library HVAC Generator Replacement Date: December 22, 2025				No. of Proposals Received: 5
VENDORS				
Jacaranda Air Const. Inc. 13114 Hello Darlin Drive Glen St. Mary, Fl. 32040 904-534-5858	KER Construction LLC 6858 NW 20th Ave. Ft. Lauderdale Fl. 33309 954-422-2492	Precision Air Systems, LLC 11101 S. Crown Way Suite 2 Wellington, Fl. 33414	Advanced Roofing inc. DBA Advanced Air Systems 1950 NW 22nd St. Ft. Lauderdale, Fl. 33311	Air Changes Mechanical 786-658-6837
$346,167.00	$324,000.00	$227,780.00	$211,270.00	$180,692.00

VILLAGE OFFICIALS PRESENT (Signature)	VENDOR REPRESENTATIVES PRESENT (Print name of Rep and Company)
Marguerite Tus	Ines Ardila Ricardo Ardila, Air Changes Mechanical Elizabeth Adams Sean Adams, Precision Air Systems

NORTH PALM BEACH

RFP-2026-PW-02 LIBRARY HVAC REPLACEMENT

DATE: 1/23/2026

SCORING SHEET

SCORER NAME: JAMIE MOUNT

0-20 FOR EACH CATEGORY FOR A MAXIMIMUM TOTAL OF 100

	PRICING/SCORE	PERSONNEL QUAL	PROJ MGMT/TECH	PAST PERFORMANCE	WORKLOAD/ LITIGATION	TOTAL
JACARANDA AIR	10	18	15	12	10	65
KER CONSTRUCTION	10	5	11	5	5	36
PRECISION AIR	15	18	15	17	15	80
ADVANCED ROOFING	15	16	18	18	0	77
AIR CHANGES	20	19	18	18	15	90

SIGNATURE

NORTH PALM BEACH

RFP-2026-PW-02 LIBRARY HVAC REPLACEMENT

DATE: 1/23/2026

SCORER NAME: JAMES ANTHONY

SCORING SHEET

0-20 FOR EACH CATEGORY FOR A MAXIMIMUM TOTAL OF 100

	PRICING/SCORE	PERSONNEL QUAL	PROJ MGMT/TECH	PAST PERFORMANCE	WORKLOAD LITIGATION	TOTAL
JACARANDA AIR	2	13	11	13	4	43
KER CONSTRUCTION	4	9	8	0	0	13
PRECISION AIR	15	14	11	12	16	68
ADVANCED ROOFING	18	17	15	14	4	68
AIR CHANGES	19	18	17	16	13	83

Weighted

SIGNATURE

NORTH PALM BEACH

RFP-2026-PW-02 LIBRARY HVAC REPLACEMENT

DATE: 1/23/2026

SCORING SHEET

SCORER NAME: NELSON SCHAD

0-20 FOR EACH CATEGORY FOR A MAXIMIMUM TOTAL OF 100

	PRICING/SCORE	PERSONNEL QUAL	PROJ MGMT/TECH	PAST PERFORMANCE	WORKLOAD LITIGATION	TOTAL
JACARANDA AIR	10	8	5	8	0	31
KER CONSTRUCTION	12	7	0	0	0	12
PRECISION AIR	16	9	3	10	18	56
ADVANCED ROOFING	18	9	14	10	4	55
AIR CHANGES	19	17	14	15	19	84

SIGNATURE

NORTH PALM BEACH

RFP-2026-PW-02 LIBRARY HVAC Replacement

DATE: 01/23/2026

SCORING SHEET SUMMARY

SCORER NAME: JAMES ANTHONY

	JAMIE	NELSON	JAMES	
JACARANDA AIR	65	31	43	46.3
KER CONSTRUCTION	36	12	13	20.3
PRECISION AIR	80	56	68	68
ADVANCED ROOFING	77	55	68	66.6
AIR CHANGES	90	84	63	55.6

0-20 FOR EACH CATEGORY FOR A MAXIMIMUM TOTAL OF 100

SIGNATURE_____JAMIE MOUNT

SIGNATURE_____NELSON SCHAD

SIGNATURE_____JAMES ANTHONY

SIGNATURE_____NPB CLERK

AIRCHANGES MECHANICAL
Lic. # CMC1250997

1365 NW 98TH CT UNIT 4, DORAL, FL 33172
https://airchanges.us/
786-615-3086

January 20th, 2026

Mr. James Anthony
North Palm Beach Public Works
Senior Procurement Specialist
645 Prosperity Farms Rd.
North Palm Beach, FL 33408

RE: Response to RFI#1 – RFP-2026-PW-02 North Palm Beach Library HVAC Replacement.

Thank you for the opportunity to provide additional clarification regarding Air Changes Mechanical's bid proposal for the North Palm Beach Library HVAC Replacement project. In response to your request, we have prepared the following document to address each question of the RFI and provide more details regarding our proposed Project Management Plan/Technical Approach. We appreciate your time and consideration, and we look forward to the possibility of working with the Village on this project.

Responses to RFI Questions

1. **Type, make, model of equipment being proposed.**

Our proposal is based on Trane equipment, as indicated in the equipment schedules of sheet M0.2, which is the basis of design. Model numbers and specifications can be reviewed in detail on the attached submittals package (submitted along with this clarification document), but can be summarized as follows:

- 7.5 Tons Systems
  - Air Handlers AHU-1, AHU-2; Model: TWE090K3AAA.
  - Condensers CU-1, CU-2; Model: TWA090K3AAA.

- 5 Tons Systems
  - Air Handlers AHU-3, AHU-4; Model: 5TEM4D07AC51S.
  - Condensers CU-3, CU-4; Model: 5TTR4060A1.

In addition to the submittals package, Trane's equipment proposal is also attached for validation of equipment quantities, and factory installed options included in our proposal.

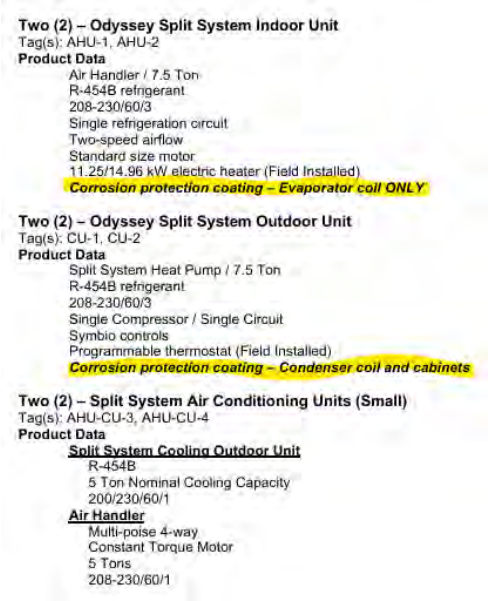
2. Type of coils and coatings proposed.

Coil Coatings:

For all air handlers, the evaporator coil will have corrosion protection coating. For all condensers, the corrosion protection will be applied to the **condenser coil AND cabinet**.

The coating solution selected for this project is recommended by Trane for their equipment: SURFSIL. This is a specialty design hybrid coating that incorporates nano-silane technology to provide superior corrosion protection with great adhesion strength while maintaining OEM heat transfer performance. This solution exceeds 15,000 hrs. ASTM B-117 testing. Attached SURFSIL brochure shows more information.

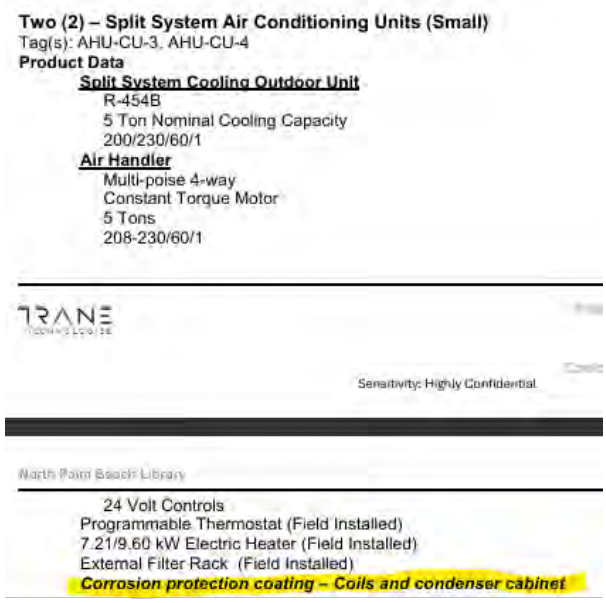
Trane's equipment proposal clearly shows that these coatings are included.



Two (2) – Odyssey Split System Indoor Unit
Tag(s): AHU-1, AHU-2
Product Data
Air Handler / 7.5 Ton
R-454B refrigerant
208-230/60/3
Single refrigeration circuit
Two-speed airflow
Standard size motor
11.25/14.96 kW electric heater (Field Installed)
Corrosion protection coating – Evaporator coil ONLY

Two (2) – Odyssey Split System Outdoor Unit
Tag(s): CU-1, CU-2
Product Data
Split System Heat Pump / 7.5 Ton
R-454B refrigerant
208-230/60/3
Single Compressor / Single Circuit
Symbio controls
Programmable thermostat (Field Installed)
Corrosion protection coating – Condenser coil and cabinets

Two (2) – Split System Air Conditioning Units (Small)
Tag(s): AHU-CU-3, AHU-CU-4
Product Data
Split System Cooling Outdoor Unit
R-454B
5 Ton Nominal Cooling Capacity
200/230/60/1
Air Handler
Multi-poise 4-way
Constant Torque Motor
5 Tons
208-230/60/1



Two (2) – Split System Air Conditioning Units (Small)
Tag(s): AHU-CU-3, AHU-CU-4
Product Data
Split System Cooling Outdoor Unit
R-454B
5 Ton Nominal Cooling Capacity
200/230/60/1
Air Handler
Multi-poise 4-way
Constant Torque Motor
5 Tons
208-230/60/1

TRANE

Sensitivity: Highly Confidential

North Palm Beach Library

24 Volt Controls
Programmable Thermostat (Field Installed)
7.21/9.60 kW Electric Heater (Field Installed)
External Filter Rack (Field Installed)
Corrosion protection coating – Coils and condenser cabinet

Coil Type:

The following information was extracted from the submittals package in the cases that it was explicitly available and confirmed with the manufacturer:

- 7.5 Tons Systems
  - Air Handlers AHU-1, AHU-2; Model: TWE090K3AAA.
    Coil type: Copper tube, aluminum fin.
  - Condensers CU-1, CU-2; Model: TWA090K3AAA.
    Coil type: Fin/tube with louvered panels.

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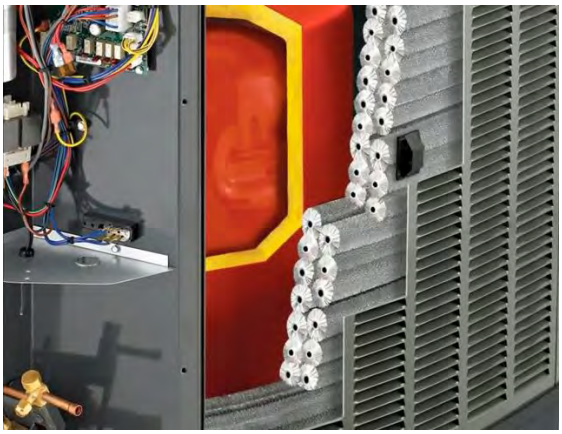
- 5 Tons Systems
  - Air Handlers AHU-3, AHU-4; Model: 5TEM4D07AC51S.
    Coil type: All Aluminum plate fin.

  - Condensers CU-3, CU-4; Model: 5TTR4060A1.
    Coil type: Spine Fin All Aluminum (NOT microchannel) with louvered panels.

Please note that on the 5-ton systems, Trane does NOT have the traditional coil construction option of copper tubes with aluminum fins. At those capacities, for the equipment specified in the plans, Trane only offers Spine Fin coil technology for the outdoor unit and Aluminum fin and tube for the evaporator. The following link can be used to learn more about Trane's Spine Fin technology:

https://www.trane.com/residential/en/resources/glossary/what-is-a-spine-fin-coil/

It is important to remark that Spine Fin coils are different from microchannel coils on their construction properties. Below picture shows a detail of the Spine Fin technology.



As indicated in Note 12 of the equipment schedule, since copper tubes are not available for this size unit (5 tons), the coating solution is required and was included to fulfill the requirement of this specific note.

AIR HANDLING UNIT SCHEDULE

MANUFACTURER	CONDENSING UNIT				AIR HANDLER UNIT				CAPACITY (BTU/H)	SENSIBLE (BTU/H)	HEATING CAPACITY (KW)	ESP(WG)	SEER 2 / (IEER)	SUPPLY AIR	V/P/Hz
	UNIT TAG	MODEL NO.	DIMENSIONS LxWxH (IN)	WEIGHT (LBS)	UNIT TAG	MODEL NO.	DIMENSIONS LxWxH (IN)	WEIGHT (LBS)							
TRANE	CU-1,CU-2	TWA090KA	40x35x39	262.5	AHU-1,2	TWE0909KA	54x47x25	382	94,000	81,000	15	0.8	(14.1)	3000	208/3/60
TRANE	CU-3,CU-4	5TTR4060A	34x37x37	276	AHU-3,4	5TEM4D07AC51SA	23x26x54	197	60,000	51,000	10	0.5	14.8	2000	208/1/60

A/C EQUIPMENT NOTES:
1. VERIFY ALL A/C ELECTRICAL REQUIREMENTS WITH MANUFACTURERS SPEC. PRIOR TO INSTALLATION.
2. PROVIDE R-454B REFRIGERANT
3. PROVIDE DISCONNECTING MEANS AT AHUs.
4. PROVIDE 7 DAY DIGITAL PROGRAMMABLE T-STAT WITH NIGHT SET-BACK, THERMOSTAT OR EQUAL
5. COOLING CAPACITY BASED ON 75°F DB, 63°F WB.
6. CONTRACTOR TO PROVIDE QUOTES FOR EQUIVALENT EQUIPMENT.
7. PROVIDE UL 508 LISTED FLOAT SWITCH IN DRAIN PAN TO PREVENT CONDENSATE OVERFLOW.
8. PROVIDE COASTAL CORROSION PROTECTIVE COATING EQUAL TO MODINE 'E-FIN PRO SHIELD 10' FOR ALL EVAPORATOR COILS, CONDENSER COILS, AND HOUSING EXPOSED TO OUTDOORS.
9. PROVIDE ENGINEER OF RECORD EQUIPMENT STATE UP DOCUMENTATION AND TEST AND BALANCING REPORT TO DOCUMENT PERFORMANCE AT PROJECT COMPLETION.
10. CONTRACTOR SHALL CONFIRM REQUIRED PIPE SIZES WITH MANUFACTURER AND REPLACE EXISTING REFRIGERANT PIPING.
11. PROVIDE DUCT SMOKE DETECTOR TO SHUT DOWN EQUIPMENT UPON DETCTION OF SMOKE AND THE OWNER'S LICENSED FIRE ALARM INSTALLER SHALL INTERGRATE WITH THE EXISTING FIRE ALARM SYSTEM IF REQUIRED BY THE LOCAL FIRE MARSHAL AHJ.
12. COPPER IS THE PREFERRED MATERIAL FOR TUBING AND FINS. SHOULD COPPER MATERIAL BE UNAVAILABLE, OR IMPRACTICAL DUE TO EQUIPMENT SPACE ALLOCATION, SUBSTITUTED MATERIALS MUST BE COATED WITH A PROTECTIVE TREATMENT. REFER TO NOTE 8 FOR BASIS OF DESIGN COATING.

3. **Procurement lead time.**

The proposed equipment is usually in stock; at time of this submission, 3 air handlers are in stock, and all outdoor units are as well. Two (2) weeks would be needed to complete the anti-corrosion coating treatment and be ready to deliver equipment to the job site. However, stock availability changes daily. Therefore, the standard lead time cycles to order from factory are considered in our proposal and these are: **6 weeks fabrication + 2 weeks coating for a total of 8 weeks lead time on all equipment (TWE, TWA, 5TTR, 5TEM)**.

4. **Proposed schedule duration for project completion (timeline/sequence of events).**

Following is a preliminary project execution plan, following a Notice to Proceed:

I. Mobilization & Site Preparation.

- Mobilize ACM crew, tools, materials, and equipment.
- Install protective floor coverings and establish controlled access, staging, and equipment-handling paths.
- Coordinate with drywall subcontractor to create required drywall access openings for removal and installation activities.

II. Demolition & Removal Phase.

- Perform safe preparation and disconnection of existing AHUs.
- Move-out crew to carry out complete demolition and removal of existing air handlers.
- Ductwork team to execute all ductwork modifications and capping per the engineered drawings.

III. Refrigerant Piping, Mechanical Systems & LV Installation.

- ACM to install new refrigerant line sets, low-voltage wiring, drain lines, and condensate pump copper piping.
- Pressurize and test piping systems to meet inspection requirements and obtain rough inspection approvals.

IV. Equipment Delivery, Installation & Electrical Work.

- Move-in to move new air handlers into the attic area using safe and coordinated rigging.
- ACM to lift and hang new small AHUs in designated interior locations.
- ACM to set new outdoor condensers in place.
- ACM to perform required exterior concrete work for equipment support pads.
- Electrical subcontractor to complete all required work as per electrical plans.

V. Finishes, Piping & Completion Work.

- Complete all ductwork adjustments and connections.
- Perform line-set brazing by qualified technicians following strict hot-work procedures.
- Install insulation on piping, ductwork, and equipment per specifications.
- Install new line covers and complete required painting.

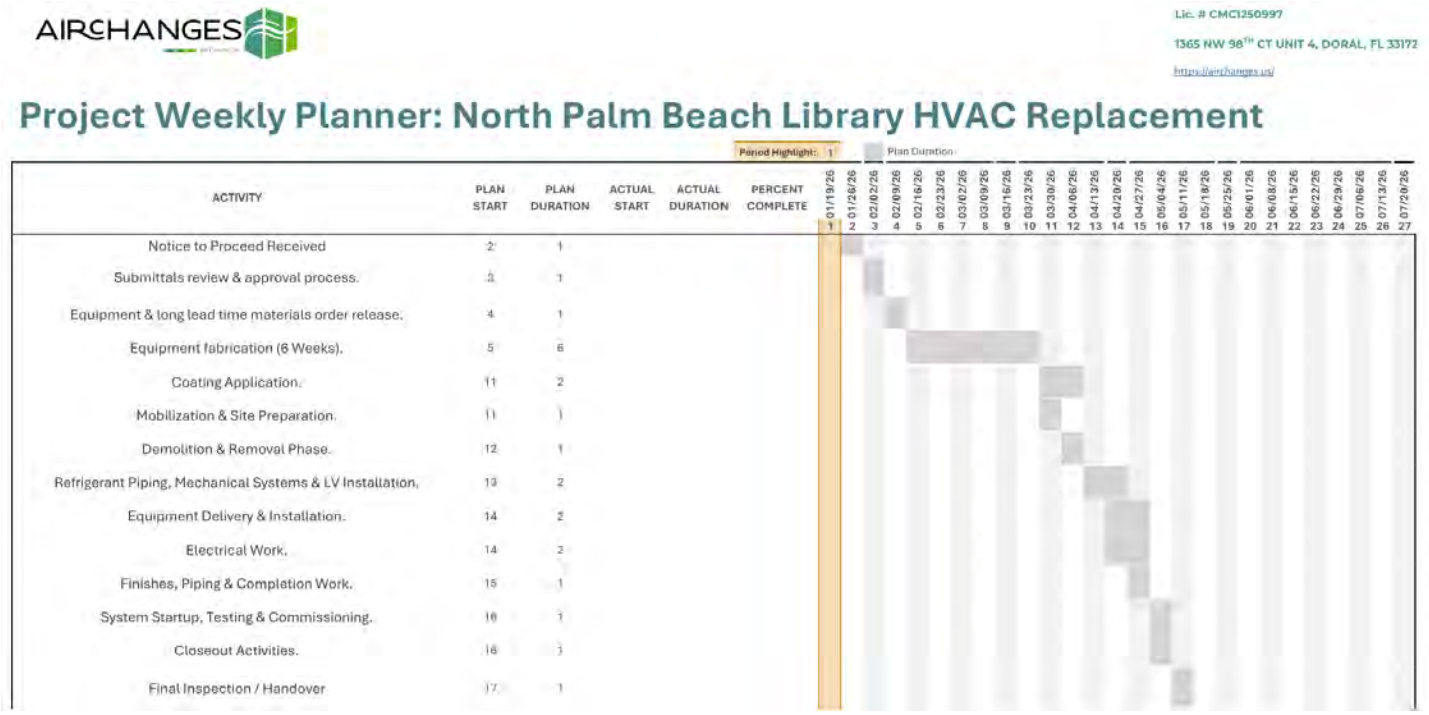
VI. System Startup, Testing & Commissioning.

- Conduct full system startup including electrical verification, refrigerant charging, airflow balancing (TAB), and controls testing.
- Complete commissioning checklists and verify operational performance.

VII. Closeout Activities.

- Drywall subcontractor to patch, repair, and finish drywall access openings, including required service access for the 5-ton systems.
- Conduct final quality control walk-through and ensure complete site cleanup.
- Submit final closeout package for inspection, acceptance, and project turnover.
- Provide training to Village maintenance personnel and deliver O&M documentation.

A detailed project schedule is also attached to this submission:



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Lic. # CMC1250997

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5. **Proposed library access plan.**

Our proposal is based on the premise that no additional supplemental cooling is being provided, as indicated in the pre-bid meeting. Therefore, the 2nd level will need to be closed for the duration of the installation phase that is disruptive of the upstairs space. This period is estimated to last 3-4 weeks. **The first floor can continue operational with minimal impact**.

6. **Detail type of service access for the 5-ton units.**

As indicated in Note #8 of sheet M1.2, an access panel of 60" by 30" (at minimum) is needed. Our proposal considers 2 alternatives, to be presented to the engineering team for review.

- Alternative A: Heavy duty access door with drywall bead flange by Cendrex.
- Alternative B: Specialty access door by BAD.

Data sheets for both alternatives included with this submission.

7. **Type of floor protection.**

We will be using Masonite floor protection.

Do not hesitate to contact me if you have additional questions or need further clarification.

Regards,

Ricardo Ardila C.E.M.
Managing Partner, Air Changes Mechanical
(c) 786 658 6837

REQUEST FOR PROPOSALS
RFP-2026-PW-02

Library HVAC Replacement

Village of North Palm Beach
501 US Highway One
North Palm Beach, Florida 33408-4906

November 7, 2025

Village of North Palm Beach

REQUEST FOR PROPOSALS
RFP-2026-PW-02

Library HVAC Replacement

The Village of North Palm Beach is seeking Proposals from qualified firms to provide services for the replacement of the Village Library HVAC system.

Request for Proposal documents are available on the Village of North Palm Beach website at http://www.village-npb.org/bids.aspx , www.demandstar.com, NPB Palm Beach County, FL Legal Notices or by contacting the Village Public Work's office at (561) 561-691-3440.

Sealed Proposals must be clearly marked **"RFP-2026-PW-02, "Library HVAC Replacement"** and delivered to the Village Clerk at 501 U.S. Highway One, North Palm Beach, Florida, 33408. The deadline for submission of Proposals is **Monday, December 15, 2025 at 3:00 p.m. local time.** Proposals submitted after the established deadline will not be accepted and will be returned to the sender unopened.

There will be a mandatory Pre-Proposal meeting on Tuesday, November 18, 2025 at 8:00 a.m. local time at the NPB Library, 303 Anchorage Drive, North Palm Beach, FL 33408. Failure to attend this meeting may result in your submission being deemed ineligible.

It is the responsibility of the Proposer to ensure all pages are included in the submission. All Proposers are advised to closely examine the request for qualification documents. Any questions regarding the completeness or substance of the request for proposal documents or the scope of services must be submitted in writing via email to James Anthony, Facilities Manager, janthony@village-npb.org

The Village reserves the right to accept or reject any or all Proposal, in whole or in part, with or without cause, to waive any irregularities and/or technicalities, and to select the Proposer that it deems will best serve the interests of the Village.

VILLAGE OF NORTH PALM BEACH, FLORIDA
Chuck Huff, Village Manager

Publish: Palm Beach County Legal Notices Website
Date: 11/7/25

Publish: DemandStar
Date: 11/7/25

Publish: Village of NPB Website
Date: 11/7/25

1 INSTRUCTIONS TO PROPOSERS - RFP

1.1 GENERAL INFORMATION, PURPOSE, & SCOPE

The Request for Proposals ("RFP") Documents consist of:

Instructions to Proposers and Terms and Conditions
Scope of Work/Specifications
Drug Free Workplace Certification;
Sworn Statement on Public Entity Crimes;
Scrutinized Vendor Certification
Proposal Form;
Standard Contract for Services;
Any Addenda issued prior to the date designated for receipt of proposal.

Complete sets of the RFP Documents shall be used in preparing the submitted Proposal. The Village of North Palm Beach ("Village") does not assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets. **The Proposal Form is to be filled in, signed, and all required documents are to be placed in a sealed envelope bearing the words "RFP-2026-PW-02, Library HVAC Replacement" on the outside and mailed or hand-delivered to the Village Clerk on or before the specified time and date.** Each Proposer shall submit one (1) original, five (5) copies, and (1) digital copy of its Proposal.

It is the Proposer's sole responsibility to ensure that its Proposal is received by the Village Clerk on or before the closing date and time. The Village shall in no way be responsible for delays caused by any other occurrence. Proposals submitted by e-mail, telephone, telegram, or facsimile will not be accepted.

The Proposal opening time shall be scrupulously observed. Under no circumstances shall Proposals delivered after the time specified be considered. Such Proposals shall be returned unopened.

All responses to this RFP (hereinafter referred to as "Proposals") must be typewritten or filled in with pen and ink. Proposals by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed or the signature attested to by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.

Proposals by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.

All corrections made to the Proposal price must be initialed.

Proposers shall not be allowed to modify their Proposals after the opening time and date.

Pursuant to Section 119.071(1)(b)2, Florida Statutes, sealed Proposals remain exempt from public disclosure until such time as the Village provides notice of its intended decision to accept a Proposal or for thirty (30) days after opening, whichever is earlier.

The submission of a Proposal shall constitute an incontrovertible representation by the Proposer that the RFP Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the requested services.

1.2 CONTACT PERSON

For information concerning this RFP, please contact:

Via Mail: James Anthony
Facilities Manager
Village of North Palm Beach, 501 US Highway 1
North Palm Beach, FL 33408
Via E-Mail: janthony@village-npb.org

CONTACT WITH THE VILLAGE'S ELECTED OFFICIALS OR VILLAGE PERSONNEL OTHER THAN THE CONTACT PERSON REGARDING THIS REQUEST FOR PROPOSALS SHALL BE GROUNDS FOR DISQUALIFICATION AND ELIMINATION FROM THE SELECTION PROCESS.

1.3 ACCEPTANCE/REJECTION

The Village reserves the right to accept or to reject any or all Proposals in whole or in part, with or without cause, to waive any informalities and technicalities and to make the award to the Proposer, who in the sole opinion of the Village, is the lowest responsive, responsible Proposer and whose Proposal will be most advantageous to the Village. The Village reserves the right to reject the Proposal of any Proposer who has previously failed in the proper performance of an award or to deliver on time contracts of a similar nature or who is not in a position to perform properly under this award. The Village reserves the right to re-issue the Request for Proposals.

1.4 ADDITIONAL TERMS AND CONDITIONS

No additional terms and conditions included with the Proposal shall be evaluated or considered and any and all such additional terms and conditions shall have no force and effect and are inapplicable to this RFP, whether submitted either purposely through intent or design or inadvertently appearing separately in transmittal letters, specifications, literature, price lists, or warranties. It is understood and agreed that the terms and conditions in this RFP are the only conditions applicable to the Proposal and the Proposer's authorized signature affixed to the Proposer acknowledgment form attests to this.

1.5 INTERPRETATIONS, CLARIFICATIONS AND ADDENDA

No oral interpretations will be made to any Proposer as to the meaning of the RFP Documents.

Any inquiry or request for interpretation received seven (7) or more days prior to the date fixed for opening of Proposals will be given consideration. All such changes and interpretations will be made in writing in the form of an addendum and, if issued, will be mailed or sent by available means to all known prospective Proposers prior to the established Proposal opening date. Submission of a Proposal constitutes acknowledgment by the Proposer of the receipt of addenda. All addenda are a part of the RFP Documents, and each Proposer will be bound by such addenda, whether or not received by him/her. It is the responsibility of each Proposer to verify that he/she received all addenda issued before Proposals are opened. Village personnel lack authorization to interpret or give information as to Proposal requirements in addition to that which is contained in the written RFP Documents and addenda.

1.6 PUBLIC RECORDS

Any material submitted in response to this RFP will become a public record and shall be subject to public disclosure consistent with the Florida Public Records Law (Part 119, Florida Statutes), except as may be provided by the Public Records Law or other applicable state or federal law. If a Proposer contends that part of its Proposal is not subject to disclosure, the Proposer shall identify specifically any information contained in the Proposal that the Proposer considers confidential or otherwise exempt from disclosure under the Public Records Law, and the Proposer shall cite the specific section of the law creating the exemption for such information. The Village reserves its right to make all determinations concerning the applicability of the Florida Public Records Law to any documents submitted in response to this RFP. The Village shall have no liability to a Proposer for the public disclosure of any material submitted to the Village in response to this RFP, and the Proposer shall defend, indemnify, and hold harmless the Village and the Village's officers, employees, and agents, against any loss or damages incurred by any person or entity as a result of the Village's treatment of records as public records.

1.7 COST OF PROPOSAL PREPARATION

Proposers assume all risks and expenses associated with the preparation and submittal of Proposals in response to this RFP. The Village shall not be liable for any expenses incurred by Proposers when responding to this RFP, including but not limited to the cost of making presentations to the Village.

1.8 PROPERTY OF THE VILLAGE

All materials submitted in response to this RFP become the property of the Village. The Village has the right to use any or all ideas presented in any response to this RFP, whether amended or not, and disqualification or rejection of a Proposal does not affect this right.

1.9 LITIGATION CONCERNING THE RFP

By submitting a Proposal, a Proposer agrees that (a) any and all legal actions necessary to interpret or enforce this RFP shall be governed by the laws of the State of Florida; and (b) the exclusive venue for any litigation concerning this RFP shall be the state and federal courts in and for Palm Beach County, Florida.

1.10 CONTRACTUAL AGREEMENT

The resulting Contract shall be in substantially the same form as the Standard Contract attached to this RFP. If a Proposer has any objections to any of the terms and conditions of the Standard Contract, the Proposer shall list those objections as an attachment to its Proposal. Otherwise, by submitting its Proposal, Proposer is agreeing to enter into the Contract if selected and the terms and conditions will be non-negotiable unless otherwise agreed to in writing by the Village

The order of contract precedence shall be the Contract and then RFP Documents and then Proposal. Any and all legal action necessary to enforce the Contract will be held in Palm Beach County and the Contract will be interpreted according to the laws of Florida.

1.11 FEDERAL AND STATE TAX

The Village is exempt from Federal and State taxes for tangible personal property. However, vendors or contractors doing business with the Village shall not be authorized to use the Village's Tax Exemption Number in securing materials for performance of the work associated with this Project.

1.12 PUBLIC ENTITY CRIMES

A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a proposal on a contract to provide any goods or services to a public entity, may not submit a proposal on a contract with a public entity for the construction or repair of a public building or public work, may not submit proposals on leases or real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list.

1.13 VARIANCES

The Proposer shall be responsible for reading very carefully, and understanding completely, the requirements and the specifications for the Contract being proposed. For purposes of Proposal evaluation, Proposers must indicate any variances to the specifications, terms and conditions, no matter how slight. If variations are not stated in the Proposal, the Village shall construe the Proposal to fully comply with the specifications, terms, and conditions as prescribed herein.

1.14 AWARD

The Village reserves the right to hold all Proposals for a period not to exceed sixty (60) days after the date of Proposal opening stated in the Request for Proposal.

1.15 PROPOSAL WITHDRAWAL

Any Proposal may be withdrawn up until the time set for opening of the Proposals. Any Proposals not so withdrawn shall, upon opening, constitute an irrevocable offer to sell to the Village the

goods or services set forth in the attached specifications until one or more of the Proposals have been duly accepted by the Village.

If, within twenty-four (24) hours after Proposals are opened, any Proposer files a duly signed written notice with the Village and promptly demonstrates to the reasonable satisfaction of the Village that there was a material and substantial mistake in the preparation of his/her Proposal, that Proposer may withdraw his/her Proposal. Thereafter, that Proposer will be disqualified from further proposals on the work.

1.16 CERTIFICATION

When applicable, Proposer must hold Certificate of Competency issued by the State of Florida or the Palm Beach County Construction Industry Licensing Board and a current Business Tax Receipt. Copies of such Certificate and Receipt must be submitted with the Proposal and must be in the name of the Proposer shown on the Proposal page.

1.17 NON-APPROPRIATIONS

The obligations of the Village to select a Proposal and execute a Contract under the terms of this RFP are contingent upon funds lawfully appropriated for this purpose. Should funds not be appropriated for this purpose, the Village, at its sole discretion, shall have the right to reject all Proposals.

1.18 INSURANCE REQUIREMENTS

The selected Proposer, at its sole expense, shall be required to carry and maintain the following insurance coverages through the time it furnishes all required goods and services to the Village and completes its obligations under the contract. The required insurance coverage must be issued by an insurance company authorized, licensed, and registered to do business in the State of Florida, with the minimum rating of B+ or better, in accordance with the latest edition of A.M. Best's Insurance Guide. This insurance shall be documented in certificates of insurance which provides that the Village of North Palm Beach shall be notified at least thirty (30) days in advance of cancellation, non-renewal, or adverse change. The receipt of certificates or other documentation of insurance or policies or copies of policies by the Village or by any of its representatives, which indicate less coverage than is required, does not constitute a waiver of the awarded Bidder's obligation to fulfill the insurance requirements herein. Prior to commencement of services, the Proposer shall provide to the Village Certificates of Insurance evidencing the insurance coverage specified below.

A. The Proposer shall maintain Comprehensive General Liability Insurance with minimum coverage limits of $1,000,000 combined single limit of insurance per occurrence and $2,000,000 in the general aggregate for bodily injury and property damage and $2,000,000 in the general aggregate for products/completed operations. Comprehensive General Liability Insurance shall include endorsements for property damage, personal injury, contract liability, product liability, and independent contractor coverage.

B. The Proposer shall maintain Comprehensive Automobile Liability Insurance in the minimum amount of $1,000,000 combined single limit for bodily injury and property damages

liability to protect against claims which may arise from the ownership, use, or maintenance of owned and non-owned automobiles, including rented automobiles whether such operations be by the Proposer or by anyone directly or indirectly employed by the Proposer.

C. The Proposer shall carry Workers' Compensation Insurance and Employer's Liability Insurance for all employees as required by Florida Statutes.

D. All insurance, other than Worker's Compensation, to be maintained by the Proposer shall specifically include the "Village of North Palm Beach, its elected officials, employees, and agents "as an Additional Insured. The Proposer shall be responsible for any deductibles related to said insurance.

E. The Proposer shall agree to a Waiver of Subrogation for each required policy. When required by the insurer or should a policy condition not permit an insured to enter into a pre-loss contract to waive subrogation without an endorsement then the selected firm shall agree to notify the insurer and request the policy be endorsed with a Waiver of Transfer of Rights of Recovery Against Others, or its equivalent. This Waiver of Subrogation requirement shall not apply to any policy where a condition to the policy specifically prohibits such an endorsement, or voids coverage should the firm enter into such a contract on a pre-loss basis.

F. It shall be the responsibility of the Proposer to ensure that all independent consultants and/or sub-consultants comply with the same insurance requirements herein.

1.19 TERM OF CONTRACT

The term of this contract shall commence upon execution by both parties and shall continue until the completion of all task deliverables outlined in the Scope of Work section of this RFP.

1.20 CONE OF SILENCE

This RFP is expressly subject to the Cone of Silence provisions of Section 2- 355 of the Palm Beach County Code of Ordinances. Any contract entered into in violation of the cone of silence provisions shall render the transaction voidable.

1.21 NON-COLLUSION

By submitting a Proposal, each Proposer affirmatively represents that neither the Proposer nor any of its officers, partners, owners, agents, representatives, or employees have in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other Proposer to submit a collusive or sham Proposal or have in any manner directly or indirectly sought by agreement or collusion to fix the prices of the Proposal or to secure through any agreement or collusion any advantage. The prices quoted in the Proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Proposer or any of its agents, representatives, owners, or employees.

1.22 SOCIAL, POLITICAL, OR IDEOLOGICAL INTERESTS

Pursuant to section 287.05701, Florida Statutes, the Village may not request documentation of or consider a proposer's social, political, or ideological interests when determining if the proposer is responsible. Further, the Village may not give a preference to a proposer based on the proposer's social, political, or ideological interests.

1.19 RFP SELECTION SCHEDULE

A summary schedule of the major activities associated with this RFP is presented below. The Village, in its sole discretion, may modify the schedule as the Village deems appropriate.

Issuance of RFP:	Fri.	11/7/25	
Mandatory Pre-Bid Meeting:	Mon.	11/18/25	8:00 am
Deadline for Written Questions:	Fri.	12/5/25	3:00 pm
Deadline for Bid Submission:	Mon.	12/15/25	3:00 pm
RFP Proposal Opening Date:	Mon.	12/22/25	3:00 pm
Evaluation Committee Meeting:	Tues.	12/23/25	2:00 pm
Consideration/Award by Village Council:	Thurs.	01/8/26	

2 PROPOSAL SUBMISSION REQUIREMENTS

2.1 PROPOSAL FORMS

In filling out proposal forms, Proposers shall be governed by the following provisions.

A. Proposals must be made on the blanks provided herewith.

B. Proposal amount shall be shown in words and figures.

C. Any Proposal that fails to conform to the condition of the published notice may be rejected.

D. Proposals must be signed in ink by the Proposer with the signature in full.

E. Proposals that contain any omission, erasure, alteration, addition, or item not called for, or that show irregularities of any kind, will be considered as informal or irregular. This will constitute cause for the rejection of the Proposal.

F. If a Proposer wishes to change prices, they shall strike the price and add the changes in the appropriate space. Changes shall be initialed by the person submitting the Proposal. Any changes or alteration of prices in the Proposal must be initialed. Failure to initial these changes or illegible entries or corrections or prices will be cause for the rejection of the Proposal as informal or irregular.

2.2 QUALIFICATION OF PROPOSERS

This proposal shall be awarded only to a responsible Proposer, qualified by experience to provide the services specified. Each Proposer shall submit the following information with its Proposal:

A. A list of at least three (3) client references providing the client name, address, project representative, and telephone number for clients served within the past three (2) years. Include a brief description of the services performed for each client.

B. List of equipment, and/or facilities available to do the work.

C. Evidence of valid state, county and local licenses and receipts proving authority to conduct business in the jurisdiction of the work.

D. List of experience and personnel requirements as set forth in Section 3.3 below.

Failure to submit the above requested information may be cause for rejection of the Proposal.

2.3 REGULATIONS, PERMITS AND FEES

The selected Proposer will be required to obtain at its own expense all licenses required to provide the required services to the Village. The permit and plan review fees for this project shall be based on the Village's Building Permit Fee Schedule, a copy of which is attached to this RFP. The selected Proposer must comply with all Federal, State, and local laws and regulations that may apply, including, but not limited to, those specifically referenced in the RFP Documents.

3 EVALUATION & CRITERIA PROCEDURES

3.1 VENDOR INFORMATION

Proposals are evaluated as per the Evaluation Criteria. The Village reserves the right to obtain additional information from Proposers.

Vendors have a continuing obligation to provide the Village with any material changes to the information requested.

3.2 EVALUATION RATING CATEGORIES

Points for each of the Evaluation Criteria are identified below:

20 Maximum Points Proposal Pricing
20 Maximum Points Personnel Qualifications
20 Maximum Points Project Management Plan/Technical Approach
20 Maximum Points Past Performance/Client References
20 Maximum Points Workload and Contract Litigation

100 Maximum Points Total

3.3 PROPOSAL REQUIRED INFORMATION (to be included in Qualification Statement)

A. Proposal Pricing: (20 Point Maximum)
Provide pricing on the Proposal Form supplied with this RFP.

B. Personnel Qualifications: (20 Point Maximum)
Provide the qualifications and experience of key personnel that are intended to be assigned to this project. List key members of proposed team, including project manager and primary support staff, describe their relevant experience and the role they will play in the project.

Provide a brief resume for each employee who will furnish professional/technical support expertise on this contract. This should include, at a minimum, the following:

Function(s) in the company.
Title and number of years of service with the company.
Previous relevant project experience

C. Project Management Plan: (20 Point Maximum)
Detail how you intend to manage and develop all Vulnerability Assessment tasks.

D. Past Performance: (20 Point Maximum)
Client References – Provide the names and contact information of persons whom the Village may contact for references regarding the company's past performance, on similar contracts. Provide a minimum of three (3) and maximum of five (5) client references.

Identify each client reference:

Name of Client.
Client contact information including email address
Project description, award date, and expiration date of contract
Annual dollar value of contract.

E. Workload and Contract Litigation: (20 Point Maximum)
Project List – Provide a list of relevant contracts to which your company is currently committed or that your company will be committed from December 2025 to June 2026. The individual project details shall include:

Name of Contract Client
Brief Project Scope
Contract Budget
Contract Duration (Award Date – Expiration Date)

F. Litigation – Provide a list of all ligation cases during the past three (3) years in which the proposing company has been a named party. Provide case number, case venue, and brief description of facts.

Provide all items listed in the above Proposal Pricing, Personnel Qualifications, Project Management Plan, Past Performance (Client References), and Workload and Contract Litigation sections as part of your RFP response. These items are the expected deliverables to be evaluated for award of contract.

The Village expressly reserves the right to modify the procedures set forth herein for the selection/evaluation process.

3.4 EVALUATION SCORING SCALE AND DEFINITIONS

20 Point Scale
Superior Response: (16 - 20 Points)
Good Response: (10 - 15 Points)
Fair Response: (5 - 9 Points)
Failed Response: (0 - 4 Points)

Evaluation Scoring Scale Definitions:

Superior Response: Comprehensively meets the requirements and intent for the RFP. Information was clearly presented and complete. Response demonstrated a thorough understanding of the RFP scope and requirements. Evaluation demonstrates a mastery of the evaluation category. Response demonstrates Proposer's selection would be both a considerable value and benefit to the RFP project goals.

Good Response: Meets the majority of the requirements and intent for the RFP. Information was clearly presented and complete with minimal deficiencies. Response demonstrated a good understanding of the RFP scope and requirements. Evaluation demonstrates a considerable knowledge of the evaluation category. Response demonstrates Proposer's selection would be both a value and benefit to the RFP project goals.

Fair Response: Minimally meets the requirements and intent for the RFP. Information was presented with some deficiencies. Response demonstrated an average understanding of the RFP scope and requirements. Evaluation demonstrates a minimal knowledge of the evaluation category.

Failed Response: Does not meet the requirements and intent for the RFP. Information was presented with excessive deficiencies. Response demonstrated an insufficient understanding of the RFP scope and requirements. Evaluation demonstrates an insufficient knowledge of the evaluation category.

3.5 RANKING OF PROPOSALS AND CONTRACT NEGOTIATION

An evaluation committee will independently evaluate each Proposal based on the rating categories for the evaluation process. Points will be awarded from zero (0) to the maximum points allowed for the category. Points are not awarded in a winner-takes-all format. Proposers may tie in individual category and cumulative point awards. Following award of points by the evaluation committee to all Proposers, the Village Clerk will combine and average points awarded to each firm for each category. The evaluation committee may recommend the top ranked firms for oral presentations/interviews.

The evaluation committee's rankings shall be presented to the Village Council for ratification. Upon the Village Council's ratification, the Village will commence contract negotiations with the proposer scoring the highest rating, based on the evaluation process scoring, and continue negotiations in order of ranking, if required.

3.6 MODIFICATION OF PROCEDURES

The Village expressly reserves the right to modify the procedures set forth herein for the selection/evaluation process.

4 SCOPE OF WORK

4.1 INTRODUCTION

The Village is requesting proposals from qualified contractors to replace the HVAC system in the North Palm Beach Library.

4.2 SCOPE OF WORK

Scope of work includes the replacement of existing HVAC units at the NPB Library Building located at 303 Anchorage Drive, North Palm Beach, FL 33408. Proposer shall use the construction plans prepared by REG Architects dated 10/23/2025.

5. DISCLOSURE AND DISCLAIMER

The information contained herein is provided solely for the convenience of responding firms. It is the responsibility of a firm to assure itself that information contained herein is accurate and complete. Neither the Village, nor its advisors provide any assurances as to the accuracy of any information in this RFP. Any reliance on the contents of this RFP, or on any communications with Village representatives or advisors, shall be at each firm's own risk. Firms should rely exclusively on their own investigations, interpretations, and analyses in connection with this matter. The RFP is being provided by the Village without any warranty or representation, express or implied, as to its content, accuracy, or completeness and no firm or other party shall have recourse to the Village if any information herein contained shall be inaccurate or incomplete. No warranty or representation is made by the Village that any qualifications conforming to these requirements will be selected for consideration, negotiation, or approval.

In its sole discretion, the Village may withdraw this RFP either before or after receiving Proposals, may accept or reject any or all Proposals, may accept Proposals which deviate from the non-material provisions of this RFP, and may postpone the Proposals due date and time. The Village may waive any minor irregularity which is defined as a variation from the terms and conditions of this solicitation that does not give the firm an unfair competitive advantage over other firms or adversely impact the interests of the Village. In its sole discretion, the Village may determine the qualifications and acceptability of any firm or firms submitting Proposals in response to this RFP. Following submission of Proposals, the firm agrees to promptly deliver such further details, information, and assurances, including, but not limited to, financial and disclosure data, relating to the Proposals and/or the firm, including the firm's affiliates, officers, directors, shareholders, partners, and employees, as requested by the Village. Any action taken by the Village in response to Proposals made pursuant to this RFP or in making any award or failure or refusal to make any award pursuant to such Proposals, or in any cancellation of award, or in any withdrawal, postponement, or cancellation of this RFP, either before or after issuance of an award, shall be without any expense, liability, or obligation on the part of the Village, or its advisors. Any Proposal which does not meet the requirements of this RFP may be considered non-responsive, and the Proposal may be rejected.

Any recipient of this RFP who responds hereto fully acknowledges all the provisions of this Disclosure and Disclaimer and agrees to be bound by the terms hereof. Any Proposal submitted pursuant to this RFP is at the sole risk and responsibility of the firm submitting such Proposal.

PROPOSER'S ACKNOWLEDGEMENT AND PROPOSAL FORM

SUBMIT ONE (1) ORIGINAL, FIVE (5) COPIES AND ONE (1) ELECTRONIC COPY OF YOUR PROPOSAL TO:

Village of North Palm Beach
Village Clerk's Office
501 U.S. Highway One,
North Palm Beach, FL 33408

RFP TITLE:

Proposal must be received **PRIOR TO 3:00 P.M. on MONDAY, DECEMBER 15, 2025. Bid proposals will be opened MONDAY, DECEMBER 22, 2025 at 3:00 P.M.**

Proposer's Name: SFR Engineering Group, LLC DBA Air Changes Mechanical.
(Please specify if a corporation, partnership, other entity or individual)

Fed. ID# or SSN: 80-3411387

Address: 1365 NW 98th Ct. Unit #4, Doral FL 33172

Fax Number: _____

Telephone No.: 7866586837

E-mail Address: rardila@airchanges.us

Contact representative: Ricardo Ardila

The undersigned authorized representative of the Proposer agrees to all terms and conditions stated in the RFP, to supply Tree Trimming, Management, and Maintenance Services meeting all specifications, and proposes and agrees that if this proposal is accepted by the Village, the Proposer will in good faith enter into contract negotiations with the Village utilizing the standard Village Contract in accordance with the terms and conditions of this RFP. No proposal may be withdrawn for a period of ninety (90) days following the opening of the proposals. The Proposer further acknowledges and affirms the certifications set forth in Section 8 of the RFP.

PROPOSER REPRESENTATIVE WITH AUTHORITY TO BIND PROPOSER

_____ 12-15-2025
Authorized Representative's Signature — Date

Ricardo Ardila — Managing Partner
Name — Position

CORPORATE SEAL

Attest By: _____
Secretary

Signature: _____ **Date:** _____

In accordance with the terms and conditions stated in the Request for Proposals (RFP) requesting all goods and services for the replacement of the Village Library HVAC system, the entity identified above proposes the following to the Village of North Palm Beach:

SJR Engineering Group, LLC dba Air Changes Mechanical (Proposer's legal name) certifies that it is licensed to perform the requested services in the State of Florida and Palm Beach County. Proposer agrees to provide the required goods and services stated in the RFP for an amount not to exceed the following sum:

One hundred Eighty Thousand Six Hundred Ninety Two.

Written Dollar Amount

($ 180,692)

DRUG FREE WORKPLACE

Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids or proposals which are equal with respect to price, quality, and service are received by any political subdivision for the procurement of commodities or contractual services, a bid or proposal received from a business that certifies that it has implemented a drug-free workplace program shall be given preference in the award process. In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.

3. Give each employee engaged in providing the commodities or contractual services that are under bid or proposal a copy of the statement specified in subsection (1).

4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid or proposal, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.

5. Impose a sanction on or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.

6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.



Proposer's Signature

PUBLIC ENTITY CRIMES STATEMENT
UNDER § 287.133, FLORIDA STATUTES

1. This sworn statement is submitted to the Village of North Palm Beach, Florida

by Ricardo Ardila
(print individual's name and title)

for S&R Engineering Group LLC, dba Air Changes Mechanical.
(print name of entity submitting sworn statement)

whose business address is 1365 NW 98th Ct. Unit #4, Doral FL 33172

and (if applicable) its Federal Employer Identification Number (FEIN) is: 86-3411387

(If the entity has no FEIN, include the Social Security Number of the Individual signing this sworn statement:_____)

2. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), **Florida Statutes**, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or of the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision or any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy or material misrepresentation.

3. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), **Florida Statutes**, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

4. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), **Florida Statutes**, means:

   a. A predecessor or successor of a person convicted of a public entity crime; or

   b. An entity under the control any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

5. I understand that a "person" as defined in Paragraph 287.133(1)(c), **Florida Statutes**, means any natural person or entity organized under the laws of any state or of the United States with the legal power

to enter into binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

6. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. **(indicate which statement applies.)**

X Neither the entity submitting this sworn statement, nor any of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding before a Hearing Officer of the State of Florida, Division of Administrative Hearings and the Final Order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. **(attach a copy of the final order)**

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND, THAT HIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES FOR CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

_____
(Signature)

The foregoing document was sworn and subscribed before me this 12 day of December 2025, by Ricardo Ardila who is personally known to me or produced Florida Driver's License as identification.

_____
Notary Public
My Commission Expires: 4/13/2026

NOTARY PUBLIC STATE OF FLORIDA
MARTHA D. ALTAMIRANO
Commission # HH 207042
Expires April 13, 2026

SCRUTINIZED VENDOR CERTIFICATION
PURSUANT TO SECTION 287.135, FLORIDA STATUTES

This sworn statement is submitted to the Village of North Palm Beach, Florida

by Ricardo Ardila - Managing Partner
(print individual's name and title)

for S&R Engineering Group LLC dba Air Changes Mechanical.
(print name of entity submitting sworn statement)

whose business address is 1365 NW 98th Ct Unit #4, Doral FL 33172

and (if applicable) its Federal Employer Identification Number (FEIN) is: 86-3411387

(If the entity has no FEIN, include the Social Security Number of the Individual signing this sworn statement: _____)

1. I hereby certify that the above-named entity:

   A. Does not participate in the boycott of Israel; and

   B. Is not on the Scrutinized Companies that Boycott Israel List.

2. If the Contract for goods and services is for more than $1,000,000, I hereby certify that the above-named entity:

   A. Is not on the Scrutinized Companies with Activities in Sudan List; and

   B. Is not on the Scrutinized Companies with Activities in the Iran Terrorism Sector List; and

   C. Has not engaged in business operations in Cuba or Syria.

Section 287.135, Florida Statutes, prohibits the Village from: (1) contracting with companies for goods or services in any amount if at the time of bidding on, submitting a proposal for, or entering into or renewing a contract if the company is on the Scrutinized Companies that Boycott Israel List, created pursuant to Section 215.4725, Florida Statutes, or is engaged in a boycott of Israel; and (2) contracting with companies, for goods or services over $1,000,000 that are on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Terrorism Sector List created pursuant to Section 215.473, Florida Statutes or is engaged in business operations in Cuba or Syria.

As the person authorized to sign on behalf of the above-named entity, I hereby certify that the statements set forth above are true and that pursuant to Section 287.135, Florida Statutes, the submission of a false certification may subject the company to civil penalties, attorney's fees and/or costs. I further understand that any contract with the Village for goods or services may be terminated at the option of the Village if the company has been found to have submitted a false certification.

(Signature)

The foregoing document was sworn and subscribed before me this 12 day of December, 2025 by Ricardo Avila, who is personally known to me or produced Fla. Drivers License as identification.

Notary Public
My Commission Expires: 4/13/2026

NOTARY PUBLIC STATE OF FLORIDA
MARTHA D. ALTAMIRANO
Commission # HH 207042
Expires April 13, 2026

STANDARD VILLAGE CONTRACT

This Contract is made as of the _____day of _____, 20___, by and between the VILLAGE OF NORTH PALM BEACH, a municipal corporation organized and existing under the laws of the State of Florida, hereinafter referred to as the VILLAGE, and _____, an individual or corporation authorized to do business in the State of Florida, hereinafter referred to as the VENDOR.

In consideration of the promises and mutual covenants herein contained and other good and valuable consideration, the receipt and sufficiency of which is acknowledged by both parties, the VILLAGE and VENDOR hereby agree as follows:

SECTION 1: SCOPE OF SERVICES OF THE VENDOR.

The Scope of Work is for the replacement of the Village Library HVAC System in accordance with the Request for Proposals issued by the Village, and VENDOR's Proposal submitted in response to the Request for Proposals, which are incorporated herein by reference.

SECTION 2: TERM OF CONTRACT.

The term of this Contract shall commence upon the VILLAGE's issuance of a Notie to Proceed and shall remain in effect until all goods are delivered and all services performed, unless earlier terminated in accordance with Section 7. Delivery and installation shall be coordinated by the VILLAGE and VENDOR, provide, however, that all services shall be completed within ninety (90) days of the issuance of a Notice to Proceed.

B. VENDOR shall not be entitled to an increase in the agreed to compensation resulting from this Contract or payment or compensation of any kind from the VILLAGE for direct, indirect, consequential, impact or other costs, expenses, or damages.

SECTION 3: VILLAGE'S REPRESENTATIVE.

Unless otherwise specified by the VILLAGE, the VILLAGE's representative shall be _____. The Village Manager or Village Representative shall have the right at all reasonable times during the term of this Contract to inspect or otherwise evaluate the work being performed thereunder and the premises in which it is being performed.

SECTION 4: COMPENSATION AND METHOD OF PAYMENT.

A. The VILLAGE agrees to compensate the VENDOR for providing the required services to replace the Village Library HVAC System and for which Purchase Orders are issued in accordance with VENDOR's Proposal, which is attached hereto and incorporated herein by reference.

B. In order for both parties herein to close their books and records, VENDOR will clearly state "final invoice" on the VENDOR's final/last billing to the VILLAGE. This certifies that all goods and services have been properly performed and all charges have been invoiced to the VILLAGE. Since this account will thereupon be closed, any additional charges if not

properly included in this final invoice are waived by the VENDOR. The VILLAGE will not be liable for any invoice from the VENDOR submitted thirty (30) days after the provision of all goods and services.

SECTION 5: INDEMNIFICATION.

A. The VENDOR shall indemnify and save harmless and defend the VILLAGE, its agents, servants, and employees from and against any and all claims, liability, losses, and/or cause of action which may arise from any negligent act or omission of the VENDOR, its agents, servants, or employees in the performance of services under this Contract.

B. The VENDOR further agrees to indemnify, save harmless and defend the VILLAGE, its agents, servants, and employees from and against any claim, demand, or cause of action of whatsoever kind or nature arising out of any conduct or misconduct of the VENDOR its agents, servants, or employees not included in the paragraph above and for which the VILLAGE, its agents, servants, or employees are alleged to be liable.

C. Nothing contained in this Contract shall create a contractual relationship with or a cause of action in favor of a third party against either the VILLAGE or VENDOR, nor shall this Contract be construed a waiver of sovereign immunity beyond the waiver provided in §768.28, Florida Statutes.

SECTION 6: PERSONNEL.

A. The VENDOR represents that it has, or will secure at its own expense, all necessary personnel required to perform the services under this Contract.

B. All of the services required hereunder shall be performed by the VENDOR or under its supervision, and all personnel engaged in performing the services shall be fully qualified and, if required, authorized, or permitted under state and local law to perform such services.

C. All of the VENDOR's personnel (and all sub-contractors OR sub-consultants) while on VILLAGE premises, will comply with all VILLAGE requirements governing conduct, safety, and security.

SECTION 7: TERMINATION.

This Contract may be cancelled by the VENDOR upon thirty (30) days prior written notice to the VILLAGE's representative in the event of substantial failure by the VILLAGE to perform in accordance with the terms of this Contract through no fault of the VENDOR. It may also be terminated, in whole or in part, by the VILLAGE without cause upon thirty (30) days written notice to the VENDOR. The VILLAGE may also terminate this Contract with written notice of cause to the VENDOR, who fails to cure such cause within ten (10) days of the receipt of the VILLAGE's notice. Unless the VENDOR is in breach of this Contract, the VENDOR shall be paid for services rendered to the VILLAGE's satisfaction through the date of termination. After receipt of a Termination Notice and except as otherwise directed by the VILLAGE, the VENDOR shall:

A. Stop work on the date and to the extent specified;

B. Terminate and settle all orders and subcontracts relating to the performance of the terminated work;

C. Transfer all work in progress, completed work, and other materials related to the terminated work to the VILLAGE; and

D. Continue and complete all parts of the work that have not been terminated.

SECTION 8: FEDERAL AND STATE TAX.

The VILLAGE is exempt from payment of Florida State Sales and Use Tax. Unless purchased directly by the VILLAGE, the VENDOR shall not be exempted from paying sales tax to its suppliers for materials used to fill contractual obligations with the VILLAGE, nor is the VENDOR authorized to use the VILLAGE's Tax Exemption Number in securing such materials.

SECTION 9: INSURANCE.

A. Prior to commencing any work, the VENDOR shall provide certificates evidencing insurance coverage as required in the Request of Proposals. All insurance policies shall be issued by companies authorized to do business under the laws of the State of Florida. The Certificates shall clearly indicate that the VENDOR has obtained insurance of the type, amount, and classification as required for strict compliance with this Section and that no material change or cancellation of the insurance shall be effective without thirty (30) days' prior written notice to the VILLAGE's representative. Failure to comply with the foregoing requirements shall not relieve the VENDOR of its liability and obligations under this Contract.

B. The parties to this Contract shall carry Workers' Compensation Insurance and Employer's Liability Insurance for all employees as required by Florida Statutes. In the event that a party does not carry Workers' Compensation Insurance and chooses not to obtain same, then such party shall in accordance with Section 440.05, Florida Statutes, apply for and obtain an exemption authorized by the Department of Insurance and shall provide a copy of such exemption to the VILLAGE.

C. All insurance, other than Worker's Compensation, to be maintained by the VENDOR shall specifically include the VILLAGE as an Additional Insured.

SECTION 10: SUCCESSORS AND ASSIGNS.

The VILLAGE and the VENDOR each binds itself and its partners, successors, executors, administrators and assigns to the other party of this Contract and to the partners, successors, executors, administrators and assigns of such other party, in respect to all covenants of this Contract. Except as above, neither the VILLAGE nor the VENDOR shall assign, sublet, convey, or transfer its interest in this Contract without the written consent of the other. Nothing herein shall be construed as creating any personal liability on the part of any officer or agent of

the VILLAGE which may be a party hereto, nor shall it be construed as giving any rights or benefits hereunder to anyone other than the VILLAGE and the VENDOR.

SECTION 11: DISPUTE RESOLUTION, LAW, VENUE AND REMEDIES.

This Contract shall be governed by the laws of the State of Florida. Any and all legal action necessary to enforce the Contract will be held in Palm Beach County. No remedy herein conferred upon any party is intended to be exclusive of any other remedy, and each and every such remedy shall be cumulative and shall be in addition to every other remedy given hereunder or now or hereafter existing at law or in equity or by statute or otherwise. No single or partial exercise by any party of any right, power, or remedy hereunder shall preclude any other or further exercise thereof. The VILLAGE and the VENDOR **knowingly, voluntarily, and intentionally waive any right they may have to trial by jury with respect to any litigation arising out of or in connection with this Contract.**

SECTION 12: INDEPENDENT CONTRACTOR RELATIONSHIP.

The VENDOR is, and shall be, in the performance of all Services under this Contract, an Independent Contractor, and not an employee, agent, or servant of the VILLAGE. All persons engaged in any of the Services performed pursuant to this Contract shall at all times, and in all places, be subject to the VENDOR'S sole direction, supervision, and control. The VENDOR shall exercise control over the means and manner in which it and its employees perform the Services.

SECTION 13: ACCESS AND AUDITS.

The VENDOR shall maintain adequate records to justify all charges, expenses and costs incurred in estimating and performing the Services for at least three (3) years after completion of this Contract. The VILLAGE shall have access to such books, records and documents as required in this section for the purpose of inspection or audit during normal business hours, at the VENDOR's place of business. In no circumstances will VENDOR be required to disclose any confidential or proprietary information regarding its products and service costs.

SECTION 14: NONDISCRIMINATION.

The VENDOR warrants and represents that all of its employees are treated equally during employment without regard to race, color, religion, disability, sex, age, national origin, ancestry, marital status, or sexual orientation.

SECTION 15: ENFORCEMENT COSTS.

If any legal action or other proceeding is brought for the enforcement of this Contract, or because of an alleged dispute, breach, default or misrepresentation in connection with any provisions of this Contract, the successful or prevailing party or parties shall be entitled to recover reasonable attorney's fees, court costs and all expenses (including taxes) even if not taxable as court awarded costs (including, without limitation, all such fees, costs and expenses incident to appeals), incurred in that action or proceeding, in addition to any other relief to which such party or parties may be entitled.

SECTION 16: SEVERABILITY.

If any term or provision of this Contract, or the application thereof to any person or circumstances shall, to any extent, be held invalid or unenforceable, to remainder of this Contract, or the application of such terms or provision, to persons or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected, and every other term and provision of this Contract shall be deemed valid and enforceable to the extent permitted by law.

SECTION 17: MODIFICATIONS OF WORK.

A. The VILLAGE reserves the right to make changes in the work, including alterations, reductions therein or additions thereto. Upon receipt by the VENDOR of the VILLAGE's notification of a contemplated change, the VENDOR shall, in writing: (1) provide a detailed estimate for the increase or decrease in cost due to the contemplated change, (2) notify the VILLAGE of any estimated change in the completion date, and (3) advise the VILLAGE if the contemplated change shall affect the VENDOR's ability to meet the completion dates or schedules of this Contract.

B. If the VILLAGE so instructs in writing, the VENDOR shall suspend work on that portion of the work affected by the contemplated change, pending the VILLAGE's decision to proceed with the change.

C. If the VILLAGE elects to make the change, the VILLAGE shall initiate a Change to the Purchase Order and the VENDOR shall not commence work on any such change until such revised Purchase Order is received.

SECTION 18: PUBLIC ENTITY CRIMES.

VENDOR acknowledges and agrees that a person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals or replies on leases of real property to a public entity; may not be awarded or perform work as a VENDOR, supplier, sub-VENDOR or VENDOR under a contract with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, Florida Statues, for CATEGORY TWO for a period of thirty-six (36) months following the date of being placed on the convicted vendor list. The VENDOR will advise the VILLAGE immediately if it becomes aware of any violation of this statute.

SECTION 19: PROTECTION OF WORK AND PROPERTY.

A. The VENDOR shall continuously maintain adequate protection of all work from damage and shall protect the VILLAGE's property from injury or loss arising in connection with the Contract. Except for any such damage, injury, or loss, except that which may be directly due to errors caused by the VILLAGE or employees of the VILLAGE, the VENDOR shall provide any necessary materials to maintain such protection.

B. The VENDOR will also take every necessary precaution to ensure the safety of the VILLAGE, public and other guests and invitees thereof at or near the areas where work is being accomplished during and throughout the completion of all work.

SECTION 20: WARRANTY/GUARANTY.

VENDOR warrants that its goods and services under this Contract will be free of defects in materials and workmanship for a period of one (1) year following the provision of said goods and services.

SECTION 21: COMPLIANCE WITH LAWS.

VENDOR shall, in performing the services contemplated by this Contract, faithfully observe and comply with all federal, state, and local laws, ordinances and regulations that are applicable to the services to be rendered under this Contract.

SECTION 22: NOTICE.

All notices required in this Contract shall be sent by certified mail, return receipt requested and if sent to the VILLAGE shall be mailed to:

Village of North Palm Beach
Village Manager
501 U.S. Highway One
North Palm Beach, FL 33408

and if sent to the VENDOR shall be mailed to:

SECTION 23: ENTIRETY OF CONTRACTUAL AGREEMENT.

The VILLAGE and the VENDOR agree that this Contract sets forth the entire agreement between the parties, and that there are no promises or understandings other than those stated herein. None of the provisions, terms and conditions contained in this Contract may be added to, modified, superseded, or otherwise altered, except by written instrument executed by the parties hereto. In the event of a conflict between this Contract and the VILLAGE's Request for Proposals and the VENDOR's Proposal, this Contract shall take precedence with the VILLAGE's Request for Qualifications taking precedence over the VENDOR's proposal. All such documents shall be read in a manner so as to avoid a conflict.

SECTION 24: WAIVER.

Failure of a party to enforce or exercise any of its right(s) under this Contract shall not be

deemed a waiver of that parties' right to enforce or exercise said right(s) at any time thereafter.

SECTION 25: PREPARATION.

This Contract shall not be construed more strongly against either party regardless of who was more responsible for its preparation.

SECTION 26: SURVIVABILITY.

Any provision of this Contract which is of a continuing nature or imposes an obligation which extends beyond the term of this Contract shall survive its expiration or earlier termination.

SECTION 27: WAIVER OF SUBROGATION.

VENDOR hereby waives any and all rights to Subrogation against the VILLAGE, its officers, employees, and agents for each required policy. When required by the insurer, or should a policy condition not permit an insured to enter into a pre-loss agreement to waive subrogation without an endorsement, then VENDOR shall agree to notify the insurer and request the policy be endorsed with a Waiver of Transfer of Rights of Recovery Against Others, or its equivalent.

This Waiver of Subrogation requirement shall not apply to any policy, which a condition to the policy specifically prohibits such an endorsement, or voids coverage should VENDOR enter into such an agreement on a pre-loss basis.

SECTION 28: INSPECTOR GENERAL.

VENDOR is aware that the Inspector General of Palm Beach County has the authority to investigate and audit matters relating to the negotiation and performance of this Contract and in furtherance thereof, may demand and obtain records and testimony from VENDOR. VENDOR understands and agrees that in addition to all other remedies and consequences provided by law, the failure of VENDOR to fully cooperate with the Inspector General when requested may be deemed by the VILLAGE to be a material breach of this Contract justifying its termination.

SECTION 29: INVOICING AND PAYMENT:

Payment for any and all invoice(s) that may arise as a result of a Contract or Purchase Order issued pursuant to this Request for Qualifications shall minimally meet the following conditions to be considered as a valid payment request:

A. A timely submission of a properly certified invoice(s) in strict accordance with the price(s) and delivery elements as stipulated in the Contract or Purchase Order document, and submitted to:

Village of North Palm Beach
501 U.S. Highway One
North Palm Beach, Florida 33408
ATTN: Accounts Payable

B. All invoices submitted shall consist of an "original" invoice which clearly references the subject Contract or Purchase Order Number; provide a sufficient salient description to identify the good(s) and/or service(s) for which payment is requested; include and be clearly marked as "partial," "complete" or "final invoice."

C. The invoice shall contain the Proposer's Federal Employer Identification Number.

D. All payments made by the Village pursuant to the Contract Documents shall be in accordance with Florida's Prompt Payment Act (for non-construction).

SECTION 30: ADDITIONAL SERVICES;

If during the contractual period covered by the agreement, additional services are needed, VENDOR may, at the option of the VILLAGE, be engaged to perform these services under the terms of this Contract.

SECTION 31: PUBLIC RECORDS.

IF VENDOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO VENDOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE VILLAGE'S CUSTODIAN OF PUBLIC RECORDS AT: (561) 841-3355; NPBCLERK@VILLAGE-NPB.ORG; OR 501 U.S. HIGHWAY ONE, NORTH PALM BEACH, FL 33408.

In performing services pursuant to this Contract, VENDOR shall comply with all relevant provisions of Chapter 119, Florida Statutes. As required by Section 119.0701, Florida Statutes, VENDOR shall:

1. Keep and maintain public records required by the VILLAGE to perform the service.

2. Upon request from the VILLAGE's custodian of public records, provide the VILLAGE with a copy the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes, or as otherwise provided by law.

3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the Contract term and following completion of the Contract if the VENDOR does not transfer the records to the VILLAGE.

4. Upon completion of the Contract, transfer, at no cost, to the VILLAGE all public records in possession of VENDOR or keep and maintain public records required by the VILLAGE to perform the services. If VENDOR transfers all public records to the VILLAGE upon completion of the Contract, VENDOR shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If VENDOR keeps and maintains public records upon completion of the Contract, VENDOR shall meet

all applicable requirements for retaining public records. All records stored electronically must be provided to the VILLAGE, upon request from the VILLAGE's custodian of public records, in a format that is compatible with the information technology systems of the VILLAGE.

SECTION 32. PROHIBITION AGAINST CONTINGENT FEES.

VENDOR warrants that it has not employed or retained any company or person, other than a bona fide employee working solely for VENDOR, to solicit or secure this Contract and that VENDOR has not paid, or agreed to pay, any person, company, corporation, individual or firm, other than a bona fide employee working solely for VENDOR, any fee, commission, percentage, gift, or other consideration contingent upon, or resulting from, aware or making of the Contract. For the breach or violation of this provision, the VILLAGE shall have the right to terminate this Contract and its sole discretion, without liability, and to deduct from the Contract price, or otherwise recover, the full amount of such fee, commission, percentage, fit or consideration.

SECTION 33. E-VERIFY.

Pursuant to Section 448.095(5), Florida Statutes, VENDOR shall:

A. Register with and use the E-Verify system to verify the work authorization status of all newly hired employees pursuant to Section 448.095(2), Florida Statutes, and require all subcontractors do the same;

B. Secure an affidavit from all subcontractors stating that the subcontractor does not employ, contract with, or subcontract with an "unauthorized alien" as defined in Section 448.095(1)(f), Florida Statutes;

C. Maintain copies of all subcontractor affidavits for the duration of this Contract and provide the same to the VILLAGE upon request;

D. Comply fully, and ensure all subcontractors comply fully, with Section 448.095, Florida Statutes;

E. Be aware that a violation of Section 448.09(1), Florida Statutes (Unauthorized aliens; employment prohibited), shall be grounds for termination of this Contract;

F. Be aware that a violation of Section 448.095(5) by a subcontractor, and not VENDOR, shall be grounds for the VILLAGE to order VENDOR immediately terminate the contract with the subcontractor; and

G. Be aware that if the VILLAGE terminates this Contract under Section 448.095(5)(c), Florida Statues, VENDOR may not be awarded a contract for at least one year after the date on which the Contract is terminated and will be liable for any additional costs incurred by the VILLAGE as a result of the termination of the Contract.

IN WITNESS WHEREOF, the VILLAGE and VENDOR hereto have made and executed this Contract as of the day and year first above written.

VENDOR

By: _____ S&R Engineering Group, LLC dba Air Changes Mechanical

Print Name: Ricardo Ardila

Position: Managing Partner

VILLAGE OF NORTH PALM BEACH

BY: _____
MAYOR

ATTEST:

BY: _____
VILLAGE CLERK

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:

BY: _____
VILLAGE ATTORNEY

AFFIDAVIT

1. I am over 18 years of age and otherwise competent to affirm the matters set forth in this Affidavit, which are based on my personal knowledge.

2. I am an officer or authorized representative of S&R Engineering Group, LLC d/b/a Air Changes Mechanical.

3. S&R Engineering Group LLC d/b/a Air Changes Mechanical does not use coercion for labor or services as defined in Section 787.06, Florida Statutes.

Under the penalties of perjury, I declare that I have read the foregoing affidavit and that the facts stated in it are true.

By: _____

Print Name: Ricardo Andilla

Title: Managing Partner.

SUBMITTAL/TECHNICAL DATA SHEET

cendrex

STANDARD OPTIONS

METERIAL:
16 gauge cold rolled steel

HINGE:
Continuous piano hinge.
Note: Hinge on second dimension (Height)

LOCK / LATCH:
Screwdriver-operated cylinder cam latch

FINISH:
High quality white powder coat primer

PACKAGING:
- Individually wrapped
- 1 Per box

OPTIONS AVAILABLE

MATERIAL:
Stainless steel 304 #4(brushed finish)

LOCK / LATCH:
- Key operated cylinder cam latch
- Handle operated cam latch
- Mortise preparation for cylinder (cylinder optional)
- Mortise deadbolt lock

DESIGN: Double leaf

For a complete list of options visit www.AccessDoorsAndPanels.com

Scan or Click

To view Pricing and Additional Product Info.

LEED READY: THIS PRODUCT CONTRIBUTES TO LEED® CREDITS

SKU: **HHD-GYP**

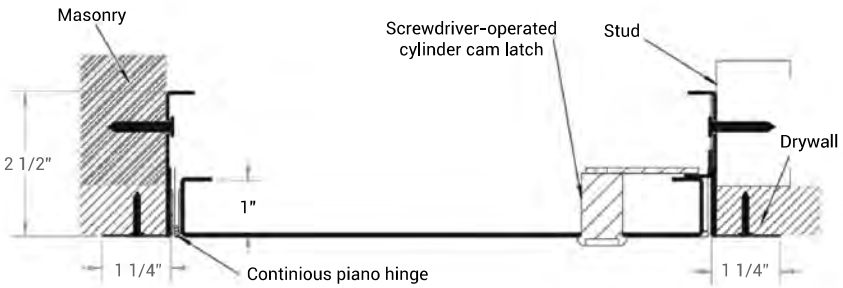
HEAVY DUTY ACCESS DOOR FOR LARGE OPENINGS

WITH DRYWALL BEAD FLANGE



INSTALLATION

>> CLICK TO VIEW ADDITIONAL DETAILS AND PRICING <<

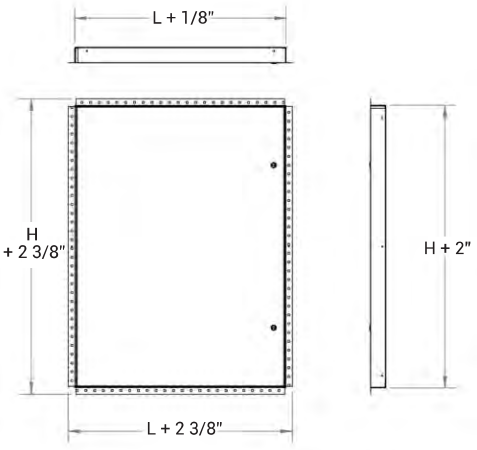


DIMENSIONS AND APPEARANCE

STANDARD SIZES:

DOOR SIZE W x H INCHES (MM)	NUMBER OF LOCKS	WEIGHT LBS	WEIGHT KG
48 x 48 (1219 x 1219)	2	61.1	27.7

Rough wall opening = door size + 1/4" or + 6mm



PROJECT DATA

Custom Sizes Available - Fast!

PROJECT NAME :	QTY	W	H	OPTIONS
ARCHITECT :				
DEALER :				
CONTRACTOR :				
LOCATION :	SPECIAL INSTRUCTIONS :			
DATE :				
TAGGING INSTRUCTIONS :	SUBMITTAL APPROVAL : (signature or stamp)			

TELEPHONE:
1-888-457-1275
FAX:
1-888-626-2907

PO BOX 66738 #76520,
SAINT LOUIS, MO
63166-6738
USA

WEBSITE:
www.AccessDoorsAndPanels.com

E-MAIL:
info@AccessDoorsAndPanels.com

SUBMITTAL/TECHNICAL DATA SHEET

BEST ACCESS DOORS
Quality Access Doors- FAST!

SKU: **BA-WD-8000**

DUCT & SPECIALTY DOOR

WALK THROUGH DOOR



APPLICATION

- Designed to provide convenient walk through access to duct work interiors & air handling units
- Low to medium pressure systems and plenums

FEATURES

Heavy duty construction, along with a continuous hinge and compression handles

OPTIONAL FEATURES: Removable Door Panel / Vision Panel / High Pressure Units / Key Operated Handles

SPECIFICATIONS

MATERIAL: Galvanized steel, also available in Aluminum and Stainless Steel

DOOR: 22 gauge

MOUNTING FRAME: Double panel frame is 1 15/16" wide x 1 1/2" deep extruded aluminum with mitred corners

GASKET: 1/8" thick x 1/2" wide closed cell neoprene gasketing between door and frame

HINGE: Continuous steel piano hinge-opens 180 degrees

INSULATION: Door panel filled with 1" thick fiberglass insulation - 4 R value

STANDARD LATCH: Dual acting compression handles-operable from both sides

Units 48" high and under to have 2 handles

Units over 48" high to have 3 handles

FINISH: Mill finish

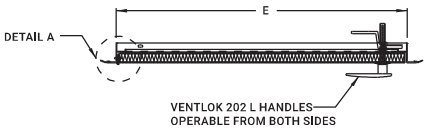
For a complete list of options visit www.BestAccessDoors.com

DIMENSIONS AND APPEARANCE

>> CLICK TO VIEW ADDITIONAL DETAILS AND PRICING <<

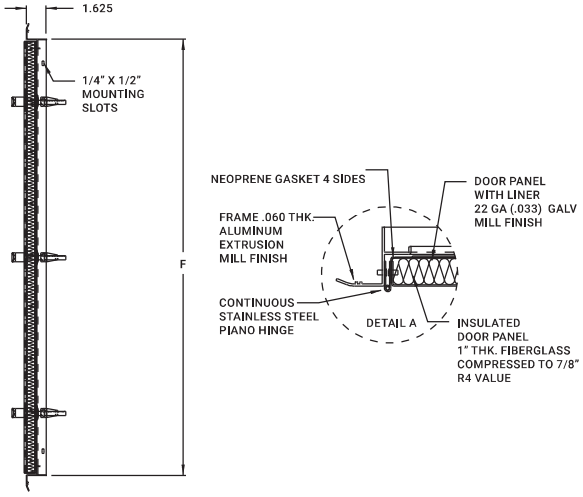
DOOR SIZE W x H INCHES (MM)		WEIGHT LBS	KG
24 x 36	(610 x 914)	52.80	24
24 x 48	(610 x 1219)	77.00	35
24 x 60	(610 x 1524)	97.00	44
24 x 72	(610 x 1829)	114.0	52
30 x 36	(762 x 914)	70.40	32
30 x 48	(762 x 1219)	95.00	43
30 x 60	(762 x 1524)	119.0	54
30 x 72	(762 x 1829)	143.0	65

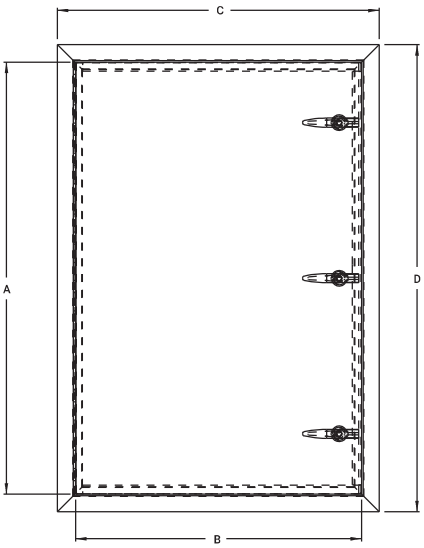
Wall or ceiling opening is W + 3/8" (9mm)



MANUFACTURED BY ACUDOR

For detailed specifications see submittal sheet





PROJECT DATA

Custom Sizes Available - Fast!

PROJECT NAME :	QTY	W	H	OPTIONS
ARCHITECT :				
DEALER :				
CONTRACTOR :				
LOCATION :	SPECIAL INSTRUCTIONS :			
DATE :				
TAGGING INSTRUCTIONS :	SUBMITTAL APPROVAL : (signature or stamp)			

Scan or Click

To view Pricing and Additional Product Info.

TELEPHONE:
1-800-483-0823
FAX:
1-888-828-6021

228 PARK AVE. S. #76520
NEW YORK, NY, 10003

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www.BestAccessDoors.com

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SUBMITTAL

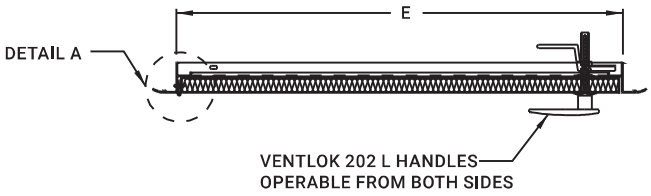
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FAX:
1-888-828-6021

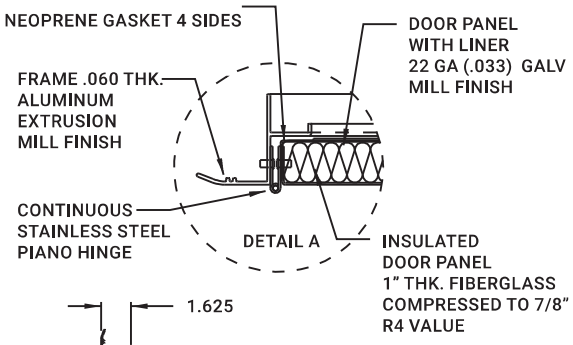
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NEW YORK, NY, 10003

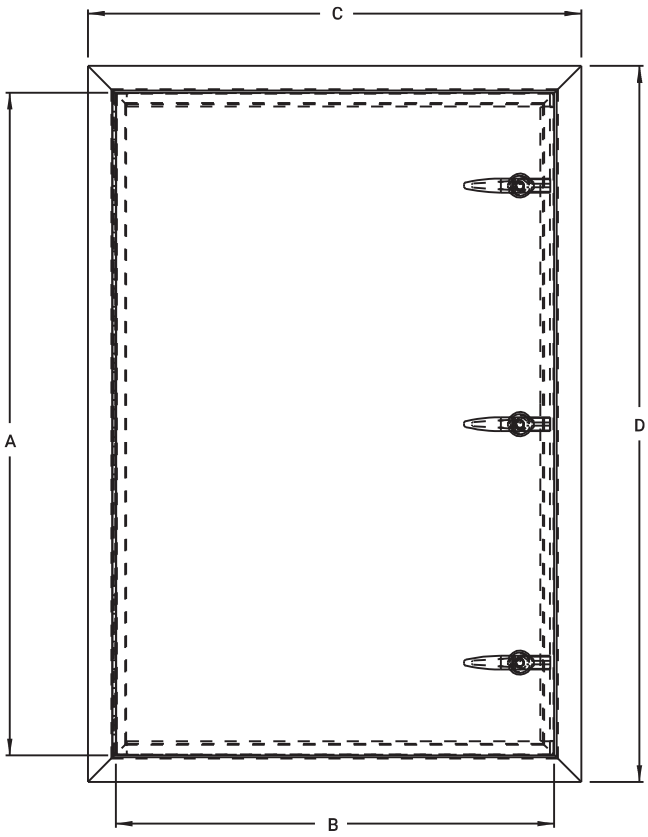
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info@bestaccessdoors.com

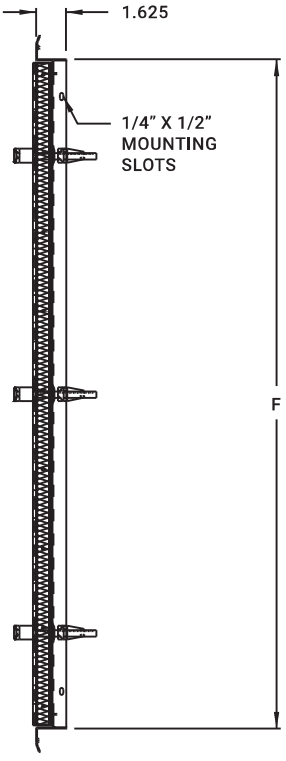
BA-WD-8000 WALK THROUGH ACCESS DOOR

NOMINAL DOOR SIZE Inches (mm)	A	B	C	D	E	F	LATCHES
24 x 36 (610 X 914)	35.625 (905)	23.500 (597)	24.484 (673)	38.484 (977)	24.000 (610)	36.000 (914)	2
24 x 48 (610 X 1219)	47.625 (1210)	23.500 (597)	24.484 (673)	50.484 (1282)	24.000 (610)	48.000 (1219)	2
24 x 60 (610 X 1524)	59.625 (1514)	23.500 (597)	24.484 (673)	62.484 (1587)	24.000 (610)	60.000 (1524)	3
24 x 72 (610 X 1829)	71.625 (1819)	23.500 (597)	24.484 (673)	74.484 (1892)	24.000 (610)	72.000 (1829)	3
30 x 36 (762 X 914)	35.625 (905)	29.500 (749)	32.484 (825)	38.484 (977)	30.000 (762)	36.000 (914)	2
30 x 48 (762 X 1219)	47.625 (1210)	29.500 (749)	32.484 (825)	50.484 (1282)	30.000 (762)	48.000 (1219)	2
30 x 60 (762 X 1524)	59.625 (1514)	29.500 (749)	32.484 (825)	62.484 (1587)	30.000 (762)	60.000 (1524)	3
30 x 72 (762 X 1829)	71.625 (1819)	29.500 (749)	32.484 (825)	74.484 (1892)	30.000 (762)	72.000 (1829)	3









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Submittal

Prepared For:
Fae Consulting

Sold To:
Air Changes Mechanical

Date: January 15, 2026

Job Name:
North Palm Beach Library

Opportunity ID: 8466965

Trane U.S. Inc. is pleased to provide the following submittal for your review and approval.

Product Summary

Qty	Product
2	Odyssey Split System Indoor Unit (Large)
2	Split System Air Conditioning Units (Small)

Jorge Aragon
Trane U.S. Inc.
2884 Corporate Way
Miramar, FL 33025
Office Phone: (954) 499-6900

The attached information describes the equipment we propose to furnish for this project and is submitted for your approval.

Submittal acceptance and return is a critical step, so please ensure submittals are returned with approval to release to production within 14 days of submittal date.

Product performance and submittal data is valid for a period of 6 months from the date of submittal generation. If six months or more has elapsed between submittal generation and equipment release, the product performance and submittal data will need to be verified. It is the customer's responsibility to obtain such verification.

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Tag Data - Odyssey Split System Indoor Unit (Qty: 2)

Item	Tag(s)	Qty	Description	Model Number
A1	AHU-1, AHU-2	2	7.5 Ton Unitary Split Systems Indoor	TWE090K3AAA

Product Data - Odyssey Split System Indoor Unit
Item: A1 Qty: 2 Tag(s): AHU-1, AHU-2

Air Handler
7.5 Ton
R-454B refrigerant
208-230/60/3
Single refrigeration circuit
Two-speed airflow
Standard 1" throwaway filters
Drip panel kit (Field Installed)
11.25/14.96 kW electric heat 208/240/3/60 (Field Installed)
Indoor Options Module
Corrosion protection coating – Evaporator coil

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Product Report - Odyssey Split System Indoor Unit
Item: A1 Qty: 2 Tag(s): AHU-1, AHU-2

6 - 25 Ton Unitary Split Systems Indoor

Unit Overview

Model	TWE090K3AAA**BC000000000000000000000000000
AHU Tonnage	7.5 Ton
Refrigerant	R-454B Refrigerant
AHU Voltage	208-230/60/3
AHU Refrigeration Circuit	Single Circuit
AHU Controls	2 Speed
Liquid Line Connection Size	0.500 in
Suction Line Connection Size	1.380 in

Note: For line lengths other than 25', please refer to the Application Guide (SS-APG008*-EN) for charge levels, oil addition and line sizes.



Matched Outdoor Unit

Matched System EER	11.0 EER
Matched System IEER	14.10 Number
COP (High Temperature)	3.40 Number
COP (Low Temperature)	2.25 Number

Fan Information

Airflow	3000 cfm	**Supply fan motor BHP**	1.68 bhp
External Static Pressure	0.800 in H2O	**Supply fan motor RPM**	972 rpm
External plus component static pressure	0.920 in H2O	**Fan motor heat**	2.41 MBh

Cooling Information

Cooling EDB	80.00 F	**Gross sensible capacity**	76.38 MBh
Cooling EWB	67.00 F	**Latent capacity**	19.56 MBh
Summer outdoor ambient	95.00 F	**Net total capacity**	92.65 MBh
Unit Leaving Dry Bulb	57.78 F	**Net sensible capacity**	73.24 MBh
Unit Leaving Wet Bulb	57.18 F		
Gross total capacity	95.78 MBh		

Electrical Information

MCA - A.H.	48.00 A	**MCA - A.H. for 230V w/elect. heat**	54.00 A
MOP - A.H.	50.00 A	**MOP - A.H. for 230V w/elect heat**	60.00 A
Supply Fan Motor FLA	6.80 A		

Heating Information

Heat Pump Information		**Auxiliary Heat**	
Winter EDB	70.00 F	**Electric heat capacity**	14.96 kW
Winter outdoor ambient DB	47.00 F	**Electric heat delta T**	15.68 F
Heat Pump Capacity	88.22 MBh		
Gross heating capacity	82.82 MBh		
Heating delta T	28.63 F		
Heating LAT	98.63 F		

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Product Report - Odyssey Split System Indoor Unit
Item: A1 Qty: 2 Tag(s): AHU-1, AHU-2

Refrigerant Information

Refrigerant	R-454B Refrigerant	**Evaporator face velocity**	388 ft/min
Liquid Line Connection Size	0.500 in	**Evaporator face area**	8.07 sq ft
Suction Line Connection Size	1.380 in	**Supply Fan Motor FLA**	6.80 A
Evaporator Rows	4		
Evaporator fin spacing	168 Per Foot		

Filter

Filter	Standard 1" throwaway filters

Weights

Max/Min Airhandler Operating Weight		Vertical Corner Weight				Horizontal Corner Weight			
Max	373.0 lb	**Corner A**	70.0 lb	**Corner C**	78.0 lb	**Corner A**	59.0 lb	**Corner C**	90.0 lb
Min	336.0 lb	**Corner B**	102.0 lb	**Corner D**	86.0 lb	**Corner B**	95.0 lb	**Corner D**	92.0 lb

Field Installed Accessories

Heaters	11.25/14.96kW (208/230/3/60)
Drip panel kits	Drip panel kits

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Mechanical Specifications - Odyssey Split System Indoor Unit
Item: A1 Qty: 2 Tag(s): AHU-1, AHU-2

General - ***(TWE)***
- Completely factory assembled
- Convertible for horizontal or vertical configuration
- Convertible for cooling only or heat pump application
- Convertible for left or right external connections (refrigerant and/or electrical)
- Convertible for front or bottom air return
- Nitrogen holding charge
- Certified to UL 1995 for indoor blower coil units
- Unit shall be furnished with a leak detection system from the factory. The leak detection system shall consist of one or more refrigerant detection sensors. When the system detects a leak, the unit controller shall initiate mitigation actions.

Casing - ***(TWE)***
- Zinc coated, heavy gauge, galvanized steel
- Weather resistant baked enamel finish
- Access panels with captive screws
- Completely insulated with foil faced, cleanable, fire retardant, permanent, odorless glass fiber material
- Captured or sealed insulation edges
- Electrical connection bushings or plugs
- Refrigerant connection bushings or plugs
- Withstand elevated internal static pressure

Refrigeration System - ***(TWE)***
- Single or dual circuit
- Distributor(s)
- Thermal expansion valves (TXVs)

Evaporator Coil - ***(TWE)***
- 3/8" internally enhanced copper tube mechanically bonded to lanced aluminum plate fins
- Factory pressure and leak tested to 449 psig.
- Draw-through airflow
- Dual circuits are interlaced/intertwined
- Double sloped, removable, cleanable, composite drain pan
- Four drain pan positions

Indoor Fan - ***(TWE)***
- Double inlet, double width, forward curved, centrifugal type fan
- Dual fans on 12.5-25 ton air handlers-Adjustable belt drive
- Permanently lubricated bearings

Indoor Motor - ***(TWE***)
- Adjustable motor sheaves (constant volume units)
- Fixed motor sheaves (SZVAV and 2-Speed VFD)
- Thermal overload protection
- Permanently lubricated bearings
- Meet energy policy of 1992 (EPACT)
- Optional oversized motors for high static applications

Controls - ***(TWE)***
- Completely internally wired
- Colored and keyed connectors, colored wires
- Magnetic indoor fan contactor
- Detachable low voltage connectors
- Single point power entry
- Evaporator defrost control

2-Speed VFD Control

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- 2-Speed airflow
- Variable Frequency Drive (VFD)
- Motor soft start - avoids start up belt noise and increases belt life
- Programmable keypad accessible outside of airstream
- VFD rated motor
- Factory installed high static motor available

Electric Heaters - ***(TWE)***
- Heavy duty nickel chromium elements
- Agency approved
- Installs directly on fan discharge
- One or two stage control (dependent upon capacity)
- Single point power entry
- Terminal strip connections

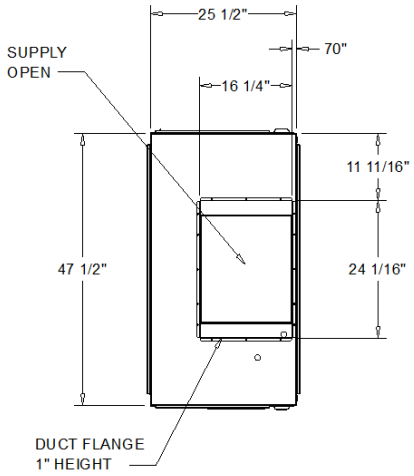
230V Heaters
- Internally delta connected
- Automatic reset of high limit controls through pilot duty with secondary backup fuse links

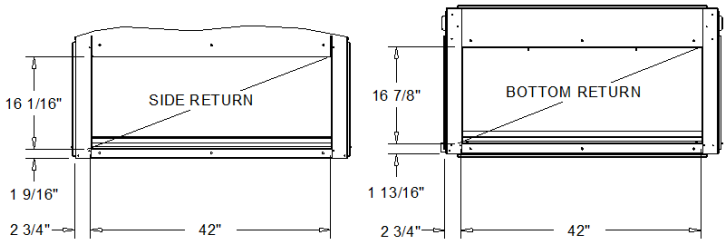
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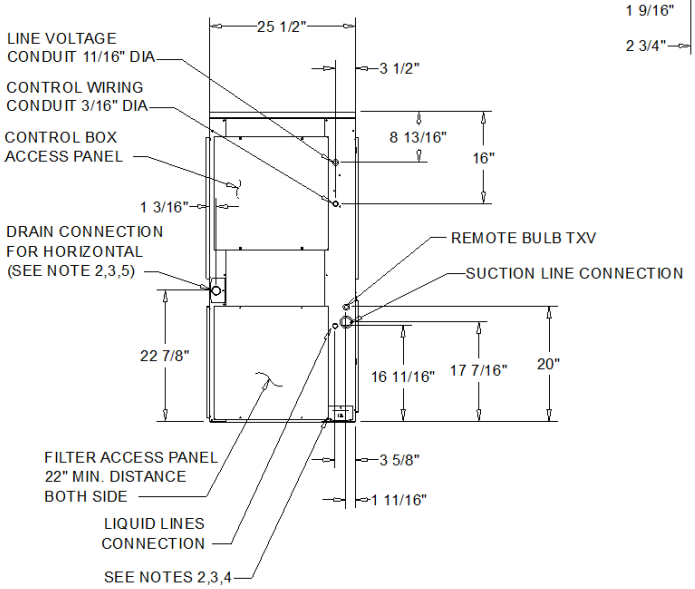
Dimensional Drawings - Odyssey Split System Indoor Unit
Item: A1 Qty: 2 Tag(s): AHU-1, AHU-2

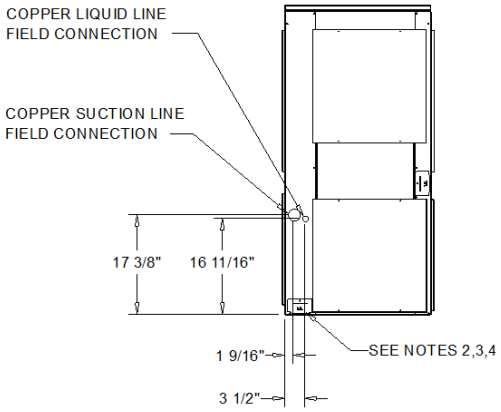
NOTES:
1. PANEL DEPTH 1/2" (TYP.ALL PANELS).
2. REMOVABLE DRAIN PAN AND ATTACHED DRAIN CONNECTION MAY BE INSTALLED ON END OF UNIT IN EITHER THE VERTICAL OR HORIZONTAL CONFIGURATION, PLASTIC DRAIN PAN ACCESS PLATE ON THE END OF UNIT OPPOSITE DRAIN CONNECTION MUST BE REMOVED TO SLIDE DRAIN PAN OUT OF UNIT CLEANING. ACCESS PLATE MUST BE RE-INSTALLED AFTER SLIDING DRAIN PAN BACK INTO UNIT.
3. IF PERIODIC DRAIN PAN CLEANING IS REQUIRED, ALLOW ROOM FOR PARTIAL REMOVAL OF DRAIN PAN CONNECTION AT END OF UNIT.
4. 1" FEMALE SCHED. 40 PVC PIPE DRAIN CONNECTION VERTICAL CONFIGURATION.
5. 1" FEMALE SCHED. 40 PVC PIPE DRAIN CONNECTION HORIZONTAL CONFIGURATION.

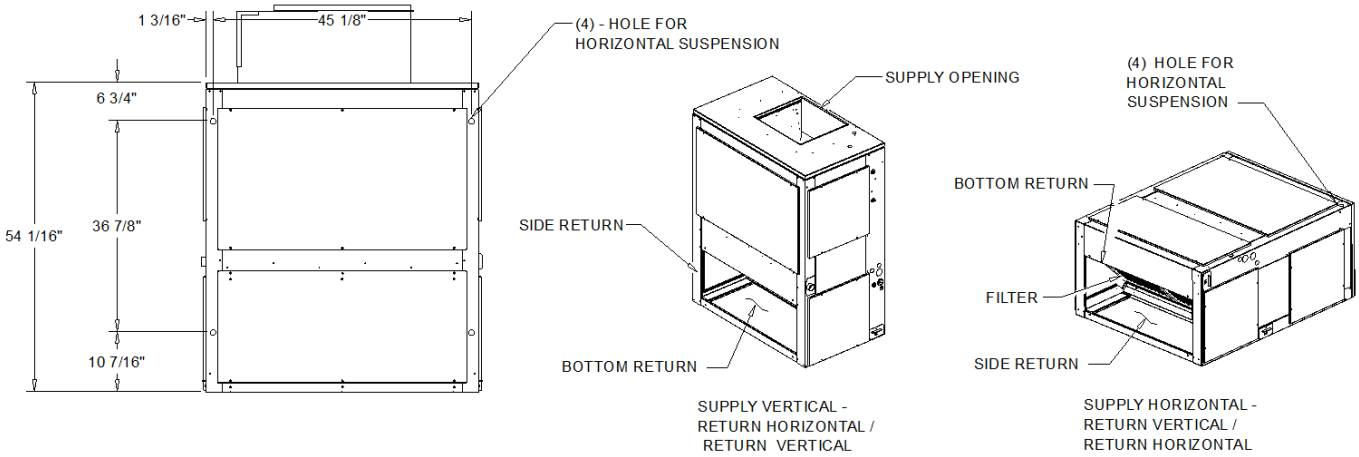
REFRIGERANT
1. SUCTION CONNECTION (1 3/8" OD) AND LIQUID CONNECTION (1/2" OD)







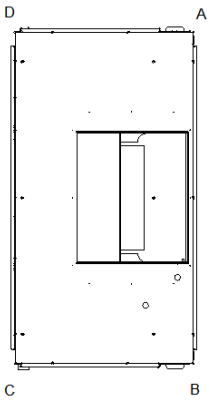


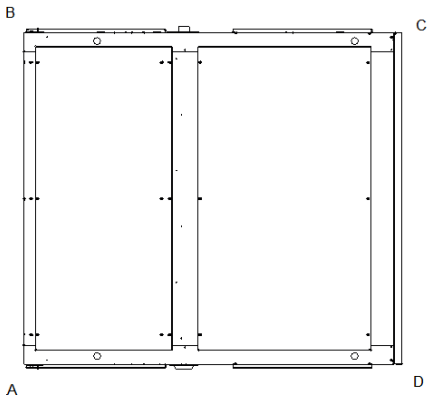


7 1/2 TON AIR HANDLER (SINGLE CIRCUIT)
DIMENSIONAL DRAWING

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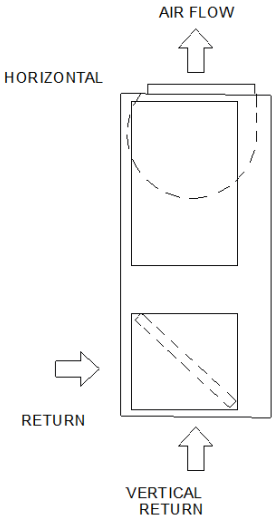
Weight, Clearance & Rigging - Odyssey Split System Indoor Unit
Item: A1 Qty: 2 Tag(s): AHU-1, AHU-2

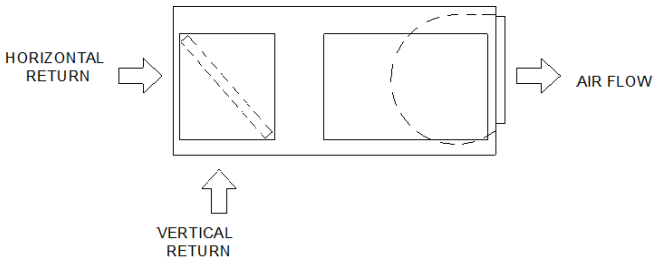




WEIGHTS AND CORNER WEIGHTS

Unit Weights:	
Max A.H. operating weight:	373.0 lb
<<2070527~FD>>	336.0 lb
Vertical Corner Weights:	
Vertical corner weight A:	70.0 lb
Vertical corner weight B:	102.0 lb
Vertical corner weight C:	78.0 lb
Vertical corner weight D:	86.0 lb
Horizontal Corner Weights:	
Horizontal corner weight A:	59.0 lb
Horizontal corner weight B:	95.0 lb
Horizontal corner weight C:	90.0 lb
Horizontal corner weight D:	92.0 lb



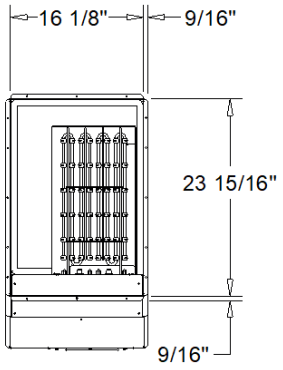


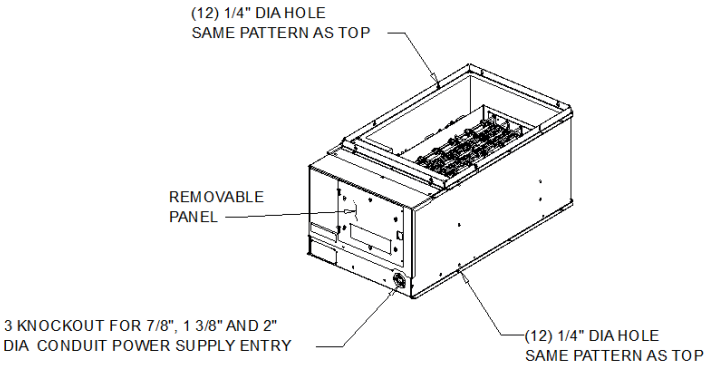
WEIGHTS AND LOAD POINT LOCATION

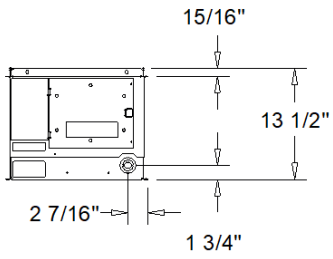
WEIGHT AND RIGGING

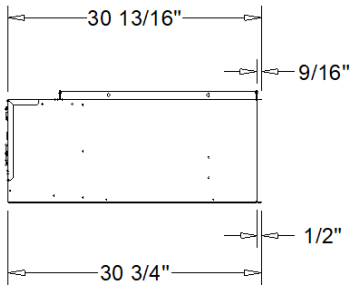
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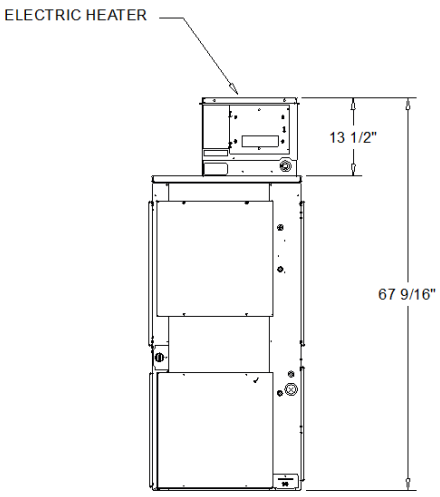
Accessory - Odyssey Split System Indoor Unit
Item: A1 Qty: 2 Tag(s): AHU-1, AHU-2

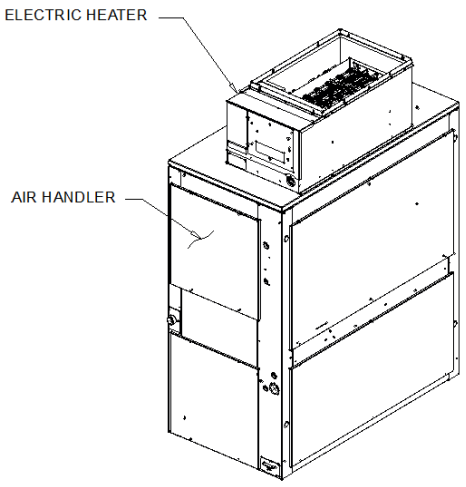










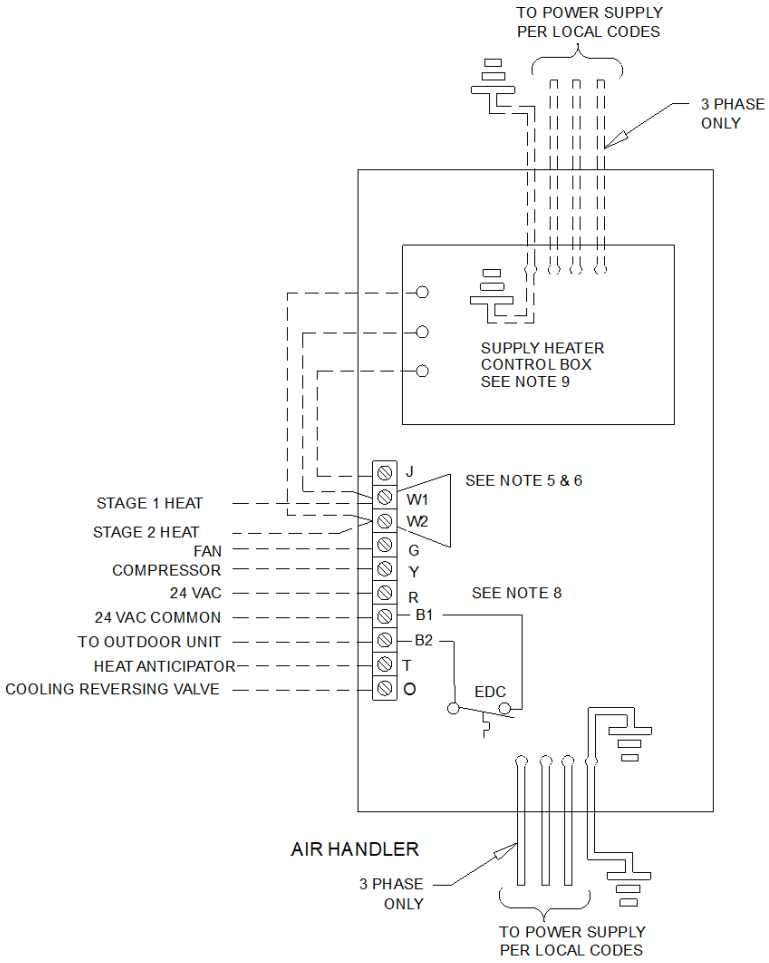


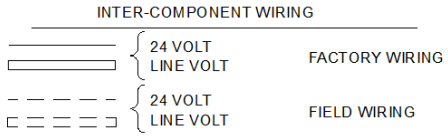
7 1/2 TON ELECTRIC HEATER

DIMENSIONAL DRAWING

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Field Wiring - Odyssey Split System Indoor Unit
Item: A1 Qty: 2 Tag(s): AHU-1, AHU-2





NOTES:

1. POWER WIRING AND GROUNDING OF EQUIPMENT MUST COMPLY WITH LOCAL CODES.
2. BE SURE POWER SUPPLY AGREES WITH EQUIPMENT NAMEPLATE.
3. LOW VOLTAGE WIRING TO BE 18 A.W.G. MINIMUM CONDUCTOR.
4. USE COPPER CONDUCTORS ONLY.
5. IF TWO STAGE ELECTRIC HEATERS AND THERMOSTAT ARE USED, REMOVE JUMPER BETWEEN W1 AND W2.
6. FOR SINGLE STAGE ELECTRIC HEATER, OMIT WIRE BETWEEN W2 AND THERMOSTAT AND W2 AND ELECTRIC HEATER.
7. FOR COOLING ONLY, OMIT WIRES BETWEEN W1,W2 AND THERMOSTAT AND OMIT ELECTRIC HEATER.
8. IF THE EDC SWITCH IS TO BE CONNECTED IN THE CIRCUIT, THE EDC WIRE MUST BE REMOVED FROM THE B1 TERMINAL AND RECONNECTED TO THE "Y" TERMINAL ON THE INDOOR SECTION LOW VOLTAGE TERMINAL BOARD AS SHOWN.
9. WHEN ELECTRIC HEATER ACCESSORY IS USED, SINGLE POINT POWER ENTRY OR DUAL POINT POWER ENTRY IS FIELD OPTIONAL. SINGLE POINT POWER ENTRY OPTION IS THROUGH ELECTRIC HEATER ONLY.

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Tag Data - Odyssey Split System Outdoor Unit (Qty: 2)

Item	Tag(s)	Qty	Description	Model Number
B1	CU-1, CU-2	2	7.5 Ton Unitary Split Systems Outdoor	TWA090K3AAA

Product Data - Odyssey Split System Outdoor Unit
Item: B1 Qty: 2 Tag(s): CU-1, CU-2

Split System Heat Pump
7.5 Ton
R-454B refrigerant
208-230/60/3
Single Compressor / Single Circuit
Symbio controls
Touchscreen programmable thermostat, 4H/2C (Field Installed)
Corrosion protection coating – Condenser coil and cabinets

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Product Report - Odyssey Split System Outdoor Unit
Item: B1 Qty: 2 Tag(s): CU-1, CU-2

6 - 25 Ton Unitary Split Systems Outdoor

Unit Overview

Model	TWA090K3AAA**BS000000000000 0000000000000
Construction	New Construction
Unit Tonnage	7.5 Ton
Controls	Symbio (Heat Pump)
Voltage	208-230/60/3
Refrigeration Circuit / Stage	Single Compressor / Single Circuit
Refrigerant	R-454B Refrigerant
Unit Function	Heat Pump
Max. Cond. Operating Weight	362.5 lb



Electrical Information

MCA	38.00 A	**Compressor 1 RLA**	27.10 A	**Cond. Motor 1 FLA**	2.30 A
MOP	60.00 A	**Compressor 2 RLA**	0.00 A	**Cond. Motor 2 FLA**	0.00 A

Refrigerant Information

Refrigerant	R-454B Refrigerant
Suction Line Connection Size	1.375 in
Liquid Line Connection Size	0.625 in

Field Installed Accy

Thermostats	Touchscreen Programmable 4H/2C

Weights

Approx Installed Weight	Corner Weight A	Corner Weight B	Corner Weight C	Corner Weight D
362.5 lb	90.0 lb	128.0 lb	66.0 lb	80.0 lb

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Mechanical Specifications - Odyssey Split System Outdoor Unit
Item: B1 Qty: 2 Tag(s): CU-1, CU-2

General - *(TWA)*
Weatherproofed steel mounting/lifting rails
- Hermetic scroll compressors
- Plate fin condenser coils
- Fans and motors
- Standard operating range 50-125°F (min. 0°F with low ambient accessory)
- Nitrogen holding charge
- Certified and rated in accordance with AHRI and DOE standards
- Certified to UL 1995
- Capacities and efficiencies for split systems are rated within the scope of the Air-Conditioning, Heating, & Refrigeration Institute (AHRI) certification program and display the AHRI Standard 340-360 (I-P) mark. This standard applies to units between 65,000 and 250,000 btu/hr.
- Unit shall be furnished with a leak detection system from the factory. The leak detection system shall consist of one or more refrigerant detection sensors. When the system detects a leak, the unit controller shall initiate mitigation actions.

Thermostat
- 1H/1C available
- 2H/1C available
- Manual or automatic changeover available
- Programmable and non-programmable solutions available

Phase Monitor/Reversal Protection
Phase monitor shall provide 100% protection for motors and compressors against problems caused by phase loss, phase imbalance, and phase reversal. Phase monitors are equipped with an LED that provides an ON or FAULT indicator. Quick-Access Panels

- Remove a few screws for access to the standardized internal components and wiring.

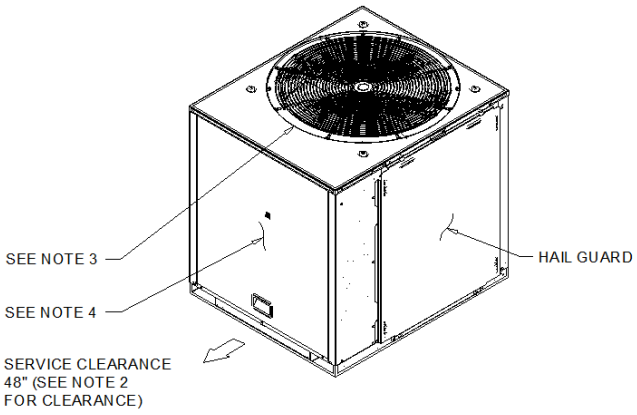
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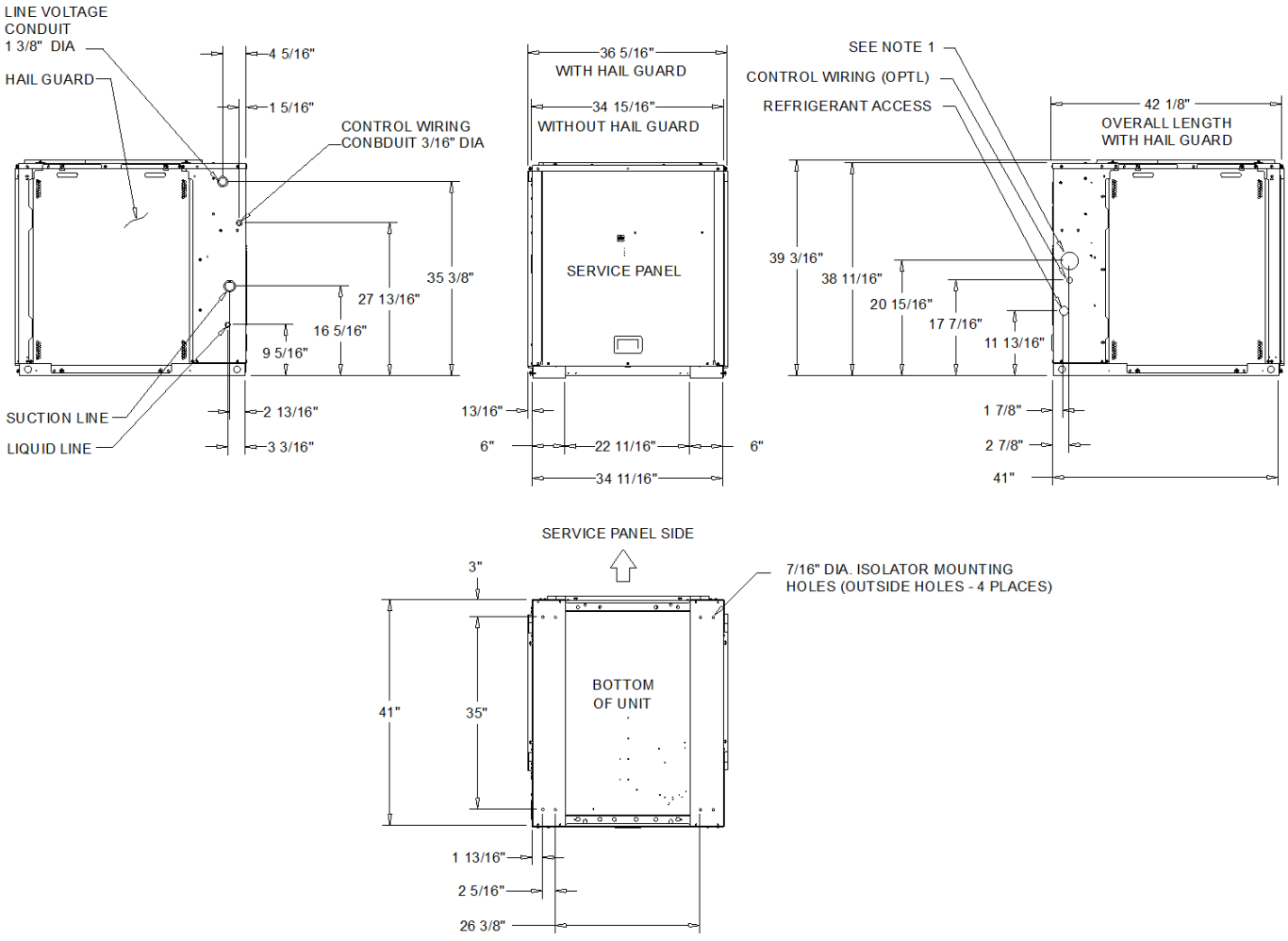
Dimensional Drawings - Odyssey Split System Outdoor Unit
Item: B1 Qty: 2 Tag(s): CU-1, CU-2

NOTES:
1. ACCESS OPENING IS FOR FIELD INSTALLED BAYLOAM ACCESSORY.
2. MINIMUM CLEARANCE FOR PROPER OPERATION IS 36" FROM WALLS, SHRUBBERY, PRIVACY FENCES ETC. MINIMUM CLEARANCE BETWEEN ADJACENT UNITS IS 72". RECOMMENDED SERVICE CLEARANCE 48"
3. TOP DISCHARGE AREA SHOULD BE UNRESTRICTED FOR 100" MINIMUM. UNIT SHOULD BE PLACED SO ROOF RUN-OFF WATER DOES NOT POUR DIRECTLY ON UNIT
4. OUTDOOR AIR TEMPERATURE SENSOR OPENING (DO NOT BLOCK OPENING)

REFRIGERANT

5.

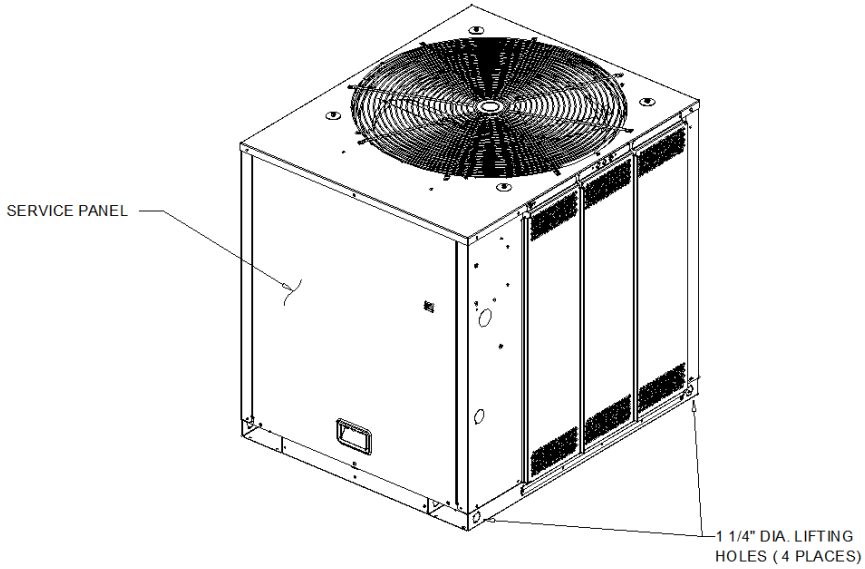




7.5 TON SINGLE COMPRESSOR HEAT PUMP CONDENSER
DIMENSIONAL DRAWING

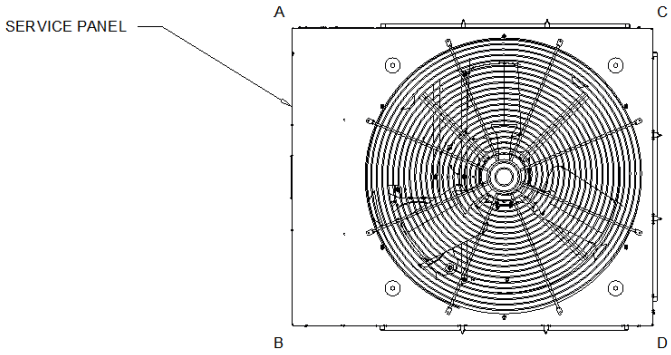
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Weight, Clearance & Rigging - Odyssey Split System Outdoor Unit
Item: B1 Qty: 2 Tag(s): CU-1, CU-2



WEIGHTS AND CORNER WEIGHTS

Unit Weights	
Approx Installed Weight	362.5 lb
Corner Weights	
Corner Weight A:	90.0 lb
Corner Weight B:	128.0 lb
Corner Weight C:	66.0 lb
Corner Weight D:	80.0 lb



WEIGHTS AND LOAD POINT LOCATION

WEIGHT AND RIGGING

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Tag Data - Split System Air Conditioning Units (Small) (Qty: 2)

Item	Tag(s)	Qty	Description	Model Number
C1	AHU-CU-3, AHU-CU-4	2	5 Ton Unitary Split Systems (SSC)	5TTR4060A1 - 5TEM4D07AC51S

Product Data - Split System Air Conditioning Units (Small)
Item: C1 Qty: 2 Tag(s): AHU-CU-3, AHU-CU-4

5TTR4 Split System Single Stage Cooling Outdoor Unit, R-454B
- 5 Ton Nominal Cooling Capacity
- 200-230/60/1

5TEM - Air Handler, R-454B
- Multi-position upflow/downflow/horizontal left/horizontal right
- Constant Torque Motor
- 5 Tons
- 208-230/60/1
- 24 Volt Controls

Touchscreen Programmable Thermostat, 4H/2C (Field Installed)
7.21/9.60 kW Htr w/Ckt Brk 208/240/1 (Field Installed)
External Filter Rack (Field Installed)
Corrosion protection coating – Condenser coil and cabinets

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Product Report - Split System Air Conditioning Units (Small)
Item: C1 Qty: 2 Tag(s): AHU-CU-3, AHU-CU-4

1.5 - 5 Ton Unitary Split System

Unit Overview

System Type	A/C with Air Handler		
Outdoor Unit Model	1.5-5 Ton Split Sys Clg R-454B	**Indoor Unit Model**	
Outdoor Unit Nominal Capacity	060	**Indoor Unit Nominal Capacity**	42 - 60K Cooling Capacity

AHRI Data

AHRI Reference Number	-1
Airflow @ AHRI	1590 cfm
Capacity @ AHRI	55500.00 Btuh
EER2 @ AHRI	11.7
SEER2 @ AHRI	14.30



Unit Electrical

Outdoor Unit	5TTR4060A1	**Indoor Unit**	5TEM4D07AC51
Power Supply	200-230/60/1	**Electric Heat (kW)**	7.21/9.60 kW Htr w/Ckt Brk 208/240/1
		Power Supply	208- 230/60/1

Cooling Performance

Cooling Airflow	2000 cfm	**Net Cooling Capacity**	57834.00 Btuh
Cooling EDB	80.00 F	**Net Sensible Capacity**	44191.00 Btuh
Cooling EWB	67.00 F	**Net Latent Capacity**	13643.00 Btuh
Cooling Outdoor Temp.	95.00 F	**Cooling LDB**	59.20 F
		Cooling LWB	57.60 F

Heating Performance - Electric Heat

Heating Airflow	2000 cfm	**Heating LDB (208v)**	79.34 F
Heating EDB	68.00 F	**Heating Temp. Rise (208v)**	11.34 F
kW (208v)	7.21 kW	**Heating LDB (240v)**	83.10 F
kW (240v)	9.60 kW	**Heating Temp. Rise (240v)**	15.10 F

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Mechanical Specifications - Split System Air Conditioning Units (Small)
Item: C1 Qty: 2 Tag(s): AHU-CU-3, AHU-CU-4

5TTR - General
The outdoor condensing units are factory charged with the system charge required for the outdoor condensing unit, ten (10) feet of tested connecting line, and the smallest rated indoor evaporative coil match. This unit is designed to operate at outdoor ambient temperatures as high as 115°F. Cooling capacities are matched with a wide selection of air handlers and furnace coils that are AHRI certified. The unit is certified to UL 60335-2-40. Exterior is designed for outdoor application.

5TTR - Casing
Unit casing is constructed of heavy gauge, galvanized steel and painted with a weather-resistant powder paint finish. The corner panels are preprinted. All panels are subjected to our 1,000-hour salt spray test.

5TTR - Refrigerant Controls
Refrigeration system controls include condenser fan, compressor contactor and low and high pressure switches. A factory supplied, field installed liquid line drier is standard.

5TTR - Compressor
The compressor features internal over temperature and pressure protection. Other features include: Centrifugal oil pump and low vibration and noise.

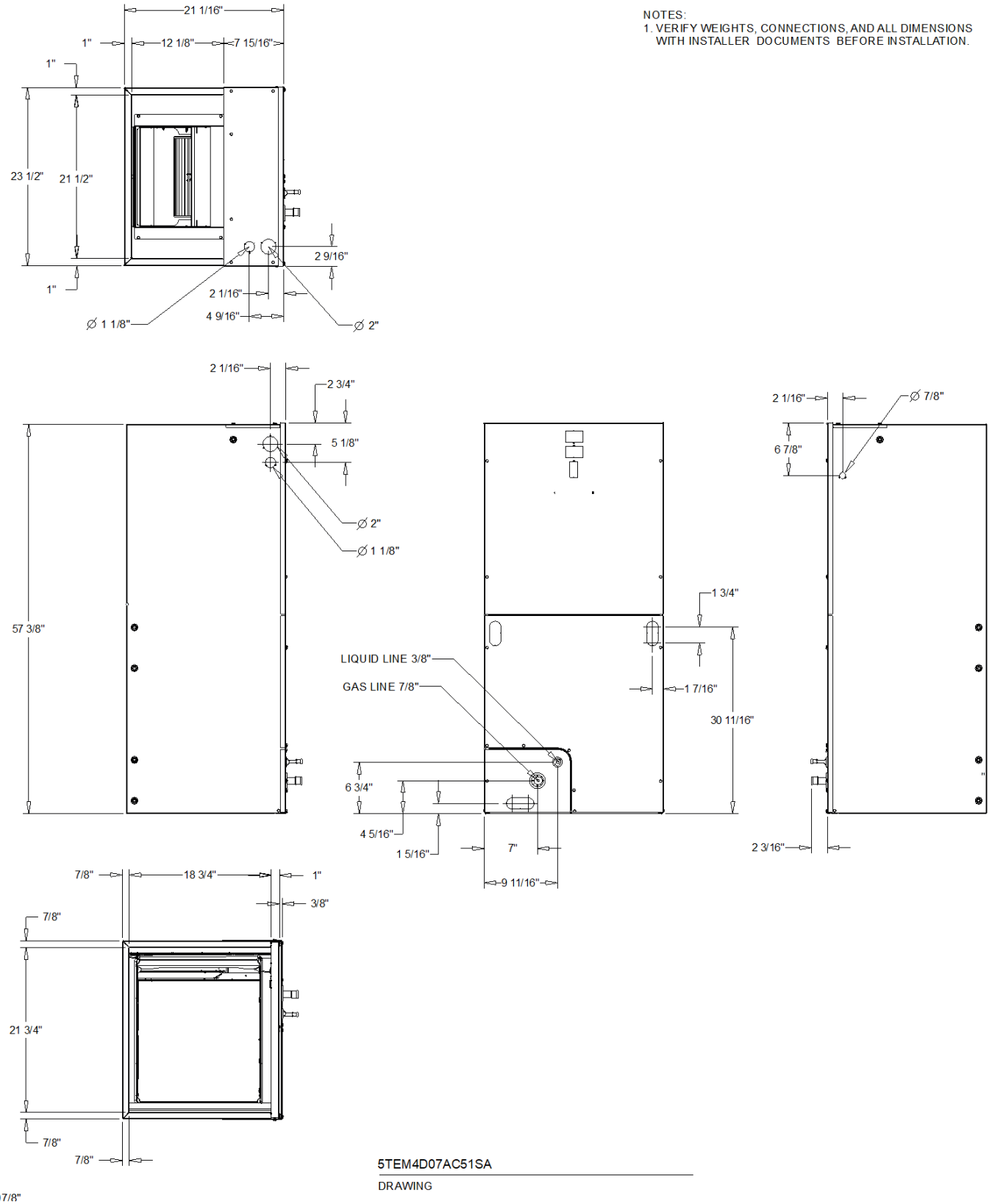
5TTR - Condenser Coil
The outdoor coil provides low airflow resistance and efficient heat transfer. The coil is protected on all four sides by louvered panels.

5TTR - Thermostats
Cooling only and heat/cooling (manual and automatic change over). Sub-base to match thermostat and locking thermostat cover

5TEM4 Convertible Air Handler
Features and Benefits
-Painted metal cabinet with captured foil face insulation
-2% or less air leakage
-R-4.2 Insulating Value
-Multi-Position UP/Down Flow, Horizontal Left /Right
-ALL Aluminum Coil
-Electric Heaters with polarized plug connections (sold as accessory)
-R-454B Thermal Expansion Valve
-ECM Motor
-Low Voltage Pigtail Connections
-Draw Through Design
-Horizontal Drain pan
-Fused 24V Power

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Dimensional Drawings - Split System Air Conditioning Units (Small)
Item: C1 Qty: 2 Tag(s): AHU-CU-3, AHU-CU-4



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Dimensional Drawings - Split System Air Conditioning Units (Small)
Item: C1 Qty: 2 Tag(s): AHU-CU-3, AHU-CU-4

ELECTRICAL / GENERAL DATA

GENERAL (1)(2)(4)	
Model:	5TEM4D07AC51SA
Unit Primary Voltage:	208
Unit Secondary Voltage:	230
Unit Hertz:	60
Unit Phase:	1

STANDARD (5)	
230 Volt / 208 Volt	
Minimum Circuit Ampacity:	8.0/8.0
Maximum Overload Protection:	15.0/15.0

ELECTRIC HEAT	
240 Volt / 208 Volt	
Capacity Circuit #1:	9.60/7.20
Capacity Circuit #2:	N/A
Capacity Circuit #3:	N/A
# of Circuit:	1
Phase:	1
Heater Amps Per Circuit Circuit #1:	40.0/34.6
Heater Amps Per Circuit Circuit #2:	N/A
Heater Amps Per Circuit Circuit #3:	N/A
Minimum Circuit Ampacity Circuit #1:	59.0/51.0
Minimum Circuit Ampacity Circuit #2:	N/A
Minimum Circuit Ampacity Circuit #3:	N/A
Maximum Overload Protection Circuit #1:	60.0/60.0
Maximum Overload Protection Circuit #2:	N/A
Maximum Overload Protection Circuit #3:	N/A

INDOOR MOTOR (1)	
Number:	1
Horsepower:	0.75
Motor Speed (RPM):	-
Phase:	1
Full Load Amps:	6.0
Locked Rotor Amps:	-

REFRIGERANT	
Type:	R-454B
REF. Line Connections	7/8"
Coupling or Conn. Size - Gas:	3/8"
Coupling or Conn. Size - Liq.:	

FILTERS (3)	
Type:	Remote filter
Furnished:	No
Number:	-
Recommended:	-

Weights	
Shipping:	185.0 lb
Net:	174.0 lb

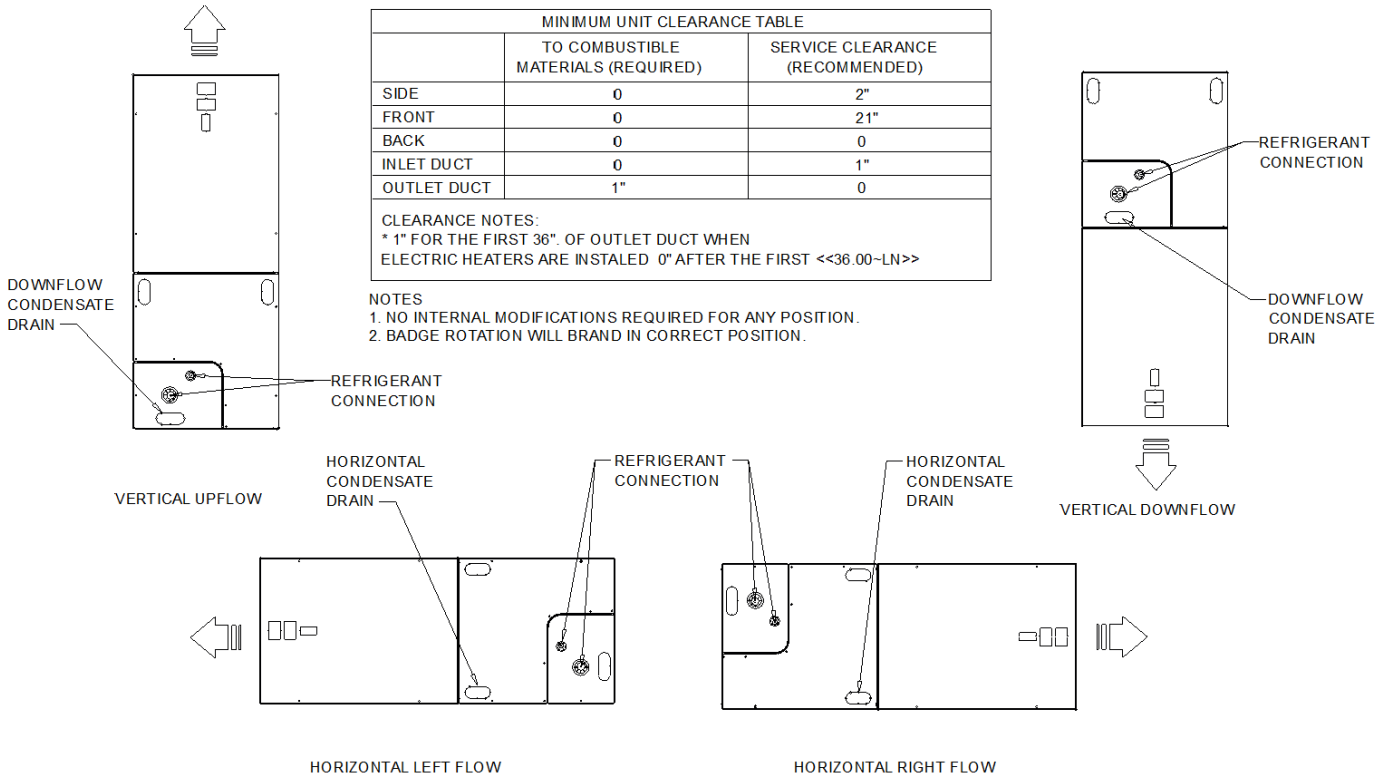
NOTES:

1. These air handlers are a.r.i. certified with various split system air conditioners and heat pumps (ari standard 210/240). refer tothesplit system outdoor unit product data guides for performance data.
2. 3/4" male plastic pipe (ref.: astm 1785-76)
3. Minimum filter size for horizontal applications will be based on airflow selection and will be calculated as follows:
   low velocity filter: face area (sq. ft.) = cfm / 300
   high velocity filter: face area (sq. ft.) = cfm / 500
4. For customer ease of filter maintenance, it is recommended that a properly sized, remote filter and grille be installed for horizontal applications. airflow should not exceed the face value of the filter being used
5. Standard mca and mop without electric heat.

MINIMUM UNIT CLEARANCE TABLE		
	TO COMBUSTIBLE MATERIALS (REQUIRED)	SERVICE CLEARANCE (RECOMMENDED)
SIDE	0	2"
FRONT	0	21"
BACK	0	0
INLET DUCT	0	1"
OUTLET DUCT	1"	0

CLEARANCE NOTES:
* 1" FOR THE FIRST 36". OF OUTLET DUCT WHEN ELECTRIC HEATERS ARE INSTALED 0" AFTER THE FIRST <<36.00~LN>>

NOTES
1. NO INTERNAL MODIFICATIONS REQUIRED FOR ANY POSITION.
2. BADGE ROTATION WILL BRAND IN CORRECT POSITION.



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Dimensional Drawings - Split System Air Conditioning Units (Small)
Item: C1 Qty: 2 Tag(s): AHU-CU-3, AHU-CU-4

ELECTRICAL / GENERAL DATA

MODEL:	5TTR4060A1000*
POWER CONNS. V/PH/HZ:	208/230/1/60
MINIMUM CIRCUIT AMPACITY:	28.0/30.0
MAXIMUM CIRCUIT BREAKER:	50.0
MINIMUM PROTECTION RATING:	50.0
COMPRESSOR:	CLIMATUFF - SCROLL
RL AMPS - LR AMPA:	21.8 - 143 / 23.4 - 134
OUTDOOR FAN FL AMPS:	0.93
FAN HP:	0.20
FAN DIA:	27 1/2"
COIL:	SPINE FIN
REFRIGERANT (R - 454B):	6.3 lb
LINE SIZE O.D. GAS:	7/8"
LINE SIZE O.D. LIQUID:	5/16"

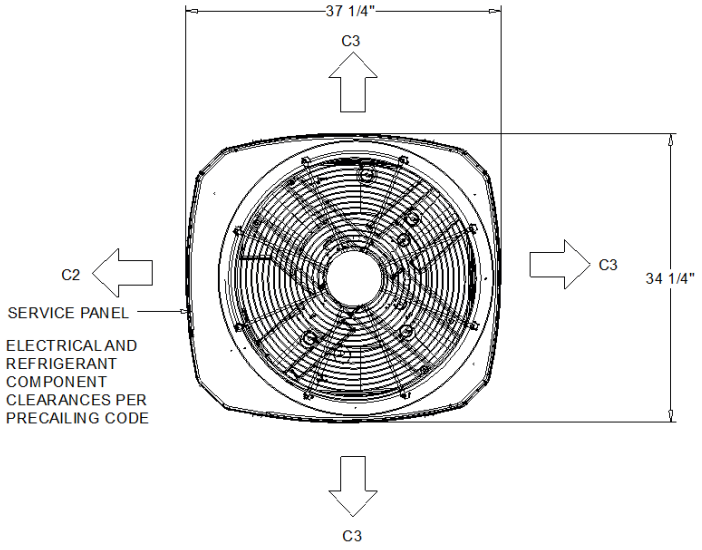
1. CERTIFIED IN ACCORDANCE WITH THE UNITARY AIR-CONDITIONER EQUIPMENT CERTIFICATION PROGRAM WHICH IS BASED ON AHRI STANDARD 210/240.
2. CALCULATED IN ACCORDANCE WITH N.E.C. USE ONLY HACR CIRCUIT BREAKERS OR FUSES.
3. STANDARD LINE LENGTHS - 60'. STANDARD LIFT - 60' SUCTION AND LIQUID LINE. FOR GREATER LENGTHS AND LIFTS REFER TO REFRIGERANT PIPING SOFTWARE PUB# 32-3312-0
4. * = 15, 20, 25, 30, 40 AND 50 FOOT LINESET AVAILABLE.

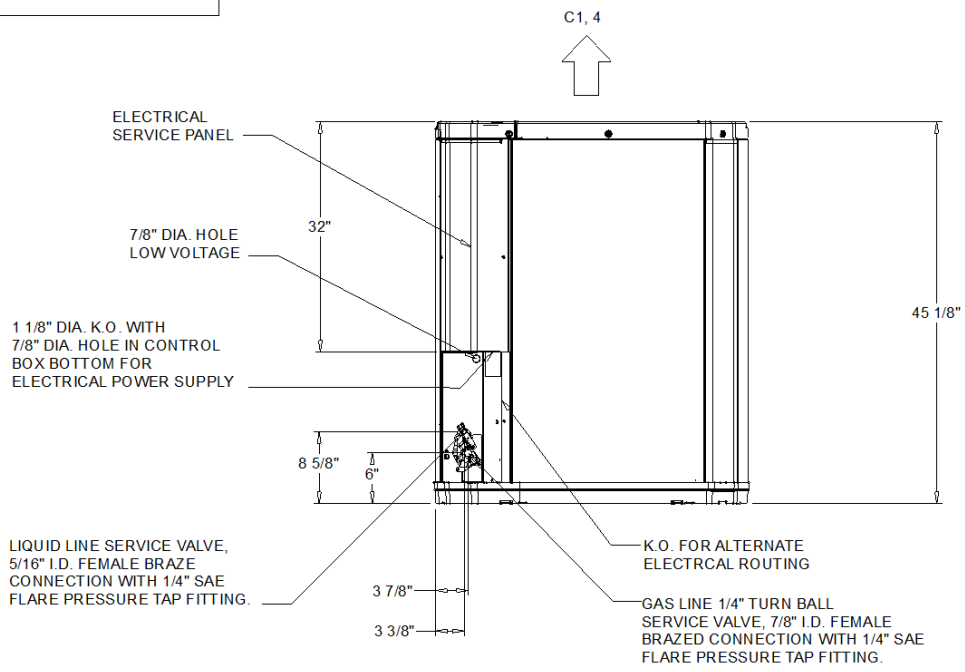
WEIGHTS

SHIPPING:	302.0 lb
NET:	252.0 lb

NOTES:
C1. TOP DISCHARGE SHOULD BE UNRESTRICTED FOR AT LEAST 60" ABOVE UNIT
C2. PLACE UNIT FROM WALL
C3. PLACE SHRUBBERY AT LEAST 12" FROM UNIT ON TWO SIDES, OTHER SIDES UNRESTRICTED
C4. PLACE UNIT SO ROOF RUN-OFF DOES NOT FALL DIRECTLY ON UNIT

NOTES
1. TOP DISCHARGE AREA SHOULD BE UNRESTRICTED FOR AT LEAST 60" ABOVE UNIT. UNIT SHOULD BE PLACED SO ROOF RUN-OFF WATER DOES NOT POUR DIRECTLY ON UNIT, AND SHOULD BE AT LEAST 12" FROM WALL AND ALL SURROUNDING SHRUBBERY ON TWO SIDES. OTHER TWO SIDES UNRESTRICTED.
2. ELECTRICAL AND REFRIGERANT COMPONENT CLEARANCES PER PREVAILING CODES.
3. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION





5TTR4060A1000A

OUTLINE DRAWING

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Tag Data - Coating (Qty: 4)

Item	Tag(s)	Qty
D1	MAT-1-1, MAT-1-2, MAT-1-3, MAT-1-4	4

Product Data - Coating
Item: D1 Qty: 4 Tag(s): MAT-1-1, MAT-1-2, MAT-1-3, MAT-1-4

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Other -

SURFSIL

CHOOSING THE RIGHT SOLUTION FOR THE JOB



Choosing the most appropriate coil coating for the application could save the project thousands of dollars and eliminate repeat treatments. Choosing the wrong coil coating could reduce heat transfer properties and lead to higher energy bills, premature failure, and unnecessary costs.

SURFSIL is a specialty designed hybrid coating unlike any product in the market. By incorporating the best properties of organic and inorganic materials with the latest nano-silane technology, the ideal coil coating solution has been created. Having tailored this product to the HVAC/R industry, it is able to provide superior corrosion protection with unparalleled adhesion strength while maintaining OEM heat-transfer performance. After more than 15,000 hours of ASTM B-117 testing showing NO SIGN OF CORROSION and countless real-world projects in the most extreme environments, there is NO doubt this is the right choice.

DURABILITY

- Superior corrosion and chemical resistance
- Strongest adhesion via covalent chemical bond
- Flexible and scratch resistant

ENERGY SAVINGS

- Thin dry film thickness <1 mil
- No bridging or effect on heat transfer
- Preserves original equipment efficiency

INDOOR AIR QUALITY (IAQ)

- Hydrophobic surface maintains cleanliness
- Inhibits mold, algae, and bacteria growth

REDUCE MAINTENANCE COSTS

- Extends the useful life of HVAC/R equipment
- Simplifies coil cleaning

ELIMINATING CORROSION, ONE JOB AT A TIME

www.surfsil.com

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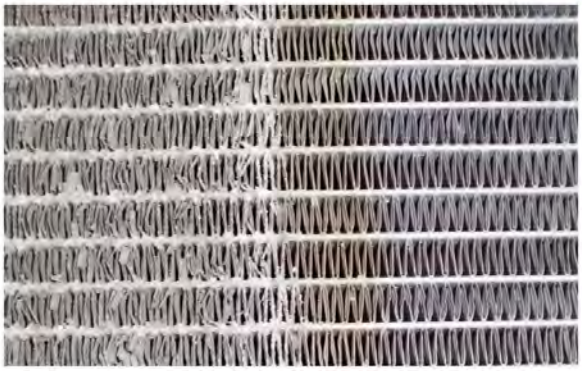
WHICH SIDE WOULD YOU LIKE YOUR COIL TO LOOK LIKE?

PROBLEM / SOLUTION



Test performed for 5,000 hours using ASTM G85 A3 (a more aggressive, modified ASTM B117 using acidified sea water). The image above compares the performance of a bare coil, half of which has been treated with SURFSIL and half left untreated.

PROBLEM / SOLUTION



As the image above shows, even the micro-channel coils tested, using the ASTM G85 A3, show how our intelligent coating design is able to penetrate into all the cavities of the coil, essentially sealing it from its environment and protecting it from corroding.

APPLICABILITY:

Surfsil can be applied on all HVAC/R equipment including:

- Air Handlers
- Packaged Units
- 100% O.A. Units
- Condensing Units
- Mini-Splits / VRF

SURFSIL

TEST PERFORMED

CORROSION, CHEMICAL, AND UV RESISTANCE	MINIMUN RATING
ASTM B117 Salt Spray Test	15,000 hours (No Sign of Corrosion)
ASTM G85-A3 Acidified Sea Water (SWAAT)	5,000 hours (No Sign of Corrosion)
ASTM D870 Water Immersion	1,000 hours (No Effect)
ASTM D4587 UV Exposure	1,000 hours (No Effect)
ABRASION, IMPACT RESISTANCE, AND FLEXIBILITY	**RESULTS**
ASTM D2794 Impact Resistance Test	150 lb/in^2 - No Peeling or Cracking
ASTMD522 Mandrel Bend Test	No Peeling or Cracking
ASTM D3359 Adhesion Test	5B - 0% Removed
ASTM D3363 Hardness Test	5H
MOLD & BACTERIA RESISTANCE	**RESULTS**
ASTM G21 Resistance to Fungi, Mold Growth	Pass (No Growth Observed)
OTHER STANDARDS	**MEETS**
ISO Standard 12944	C5 and CX environments

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MEXICO
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Col. Santiago Occipaco
Naucalpan, Edo.
México - C.P.53250
Phone: (55) 1009-9108

advancoat
CORROSION SPECIALISTS

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Field Installed Options - Part/Order Number Summary
This is a report to help you locate field installed options that arrive at the jobsite. This report provides part or order numbers for each field installed option, and references it to a specific product tag. It is NOT intended as a bill of material for the job.

Product Family - Odyssey Split System Indoor Unit

Item	Tag(s)	Qty	Description	Model Number
A1	AHU-1, AHU-2	2	6 - 25 Ton Unitary Split Systems Indoor	TWE090K3AAA**BC

Field Installed Option Description	Part/Ordering Number
Drip panel kit	BAYDRKT007B
11.25/14.96 kW electric heat 208/240/3/60	BAYHTRS315A

Product Family - Odyssey Split System Outdoor Unit

Item	Tag(s)	Qty	Description	Model Number
B1	CU-1, CU-2	2	6 - 25 Ton Unitary Split Systems Outdoor	TWA090K3AAA**BS

Field Installed Option Description	Part/Ordering Number
Touchscreen programmable thermostat, 4H/2C	TCONT302AS42DA

Product Family - Split System Air Conditioning Units (Small)

Item	Tag(s)	Qty	Description	Model Number
C1	AHU-CU-3, AHU-CU-4	2	1.5 - 5 Ton Unitary Split Systems (SSC)	5TTR4060A1 - 5TEM4D07AC51S

Field Installed Option Description	Part/Ordering Number
Touchscreen Programmable Thermostat, 4H/2C	TCONT302AS42DA
7.21/9.60 kW Htr w/Ckt Brk 208/240/1	BAYHTR1510BRKC
External Filter Rack	BAYSF1235BAA

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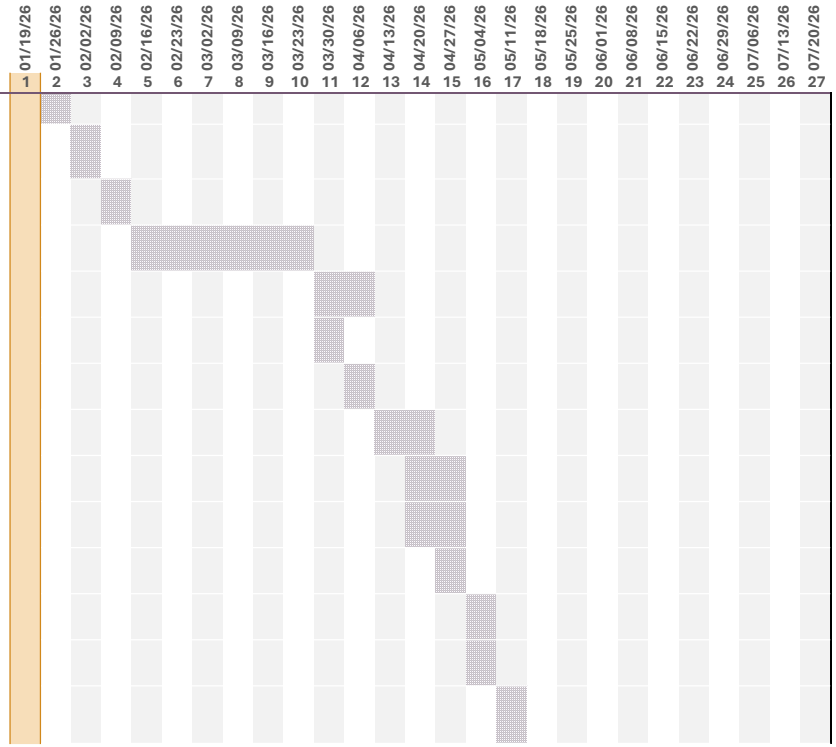
1365 NW 98TH CT UNIT 4, DORAL, FL 33172

https://airchanges.us/

Project Weekly Planner: North Palm Beach Library HVAC Replacement

Period Highlight: 1 | Plan Duration

ACTIVITY	PLAN START	PLAN DURATION	ACTUAL START	ACTUAL DURATION	PERCENT COMPLETE
Notice to Proceed Received	2	1			
Submittals review & approval process.	3	1			
Equipment & long lead time materials order release.	4	1			
Equipment fabrication (6 Weeks).	5	6			
Coating Application.	11	2			
Mobilization & Site Preparation.	11	1			
Demolition & Removal Phase.	12	1			
Refrigerant Piping, Mechanical Systems & LV Installation.	13	2			
Equipment Delivery & Installation.	14	2			
Electrical Work.	14	2			
Finishes, Piping & Completion Work.	15	1			
System Startup, Testing & Commissioning.	16	1			
Closeout Activities.	16	1			
Final Inspection / Handover	17	1			



Proposal

Proposal is valid for 15 days.
Customer must obtain credit approval and release order to production within 60 days of proposal date.

Prepared For:
All Bidders

Date: December 10, 2025

Proposal Number: H4-254476-45973-1

Job Name:
North Palm Beach Library

Opportunity ID: 8466965

Engineer: FAE Consulting

Delivery Terms:
Freight Allowed and Prepaid - F.O.B. Factory

Payment Terms: Net 30 Days

Trane U.S. Inc. is pleased to provide the following proposal for your review and approval based on mechanical drawings dated 10-23-2025.

Two (2) – Odyssey Split System Indoor Unit

Tag(s): AHU-1, AHU-2

Product Data

Air Handler / 7.5 Ton
R-454B refrigerant
208-230/60/3
Single refrigeration circuit
Two-speed airflow
Standard size motor
11.25/14.96 kW electric heater (Field Installed)
Corrosion protection coating – Evaporator coil ONLY

Two (2) – Odyssey Split System Outdoor Unit

Tag(s): CU-1, CU-2

Product Data

Split System Heat Pump / 7.5 Ton
R-454B refrigerant
208-230/60/3
Single Compressor / Single Circuit
Symbio controls
Programmable thermostat (Field Installed)
Corrosion protection coating – Condenser coil and cabinets

Two (2) – Split System Air Conditioning Units (Small)

Tag(s): AHU-CU-3, AHU-CU-4

Product Data

Split System Cooling Outdoor Unit

R-454B
5 Ton Nominal Cooling Capacity
200/230/60/1

Air Handler

Multi-poise 4-way
Constant Torque Motor
5 Tons
208-230/60/1

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Sensitivity: Highly Confidential

24 Volt Controls
Programmable Thermostat (Field Installed)
7.21/9.60 kW Electric Heater (Field Installed)
External Filter Rack (Field Installed)
Corrosion protection coating – Coils and condenser cabinet

NOT INCLUDED: Installation/rigging/startup/training/supervision, warranty beyond Trane standard or as listed above, disconnect, smoke detectors, refrigerant piping and specialties, external vibration isolators, dampers, communication interface, Tie-In to BAS, condensate pumps, float switches, plenums, stands, sensors, extra materials/filters, bipolar ionizers, hurricane tie downs, any material or labor not specifically described in this proposal.

Total Net Price *(excluding sales tax)* .....

Trane shall have the right, at its discretion, to pass along any related increases should (1) its costs related to the manufacture, supply, and shipping for any product or service materially increase. This includes, but is not limited to, cost increases in raw materials, supplier components, labor, utilities, freight, logistics, wages and benefits, regulatory compliance, or any other event beyond Company's control and/or (2) any tariffs, taxes, levies or fees affecting, placed on or related to any product or service materially increases.

Sincerely,

Will Sawarynski
Trane U.S. Inc.
2884 Corporate Way
Miramar, FL 33025

This proposal is subject to your acceptance of the attached Trane terms and conditions.

Sensitivity: Highly Confidential
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TERMS AND CONDITIONS - COMMERCIAL EQUIPMENT

"Company" shall mean Trane U.S. Inc. for sales in the United States and Trane Canada ULC for sales in Canada.

1. Acceptance. These terms and conditions are an integral part of Company's offer and form the basis of any agreement (the "Agreement") resulting from Company's proposal (the "Proposal") for the sale of the described commercial equipment and any ancillary services (the "Equipment"). COMPANY'S TERMS AND CONDITIONS AND EQUIPMENT PRICES ARE SUBJECT TO PERIODIC CHANGE OR AMENDMENT. The Proposal is subject to acceptance in writing by the party to whom this offer is made or an authorized agent ("Customer") delivered to Company within 15 days from the date of the Proposal. Prices in the Proposal are subject to change at any time upon notice to Customer. If Customer accepts the Proposal by placing an order, without the addition of any other terms and conditions of sale or any other modification, Customer's order shall be deemed acceptance of the Proposal subject to Company's terms and conditions. If Customer's order is expressly conditioned upon Company's acceptance or assent to terms and/or conditions other than those expressed herein, return of such order by Company with Company's terms and conditions attached or referenced serves as Company's notice of objection to Customer's terms and as Company's counteroffer to provide Equipment in accordance with the Proposal and the Company's terms and conditions. If Customer does not reject or object in writing to Company within 10 days, Company's counteroffer will be deemed accepted. Notwithstanding anything to the contrary herein, Customer's acceptance of the Equipment will in any event constitute an acceptance by Customer of Company's terms and conditions. This Agreement is subject to credit approval by Company. Upon disapproval of credit, Company may delay or suspend performance or, at its option, renegotiate prices and/or terms and conditions with Customer. If Company and Customer are unable to agree on such revisions, this Agreement shall be cancelled without any liability.

2. Connected Services. In addition to these terms and conditions, the Connected Services Terms of Service ("Connected Services Terms"), available at https://www.trane.com/TraneConnectedServicesTerms, as updated from time to time, are incorporated herein by reference and shall apply to the extent that Company provides Customer with Connected Services, as defined in the Connected Services Terms.

3. Title and Risk of Loss. All Equipment sales with destinations to Canada or the U.S. shall be made as follows: FOB Company's U.S. manufacturing facility or warehouse (full freight allowed). Title and risk of loss or damage to Equipment will pass to Customer upon tender of delivery of such to carrier at Company's U.S. manufacturing facility or warehouse.

4. Pricing and Taxes., Within forty-five (45) days following Customer acceptance of the Proposal without addition of any other terms and conditions of sale or any modification, Customer shall provide notification of release for immediate production at Company's factory. Prices for Equipment are subject to change at any time prior to shipment to reflect any cost increases related to the manufacture, supply, and shipping of Equipment. This includes, but is not limited to, cost increases in raw materials, supplier components, labor, utilities, freight, logistics, wages and benefits, regulatory compliance, or any other event beyond Company's control. If shipment is delayed due to Customer's actions, Company may also charge Customer with storage fees. If a release is not received within 6 months following order acceptance, Company reserves the right to cancel any order. Company shall be entitled to equitable adjustments in the contract price to reflect any cost increases as set forth above and will provide notice to Customer prior to the date for which the increased price is to be in effect for the applicable customer contract. In no event will prices be decreased. The price of Equipment does not include any present or future foreign, federal, state, or local property, license, privilege, sales, use, excise, value added, gross receipts or other like taxes or assessments. Such amounts will be itemized separately to Customer, who will make prompt payment to Company. Company will accept valid exemption documentation for such taxes and assessments from Customer, if applicable. All prices include packaging in accordance with Company's standard procedures. Charges for special packaging, crating or packing are the responsibility of Customer.

5. Delivery and Delays. Delivery dates are approximate and not guaranteed. Company will use commercially reasonable efforts to deliver the Equipment on or before the estimated delivery date, will notify Customer if the estimated delivery dates cannot be honored, and will deliver the Equipment and services as soon as practicable thereafter. In no event will Company be liable for any damages or expenses caused by delays in delivery.

6. Performance. Company shall be obligated to furnish only the Equipment described in the Proposal and in submittal data (if such data is issued in connection with the order). Company may rely on the acceptance of the Proposal and submittal data as acceptance of the suitability of the Equipment for the particular project or location. Unless specifically stated in the Proposal, compliance with any local building codes or other laws or regulations relating to specifications or the location, use or operation of the Equipment is the sole responsibility of Customer. If Equipment is tendered that does not fully comply with the provisions of this Agreement and Equipment is rejected by Customer, Company will have the right to cure within a reasonable time after notice thereof by substituting a conforming tender whether or not the time for performance has passed.

7. Force Majeure. Company's duty to perform under this Agreement and the Equipment prices are contingent upon the non-occurrence of an Event of Force Majeure. If the Company shall be unable to carry out any material obligation under this Agreement due to an Event of Force Majeure, this Agreement shall at Company's election (i) remain in effect but Company's obligations shall be suspended until the uncontrollable event terminates or (ii) be terminated upon 10 days' notice to Customer, in which event Customer shall pay Company for all parts of the Work furnished to the date of termination. An "Event of Force Majeure" shall mean any cause or event beyond the control of Company. Without limiting the foregoing, "Event of Force Majeure" includes: acts of God; acts of terrorism, war or the public enemy; flood; earthquake; tornado; storm; fire; civil disobedience; pandemic insurrections; riots; labor/labour disputes; labor/labour or material shortages; sabotage; restraint by court order or public authority (whether valid or invalid); and action or non-action by or inability to obtain or keep in force the necessary governmental authorizations, permits, licenses, certificates or approvals if not caused by Company; and the requirements of any applicable government in any manner that diverts either the material or the finished product to the direct or indirect benefit of the government.

8. Limited Warranty. Company warrants the Equipment manufactured by Company for a period of the lesser of 12 months from initial start-up or 18 months from date of shipment, whichever is less, against failure due to defects in material and manufacture and that it has the capacities and ratings set forth in Company's catalogs and bulletins ("Warranty"). **Equipment manufactured by Company that includes required start-up and sold in North America will not be warranted by Company unless Company performs the Equipment startup**. Exclusions from this Warranty include damage or failure arising from: wear and tear; corrosion, erosion, deterioration; modifications made by others to the Equipment; repairs or alterations by a party other than Company that adversely affects the stability or reliability of the Equipment; vandalism; neglect; accident; adverse weather or environmental conditions; abuse or improper use; improper installation; commissioning by a party other than Company; unusual physical or electrical or mechanical stress; operation with any accessory, equipment or part not specifically approved by Company; refrigerant not supplied by Company; and/or lack of proper maintenance as recommended by Company. Company shall not be obligated to pay for the cost of lost refrigerant or lost product. Company's obligations and liabilities under this Warranty are limited to furnishing replacement equipment or parts, at its option, FCA (Incoterms 2000) factory or warehouse (f.o.b. factory or warehouse for US domestic purposes) at Company-designated shipping point, freight-allowed to Company's warranty agent's stock location, for all non-conforming Company-manufactured Equipment (which have been returned by Customer to Company). Returns must have prior written approval by Company and are subject to restocking charge where applicable. Equipment, material and/or parts that are not manufactured by Company ("Third-Party Product(s)") are not warranted by Company and have such warranties as may be extended by the respective manufacturer. **CUSTOMER UNDERSTANDS THAT COMPANY IS NOT THE MANUFACTURER OF ANY THIRD-PARTY PRODUCT(S) AND ANY WARRANTIES, CLAIMS, STATEMENTS, REPRESENTATIONS, OR SPECIFICATIONS ARE THOSE OF THE THIRD-PARTY MANUFACTURER, NOT COMPANY AND CUSTOMER IS NOT RELYING ON ANY WARRANTIES, CLAIMS, STATEMENTS, REPRESENTATIONS, OR SPECIFICATIONS REGARDING THE THIRD-PARTY PRODUCT THAT MAY BE PROVIDED BY COMPANY OR ITS AFFILIATES, WHETHER ORAL OR WRITTEN. COMPANY MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND, INCLUDING WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE.ADDITIONALLY, COMPANY MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING PREVENTING., ELIMINATING, REDUCING OR INHIBITING ANY MOLD, FUNGUS, BACTERIA, VIRUS, MICROBIAL GROWTH, OR ANY OTHER CONTAMINANTS (INCLUDING COVID-19 OR ANY SIMILAR VIRUS) (COLLECTIVELY, "CONTAMINANTS"), WHETHER INVOLVING OR IN CONNECTION WITH EQUIPMENT, ANY COMPONENT THEREOF, SERVICES OR OTHERWISE. IN NO EVENT SHALL COMPANY HAVE ANY LIABILITY FOR THE PREVENTION, ELIMINATION, REDUCTION OR INHIBITION OF THE GROWTH OR SPREAD OF SUCH CONTAMINANTS INVOLVING OR IN CONNECTION WITH ANY EQUIPMENT, THIRD-PARTY PRODUCT, OR ANY COMPONENT THEREOF, SERVICES OR OTHERWISE AND CUSTOMER HEREBY SPECIFICALLY ACKNOWLDGES AND AGREES THERETO.** No warranty liability whatsoever shall attach to Company until Customer's complete order has been paid for in full and Company's liability under this Warranty shall be limited to the purchase price of the Equipment shown to be defective. Additional warranty protection is available on an extra-cost basis and must be in writing and agreed to by an authorized signatory of the Company. **EXCEPT FOR COMPANY'S WARRANTY EXPRESSLY SET FORTH HEREIN, COMPANY DOES NOT MAKE, AND HEREBY EXPRESSLY DISCLAIMS, ANY WARRANTIES, EXPRESS OR IMPLIED CONCERNING ITS PRODUCTS, EQUIPMENT OR SERVICES, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF DESIGN, MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR OTHERS THAT ARE ALLEGED TO ARISE FROM COURSE OF DEALING OR TRADE.**

9. Indemnity. To the fullest extent permitted by law, Company and Customer shall indemnify, defend and hold harmless each other from any and all claims, actions, costs, expenses, damages and liabilities, including reasonable attorneys' fees, resulting from death or bodily injury or damage to real or personal property, to the extent caused by the negligence or misconduct of their respective employees or other authorized agents in connection with their activities within the scope of this Agreement. Neither party shall indemnify the other against claims, damages, expenses or liabilities to the extent attributable to the acts or omissions of the other party. If the parties are both at fault, the obligation to indemnify shall be proportional to their relative fault. The duty to indemnify will continue in full force and effect, notwithstanding the expiration or early termination hereof, with respect to any claims based on facts or conditions that occurred prior to expiration or termination.

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10. Insurance. Upon request, Company will furnish evidence of its standard insurance coverage. If Customer has requested to be named as an additional insured under Company's insurance policy, Company will do so but only subject to Company's manuscript additional insured endorsement under its primary Commercial General Liability policies. In no event does Company waive any rights of subrogation.

11. Customer Breach. Each of the following events or conditions shall constitute a breach by Customer and shall give Company the right, without an election of remedies, to terminate this Agreement, require payment prior to shipping, or suspend performance by delivery of written notice: (1) Any failure by Customer to pay amounts when due; (2) any general assignment by Customer for the benefit of its creditors, or if Customer becomes bankrupt or insolvent or takes the benefit of any statute for bankrupt or insolvent debtors, or makes or proposes to make any proposal or arrangement with creditors, or if any steps are taken for the winding up or other termination of Customer or the liquidation of its assets, or if a trustee, receiver, or similar person is appointed over any of the assets or interests of Customer; (3) Any representation or warranty furnished by Customer in connection with this Agreement is false or misleading in any material respect when made; or (4) Any failure by Customer to perform or comply with any material provision of this Agreement. Customer shall be liable to the Company for all Equipment furnished and all damages sustained by Company (including lost profit and overhead).

12. Limitation of Liability. NOTWITHSTANDING ANYTHING TO THE CONTRARY, IN NO EVENT SHALL COMPANY BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT CONSEQUENTIAL, PUNITIVE, EXEMPLARY DAMAGES (INCLUDING WITHOUT LIMITATION REFRIGERANT LOSS, BUSINESS INTERRUPTION, LOST DATA, LOST REVENUE, LOST PROFITS),OR CONTAMINANTS LIABILITIES, EVEN IF A PARTY HAS BEEN ADVISED OF SUCH POSSIBLE DAMAGES OR IF SAME WERE REASONABLY FORESEEABLE AND REGARDLESS OF WHETHER THE CAUSE OF ACTION IS FRAMED IN CONTRACT, NEGLIGENCE, ANY OTHER TORT, WARRANTY, STRICT LIABILITY, OR PRODUCT LIABILITY. In no event will Company's liability in connection with the provision of products or services or otherwise under this Agreement exceed the entire amount paid to Company by Customer under this Agreement.

13. CONTAMINANTS LIABILITY

The transmission of COVID-19 may occur in a variety of ways and circumstances, many of the aspects of which are currently not known. HVAC systems, products, services and other offerings have not been tested for their effectiveness in reducing the spread of COVID-19, including through the air in closed environments**. IN NO EVENT WILL COMPANY BE LIABLE UNDER THIS AGREEMENT OR OTHERWISE FOR ANY INDEMNIFICATION, ACTION, OR CLAIM, WHETHER BASED ON WARRANTY, CONTRACT, TORT OR OTHERWISE, FOR ANY BODILY INJURY (INCLUDING DEATH), DAMAGE TO PROPERTY, OR ANY OTHER LIABILITIES, DAMAGES OR COSTS RELATED TO CONTAMINANTS (INCLUCING THE SPREAD, TRANSMISSION, MITIGATION, ELIMINATION, OR CONTAMINATION THEREOF) (COLLECTIVELY, "CONTAMINANTS LIABILITIES") AND CUSTOMER HEREBY EXPRESSLY RELEASES COMPANY FROM ANY SUCH CONTAMINANTS LIABILITIES.**

14. Nuclear Liability. In the event that the Equipment sold hereunder is to be used in a nuclear facility, Customer will, prior to such use, arrange for insurance or governmental indemnity protecting Company against all liability and hereby releases and agrees to indemnify Company and its suppliers for any nuclear damage, including loss of use, in any manner arising out of a nuclear incident, whether alleged to be due, in whole or in part to the negligence or otherwise of Company or its suppliers.

15. Intellectual Property; Patent Indemnity. Company retains all ownership, license and other rights to all patents, trademarks, copyrights, trade secrets and other intellectual property rights related to the Equipment, and, except for the right to use the Equipment sold, Customer obtains no rights to use any such intellectual property. Company agrees to defend any suit or proceeding brought against Customer so far as such suit or proceeding is solely based upon a claim that the use of the Equipment provided by Company constitutes infringement of any patent of the United States of America, provided Company is promptly notified in writing and given authority, information and assistance for defense of same. Company will, at its option, procure for Customer the right to continue to use said Equipment, or modify it so that it becomes non-infringing, or replace same with non-infringing Equipment, or to remove said Equipment and to refund the purchase price. The foregoing will not be construed to include any Agreement by Company to accept any liability whatsoever in respect to patents for inventions including more than the Equipment furnished hereunder, or in respect of patents for methods and processes to be carried out with the aid of said Equipment. The provision of Equipment by Company does not convey any license, by implication, estoppel, or otherwise, under patent claims covering combinations of said Equipment with other devices or elements. The foregoing states the entire liability of Company with regard to patent infringement. Notwithstanding the provisions of this paragraph, Customer will hold Company harmless against any expense or loss resulting from infringement of patents or trademarks arising from compliance with Customer's designs or specifications or instructions.

16. Cancellation. Equipment is specially manufactured in response to orders. An order placed with and accepted by Company cannot be delayed, canceled, suspended, or extended except with Company's written consent and upon written terms accepted by Company that will reimburse Company for and indemnify Company against loss and provide Company with a reasonable profit for its materials, time, labor, services, use of facilities and otherwise. Customer will be obligated to accept any Equipment shipped, tendered for delivery or delivered by Company pursuant to the order prior to any agreed delay, cancellation, suspension or extension of the order. Any attempt by Customer to unilaterally revoke, delay or suspend acceptance for any reason whatever after it has agreed to delivery of or accepted any shipment shall constitute a breach of this Agreement. For purposes of this paragraph, acceptance occurs by any waiver of inspection, use or possession of Equipment, payment of the invoice, or any indication of exclusive control exercised by Customer.

17. Invoicing and Payment. Unless otherwise agreed to in writing by Company, equipment shall be invoiced to Customer upon tender of delivery thereof to the carrier. Customer shall pay Company's invoices within net 30 days of shipment date. Company reserves the right to add to any account outstanding for more than 30 days a service charge equal to the lesser of the maximum allowable legal interest rate or 1.5% of the principal amount due at the end of each month. Customer shall pay all costs (including attorneys' fees) incurred by Company in attempting to collect amounts due and otherwise enforcing these terms and conditions. If requested, Company will provide appropriate lien waivers upon receipt of payment. Company may at any time decline to ship, make delivery or perform work except upon receipt of cash payment, letter of credit, or security, or upon other terms and conditions satisfactory to Company. Customer agrees that, unless Customer makes payment in advance, Company will have a purchase money security interest in all Equipment to secure payment in full of all amounts due Company and its order for the Equipment, together with these terms and conditions, form a security agreement (as defined by the UCC in the United States and as defined in the Personal Property Security Act in Canada). Customer shall keep the Equipment free of all taxes and encumbrances, shall not remove the Equipment from its original installation point and shall not assign or transfer any interest in the Equipment until all payments due Company have been made. The purchase money security interest granted herein attaches upon Company's acceptance of Customer's order and on receipt of the Equipment described in the accepted Proposal but prior to its installation. The parties have no agreement to postpone the time for attachment unless specifically noted in writing on the accepted order. Customer will have no rights of set off against any amounts, which become payable to Company under this Agreement or otherwise.

18. Claims. Company will consider claims for concealed shortages in shipments or rejections due to failure to conform to an order only if such claims or rejections are made in writing within 15 days of delivery and are accompanied by the packing list and, if applicable, the reasons in detail why the Equipment does not conform to Customer's order. Upon receiving authorization and shipping instructions from authorized personnel of Company, Customer may return rejected Equipment, transportation charges prepaid, for replacement. Company may charge Customer any costs resulting from the testing, handling, and disposition of any Equipment returned by Customer which are not found by Company to be nonconforming. All Equipment damaged during shipment and all claims relating thereto must be made with the freight carrier in accordance with such carrier's policies and procedures. Claims for Equipment damaged during shipment are not covered under the warranty provision stated herein.

19. Export Laws. The obligation of Company to supply Equipment under this Agreement is subject to the ability of Company to supply such items consistent with applicable laws and regulations of the United States and other governments. Company reserves the right to refuse to enter into or perform any order, and to cancel any order, under this Agreement if Company in its sole discretion determines that performance of the transaction to which such order relates would violate any such applicable law or regulation. Customer will pay all handling and other similar costs from Company's factories including the costs of freight, insurance, export clearances, import duties and taxes. Customer will be "exporter of record" with respect to any export from the United States of America and will perform all compliance and logistics functions in connection therewith and will also comply with all applicable laws, rules and regulations. Customer understands that Company and/or the Equipment are subject to laws and regulations of the United States of America which may require licensing or authorization for and/or prohibit export, re-export or diversion of Company's Equipment to certain countries, and agrees it will not knowingly assist or participate in any such diversion or other violation of applicable United States of America laws and regulations. Customer agrees to hold harmless and indemnify Company for any damages resulting to Customer or Company from a breach of this paragraph by Customer.

20. General. Except as provided below, to the maximum extent provided by law, this Agreement is made and shall be interpreted and enforced in accordance with the laws of the state of New York for Equipment shipped to a U.S. location and the laws of the province to which Equipment is shipped within Canada, without regard to its conflict of law principles that might otherwise call for the application of a different state's or province's law, and not including the United Nations Convention on Contracts for the International Sale of Goods. To the extent the Equipment is being used at a site owned and/or operated by any agency of the Federal Government, determination of any substantive issue of law shall be according to the Federal common law of Government contracts as enunciated and applied by Federal judicial bodies and boards of contract appeals of the Federal Government. This Agreement contains all of the agreements, representations and understandings of the parties and supersedes all previous understandings, commitments or agreements, oral or written, related to the subject matter hereof. This Agreement may not be amended, modified or terminated except by a writing signed by the parties hereto. No documents shall be incorporated herein by reference except to the extent Company is a signatory thereon. If any term or condition of this Agreement is invalid, illegal or incapable of being enforced by any rule of law, all other terms and conditions of this Agreement will nevertheless remain in full force and effect as long as the economic or legal substance of the transaction contemplated hereby is not affected in a manner adverse to any party hereto. Customer may not assign, transfer, or convey this Agreement, or any part hereof, or its right, title or interest herein, without the written consent of the Company. Subject to the foregoing, this Agreement shall be binding upon and inure to the benefit of Customer's permitted successors and assigns. This Agreement may be executed in several

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counterparts, each of which when executed shall be deemed to be an original, but all together shall constitute but one and the same Agreement. A fully executed facsimile copy hereof or the several counterparts shall suffice as an original.

21. Federal Requirements. The Parties shall comply with all United States federal labor law obligations under 29 CFR part 471, appendix A to subpart A. THE FOLLOWING PROVISIONS ARE INCORPORATED HEREIN BY REFERENCE: Executive Order 11701 and 41 CFR §§ 60-250.5(a), 60-300.5; Executive Order 11758 and 41 CFR § 60-741.5(a); U.S. immigration laws, including the L-1 Visa Reform Act of 2004 and the H-1B Visa Reform Act of 2004; and Executive Order 13496. The Parties shall abide by the requirements of 41 CFR 60-300.5(a) and 60-741.5(a). These regulations prohibit discrimination against qualified individuals based on their status as protected veterans or individuals with disabilities. Moreover, these regulations require that covered prime contractors and subcontractors take affirmative action to employ and advance in employment individuals without regard to protected veteran status or disability. The Parties certify that they do not operate any programs promoting DEI that violate any applicable United States anti-discrimination laws and acknowledge and agree that their compliance with all applicable federal anti-discrimination laws is material to the federal government's payment decisions. The Parties acknowledge and agree that their employment, procurement, and contracting practices shall not consider race, color, sex, sexual preference, religion, or national origin in ways that violate United States federal civil rights laws.

22. U.S. Government Work.

The following provision applies only to direct sales by Company to the US Government. The Parties acknowledge that Equipment ordered and delivered under this Agreement are Commercial Items as defined under Part 12 of the Federal Acquisition Regulation (FAR). In particular, Company agrees to be bound only by those Federal contracting clauses that apply to "commercial" suppliers and that are contained in FAR 52.212-5(e)(1).

The following provision applies only to indirect sales by Company to the US Government. As a Commercial Item Subcontractor, Company accepts only the following mandatory flow down provisions: 52.219-8; 52.222-26; 52.222-35; 52.222-36; 52.222-39; 52.247-64. If the sale of the Equipment is in connection with a U.S. Government contract, Customer certifies that it has provided and will provide current, accurate, and complete information, representations and certifications to all government officials, including but not limited to the contracting officer and officials of the Small Business Administration, on all matters related to the prime contract, including but not limited to all aspects of its ownership, eligibility, and performance. Anything herein notwithstanding, Company will have no obligations to Customer unless and until Customer provides Company with a true, correct and complete executed copy of the prime contract. Upon request, Customer will provide copies to Company of all requested written communications with any government official related to the prime contract prior to or concurrent with the execution thereof, including but not limited to any communications related to Customer's ownership, eligibility or performance of the prime contract. Customer will obtain written authorization and approval from Company prior to providing any government official any information about Company's performance of the work that is the subject of the Proposal or this Agreement, other than the Proposal or this Agreement.

23. Limited Waiver of Sovereign Immunity. If Customer is an Indian tribe (in the U.S.) or a First Nation or Band Council (in Canada), Customer, whether acting in its capacity as a government, governmental entity, a duly organized corporate entity or otherwise, for itself and for its agents, successors, and assigns: (1) hereby provides this limited waiver of its sovereign immunity as to any damages, claims, lawsuit, or cause of action (herein "Action") brought against Customer by Company and arising or alleged to arise out of the furnishing by Company of any product or service under this Agreement, whether such Action is based in contract, tort, strict liability, civil liability or any other legal theory; (2) agrees that jurisdiction and venue for any such Action shall be proper and valid (a) if Customer is in the U.S., in any state or United States court located in the state in which Company is performing this Agreement or (b) if Customer is in Canada, in the superior court of the province or territory in which the work was performed; (3) expressly consents to such Action, and waives any objection to jurisdiction or venue; (4) waives any requirement of exhaustion of tribal court or administrative remedies for any Action arising out of or related to this Agreement; and (5) expressly acknowledges and agrees that Company is not subject to the jurisdiction of Customer's tribal court or any similar tribal forum, that Customer will not bring any action against Company in tribal court, and that Customer will not avail itself of any ruling or direction of the tribal court permitting or directing it to suspend its payment or other obligations under this Agreement. The individual signing on behalf of Customer warrants and represents that such individual is duly authorized to provide this waiver and enter into this Agreement and that this Agreement constitutes the valid and legally binding obligation of Customer, enforceable in accordance with its terms.

1-26.130-4 (0225)
Supersedes 1-26.130-4(1024)

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SECURITY ADDENDUM

This Addendum shall be applicable to the sale, installation and use of Trane equipment and the sale and provision of Trane services. "Trane" shall mean Trane U.S. Inc. for sales and services in the United States, or Trane Canada ULC for sales and services in Canada.

1. **Definitions.** All terms used in this Addendum shall have the meaning specified in the Agreement unless otherwise defined herein. For the purposes of this Addendum, the following terms are defined as follows:
"Customer Data" means Customer account information as related to the Services only and does not include HVAC Machine Data or personal data. Trane does not require, nor shall Customer provide personal data to Trane under the Agreement. Such data is not required for Trane to provide its Equipment and/or Services to the Customer.
"Equipment" shall have the meaning set forth in the Agreement.
"HVAC Machine Data" means data generated and collected from the product or furnished service without manual entry. HVAC Machine Data is data relating to the physical measurements and operating conditions of a HVAC system, such as but not limited to, temperatures, humidity, pressure, HVAC equipment status. HVAC Machine Data does not include Personal Data and, for the purposes of this agreement, the names of users of Trane's controls products or hosted applications shall not be Personal Data, if any such user chooses to use his/her name(s) in the created accounts within the controls product (e.g., firstname.lastname@address.com). HVAC Machine Data may be used by Trane: (a) to provide better support services and/or products to users of its products and services; (b) to assess compliance with Trane terms and conditions; (c) for statistical or other analysis of the collective characteristics and behaviors of product and services users; (d) to backup user and other data or information and/or provide remote support and/or restoration; (e) to provide or undertake: engineering analysis; failure analysis; warranty analysis; energy analysis; predictive analysis; service analysis; product usage analysis; and/or other desirable analysis, including, but not limited to, histories or trends of any of the foregoing; and (f) to otherwise understand and respond to the needs of users of the product or furnished service. "Personal Data" means data and/or information that is owned or controlled by Customer, and that names or identifies, or is about a natural person, such as: (i) data that is explicitly defined as a regulated category of data under any data privacy laws applicable to Customer; (ii) non-public personal information ("NPI") or personal information ("PI"), such as national identification number, passport number, social security number, social insurance number, or driver's license number; (iii) health or medical information, such as insurance information, medical prognosis, diagnosis information, or genetic information; (iv) financial information, such as a policy number, credit card number, and/or bank account number; (v) personally identifying technical information (whether transmitted or stored in cookies, devices, or otherwise), such as IP address, MAC address, device identifier, International Mobile Equipment Identifier ("IMEI"), or advertising identifier; (vi) biometric information; and/or (vii) sensitive personal data, such as, race, religion, marital status, disability, gender, sexual orientation, geolocation, or mother's maiden name.
"Security Incident" shall refer to (i) a compromise of any network, system, application or data in which Customer Data has been accessed or acquired by an unauthorized third party; (ii) any situation where Trane reasonably suspects that such compromise may have occurred; or (iii) any actual or reasonably suspected unauthorized or illegal Processing, loss, use, disclosure or acquisition of or access to any Customer Data.
"Services" shall have the meaning set forth in the Agreement.

2. HVAC Machine Data; Access to Customer Extranet and Third Party Systems. If Customer grants Trane access to HVAC Machine Data via web portals or other non-public websites or extranet services on Customer's or a third party's website or system (each, an "Extranet"), Trane will comply with the following:
    a. Accounts. Trane will ensure that Trane's personnel use only the Extranet account(s) designated by Customer and will require Trane personnel to keep their access credentials confidential.
    b. Systems. Trane will access the Extranet only through computing or processing systems or applications running operating systems managed by Trane that include: (i) system network firewalls; (ii) centralized patch management; (iii) operating system appropriate anti-malware software; and (iv) for portable devices, full disk encryption.
    c. Restrictions. Unless otherwise approved by Customer in writing, Trane will not download, mirror or permanently store any HVAC Machine Data from any Extranet on any medium, including any machines, devices or servers.
    d. Account Termination. Trane will terminate the account of each of Trane's personnel in accordance with Trane's standard practices after any specific Trane personnel who has been authorized to access any Extranet (1) no longer needs access to HVAC Machine Data or (2) no longer qualifies as Trane personnel (e.g., the individual leaves Trane's employment).
    e. Third Party Systems. Trane will provide Customer prior notice before it uses any third party system that stores or may otherwise have access to HVAC Machine Data, unless (1) the data is encrypted and (2) the third party system will not have access to the decryption key or unencrypted "plain text" versions of the HVAC Machine Data.

3. Customer Data; Confidentiality. Trane shall keep confidential, and shall not access or use any Customer Data and information that is marked confidential or by its nature is considered confidential ("Customer Confidential Information") other than for the purpose of providing the Equipment and Services, and will disclose Customer Confidential Information only: (i) to Trane's employees and agents who have a need to know to perform the Services, (ii) as expressly permitted or instructed by Customer, or (iii) to the minimum extent required to comply with applicable law, provided that Trane (1) provides Customer with prompt written notice prior to any such disclosure, and (2) reasonably cooperate with Customer to limit or prevent such disclosure.

4. Customer Data; Compliance with Laws. Trane agrees to comply with laws, regulations governmental requirements and industry standards and practices relating to Trane's processing of Customer Confidential Information (collectively, "***Laws***").

5. Customer Data; Information Security Management. Trane agrees to establish and maintain an information security and privacy program, consistent with applicable HVAC equipment industry practices that complies with this Addendum and applicable Laws ("***Information Security Program***"). The Information Security Program shall include appropriate physical, technical and administrative safeguards, including any safeguards and controls agreed by the Parties in writing, sufficient to protect Customer systems, and Customer's Confidential Information from unauthorized access, destruction, use, modification or disclosure. The Information Security Program shall include appropriate, ongoing training and awareness programs designed to ensure that Trane's employees and agents, and others acting on Trane's, behalf are aware of and comply with the Information Security Program's policies, procedures, and protocols.

6. Monitoring. Trane shall monitor and, at regular intervals consistent with HVAC equipment industry practices, test and evaluate the effectiveness of its Information Security Program. Trane shall evaluate and promptly adjust its Information Security Program in light of the results of the testing and monitoring, any material changes to its operations or business arrangements, or any other facts or circumstances that Trane knows or reasonably should know may have a material impact on the security of Customer Confidential Information, Customer systems and Customer property.

7. Audits. Customer acknowledges and agrees that the Trane SOC2 audit report will be used to satisfy any and all audit/inspection requests/requirements by or on behalf of Customer. Trane will make its SOC2 audit report available to Customer upon request and with a signed nondisclosure agreement.

8. Information Security Contact. Trane's information security contact is Local Sales Office.

9. Security Incident Management. Trane shall notify Customer after the confirmation of a Security Incident that affects Customer Confidential Information, Customer systems and Customer property. The written notice shall summarize the nature and scope of the Security Incident and the corrective action already taken or planned.

10. Threat and Vulnerability Management. Trane regularly performs vulnerability scans and addresses detected vulnerabilities on a risk basis. Periodically, Trane engages third-parties to perform network vulnerability assessments and penetration testing. Vulnerabilities will be reported in accordance with Trane's cybersecurity vulnerability reported process. Trane periodically provides security updates and software upgrades.

11. Security Training and Awareness. New employees are required to complete security training as part of the new hire process and receive annual and targeted training (as needed and appropriate to their role) thereafter to help maintain compliance with Security Policies, as well as other corporate policies, such as the Trane Code of Conduct. This includes requiring Trane employees to annually re-acknowledge the Code of Conduct and other Trane policies as appropriate. Trane conducts periodic security awareness campaigns to educate personnel about their responsibilities and provide guidance to create and maintain a secure workplace.

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12. Secure Disposal Policies. Trane will maintain policies, processes, and procedures regarding the disposal of tangible and intangible property containing Customer Confidential Information so that wherever possible, Customer Confidential Information cannot be practicably read or reconstructed.

13. Logical Access Controls. Trane employs internal monitoring and logging technology to help detect and prevent unauthorized access attempts to Trane's corporate networks and production systems. Trane's monitoring includes a review of changes affecting systems' handling authentication, authorization, and auditing, and privileged access to Trane production systems. Trane uses the principle of "least privilege" (meaning access denied unless specifically granted) for access to customer data.

14. Contingency Planning/Disaster Recovery. Trane will implement policies and procedures required to respond to an emergency or other occurrence (i.e. fire, vandalism, system failure, natural disaster) that could damage Customer Data or any system that contains Customer Data. Procedures include the following
    (i) Data backups; and
    (ii) Formal disaster recovery plan. Such disaster recovery plan is tested at least annually.

15. Return of Customer Data. If Trane is responsible for storing or receiving Customer Data, Trane shall, at Customer's sole discretion, deliver Customer Data to Customer in its preferred format within a commercially reasonable period of time following the expiration or earlier termination of the Agreement or, such earlier time as Customer requests, securely destroy or render unreadable or undecipherable each and every original and copy in every media of all Customer's Data in Trane's possession, custody or control no later than [90 days] after receipt of Customer's written instructions directing Trane to delete the Customer Data.

16. Background Checks Trane shall take reasonable steps to ensure the reliability of its employees or other personnel having access to the Customer Data, including the conducting of appropriate background and/or verification checks in accordance with Trane policies.

17. DISCLAIMER OF WARRANTIES. EXCEPT FOR ANY APPLICABLE WARRANTIES IN THE AGREEMENT, THE SERVICES ARE PROVIDED "AS IS", WITH ALL FAULTS, AND THE ENTIRE RISK AS TO SATISFACTORY QUALITY, PERFORMANCE, ACCURACY AND EFFORT AS TO SUCH SERVICES SHALL BE WITH CUSTOMER. TRANE DISCLAIMS ANY AND ALL OTHER EXPRESS OR IMPLIED REPRESENTATIONS AND WARRANTIES WITH RESPECT TO THE SERVICES AND THE SERVICES PROVIDED HEREUNDER, INCLUDING ANY EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR THAT THE SERVICES WILL OPERATE ERROR-FREE OR UNINTERRUPTED OR RETURN/RESPONSE TO INQUIRIES WITHIN ANY SPECIFIC PERIOD OF TIME.

October 2024
Supersedes: November 2023v2

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SURFSIL

CHOOSING THE RIGHT SOLUTION FOR THE JOB



Choosing the most appropriate coil coating for the application could save the project thousands of dollars and eliminate repeat treatments. Choosing the wrong coil coating could reduce heat transfer properties and lead to higher energy bills, premature failure, and unnecessary costs.

SURFSIL is a specialty designed hybrid coating unlike any product in the market. By incorporating the best properties of organic and inorganic materials with the latest nano-silane technology, the ideal coil coating solution has been created. Having tailored this product to the HVAC/R industry, it is able to provide superior corrosion protection with unparalleled adhesion strength while maintaining OEM heat-transfer performance. After more than 15,000 hours of ASTM B-117 testing showing NO SIGN OF CORROSION and countless real-world projects in the most extreme environments, there is NO doubt this is the right choice.

DURABILITY

- Superior corrosion and chemical resistance
- Strongest adhesion via covalent chemical bond
- Flexible and scratch resistant

ENERGY SAVINGS

- Thin dry film thickness <1 mil
- No bridging or effect on heat transfer
- Preserves original equipment efficiency

INDOOR AIR QUALITY (IAQ)

- Hydrophobic surface maintains cleanliness
- Inhibits mold, algae, and bacteria growth

REDUCE MAINTENANCE COSTS

- Extends the useful life of HVAC/R equipment
- Simplifies coil cleaning

ELIMINATING CORROSION, ONE JOB AT A TIME

www.surfsil.com

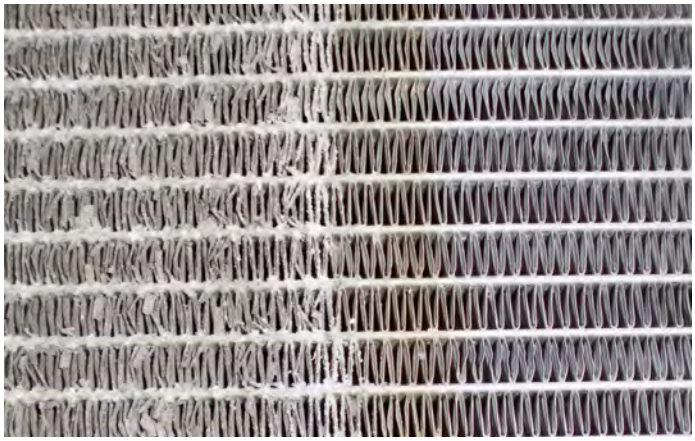
WHICH SIDE WOULD YOU LIKE YOUR COIL TO LOOK LIKE?

PROBLEM / SOLUTION



Test performed for 5,000 hours using ASTM G85 A3 (a more aggressive, modified ASTM B117 using acidified sea water). The image above compares the performance of a bare coil, half of which has been treated with **SURFSIL** and half left untreated.

PROBLEM / SOLUTION



As the image above shows, even the micro-channel coils tested, using the ASTM G85 A3, show how our intelligent coating design is able to penetrate into all the cavities of the coil, essentially sealing it from its environment and protecting it from corroding.

APPLICABILITY:

Surfsil can be applied on all HVAC/R equipment including:

- Air Handlers
- Packaged Units
- 100% O.A. Units
- Condensing Units
- Mini-Splits / VRF

SURFSIL

TEST PERFORMED

CORROSION, CHEMICAL, AND UV RESISTANCE	MINIMUN RATING
ASTM B117 Salt Spray Test	15,000 hours (No Sign of Corrosion)
ASTM G85-A3 Acidified Sea Water (SWAAT)	5,000 hours (No Sign of Corrosion)
ASTM D870 Water Immersion	1,000 hours (No Effect)
ASTM D4587 UV Exposure	1,000 hours (No Effect)
ABRASION, IMPACT RESISTANCE, AND FLEXIBILITY	**RESULTS**
ASTM D2794 Impact Resistance Test	150 lb/in^2 - No Peeling or Cracking
ASTMD522 Mandrel Bend Test	No Peeling or Cracking
ASTM D3359 Adhesion Test	5B - 0% Removed
ASTM D3363 Hardness Test	5H
MOLD & BACTERIA RESISTANCE	**RESULTS**
ASTM G21 Resistance to Fungi, Mold Growth	Pass (No Growth Observed)
OTHER STANDARDS	**MEETS**
ISO Standard 12944	C5 and CX environments

U.S.A.
7050 W Palmetto Park Rd.
Suite# 15-555
Boca Raton, FL 33433
Phone: (954) 237-1757
E-mail: sales@advancoat.com

MEXICO
Ave. Prolongación Álamos 47-2
Col. Santiago Occipaco
Naucalpan, Edo.
México - C.P.53250
Phone: (55) 1009-9108

advancoat
CORROSION SPECIALISTS

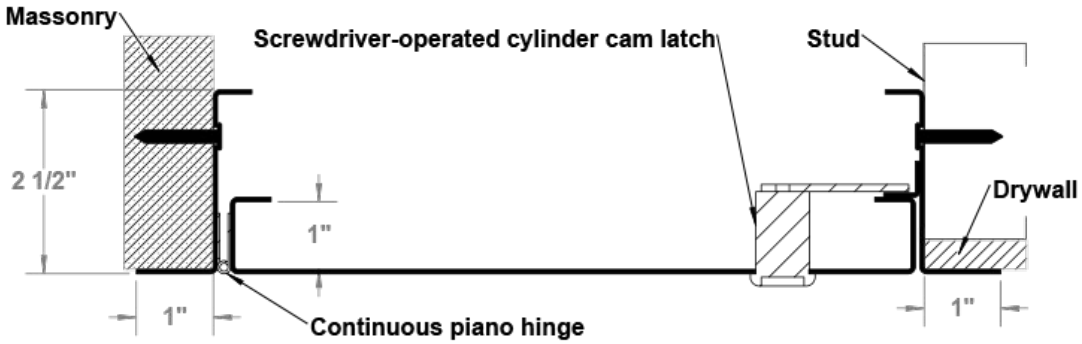
BEST ACCESS DOORS

SUBMITTAL / TECHNICAL DATA SHEET

HEAVY DUTY ACCESS DOOR
FOR LARGE OPENINGS WITH EXPOSED FLANGE

BA-HHD

INSTALLATION



DIMENSIONS AND APPEARANCE

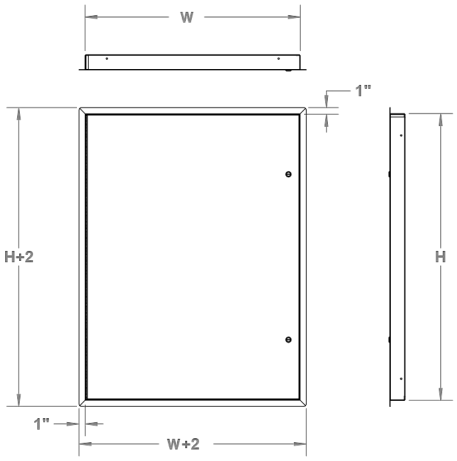
LEED ready: This product contributes to LEED® credits.

DOOR SIZE - W x H INCHES	NUMBER OF LOCKS	WEIGHT LBS	KG
36 X 60	2	62.9	28.5

Any size made in record time

Rough wall opening = door size + 1/4" or + 6mm

Your odd sizes:
Made in 5 days





DESCRIPTION AND MATERIAL SPECIFICATION

Material: 16 gauge cold rolled steel
Hinge: continuous piano hinge
Lock / latch: screwdriver-operated cylinder cam latch

Inside panel release: standard on all doors

Finish: high quality white powder coat primer
Packaging : individually wrapped, 1 per box

POPULAR OPTIONS For complete list of options go to: www.BestAccessDoors.com

Material: stainless steel 304 #4(brushed finish),
Lock / latch: key operated cylinder cam latch, handle operated slam latch, mortise preparation for cylinder (cylinder optional), mortise deadbolt lock
Design: double leaf

PARTNERS

PROJECT DATA

PROJECT NAME:	QTY	W	H	OPTIONS
ARCHITECT:				
DEALER:				
CONTRACTOR:				

LOCATION:	SPECIAL INSTRUCTIONS:
DATE:	
TAGGING INSTRUCTIONS:	SUBMITTAL APPROVAL: (signature or stamp)

228 Park Ave S # 76520, New York NY 10003-1502, United States
www.BestAccessDoors.com | sales@bestaccessdoors.com
Tel.: 1-800-483-0823 | Fax: 1-888-828-6021

SUBMITTAL

Project

North Palm Beach Library

Date

Monday, December 8, 2025

Brian Slamon
Carrier Enterprise
1260 NE 48th Street
Pompano Beach FL 33064
954-234-5042

CU-1,2

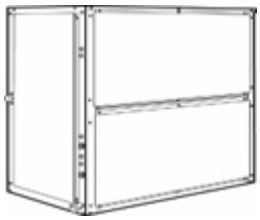
Submittal Cover Sheet
Unit Report
Performance Summary Report
Certified Drawings

Unit Report For CU-1,2

Project: North Palm Beach Library
Prepared By: Brian Slamon

12/08/2025
02:27PM





Outdoor Unit Parameters

Unit Quantity:	**1**	
Unit Model:	**38AXZ**	
Unit Size:	**7.5 Tons**	
Voltage:	**208-3-60**	V-Ph-Hz
Condenser Coil:	**Pre Coated Al/Cu**	
No. of DX Circuits:	**1**	
No. of Stages:	**Dual Stage**	

Indoor Unit Parameters

Unit Model:	**40RLA**	
Unit Size:	**7.5 Tons**	
No. of Coils:	**1**	
Voltage:	**208-3-60**	V-Ph-Hz

System Parameter

System Quantity:	**2**
Refrigerant Type:	**PURONA**
Compressor Quantity:	**1**
Compressor Type:	**Scroll**
No. of Outdoor fans:	**2**

Outdoor Unit Dimensions and Weight

Unit Length:	**4' 11.4"**	
Unit Width:	**3' 9.9"**	
Unit Height:	**3' 6.4"**	
Unit Weight:	**430**	lb

Indoor Unit Dimensions and Weight

Unit Length:	**4' 1.0"**	
Unit Width:	**2' 4.2"**	
Unit Height:	**4' 8.1"**	
Unit Weight:	**404**	lb
Add Service Clearance for Accy Heater:	**2' 6.0"**	

Warranty Information Outdoor (Note: for US & Canada only)
First Year - Parts Only (Standard)

Warranty Information Indoor (Note: for US & Canada only)
First Year - Parts Only (Standard)

NOTE: Please see Warranty Catalog 808-218 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
Base Unit - Outdoor		
38AXZM08A0B5-0A0A0		2
	Base Unit	
	Pre Coated Al/Cu Condensing Coil	2
	Single Circuit/ Dual Stage Refrigerant Options	2
	Service Options - None	2
	Electrical Options - None	2
	Packaging Options - Standard	2
	Standard Electrical Mechanical Controls	2
	Refrig Circ/Compressor Staging - Single Circ/Dual Stage	2
Base Unit - Indoor		
40RLAA08A2A5-UA0A0		2
	Base Unit	
	Standard/Medium Static (Ecoblue)	2
	Cabinet Paint - None	2
	Two Speed Direct Drive - EcoBlue Vane Axial Fan	2
	Electromechanical Unit Control Board	2
	Standard	2

CAELHEAT055A00	15.0 kW, 240-3-60 Electric Heater	2

Performance Summary For CU-1,2

Project: North Palm Beach Library
Prepared By: Brian Slamon

12/08/2025
02:27PM

System:	**38AXZ008/40RLA_08**	
No. of Circuits:	**Single Circuit**	
System Quantity:	**2**	
Altitude:	**0.0**	ft
EER @ ARI Conditions:	**11.2**	
IEER:	**15.5**	
Suction Line Loss:	**1.4**	°F

System meets ASHRAE 90.1-2023 min IEER requirement.

This system has a combined part load efficiency (IEER) that meets or exceeds the US DOE 2023 minimum cooling efficiency standards.

Typical Liquid and Suction Line Sizing

Pipe Length	Liquid Line Size	Suction Line Size
0 - 25	1/2	1 1/8
26 - 50	1/2	1 1/8
51 - 75	1/2	1 1/8
76 - 100	1/2	1 1/8
101 - 125	5/8	1 1/8
126 - 150	5/8	1 1/8
151 - 175	5/8	1 1/8
176 - 200	5/8	1 1/8

Outdoor Unit Parameters

Unit Quantity:	**1**	
PartNumber:	**38AXZM08A0B5-0A0A0**	
Unit Model:	**38AXZ**	
Unit Size:	**7.5 Tons**	
Condenser Coil:	**Pre Coated Al/Cu**	
No. of DX Circuits:	**1**	
Voltage:	**208-3-60**	V-Ph-Hz
Clg Ent Air DB:	**95.0**	°F

Outdoor Electrical Data

Unit Voltage:	**208-3-60**	V-Ph-Hz
Unit MCA:	**37.0**	Amps
Unit MOCP:	**60.0**	Amps
Total Compressor Power of Unit:	**NA**	
Voltage Range Min:	**187**	V
Voltage Range Max:	**253**	V
Compressor RLA:	**26.6**	
Compressor LRA:	**191**	
Compressor Quantity:	**1**	
Fan Motors Qty:	**2**	
Fan Motor FLA:	**1.5**	Amps

Notice: Outdoor unit elect. data is based on 208-3-60

Control Panel SCCR: 5kA RMS at Rated Symmetrical Voltage

Indoor Unit Parameters

PartNumber:	**40RLAA08A2A5-UA0A0**	
Unit Model:	**40RLA**	
Unit Size:	**7.5 Tons**	
Coil Rows:	**4**	
No. of Splits:	**1**	
Voltage:	**208-3-60**	V-Ph-Hz
Actual Airflow:	**3000.0**	CFM
Standard Airflow:	**3000.0**	CFM
Total Clg Cap.(Gross):	**94.1**	MBH
Sensible Clg Cap.(Gross):	**67.8**	MBH
Ent Air DB:	**80.0**	°F
Ent Air WB:	**67.0**	°F
Ent Enthalpy:	**31.44**	BTU/lb
Lvg Air DB:	**59.1**	°F

Lvg Air WB:	**57.1**	°F
Lvg Enthalpy:	**24.47**	BTU/lb
Coil Bypass Factor:	**NA**	

Accessory Heating

Heating Type:	**Electric**	
Acc Htg Capacity:	**38.56**	MBH
Acc Htg Ent. Air Temp:	**60.0**	°F
Acc Htg Lvg. Air Temp:	**71.9**	°F
Acc Heater Nominal Voltage:	**208-3-60**	
Acc Heater Nominal kW:	**15.0**	kW
Acc Heater Actual Voltage:	**208-3-60**	
Acc Heater FLA:	**31.3**	amps
Acc Stage 1 Actual kW:	**11.3**	kW

Indoor Supply Fan

Indoor Unit External Static:	**1.00**	in wg
Economizer Loss:	**0.00**	in wg
Grille Loss:	**0.00**	in wg
Plenum Loss:	**0.00**	in wg
Dehumidification Loss:	**0.00**	in wg
Acc. Heating Loss:	**0.10**	in wg
Total Ext Static:	**1.10**	in wg
Fan Speed:	**1525**	RPM
Fan Power:	**1.33**	BHP
Fan Motor Max:	**2.40**	BHP
Fan Motor FLA:	**6.4**	Amps

Motor and Medium Static Drive Required.
Selected Medium Static Drive Range: 200 - 1788 RPM

Indoor Electrical Data

Unit Voltage:	**208-3-60**	V-Ph-Hz
Unit MCA:	**47.1**	Amps
Unit MOCP:	**50.0**	Amps

Notice: Indoor unit elect. data is based on 208-3-60

Acoustics

Sound Power Levels, db re 10E-12 Watts

A-Weighted	Outdoor Unit (dB)	Indoor Unit (dB,Ducted)
Total Level	84.6	88.4
63Hz	63.1	69.1
125Hz	68.9	75.2
250Hz	73.4	78.7
500Hz	79.5	83.1
1000Hz	80.2	82.3
2000Hz	76.4	81.5
4000Hz	72.0	77.3
8000Hz	64.9	NA
Sound Message	Sound for AXZ008	Sound for RLA008

Acoustic Notes:

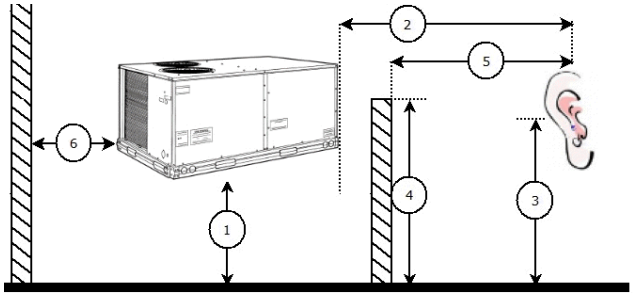
1. 38AXZ/D,38AUZ/D/Q units sound ratings are in accordance with AHRI 270-2008 - Sound Rating of Outdoor Unitary Equipment.
2. 40RL/40RF/40RU units sound ratings are in accordance with AHSRAE 1987 HVAC Systems and Applications handbook.
3. The acoustic center of the unit is located at the geometric center of the unit.

Performance Summary For CU-1,2

Project: North Palm Beach Library 12/08/2025
Prepared By: Brian Slamon 02:27PM

Advanced Acoustics Parameters

1. Unit height above ground: **1.0** ft
2. Horizontal distance from unit to receiver: **20.0** ft
3. Receiver height above ground: **5.7** ft
4. Height of obstruction: **0.0** ft
5. Horizontal dist. from obstruction to receiver: **0.0** ft
6. Horizontal dist. from unit to obstruction: **0.0** ft



Detailed Acoustics Information

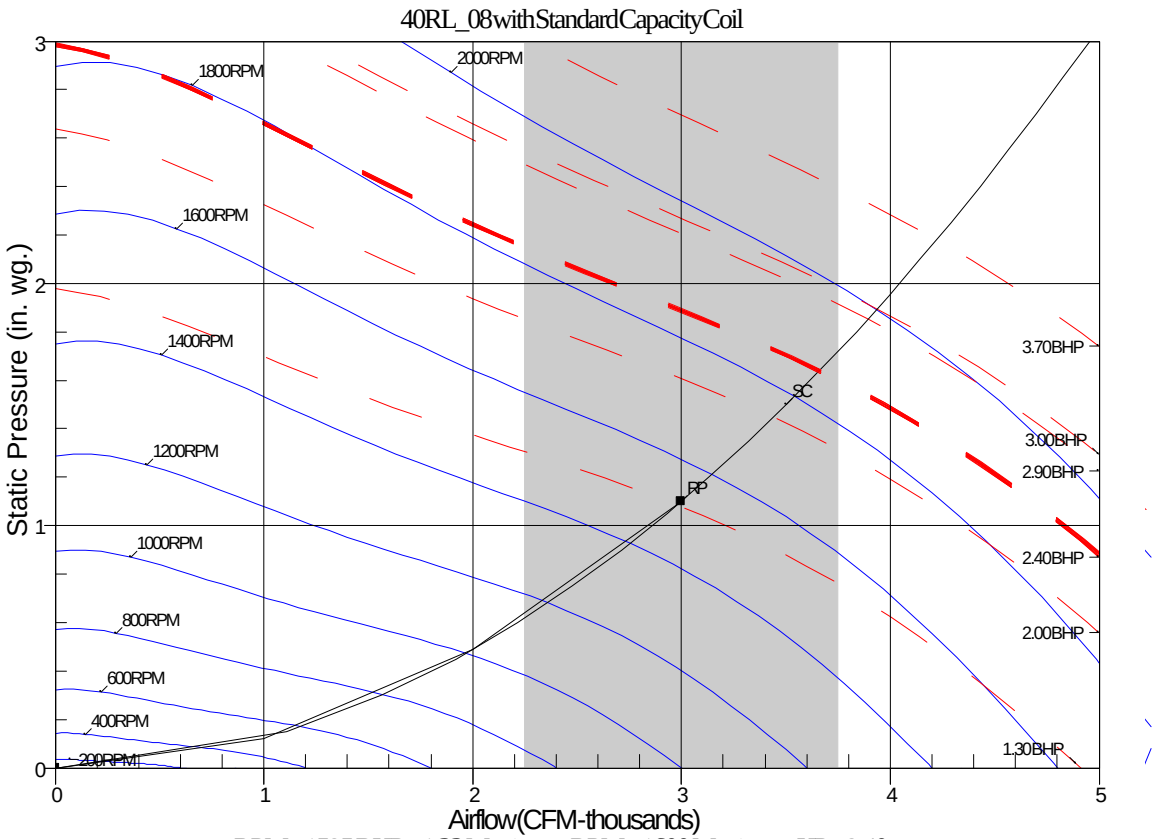
Octave Band Center Frequency, Hz	63	125	250	500	1k	2k	4k	8k	Overall
Sound Power Levels at Unit's Acoustic Center (Lw), dB	89	85	82	83	80	75	71	66	92
A-Wgted Sound Power Levels at Unit's Acoustic Center (LwA), dBA	63	69	73	80	80	76	72	65	85
Sound Press. Levels at Dist. Specified above (Lp), dB	65	61	58	58	56	51	47	42	68
A-Wgted Sound Press. Levels at Dist. Specified above (LpA), dBA	39	45	49	55	56	52	48	41	60

Calculation methods used in this program are patterned after the ASHRAE Guide; other ASHRAE Publications and the AHRI Acoustical Standards. While a very significant effort has been made to insure the technical accuracy of this program, it is assumed that the user is knowledgeable in the art of system sound estimation and is aware of the tolerances involved in real world acoustical estimation. This program makes certain assumptions as to the dominant sound sources and sound paths which may not always be appropriate to the real system being estimated. Because of this, no assurances can be offered that this software will always generate an accurate sound prediction from user supplied input data. If in doubt about the estimation of expected sound levels in a space, an Acoustical Engineer or a person with sound prediction expertise should be consulted.

Performance Summary For CU-1,2

Project: North Palm Beach Library
Prepared By: Brian Slamon

12/08/2025
02:27PM



RPM=1525 BHP=1.33 Maximum RPM=1600 Maximum HP=2.40
Shaded Area-Recommended Operating Range
SC-System Curve RP-Rated Point MP-Minimum Point

Carrier

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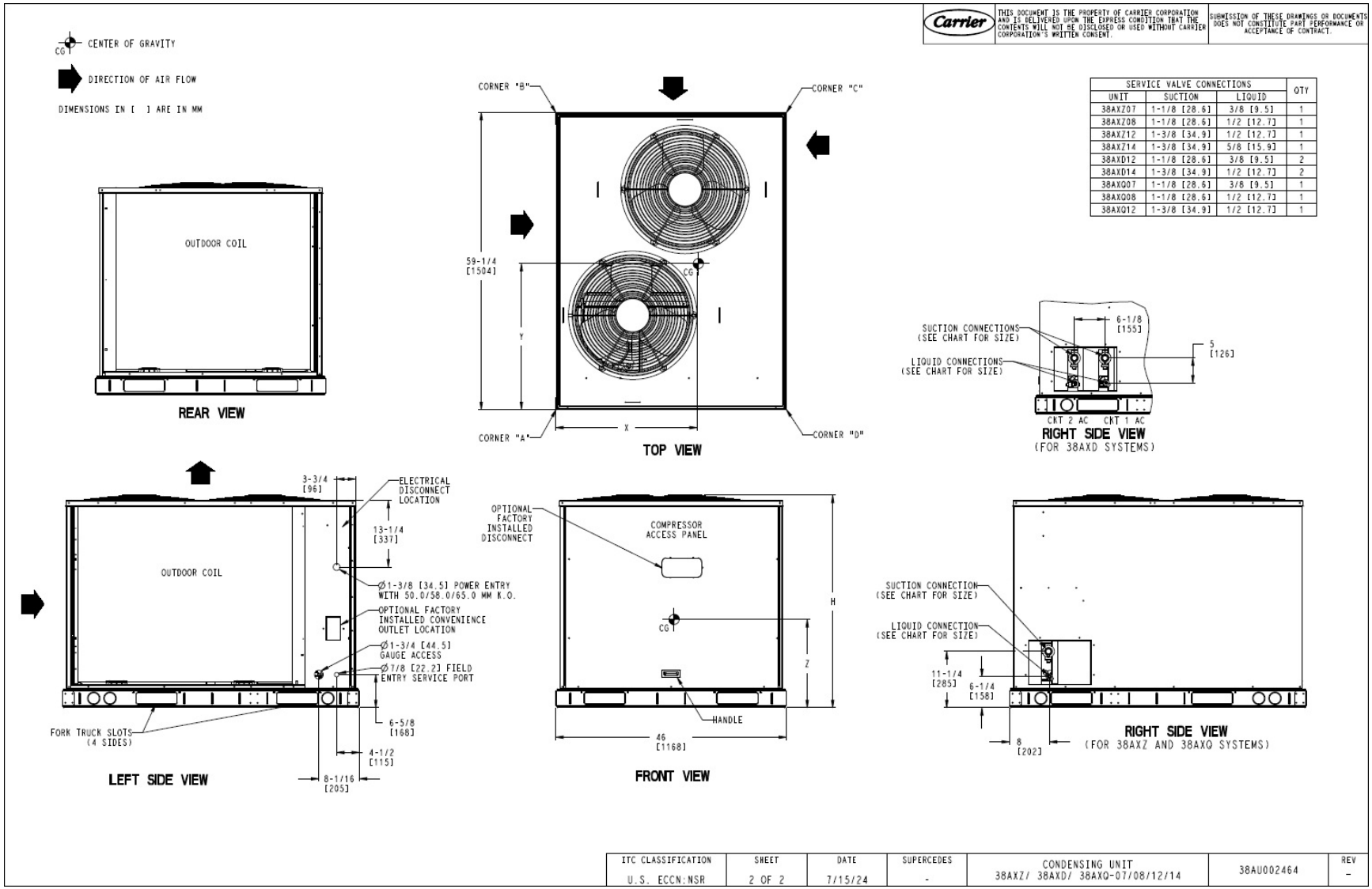
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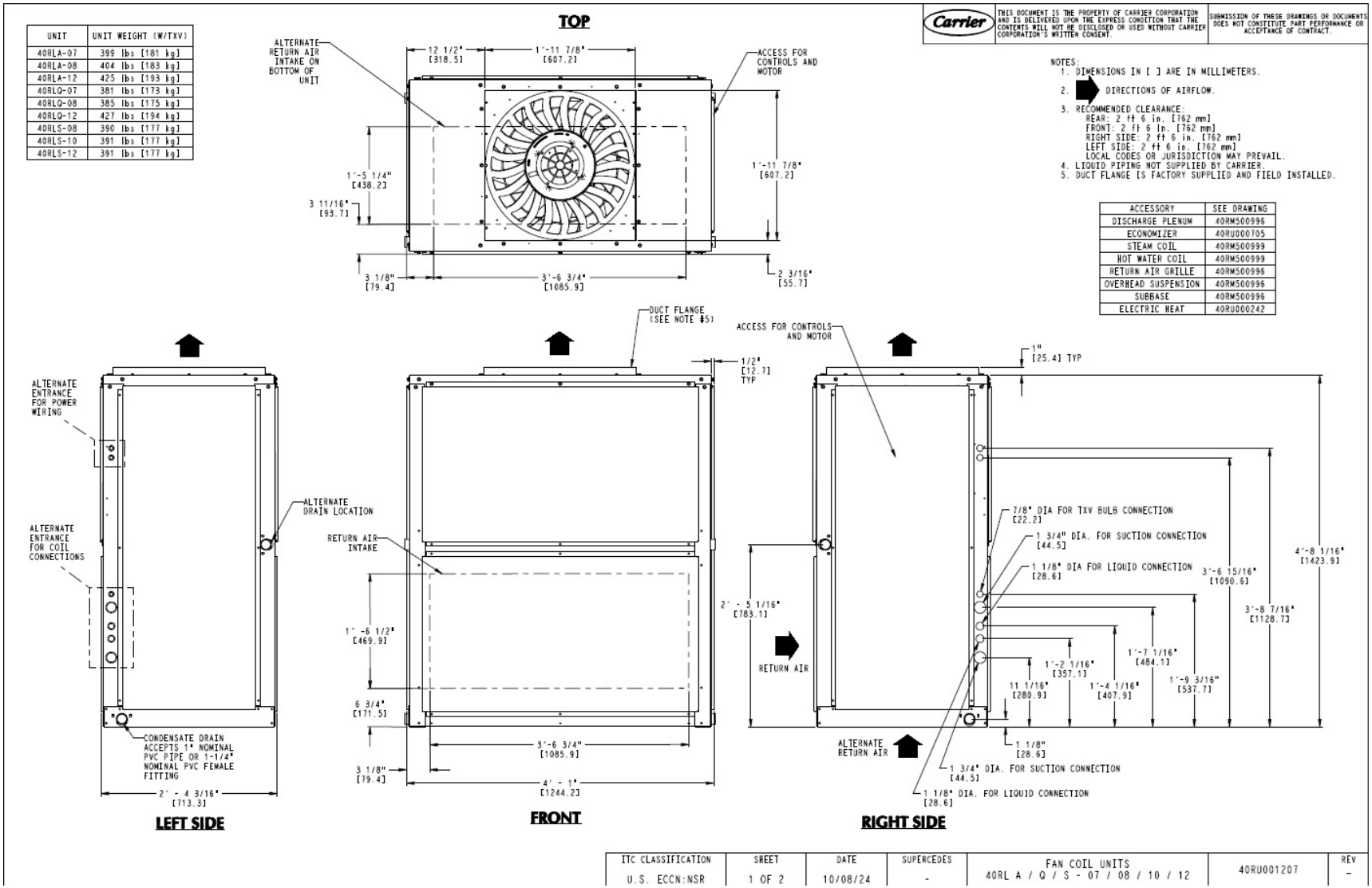
UNIT	ELECTRICAL CHARACTERISTICS	STD. UNIT WT.		CORNER A		CORNER B		CORNER C		CORNER D		CENTER OF GRAVITY			UNIT HEIGHT
		LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z	H
38AXZ-07 (RTPF)	208/230-3-60,460-3-60,575-3-60	388	176	141	64	96	44	62	28	91	41	18 [457.2]	24 [609.6]	21 [533.4]	42-3/8 [1076.0]
38AXZ-08 (RTPF)	208/230-3-60,460-3-60,575-3-60	430	195	142	64	96	44	76	34	111	50	18 [457.2]	24 [609.6]	21 [533.4]	42-3/8 [1076.0]
38AXZ-12 (RTPF)	208/230-3-60,460-3-60,575-3-60	490	222	177	80	120	54	78	35	114	52	18 [457.2]	24 [609.6]	24 [609.6]	50-3/8 [1279.2]
38AXZ-14 (RTPF)	208/230-3-60,460-3-60,575-3-60	598	271	195	88	142	64	110	50	151	68	20 [508.0]	25 [635.0]	24 [609.6]	50-3/8 [1279.2]
38AXD-12 (RTPF)	208/230-3-60,460-3-60,575-3-60	516	234	185	84	117	53	83	38	131	59	19 [482.6]	23 [584.2]	24 [609.6]	50-3/8 [1279.2]
38AXD-14 (RTPF)	208/230-3-60,460-3-60,575-3-60	654	297	214	97	155	70	120	54	165	75	20 [508.0]	25 [635.0]	24 [609.6]	50-3/8 [1279.2]
38AXQ-07 (RTPF)	208/230-3-60,460-3-60,575-3-60	444	201	154	61	97	44	90	41	123	56	22 [558.8]	25 [635.0]	13 [330.2]	42-3/8 [1076.0]
38AXQ-08 (RTPF)	208/230-3-60,460-3-60,575-3-60	525	237	174	79	118	54	96	44	135	61	21 [533.4]	24 [609.6]	23 [584.2]	50-3/8 [1279.2]
38AXQ-12 (RTPF)	208/230-3-60,460-3-60,575-3-60	575	261	186	84	126	57	106	48	157	71	21 [533.4]	24 [609.6]	23 [584.2]	50-3/8 [1279.2]

NOTES:

1. MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL):
   A. BOTTOM TO COMBUSTIBLE SURFACES: 0 INCHES.
   B. OUTDOOR COIL, FOR PROPER AIR FLOW: 36 INCHES ONE SIDE, 12 INCHES THE OTHER. THE SIDE GETTING THE GREATER CLEARANCE IS OPTIONAL. STANDARD CLEARANCES ON REMAINING TWO SIDES.
   C. OVERHEAD: 60 INCHES, TO ASSURE PROPER OUTDOOR FAN OPERATION.
   D. BETWEEN UNITS: CONTROL BOX SIDE, 42 INCHES PER NEC.
   E. BETWEEN UNIT AND UNGROUNDED SURFACES: CONTROL BOX SIDE, 36 INCHES PER NEC.
   F. BETWEEN UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES: CONTROL BOX SIDE, 42 INCHES PER NEC.
2. WITH EXCEPTION OF THE CLEARANCE FOR THE OUTDOOR COIL AS STATED IN NOTE 1B, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
3. UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B OR C ROOF COVERING MATERIAL.

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	CONDENSING UNIT		REV
U.S. ECCN:NSR	1 OF 2	7/15/24	-	38AXZ/ 38AXD/ 38AXQ-07/08/12/14	38AU002464	-


CENTER OF GRAVITY
DIRECTION OF AIR FLOW
DIMENSIONS IN [ ] ARE IN MM
THIS DOCUMENT IS THE PROPERTY OF CARRIER CORPORATION AND IS DELIVERED UPON THE EXPRESS CONDITION THAT THE CONTENTS WILL NOT BE DISCLOSED OR USED WITHOUT CARRIER CORPORATION'S WRITTEN CONSENT.
SUBMISSION OF THESE DRAWINGS OR DOCUMENTS DOES NOT CONSTITUTE PART PERFORMANCE OR ACCEPTANCE OF CONTRACT.
SERVICE VALVE CONNECTIONS
UNIT | SUCTION | LIQUID | QTY
38AXZ07 | 1-1/8 [28.6] | 3/8 [9.5] | 1
38AXZ08 | 1-1/8 [28.6] | 1/2 [12.7] | 1
38AXZ12 | 1-3/8 [34.9] | 1/2 [12.7] | 1
38AXZ14 | 1-3/8 [34.9] | 5/8 [15.9] | 1
38AXD12 | 1-1/8 [28.6] | 3/8 [9.5] | 2
38AXD14 | 1-3/8 [34.9] | 1/2 [12.7] | 2
38AXQ07 | 1-1/8 [28.6] | 3/8 [9.5] | 1
38AXQ08 | 1-1/8 [28.6] | 1/2 [12.7] | 1
38AXQ12 | 1-3/8 [34.9] | 1/2 [12.7] | 1
OUTDOOR COIL
REAR VIEW
CORNER "B"
CORNER "C"
CORNER "A"
CORNER "D"
59-1/4 [1504]
CG
Y
X
TOP VIEW
SUCTION CONNECTIONS (SEE CHART FOR SIZE)
LIQUID CONNECTIONS (SEE CHART FOR SIZE)
6-1/8 [155]
5 [126]
CKT 2 AC
CKT 1 AC
RIGHT SIDE VIEW
(FOR 38AXD SYSTEMS)
OUTDOOR COIL
3-3/4 [96]
ELECTRICAL DISCONNECT LOCATION
13-1/4 [337]
Ø1-3/8 [34.5] POWER ENTRY WITH 50.0/58.0/65.0 MM K.O.
OPTIONAL FACTORY INSTALLED CONVENIENCE OUTLET LOCATION
Ø1-3/4 [44.5] GAUGE ACCESS
Ø7/8 [22.2] FIELD ENTRY SERVICE PORT
6-5/8 [168]
FORK TRUCK SLOTS (4 SIDES)
4-1/2 [115]
8-1/16 [205]
LEFT SIDE VIEW
OPTIONAL FACTORY INSTALLED DISCONNECT
COMPRESSOR ACCESS PANEL
CG
H
Z
HANDLE
46 [1168]
FRONT VIEW
SUCTION CONNECTION (SEE CHART FOR SIZE)
LIQUID CONNECTION (SEE CHART FOR SIZE)
11-1/4 [285]
6-1/4 [158]
8 [202]
RIGHT SIDE VIEW
(FOR 38AXZ AND 38AXQ SYSTEMS)
ITC CLASSIFICATION
U.S. ECCN:NSR
SHEET
2 OF 2
DATE
7/15/24
SUPERCEDES
-
CONDENSING UNIT
38AXZ/ 38AXD/ 38AXQ-07/08/12/14
38AU002464
REV
-



UNIT	UNIT WEIGHT (W/TXV)
40RLA-07	399 lbs [181 kg]
40RLA-08	404 lbs [183 kg]
40RLA-12	425 lbs [193 kg]
40RLQ-07	381 lbs [173 kg]
40RLQ-08	385 lbs [175 kg]
40RLQ-12	427 lbs [194 kg]
40RLS-08	390 lbs [177 kg]
40RLS-10	391 lbs [177 kg]
40RLS-12	391 lbs [177 kg]

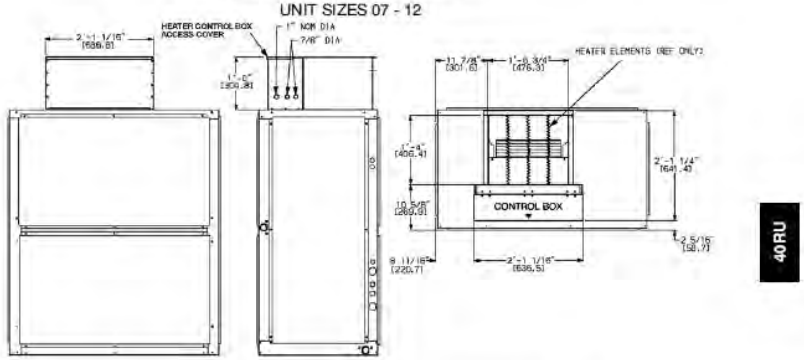
ACCESSORY	SEE DRAWING
DISCHARGE PLENUM	40RM500996
ECONOMIZER	40RU000705
STEAM COIL	40RM500999
HOT WATER COIL	40RM500999
RETURN AIR GRILLE	40RM500996
OVERHEAD SUSPENSION	40RM500996
SUBBASE	40RM500996
ELECTRIC HEAT	40RU000242

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES			REV
U.S. ECCN:NSR	1 OF 2	10/08/24	-	FAN COIL UNITS 40RL A / Q / S - 07 / 08 / 10 / 12	40RU001207	-

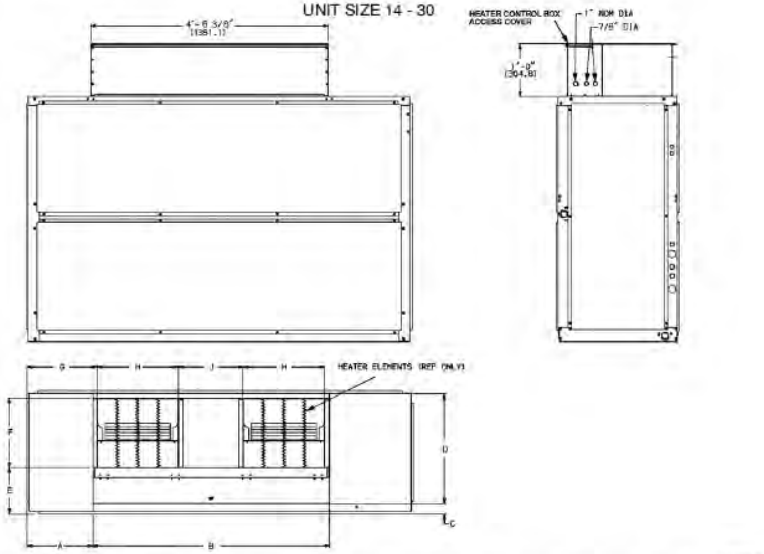
ELECTRIC HEAT ACCESSORY

40RU

UNIT SIZES 07 - 12



UNIT SIZE 14 - 30



C160006

40RU UNIT SIZE	A	B	C	D	E	F	G	H	J
14 – 25	1'-3 1/4" [387.4]	4'-6 3/8" [1381.1]	2 5/16" [58.7]	2'-11/4" [641.4]	10 5/8" [269.9]	1'-4" [406.4]	1'-4 5/16" [414.3]	1'-6 3/4" [476.3]	1'-7 1/8" [327.0]
28, 30	1'-3 3/8" [390.5]	5'-4 7/8" [1636.8]	2 1/16" [52.4]	2'-6 9/16" [766.8]	1'-1 1/4" [311.2]	1'-7" [482.6]	1'-4 5/16" [414.3]	1'-10" [558.8]	1'-4 7/16" [417.1]

NOTE: Dimensions in [ ] are millimeters.

CU-3,4

Submittal Cover Sheet
Unit Report
Performance Summary Report
Certified Drawings

Unit Report For CU-3,4

Project: North Palm Beach Library 12/08/2025
Prepared By: Brian Slamon





Outdoor Unit Parameters

Unit Model:	**26SCA**	
Unit Size:	**5 Tons (Size 60)**	
Voltage:	**208/230-1-60**	V-Ph-Hz

Indoor Coil Parameters

Unit Model:	**FJ5A**	
Unit Size:	**60,000 Btuh (Size 60)**	
Voltage:	**208-1-60**	V-Ph-Hz
Heating Size:	**No Heat**	

Outdoor Unit Dimensions and Weight

Unit Length:	**31.1875**	in
Unit Width:	**31.1875**	in
Unit Height:	**38.875**	in
Unit Shipping Weight:	**216.**	lb

Indoor Coil Dimensions and Weight

Unit Length:	**22.0625**	in
Unit Width:	**24.6875**	in
Unit Height:	**59.1875**	in
Unit Shipping Weight:	**210.**	lb

RESIDENTIAL APPLICATIONS

This warranty is to the original purchasing owner and subsequent owners only to the extent and as stated in the Warranty Conditions and below. The limited warranty period in years, depending on the part and the claimant, is as shown in the table below.

Limited Warranty (Years)		
Item	**Original Owner**	**Subsequent Owner**
Parts	10* (or 5)	5
Compressor	10* (or 5)	5

***If properly registered within 90 days of original installation, otherwise 5 years (except in California and Quebec and other jurisdictions that prohibit warranty benefits conditioned on registration). See Warranty Conditions below.**

OTHER APPLICATIONS

The warranty period is five (5) years on the compressor, and one (1) year on all other parts. The warranty is the original owner only and is not available for subsequent owners.

Ordering Information

Part Number	Description	Quantity
Outdoor Unit		
26SCA560W003	Comfort Single Stage Air Conditioner with Puron Advance 5 Tons Cooling	2
	15 SEER @ ARI Conditions	
Indoor Coil		
FJ5ANXD60L00	FJ5A Comfort Series Fan Coil with Puron Advance (R-454B) Refrigerant 60000 BTU Cooling 208/230-1-60	2
	Singular, TXV/ 24 Inches Cabinet	
	Aluminum	
Accessories		
KFFEH2601C10	10 KW-CKT BRKR for Indoor Unit	

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at www.ahridirectory.org for the most up-to-date information.

Performance Summary For CU-3,4

Project: North Palm Beach Library 12/08/2025
Prepared By: Brian Slamon

System Performance

System:	**26SCA/FJ5A**	
System Quantity:	**2**	
Altitude:	**0.0**	ft
Linear Pipe Length:	**0.0**	ft
SEER2 @ ARI Conditions:	**16.0**	
EER2 @ ARI Conditions:	**13.0**	
Actual Clg Airflow:	**2000.0**	CFM
Standard Clg Airflow:	**2000.0**	CFM
Total Net Clg Capacity:	**60.10**	MBH
Net Sensible Clg Capacity:	**45.96**	MBH
Total System Power:	**4.67**	kW

System Parameters

Outdoor Unit Parameters

Unit Model:	**26SCA560W003**	
Unit Size (Nominal):	**5 Tons (Size 60)**	
Voltage:	**208/230-1-60**	V-Ph-Hz
Clg Ent Air DB Ambient:	**95.0**	°F

Indoor Coil Parameters

Unit Model:	**FJ5ANXD60L00**	
Unit Size (Nominal):	**60,000 Btuh (Size 60)**	
Voltage:	**208-1-60**	V-Ph-Hz
Ent Air DB:	**80.00**	°F
Ent Air WB:	**67.00**	°F
Ent Enthalpy:	**31.44**	BTU/lb
Lvg Air DB:	**58.72**	°F
Lvg Air WB:	**57.57**	°F
Lvg Enthalpy:	**24.76**	BTU/lb
Heating Size (Nominal):	**No Heat**	
Total External Static Pressure:	**0.50**	in wg

Electrical Data

Outdoor Electrical Data

Unit Voltage:	**208/230-1-60**	V-Ph-Hz
Fan Motor FLA:	**1.40**	Amps
MCA:	**31.1**	Amps
Max Fuse:	**50**	Amps
Operating Range Min:	**197**	V
Operating Range Max:	**253**	V
Compressor RLA:	**23.7**	Amps
Compressor LRA:	**157.0**	Amps

Indoor Electrical Data

Unit Voltage:	**208-1-60**	V-Ph-Hz
Motor HP:	**3/4**	HP
Motor FLA:	**6.1**	Amps

Accessory Electric Heater Data

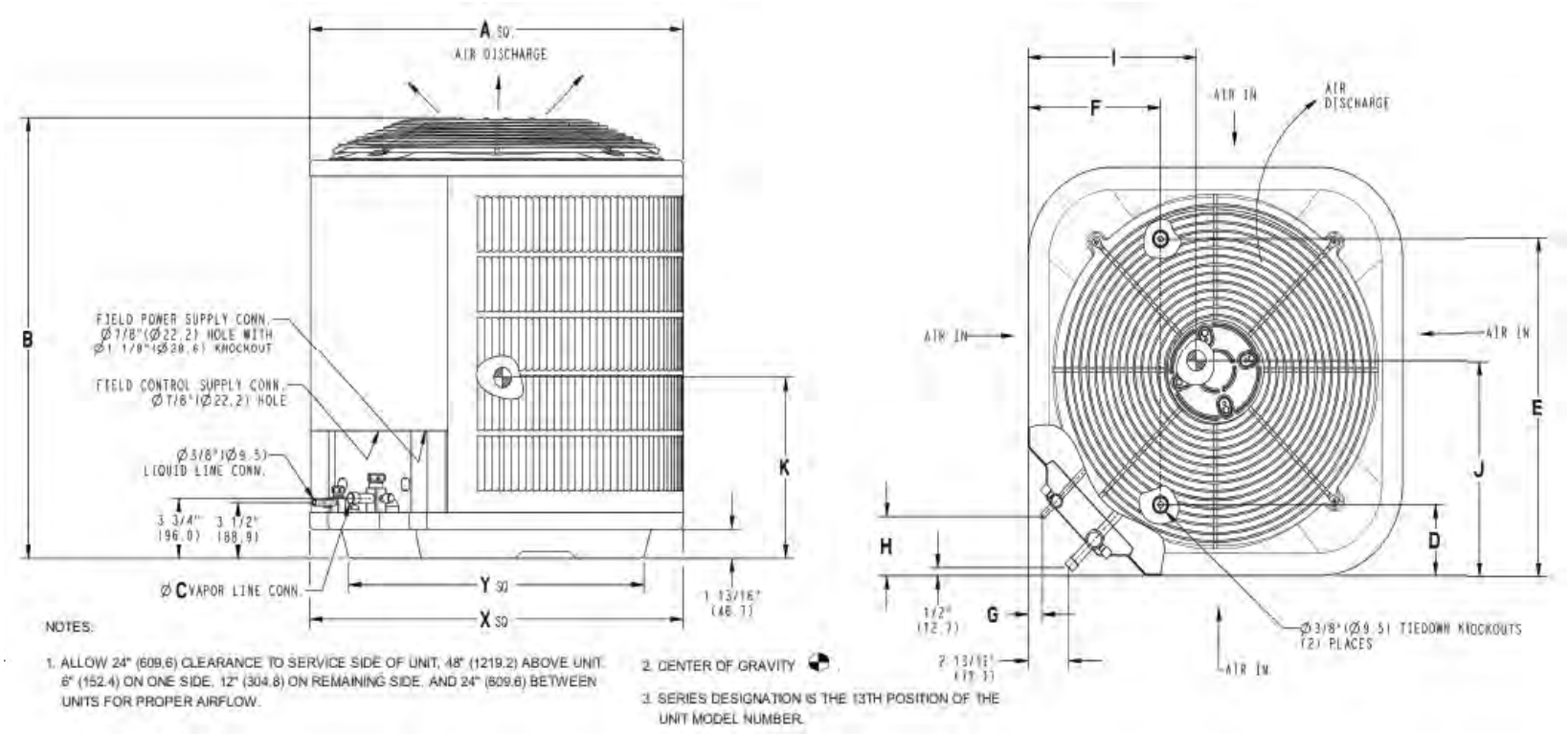
EH Part Number:	**KFFEH2601C10**	
Electric Heater kW:	**7.5**	kW
For 2 wire operation (single circuit):		
Heater Amps:	**35.6**	Amps
Heater + Motor MCA:	**52.1**	Amps
Heater + Motor MOCP:	**60**	Amps
Accessory Voltage:	**208-1-60**	V-Ph-Hz

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at www.ahridirectory.org for the most up-to-date information.

Certified Drawing For CU-3,4

Project: North Palm Beach Library
Prepared By: Brian Slamon

12/08/2025



Outdoor Model

Unit Model:	**26SCA**	
Unit Size:	**5 Tons (Size 60)**	
Voltage:	**208/230-1-60**	V-Ph-Hz
SEER:	**15**	
PartNumber:	**26SCA560W003**	

Shipping Dimensions and Weights	Outdoor Unit
Height	43.25 in
Width	34.25 in
Length	34.25 in
Operating Weight	196. lb
Shipping Weight	216. lb

Dimensions										
A	B	C	D	E	F	G	H	I	J	K
31.19 in	38.88 in	0.88 in	6.56 in	24.69 in	9.13 in	0.31 in	3.00 in	15.75 in	16.50 in	19.25 in

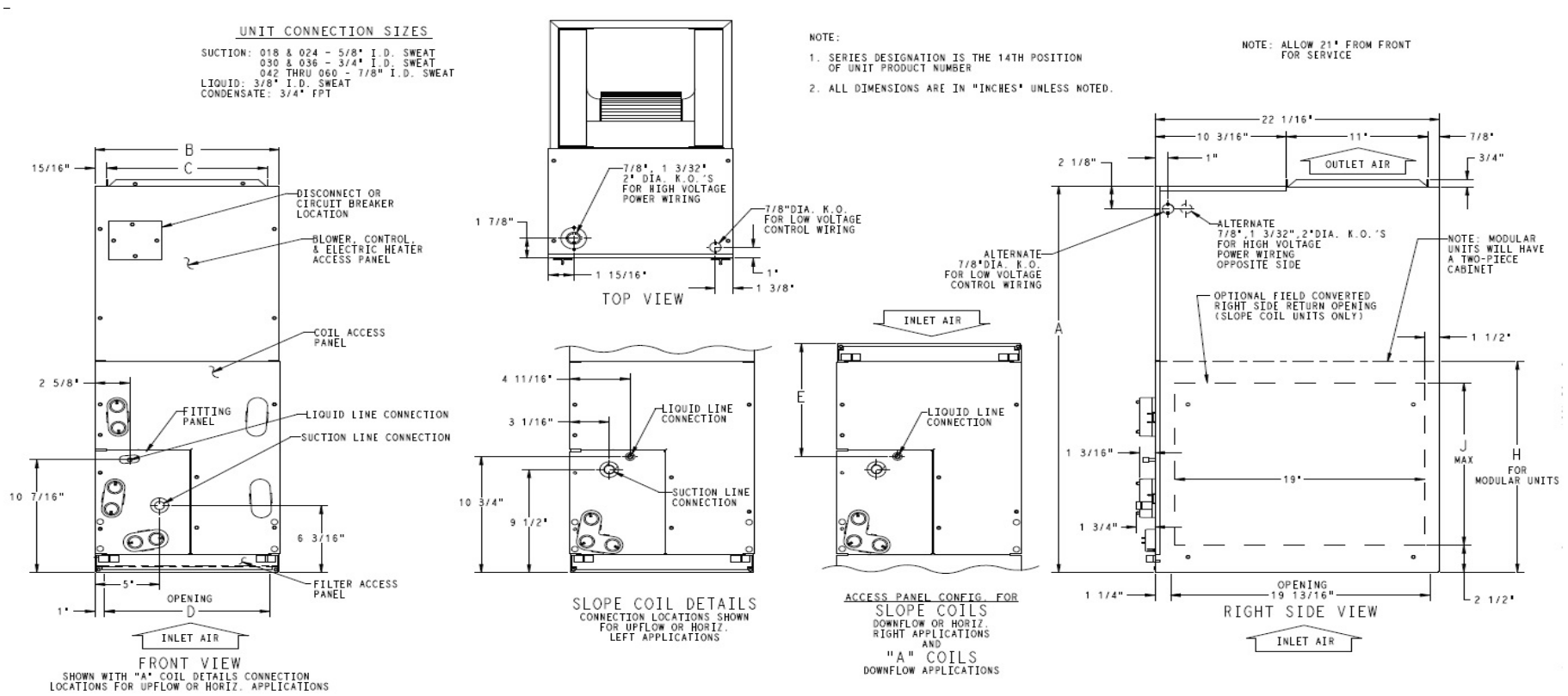
The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at www.ahridirectory.org for the

Certified Drawing For CU-3,4

Project: North Palm Beach Library
Prepared By: Brian Slamon

12/08/2025

most up-to-date information.



Indoor Coil

Unit Model: **FJ5A**
Unit Size: **60,000 Btuh (Size 60)**
Voltage: **208-1-60** V-Ph-Hz
Cabinet Insulation: **Singular, TXV/ 24 Inches Cabinet**
PartNumber: **FJ5ANXD60L00**

Dimensions and Weights	Indoor Coil
Height	59.19 in
Width	24.69 in
Length	22.06 in
Shipping Weight	210. lb

Dimensions								
A	B	C	D	E	F	G	H	J
59.19 in	24.69 in	22.75 in	22.69 in	25.25 in	32.94 in	32.63 in	--	--

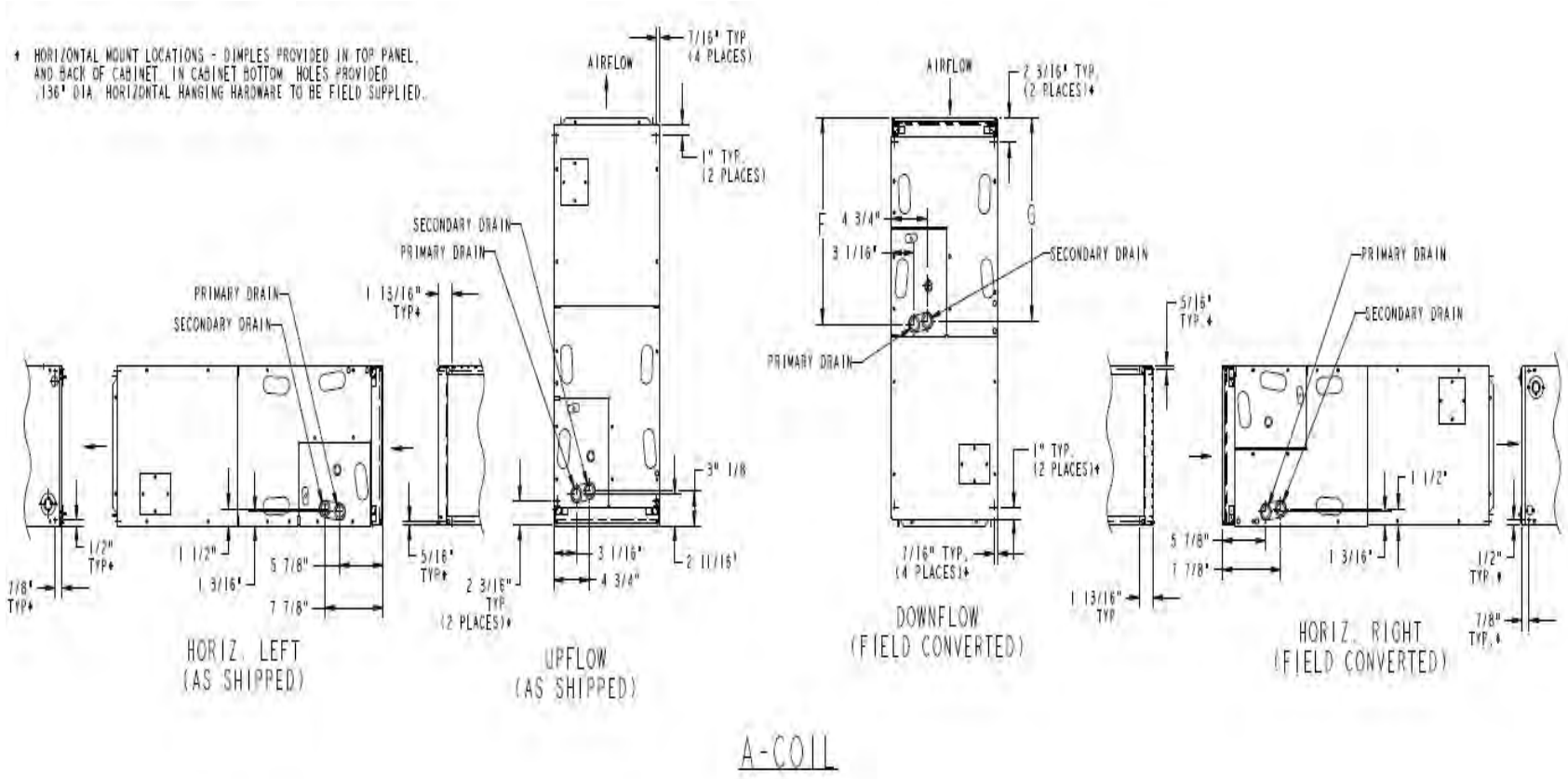
The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at www.ahridirectory.org for the

most up-to-date information.

Certified Drawing For CU-3,4

Project: North Palm Beach Library
Prepared By: Brian Slamon

12/08/2025



A-COIL

Indoor Coil

Unit Model:	**FJ5A**	
Unit Size:	**60,000 Btuh (Size 60)**	
Voltage:	**208-1-60**	V-Ph-Hz
PartNumber:	**FJ5ANXD60L00**	

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at www.ahridirectory.org for the most up-to-date information.

Copy

PROPOSER'S ACKNOWLEDGEMENT AND PROPOSAL FORM

SUBMIT ONE (1) ORIGINAL, FIVE (5) COPIES AND ONE (1) ELECTRONIC COPY OF YOUR PROPOSAL TO:

Village of North Palm Beach
Village Clerk's Office
501 U.S. Highway One,
North Palm Beach, FL 33408

RFP TITLE:

Proposal must be received **PRIOR TO 3:00 P.M. on MONDAY, DECEMBER 15, 2025. Bid proposals will be opened MONDAY, DECEMBER 22, 2025 at 3:00 P.M.**

Proposer's Name: Precision Air Systems, LLC
(Please specify if a corporation, partnership, other entity or individual)

Fed. ID# or SSN: 65-0480483

Address: 11101 South Crown Way #2, Wellington, FL 33414
Fax Number: _____

Telephone No.: 561-791-3980

E-mail Address: rachael@precisionairsystemsinc.com 5617913980

Contact representative: Rachael Clarke

The undersigned authorized representative of the Proposer agrees to all terms and conditions stated in the RFP, to supply Tree Trimming, Management, and Maintenance Services meeting all specifications, and proposes and agrees that if this proposal is accepted by the Village, the Proposer will in good faith enter into contract negotiations with the Village utilizing the standard Village Contract in accordance with the terms and conditions of this RFP. No proposal may be withdrawn for a period of ninety (90) days following the opening of the proposals. The Proposer further acknowledges and affirms the certifications set forth in Section 8 of the RFP.

PROPOSER REPRESENTATIVE WITH AUTHORITY TO BIND PROPOSER

_____ 12/11/2025
Authorized Representative's Signature — Date

Sean Adams — Vice President
Name — Position

CORPORATE SEAL

Attest By: Rachael Clarke
Secretary

Signature: _____ **Date:** 12/11/2025

In accordance with the terms and conditions stated in the Request for Proposals (RFP) requesting all goods and services for the replacement of the Village Library HVAC system, the entity identified above proposes the following to the Village of North Palm Beach:

Precision Air Systems, LLC (Proposer's legal name) certifies that it is licensed to perform the requested services in the State of Florida and Palm Beach County. Proposer agrees to provide the required goods and services stated in the RFP for an amount not to exceed the following sum:

TWO HUNDRED TWENTY SEVEN THOUSAND SEVEN HUNDRED EIGHTY DOLLARS AND ZERO CENTS

Written Dollar Amount

($ 227,780.00)

DRUG FREE WORKPLACE

Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids or proposals which are equal with respect to price, quality, and service are received by any political subdivision for the procurement of commodities or contractual services, a bid or proposal received from a business that certifies that it has implemented a drug-free workplace program shall be given preference in the award process. In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.

3. Give each employee engaged in providing the commodities or contractual services that are under bid or proposal a copy of the statement specified in subsection (1).

4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid or proposal, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.

5. Impose a sanction on or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.

6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.



Proposer's Signature

PUBLIC ENTITY CRIMES STATEMENT
UNDER § 287.133, FLORIDA STATUTES

1. This sworn statement is submitted to the Village of North Palm Beach, Florida

by Sean Adams, Vice President
(print individual's name and title)
for Precision Air Systems, LLC
(print name of entity submitting sworn statement)

whose business address is 11101 South Crown Way #2, Wellington, FL 33414

and (if applicable) its Federal Employer Identification Number (FEIN) is: 65-0480483

(If the entity has no FEIN, include the Social Security Number of the Individual signing this sworn statement:_____)

2. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), **Florida Statutes**, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or of the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision or any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy or material misrepresentation.

3. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), **Florida Statutes**, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

4. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), **Florida Statutes**, means:

   a. A predecessor or successor of a person convicted of a public entity crime; or

   b. An entity under the control any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

5. I understand that a "person" as defined in Paragraph 287.133(1)(e), **Florida Statutes**, means any natural person or entity organized under the laws of any state or of the United States with the legal power

to enter into binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

6. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. **(indicate which statement applies.)**

__X__ Neither the entity submitting this sworn statement, nor any of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding before a Hearing Officer of the State of Florida, Division of Administrative Hearings and the Final Order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. **(attach a copy of the final order)**

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND, THAT HIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES FOR CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

_____
(Signature)

The foregoing document was sworn and subscribed before me this 15 day of December 2025, by Sean Adams who is personally known to me or produced _____ as identification.

MICHELLE L. COSME
MY COMMISSION # HH 228242
EXPIRES: June 14, 2026

_____
Notary Public
My Commission Expires: June 14, 2026

SCRUTINIZED VENDOR CERTIFICATION
PURSUANT TO SECTION 287.135, FLORIDA STATUTES

This sworn statement is submitted to the Village of North Palm Beach, Florida

by Sean Adams, Vice President
(print individual's name and title)
for Precision Air Systems, LLC
(print name of entity submitting sworn statement)

whose business address is 11101 South Crown Way #2, Wellington, FL 33414

and (if applicable) its Federal Employer Identification Number (FEIN) is: 65-0480483

(If the entity has no FEIN, include the Social Security Number of the Individual signing this sworn statement: _____)

1. I hereby certify that the above-named entity:

   A. Does not participate in the boycott of Israel; and

   B. Is not on the Scrutinized Companies that Boycott Israel List.

2. If the Contract for goods and services is for more than $1,000,000, I hereby certify that the above-named entity:

   A. Is not on the Scrutinized Companies with Activities in Sudan List; and

   B. Is not on the Scrutinized Companies with Activities in the Iran Terrorism Sector List; and

   C. Has not engaged in business operations in Cuba or Syria.

Section 287.135, Florida Statutes, prohibits the Village from: (1) contracting with companies for goods or services in any amount if at the time of bidding on, submitting a proposal for, or entering into or renewing a contract if the company is on the Scrutinized Companies that Boycott Israel List, created pursuant to Section 215.4725, Florida Statutes, or is engaged in a boycott of Israel; and (2) contracting with companies, for goods or services over $1,000,000 that are on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Terrorism Sector List created pursuant to Section 215.473, Florida Statutes or is engaged in business operations in Cuba or Syria.

As the person authorized to sign on behalf of the above-named entity, I hereby certify that the statements set forth above are true and that pursuant to Section 287.135, Florida Statutes, the submission of a false certification may subject the company to civil penalties, attorney's fees and/or costs. I further understand that any contract with the Village for goods or services may be terminated at the option of the Village if the company has been found to have submitted a false certification.

(Signature)

The foregoing document was sworn and subscribed before me this 15 day of December, 2025 by Sean Adams, who is personally known to me or produced _____ as identification.

MICHELLE L. COSME
MY COMMISSION # HH 228242
EXPIRES: June 14, 2026

Notary Public
My Commission Expires: June 14, 2026

PRECISION Air Systems
Building Efficiency and Sustainability
A Service Logic Company

QUALIFICATION STATEMENT

Precision Air Systems is a State Licensed Mechanical Contractor that has been actively involved in providing quality HVAC service for numerous commercial customers, including governmental, medical, pharmaceutical, and educational entities since 1994. This service includes HVAC installation, maintenance, and repair to critical facilities equipment. With our certified technicians, extensive project experience, and strong safety record, our company is well-qualified for this HVAC project.

❖ EXPERIENCE AND PERSONNEL

Sean Adams, Vice President (24 years with Precision)
Role in Project: Project Manager
Relevant Experience: 11 years' experience as a Service Technician and Service Manager and 14 years' experience as a Project Manager. Equipped with extensive knowledge of servicing, installing, and managing projects of:

- Split Systems
- RTU's
- Chillers and Cooling Towers
- Piping and Retrofit

Rachael Clarke, Director of Operations (10 years with Precision)
Role in Project: Project Administrator
Relevant Experience: 10 years' experience administering HVAC projects, including but not limited to:

- executing contracts
- providing bonds and applying for permits
- operating as the point of contact for all project communications
- providing and updating project status, work schedules, and AIA billing
- completing necessary project close out documentation

❖ PROJECT MANAGEMENT PLAN

Precision Air Systems is experienced in mitigating any potential project risks. We will work with the Village of North Palm Beach to ensure all items of concern are addressed prior to project commencement.

Safety & Compliance: A Jobsite Hazard Analysis will be conducted to identify any existing safety concerns and to create a project specific safety plan. All work will comply with OSHA safety standards,

EPA refrigerant handling requirements, local building codes, and manufacturer installation guidelines. Required permits will be obtained prior to installation.

Quality Control: System installation and startup will be inspected and tested to ensure proper operation, airflow, electrical connections, and performance prior to turnover.

❖ REFERENCES

Henry Glendenning, Teleperformance Answering Group
304-657-9532, Harry.Glendenning@teleperformance.com
Replace (28) HVAC Units
Award Date: July 2024
Substantially Complete: December 2025
$708,325.00

Caleb More, JFK Medical Center
561-548-3784, caleb.more@hcahealthcare.com
Replace (1) Indoor Liebert Unit
Award Date: December 2020
Substantially Complete: March 2021
$56,500

Shakira Kolb, Palm Beach County
Skolb@pbc.gov
Juno Beach Ocean Rescue HVAC Replacement
Award Date: May 2022
Substantially Complete: October 2023
$95,810.66

❖ WORKLOAD

Palm Beach State College
Bio-Science Exhaust Fan Replacement
$487,201.00
Duration (December 2025 – July 2026)

Palm Beach County
Vista ISS Chiller Replacement
$952,770.00
Duration (November 2025 – November 2026)

Marina Tower
Cooling Tower Replacement
$252,000.00
Duration (July 2025 – March 2026)

❖ LITIGATION

Precision Air Systems has no litigation cases within the past 3 years in which it was named a party.

❖ EVIDENCE OF VALID LICENSES

See attached State of Florida license and Palm Beach County tax receipt.

- State of Florida Mechanical Contractor, License # CMC1251363
- Palm Beach County BTR #2024165287

❖ FACILITIES/EQUIPMENT

Precision Air Systems has one location based out of Wellington, FL that consists of an office and warehouse fully stocked with parts and materials required for the replacement of HVAC equipment.

Ron DeSantis, Governor

Melanie S. Griffin, Secretary

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE MECHANICAL CONTRACTOR HEREIN IS CERTIFIED UNDER THE
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

BERGENS, TYLER M

PRECISION AIR SYSTEMS, LLC
1101 S CROWN WAY STE 2
WELLINGTON FL 33414

LICENSE NUMBER: CMC1251363

EXPIRATION DATE: AUGUST 31, 2026

Always verify licenses online at MyFloridaLicense.com

ISSUED: 06/05/2024

Do not alter this document in any form.

This is your license. It is unlawful for anyone other than the licensee to use this document.

ANNE M. GANNON
CONSTITUTIONAL TAX COLLECTOR
Serving Palm Beach County
Serving you.

P.O. Box 3353, West Palm Beach, FL 33402-3353
www.pbctax.gov Tel: (561) 355-2264

LOCATED AT
11101 S CROWN WAY #2
WELLINGTON, FL 33414-8755

TYPE OF BUSINESS	OWNER	CERTIFICATION #	RECEIPT #/DATE PAID	AMT PAID	BILL #
MECHANICAL CONTRACTOR	BERGENS TYLER M	CMC1251363	B25.646034 08/04/2025	$79.30	B40183187

This document is valid only when receipted by the Tax Collector's Office.

PRECISION AIR SYSTEMS LLC
PRECISION AIR SYSTEMS LLC
11101 S CROWN WAY # 2
WELLINGTON FL 33414-8792

14
7-297

STATE OF FLORIDA
PALM BEACH COUNTY
2025 / 2026 LOCAL BUSINESS TAX RECEIPT
LBTR Number: 2024165287
EXPIRES: 09/30/2026

This receipt MUST be conspicuously displayed at the place of business and in such a manner as to be open to the view of the public.

Detail by Entity Name

Florida Limited Liability Company
PRECISION AIR SYSTEMS, LLC

Filing Information

Document Number	L23000552778
FEI/EIN Number	65-0480483
Date Filed	12/15/2023
Effective Date	04/04/1994
State	FL
Status	ACTIVE
Last Event	CONVERSION
Event Date Filed	12/15/2023
Event Effective Date	NONE

Principal Address

11101 S CROWN WAY STE 2
WELLINGTON, FL 33414

Mailing Address

11101 S CROWN WAY STE 2
WELLINGTON, FL 33414

Registered Agent Name & Address

C T CORPORATION SYSTEM
1200 SOUTH PINE ISLAND ROAD
PLANTATION, FL 33324

Authorized Person(s) Detail

Name & Address

Title AMBR

MSHC, INC.
650 S TRYON ST STE 1000
CHARLOTTE, NC 28202

Title Chairman

Steinke, Craig A
650 S. Tryon Street
Suite 1000

Charlotte, NC 28202

Title Executive Vice President

Ponzo, Anthony
650 S. Tryon Street
Suite 1000
Charlotte, NC 28202

Title VP

Adams, Sean
11101 S CROWN WAY STE 2
WELLINGTON, FL 33414

Title CEO

Richardson, Jason
650 S. Tryon Street
Suite 1000
Charlotte, NC 28202

Title CFO

Sonny, Premanand
11101 S CROWN WAY STE 2
WELLINGTON, FL 33414

Title Secretary, Treasurer

wulinsky, Scott
650 S. Tryon Street
Suite 1000
Charlotte, NC 28202

Annual Reports

Report Year	Filed Date
2024	01/03/2024
2025	04/04/2025

Document Images

04/04/2025 -- ANNUAL REPORT	View image in PDF format
01/03/2024 -- ANNUAL REPORT	View image in PDF format
12/15/2023 -- Florida Limited Liability	View image in PDF format

PRECISION Air Systems
Building Efficiency and Sustainability
A Service Logic Company

REQUEST FOR INFORMATION 1

RFP-2026-PW-02

1. List specifically the type, make and model of the equipment being proposed. A cut sheet would be highly useful.

Response: *Carrier Equipment – 38AXZM08A0B5-0A0A0 / 40RLAA08A2A5-UA0A0*
Cust sheets attached.

2. What type of coils and coatings are being proposed? Note, no microchannel type units will be used, and a hail guard will be present.

Response: *Modine coil coatings*

3. What is the procurement lead time for delivery of this equipment?

Response: *Equipment is currently in stock. There is a 2-3 week lead time for coil equipment coating.*

4. What is your organizations' proposed scheduled duration for project completion (calendar days)? Provide a timeline/sequence of events.

Response: *The project duration is 14 calendar days. Tentative project schedule attached.*

5. What is your proposed library access plan to achieve construction completion while maintaining library access? E.g.-Will the entire library need to be closed? Will just the upstairs need to be closed? Would phased construction be proposed/requested?

Response: *The recommended library access plan would include a 1-week entire library closure. An alternative access plan could include a 2-day entire library closure with the upstairs closed for an additional 3 days. Please note that noise could be a factor with the alternative access plan.*

Phased construction is being proposed as per the attached project schedule, with the indoor units being completed during the first week and the outdoor units being completed during the second week.

6. Please detail the type of service access being provided for the 5-ton units.

Response: *36”H x 60”L access doors with gas shocks. Cut sheet attached.*

7. What type of floor protection will be provided (carpet is new)?

Response: *Masonite floor protection will be provided to protect flooring.*

PRECISION Air Systems
Building Efficiency and Sustainability
A Service Logic Company

TENTATIVE PROJECT SCHEDULE

Tasks	Start	Finish	Duration	Predecesso...
Demo	02/09/26	02/09/26	1d	
Set new equipment INTERIOR	02/10/26	02/10/26	1d	1
Ductwork	02/11/26	02/13/26	3d	2
Eelctrical	02/11/26	02/13/26	3d	2
Piping	02/11/26	02/13/26	3d	2
Carpentry	02/11/26	02/13/26	3d	2
Install access panels	02/11/26	02/13/26	3d	
Set new equipment EXTERIOR	02/16/26	02/16/26	1d	
Piping	02/17/26	02/17/26	1d	8
Electrical	02/17/26	02/17/26	1d	8
Startup	02/18/26	02/20/26	3d	10



Submittal Data Sheet

15.2 SEER2 R-32 AC, 5 ton

DC5SEA6010

STANDARD FEATURES

- High efficiency scroll compressor
- High-density foam compressor sound blanket
- Advanced Copeland® CoreSense™ Technology
- Fully charged for 15’ of tubing length
- Copper tube/ enhanced aluminum fin coil 5mm diameter
- Factory-installed filter drier
- Sweat connection service valves with easy access to gauge ports
- Enclosed contactor
- High-pressure switch
- Ground lug connection
- Capacitors with extended life
- AHRI Certified
- ETL Listed



CABINET FEATURES

- Removable grille-style top design compliant with UL 60335-2-40
- Venturi for increased velocity of airflow
- Custom Nickel Gray powder-paint finish
- 500-hour salt-spray tested
- Wire fan discharge grille
- Steel louver coil guard
- Rust-resistant coated screws
- Top and side maintenance access
- Single-panel access to controls with space provided for field-installed accessories
- When properly anchored, meets the 2023 Florida Building Code unit integrity requirements for hurricane-type winds (Anchor bracket kits available.)

(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations)

Submittal Data Sheet
15.2 SEER2 R-32 AC, 5 ton
DC5SEA6010

PERFORMANCE COMBINATION (HSVTC)	* VALUES SHOWN ARE FOR AHRI RATED HIGH SALES VOLUME TESTED		
Outdoor Unit Model No.	DC5SEA6010	Outdoor Unit Name:	15.2 SEER2 R-32 AC, 5 ton
Rated Cooling Conditions:	Indoor (°F DB/WB): 80 / 67 Ambient (°F DB/WB): 95 / 72	Rated Heating Conditions:	Indoor (°F DB/WB): / Ambient (°F DB/WB): /
* EER:		* EER2:	
* SEER:		* SEER2:	
* Rated Cooling Capacity (Btu/hr):			

OUTDOOR UNIT DETAILS			
Power Supply (V/Hz/Ph):	208/230 / 60 / 1	Compressor Stage:	Two Stage
Min. Circuit Amps MCA (A):	36.4	Suction Valve Connection Size (inch):	7/8
Max Overcurrent Protection (MOP) (A):	60	Liquid Valve Connection Size (inch):	3/8
Rated Load Amps RLA(A):		Sound Power (High) (dBA):	74
Refrigerant Type:	R-32	Cooling Operation Range (°F DB):	55 - 115
Holding Refrigerant Charge (ozs):	167	Heating Operation Range (°F DB):	-
Additional Charge (ounces/ft):		Max. Pipe Length (Vertical) (ft):	50
Pre-charge Piping (Length) (ft):	15	Min. Cooling Range w/Baffle (°F DB):	
Max. Pipe Length (Total) (ft):	79	Min. Heating Range w/Baffle (°F DB):	
Net Weight (lb):		Gross Weight (lb):	300
Dimensions (HxWxD) (in):	41.625 x 35-1/2 x 35.5		

(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations)

Submittal Data Sheet
15.2 SEER2 R-32 AC, 5 ton
DC5SEA6010

DIMENSIONAL DRAWING



(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations)

ACCESSORIES

PART NUMBER	DESCRIPTION	INCLUDED
0130R00000S	PRESSURE SWITCH KIT	No
ABK-20	ANCHOR BRACKET KIT	No
ASC01A	ANTI-SHORT CYCLE KIT	No
CSR-U-1	Compressor Saver - Hard Start Kit - 1 TO 3 Ton	No
FSK01A	Freeze-Stat Kit	No
LSK02A	SOLENOID KIT FOR REM	No

(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations)

Submittal Data Sheet

7.5 Ton Light Commecial Air Handler 208/230V 3PH R32

DAQ09033

STANDARD FEATURES

- • TXV Control; Units have two (2) thermal expansion valves • DAQ units feature two 5-speed direct-drive motors • Copper tube/aluminum fin coils • AHRI Certified; ETL Listed • R-32 leak mitigation system

CABINET FEATURES

- • Heavy-gauge, reinforced, galvanized-steel cabinet • Fully insulated with fiberglass blanket • Horizontal and vertical condensate pans • Built-in filter rack (2" filter included) • Entry on top of panel for both low and high voltage • Removable access panels make servicing of unit faster and easier



(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations)

Submittal Data Sheet

7.5 Ton Light Commecial Air Handler 208/230V 3PH R32

DAQ09033

PERFORMANCE

Product Model No.	DAQ09033	Product Model Name:	7.5 Ton Light Commecial Air Handler 208/230V 3PH R32
Type:	Light Commercial Air Handler	Cooling Capacity (Nominal) (Btu/hr):	90,000

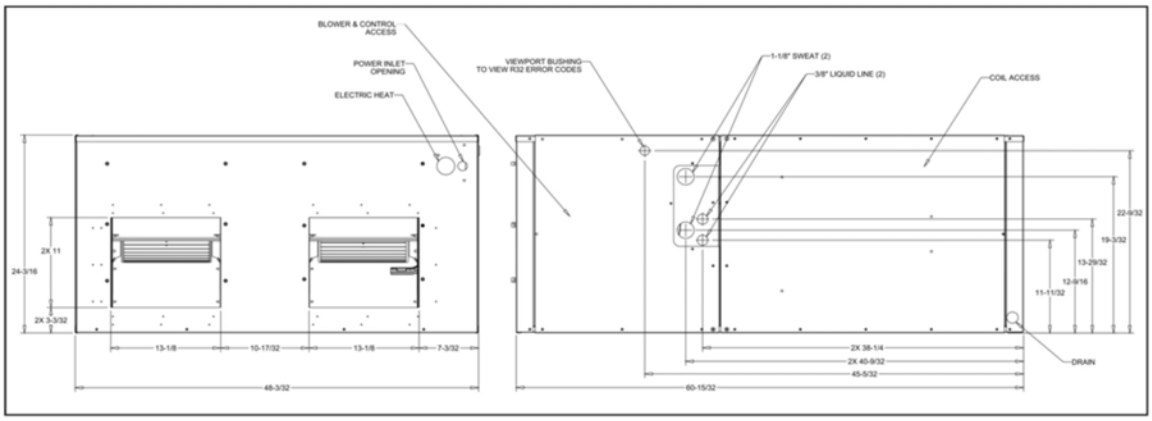
PRODUCT DETAILS

Dimensions (HxWxD) (in):	24.1875 x 60-1/2 x 48.09375	Suction Valve Connection Size (inch):	1-1/8
Net Weight (lb):	430	Liquid Valve Connection Size (inch):	5/8
Gross Weight (lb):	393	Condensate Connection (inch):	

(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations)

DIMENSIONAL DRAWING

DIMENSIONS

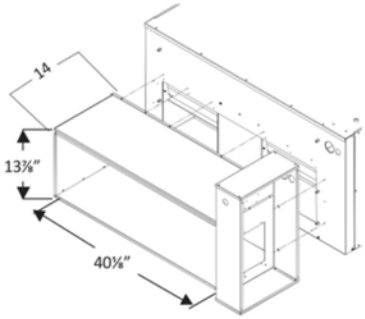


DUCT CONNECTION SIZING WITHOUT ELECTRIC HEATERS

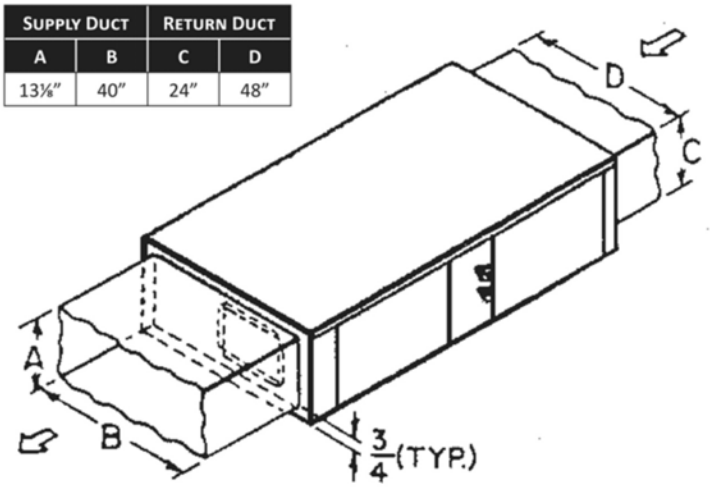
MINIMUM SUPPLY AND RETURN DUCT DIMENSIONS

DIMENSIONAL DATA FOR ELECTRIC HEATER KITS

- 15, 20, & 30 kW Heater Kits
- Supply opening is 13⅞" x 40⅛"



SUPPLY DUCT		RETURN DUCT	
A	B	C	D
13⅞"	40"	24"	48"



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Submittal Data Sheet
7.5 Ton Light Commecial Air Handler 208/230V 3PH R32
DAQ09033

ACCESSORIES

PART NUMBER	DESCRIPTION	INCLUDED
0151A00013	Adjustable Valve TXV .R32	No
0151A00014	Adjustable Valve TXV .R32	No
AHKD15-3A	Elec Heatkit 15Kw 230V	No
AHKD20-3A	Elec Heatkit 20Kw 230V	No
AHKD30-3A	Elec Heatkit 30Kw 230V	No
FSK05A	Freeze Thermostat Kit	No

(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations)

Submittal Data Sheet

16.4 IEER A/C R32, 7.5 Ton 208/230V 3PH

DC6TE09030

STANDARD FEATURES

- Two-Stage tandem compressor design
- Quiet operating top discharge
- High-efficiency copper tube / aluminum fin coil
- Brass liquid and suction service valves
- High- and low-pressure switches
- Factory-installed filter drier
- Complies with ASHRAE 90.1
- AHRI Certified; ETL Listed



CABINET FEATURES

- Innovative sound control top design
- Steel louver coil guard protects the coil from damage and adds strength to unit
- Bottom pan rails elevate unit above slab
- Heavy-gauge galvanized-steel cabinet
- Attractive Nickel Gray powder-paint finish
- When properly anchored, meets the 2010 Florida Building Code unit integrity requirements for hurricane-type winds (Anchor bracket kits available.)

(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations)

Submittal Data Sheet

16.4 IEER A/C R32, 7.5 Ton 208/230V 3PH

DC6TE09030

PERFORMANCE COMBINATION (HSVTC)	* VALUES SHOWN ARE FOR AHRI RATED HIGH SALES VOLUME TESTED		
Outdoor Unit Model No.	DC6TE09030	Outdoor Unit Name:	16.4 IEER A/C R32, 7.5 Ton 208/230V 3PH
Rated Cooling Conditions:	Indoor (°F DB/WB): 80 / 67 Ambient (°F DB/WB): 95 / 75	Rated Heating Conditions:	Indoor (°F DB/WB): / Ambient (°F DB/WB): /
* EER:	12.30	* EER2:	
* SEER:		* SEER2:	
* Rated Cooling Capacity (Btu/hr):	95,000		

OUTDOOR UNIT DETAILS

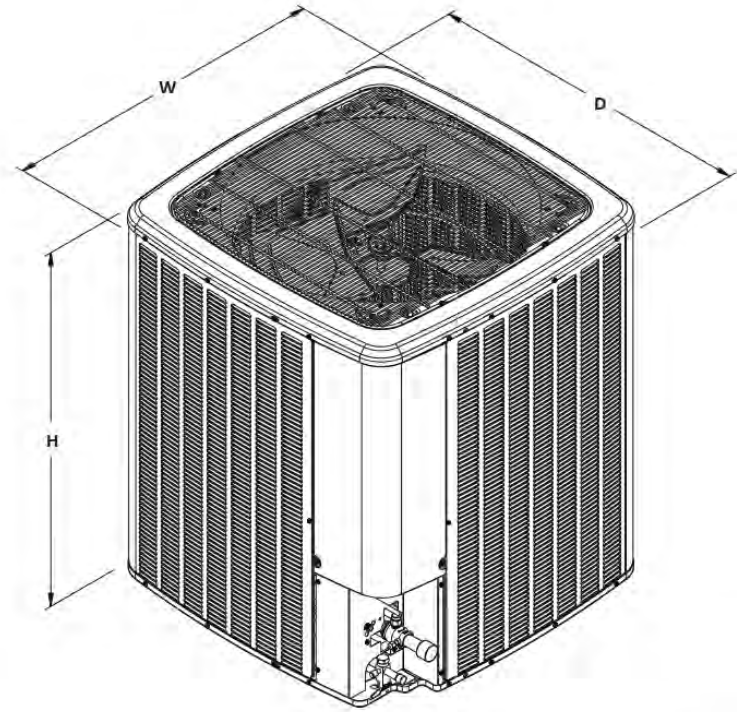
Power Supply (V/Hz/Ph):	208/230 / 60 / 3	Compressor Stage:	Two Stage
Min. Circuit Amps MCA (A):	38.7	Suction Valve Connection Size (inch):	1-1/8
Max Overcurrent Protection (MOP) (A):	50	Liquid Valve Connection Size (inch):	5/8
Rated Load Amps RLA(A):	14.1	Sound Power () (dBA):	
Refrigerant Type:	R-32	Cooling Operation Range (°F DB):	55 - 125
Holding Refrigerant Charge (ozs):	110	Heating Operation Range (°F DB):	-
Additional Charge (ounces/ft):	1.54	Max. Pipe Length (Vertical) (ft):	25
Pre-charge Piping (Length) (ft):	15	Min. Cooling Range w/Baffle (°F DB):	
Max. Pipe Length (Total) (ft):	150	Min. Heating Range w/Baffle (°F DB):	
Net Weight (lb):	350	Gross Weight (lb):	391
Dimensions (HxWxD) (in):	41.5 x 35-1/2 x 35.5		

(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations)

Submittal Data Sheet
16.4 IEER A/C R32, 7.5 Ton 208/230V 3PH
DC6TE09030

DIMENSIONAL DRAWING

DIMENSIONS



MODELS	DIMENSIONS		
	W"	D"	H"
DC6TE09030A*	35½"	35½"	41½"
DC6TE09040A*	35½"	35½"	41½"
DC6TE12030A*	35½"	35½"	41½"
DC6TE12040A*	35½"	35½"	41½"

(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations)

Submittal Data Sheet
16.4 IEER A/C R32, 7.5 Ton 208/230V 3PH
DC6TE09030

ACCESSORIES

PART NUMBER	DESCRIPTION	INCLUDED
ABK-20	ANCHOR BRACKET KIT	No
LAKT01AC	Low-Ambient Kit	No
LSK01A	SOLENOID KIT FOR REM	No
OT18-60-02A	Outdoor Thermostat Kit	No

(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations)

PROJECT MANAGEMENT PLAN / TECHNICAL APPROACH

RFP-2026-PW-02 – North Palm Beach Library HVAC Replacement

Project Scope Summary (Plan-Based)

Based on the provided mechanical and electrical drawings, this project replaces the existing split-system HVAC serving the main library areas. Key scope elements include (final quantities and routing to be verified during field walk prior to demolition):

- Demolish and replace four (4) air handling units located above ceiling/soffit areas serving the main library.
- Demolish and replace four (4) outdoor condensing units located at grade; provide housekeeping pads/supports and manufacturer-required clearances.
- Install new refrigerant line sets between the air handlers and condensers, routed adjacent to exterior wall locations; provide protective line-set covers where exposed.
- Provide condensate management (traps, pumps/discharge piping as detailed) and restore finishes at access points as required for a complete, functional installation.
- Reconnect supply/return ductwork to existing systems as shown; provide required access panels and above-ceiling coordination.
- Provide electrical connections, disconnects, and associated circuitry for new/replaced HVAC equipment per electrical documents; execute all work under LOTO controls.
- Verify/start-up, Testing/Adjusting/Balancing (TAB), and owner training; provide closeout deliverables including O&M manuals, warranties, and as-builts.

1. Project Objectives and Execution Priorities

Our primary objective is to deliver a safe, code-compliant HVAC replacement that maintains library operations with minimal disruption. We will accomplish this by phasing work, controlling the work environment (noise, dust, access), and coordinating shutdowns and inspections in advance.

- Safety first: protect patrons, staff, and workers through controlled access, documented safety plans, and disciplined field supervision.
- Operational continuity: plan cutovers to minimize loss of cooling/ventilation; perform high-impact work during approved low-occupancy windows when required.
    - Equipment replacement shall take place during nighttime hours.
- Quality and performance: install per permitted plans; verify existing conditions early; deliver reliable, maintainable systems with complete turnover documentation.
- Schedule certainty: manage long-lead procurement, submittals, and inspections with a baseline schedule and rolling look-ahead planning.
    - Preliminary project schedule attached.

2. Project Team, Roles, and Communication

Advanced Air Systems will assign a dedicated Project Manager (PM) and Site Superintendent/Foreman to lead planning, daily field execution, and coordination with the Village and design team. Key roles and responsibilities are summarized below.

- Project Manager (PM): contract administration, submittals/RFIs, procurement, cost control, schedule updates, stakeholder communication, change management.
- Superintendent/Foreman: daily safety and quality control, work-zone management, coordination with library staff, verification of existing conditions, punchlist closure.
- Safety Lead: job hazard analysis (JHA), public protection measures, hot-work/LOTO oversight, incident prevention, compliance audits.
- MEP Coordination Lead (Mechanical/Electrical/Controls): coordinates power, controls, condensate, refrigerant piping, and any BAS/interface requirements; plans shutdowns and cutovers.
- TAB/Commissioning Coordinator: manages start-up readiness, TAB scheduling, functional checks, and training/turnover documentation.

Communication cadence and controls:

- Weekly OAC meeting (or as required): progress, upcoming impacts, RFIs/submittals, shutdowns, safety, and constraints.
- Daily on-site huddles during active installation/cutover: planned work, hazards, access limitations, and day-end restoration.
- Single-source logs maintained by PM: submittal log, RFI log, procurement log, constraint log, change log, and risk (vulnerability) register.

3. Work Plan and Phasing to Minimize Operational Impact

Our work plan is structured around maintaining safe public access and minimizing interruptions to conditioned spaces. We will coordinate all high-impact activities (shutdowns, ceiling access, noisy demolition, rigging, and electrical tie-ins) with the Village in advance.

- We will coordinate closely with library staff to identify closed areas, relocate bookshelves as needed, and install temporary barriers to keep spaces clear, safe, and minimize the impact on library's operations.
    - Majority of work is expected to take place during nighttime hours, to minimize the impact on library operations.
    - Closures only expected to impact areas surrounding new unit locations on the ground floor, and below return grille connected to 7.5 Ton units.

3.1 Pre-Construction Planning (Award to Mobilization)

- Conduct a kickoff meeting with the Village/Engineer to confirm phasing expectations, work hours, access routes, laydown areas, and shutdown approval process.
- Perform a documented field verification walk (ceiling spaces, equipment locations, existing power feeds, condensate routing, refrigerant line routing, roof/grade access).
- Submit early submittals for major equipment, controls, and electrical materials; release long-lead items upon approval.
- Develop a baseline schedule including submittals, procurement, installation, inspections, TAB/commissioning, training, and closeout.

- Estimated time from award to mobilization: 45 Days.
  - Equipment lead times: 5-6 Weeks.

3.2 Construction Phasing and Cutover Strategy

To reduce downtime, we will phase the work by system/zone wherever feasible and complete one cutover at a time. Our approach is to keep unaffected areas operational while work occurs in controlled zones.

- Establish controlled work zones with temporary barriers and signage; maintain clear public egress at all times.
- Open ceilings only where required; protect finishes and furnishings; restore ceiling tiles and clean daily in active areas.
- Plan and execute electrical/mechanical shutdowns through a formal shutdown request and rollback plan (materials-on-hand, staffing confirmed, inspections scheduled).
- Sequence demolition, installation, and start-up to minimize the time a space is without conditioning; provide temporary conditioning if required by phasing constraints.

3.3 Housekeeping, Noise, and Indoor Air Quality Controls

- Dust control: localized containment, HEPA vacuums, and daily cleaning; protect return paths and sensitive areas during ceiling work.
- Noise control: coordinate loud work (core drilling, demolition, fastening) for approved hours; maintain clear communication with library staff.
- Material staging: keep aisles and exits clear; secure tools/materials after hours; maintain clean work zones to protect patrons and staff.
- Carpet protection: floor protection to cover carpets to ensure cleanliness and damage-free project areas during the HVAC replacement.

4. Safety Management (Occupied Facility)

Safety management is integrated into planning and daily field execution. Our superintendent leads daily JHAs and verifies controls are in place before work starts. Because this is a public facility, we emphasize separation of the public from work zones and disciplined access control.

- Job Hazard Analysis (JHA) completed daily and updated for changing site conditions.
- Public protection: hard barricades, signage, controlled access, and escorted access where needed.
- Lockout/Tagout (LOTO) for all electrical tie-ins and equipment servicing; verification of de-energization.
- Hot work program (permit, fire watch, extinguishers, and protection of combustibles) as required.
- Ladder/scaffold/scissor-lift safety for ceiling work; fall protection as applicable.
- Rigging and lifting controls for equipment handling; maintained clear paths and spotters in public-adjacent areas.
- Silica/dust controls for any drilling/cutting; PPE enforcement and housekeeping standards.

5. Quality Control and Constructability Management

Our QC program is designed to prevent rework, protect the schedule, and ensure the installed system performs as intended. We treat early verification and disciplined documentation as the primary quality drivers on an existing building project.

- Field verification and RFI resolution prior to demolition whenever practical (dimensions, routing, access clearances, existing utilities).
- Submittal review for compliance with permitted drawings and specifications; coordination across mechanical/electrical/controls prior to release.
- Installation checklists: refrigerant piping practices, condensate management, equipment supports, duct connections, sealing/insulation, and labeling.
- Daily superintendent QC walk with punchlist items captured and closed progressively (not deferred to the end).

6. Schedule, Procurement, and Constraint Management

We will manage the project using a baseline schedule supported by a rolling three-week look-ahead. Key constraints are tracked proactively (long-lead equipment, inspections, access windows, and shutdown approvals).

- Baseline schedule submitted after award and updated at least biweekly (or per OAC cadence).
- Rolling three-week look-ahead issued weekly, highlighting upcoming impacts to operations and required owner actions (access/shutdown approvals).
- Procurement log tracking: submittal dates, approvals, fabrication, shipping, delivery, and site readiness.
- Inspection planning: coordinate rough/above-ceiling inspections and final inspections to avoid rework and repeated ceiling access.
- Approximate Project Duration: 3-4 Months from award to substantial completion.

7. Electrical, Controls, and Shutdown Coordination

Successful delivery depends on tight coordination between mechanical installation, electrical power, and controls/start-up. We will coordinate all tie-ins and system enablement activities to reduce outages and ensure safe commissioning.

- Verify existing electrical capacity and routes; coordinate any panel work, disconnects, and equipment connections prior to cutover.
- Coordinate controls scope and sequences; confirm sensor locations, smoke detector/interface requirements, and thermostat locations prior to installation.
- Shutdown Request Process: written request, start/stop time, affected areas, notifications, staffing plan, materials staged, and rollback plan.
- Day-end restoration: ensure spaces are safe, secure, and clean; restore temporary barriers and maintain egress.

8. Start-Up, TAB, Training, and Closeout

We plan turnover activities from the start of the project so the Village receives a complete, organized closeout package with verified system performance.

- Start-up readiness checks completed prior to manufacturer start-up (power, controls, condensate, refrigerant charge, airflow paths).
- Testing, Adjusting, and Balancing (TAB) scheduled in coordination with the Village; deficiencies tracked to closure.

- Owner training: operations overview, filter changes, thermostat/control functions, condensate maintenance, and warranty procedures.
- Closeout package: as-built markups, equipment submittals, O&M manuals, warranties, TAB/commissioning documentation, and final punchlist closure.

9. Managing and Developing Vulnerability Assessment Tasks (Risk Management)

The RFP requests a description of how we will manage and develop Vulnerability Assessment tasks. For this project, we treat "vulnerabilities" as conditions or constraints that could create safety incidents, outages, schedule delays, cost growth, or performance issues. Our VA process is embedded in the project controls described above and is managed through a living risk register.

9.1 VA Process and Tools

- Kickoff VA workshop (pre-construction): identify project-specific risks (existing conditions, access constraints, long-lead items, shutdown windows, public safety interfaces).
- Risk register with probability/impact scoring, mitigation actions, assigned owners, and due dates (updated weekly).
- Trigger-based reviews: any RFI, hidden condition, planned outage, or design clarification automatically prompts VA update and mitigation planning.
- Verification: risks are closed only when mitigations are implemented and verified in the field (photos, checklists, inspection sign-offs).

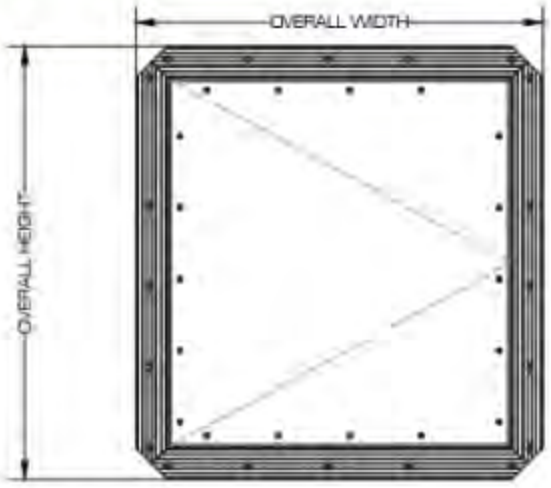
9.2 Typical Vulnerabilities and Mitigations for an Occupied Library

- Unplanned loss of conditioning: phase cutovers and pre-stage materials; execute outages with rollback plans; provide temporary conditioning if required.
- Public exposure to work areas: hard barricades, controlled access, clear signage, and daily restoration of safe paths.
- Dust/noise impacts: containment and HEPA cleaning; schedule high-noise work for approved periods; proactive communication to staff.
- Existing-condition conflicts: early field verification and rapid RFI resolution to prevent rework and repeated ceiling access.
- Startup/performance issues: coordinated controls checks, TAB planning, and structured functional verification prior to turnover.

BAUCO XL

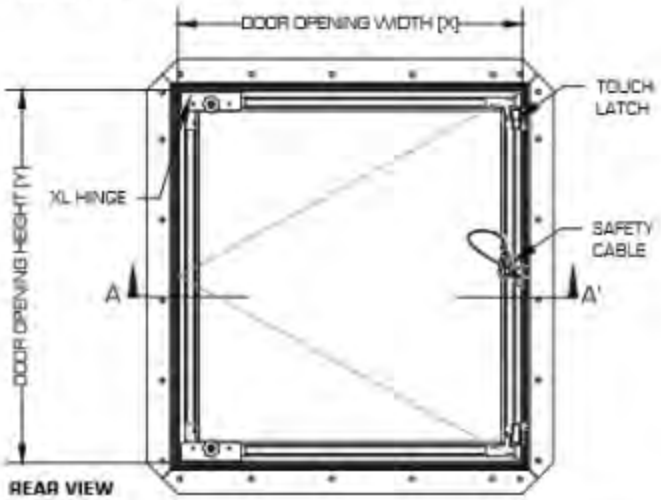
Drywall Access Panel with front-mount frame and fixed hinge

Submittal Sheet



FRONT VIEW





REAR VIEW

STANDARD FEATURES

- Front-mount frame
- For openings in drywall walls and ceilings
- Concealed aluminum frame, hardware and mechanical touch latch
- Factory installed moisture/ mold resistant drywall inlay
- Frame acts as finishing bead
- 2mm perimeter gap
- Virtually invisible continous finish
- Foam filled bulb gasket
- Good sound control with seal and mass of drywall inlay
- Fully removable door leaf with easy hinge release
- Concealed steel hinge with and safety cable

Standard Sizes

(Wide range of custom sizes and custom options available.)

Access Panel Size Clear Opening		Weight
Inch	mm	lbs
24 x 36"	610 x 914mm	21
36 x 36"	914 x 914mm	30
24 x 48"	610 x 1219mm	28
48 x 48"	1219 x 1219mm	49
30 x 60"	662 x 1524mm	40
30 x 72"	762 x 1829mm	46

BUY DIRECT from BAUCO for best pricing and shortest lead time.

Size

_____" Width(X) x _____" Length(Y)

Application

- ☐ Wall
- ☐ Ceiling

Latch Options

- ☐ (Standard) Mechanical Touch Latch
- ☐ Slotted Cam
- ☐ Torx Cam
- ☐ Keyed Lock

Inlay Options

- ☐ (Standard) Drywall
- ☐ Acoustic Board
- ☐ Plaster Board (to bond with plaster veneer)
- ☐ Plywood
- ☐ Double Layer Drywall

Time Saving Option

- ☐ BAUCO Paint-ready (Factory-primed door leaf. Ready to paint.)

Project: _____

Client: _____

Approved by: _____

Date: _____

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PROPOSER'S ACKNOWLEDGEMENT AND PROPOSAL FORM

SUBMIT ONE (1) ORIGINAL, FIVE (5) COPIES AND ONE (1) ELECTRONIC COPY OF YOUR PROPOSAL TO:

Village of North Palm Beach
Village Clerk's Office
501 U.S. Highway One,
North Palm Beach, FL 33408

RFP TITLE:

Proposal must be received **PRIOR TO 3:00 P.M. on MONDAY, DECEMBER 15, 2025. Bid proposals will be opened MONDAY, DECEMBER 22, 2025 at 3:00 P.M.**

Proposer's Name: Advanced Roofing, Inc. dba Advanced Air Systems Corporation
(Please specify if a corporation, partnership, other entity or individual)

Fed. ID# or SSN: 59-2360591

Address: 1950 NW 22nd Street, Fort Lauderdale, FL 33311

Fax Number: 954-566-2967

Telephone No.: 954-522-6868

E-mail Address: paulm@advancedairsystem.com

Contact representative: Paul Murphy

The undersigned authorized representative of the Proposer agrees to all terms and conditions stated in the RFP, to supply Tree Trimming, Management, and Maintenance Services meeting all specifications, and proposes and agrees that if this proposal is accepted by the Village, the Proposer will in good faith enter into contract negotiations with the Village utilizing the standard Village Contract in accordance with the terms and conditions of this RFP. No proposal may be withdrawn for a period of ninety (90) days following the opening of the proposals. The Proposer further acknowledges and affirms the certifications set forth in Section 8 of the RFP.

PROPOSER REPRESENTATIVE WITH AUTHORITY TO BIND PROPOSER

Authorized Representative's Signature — Date: 12/15/2025

Michael Kornahrens — Name

Vice President — Position

CORPORATE SEAL

Attest By: Robert P. Kornahrens
Secretary

Signature: _____ **Date:** 12/15/2025

In accordance with the terms and conditions stated in the Request for Proposals (RFP) requesting all goods and services for the replacement of the Village Library HVAC system, the entity identified above proposes the following to the Village of North Palm Beach:

Advanced Roofing, Inc. dba Advanced Air Systems (Proposer's legal name) certifies that it is licensed to perform the requested services in the State of Florida and Palm Beach County. Proposer agrees to provide the required goods and services stated in the RFP for an amount not to exceed the following sum:

Two Hundred Eleven Thousand Two Hundred Sevety Dollars

Written Dollar Amount

($ 211,270.00)

DRUG FREE WORKPLACE

Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids or proposals which are equal with respect to price, quality, and service are received by any political subdivision for the procurement of commodities or contractual services, a bid or proposal received from a business that certifies that it has implemented a drug-free workplace program shall be given preference in the award process. In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.

3. Give each employee engaged in providing the commodities or contractual services that are under bid or proposal a copy of the statement specified in subsection (1).

4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid or proposal, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.

5. Impose a sanction on or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.

6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.



Proposer's Signature Robert P. Kornahrens, President

PUBLIC ENTITY CRIMES STATEMENT
UNDER § 287.133, FLORIDA STATUTES

1. This sworn statement is submitted to the Village of North Palm Beach, Florida

by Robert P. Kornahrens, President
(print individual's name and title)
for Advanced Roofing, Inc. dba Advanced Air Systems
(print name of entity submitting sworn statement)

whose business address is 1950 NW 22nd Street, Fort Lauderdale, FL 33311

and (if applicable) its Federal Employer Identification Number (FEIN) is: 59-2360591

(If the entity has no FEIN, include the Social Security Number of the Individual signing this sworn statement:_____)

2. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), **Florida Statutes**, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or of the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision or any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy or material misrepresentation.

3. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), **Florida Statutes**, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

4. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), **Florida Statutes**, means:

   a. A predecessor or successor of a person convicted of a public entity crime; or

   b. An entity under the control any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

5. I understand that a "person" as defined in Paragraph 287.133(1)(e), **Florida Statutes**, means any natural person or entity organized under the laws of any state or of the United States with the legal power

to enter into binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

6. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. **(indicate which statement applies.)**

X Neither the entity submitting this sworn statement, nor any of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding before a Hearing Officer of the State of Florida, Division of Administrative Hearings and the Final Order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. **(attach a copy of the final order)**

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND, THAT HIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES FOR CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

_____
(Signature) Robert P. Kornahrens, President

The foregoing document was sworn and subscribed before me this 15 day of December 2025, by XX who is personally known to me or produced _____ as identification.

TIERRA DAVIS
MY COMMISSION # HH 614622
EXPIRES: November 20, 2028

_____
Notary Public
My Commission Expires:

SCRUTINIZED VENDOR CERTIFICATION
PURSUANT TO SECTION 287.135, FLORIDA STATUTES

This sworn statement is submitted to the Village of North Palm Beach, Florida

by Robert P. Kornahrens, President
(print individual's name and title)
for Advanced Roofing, Inc. dba Advanced Air Systems
(print name of entity submitting sworn statement)

whose business address is 1950 NW 22nd Street, Fort Lauderdale, FL 33311

and (if applicable) its Federal Employer Identification Number (FEIN) is: 59-2360591

(If the entity has no FEIN, include the Social Security Number of the Individual signing this sworn statement: _____)

1. I hereby certify that the above-named entity:

   A. Does not participate in the boycott of Israel; and

   B. Is not on the Scrutinized Companies that Boycott Israel List.

2. If the Contract for goods and services is for more than $1,000,000, I hereby certify that the above-named entity:

   A. Is not on the Scrutinized Companies with Activities in Sudan List; and

   B. Is not on the Scrutinized Companies with Activities in the Iran Terrorism Sector List; and

   C. Has not engaged in business operations in Cuba or Syria.

Section 287.135, Florida Statutes, prohibits the Village from: (1) contracting with companies for goods or services in any amount if at the time of bidding on, submitting a proposal for, or entering into or renewing a contract if the company is on the Scrutinized Companies that Boycott Israel List, created pursuant to Section 215.4725, Florida Statutes, or is engaged in a boycott of Israel; and (2) contracting with companies, for goods or services over $1,000,000 that are on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Terrorism Sector List created pursuant to Section 215.473, Florida Statutes or is engaged in business operations in Cuba or Syria.

As the person authorized to sign on behalf of the above-named entity, I hereby certify that the statements set forth above are true and that pursuant to Section 287.135, Florida Statutes, the submission of a false certification may subject the company to civil penalties, attorney's fees and/or costs. I further understand that any contract with the Village for goods or services may be terminated at the option of the Village if the company has been found to have submitted a false certification.

(Signature) Robert P. Kornahrens, President

The foregoing document was sworn and subscribed before me this 15 day of December, 2025 by Robert P. Kornahrens, who is personally known to me or produced _____ as identification.

TIERRA DAVIS
MY COMMISSION # HH 614622
EXPIRES: November 20, 2028

Notary Public
My Commission Expires:

EXPERIENCE MATTERS
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Web: *advancedairsystem.com*

State License: CAC1818806

Bidder's Experience/References

Project Reference #1: Eastern Regional Water Supply Facility Laboratory Building Air Handlers and Chillers Emergency Replacement

1. **Description of Scope of Work Performed:**
   Removal and replacement of air handling units (AHUs) and chillers at the Eastern Regional Water Supply Facility. This included removing five air-handling units, chilled water circulation pumps, heat recovery loop circulation pumps, two 130-ton nominal capacity air-cooled chillers, and associated piping. New installations included updated AHUs, glycol-water circulation pumps, chilled water circulation pumps, AHU controls, and electrical services. The project also encompassed system testing, adjusting, and balancing, along with all necessary cutting, patching, and surface restoration.
2. **Project Address:** 9150 Curry Ford Road, Orlando, Florida 32825.
3. **Key Personnel Assigned:**
   - **Erick Rodriguez** - Construction Manager
   - **Raymond Urgelles** - Project Manager
4. **Client Contact Information:**
   - **Name:** Terra L. Reffitt
   - **Title:** Chief Inspector
   - **Organization:** Orange County Utilities, Field Services Division
   - **Address:** 9150 Curry Ford Road, Orlando, Florida 32825
   - **Phone Number:** 407-254-9796 / 407-947-9802
   - **Email Address:** terra.reffitt@ocfl.net
5. **Project Cost:** $2,053,258.32
6. **Project Start and Completion Dates:**
   - **Notice to Proceed:** April 11, 2022
   - **Substantial Completion:** June 4, 2023
   - **Final Completion:** July 4, 2023

Project Reference #2: Riverside Hotel HVAC Upgrades

1. **Description of Scope of Work Performed:**
    - **Fan Coil Replacement:** Removal of existing chilled water fan coils and installation of forty (40) new 400 CFM chilled water vertical stack fan coils. Scope included electrical lockout/tagout, ductwork reconnections, drywall repair, insulation, condensate management, system bleeding, and performance calibration. Each unit featured ECM motors, stainless steel components, programmable thermostats, and safety overflow devices.
    - **Chiller Replacement:** Replacement of two 110 ton chillers with upgraded systems designed to enhance cooling efficiency. The scope included removal of old units, installation of new chillers, reconnections of all associated piping and electrical systems, and commissioning of the updated system.
2. **Project Address:** 620 E Las Olas Blvd, Fort Lauderdale, FL 33301
3. **Key Personnel Assigned:**
    - **Emerson Montalvan** - Construction Manager
    - **Leena Ishmael** - Project Manager
4. **Client Contact Information:**
    - **Name:** Michael Weymouth
    - **Title:** President
    - **Organization:** Riverside Hotel and Las Olas Company
    - **Address:** 600 Sagamore Road, Fort Lauderdale, FL 33301
    - **Phone Number:** 954-444-3130
    - **Email Address:** mike@lasolas.co
5. **Project Cost:** $821,900.00
6. **Project Start and Completion Dates:**
    - **Notice to Proceed:** February 26, 2024
    - **Substantial Completion:** October 15, 2024
    - **Completion Date:** November 8, 2024

Project Reference #3: Lauderhill Police Department HVAC Upgrades

1. **Description of Scope of Work Performed:**
   A multi-phase HVAC upgrade project designed to address immediate needs and long-term improvements at the Lauderhill Police Department. The extended timeline was due to the complex nature of the upgrades and phased implementation to minimize disruption to critical police operations. The work included:

   - **Phase 1:** Replacement of the existing DX split systems with an air-cooled chilled water system. This phase involved the installation of chillers, chilled water pumps, hydronic specialties, and AHUs, as well as temporary trailer-mounted chillers and spot coolers during construction. Pre-construction and post-construction test and balance (TAB) and integration into the Johnson Controls Building Automation System were also completed.

   - **Phase 2:** Further enhancements including the installation of VAV diffusers, new supply air temperature controls, replacement of inline exhaust fans and supply air ceiling diffusers, and installation of a mini-split system for localized cooling. Electrical work to support the upgraded HVAC components was completed.

   - **Ongoing Operations:** Both phases required careful scheduling and coordination to allow the police department to maintain continuous operations. This included the provision of temporary cooling solutions, phased commissioning of systems, and integration of controls across different project stages.

2. **Project Address:** 6279 W. Oakland Park Boulevard, Lauderhill, FL 33313

3. **Key Personnel Assigned:**

   - **Erick Rodriguez** - Construction Manager

   - **Raymond Urgelles** - Project Manager

4. **Client Contact Information:**

   - **Name:** Marc Celetti

   - **Title:** Public Works Director

   - **Organization:** City of Lauderhill

   - **Address:** 5581 W. Oakland Park Boulevard, Lauderhill, FL 33313

   - **Phone Number:** 954-730-2980

   - **Email Address:** mceletti@lauderhill-fl.gov

5. **Project Cost:** $1,136,050.00

6. **Project Start and Completion Dates:**

   - **Notice to Proceed -** November 11, 2018

- **Substantial Completion:** April 23, 2024
- **Completion Date:** August 14, 2024

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State License: CAC1818806

Business and Key Personnel Resumes

Bidder's Qualification Experience Resumes:

Paul Murphy – Vice President

My HVAC journey began in 2002, learning from his father in their family business. With a natural mechanical aptitude and passion for HVAC technologies, he excelled in the field. Over the years, he became certified in specialized areas and advanced to roles like Service Manager and Production Manager, managing multi-million-dollar projects. In 2021, he proudly took on the position of Vice President of Advanced Air Systems. As a Certified Mechanical Contractor, he brings expert knowledge and compliance to every project. Alongside in his career growth, he is dedicated to mentoring new talent in the HVAC trade. His journey reflects his commitment to excellence and positively impacting the industry.

Gabriel Jordan – Estimator

Gabriel Jordan joined Advanced Air Systems in 2022 and is an experienced estimator with a strong background in large scale design-build construction projects. Currently working at Advanced Air Systems, he specializes in providing accurate and detailed cost estimates for commercial and industrial Mechanical/HVAC projects, including coordination with subcontractors across various trades as a licensed General Contractor. With a background in architecture and experience in the construction industry, he has a deep understanding of technical knowledge, cost analysis, materials and labor pricing, scheduling, and contract negotiations amongst all 16 divisions and trades. He has a proven track record of building and maintaining relationships with general contractors, sub-contractors, vendors, and clients to ensure project success and repeat business. Additionally, he has hands-on experience with drafting, 3D modeling, rendering, contributing to business development efforts through innovative design proposals. Gabriel is adept at utilizing software such as AutoCAD, Revit, SolidWorks, and SketchUp to support design teams and project management teams.

Leena Ishmael – Project Manager

Leena's journey in HVAC began in 2013 with a focus on project coordination and client relations. Her ability to manage intricate details and build strong relationships quickly distinguished her as a leader in the industry. Leena advanced to Project Manager by overseeing high-profile commercial projects and ensuring seamless execution from design to completion. With certifications in project management and sustainable building systems, she brings a unique perspective to Advanced Air Systems with her MBA. Leena is dedicated to integrating innovative solutions and fostering a culture of excellence in her teams, ensuring every project meets the highest standards of quality.

Raymond Urgelles – Project Manager

Raymond's HVAC career began in 2014 as a technician, where he developed a deep understanding of HVAC systems and their installation. His technical expertise and leadership abilities quickly propelled him into supervisory roles. Over the years, he has successfully managed complex projects, including large-scale commercial installations and retrofits. Certified in project management and specialized HVAC systems, Raymond has built a reputation for delivering projects on time and within budget. Since joining Advanced Air Systems, he has excelled in coordinating multidisciplinary teams and ensuring client satisfaction. Raymond is committed to fostering collaboration and driving innovation in every project he leads.

Erick Rodriguez – Construction Manager

Erick began his career in the construction and HVAC industries in 2000, developing hands-on expertise in field operations and team management. His comprehensive knowledge of HVAC systems and construction practices laid the foundation for his success in managing large-scale projects. Erick joined Advanced Air Systems as a Construction Manager, where he oversees all phases of project execution, from planning and scheduling to quality assurance. Known for his leadership skills and ability to adapt to complex challenges, Erick ensures that every project is delivered efficiently and safely. His commitment to operational excellence drives the company's reputation for quality and reliability.

Emerson Montalvan – Construction Manager

Emerson joined our team in 2016 as a Certified Duct Mechanic, bringing hands-on expertise and a strong work ethic to every project. Over the years, he has excelled in leadership roles, steadily advancing through the ranks. Today, as a Construction Manager, Emerson oversees multiple crews and complex ductwork and mechanical projects across the state of Florida. Known for his precision, efficiency, and ability to coordinate teams, he ensures every project is completed to the highest standards. Emerson’s dedication to quality and growth reflects his passion for advancing the HVAC industry.

COMPANY QUALIFICATIONS

Advanced Roofing, Inc. is uniquely positioned to bring the most innovative roofing techniques and products our customers. ARI began in 1983 and has since grown to be South Florida's premier commercial roofing specialist. We have become a full-service roofing contractor, consisting of: a service department providing repairs and maintenance, metal roofing department, HVAC department, a custom sheet metal fabrication department, crane division and solar/renewable energy department.

We fully acknowledge and understand the challenges inherent in every roofing project; particularly the specialty work required on occupied buildings. Our extensive experience in roofing occupied government facilities has made us mindful and aware that we must accommodate you in having as little disruption as possible during the roofing process.

We are pleased to announce that we have won "The Excelle Protection Award". We received this honor (in which only 35 out of thousands of contractors received this award in the USA). You can count on ARI to bring over 37 years of impeccable service along with our outstanding safety record throughout every phase of the project. You can expect constant communication, excellent workmanship and superior service from start to finish. Any challenge is an opportunity for us to bring a solution. From the time you sign with us, we've got it all covered. When we say we'll do something, you can swear by it.

Established in 1983, Advanced Roofing, Inc. is a full-service commercial roofing company. With "Commitment to Quality" through solving customers' needs with premium materials and excellent craftsmanship, Advanced Roofing has been named one of the top ten roofing contractors in the United States. Licensed, bonded and insured, Advanced Roofing's dedication to safety, professionalism, and quality work is signified through the satisfaction of hundreds of customers. Advanced Roofing has your solutions all under one roof.

In addition, due to Advanced Roofing's elite status in the industry, we are able to provide our customers with additional benefits including:

- Named #1 Roofing Contractor in South Florida
- $150 million Bonding Capacity
- Additional Captive Insurance
- FPL Approved Contractor
- Certified with all major manufacturers
- Full Safety Division
- In-house Sheet Metal Department, Crane Division, HVAC, Lightning Protection, Solar
- 24/7 Service and Emergency Repairs

We offer a wide variety of roof systems to fit your needs, and we are certified by every major material manufacturer to install the highest quality roofing systems with the best warranties. Our goal is to make the roofing process easy and hassle free for you, our customer. Roofing of occupied buildings is a highly technical process. Our experience constantly improves, from protecting the property, documentation, existing conditions, pre-construction, job meetings, code compliance, involving building departments, manufacturers' representatives, close out and getting other recommendations from you. Our roofing department has over 300 expertly trained Construction Managers, foreman, roofing mechanics and laborers. They are all intensively trained in roofing safety procedures.

Our service department handles all major and minor problems that may occur on your roof quickly, efficiently, and at a reasonable cost. With over 325 buildings, totaling over 9 million square feet of roof, under Advanced Roofing's Proactive Maintenance Agreement, our commitment to service speaks for itself. Advanced Roofing's dedication to clients has allowed Advanced Roofing to grow, expand, and service the roofing needs of some of Florida's biggest businesses, government entities, schools, and more.

In 1994, Advanced Roofing established DBA Advanced Air Systems to specialize in HVAC new construction, retrofit, unit change outs, service repairs, and maintenance solutions for residential, commercial, industrial, institutional and historical properties throughout Florida. Advanced Air Systems holds a Class A license with services unlimited in the execution of contracts requiring the experience, knowledge, and skill to install, maintain, repair, fabricate, alter, extend, or design central air-conditioning, refrigeration, heating, and ventilating systems.



Paul Murphy
HVAC Service Manager

Paul joined Advanced Roofing Inc. in 2017 and is the HVAC Service Manager that manages the daily operations of the HVAC division.

Experience: Paul has over 18 years of experience in the HVAC experience with 8 years of experience as a service manager. Paul has extensive knowledgeon water cooled systems, chillers and cooling towers.

Education: Broward College, Majoring in Business Administration. VFD Certification.

PROJECT REFERENCES

Contact Person: Tim Woodruff
Name of Firm: School District of Palm Beach County
Scope: Roofing Repairs, Maintenance, Design-Build & Re-Roof
Email: Tim.Woodruff@palmbeachschools.org / woodruft@palmbeach.k12.fl.us
Phone: (561) 687-7046 / (561) 722-1803
Date of Service: 25 years
Cost of Service: $28,000,000.00 over the past 25 years – Hard Bids & RS means

Contact Person: Sean Devaney
Name of Firm: Broward College Roofing Term Contract
Scope: Roofing Repairs, Maintenance, Design-Build & Re-Roof
Email: Sdevaney@broward.edu
Phone: (954) 201-6974 / (754) 581-3708
Date of Service: Since 2003
Cost of Service: $12,000,000.00 since 2003

Contact Person: Bobby Stewart
Name of Firm: Publix Supermarkets – Roofing Service Level Agreement
Scope: Roofing Repairs, Maintenance, Design-Build & Re-Roof
Email: Bobby.Stewart@Publix.com
Phone: (813) 299-6466 / (863) 680-5337
Date of Service: Since 1996
Cost of Service: $33,000,000.00 since 1996

PROJECT MANAGEMENT PLAN / TECHNICAL APPROACH

RFP-2026-PW-02 – North Palm Beach Library HVAC Replacement

Project Scope Summary (Plan-Based)

Based on the provided mechanical and electrical drawings, this project replaces the existing split-system HVAC serving the main library areas. Key scope elements include (final quantities and routing to be verified during field walk prior to demolition):

- Demolish and replace four (4) air handling units located above ceiling/soffit areas serving the main library.
- Demolish and replace four (4) outdoor condensing units located at grade; provide housekeeping pads/supports and manufacturer-required clearances.
- Install new refrigerant line sets between the air handlers and condensers, routed adjacent to exterior wall locations; provide protective line-set covers where exposed.
- Provide condensate management (traps, pumps/discharge piping as detailed) and restore finishes at access points as required for a complete, functional installation.
- Reconnect supply/return ductwork to existing systems as shown; provide required access panels and above-ceiling coordination.
- Provide electrical connections, disconnects, and associated circuitry for new/replaced HVAC equipment per electrical documents; execute all work under LOTO controls.
- Verify/start-up, Testing/Adjusting/Balancing (TAB), and owner training; provide closeout deliverables including O&M manuals, warranties, and as-builts.

1. Project Objectives and Execution Priorities

Our primary objective is to deliver a safe, code-compliant HVAC replacement that maintains library operations with minimal disruption. We will accomplish this by phasing work, controlling the work environment (noise, dust, access), and coordinating shutdowns and inspections in advance.

- Safety first: protect patrons, staff, and workers through controlled access, documented safety plans, and disciplined field supervision.
- Operational continuity: plan cutovers to minimize loss of cooling/ventilation; perform high-impact work during approved low-occupancy windows when required.
- Quality and performance: install per permitted plans; verify existing conditions early; deliver reliable, maintainable systems with complete turnover documentation.
- Schedule certainty: manage long-lead procurement, submittals, and inspections with a baseline schedule and rolling look-ahead planning.

2. Project Team, Roles, and Communication

Advanced Air Systems will assign a dedicated Project Manager (PM) and Site Superintendent/Foreman to lead planning, daily field execution, and coordination with the Village and design team. Key roles and responsibilities are summarized below.

- Project Manager (PM): contract administration, submittals/RFIs, procurement, cost control, schedule updates, stakeholder communication, change management.
- Superintendent/Foreman: daily safety and quality control, work-zone management, coordination with library staff, verification of existing conditions, punchlist closure.
- Safety Lead: job hazard analysis (JHA), public protection measures, hot-work/LOTO oversight, incident prevention, compliance audits.
- MEP Coordination Lead (Mechanical/Electrical/Controls): coordinates power, controls, condensate, refrigerant piping, and any BAS/interface requirements; plans shutdowns and cutovers.
- TAB/Commissioning Coordinator: manages start-up readiness, TAB scheduling, functional checks, and training/turnover documentation.

Communication cadence and controls:

- Weekly OAC meeting (or as required): progress, upcoming impacts, RFIs/submittals, shutdowns, safety, and constraints.
- Daily on-site huddles during active installation/cutover: planned work, hazards, access limitations, and day-end restoration.
- Single-source logs maintained by PM: submittal log, RFI log, procurement log, constraint log, change log, and risk (vulnerability) register.

3. Work Plan and Phasing to Minimize Operational Impact

The library is an occupied facility. Our work plan is structured around maintaining safe public access and minimizing interruptions to conditioned spaces. We will coordinate all high-impact activities (shutdowns, ceiling access, noisy demolition, rigging, and electrical tie-ins) with the Village in advance.

3.1 Pre-Construction Planning (Award to Mobilization)

- Conduct a kickoff meeting with the Village/Engineer to confirm phasing expectations, work hours, access routes, laydown areas, and shutdown approval process.
- Perform a documented field verification walk (ceiling spaces, equipment locations, existing power feeds, condensate routing, refrigerant line routing, roof/grade access).
- Submit early submittals for major equipment, controls, and electrical materials; release long-lead items upon approval.
- Develop a baseline schedule including submittals, procurement, installation, inspections, TAB/commissioning, training, and closeout.

3.2 Construction Phasing and Cutover Strategy

To reduce downtime, we will phase the work by system/zone wherever feasible and complete one cutover at a time. Our approach is to keep unaffected areas operational while work occurs in controlled zones.

- Establish controlled work zones with temporary barriers and signage; maintain clear public egress at all times.
- Open ceilings only where required; protect finishes and furnishings; restore ceiling tiles and clean daily in active areas.
- Plan and execute electrical/mechanical shutdowns through a formal shutdown request and rollback plan (materials-on-hand, staffing confirmed, inspections scheduled).
- Sequence demolition, installation, and start-up to minimize the time a space is without conditioning; provide temporary conditioning if required by phasing constraints.

3.3 Housekeeping, Noise, and Indoor Air Quality Controls

- Dust control: localized containment, HEPA vacuums, and daily cleaning; protect return paths and sensitive areas during ceiling work.
- Noise control: coordinate loud work (core drilling, demolition, fastening) for approved hours; maintain clear communication with library staff.
- Material staging: keep aisles and exits clear; secure tools/materials after hours; maintain clean work zones to protect patrons and staff.

4. Safety Management (Occupied Facility)

Safety management is integrated into planning and daily field execution. Our superintendent leads daily JHAs and verifies controls are in place before work starts. Because this is a public facility, we emphasize separation of the public from work zones and disciplined access control.

- Job Hazard Analysis (JHA) completed daily and updated for changing site conditions.
- Public protection: hard barricades, signage, controlled access, and escorted access where needed.
- Lockout/Tagout (LOTO) for all electrical tie-ins and equipment servicing; verification of de-energization.
- Hot work program (permit, fire watch, extinguishers, and protection of combustibles) as required.
- Ladder/scaffold/scissor-lift safety for ceiling work; fall protection as applicable.
- Rigging and lifting controls for equipment handling; maintained clear paths and spotters in public-adjacent areas.
- Silica/dust controls for any drilling/cutting; PPE enforcement and housekeeping standards.

5. Quality Control and Constructability Management

Our QC program is designed to prevent rework, protect the schedule, and ensure the installed system performs as intended. We treat early verification and disciplined documentation as the primary quality drivers on an existing building project.

- Field verification and RFI resolution prior to demolition whenever practical (dimensions, routing, access clearances, existing utilities).
- Submittal review for compliance with permitted drawings and specifications; coordination across mechanical/electrical/controls prior to release.
- Installation checklists: refrigerant piping practices, condensate management, equipment supports, duct connections, sealing/insulation, and labeling.
- Daily superintendent QC walk with punchlist items captured and closed progressively (not deferred to the end).

6. Schedule, Procurement, and Constraint Management

We will manage the project using a baseline schedule supported by a rolling three-week look-ahead. Key constraints are tracked proactively (long-lead equipment, inspections, access windows, and shutdown approvals).

- Baseline schedule submitted after award and updated at least biweekly (or per OAC cadence).
- Rolling three-week look-ahead issued weekly, highlighting upcoming impacts to operations and required owner actions (access/shutdown approvals).
- Procurement log tracking: submittal dates, approvals, fabrication, shipping, delivery, and site readiness.
- Inspection planning: coordinate rough/above-ceiling inspections and final inspections to avoid rework and repeated ceiling access.

7. Electrical, Controls, and Shutdown Coordination

Successful delivery depends on tight coordination between mechanical installation, electrical power, and controls/start-up. We will coordinate all tie-ins and system enablement activities to reduce outages and ensure safe commissioning.

- Verify existing electrical capacity and routes; coordinate any panel work, disconnects, and equipment connections prior to cutover.
- Coordinate controls scope and sequences; confirm sensor locations, smoke detector/interface requirements, and thermostat locations prior to installation.
- Shutdown Request Process: written request, start/stop time, affected areas, notifications, staffing plan, materials staged, and rollback plan.
- Day-end restoration: ensure spaces are safe, secure, and clean; restore temporary barriers and maintain egress.

8. Start-Up, TAB, Training, and Closeout

We plan turnover activities from the start of the project so the Village receives a complete, organized closeout package with verified system performance.

- Start-up readiness checks completed prior to manufacturer start-up (power, controls, condensate, refrigerant charge, airflow paths).
- Testing, Adjusting, and Balancing (TAB) scheduled in coordination with the Village; deficiencies tracked to closure.
- Owner training: operations overview, filter changes, thermostat/control functions, condensate maintenance, and warranty procedures.
- Closeout package: as-built markups, equipment submittals, O&M manuals, warranties, TAB/commissioning documentation, and final punchlist closure.

9. Managing and Developing Vulnerability Assessment Tasks (Risk Management)

The RFP requests a description of how we will manage and develop Vulnerability Assessment tasks. For this project, we treat "vulnerabilities" as conditions or constraints that could create safety incidents, outages, schedule delays, cost growth, or performance issues. Our VA process is embedded in the project controls described above and is managed through a living risk register.

9.1 VA Process and Tools

- Kickoff VA workshop (pre-construction): identify project-specific risks (existing conditions, access constraints, long-lead items, shutdown windows, public safety interfaces).
- Risk register with probability/impact scoring, mitigation actions, assigned owners, and due dates (updated weekly).
- Trigger-based reviews: any RFI, hidden condition, planned outage, or design clarification automatically prompts VA update and mitigation planning.
- Verification: risks are closed only when mitigations are implemented and verified in the field (photos, checklists, inspection sign-offs).

9.2 Typical Vulnerabilities and Mitigations for an Occupied Library

- Unplanned loss of conditioning: phase cutovers and pre-stage materials; execute outages with rollback plans; provide temporary conditioning if required.
- Public exposure to work areas: hard barricades, controlled access, clear signage, and daily restoration of safe paths.
- Dust/noise impacts: containment and HEPA cleaning; schedule high-noise work for approved periods; proactive communication to staff.
- Existing-condition conflicts: early field verification and rapid RFI resolution to prevent rework and repeated ceiling access.
- Startup/performance issues: coordinated controls checks, TAB planning, and structured functional verification prior to turnover.

EXPERIENCE MATTERS
ADVANCED AIR SYSTEMS
ESTABLISHED 1983

Florida's Premiere HVAC Contractor
1950 NW 22nd St, Fort Lauderdale, FL 33311
Toll Free: (84) TO-KEEP-COOL
Office: (954) 332-1418
Web: *advancedairsystem.com*

State License: CMC1251466

North Palm Beach Library – Equipment List

- (2) – DC6/DAQ
  - 7.5 Ton Daikin Dx Split System
    - 208-230/3
    - Cooling Only
    - R32

- (2) – DC5/AMST
  - 5 Ton Daikin Dx Split System
    - 208-230/1
    - Cooling Only
    - R32

- (2) – AHKD
  - 15 KW Electric Heater

- (2) – DC5/AMST
  - 10 KW Electric Heater, w/ CB

- (4) – Programable Thermostats

- (All Units) - Condenser & Evaporator Coil Coating

Subject to Advanced Air Systems Terms and Conditions on following Pages

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North Palm Beach Library – Workload
December '25 – June '26

- Client – Vanguard Building Solutions – Our Lady of Florida Spiritual Center
  - Scope – Furnish and Install New VRF System
  - Budget - $1,066,059.62
  - Duration
    - Start – 11/12/24
    - Expected Completion – April 2026

- Client – Sheltair Aviation – Direct to Owner
  - Scope – Furnish and Install (11) New Split Systems
  - Budget - $991,360.00
  - Duration
    - Start – 11/3/25
    - Expected Completion – March 2026

- Client – Memorial Hospital Pembroke Pines – Direct to Owner
  - Scope – Furnish and Install Curb Extensions, Line Sets, Drain Lines, & Lightning Protection System
  - Budget - $288,890.00
  - Duration
    - Start – 11/3/2025
    - Expected Completion – April 2026

- Client – Broward County - Broward County Wastewater Treatment Plant
  - Scope – Furnish and Install (11) exhaust fans & ductwork
  - Budget - $260,008.33
  - Duration
    - Start – 5/9/2025
    - Expected Completion – February 2026

- Client – Palm Beach County – Eagle Academy
  - Scope – Replace Chiller and Pump Skid
  - Budget - $568,780.00
  - Duration
    - Start – 10/17/25
    - Expected Completion – January 2026

Subject to Advanced Air Systems Terms and Conditions on following Pages

EXPERIENCE MATTERS.

ADVANCED ROOFING INC

Year	Plaintiff	Defendant	Case No.	County	Court	Status	Comments/Project	Outcome
2023	RENE OBREGON DIEPPA	Advanced Roofing, Inc.	23-CA-001718 Division I	Hillsborough	Circuit	Closed	Auto Negligence (not construction related); claim in excess of $50,000	Voluntary Dismissal
2023	MISLEYDIS MARRERO CARRILLO	Advanced Roofing, Inc.	23-CA-001720 Division J	Hillsborough	Circuit	Closed	Auto Negligence (not construction related); claim in excess of $50,000	Voluntary Dismissal
2023	MICHELLE BUITENMAN-ALICEA	Advanced Roofing, Inc.	CACE-23-010851	Broward	Circuit	Closed	Slip and Fall (not construction related); claim in excess of $50,000	Confidential Settlement
2023	ADVANCED ROOFING, INC.	Investements SWK, LLC	CACE-23-018201	Broward	Circuit	Stayed	Non-payment for work performed; claim in excess of $50,000	Pending/Stayed Investments SWK filed Bankrutcy
2023	Anthony and Barbara Scarpo	Advanced Roofing, Inc., et al.	23-CA-014275	Hillsborough	Circuit	Closed	Injunctive Relief **(not constructon related)**	Pending
2023	TF North Run, LLC	Advanced Roofing, Inc. et. al	23-027927-CA-01	Miami-Dade	Circuit	Open	Contract Dispute; claim in excess of $50,000	Pending
2023	26Edgewater Condo Association	Advanced Roofing, Inc. et. al	23-004612=CA-01	Miami-Dade	Circuit	Closed	New Condo Construction Defect; claimn in excess of $50,000	Confidential Settlement
2023	Guerami	Advanced Roofing, Inc. et. al	23-025797-CA-01	Miami-Dade	Circuit	Open	Condo unit owner leak claim; clam in excess of $30,000	Pending
2024	ADVANCED ROOFING, INC.	Harbourage Condominium	CACE-24-001012 (14)	Broward County	Circuit	Closed	Non-payment for work performed; claim in excess of $50,000	Voluntary Dismissal
2024	Harbourage Condominium	Advanced Roofing, Inc.	CACE-24-005176 (14)	Broward County	Circuit	Closed	Contract Dispute; claim in excess of $50,000	Confidential Settlement
2024	ADVANCED ROOFING, INC.	Jack Hudlow and Core Roofing	CACE-24-001249 (13)	Broward County	Circuit	Closed	Breach of Non-Solicitation **(not construction related)**	Voluntary Dismissal
2024	ADVANCED ROOFING, INC.	Pure Safety Group, Inc. d/b/a Guardian Fall Protection	16-2024-CA-004284-AXXX-MA	Duval County	Circuit	Open	Negligence (engineering disoputa); claim in excess of $50,000	Pending
2024	Universal Property a/s/o Kevin Wall	Advanced Roofing, Inc.	2024-CA-007240-O	Orange County	Circuit	Closed	Townhome owner leak claim; claim in excess of $50,000	Confidential Settlement
2024	Victor Ghersi	Advanced Roofing, Inc.	502024CA008321XXXAMB	Palm Beach	Circuit	Closed	Condo unit owner leak claim; claim in excess of $30,000	Confidential Settlement
2024	Magdalena Cuprys	Advanced Roofing, Inc.	2024-017186-CA-01	Miami-Dade	Circuit	Open	Slip and Fall **(not construction related)**; claim in excess of $10,000	Pending
2024	Steven Balram	Advanced Roofing, Inc., et al.	COCE-24-032593	Broward County	County	Open	Condo unit owner leak claim; claim in excess of $30,000	Pending
2024	Lissett and Mohammed Fathi individually and on behalf of their minor children	Advanced Roofing, Inc., et al.	2024-023006-CA-01	Miami-Dade	Cirucuit	Open	Negligence (premisis liability); claim in excess of $50,000	Pending
2024	CDB Consulting Group	Advanced Roofing, Inc., et al.	2024-022493-CA-01	Miami-Dade	Circuit	Closed	Condo unit owner leak claim; claim in excess of $50,000	Confidential Settlement
2024	William Dean Church	Advanced Roofing, Inc., et al.	CACE-24-015792	Broward County	Circuit	Open	Condo unit owner leak claim; claim in excess of $30,000	Pending
2024	Luis Virgilio Amert	Advanced Roofing, Inc., et al.	2024-CA-007441	Palm Beach	Circuit	Open	Slip and Fall; claim in excess of $50,000	Pending
2025	The Islander	Advanced Roofing, Inc.	25-001169	Broward County	Circuit	Open	Condo unit owner leak claim; claim in excess of $50,000	Pending
2025	ADVANCED ROOFING, INC.	Latour Enterprises, Inc.	CACE-25-005762	Broward County	Circuit	Open	Breach of Contract; claim in excess of $50,000	Penidng
2025	Kujwondae Butler	Advanced Roofing, Inc. et. al	CACE-25-002146	Broward County	Circuit	Open	Auto Negligence (not construction related); claim in excess of $50,000	Pending
2025	The Islander, Inc.	Advanced Roofing, Inc.	CACE-25-001169	Broward County	Circuit	Open	Condo unit owner leak claim; claim in excess of $50,000	Pending
2025	Daquane Simmons	Avenues Mall, LLC, et al.	2025-CA-000208	Duval	Circuit	Open	Slip and Fall; claim in exceiss of $50,000	Pending
2025	Shelton O'Brian	Advanced Roofing, Inc.	25-014536	Broward	Circuit	Open	Slip and Fall; claim in exceiss of $50,000	Pending
2025	Kenndy House Condominium	Advanced Roofing, Inc.	25-015958	Broward	Circuit	Open	Contract Dispute; claim in excess of $50,000	Pending
2025	Kiya Herron	Advanced Roofing, Inc.	25-cv-62221-MD	Broward	Federal	Open	Employment Discrimination; claim in excess of $20,000	Pending
2025	Jouliette Nagar	Advanced Roofing, Inc. et. al	25-022377-CA-01	Miami-Dade	Circuit	Open	Condo unit owner leak claim; claim in excess of $50,000	Pending
2025	Ricardo Moreno	Advanced Roofing, Inc. et. al	25-CA-017196	Broward	Circuit	Open	Auto Negligence (not construction related); claim in excess of $50,000	Pending

Ron DeSantis, Governor

Melanie S. Griffin, Secretary

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE MECHANICAL CONTRACTOR HEREIN IS CERTIFIED UNDER THE
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

MURPHY, PAUL JAMES

ADVANCED ROOFING, INC.
1950 NW 22ND ST
FORT LAUDERDALE FL 33311

LICENSE NUMBER: CMC1251466

EXPIRATION DATE: AUGUST 31, 2026

Always verify licenses online at MyFloridaLicense.com

ISSUED: 11/13/2024

Do not alter this document in any form.

This is your license. It is unlawful for anyone other than the licensee to use this document.

Ron DeSantis, Governor

Melanie S. Griffin, Secretary

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE CLASS A AIR CONDITIONING CONTRACTOR HEREIN IS CERTIFIED UNDER THE PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

KORNAHRENS, THOMAS MICHAEL

ADVANCED ROOFING, INC.
1950 NW 22ND ST
FORT LAUDERDALE FL 33311

LICENSE NUMBER: CAC1818806

EXPIRATION DATE: AUGUST 31, 2026

Always verify licenses online at MyFloridaLicense.com

ISSUED: 06/09/2024

Do not alter this document in any form.

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BROWARD COUNTY LOCAL BUSINESS TAX RECEIPT

115 S. Andrews Ave., Rm. A-100, Ft. Lauderdale, FL 33301-1895 – 954-357-4829

VALID OCTOBER 1, 2025 THROUGH SEPTEMBER 30, 2026

Receipt #: 183-281157

Business Name: ADVANCED ROOFING INC

Business Type: HEATING/AIRCONDITION CONTRACTR (MECHANICAL CONTRACTOR)

Owner Name: PAUL J MURPHY/QUAL

Business Location: 1950 NW 22ND ST
FT LAUDERDALE

Business Phone: 9545226868

Business Opened: 12/12/2016

State/County/Cert/Reg: CMC1251466

Exemption Code:

Rooms	Seats	Employees	Machines	Professionals
		350		

For Vending Business Only

Number of Machines: **Vending Type:**

Tax Amount	Transfer Fee	NSF Fee	Penalty	Prior Years	Collection Cost	Total Paid
150.00	0.00	0.00	0.00	0.00	0.00	150.00

Receipt Fee 150.00

THIS RECEIPT MUST BE POSTED CONSPICUOUSLY IN YOUR PLACE OF BUSINESS

THIS BECOMES A TAX RECEIPT

WHEN VALIDATED

This tax is levied for the privilege of doing business within Broward County and is non-regulatory in nature. You must meet all County and/or Municipality planning and zoning requirements. This Business Tax Receipt must be transferred when the business is sold, business name has changed or you have moved the business location. This receipt does not indicate that the business is legal or that it is in compliance with State or local laws and regulations.

Mailing Address:

ADVANCED ROOFING INC
1950 NE 22 ST
FORT LAUDERDALE, FL 33311

Receipt #WWW-24-00294316
Paid 08/29/2025 150.00

2025 - 2026

BROWARD COUNTY LOCAL BUSINESS TAX RECEIPT

115 S. Andrews Ave., Rm. A-100, Ft. Lauderdale, FL 33301-1895 – 954-357-4829

VALID OCTOBER 1, 2025 THROUGH SEPTEMBER 30, 2026

Receipt #: 183-281157

Business Name: ADVANCED ROOFING INC

Business Type: HEATING/AIRCONDITION CONTRACTR (MECHANICAL CONTRACTOR)

Owner Name: PAUL J MURPHY/QUAL

Business Location: 1950 NW 22ND ST
FT LAUDERDALE

Business Phone: 9545226868

Business Opened: 12/12/2016

State/County/Cert/Reg: CMC1251466

Exemption Code:

Rooms	Seats	Employees	Machines	Professionals
		350		

Signature

For Vending Business Only

Number of Machines: **Vending Type:**

Tax Amount	Transfer Fee	NSF Fee	Penalty	Prior Years	Collection Cost	Total Paid
150.00	0.00	0.00	0.00	0.00	0.00	150.00

Receipt #WWW-24-00294316
Paid 08/29/2025 150.00

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 4/11/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Acrisure Southeast Partners Insurance Services LLC
1317 Citizens Blvd
Leesburg FL 34748

License#: BR-1796553
ADVAROO-06

CONTACT NAME: Jalen Belle-Walker
PHONE (A/C, No, Ext): 800-845-8437 **FAX (A/C, No):**
E-MAIL ADDRESS: jbelle-walker@acrisure.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Greenwich Insurance Company	22322
INSURER B : Starr Indemnity & Liability Company	38318
INSURER C : Bridgefield Employers Insurance Company	10701
INSURER D : Continental Casualty Company	20443
INSURER E : Columbia Casualty Company	31127
INSURER F : Indian Harbor Insurance Company	36940

INSURED
Advanced Roofing Inc
dba: Advanced Air Systems
1950 Nw 22nd Street
Fort Lauderdale FL 33311

COVERAGES **CERTIFICATE NUMBER:** 421540456 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X **COMMERCIAL GENERAL LIABILITY**			CGS740979406	1/1/2025	1/1/2026	EACH OCCURRENCE	$ 2,000,000
	[ ] CLAIMS-MADE [X] OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 300,000
	X Contractual Incl						MED EXP (Any one person)	$ 10,000
	X Broad Form PD						PERSONAL & ADV INJURY	$ 2,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$ 4,000,000
	[ ] POLICY [X] PRO-JECT [X] LOC						PRODUCTS - COMP/OP AGG	$ 4,000,000
	[ ] OTHER:							$
A	**AUTOMOBILE LIABILITY**			CAH740979506	1/1/2025	1/1/2026	COMBINED SINGLE LIMIT (Ea accident)	$ 2,000,000
	X ANY AUTO						BODILY INJURY (Per person)	$
	[ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	X HIRED AUTOS ONLY [X] NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
							PIP	$ 10,000
B	[ ] **UMBRELLA LIAB** [X] OCCUR			1000588143251	1/1/2025	1/1/2026	EACH OCCURRENCE	$ 10,000,000
	X **EXCESS LIAB** [ ] CLAIMS-MADE						AGGREGATE	$ 10,000,000
	[ ] DED [X] RETENTION $ 0							$
C	**WORKERS COMPENSATION AND EMPLOYERS' LIABILITY** Y / N			830-56020	1/1/2025	1/1/2026	X PER STATUTE [ ] OTH-ER	
	ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? [Y] **(Mandatory in NH)**	N / A					E.L. EACH ACCIDENT	$ 1,000,000
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	$ 1,000,000
D	Installation Floater			4016260407	1/1/2025	1/1/2026	Per Jobsite/Aggregate	$5.5M/$15,000,000
E	Contractors Errors & Omissions			C 6018114505	1/1/2025	1/1/2026	Ea Claim/Aggregate	$5000000/$5000000
F	Contractors Poll incl Mold			CEO744615206	1/1/2025	1/1/2026	Ea Claim/Aggregate	$2000000/$2000000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

"For Bidding Purposes Only"
USA

CANCELLATION

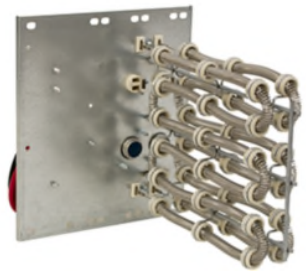
SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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Submittal Data Sheet
Electric Heat Kit for FXTQ
HKS(X)C03/05/06/08/10/15/19/20/25



DESCRIPTION

The electrical heat kit mounts directly inside FXTQ to provide auxiliary heating or to be used as alternate heat.

FEATURES

- Allows for easy addition axillary heat to supplement heating capabilities without any major equipment changes
- Sequencers for better temperature control
- Multiple branch circuit capability
- Completely assembled and tested
- Control circuitry arranged to readily permit staging
- Factory-installed circuit breakers available on specific models
- Fuse link secondary high-temperature limit control
- Plug-in wiring harness for ease of installation into air handler
- Rust-resistant nickel chromium heat elements

Specification

Model No.	Heater Capacity	Voltage	With Circuit Breaker?	Unit Compatibility									
				FXTQ_TAVJUA / FXTQ_TAVJUD									
				9	12	18	24	30	36	42	48	54	60
HKSX03XC	3 kW	208/240V	no	✓	✓	✓	✓	✓	✓	-	-	-	-
HKSC05XC	5 kW	208/240V	yes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HKSX05XC	5 kW	208/240V	no	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HKSX06XC	6 kW	208/240V	no	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
HKSX08XC	8 kW	208/240V	no	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
HKSX10XC	10 kW	208/240V	no	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
HKSC15XA	15 kW	208V	yes	-	-	-	-	-	-	✓	✓	✓	✓
HKSC15XB	15 kW	240V	yes	-	-	-	-	-	-	✓	✓	✓	✓
HKSC19CA	19 kW	208V	yes	-	-	-	-	-	-	✓	✓	-	-
HKSC19CB	19 kW	240V	yes	-	-	-	-	-	-	✓	✓	-	-
HKSC20DA	20 kW	208V	yes	-	-	-	-	-	-	-	-	✓	✓
HKSC20DB	20 kW	240V	yes	-	-	-	-	-	-	-	-	✓	✓
HKSC25DC	25 kW	208/240V	yes	-	-	-	-	-	-	-	-	✓	✓

Daikin North America LLC, 5151 San Felipe, Suite 500, Houston TX, 77056
www.daikinac.com www.daikincomfort.com

(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations).

Advanced Air Systems – Preliminary Project Schedule (Gantt Chart)

Project Start Date Mar 9, 2026 *(Edit B2 to set actual award/start date)*

Adjust durations and sequencing as field conditions, procurement lead times, and owner constraints require.

ID	Phase	Task	System	Duration (days)	Start	Finish	Start Wk	End Wk	Project Weeks (relative to Start Date) 1	2	3	4	5	6	7	8	9	10	11	12	13
1	1. Pre-Construction	Pre-Construction Phase		16	Mar 9, 2026	Mar 24, 2026	1	3													
2	2. Mobilization & Preparation	Mobilization & Preparation		6	Mar 25, 2026	Mar 30, 2026	3	4													
3	3–5. System 1	Removal Phase	System 1	5	Mar 31, 2026	Apr 4, 2026	4	4													
4	3–5. System 1	Installation Phase	System 1	8	Apr 5, 2026	Apr 12, 2026	4	5													
5	3–5. System 1	Testing & Commissioning	System 1	3	Apr 13, 2026	Apr 15, 2026	6	6													
6	3–5. System 2	Removal Phase	System 2	5	Apr 16, 2026	Apr 20, 2026	6	7													
7	3–5. System 2	Installation Phase	System 2	8	Apr 21, 2026	Apr 28, 2026	7	8													
8	3–5. System 2	Testing & Commissioning	System 2	3	Apr 29, 2026	May 1, 2026	8	8													
9	3–5. System 3	Removal Phase	System 3	5	May 2, 2026	May 6, 2026	8	9													
10	3–5. System 3	Installation Phase	System 3	8	May 7, 2026	May 14, 2026	9	10													
11	3–5. System 3	Testing & Commissioning	System 3	3	May 15, 2026	May 17, 2026	10	10													
12	3–5. System 4	Removal Phase	System 4	5	May 18, 2026	May 22, 2026	11	11													
13	3–5. System 4	Installation Phase	System 4	8	May 23, 2026	May 30, 2026	11	12													
14	3–5. System 4	Testing & Commissioning	System 4	3	May 31, 2026	Jun 2, 2026	12	13													
15	7. Project Closeout	Project Closeout		4	Jun 3, 2026	Jun 6, 2026	13	13													

Submittal Data Sheet

Multi-Position, Multi-Speed, ECB-Based Air Handler with Internal TXV R-32

AMST60DU1300

STANDARD FEATURES

- Internal factory-installed thermal expansion valves for cooling and heat pump applications
- Direct drive, 9-speed ECM blower motor
- Factory installed 7mm AlumaFin7™ Evaporator Coil on 1½ to 3½ Ton models and 3/8 in. Evaporator Coil on 4 to 5 Ton models
- All-aluminum evaporator coil with high-performance coated fin stock
- Coil mounting track for quick repositioning
- Optimized for use with R-32 refrigerant with factory installed leak detection sensor for A2L mitigation.
- Cabinet air leakage less than 2.0% at 1.0 inch H2O when tested in accordance with ASHRAE standard 193
- Cabinet air leakage less than 1.4% at 0.5 inch H2O when tested in accordance with ASHRAE standard 193
- 3 kW – 25 kW electric heater kits
- AHRI certified
- ETL listed



CABINET FEATURES

- Rigid SmartFrame cabinet
- Horizontal or vertical configuration capabilities
- 21” depth for easier attic access
- DecaBDE-free thermoplastic drain pan with secondary drain connections
- Screw-less sides and back helps to reduce condensation when installed in humid locations
- Foil-faced insulation covers the internal casing to reduce cabinet condensation
- Galvanized, leather grain-embossed finish
- Glue-less cabinet insulation retention
- Tool-less filter access

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Submittal Data Sheet

Multi-Position, Multi-Speed, ECB-Based Air Handler with Internal TXV R-32

AMST60DU1300

PERFORMANCE

Product Model No.	AMST60DU1300	Product Model Name:	Multi-Position, Multi-Speed, ECB-Based Air Handler with Internal TXV R-32
Type:	Air Handler	Cooling Capacity (Nominal) (Btu/hr):	60,000
Blower Motor Rating (HP):	1		

PRODUCT DETAILS

Power Supply (V/Hz/Ph):	208/240 / 60 / 1	Airflow Rate (High) (CFM):	
Min. Circuit Amps MCA (A):	8.6	Suction Valve Connection Size (inch):	3/4
Max Overcurrent Protection (MOP) (A):	15	Liquid Valve Connection Size (inch):	3/8
Dimensions (HxWxD) (in):	58 x 24-5/8 x 21	Condensate Connection (inch):	
Net Weight (lb):	167	Blower Size Diameter (inch):	11
Gross Weight (lb):	174	Blower Size Width (inch):	10

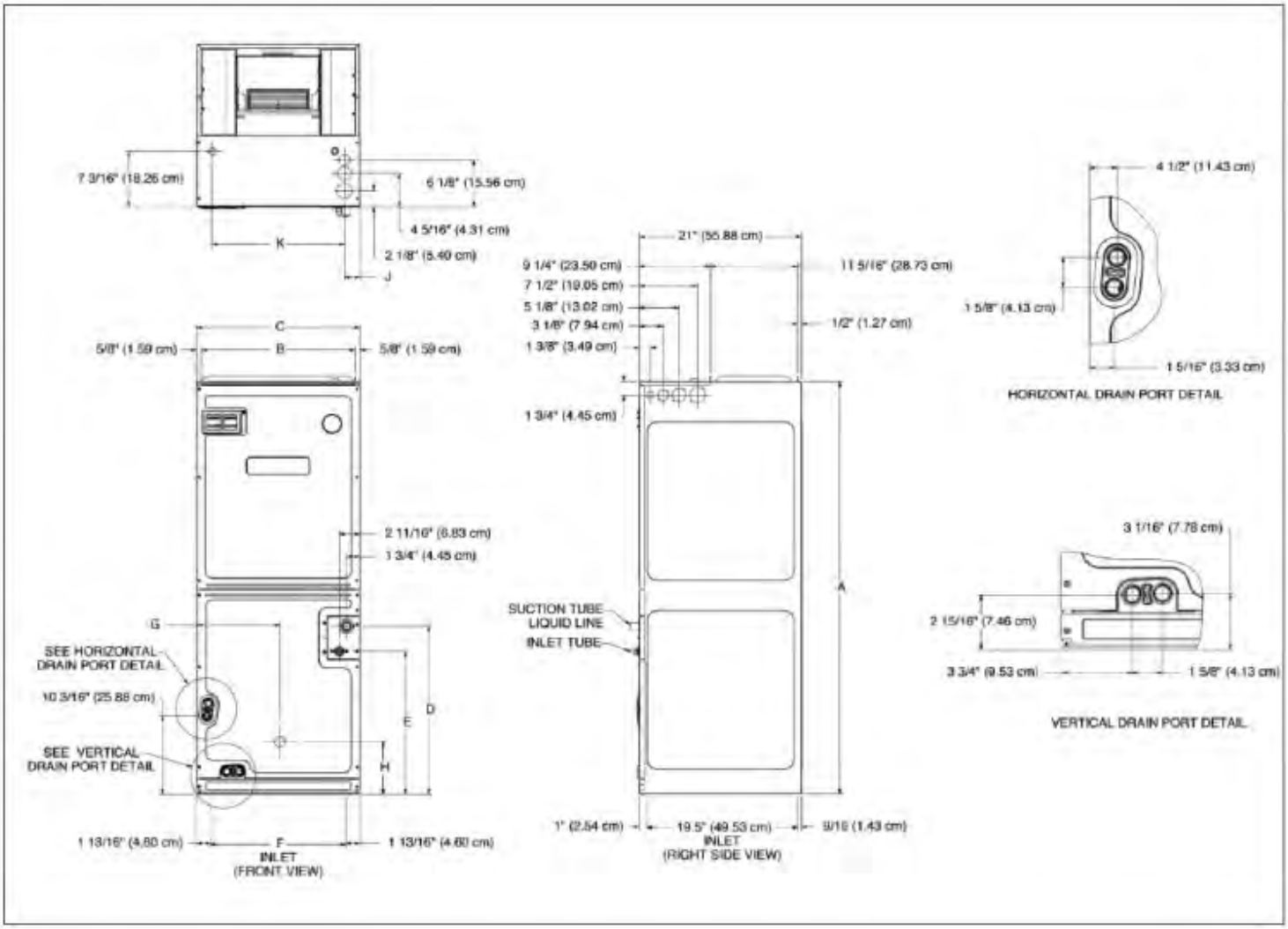
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Submittal Data Sheet

Multi-Position, Multi-Speed, ECB-Based Air Handler with Internal TXV R-32

AMST60DU1300

DIMENSIONAL DRAWING



Model	A"	B"	C"	D"	E"	F"	G"	H"	J"	K"
AMST24BU*	45	$16\frac{5}{16}$	$17\frac{9}{16}$	15¼	12	12½	9	$12\frac{9}{16}$	2	13⅝
AMST30BU*	$53\frac{7}{16}$	$16\frac{5}{16}$	$17\frac{9}{16}$	$23\frac{11}{16}$	$20\frac{1}{16}$	12½	9	12¾	2	13⅝
AMST36BU*	$53\frac{7}{16}$	$16\frac{5}{16}$	$17\frac{9}{16}$	$23\frac{11}{16}$	$20\frac{1}{16}$	12½	9	12¾	2	13⅝
AMST36CU*	49	$19\frac{13}{16}$	21⅛	$21\frac{12}{16}$	17⅜	$16\frac{1}{16}$	9	12¾	2	17⅛
AMST42CU*	$53\frac{7}{16}$	$19\frac{13}{16}$	21⅛	$21\frac{12}{16}$	18½	$16\frac{10}{16}$	9	12¾	2	17⅛
AMST48CU*	58	$19\frac{13}{16}$	21⅛	$26\frac{3}{16}$	$22\frac{15}{16}$	$14\frac{10}{16}$	$10\frac{13}{16}$	$6\frac{13}{16}$	2	17⅛
AMST06DU*	58	23¼	24⅝	26	22 3/4	$17\frac{11}{16}$	$12\frac{9}{16}$	$13\frac{13}{16}$	2	20⅝

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ACCESSORIES

PART NUMBER	DESCRIPTION	INCLUDED
HKTSD05X1	Electric Heat Kit, 5 KW	No
HKTSD08X1	Electric Heat Kit, 8 KW	No
HKTSD10X1	Electric Heat Kit, 10 KW	No
HKTSD15X3	Electric Heat Kit, 15 KW	No
HKTSD15XA	Electric Heat Kit, 15 KW	No
HKTSD15XB	Electric Heat Kit, 15 KW	No
HKTSD20DA	Electric Heat Kit, 20 KW	No
HKTSD20DB	Electric Heat Kit, 20 KW	No
HKTSD20X3	Electric Heat Kit, 20 KW	No
HKTSD25DA	Electric Heat Kit, 25KW	No
HKTSD25DB	Electric Heat Kit, 25KW	No
HKTSN03X1	Electric Heat Kit, 3 KW, 1 PH	No
HKTSN05X1	Electric Heat Kit, 5 KW, 1 PH	No
HKTSN06X1	Electric Heat Kit, 6 KW, 1 PH	No
HKTSN08X1	Electric Heat Kit, 8 KW, 1 PH	No
HKTSN10X1	Electric Heat Kit, 10 KW, 1 PH	No
HKTSN15X3	Electric Heat Kit, 15 KW	No
HKTSN20X3	Electric Heat Kit, 20 KW	No

(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations)

Office of the Village Clerk

501 U.S. Highway One,

North Palm Beach, Florida, 33408

RFP-2026-PW-02 -

LIBRARY HVAC REPLACEMENT

December 8, 2025

JACARANDA AIR CONST INC

13114 HELLO DARLIN DRIVE

GLEN ST. MARY, FL 32040

EIN:33-1149212

LICENSE:CG1514032

DUNS: 860854681

SOLEMA K. CAMPBELL

VP, OPERATIONS

904-534-5858 (PH)

904-418-9108 (FAX)

ADMIN@JACARANDACONST.COM

PROPOSER'S ACKNOWLEDGEMENT AND PROPOSAL FORM

SUBMIT ONE (1) ORIGINAL, FIVE (5) COPIES AND ONE (1) ELECTRONIC COPY OF YOUR PROPOSAL TO:

Village of North Palm Beach
Village Clerk's Office
501 U.S. Highway One,
North Palm Beach, FL 33408

RFP TITLE:

Proposal must be received **PRIOR TO 3:00 P.M. on MONDAY, DECEMBER 15, 2025. Bid proposals will be opened MONDAY, DECEMBER 22, 2025 at 3:00 P.M.**

Proposer's Name: JACARANDA AIR CONST INC
(Please specify if a corporation, partnership, other entity or individual)

Fed. ID# or SSN: 33-1149212

Address: 13114 Hello Darlin Drive Glen St.Mary FL ,32040

Fax Number: _____

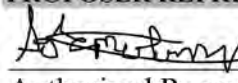
Telephone No.: 904-534-5858

E-mail Address: admin@jacarandaconst.com

Contact representative: Solema Campbell

The undersigned authorized representative of the Proposer agrees to all terms and conditions stated in the RFP, to supply Tree Trimming, Management, and Maintenance Services meeting all specifications, and proposes and agrees that if this proposal is accepted by the Village, the Proposer will in good faith enter into contract negotiations with the Village utilizing the standard Village Contract in accordance with the terms and conditions of this RFP. No proposal may be withdrawn for a period of ninety (90) days following the opening of the proposals. The Proposer further acknowledges and affirms the certifications set forth in Section 8 of the RFP.

PROPOSER REPRESENTATIVE WITH AUTHORITY TO BIND PROPOSER



Authorized Representative's Signature — 08DEC2025 — Date

Solema Campbell — Name

VP, OPERATIONS — Position

CORPORATE SEAL

Attest By: JODIE SANDERS
Secretary

Signature:  **Date:** 08DEC2025

In accordance with the terms and conditions stated in the Request for Proposals (RFP) requesting all goods and services for the replacement of the Village Library HVAC system, the entity identified above proposes the following to the Village of North Palm Beach:

JACARANDA AIR CONST INC (Proposer's legal name) certifies that it is licensed to perform the requested services in the State of Florida and Palm Beach County. Proposer agrees to provide the required goods and services stated in the RFP for an amount not to exceed the following sum:

Three Hundred Forty-six Thousand One Hundred and Sixty-seven dollars

Written Dollar Amount

($ 346,167.00)

DRUG FREE WORKPLACE

Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids or proposals which are equal with respect to price, quality, and service are received by any political subdivision for the procurement of commodities or contractual services, a bid or proposal received from a business that certifies that it has implemented a drug-free workplace program shall be given preference in the award process. In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.

3. Give each employee engaged in providing the commodities or contractual services that are under bid or proposal a copy of the statement specified in subsection (1).

4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid or proposal, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.

5. Impose a sanction on or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.

6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.

08DEC2025

Proposer's Signature

PUBLIC ENTITY CRIMES STATEMENT
UNDER § 287.133, FLORIDA STATUTES

1. This sworn statement is submitted to the Village of North Palm Beach, Florida

by SOLEMA CAMPBELL VP, OPERATIONS
(print individual's name and title)

for JACARANDA AIR CONST INC
(print name of entity submitting sworn statement)

whose business address is 13114 Hello Darlin Drive Glen St.Mary FL, 32040

and (if applicable) its Federal Employer Identification Number (FEIN) is: 33-1149212

(If the entity has no FEIN, include the Social Security Number of the Individual signing this sworn statement:_____)

2. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), **Florida Statutes**, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or of the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision or any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy or material misrepresentation.

3. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), **Florida Statutes**, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

4. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), **Florida Statutes**, means:

a. A predecessor or successor of a person convicted of a public entity crime; or

b. An entity under the control any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term “affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

5. I understand that a "person" as defined in Paragraph 287.133(1)(e), **Florida Statutes**, means any natural person or entity organized under the laws of any state or of the United States with the legal power

to enter into binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

6. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. **(indicate which statement applies.)**

_x_ Neither the entity submitting this sworn statement, nor any of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding before a Hearing Officer of the State of Florida, Division of Administrative Hearings and the Final Order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. **(attach a copy of the final order)**

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND, THAT HIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES FOR CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

_____
(Signature)

DECEMBER 2025

The foregoing document was sworn and subscribed before me this 08 day of ~~20~~ ~~25~~, by Solema Campbell who is personally known to me or produced *Personlly Known* as identification.

JODIE SANDERS
NOTARY PUBLIC - STATE OF MICHIGAN
COUNTY OF MACOMB
My Commission Expires 05/31/2031
Acting in the County of MACOMB

_____
Notary Public
My Commission Expires: 31MAY2031

SCRUTINIZED VENDOR CERTIFICATION
PURSUANT TO SECTION 287.135, FLORIDA STATUTES

This sworn statement is submitted to the Village of North Palm Beach, Florida

by SOLEMA CAMPBELL VP, OPERATIONS
(print individual's name and title)
for JACARANDA AIR CONST INC
(print name of entity submitting sworn statement)

whose business address is 13114 Hello Darlin Drlve Glen St.Mary FL, 32040

and (if applicable) its Federal Employer Identification Number (FEIN) is: 33-1149212

(If the entity has no FEIN, include the Social Security Number of the Individual signing this sworn statement: _____)

1. I hereby certify that the above-named entity:

   A. Does not participate in the boycott of Israel; and

   B. Is not on the Scrutinized Companies that Boycott Israel List.

2. If the Contract for goods and services is for more than $1,000,000, I hereby certify that the above-named entity:

   A. Is not on the Scrutinized Companies with Activities in Sudan List; and

   B. Is not on the Scrutinized Companies with Activities in the Iran Terrorism Sector List; and

   C. Has not engaged in business operations in Cuba or Syria.

Section 287.135, Florida Statutes, prohibits the Village from: (1) contracting with companies for goods or services in any amount if at the time of bidding on, submitting a proposal for, or entering into or renewing a contract if the company is on the Scrutinized Companies that Boycott Israel List, created pursuant to Section 215.4725, Florida Statutes, or is engaged in a boycott of Israel; and (2) contracting with companies, for goods or services over $1,000,000 that are on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Terrorism Sector List created pursuant to Section 215.473, Florida Statutes or is engaged in business operations in Cuba or Syria.

As the person authorized to sign on behalf of the above-named entity, I hereby certify that the statements set forth above are true and that pursuant to Section 287.135, Florida Statutes, the submission of a false certification may subject the company to civil penalties, attorney's fees and/or costs. I further understand that any contract with the Village for goods or services may be terminated at the option of the Village if the company has been found to have submitted a false certification.

(Signature)

The foregoing document was sworn and subscribed before me this 08 day of DECEMBER, 2025 by Solema Campbell, who is personally known to me or produced *Personally Known* as identification.

Notary Public
My Commission Expires: 31MAY2031

JODIE SANDERS
NOTARY PUBLIC - STATE OF MICHIGAN
COUNTY OF MACOMB
My Commission Expires 05/31/2031
Acting in the County of MACOMB

AFFIDAVIT

1. I am over 18 years of age and otherwise competent to affirm the matters set forth in this Affidavit, which are based on my personal knowledge.

2. I am an officer or authorized representative of JACARANDA AIR CONST INC.

3. JACARANDA AIR CONST INC does not use coercion for labor or services as defined in Section 787.06, Florida Statutes.

Under the penalties of perjury, I declare that I have read the foregoing affidavit and that the facts stated in it are true.

By: _____ 08DEC2025

Print Name: SOLEMA CAMPBELL

Title: VP, OPERATIONS

JACARANDA AIR CONST., INC.
13114 HELLO DARLIN DRIVE GLEN ST MARY FL 32040 • Phone: 904-534-5858• Fax: 904-418-9108 EM
ADMIN@JACARANDACONST.COM

Building Dreams Together

CONTRACTOR'S QUALIFICATION STATEMENT

SUBMITTED TO:	GENERAL CONTRACTORS
SUBMITTED BY:	Aston Campbell Procurement Jacaranda Air Const., Inc. 13114 Hello Darlin Drive Glen St Mary FL, 32040 info@jacarandaconst.com
FEIN:	33-1149212
TYPE OF WORK:	General Construction, Mechanical, Air Conditioning, Heating & Ventilation Installation, Maintenance & Service; Refrigeration: Commercial, Institutional, Domestic, and Industrial; Preventative Maintenance & Indoor Air Quality.
LICENSES:	
Florida:	General Contractor - #CGC1514032 Class an Air Conditioning - #CACO48101
North Carolina:	H1, H2, H3, Class1 Heating Contractor - #23069 Refrigeration - #3968
South Carolina:	Class 5 Mechanical - #103031
Georgia:	Class 2 Unrestricted Conditioned Air - #CN209777
CERTIFICATION:	
North Carolina:	HUB Minority

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Appendix: General Contractor License
Air Conditioning License
Certificate of Insurance

Management Responsibilities

Terrol C Barrett, President

Mr. Barrett develops and maintains the company's vision while overseeing all departments and financial obligations. In order to maximize returns on investments and increase productivity,
Mr. Barrett directs and coordinates financial programs to provide funding for new and/or continuing operations. Additionally, Mr. Barrett seeks new business opportunities and pursues strategic alliances with other organizations in accordance with the company's charter and in furtherance of his board membership duties.

Aston Campbell, CEO
Mr. Campbell helps the President interpret policies, purposes, and goals of the organization; designs and develops division strategy and organization; counsels the President on developments and matters that affect the company; assists the President and other upper-level management in all activities directed toward effectuating growth; and he directs the management.

Solema K Campbell, Secretary/Treasurer

As Comptroller, Miss. Campbell directs the financial affairs of the organization; provides financial analysis of operations for guidance to management; prepares reports which outline the company's financial position in areas of income, expense, and net worth based on past, present and future operations; helps prepare budgets and financial forecasts; and arranges for account auditing.

As Secretary, Miss. Campbell's duties include ensuring that membership records are accurate and available to the Board's members; recording and distributing minutes; and providing input on policies and procedures.

As Treasurer, Miss. Campbell's duties include managing the Board's review of and action related to the Board's financial responsibilities; presenting the annual budget to the Board; and reviewing the annual audit.

Winston Anderson, Vice President of Marketing

Mr.Anderson focuses on building the company's client base by networking with industry professionals and researching market trends. She markets our services to contractors, government agencies and residential facilities; reviews trade magazines to identify potential opportunities; and interact with engineers, architects, and city, state, and federal governments in order to acquire HVAC (Heating, Ventilation, and Air Conditioning) contracts for both new and renovation projects.

Trevor Falling, Vice President of Construction

Mr. Falling supervises field operations related to construction service activities; coordinates all construction trades; performs materials scheduling; and executes contracted projects.

Company Facts

Year Established:	1988
Year Established in State of Florida:	2006
Former Name & Year Established:	Jacaranda Air Conditioning Appliance Service Corp., 1988
Name of Parent Company/Date Acquired:	N/A
Size:	Varies from project to project

Company Overview

History

Jacaranda Air Const., Inc. (JAC) incorporated in Florida in 2006 and is a fully licensed, bonded, & insured, minority owned and operated full-service construction company serving the Southeastern United States' private and public markets. Our bonding capacity is $3.5 million dollars for a single project. JAC is licensed in Florida, Georgia, and South and North Carolina with offices in Durham, NC, Glen St. Mary, FL, and Greater Ft. Lauderdale, FL.

In 2008, JAC merged with Jacaranda Air Conditioning & Appliance Service Corporation, which had been serving the Southeastern community since 1989. Crewmembers have 112 years combined experience in the construction industry and are cross-trained to service and install HVAC equipment. Merging allowed JAC to offer more than general construction services; we now offer mechanical and electrical services as well.

The Construction Group

JAC offers an array of general construction services. We are highly skilled in construction management. Our company design-builds and. Additionally, we renovate, repair, and maintain industrial, commercial, government, & residential facilities. Public housing, schools, libraries, and apartment buildings are just some of our projects. JAC's other areas of expertise include site preparation, concrete, masonry, finish carpentry, framing, drywall, insulation, street, water, sewer, landscaping, plumbing, roofing, structural steel, precast concrete, foundation, and exterior/ interior renovation.

The Mechanical and Electrical Group

Our mechanical and electrical division offers consumers its specialty: designing, installing, maintaining, and upgrading HVAC and electrical systems. We are a Trane Comfort Specialist Dealer and authorized servicer of most OEM HVAC equipment. Service also includes refrigeration; and we are authorized to service many popular brands including Amana, Coleman, Rheem, and Trane.

JAC inspects properties for home buyers; repairs ice machines, freezers, and walk-in boxes for store owners; and offers 24-hour assistance to property managers and maintenance supervisors. We also stock our trucks with most equipment parts, enabling us to fix problems during our first response to service calls, saving our clients time and money. Our company has a quick response and turn-around time because live persons answer our phones 24 hours a day to manage emergency calls. JAC's in-office personnel are always in contact with our technicians by radio and cell phone, enabling quick dispatch. We anticipate response and turn-around times of three-hours or better for emergency calls; eight hours for routine service calls; and 24 hours for change-outs and installations. Clients benefit from our yearly preventive maintenance contracts. Our computerized system allows us to schedule all preventative

maintenance. Daily notices tell us when and where maintenance is needed and what task to perform at each location.

Mission and Core Values

In conclusion, our mission is threefold: (1) provide affordable, timely, and quality service to our customers; (2) cultivate a challenging, prosperous, and safe work environment for our employees; and (3) deal honestly and fairly with subcontractors and other affiliates. JAC unwaveringly adheres to strong work ethics and high moral standards. We uphold our standards by listening to our clients', employees', and affiliates' needs. Then, we assess each need to determine how best to satisfy it. Finally, we deliver.

Housing Loan Programs: SHIP and Weatherization

JAC participated in the SHIP and Weatherization programs. JAC has helped to build, renovate, and repair over 150 SHIP homes. Also, JAC weatherized over 200 homes.

Housing Activities

JAC has long performed work for housing authorities across the Southeastern U.S. Completed and ongoing projects are listed in the following chart.

Completed Projects

Date	Project Name	Owner/Contact	Location	Contract Price
June 2024	Centennial Townhomes West, East and Anders Park Window Replacement	Jacksonville Housing Authority	Jacksonville, FL	$1,221,000.00
May 2024	PALMETTO PARK APARTMENTS HVAC ELECT UPGRADES	DAYTONA BEACH HOUSING AUTH Kara Lennard LennardK@dbhafl.org Ph:386-777-2586 Ext 350	DAYTONA BEACH, FL	$1,548,800.00
June 2023	INSTALL MINI SPLIT AND BATROOM EXHAUST FAN	Collier County Housing Authority Alejandra Ruiz aruiz@cchafl.org 239-657-3649	FarmWorker Village 46 units	$414,250.00
April 2023	MEADOW LAKE 174 SCREEN DOORS INSTALLATION MARDEN MEADOWS 80 SCREEN DOORS INSTALLATION OMEGA 113 SCREEN DOORS INSTALLATION	Orlando Housing Authority Liza M. Martinez, liza.martinez@orl-oha.org 407-895-3300	VARIOUS LOCATIONS	$209,423.00
January 2023	WOOD OAKS APARTMENT REPLACE COMPLETE HVAC SYSTEMS	Housing Authority of Brevard County Shawn Holtz Sholtz@habc.us 321-294-2545	MERRITT ISLAND 49 VARIOUS UNITS	$262,963.00
February 2019	PALMETTO GLEN PLUMBING HVAC AND PLUMBING RENOVATION	Millennia Housing Management Ltd Toimiken (Toi) Potts tpotts@livemillennia.com| 904-551-2482	97 Units Jacksonville FL	$1,141,587.00

September 2016	STANLEY TERRACE APTS HVAC INSTALLATION	Deerfield Beach Housing Authority Deerfield beach Gabriella Pinheiro 954-428-0678 x 118 gpinheiro@dbhaonline.org	Deerfield Beach FL	$ 523,000.00
September 2014	RENOVATIONS OF VARIOUS FACILITIES	CITY OF POMPANO BEACH COMMUNITY DEVELOPMENT	VARIOUS LOCATIONS	$650,000.00
February 2009	Multi-Family Renovations	Lauderhill Housing Authority Julie Bowers 954-325-6975	Windemere Townhomes, FL	$671,000.00
August 2007	Interior/Exterior HVAC & Electrical Renovation, ductwork	Durham Housing Authority Tiffany Evans t.evans@dha-nc.org 919-683-1551 x 7298	OXFORD MANORS DURHAM NC 172 UNITS	$560,000.00

Ongoing Projects

Date	Project Name	Owner/Contact	Location	Contract Price
07/01/2025	Gainesville Rehab Project:10789	City of Gainesville Jonathan Reed 352.393.8615 ReedJA@CityofGainesville.org	Gainesville, FL	$112,923.50
07/01/2025	Modernization and Environmental Upgrades for Linton Oaks 2025	Alachua County Housing Authority Ron Hall 352.372.2549 ron@acha-fl.com	Gainesville, FL	$611,200.00

References

1. Dawn Garrick
   DGarrick Construction Group Inc.
   Ph: 754.200.5074
   dgarrickconstructiongroup@gmail.com

2. Theodore McMickle
   SameDay HVAC Services
   Ph:919.699.7070
   tedmcmickle@aol.com

3. Daniel Morgan
   Sun Band Builders Construction Inc
   Ph:561.577.4608
   sunbandbuilders5@gmail.com

4. Don Barnes
   Altron Electrical Services Inc.
   Ph:954.701.7072
   DBar55@hotmail.com

5. Justin Jackson
   Diverse Construction Inc.
   Ph:919.452.2370
   justin@diverseconstruction.net

Bonding Agent

Gladys Keith
FSB AGENCY, INC
7971 RIVIERA BLVD, #211
MIRAMAR, FLORIDA 33023
P: 954-589-1631
F: 954-589-0735
Toll Fax: 866-364-4998

We have an open line of credit with the following equipment manufacturers and suppliers:

a. The Trane Company
b. Rheem Air Conditioning
c. Daikin Comfort
d. Goodman Manufacturing Company
e. Carrier Enterprise
f. Johnstone Supply
g. Noland Supply
h. City Electrical Supply

STATE OF FLORIDA
DEPARTMENT OF FINANCIAL SERVICES
DIVISION OF WORKERS' COMPENSATION

* * CERTIFICATE OF ELECTION TO BE EXEMPT FROM FLORIDA WORKERS' COMPENSATION LAW * *

CONSTRUCTION INDUSTRY EXEMPTION

This certifies that the individual listed below has elected to be exempt from Florida Workers' Compensation law.

EFFECTIVE DATE: 7/9/2025 **EXPIRATION DATE:** 7/9/2027

PERSON: ASTON CAMPBELL **EMAIL:** INFO@JACARANDACONST.COM

FEIN: 331149212

BUSINESS NAME AND ADDRESS:

JACARANDA AIR CONST INC

13114 HELLO DARLIN DRIVE

GLEN SAINT MARY, FL 32040

This certificate of election to be exempt is NOT a license issued by the Department of Business and Professional Regulation. To determine if the certificate holder is required to have a license to perform work or to verify the license of the certificate holder, go to www.myfloridalicense.com.

IMPORTANT: Pursuant to subsection 440.05(13), F.S., an officer of a corporation who elects exemption from this chapter by filing a certificate of election under this section may not recover benefits or compensation under this chapter. Pursuant to subsection 440.05(11), F.S., Certificates of election to be exempt issued under subsection (3) apply only to the corporate officer named on the notice of election to be exempt. Pursuant to subsection 440.05(12), F.S., notices of election to be exempt and certificates of election to be exempt shall be subject to revocation if, at any time after the filing of the notice or the issuance of the certificate, the person named on the notice or certificate no longer meets the requirements of this section for issuance of a certificate. The department shall revoke a certificate at any time for failure of the person named on the certificate to meet the requirements of this section.

Ron DeSantis, Governor

Melanie S. Griffin, Secretary

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE GENERAL CONTRACTOR HEREIN IS CERTIFIED UNDER THE
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

CAMPBELL, ASTON

JACARANDA AIR CONST INC
13114 HELLO DARLIN DRIVE
GLEN ST MARY FL 32040-5136

LICENSE NUMBER: CGC1514032

EXPIRATION DATE: AUGUST 31, 2026

Always verify licenses online at MyFloridaLicense.com

ISSUED: 08/22/2024

Do not alter this document in any form.

This is your license. It is unlawful for anyone other than the licensee to use this document.

Ron DeSantis, Governor

Melanie S. Griffin, Secretary

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE CLASS A AIR CONDITIONING CONTRACTOR HEREIN IS CERTIFIED UNDER THE PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

CAMPBELL, ASTON

JACARANDA AIR CONST INC
13114 HELLO DARLIN DRIVE
GLEN ST MARY FL 32040-5136

LICENSE NUMBER: CAC048101

EXPIRATION DATE: AUGUST 31, 2026

Always verify licenses online at MyFloridaLicense.com

ISSUED: 08/22/2024

Do not alter this document in any form.

This is your license. It is unlawful for anyone other than the licensee to use this document.

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 12/04/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	**CONTACT NAME:** Kay Riordan
State Farm Kay Riordan 18503 Pines Blvd Suite 210 Pembroke Pines FL 330291418	**PHONE (A/C, No, Ext):** 954-436-1717 **FAX (A/C, No):** **E-MAIL ADDRESS:** kay.riordan.c4au@statefarm.com
INSURED JACARANDA AIR CONSTRUCTION INC 19713 CHERUBINI TRL PFLUGERVILLE TX 786604162	**INSURER(S) AFFORDING COVERAGE** / **NAIC #** **INSURER A :** State Farm Fire and Casualty Company / 25143 **INSURER B :** **INSURER C :** **INSURER D :** **INSURER E :** **INSURER F :**

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADD INSD	SUB WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	COMMERCIAL GENERAL LIABILITY						EACH OCCURRENCE	$
	☐ CLAIMS-MADE ☐ OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$
							MED EXP (Any one person)	$
							PERSONAL & ADV INJURY	$
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$
	☐ POLICY ☐ PRO-JECT ☐ LOC						PRODUCTS - COMP/OP AGG	$
	☐ OTHER:							$
A	AUTOMOBILE LIABILITY			L82 0791-D23-59B	10/23/2025	04/23/2026	COMBINED SINGLE LIMIT (Ea accident)	$
	☐ ANY AUTO						BODILY INJURY (Per person)	$ 500,000
	☐ OWNED AUTOS ONLY ☒ SCHEDULED AUTOS	N	N	J24 3747-D23-59	10/23/2025	04/23/2026	BODILY INJURY (Per accident)	$ 500,000
	☐ HIRED AUTOS ONLY ☐ NON-OWNED AUTOS ONLY			L82 8830-D23-59C	10/23/2025	04/23/2026	PROPERTY DAMAGE (Per accident)	$ 500,000
								$
	☐ UMBRELLA LIAB ☐ OCCUR						EACH OCCURRENCE	$
	☐ EXCESS LIAB ☐ CLAIMS-MADE						AGGREGATE	$
	☐ DED ☐ RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						☐ PER STATUTE ☐ OTH-ER	$
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? ☐	N / A					E.L. EACH ACCIDENT	$
	(Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

VILLAGE OF NORTH PALM BEACH
501 U.S. HIGHWAY ONE
NORTH PALM BEACH FL 33408

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

This form was system-generated on 12/04/2025

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CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 12/04/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Certificate Department
Florida National Insurance Solutions 10480 Stringfellow Rd Saint James City FL 33956	PHONE (A/C, No, Ext): 305-204-2164 FAX (A/C, No): 305-602-5975 E-MAIL ADDRESS: support@flnational.com
INSURED Jacaranda Air Const, Inc. 13114 HELLO DARLIN DRV GLEN ST MARY FL 32040	**INSURER(S) AFFORDING COVERAGE** / **NAIC #** INSURER A : Frank Winston Crum 11600 INSURER B : INSURER C : INSURER D : INSURER E : INSURER F :

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	✖ **COMMERCIAL GENERAL LIABILITY** ☐ CLAIMS-MADE ✖ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ✖ POLICY ☐ PRO-JECT ☐ LOC ☐ OTHER:			FGFL0027369402	03/03/2025	03/03/2026	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000.000 $ 300,000 $ 10,000 $ 1,000.000 $ 2,000.000 $ 2,000.000
	AUTOMOBILE LIABILITY ☐ ANY AUTO ☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS ☐ HIRED AUTOS ☐ NON-OWNED AUTOS						COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ $ $ $
	☐ **UMBRELLA LIAB** ☐ OCCUR ☐ **EXCESS LIAB** ☐ CLAIMS-MADE ☐ DED ☐ RETENTION $						EACH OCCURRENCE AGGREGATE	$ $
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? ☐ N / A **(Mandatory in NH)** If yes, describe under DESCRIPTION OF OPERATIONS below						☐ PER STATUTE ☐ OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ $ $

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

Village of North Palm Beach
501 U.S. Hwy 1

North Palm Beach FL 33408

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Nicholas Mladucky

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Proposal

Proposal is valid for 15 days.
Customer must obtain credit approval and release order to production within 60 days of proposal date.

Prepared For:
All Bidders

Date: December 10, 2025

Proposal Number: H4-254476-45973-1

Job Name:
North Palm Beach Library

Opportunity ID: 8466965

Engineer: FAE Consulting

Delivery Terms:
Freight Allowed and Prepaid - F.O.B. Factory

Payment Terms: Net 30 Days

Trane U.S. Inc. is pleased to provide the following proposal for your review and approval based on mechanical drawings dated 10-23-2025.

Two (2) – Odyssey Split System Indoor Unit

Tag(s): AHU-1, AHU-2

Product Data

Air Handler / 7.5 Ton
R-454B refrigerant
208-230/60/3
Single refrigeration circuit
Two-speed airflow
Standard size motor
11.25/14.96 kW electric heater (Field Installed)
Corrosion protection coating – Evaporator coil ONLY

Two (2) – Odyssey Split System Outdoor Unit

Tag(s): CU-1, CU-2

Product Data

Split System Heat Pump / 7.5 Ton
R-454B refrigerant
208-230/60/3
Single Compressor / Single Circuit
Symbio controls
Programmable thermostat (Field Installed)
Corrosion protection coating – Condenser coil and cabinets

Two (2) – Split System Air Conditioning Units (Small)

Tag(s): AHU-CU-3, AHU-CU-4

Product Data

Split System Cooling Outdoor Unit

R-454B
5 Ton Nominal Cooling Capacity
200/230/60/1

Air Handler

Multi-poise 4-way
Constant Torque Motor
5 Tons
208-230/60/1

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Sensitivity: Highly Confidential

24 Volt Controls
Programmable Thermostat (Field Installed)
7.21/9.60 kW Electric Heater (Field Installed)
External Filter Rack (Field Installed)
Corrosion protection coating – Coils and condenser cabinet

NOT INCLUDED: Installation/rigging/startup/training/supervision, warranty beyond Trane standard or as listed above, disconnect, smoke detectors, refrigerant piping and specialties, external vibration isolators, dampers, communication interface, Tie-In to BAS, condensate pumps, float switches, plenums, stands, sensors, extra materials/filters, bipolar ionizers, hurricane tie downs, any material or labor not specifically described in this proposal.

Total Net Price *(excluding sales tax)* .....

Trane shall have the right, at its discretion, to pass along any related increases should (1) its costs related to the manufacture, supply, and shipping for any product or service materially increase. This includes, but is not limited to, cost increases in raw materials, supplier components, labor, utilities, freight, logistics, wages and benefits, regulatory compliance, or any other event beyond Company's control and/or (2) any tariffs, taxes, levies or fees affecting, placed on or related to any product or service materially increases.

Sincerely,

Will Sawarynski
Trane U.S. Inc.
2884 Corporate Way
Miramar, FL 33025

This proposal is subject to your acceptance of the attached Trane terms and conditions.

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Product Catalog

Split System Air Conditioners Odyssey™ with Symbio™ Controls

Heat Pump Condenser, 6 to 20 Tons, 60Hz
Air Handler, 5 to 20 Tons, 60Hz



January 2025

SS-PRC050B-EN

Introduction



Odyssey™ Split Systems offer a wide range of options, allowing you to easily match unit tonnage with the right load requirements.

When a project calls for the convenience and cost efficiency of a unitary product, where a rooftop unit isn't right, Odyssey may be the answer. It provides heating and cooling in a split configuration that's unique in its versatility while staying true to our standards for efficiency and reliability. And with the Symbio® digital controller on board, Odyssey introduces smart building capabilities that take service, comfort and sustainability beyond the expected.

With wide network availability, flexible applications, installation ease, built-in reliability and easy servicing, Odyssey will meet any number of customer applications. Add to that outstanding customer service and you have the formula to make Odyssey the clear choice for continued customer satisfaction.

Wide Network Availability

A broad distribution network provides owners, maintenance personnel, contractors, etc., the means to get their hands on equipment when they need it. Whether it's an emergency replacement or a new construction project in its infancy stages, Odyssey products meet an array of needs at the right time and right price.

Flexible Applications

No matter what the application, Odyssey provides the solution. A broad array of models and tonnages are available with single or dual compressors, single or dual circuits and numerous accessories. Condensing units can be installed on the ground or on a rooftop along with extended piping runs, while air handlers can be free discharge on the ground or horizontally suspended with long duct runs from a ceiling. Should application challenges arise, Odyssey delivers.

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Easy to Install

Small footprints and low weights combined with factory installed components like TXVs, filter driers, etc., reduce installation time and cost. Colored connectors and wiring, as well as factory-tested units make Odyssey the right choice.

Built-in Reliability

Keeping in mind that productivity only occurs when equipment is operational, Trane has taken the steps to ensure that Odyssey is up and running. Early indicators such as phase/reversal monitors and loss of charge protection provide diagnostics which prevent failure and provide years of worry-free service and operation.

Easy to Service

When preventive maintenance or service is required, technicians will find efficient access to both air handlers and condensers. Panels provide complete, easy access coupled with standardized cabinets in which all components are located in proximity. Odyssey's improved design results in minimum service times and costs.

With these capabilities, Odyssey provides customers high efficiency and superior performance for the best all-around value in the market today.

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Revision History

- Added 575V data in Accessories, Model Number Description, and Electrical Data chapters.
- Updated General Data and Performance Data chapter.

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Features

Split System Overview

Unlike typical split systems on the market, Odyssey offers easy servicing, built-in reliability, ease of installation and outstanding customer service. And because today's owners are very cost-conscious when it comes to service and maintenance, the Odyssey Split System was designed with direct input from service contractors. This valuable information helped to design a product that would get the service person off the job quicker and save the owner money.

Flexible Applications

Odyssey offers outstanding standard features enhanced by a variety of factory and field installed options, multiple control options, rigorously tested proven designs and superior product and technical support. Because of this, Odyssey offers ultimate flexibility. Units are built to order in our standard "shortest in the industry" ship cycle time. Odyssey is available with single, dual and manifolded compressor options. Single compressor outdoor units feature a single refrigeration circuitry, lowering job installation costs by requiring only one set of refrigerant lines.

Equally important, Odyssey offers single refrigerant circuit/capacity unloading models. The unloading units feature dual manifolded scroll compressors with two stages of capacity modulation and a single refrigeration circuit. Dual compressor/dual circuit models give true stand-by protection - if one compressor fails, the second will automatically start-up. Also, the first compressor can be serviced without shutting down the unit since the refrigerant circuits are independent. Dual compressor models also save on energy costs. During light load conditions, only one compressor will operate to save energy.

Factory installed VFD is standard with most units. These 2–Speed and Single Zone VAV (SZVAV) solutions, combined with condensing units that have multiple compressors, provide increased part load performance (IEER) when conditions are not at the max design condition. Additionally, some states have adopted codes that require this type of performance. Odyssey units are built with installation in mind. With a smaller footprint, the outdoor unit takes up less space and weighs less, making its installation more efficient and economical. Our indoor air handlers are built to be installed in confined spaces, fitting through standard doorways and freight elevators.

Unmatched Product Support

One of our finest assets, Trane Sales Representatives are a support group that can assist you with:

- Product
- Application
- Service
- Training
- Special Applications
- Specifications
- Computer Programs and much more

Rigorous Testing

Our units are rigorously rain tested to ensure water integrity. Actual shipping tests are performed to determine packaging requirements. Units are test shipped around the country to determine the best packaging. Factory shake and drop tests are used as part of the package design process to help assure that the unit arrives at the job site in top condition. Rigging tests include lifting a unit into the air and letting it drop one foot, assuring that the lifting lugs and rails hold up under stress. A 100% coil leak test is performed at the factory. The condenser coils are leak tested at 660 psig and evaporators to 450 psig. All parts are inspected at the point of final assembly. Sub-standard parts are identified and rejected immediately. Every unit receives a 100% unit run test before leaving the production line to ensure it lives up to rigorous Trane requirements.

Standard and Optional Features

Figure 1. Compressors

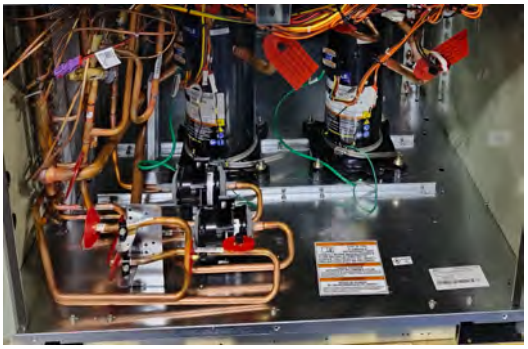
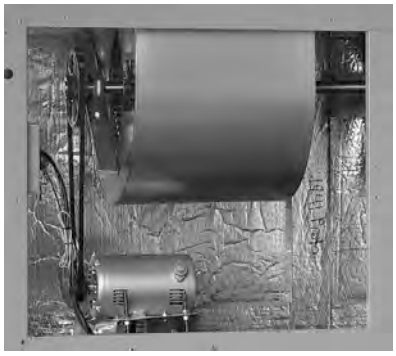


Figure 2. Belt drive motor



Airflow Distribution — Odyssey can replace an older machine with old ductwork and, in many cases, improve the comfort through better air distribution.

Anti-Short Cycle Timing — The Symbio™ 700 controller provides a 3 minute minimum “ON” time and 3 minute “OFF” time for compressors to enhance compressor reliability by assuring proper oil return.

Belt Drive Motors — For additional static requirements, Odyssey Split Systems offer standard belt drive motors to meet and exceed a wide range of airflow needs.

Black Epoxy Pre-Coated Condenser Coils — The pre-coated coils are an economical option for protection in mildly corrosive environments.

Coil Guards — Coil Guards are optional with all condensers. This feature protects the condenser coil from vandalism and/or hail damage.

Colored Connectors and Wiring — Interconnecting wiring between components is standardized using colored and keyed connectors and colored wires, helping to save time and money tracing wires and diagnosing the unit.

Compressors — Odyssey Split Systems contain the best compressor technology available to achieve the highest possible performance. Dual compressors perform very well under part load cooling conditions and system back- up applications. Dual compressors are available on 6-20 ton models and allow for efficient cooling utilizing 2-stages of compressor operation.

Convertible Units — The air handlers ship in a horizontal configuration. They can be easily converted to vertical by simply repositioning the drain pan.

Crankcase Heaters — These band heaters provide improved compressor reliability by warming the oil to prevent migration during off-cycles or low ambient conditions.

Dual Sloped Drain Pans — Every Odyssey unit has a non-corrosive, removable, double sloped drain pan that’s easy to clean and reversible to allow installation of drain trap in two positions on either side of the unit.

Duct flanges — An optional field installed kit that can save time and money.

Easy Access Low Voltage Connections — Thermostat and other low voltage control wiring connections are made directly to the Symbio 700 and other boards in the system. Screw-type pressure connectors are detachable from the boards for easy connection of control wires – saving cost and time.

Electric Heaters — Electric heat modules are available in a variety of voltages and capacities.

Foil Faced Insulation — All internal air handler surfaces have cleanable foil-faced insulation. All edges are either captured or sealed to ensure insulation fibers do not get into the airstream.

Heat Pump Fan Fail Consideration — For SZVAV/2–Speed units: In the event that airflow is not available during heating operation, a bi-metallic switch is mounted on the VFD bracket to turn off the compressors and prevent overheating of the motor and VFD.

High Static Motor —This high static motor accessory extends the capability of the standard unit.

High and Low Voltage Control Panel — High voltage components and connections are isolated from low voltage and covered with a sheet metal panel. This allows setup and test parameters at the Symbio™ 700 display and the VFD keypad display to be safely viewed and adjusted in the low voltage section of the control panel.

High Pressure Control — All units include High Pressure Control as standard.

Leak Detection System — The leak detection system consists of one or more refrigerant detection sensors. When the system detects a leak, the following mitigation actions will be initiated until refrigerant has not been detected for at least 5 minutes:

- Energize the supply fan(s) to deliver a required minimum amount of circulation airflow.
- Disable compressor operation.
- Provide an output signal to fully open all zoning dampers, such as VAV boxes.
- Provide an output to energize additional mechanical ventilation (if needed).
- Units without airflow proving will disable electric heat sources.

Building fire and smoke systems may override this function.

If the refrigerant sensor has a fault, is at the end of its life, or is disconnected, the unit will initiate the mitigation actions.

Mitigation actions may be verified by disconnecting the sensor.

The refrigerant sensors do not need service. Use only Trane-approved sensors when replacement is required.

Low Ambient Cooling — All Odyssey units have cooling capabilities down to 0°F as standard. At temperatures below 50ºF, some reduction in cooling capacity can be expected. When the optional Low Ambient Accessory kit is field installed, the full capacity of the unit is available down to 0°F.

Low Voltage Connections — Low voltage wiring connects directly to the control boards in the unit via detachable connectors. This makes it easy for the installer to attach the wires and then snap the connectors into place.

Phase Monitor/Reversal Protection — Phase monitor shall provide 100% protection for motors and compressors against problems caused by phase loss, phase imbalance, and phase reversal. Phase monitors are equipped with an LED that provides an ON or FAULT indicator.

ID Fan Fail — The Symbio™ 700 controller provides a ID fan fail feature caused by belt failure and motor freewheeling under no load. The Variable Frequency Drive records the motor torque and if below a certain value shuts the unit. Fan Fail error is displayed on controller display.

Quick-Access Panels — Remove a few screws for access to the standardized internal components and wiring.

Single Point Power — A single electrical connection powers the unit.

Single Side Service — Single side service is standard on all units.

Single Zone Variable Air Volume (SZVAV) — A variable frequency drive is used in conjunction with the Symbio™ 700 to provide supply fan motor speed modulation. For SZVAV control, the drive will accelerate or decelerate as required to meet the Zone Cooling demand. In order to maximize energy savings, the VFD will be held at minimum speed until the load in the zone requires the speed to increase. The supply fan speed will be reduced to a minimum of 58%[1] during ventilation and part load cooling demands, and 80% during full load cooling demands with the ability to fully modulate. The commissioning maximum and minimum airflow points can be easily set by programming these parameters at the display on the Symbio control board.

Standardized Components — Components are placed in the same location on all Odyssey units. Because of these standardized components throughout the Odyssey line, contractors/owners can stock fewer parts.

Symbio™ 700 — Standard on Odyssey condensers, the Symbio™ 700 controller provides exceptional machine control with a focus on system reliability and application flexibility. The Symbio controller provides direct access to the Symbio Service and Installation mobile application for easy setup and troubleshooting with no special tools. A wide range of system integration options (Non-communicating, BACnet®, LonTalk®, etc.) provide options to meet the needs of your application.

1. *64% for part load and 83% for full load if a max speed of less than 44.5 Hz is desired.*

Thermal Expansion Valve with Bypass Check Valves — This feature is standard on all indoor units.

Unit Cabinet — The compact cabinet takes up less room and is less costly to ship. The design also ensures water integrity.

Leak Detection System — Trane's Leak Detection System (LDS) consists of one or more refrigerant detection sensors and is required in ducted HVAC systems that have more than 4 lbs of A2L refrigerant charge, per safety standard UL 60335-2-40. For any units with more than 4 lbs of charge in a circuit, Trane will factory-install an LDS. Having the leak detector installed in the factory by the manufacturer on applicable units reduces the risk of improper installation in the field as well as bypassing the added cost in the field for installation, leading to peace of mind that the right solution has been applied to your unit.

Table 1. Odyssey features – standard and optional

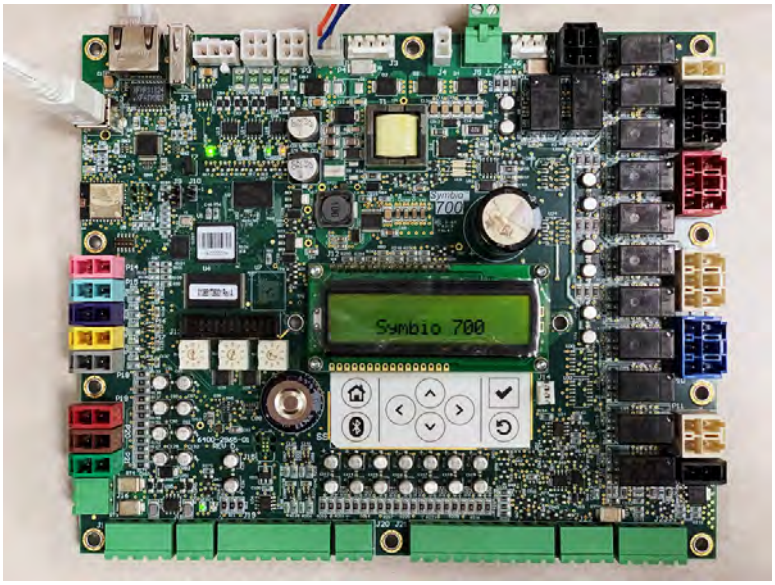
	Standard Features	Options[a]	
		Factory Installed	Field Installed
1-year Limited Parts Warranty	X		
5-year Limited Compressor Warranty	X		
Belt Drive Motors	X		
Black Epoxy Pre-Coated Coils		X	
Coil Guards		X	X
Colored Connectors and Wiring	X		
Compressor Discharge Temperature Limit (DTL)	X		
Convertible Airflow	X		
Crankcase Heaters	X		
Easy Access Low Voltage Connections	X		
Electric Heaters			X
Filters	X		
Filters – 2" MERV 13			X
Foil-Faced and Edge Captured Insulation	X		
High Pressure Control	X		
High Static Motor Kit[b]			X
IAQ Dual Sloped and Removable Drain Pans	X		
Leak Detection System	X		
Low Ambient Cooling			X
Liquid Line Refrigerant Drier	X		
Low Pressure Control	X		
Low Static Motor Kit			X
Low Voltage Circuit Protection	X		
Phase Loss/Reversal Monitor	X		
Quick Access Panels	X		
Scroll Compressors	X		
Single Point Power	X		
Single Side Service	X		
Single Zone Variable Air Volume (SZVAV / 2–Speed Fan)		X	
Standardized Components	X		
Symbio™ Controls	X		
Thermal Expansion Valve	X		
Vibration Isolators			X

[a] Refer to model number description for option availability or contact Product Support.
[b] Available on constant volume units only. See Accessories chapter for more information.

Standard Controls

Symbio™ 700 Controls

Figure 3. Symbio 700 board



Symbio 700 controls provide unit control for heating, cooling, and ventilating, utilizing input from sensors that measure outdoor and indoor temperature. Symbio also provides outputs for building automation systems and expanded diagnostics. Quality and reliability are enhanced through Symbio control and logic:

- Prevents the unit from short cycling, considerably improving compressor life.
- Ensures the compressor will run for a specific amount of time which allows oil to return for better lubrication, enhancing the reliability of the compressor.
- Provides refrigerant leak detection system and mitigation response when refrigerant is detected as required by the UL 60335-2-40 standard.
- Reduces the number of components required to operate the unit, reducing possibilities for component failure.

Installation and Service

The Symbio™ 700 control platform provides a user-friendly, onboard interface that makes setup and continued operation easy – or users can take advantage of the Symbio™ Service and Installation Mobile App for setup, troubleshooting, and operation. Both the Symbio onboard user interface and mobile app simplify troubleshooting by displaying active alarms. Symbio eliminates the need for field-installed, anti-short cycle timer and time delay relays. The wiring of the low voltage connections to the unit and zone sensors is simple, making installation easy.

Testing

Symbio™ 700 requires no special tools to run the unit through its paces. Simply navigate to the ‘Service’ section of the user interface or the ‘Utilities’ section of the Symbio™ Service and Installation Mobile App and enter the test section. Here the unit can be placed in the desired operating condition for a pre-determined amount of time supporting troubleshooting efforts in the field. The Symbio 700 will return to normal control when the user exits test mode or when the pre-determined, user-selected Service Test time has expired.

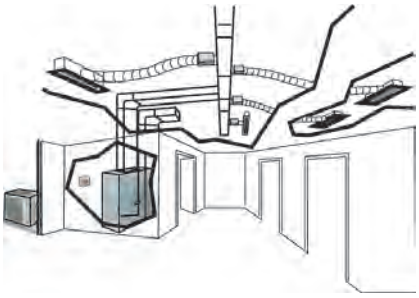
Other Benefits

- Symbio™ 700 built-in anti-shortcycle timer, time delay relay and minimum “on” time control functions are factory tested to assure proper operation.
- Symbio 700 softens electrical “spikes” by staging on fans, compressors and heaters.

- Intelligent Fallback is a benefit to the building occupant. If a component goes astray, the unit will continue to operate at predetermined temperature setpoint.
- Intelligent Anticipation is a standard feature. It functions continuously as Symbio 700 and zone sensor(s) work together in harmony to provide much tighter comfort control than conventional electromechanical thermostats.
- The Symbio 700 design is standardized across the board, ensuring a lower cost to owners.

Additional Controls

VariTrac® Building Automation System — When Trane's changeover VAV System for light commercial applications is coupled with the unit, it provides the latest in technological advances for comfort management systems and can allow thermostat control in every zone served by VariTrac.



Frostat™ — This control (a standard feature on all air handlers) utilizes a capillary bulb embedded in the face of the evaporator coil which monitors coil temperature to inhibit evaporator icing and protect the compressor. Useful for applications with low leaving air temperatures, low airflow and/or high latent load applications.

LonTalk® Communications Interface — The LonTalk communications interface allows the unit to communicate as a Tracer LON® device or directly with generic LonTalk Network Building Automation System Controls.

BACnet® Communication Interface (BCI) — The BACnet Communication Interface allows the unit to communicate directly with a generic open protocol BACnet MS/TP or IP Network Building Automation Control System.

Zone Sensors/Thermostats— Available in programmable, automatic and manual styles.

Table 2. Odyssey control options – standard and optional

	Standard Features	Options[a]	
		Factory Installed	Field Installed
BACnet® Communication Interface (BCI)		X	
Froststat™ - Evaporator Defrost Control (EDC)	X		
LonTalk® Communications Interface (LCI)		X	X
Symbio™ 700 Microprocessor Controls	X		
Thermostat			X
Zone Sensor			X

[a] Refer to model number description for option availability or contact Product Support.

Accessories

Heat Pump Condenser

Table 3. TWA accessories

Model	Used With
Rubber Isolators	
BAYISLT005* (black)	TWA072, TWA090, TWA120
BAYISLT009* (red)	TWA180
BAYISLT010* (green)	TWA240
Steel Spring Isolators	
BAYISLT023* (red)	TWA072, TWA090, TWA120
BAYISLT024* (black)	TWA180
BAYISLT025* (yellow)	TWA240
Service Valve Kit	
BAYVALV020*	TWA072K*A, TWA120K*A
BAYVALV021*	TWA090K*A
BAYVALV022*	TWA072K*D, TWA090K*D, TWA120K*D
BAYVALV025*	TWA180K*D, TWA240K*D
Low Ambient — On/Off Fan Control[a] [b]	
BAYLOAMS10* (External Mount, small cabinets)[c]	(all voltages) TWA072, TWA090, TWA120
BAYLOAMS20* (Internal mount, large cabinets)	(all voltages) TWA180, TWA240
Transducer Kit for Head Pressure Control (BAYLOAMS10*)	
BAYLOTR001*[d]	TWA072**D, TWA090**D, TWA120**D
LonTalk Communications Interface[e]	
BAYLTCI005*	All Models
Expansion Module Kit	
BAYMODU002* (XM30)	All Models
BAYMODU004* (XM32)	All Models
Coil (Hail/Vandal) Guard	
BAYGARD068A	TWA072**A, TWA090**A
BAYGARD064A	TWA072**D, TWA090**D
BAYGARD065A	TWA120
BAYGARD066A	TWA180, TWA240

[a] Cycles fan on/off (no modulating).
[b] When BAYLOAM is used, the Evaporator Defrost Control (EDC) must be disabled in the Symbio 700 controller configuration.
[c] Kit mounts external to the outdoor unit and operates by sensing ambient temperature and discharge pressure.
[d] BAYLOTR001* required when BAYLOAMS10* kits are used with units that have 2 compressors (dual circuit) and 1 condenser fan.
[e] Field installed LonTalk interface requires installation of Symbio control board with Advanced Diagnostics (not included).

Air Handler

Table 4. TWE Accessories

Model	Used With
Base (Subbase)	
BAYBASE009*	TWE060
BAYBASE0010*	TWE072, TWE090
BAYBASE0011*	TWE120
BAYBASE0012*	TWE150, TWE180
BAYBASE0013*	TWE240
Drip Kit	
BAYDRKT006*	TWE060
BAYDRKT007*	TWE072, TWE090
BAYDRKT008*	TWE120
BAYDRKT009*	TWE150, TWE180
BAYDRKT010*	TWE240
Duct Flange Kit	
BAYDUCT010*	TWE051, TWE060, TWE072, TWE076, TWE090, TWE101, TWE120
BAYDUCT020*	TWE126, TWE150, TWE156, TWE180, TWE201, TWE240, TWE251, TWE300
Filters – 2” MERV 13	
BAYFILT006*	TWE060
BAYFILT007*	TWE072, TWE090
BAYFILT008*	TWE120
BAYFILT009*	TWE150, TWE180
BAYFILT010*	TWE240
Rubber Isolators[a] [b] [c]	
BAYISLT004* (Floor — Blue)	TWE060, TWE072, TWE090, TWE120
BAYISLT009* (Floor — Red)[d]	TWE150, TWE180
BAYISLT010* (Floor — Green)	TWE240
BAYISLT012* (Suspended —Red/Green)	TWE150, TWE180
BAYISLT013* (Suspended —Red/Green)	TWE060
BAYISLT014* (Suspended — Green)	TWE072, TWE090
BAYISLT015* (Suspended — Green/Black)	TWE120
BAYISLT016* (Suspended —Red/Green)	TWE240
Steel Spring Isolators	
BAYISLT019* (Floor — Red)	TWE060, TWE072, TWE090, TWE120
BAYISLT021* (Floor — Black)	TWE150, TWE180
BAYISLT032* (Floor — Black/Yellow)	TWE240
BAYISLT028* (Suspended — Tan)	TWE060
BAYISLT029* (Suspended — Red)	TWE072, TWE090, TWE120
BAYISLT030* (Suspended — Black)	TWE150, TWE180
BAYISLT031* (Suspended — Black/Yellow)	TWE240
Plenum[e]	
BAYPLNM015* (Discharge Plenum and Grille)	TWE060
BAYPLNM016* (Discharge Plenum and Grille)	TWE072, TWE090
BAYPLNM017* (Discharge Plenum and Grille)	TWE120
BAYPLNM018* (Discharge Plenum/Hydronic Coil Plenum and Grille)	TWE150, TWE180
BAYPLNM019* (Discharge Plenum/Hydronic Coil Plenum and Grille)	TWE240
BAYPLNM020* (Hydronic Coil Discharge Plenum and Grille)	TWE060
BAYPLNM021* (Hydronic Coil Discharge Plenum and Grille)	TWE072, TWE090
BAYPLNM022* (Hydronic Coil Discharge Plenum and Grille)	TWE120
BAYPLNM030* (Electric Heat Discharge Plenum and Grille)	TWE060
BAYPLNM031* (Electric Heat Discharge Plenum and Grille)	TWE072, TWE090

Table 4. TWE Accessories (continued)

Model	Used With
BAYPLNM032* (Electric Heat Discharge Plenum and Grille)	TWE120
BAYPLNM033* (Electric Heat Discharge Plenum and Grille)	TWE150, TWE180
BAYPLNM034* (Electric Heat Discharge Plenum and Grille)	TWE240
Return Air Grille	
BAYGRLE001*	TWE060
BAYGRLE002*	TWE072, TWE090
BAYGRLE003*	TWE120
BAYGRLE004*	TWE150, TWE180
BAYGRLE005*	TWE240
Symbio™ Indoor Options Module Kit	
BAYMODU001*	All TWE units with Digit 15 = 1 and Electric heater installed
Transformer	
BAYTFMR018* - 100 VA Transfomer (208-230V)	All TWE072 – TWE300, 208-230V units
BAYTFMR019* - 100 VA Transfomer (460V)	All TWE072 – TWE120, 460V units
BAYTFMR020* - 100 VA Transfomer (575V)	All TWE072 – TWE120, 575V units
Water Kits	
BAYWATR022* (Steam Coil Enclosure)	TWE060
BAYWATR023* (Steam Coil Enclosure)	TWE072, TWE090
BAYWATR024* (Steam Coil Enclosure)	TWE120
BAYWATR025* (Steam Coil Enclosure)	TWE150, TWE180
BAYWATR026* (Steam Coil Enclosure)	TWE240
BAYWATR027* (Hot Water Coil Enclosure)	TWE060
BAYWATR028* (Hot Water Coil Enclosure)	TWE072, TWE090
BAYWATR029* (Hot Water Coil Enclosure)	TWE120
BAYWATR030* (Hot Water Coil Enclosure)	TWE150, TWE180
BAYWATR031* (Hot Water Coil Enclosure)	TWE240

(a) Requires use of subbase accessory.
(b) In units with steam or hot water coils applied vertically or horizontally, check IOM for proper Isolator Kit selection.
(c) Do not use if blower will operate less than 600 RPM.
(d) When the air handler is in the vertical position and close proximity trapping of condensate is required, use of subbase is required.
(e) When installed horizontally, plenum/water coil must be self-supported. When adding vibration isolators, see Isolator Installation Guide (ACC-SVN92*-EN) for isolator and location matrix.

Note: *See HUB case DOC-209462 for high-static and low-static drive kits (available only for constant volume air handlers).*

Electric Heaters

Table 5. Electric heaters

Model	Used With
6 to 10 Ton Electric Heater Selection	
BAYHTRP106* — 4.33/5.76 kW Heater 208/240/1 Phase	TWE060*1, TWE090*1, TWE120*1
BAYHTRS112* — 8.65/11.52 kW Heater 208/240/1 Phase	TWE060*1, TWE090*1, TWE120*1
BAYHTRT117* — 12.98/17.28 kW Heater 208/240/1 Phase	TWE060*1, TWE090*1, TWE120*1
BAYHTRS123* — 17.31/23.04 kW Heater 208/240/1 Phase	TWE060*1, TWE090*1, TWE120*1
BAYHTRP129* — 21.63/28.80 kW Heater 208/240/1 Phase	TWE090*1, TWE120*1
BAYHTRP305* — 3.76/5.00 kW Heater 208/240/3 Phase	TWE060*3 (CV and OS MTR), TWE072*3B, TWE090*3, TWE120*3 (VFD)
BAYHTRS310* — 7.48/9.96 kW Heater 208/240/3 Phase	TWE060*3 (CV and OS MTR), TWE072*3B, TWE090*3, TWE120*3 (VFD)
BAYHTRS315* — 11.24/14.96 kW Heater 208/240/3 Phase	TWE060*3 (CV and OS MTR), TWE072*3B, TWE090*3, TWE120*3 (VFD)
BAYHTRP325* — 18.72/24.92 kW Heater 208/240/3 Phase	TWE060*3 (CV and OS MTR), TWE072*3B, TWE090*3, TWE120*3 (VFD)
BAYHTRP335* — 26.20/34.88 kW Heater 208/240/3 Phase	TWE090*3, TWE120*3 (VFD)
BAYHTRP405* — 5.00 kW Heater 460/3 Phase	TWE060*4 (CV and OS MTR), TWE072*4******C/D, TWE090*4******C/D, TWE120*4******C/D
BAYHTRS410* — 9.96 kW Heater 460/3 Phase	TWE060*4 (CV and OS MTR), TWE072*4******C/D, TWE090*4******C/D, TWE120*4******C/D
BAYHTRS415* — 14.96 kW Heater 460/3 Phase	TWE060*4 (CV and OS MTR), TWE072*4******C/D, TWE090*4******C/D, TWE120*4******C/D
BAYHTRP425* — 24.92 kW Heater 460/3 Phase	TWE060*4 (CV and OS MTR), TWE072*4******C/D, TWE090*4******C/D, TWE120*4******C/D
BAYHTRP435* — 34.88 kW Heater 460/3 Phase	TWE090*4******C/D, TWE120*4******C/D
BAYHTRPW05* — 5 kW Heater 575/3 Phase	TWE060*W (CV and OS MTR), TWE072*W, TWE090*W, TWE120*W (VFD)
BAYHTRSW10* — 9.96 kW Heater 575/3 Phase	TWE060*W (CV and OS MTR), TWE072*W, TWE090*W, TWE120*W (VFD)
BAYHTRSW15* — 14.96 kW Heater 575/3 Phase	TWE060*W (CV and OS MTR), TWE072*W, TWE090*W, TWE120*W (VFD)
BAYHTRPW25* — 24.92 kW Heater 575/3 Phase	TWE060*W (CV and OS MTR), TWE072*W, TWE090*W, TWE120*W (VFD)
BAYHTRPW35* — 34.88 kW Heater 575/3 Phase	TWE090*W, TWE120*W (VFD)
15 to 20 Ton Electric Heater Selection	
BAYHTRT310* — 7.51/10.0 kW Heater 208/230 3 Phase	TWE180*3, TWE240*3 (VFD)
BAYHTRR320* — 14.96/19.92 kW Heater 208/230 3 Phase	TWE180*3, TWE240*3 (VFD)
BAYHTRR330* — 22.47/29.92 kW Heater 208/230 3 Phase	TWE180*3, TWE240*3 (VFD)
BAYHTRR350* — 37.44/49.84 kW Heater 208/230 3 Phase	TWE180*3, TWE240*3 (VFD)
BAYHTRT410* — 10.0 kW Heater 460/3 Phase	TWE180*4******C/D, TWE240*4 (VFD)
BAYHTRR420* — 19.92 kW Heater 460/3 Phase	TWE180*4******C/D, TWE240*4 (VFD)
BAYHTRR430* — 29.92 kW Heater 460/3 Phase	TWE180*4******C/D, TWE240*4 (VFD)
BAYHTRR450* — 49.84 kW Heater 460/3 Phase	TWE180*4******C/D, TWE240*4 (VFD)
BAYHTRTW10* — 10.0 kW Heater 575/3 Phase	TWE180*W, TWE240*W (VFD)
BAYHTRRW20* — 19.92 kW Heater 575/3 Phase	TWE180*W, TWE240*W (VFD)
BAYHTRRW30* — 29.92 kW Heater 575/3 Phase	TWE180*W, TWE240*W (VFD)
BAYHTRRW50* — 49.84 kW Heater 575/3 Phase	TWE180*W, TWE240*W (VFD)

Note: Electric Heaters not available for 380/60Hz.

Application Considerations

Application of this product should be within the cataloged airflow and performance considerations.

Clearance Requirements

The recommended clearances identified with unit dimensions should be maintained to assure adequate serviceability, maximum capacity and peak operating efficiency. Actual clearances which appear inadequate should be reviewed with the local representative.

Low Ambient Cooling

As manufactured, all Odyssey units have cooling capabilities down to 0°F. At temperatures below 50ºF, some reduction in cooling capacity can be expected. When the optional Low Ambient Accessory kit is field installed, the full capacity of the unit is available down to 0°F. When using these units with control systems such as bypass changeover Variable Air Volume, make sure to consider the requirement for a head pressure control to allow low ambient cooling.

Figure 4. Typical split system application

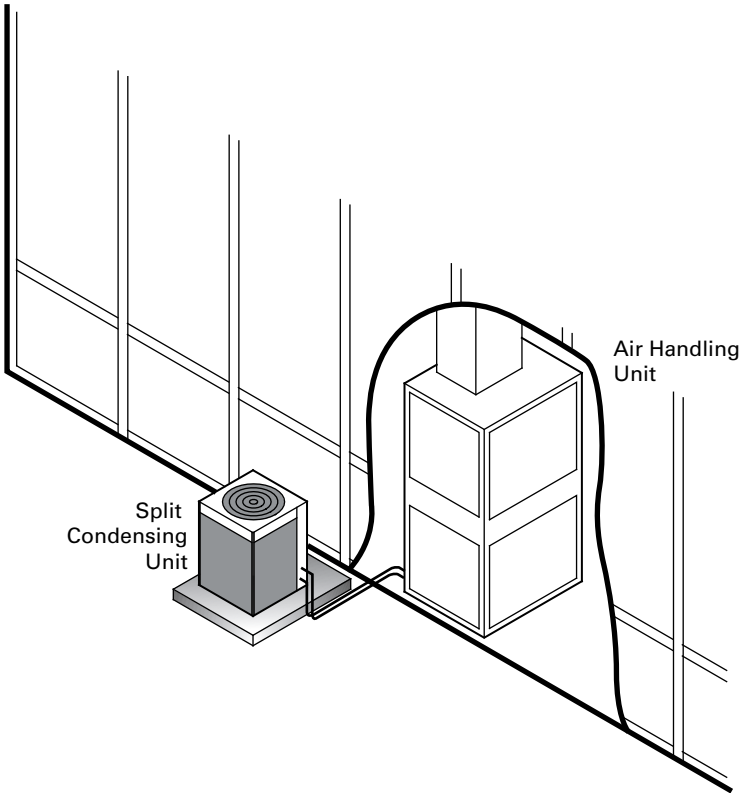


Figure 5. Typical horizontal air handler application

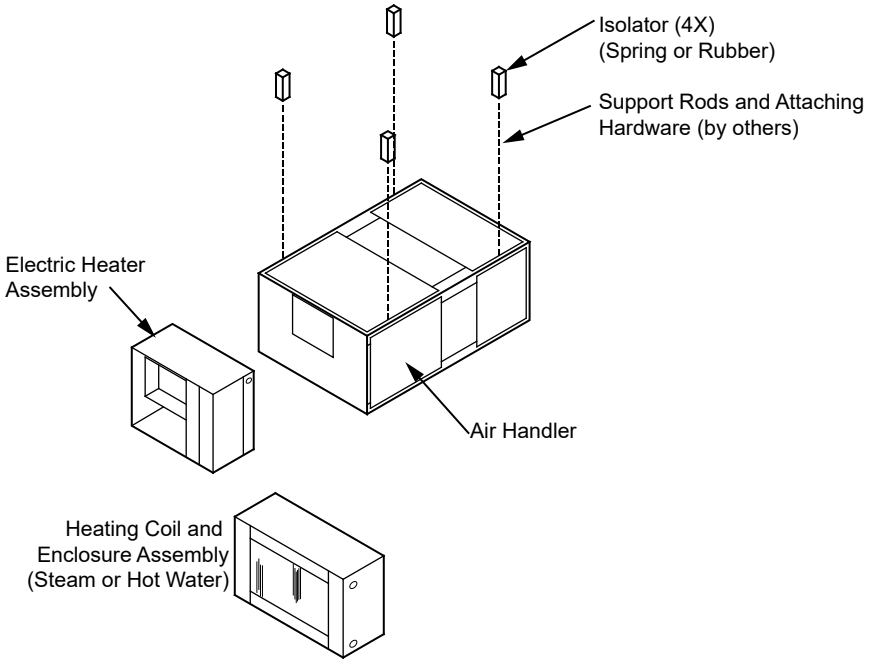
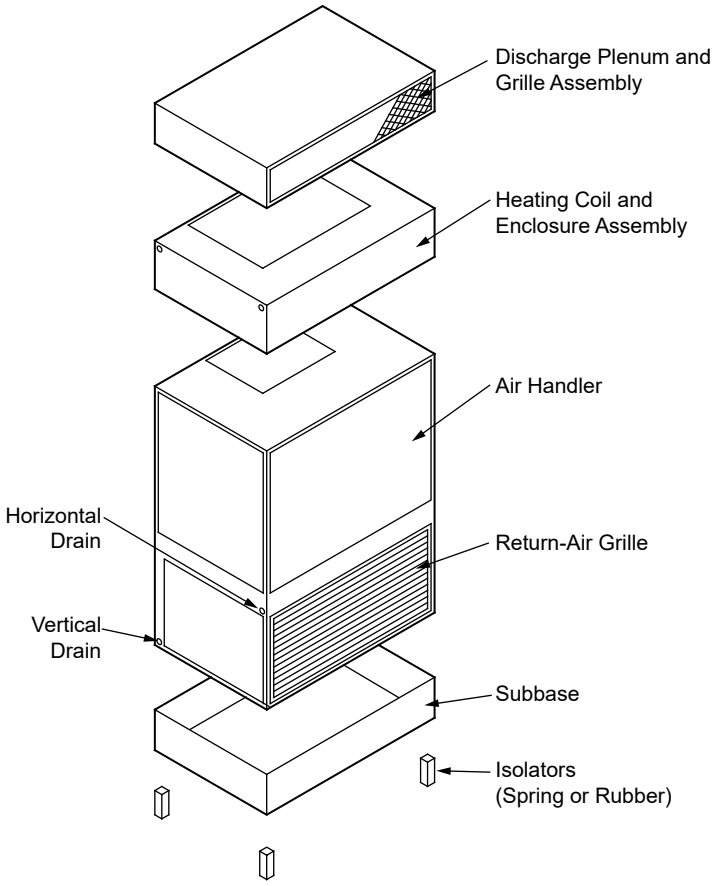


Figure 6. Typical vertical air handler application



A2L Application Considerations

This product is listed to UL standard 60335-2-40, Household and Similar Electrical Appliances – Safety – Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers, which defines safe design and use strategies for equipment using A2L refrigerants. This standard limits the refrigerant concentration in a space in the event of a refrigerant leak. To meet the requirements, the UL standard defines minimum room area, refrigerant charge limit, minimum circulation airflow and/or ventilation airflow requirements, and limits the use of ignition sources in spaces. The standard may require a unit refrigerant leak detection system.

For equipment with R-454B and charge amounts less than or equal to 3.91 lbs per circuit, this UL standard does not prescribe a room area limit and does not require a refrigerant leak detection system or any circulation airflow or ventilation airflow mitigation strategies. However, ignition sources in ductwork must be evaluated.

Depending on the application, a specific requirement of ANSI/ASHRAE Standard 15, Safety Standard for Refrigeration Systems, could be more stringent than UL 60335-2-40 requirements. See *Refrigeration Systems and Machinery Rooms Application Considerations for Compliance with ASHRAE® Standard 15-2022 Application Engineering Manual* (APP-APM001*-EN) for more information.

Minimum Room Area Limits (Refrigerant charge greater than 3.91 lb per circuit)

Equipment with R-454B charge amounts greater than 3.91 lb per circuit may require additional circulation or ventilation airflow mitigation strategies. In this case, two minimum room area (A_{min}) thresholds:

- The first threshold defines when equipment serving a single room is required to provide circulation airflow, either continuous or activated by a leak detection system. A ducted system requires circulation airflow unless the smallest room it serves is larger than the adjusted A_{min} threshold. This product contains a leak detection system if a circuit charge is greater than 3.91 lbs. As a result, no further leak detection system evaluation is required.
- The second threshold defines when additional ventilation airflow is required. If the room area, A or TA, is below the adjusted A_{min} or TA_{min} threshold, additional ventilation is required to remove refrigerant in the event of a leak. Refer to UL 60335-2-40 Clause GG.8 and ANSI\ASHRAE Standard 15 Section 7 for natural and mechanical ventilation requirements. For minimum room area, see equipment nameplate or unit Installation, Operation, and Maintenance (IOM) manual.

Minimum Room Area Limits (Refrigerant charge greater than 3.91 lb per circuit)

Equipment with R–454B charge amounts greater than 3.91 lb per circuit may require additional circulation or ventilation airflow mitigation strategies. In this case, there are two minimum room area (A_{min}) thresholds.

- The first threshold defines when equipment serving a single room is required to provide circulation airflow, either continuous or activated by a leak detection system. A ducted system requires circulation airflow unless the smallest room it serves is larger than the adjusted A_{min} threshold. This product contains a leak detection system if a circuit charge is greater than 3.91 lbs. As a result, no further leak detection system evaluation is needed.
- The second threshold defines when additional ventilation airflow is required. If the room area, A or TA, is below the adjusted A_{min} or TA_{min} threshold, additional ventilation is required to remove refrigerant in the event of a leak. Refer to UL 60335-2-40 Clause GG.8 and ANSI\ASHRAE Standard 15 Section 7 for natural and mechanical ventilation requirements. See equipment nameplate and table below for minimum room area.

Split systems minimum room area requirements need to be determined after final field charging. Use the following figures and the largest final circuit charge to determine the systems A_{min} value. Record the final charge value on the label provided on the condensing unit.

Figure 7. Charge vs min room area (IP)

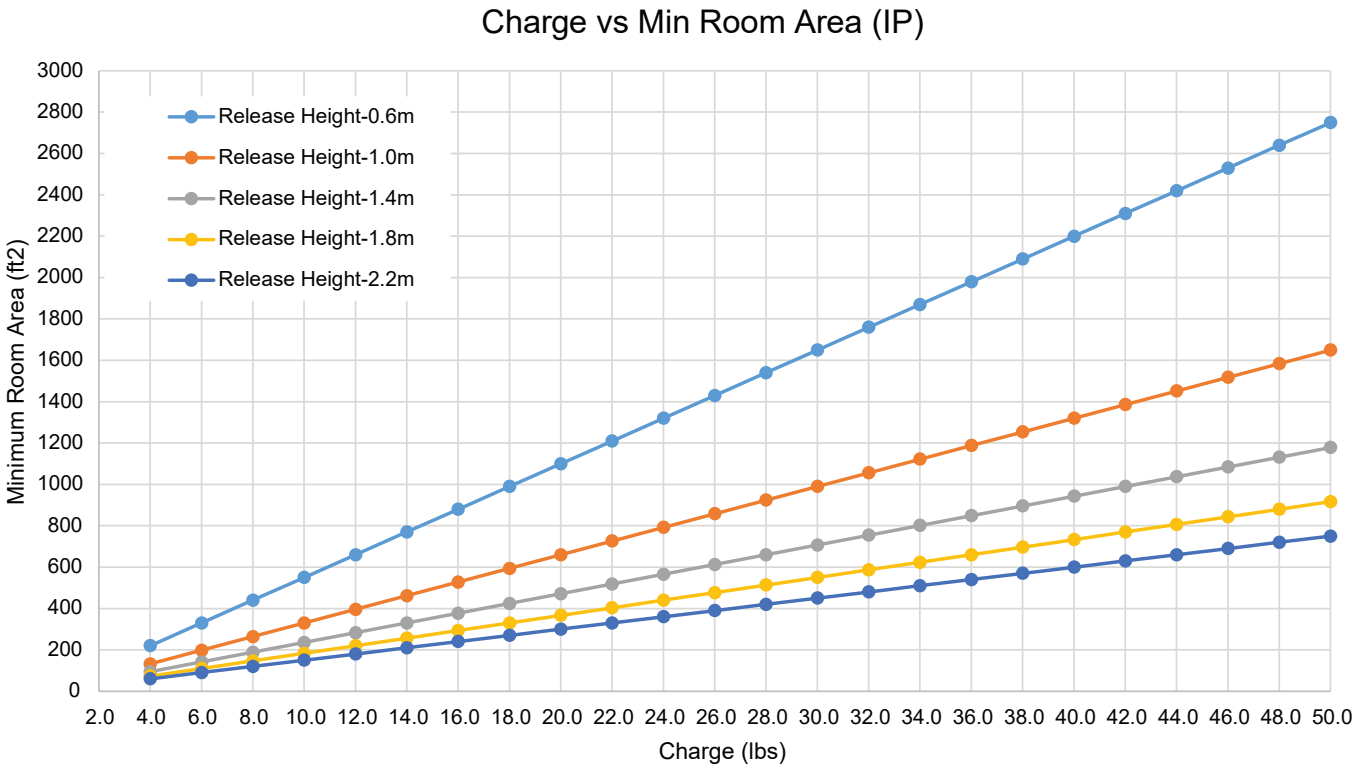
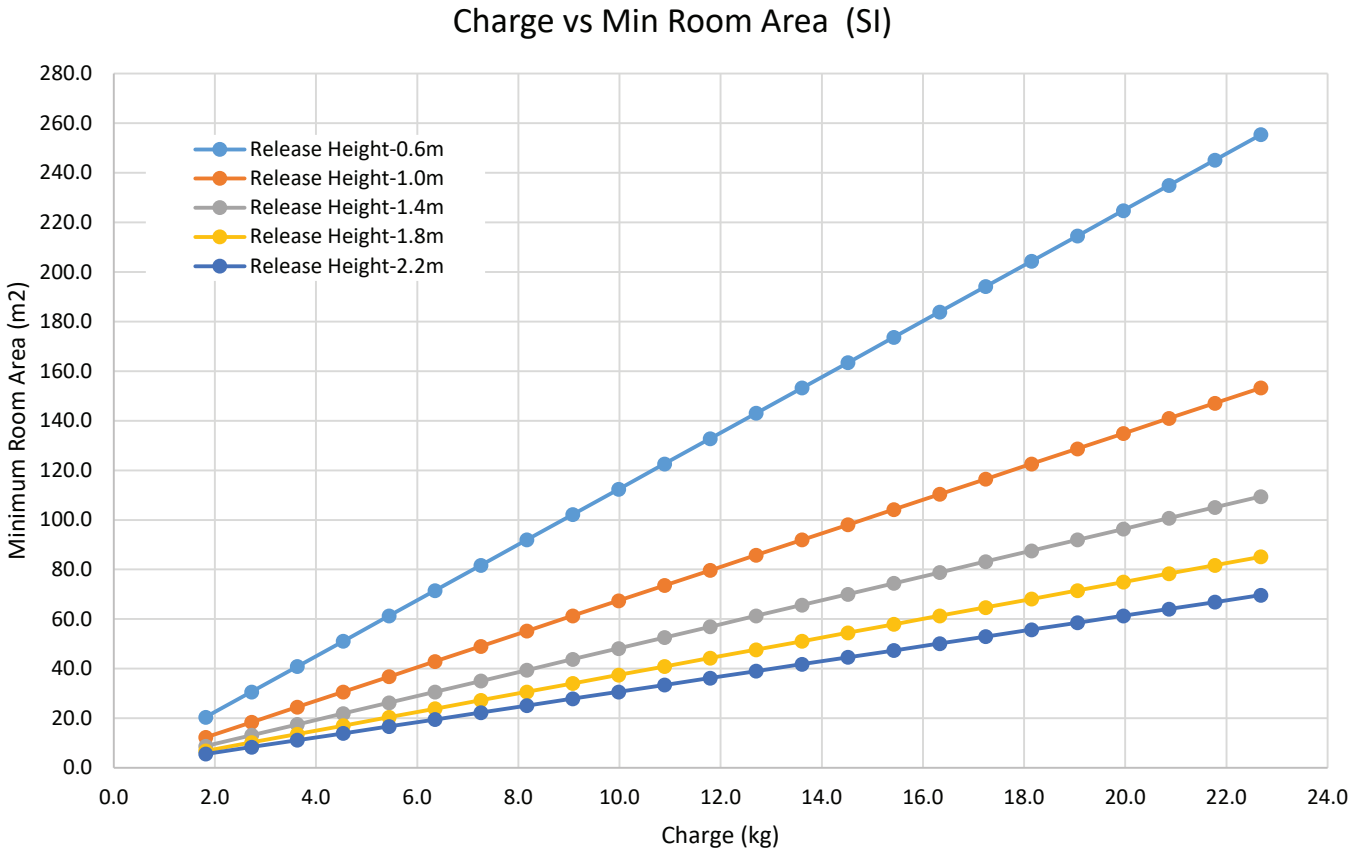


Figure 8. Charge vs min room area (SI)



Release height is the vertical distance from the floor to the lowest point in a space refrigerant would leak from first. The minimum value is 0.6 m from the floor. This point is typically the bottom of free return openings or supply diffusers. For fully ducted units, the release height is 2.2 meters.

Minimum Room Area (A_{min}) Adjustments

- **Altitude:** The A_{min} threshold changes with altitude. Multiple the altitude adjustment factor in the following table by Amin shown on the unit nameplate or in the Installation, Operation, and Maintenance (IOM) manual.

Table 6. Altitude adjustment factor

Altitude (ft)	Sea Level to 2000	2001 to 4000	4001 to 6000	6001 to 8000	8001 to 10000	10001 to 12000	12001 to 14000	14001 to 15000	Over 15000
A_{min} Adjustment	1	1.05	1.11	1.17	1.24	1.32	1.41	1.51	1.57

- **Height :** A_{min} can be adjusted if the unit is installed in a room at a height higher than the minimum height shown on the unit. Multiply A_{min} by the ratio of the unit minimum release height (in meters) / actual release height (in meters).
- **Institutional Occupancies:** For institutional occupancies, ASHRAE Standard 15 applies an additional adjustment factor, FOCC, to the amount of charge allowed in a space. To calculate the adjusted A_{min} for institutional occupancies, divide the A_{min} on the nameplate by 0.5.

Determining Room Area (A or TA)

The room area (A) is the room area enclosed by the projection to the floor of the walls, partitions, and doors of the space that the equipment serves. For ducted systems, total room area (TA) of all rooms connected by ducts, may be used instead of A.

Rooms connected by drop ceilings only are not considered a single room.

Rooms on the same floor of the building, and connected by an open passageway, can be considered part of the same room if the passageway is a permanent opening, extends to the floor and is intended for people to walk through.

Adjacent rooms on the same floor of the building and connected by permanent openings in the walls and/or doors between rooms (including gaps between the wall and the floor), can be considered part of the same room if the openings meet the following criteria.

- The opening is permanent and cannot be closed.
- Openings extending to the floor, such as door gaps, need to be at least 20 mm above the floor covering surface.
- Natural ventilations opening areas must meet the requirements of ANSI\ASHRAE Standard 15-2022, Section 7.2.3.2.

Rooms that are connected by a mechanical ventilation system can be considered a single room area if the mechanical ventilation system meets the requirements of ANSI\ASHRAE Standard 15-2022, Section 7.6.4.

Leak Detection System (Refrigerant charge greater than 3.91 lb per circuit)

The leak detection system consists of one or more refrigerant detection sensors. When the system detects a leak, the following mitigation actions will be initiated until refrigerant has not been detected for at least 5 minutes:

- Energize the supply fan(s) to deliver a required minimum amount of circulation airflow.
- Disable compressor operation.
- Provide an output signal to fully open all zoning dampers, such as VAV boxes.
- Provide an output to energize additional mechanical ventilation (if needed).
- Units without airflow proving will disable electric heat sources.

Building fire and smoke systems may override this function.

If the refrigerant sensor has a fault, is at the end of its life, or is disconnected, the unit will initiate the mitigation actions. Mitigation actions may be verified by disconnecting the sensor.

The refrigerant sensors do not need service. Use only manufacturer-approved sensors when replacement is required.

Selection Procedure

Cooling Capacity

1. Calculate the buildings total and sensible cooling loads at design conditions, using standardized calculation methods.
2. Size the equipment using the gross cooling capacity tables. Match the cooling loads at design conditions. For example, if the following specifies the building cooling requirements:

   Electrical Characteristics: 460/60/3
   Summer Design Conditions: Entering Evap Coil—80°F DB/67°F WB, Outdoor Ambient—95°F
   Total Cooling Load: 82 MBh
   Sensible Cooling Load: 60 MBh
   Airflow: 3000 cfm
   External Static Pressure: 0.77 inches of water gauge
3. Use Table 14, p. 33 to determine that TWA090K3A with TWE090K3A has a gross cooling capacity of 96.4 and 75.5 sensible capacity at 95°F DB ambient and 3000 cfm with 80°F DB/67° F WB air entering the evaporator.
4. To find the net cooling capacities, fan motor heat must be subtracted. Determine the total unit static pressure:

   External Static Duct System: 0.77
   Standard Filter: 0.10 in.
   Supplementary Electric Heat: 0.23 in.
   Total Static Pressure: 1.10 in.

   Notes:

   - *The Evaporator Fan Performance Table has included the effect of a 1 in. filter already. Therefore, the actual Total Static Pressure is 1.10 - 0.10 = 1.00 in. With 3000 cfm and 1.00 in., Table 39, p. 54 shows 1.79 Bhp (factory installed high static motor required).*
   - *This formula can be used to calculate Fan Motor Heat:*

     3.15 X Bhp = MBh
     3.15 X 1.79 = 5.64 MBh
     Net Total Cooling Capacity = 96.4 MBh - 5.64 MBh = 90.76 MBh
     Net Sensible Cooling Capacity = 75.5 MBh - 5.64 MBh = 69.86 MBh

Heating Capacity

1. Calculate the building heating load using the Trane calculation form or any other standard accepted method.
2. Size the equipment using Table 48, p. 61 to match the heating loads at design conditions. For example, if the following specifies the building heating requirements:

   Total Heating Load: 95.0 MBh
   Outdoor Ambient (Winter): 17°F DB
   Indoor Return Temperature: 70°F DB
   Airflow: 2625 cfm
3. indicates the mechanical heating portion of the heat pump will provide 54.3 MBh for the winter design conditions. Full heat load must be carried by the supplementary heater in the unlikely event the heat pump malfunctions. From Table 49, p. 62, the 34.88 kW heater at 460V has a capacity of 119,045. From the 34.88 kW heater at 460V indicates the heater model is BAYHTRP435.

Air Delivery

1. The external static pressure drop through the air distribution system is 0.77 inches of water gauge, use Table 48, p. 61 to determine that the static pressure drop through the electric heater is 0.23 inches of water (0.77 + 0.23 = 1.00 in.).
2. Enter Table 39, p. 54 for TWE090K3A at 2625 cfm and 1.00 static pressure. The high static motor at 965 RPM gives the desired airflow.

Model Number Description

Heat Pump Condenser

Digit 1, 2, 3 — Unit Function

TWA = Split System Heat Pump

Digit 4, 5, 6 — Tonnage

072 = 6 Tons (60 Hz)
090 = 7.5 Tons (60 Hz)
120 = 10 Tons (60 Hz)
180 = 15 Tons (60 Hz)
240 = 20 Tons (60 Hz)

Digit 7 — Refrigerant

K = R-454B

Digit 8 — Voltage

3 = 208-230 Vac - 3 PH (60Hz)
4 = 460 Vac - 3 PH (60Hz)
W = 575 Vac - 3 PH (60Hz)

Digit 9 — Refrigeration Circuit/Stage

A = 1 Compressor/1 Line/1 Stage (Single)
D = 2 Compressors/2 Line/2 Stage (Dual)

Digit 10 — Major Design Sequence

A = Rev A

Digit 11 — Minor Design Sequence

A = Rev A

Digit 12, 13 — Service Digits

**

Digit 14 — Efficiency Generation

B = Generation B

Digit 15 — Controls

S = Symbio™

Digit 16 — None

0 = None

Digit 17 — Coil Protection

0 = Standard Coil
1 = Standard Coil w/ Coil Guard
2 = Black Epoxy Pre-Coated Condenser Coil (FIN/TUBE)
3 = Black Epoxy Pre-Coated Condenser Coil with Coil Guard (FIN/TUBE)

Digit 18, 19, 20 — None

0 = None

Digit 21 — Communications Options

0 = No Option
1 = Advanced Diagnostics and BACnet® BAS
2 = Advanced Diagnostics and LonTalk® Communications Interface (LCI)

Digit 22 to 40 — None

0 = None

Air Handler

Digit 1, 2, 3 — Unit Function

TWE = Air Handler

Digit 4, 5, 6 — Tonnage

060 = 5 Tons (60 Hz)
072 = 6 Tons (60Hz)
090 = 7.5 Tons (60 Hz)
120 = 10 Tons (60 Hz)
180 = 15 Tons (60 Hz)
240 = 20 Tons (60 Hz)

Digit 7 — Refrigerant

K = R-454B

Digit 8 — Voltage

1 = 208-230 Vac - 1 PH (60 Hz)
3 = 208-230 Vac - 3 PH (60 Hz)
4 = 460 Vac - 3 PH (60 Hz)
W = 575 Vac - 3 PH (60Hz)

Digit 9 — Refrigeration Circuit/Stage

A = Single Circuit
B = Dual Circuit

Digit 10 — Major Design Sequence

A = Rev A

Digit 11 — Minor Design Sequence

A = Rev A

Digit 12, 13 — Service Digits

**

Digit 14 — Efficiency Generation

B = Generation B

Digit 15 — Controls

1 = Constant Volume
C = 2 Speed Airflow[a]
D = SZVAV (not for 24V T-stat)

[a] 2-Speed units can be controlled by a thermostat, eliminating the need for communication wire between the outdoor unit and indoor unit. This limits functionality. See *Split System Air Conditioners Odyssey™ with Symbio™ Controls R-454B Wiring and Start-Up - Installation Guide* (SS-SVN017*-EN) for details.

Digit 16 — Indoor Fan Sizes

0 = Standard Motor
4 = High Static

Digit 17 to 40 — None

0 = None

[a] 2-Speed units can be controlled by a thermostat, eliminating the need for communication wire between the outdoor unit and indoor unit. This limits functionality. See *Split System Air Conditioners Odyssey™ with Symbio™ Controls R-454B Wiring and Start-Up - Installation Guide*(SS-SVN017*-EN) for details.

General Data

Table 7. General data for 6 to 7.5 ton (TWA072K*A*-TWA090K*D*) heat pump units, 60 Hz

	6 Tons	6 Tons	7.5 Tons	7.5 Tons
	Single Comp TWA072K*A*	**Dual Comp TWA072K*D***	**Single Comp TWA090K*A***	**Dual Comp TWA090K*D***
Cooling Performance - Gross Cooling Capacity				
Matched Air Handler	TWE090K*A*	TWE072K*B*	TWE090K*A*	TWE090K*B*
AHRI Rated Airflow	2100	2400	2625	3000
Gross Cooling Capacity - System	80000	83000	94000	104000
AHRI Net Cooling Capacity	79000	81000	92000	101000
Efficiency				
Matched Air Handler (EER)	11.3	11.2	11	11.2
System (IEER)	14.1	14.1	14.1	14.1
System kW	6.3	6	8	7.8
Heating Performance - AHRI Htg/Matched AH				
High Temperature Capacity	67000	67000	81000	87000
System kW/COP	5.4 / 3.4	5.2 / 3.4	6.6 / 3.4	6.8 / 3.4
Low Temperature Capacity	36000	37000	42000	44000
System kW/COP	4.6 / 2.25	4.9 / 2.25	5.55 / 2.25	5.80 / 2.25
Compressor				
Type[a]	Scroll 1S	Scroll1S	Scroll 2S	Scroll 1S
No./Tons/Min Stage %/Total Stages	1/5.6 / 100 / 1	2/3;2.4; / 55[b] / 2	1/6.9 / 66[c] / 2	2/3.5 / 50[b] / 2
System Data				
No. Refrigerant Circuits[d]	1	2	1	2
Suction Line Connection (in.) OD[d]	1 3/8	7/8	1 3/8	1 1/8
Liquid Line Connection (in.) OD[d]	1/2	1/2	5/8	1/2
Outdoor Coil				
Type / Tube Size (in.) OD	Lanced / 0.375	Lanced / 0.375	Lanced / 0.375	Lanced / 0.375
Face Area (sq ft)	19.24	19.24	19.24	23.96
Rows/FPI (Fins per inch)	2/18	2/18	2/18	2/18
Outdoor Fan				
Type	Propeller	Propeller	Propeller	Propeller
No. Used/Diameter (in.)	1/26	1/26	1/26	1/26
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1
CFM	5800	5500	5800	5500
No. Motor/HP	1/0.5	1/0.5	1/0.5	1/0.5
Motor RPM	1100	1100	1100	1100
Refrigerant Charge (Field Supplied)				
lbs of R-454B	17.3	9.1/9.5	16.2	9.3/9.6
Shipping Dimensions				
HxWxD (in.)	45” x 45.25” x 39”	45” x 55” x 42”	45” x 45.25” x 39”	45” x 55” x 42”

Notes:

1. Condensing units are tested in accordance with AHRI Standard 365.
2. Units are AHRI Certified to AHRI Standard 340-360 (I-P)-2007. Rating conditions are 95°F outdoor air temperature, 80°F entering dry bulb, 67°F entering wet bulb with 25ft of interconnecting refrigerant piping with minimum external static pressure as determined by rating standard.

[a] 1-stage compressor = 1S, 2-stage compressor = 2S.

[b] 1st stage cooling is compressor 1. 2nd stage is compressor 1 and 2. In Heating mode, both the compressors will run.

[c] All compressors stage to 66% for first stage cooling, then 100% for second stage cooling. In Heating mode all compressors will run at 100%.

[d] For line lengths greater than 25ft, refer to refrigerant piping applications manual for line sizing and line length.

Table 8. General data for 10 to 20 ton (TWA120K*A*-TWA240K*D*) heat pump units, 60 Hz

	10 Tons	10 Tons	15 Tons	20 Tons
	Single Comp TWA120K*A*	Dual Comp TWA120K*D*	Dual Comp TWA180K*D*	Dual Comp TWA240K*D*
Cooling Performance - Gross Cooling Capacity				
Matched Air Handler	TWE120K*A*	TWE120K*B*	TWE180K*B*	TWE240K*B*
AHRI Rated Airflow	4000	4000	6000	8000
Gross Cooling Capacity - System	129000	130000	200000	266000
AHRI Net Cooling Capacity	125000	126000	194000	258000
Efficiency				
Matched Air Handler (EER)	11.3	11.2	10.8	10
System (IEER)	14.1	14.1	13.5	12.5
System kW	10.5	10.3	16.2	23.9
Heating Performance - AHRI Htg/Matched AH				
High Temperature Capacity	105000	108000	176000	244000
System kW/COP	8.8 / 3.4	8.9 / 3.4	15.00 / 3.3	21.2 / 3.2
Low Temperature Capacity	60000	65000	105000	142000
System kW/COP	7.9 / 2.25	8.4 / 2.25	13.6 / 2.05	18.6 / 2.05
Compressor				
Type[a]	Scroll 2S	Scroll 2S	Scroll 1S	Scroll 1S
No./Tons/Min Stage %/Total Stages	1/8.7 / 67[b] / 2	2/4.3 / 67[b] / 2	2/6.9 / 50[c] /2	2/10.1 / 50[c] / 2
System Data				
No. Refrigerant Circuits[d]	1	2	2	2
Suction Line Connection (in.) OD[d]	1 3/8	1 1/8	1 1/8	1 3/8
Liquid Line Connection (in.) OD[d]	1/2	1/2	1/2	5/8
Outdoor Coil				
Type / Tube Size (in.) OD	Lanced / 0.375	Lanced / 0.375	Lanced / 0.375	Lanced / 0.375
Face Area (sq ft)	29.02	29.02	52.6	52.6
Rows/FPI (Fins per inch)	2/18	2/18	2/18	2/18
Outdoor Fan				
Type	Propeller	Propeller	Propeller	Propeller
No. Used/Diameter (in.)	1/28	1/28	2/28	2/28
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1
CFM	8900	8900	17500	17500
No. Motor/HP	1/1	1/1	2/1	2/1
Motor RPM	1125	1125	1125	1125
Refrigerant Charge (Field Supplied)				
lbs of R-454B	23.2	12.6/12.6	21.2/21.2	19.9/19.9
Shipping Dimensions				
HxWxD (in.)	52.1” x 55” x 42”	52.1” x 55” x 42”	51.1” x 96” x 48”	51.1” x 96” x 48”

Notes:

1. Condensing units are tested in accordance with AHRI Standard 365.
2. Units are AHRI Certified to AHRI Standard 340-360 (I-P)-2007. Rating conditions are 95°F outdoor air temperature, 80°F entering dry bulb, 67°F entering wet bulb with 25ft of interconnecting refrigerant piping with minimum external static pressure as determined by rating standard.

[a] 1-stage compressor = 1S, 2-stage compressor = 2S.

[b] All compressors stage to 66% for first stage cooling, then 100% for second stage cooling. In Heating mode all compressors will run at 100%.

[c] 1st stage cooling is compressor 1. 2nd stage is compressor 1 and 2. In Heating mode, both the compressors will run.

[d] For line lengths greater than 25ft, refer to refrigerant piping applications manual for line sizing and line length.

Table 9. General data - 6 to 10 tons (TWE072K*B* - TWE120K*B*) SZVAV and 2-speed VFD air handler - 60Hz

	6 Tons	7.5 Tons	7.5 Tons	10 Tons	10 Tons
	Dual Circuit TWE072K3B*, 4B*, WB*	**Single Circuit TWE090K3A*, 4A*, WA***	**Dual Circuit TWE090K3B*, 4B*, WB***	**Single Circuit TWE120K3A*, 4A*, WA***	**Dual Circuit TWE120K3B*, 4B*, WB***
System Data					
No. Refrigerant Circuits	2	1	2	1	2
Suction Line Connection (in.) OD	1-1/8	1-3/8	1-1/8	1-3/8	1-1/8
Liquid Line Connection (in.) OD	1/2	1/2	1/2	1/2	1/2
Indoor Coil					
Type	Lanced/Intertwined	Lanced/Intertwined	Lanced/Intertwined	Lanced/Intertwined	Lanced/Intertwined
Tube Size (in.)	0.375	0.375	0.375	0.375	0.375
Face Area (sq. ft.)	8.1	8.1	8.1	11.2	11.2
Rows/FPI (Fins per inch)	4/14	4/14	4/14	4/14	4/14
Refrigerant Control	Expansion Valve	Expansion Valve	Expansion Valve	Expansion Valve	Expansion Valve
Drain Connection Size (in.)	1 PVC	1 PVC	1 PVC	1 PVC	1 PVC
Indoor Fan					
Type	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal
No. Used/Diameter x Width (in.)	1/15x15	1/15x15	1/15x15	1/15x15	1/15x15
Drive Type/No. Speeds	Belt/VFD Variable	Belt/VFD Variable	Belt/VFD Variable	Belt/VFD Variable	Belt/VFD Variable
CFM (Nominal)	2400	2625	3000	4000	4000
No. Motors	1	1	1	1	1
Motor HP - Standard/Oversized	2.0/3.0	2.0/3.0	2.0/3.0	2.0/3.0	2.0/3.0
Motor RPM	1725	1725	1725	1725	1725
Motor Frame Size	56 H	56 H	56 H	56 H	56 H
Filters[(a)]					
Type/Furnished	Throwaway/Yes	Throwaway/Yes	Throwaway/Yes	Throwaway/Yes	Throwaway/Yes
(No.)/Size Recommended	(3) 16x25x1	(3) 16x25x1	(3) 16x25x1	(4) 16x25x1	(4) 16x25x1
MERV 13 (No.)/Size Recommended	(3) 16x25x2	(3) 16x25x2	(3) 16x25x2	(4) 16x25x2	(4) 16x25x2
Shipping Dimensions					
HxWxD (in.)	61.2" x 30.5" x 53"	61.2" x 30.5" x 53"	61.2" x 30.5" x 53"	61.2" x 30.5" x 69"	61.2" x 30.5" x 69"

[(a)] One inch, throw-away filters shall be standard on TWE060, TWE072, TWE090, TWE120 model air handlers from the factory. The filter rack can be field converted to two inch capability. Two inch, throw-away filters shall be standard on TWE180 and TWE240 models.

Table 10. General data - 15 to 20 tons (TWE180K*B* - TWE240K*B*) SZVAV and 2-speed VFD air handler - 60Hz

	15 Tons	20 Tons
	Dual Circuit TWE180K3B*, 4B*, WB*	**Dual Circuit TWE240K3B*, 4B*, WB***
System Data		
No. Refrigerant Circuits	2	2
Suction Line Connection (in.) OD	1-3/8	1-3/8
Liquid Line Connection (in.) OD	1/2	5/8
Indoor Coil		
Type	Lanced/Intertwined	Lanced/Intertwined
Tube Size (in.)	0.375	0.375
Face Area (sq. ft.)	16.3	21.7
Rows/FPI (Fins per inch)	4/14	3/14
Refrigerant Control	Expansion Valve	Expansion Valve
Drain Connection Size (in.)	1 PVC	1 PVC
Indoor Fan		
Type	Centrifugal	Centrifugal
No. Used/Diameter x Width (in.)	2/15x15	2/15x15
Drive Type/No. Speeds	Belt/VFD Variable	Belt/VFD Variable
CFM (Nominal)	6000	8000
No. Motors	1	1
Motor HP - Standard/Oversized	3.0/5.0	5.0/7.5
Motor RPM	1725/3450	3450
Motor Frame Size	56 H	56 H/184 T
Filters[a]		
Type/Furnished	Throwaway/Yes	Throwaway/Yes
(No.)/Size Recommended	(8) 15x20x2	(4) 16x25x2 (4) 16x20x2
MERV 13 (No.)/Size Recommended	(8) 15x20x2	(4) 16x25x2 (4) 16x20x2
Shipping Dimensions		
HxWxD (in.)	76.3" x 33.3" x 85"	79.1" x 35.8" x 95"

[a] One inch, throw-away filters shall be standard on TWE060, TWE072, TWE090, TWE120 model air handlers from the factory. The filter rack can be field converted to two inch capability. Two inch, throw-away filters shall be standard on TWE180 and TWE240 models.

Table 11. 5 to 10 tons (TWE060K*A - TWE120K*B*) constant volume air handler - 60Hz

	5 Tons	5 Tons	7.5 Tons	7.5 Tons	10 Tons	10 Tons
	Single Circuit TWE060K3A*, 4A*, 1A*, WA*	**Dual Circuit TWE060K3B*, 4B*, 1B*, WB***	**Single Circuit TWE090K1A***	**Dual Circuit TWE090K1B***	**Single Circuit TWE120K1A***	**Dual Circuit TWE120K1B***
System Data						
No. Refrigerant Circuits	1	2	1	2	1	2
Suction Line Connection (in.) OD	1-1/8	1-1/8	1-3/8	1-1/8	1-3/8	1-1/8
Liquid Line Connection (in.) OD	1/2	1/2	1/2	1/2	1/2	1/2
Indoor Coil						
Type	Lanced/Intertwined	Lanced/Intertwined	Lanced/Intertwined	Lanced/Intertwined	Lanced/Intertwined	Lanced/Intertwined
Tube Size (in.)	0.375	0.375	0.375	0.375	0.375	0.375
Face Area (sq. ft.)	5	5	8.1	8.1	11.2	11.2
Rows/FPI (Fins per inch)	4/14	4/14	4/14	4/14	4/14	4/14
Refrigerant Control	Expansion Valve	Expansion Valve	Expansion Valve	Expansion Valve	Expansion Valve	Expansion Valve
Drain Connection Size (in.)	1 PVC	1 PVC	1 PVC	1 PVC	1 PVC	1 PVC
Indoor Fan						
Type	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal
No. Used/Diameter x Width (in.)	1/12x12	1/12x12	1/15x15	1/15x15	1/15x15	1/15x15
Drive Type/No. Speeds	Belt/Adjustable	Belt/Adjustable	Belt/Adjustable	Belt/Adjustable	Belt/Adjustable	Belt/Adjustable
CFM (Nominal)	2000	2000	2625	3000	4000	4000
No. Motors	1	1	1	1	1	1
Motor HP - Standard/Oversized	0.75/1.5	0.75/1.5	1.5/2.0	1.5/2.0	2.0[a]	2.0[a]
Motor RPM	1725	1725	1725	1725	1725	1725
Motor Frame Size	56 H	56 H	56 H	56 H	56 H	56 H
Filters[b]						
Type/Furnished	Throwaway/Yes	Throwaway/Yes	Throwaway/Yes		Throwaway/Yes	Throwaway/Yes
(No.)/Size Recommended	(1) 16x20x1 (1) 20x20x1	(1) 16x20x1 (1) 20x20x1	(3) 16x25x1	(3) 16x25x1	(4) 16x25x1	(4) 16x25x1
MERV 13 (No.)/Size Recommended	(1) 16x20x2 (1) 20x20x2	(1) 16x20x2 (1) 20x20x2	(3) 16x25x2	(3) 16x25x2	(4) 16x25x2	(4) 16x25x2
Shipping Dimensions						
HxWxD (in.)	55.1" x 27.5" x 43.5"	55.1" x 27.5" x 43.5"	61.2" x 30.5" x 53"	61.2" x 30.5" x 53"	61.2" x 30.5" x 69"	61.2" x 30.5" x 69"

(a) Standard motor only, 120K1 does not have any oversize motor.

(b) One inch, throw-away filters shall be standard from the factory. The filter rack can be field converted to two inch capability.

Performance Data

Gross Cooling Capacities

Table 12. Gross cooling capacities (MBH) 6 tons TWA072K*A heat pump with 7.5 tons TWE090K*A air handler (IP)

CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb (°F) 61 MBH	61 SHC	67 MBH	67 SHC	73 MBH	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb (°F) 61 MBH	61 SHC	67 MBH	67 SHC	73 MBH	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb (°F) 61 MBH	61 SHC	67 MBH	67 SHC	73 MBH	73 SHC
2100	75	76.0	62.3	83.7	48.8	93.1	34.3	72.6	60.6	79.7	47.1	88.7	32.8	69.1	58.8	76.0	45.3	84.0	31.1
	80	76.8	73.7	84.3	59.9	92.9	45.9	73.5	72.1	80.5	58.2	88.5	44.3	70.2	70.2	76.5	56.4	83.8	42.7
	85	80.3	80.3	84.7	71.1	93.2	57.2	77.4	77.4	81.0	69.5	88.9	55.5	74.3	74.3	77.1	67.7	84.5	53.7
	90	85.6	82.6	85.6	82.6	93.6	68.4	81.6	81.6	82.0	81.0	89.4	66.8	78.4	78.4	78.5	78.5	85.0	65.0
2400	75	78.0	67.0	85.8	51.3	94.8	35.1	74.5	65.2	81.8	49.6	90.2	33.5	70.8	63.4	77.6	47.7	85.2	31.8
	80	79.5	79.5	86.3	64.1	94.6	48.3	76.6	76.6	82.4	62.4	89.9	46.7	73.3	73.3	78.2	60.5	85.0	45.0
	85	84.1	84.1	87.0	77.1	95.2	61.0	81.0	81.0	83.1	75.4	90.8	59.3	77.6	77.6	79.0	73.6	86.2	57.5
	90	88.7	88.7	88.8	88.8	95.7	73.9	85.4	85.4	85.6	85.6	91.4	72.2	82.0	82.0	82.1	82.1	86.8	70.4
2640	75	79.4	70.6	87.1	53.4	95.9	35.7	75.8	68.9	83.0	51.6	91.0	34.0	72.0	67.0	78.7	49.7	85.9	32.3
	80	82.0	82.0	87.7	67.4	95.7	50.2	78.8	78.8	83.6	65.7	90.8	48.6	75.4	75.4	79.4	63.8	86.6	46.4
	85	86.7	86.7	88.5	81.8	96.6	64.0	83.4	83.4	84.6	80.1	92.1	62.3	79.9	79.9	80.5	78.3	87.4	60.4
	90	91.5	91.5	91.7	91.7	97.2	78.3	88.1	88.1	88.2	88.2	92.7	76.6	84.4	84.4	84.5	84.5	88.0	74.7
2880	75	80.6	74.3	88.2	55.3	96.7	36.2	77.0	72.5	84.0	53.5	91.7	34.5	73.1	70.6	79.6	51.6	86.5	32.8
	80	84.1	84.1	88.8	70.7	97.1	51.7	80.8	80.8	84.7	69.0	92.4	49.9	77.2	77.2	80.4	67.1	87.5	48.0
	85	89.0	89.0	90.0	86.5	97.8	67.0	85.5	85.5	86.0	84.7	93.1	65.2	81.9	81.9	82.0	82.0	88.3	63.4
	90	94.0	94.0	94.1	94.1	98.5	82.6	90.4	90.4	90.5	90.5	93.9	80.9	86.5	86.5	86.6	86.6	89.2	79.0

CFM	Ent DB (°F)	Ambient Temperature (°F) 115 Entering Wet Bulb (°F) 61 MBH	61 SHC	67 MBH	67 SHC	73 MBH	73 SHC	Ambient Temperature (°F) 125 Entering Wet Bulb (°F) 61 MBH	61 SHC	67 MBH	67 SHC	73 MBH	73 SHC
2100	75	65.3	57.0	71.7	43.4	79.0	29.4	61.3	55.0	67.2	41.3	73.5	27.5
	80	67.1	67.1	72.3	54.5	78.8	40.9	63.6	63.6	67.9	52.6	73.4	39.1
	85	71.0	71.0	73.0	65.9	79.9	51.9	67.4	67.4	68.6	64.0	74.9	49.9
	90	75.0	75.0	75.1	75.1	80.4	63.2	71.2	71.2	71.4	71.4	75.5	61.2
2400	75	66.9	61.5	73.2	45.8	79.9	30.0	62.8	59.5	68.5	43.7	74.3	28.2
	80	69.9	69.9	73.9	58.6	80.6	42.8	66.2	66.2	69.3	56.6	75.5	40.7
	85	74.0	74.0	74.8	71.7	81.4	55.6	70.2	70.2	70.4	69.8	76.3	53.5
	90	78.3	78.3	78.4	78.4	82.0	68.6	74.2	74.2	74.3	74.3	77.0	66.6
2640	75	68.1	65.1	74.2	47.7	80.5	30.5	63.9	63.0	69.3	45.5	74.7	28.7
	80	71.8	71.8	74.9	61.9	81.6	44.4	67.9	67.9	70.2	59.8	76.3	42.2
	85	76.1	76.1	76.3	76.3	82.4	58.5	72.1	72.1	72.2	72.2	77.2	56.4
	90	80.5	80.5	80.6	80.6	83.2	72.9	76.2	76.2	76.4	76.4	78.0	70.9
2880	75	69.2	68.7	75.0	49.5	80.9	31.0	65.1	65.1	70.0	47.3	75.0	29.2
	80	73.5	73.5	75.8	65.1	82.4	45.9	69.4	69.4	71.1	63.0	77.0	43.7
	85	77.9	77.9	78.0	78.0	83.3	61.4	73.7	73.7	73.8	73.8	78.0	59.3
	90	82.4	82.4	82.6	82.6	84.2	77.1	78.0	78.0	78.1	78.1	79.0	75.1

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. MBh = Total Gross Capacity, SHC = Sensible Heat Capacity

Table 13. Gross cooling capacities (MBH) 6 tons TWA072K*D heat pump with 6 tons TWE072K*B air handler (IP)

CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb (°F) 61 MBH	SHC	67 MBH	SHC	73 MBH	SHC	Ambient Temperature (°F) 95 Entering Wet Bulb (°F) 61 MBH	SHC	67 MBH	SHC	73 MBH	SHC	Ambient Temperature (°F) 105 Entering Wet Bulb (°F) 61 MBH	SHC	67 MBH	SHC	73 MBH	SHC
2160	75	75.0	62.7	83.0	48.8	92.7	34.2	72.9	61.7	80.6	47.8	89.8	33.2	70.6	60.5	77.9	46.6	86.6	32.1
	80	76.4	73.4	83.7	60.4	92.7	46.2	74.5	71.9	81.3	59.4	89.8	45.2	72.4	70.4	78.6	58.2	86.7	44.0
	85	80.4	80.4	84.4	72.2	93.2	57.9	78.6	78.6	82.0	71.1	90.4	56.8	76.5	76.5	79.4	70.0	87.4	55.7
	90	86.1	82.5	86.1	82.5	93.8	69.6	83.1	83.1	83.9	81.0	91.1	68.6	81.0	81.0	81.6	79.3	88.1	67.4
2400	75	76.6	66.4	84.6	50.9	94.0	34.9	74.4	65.4	82.1	49.8	91.0	33.8	72.0	64.2	79.3	48.6	87.6	32.7
	80	78.7	77.4	85.3	63.8	94.2	48.1	76.8	76.0	82.8	62.8	91.3	47.0	74.6	74.5	80.1	61.6	88.0	45.8
	85	83.4	83.4	86.2	77.0	94.9	61.0	81.5	81.5	83.8	75.9	92.0	59.9	79.3	79.3	81.1	74.7	88.9	58.7
	90	88.4	88.4	88.7	87.4	95.7	74.1	86.3	86.3	86.5	85.9	92.7	73.0	84.0	84.0	84.1	84.1	89.7	71.8
2640	75	78.0	70.2	85.9	53.0	95.1	35.4	75.8	69.1	83.3	51.9	91.9	34.4	73.3	67.9	80.4	50.6	88.5	33.2
	80	81.0	81.0	86.7	67.2	95.5	49.9	79.1	79.1	84.2	66.1	92.4	48.8	76.9	76.9	81.3	64.9	89.2	47.5
	85	86.1	86.1	87.9	81.7	96.4	64.1	84.0	84.0	85.4	80.5	93.3	62.9	81.7	81.7	82.9	78.1	90.2	61.7
	90	91.3	91.3	91.4	91.4	97.2	78.5	89.1	89.1	89.2	89.2	94.2	77.4	86.6	86.6	86.8	86.8	91.1	76.2
2880	75	79.3	73.9	87.0	55.0	96.0	36.0	77.1	72.8	84.4	53.9	92.7	34.9	74.6	70.7	81.4	52.6	89.1	33.7
	80	83.2	83.2	87.9	70.6	96.6	51.7	81.1	81.1	85.3	69.5	93.4	50.4	78.8	78.8	82.4	68.2	90.3	49.2
	85	88.5	88.5	89.6	85.3	97.6	67.2	86.3	86.3	87.2	83.3	94.4	66.0	83.8	83.8	84.5	81.5	91.3	64.8
	90	93.8	93.8	94.0	94.0	98.6	82.9	91.5	91.5	91.7	91.7	95.5	81.7	88.9	88.9	89.1	89.1	92.3	80.5

CFM	Ent DB (°F)	Ambient Temperature (°F) 115 Entering Wet Bulb (°F) 61 MBH	SHC	67 MBH	SHC	73 MBH	SHC	Ambient Temperature (°F) 125 Entering Wet Bulb (°F) 61 MBH	SHC	67 MBH	SHC	73 MBH	SHC
2160	75	68.1	59.3	75.1	45.4	83.2	30.9	65.4	58.0	72.1	44.0	79.5	29.7
	80	70.1	68.7	75.9	57.0	83.5	42.8	67.7	67.0	72.9	55.7	80.0	41.5
	85	74.3	74.3	76.7	68.8	84.3	54.4	72.0	72.0	73.8	67.5	80.9	53.1
	90	78.7	78.7	79.1	77.6	85.0	66.2	76.2	76.2	76.4	75.9	81.6	64.9
2400	75	69.5	63.0	76.4	47.4	84.1	31.5	66.8	61.7	73.3	46.0	80.3	30.2
	80	72.4	72.4	77.2	60.3	84.7	44.6	70.0	70.0	74.1	59.0	81.2	43.2
	85	77.0	77.0	78.4	73.1	85.7	57.5	74.4	74.4	75.6	70.8	82.2	56.1
	90	81.6	81.6	81.7	81.7	86.5	70.6	78.9	78.9	79.1	79.1	83.0	69.2
2640	75	70.8	66.4	77.5	49.3	84.8	32.0	68.2	64.1	74.3	47.9	80.9	30.7
	80	74.5	74.5	78.4	63.6	85.9	46.2	72.0	72.0	75.2	62.3	82.2	44.8
	85	79.2	79.2	80.2	76.2	86.8	60.5	76.6	76.6	77.2	74.1	83.3	59.1
	90	84.0	84.0	84.2	84.2	87.8	74.9	81.3	81.3	81.4	81.4	84.3	73.6
2880	75	72.1	68.6	78.4	51.3	85.4	32.5	69.4	66.6	75.1	49.8	81.3	31.2
	80	76.4	76.4	79.4	66.9	86.8	47.9	73.7	73.7	76.2	65.6	83.1	46.4
	85	81.3	81.3	81.7	79.5	87.8	63.4	78.5	78.5	78.7	77.5	84.2	62.0
	90	86.2	86.2	86.4	86.4	89.0	79.3	83.3	83.3	83.4	83.4	85.4	77.9

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. MBh = Total Gross Capacity, SHC = Sensible Heat Capacity

Table 14. Gross cooling capacities (MBH) 7.5 tons TWA090K*A heat pump with 7.5 tons TWE090K*A air handler (IP)

CFM	Ent DB (°F)	Ambient Temperature (°F) 85						Ambient Temperature (°F) 95						Ambient Temperature (°F) 105					
		Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
		MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC
2625	75	89.8	75.5	98.6	58.2	108.7	40.0	85.8	73.6	94.1	56.4	103.7	38.2	81.5	71.5	89.2	54.4	98.5	36.3
	80	91.0	89.8	98.9	72.2	108.6	54.4	87.2	87.2	94.4	70.3	103.6	52.6	83.5	83.5	89.8	68.2	98.3	50.8
	85	95.5	95.5	99.4	86.2	108.6	68.6	91.9	91.9	95.1	84.3	103.7	66.7	88.2	88.2	90.4	82.4	98.6	64.8
	90	100.8	100.6	100.8	100.6	108.9	82.6	96.7	96.7	96.9	96.9	104.1	80.7	92.8	92.8	93.0	93.0	99.0	78.8
3000	75	92.0	81.3	100.5	61.6	110.5	40.8	87.8	79.3	95.7	59.7	105.4	39.0	83.4	77.2	91.0	57.5	99.9	37.2
	80	94.4	94.4	101.0	77.4	110.4	57.3	90.7	90.7	96.4	75.5	105.2	55.5	86.8	86.8	91.5	73.4	99.8	53.7
	85	99.5	99.5	101.8	93.6	110.6	73.3	95.7	95.7	97.3	91.7	105.6	71.4	91.7	91.7	92.6	89.7	100.3	69.4
	90	104.6	104.6	104.8	104.8	111.1	89.4	100.7	100.7	100.9	100.9	106.1	87.5	96.6	96.6	96.7	96.7	100.9	85.6
3300	75	93.4	85.8	101.8	64.1	111.7	41.5	89.2	83.8	97.1	62.1	106.4	39.7	84.7	81.7	92.1	60.0	100.9	37.9
	80	96.9	96.9	102.3	81.6	111.6	59.6	93.1	93.1	97.6	79.6	106.3	57.8	89.0	89.0	92.7	77.5	100.7	56.0
	85	102.2	102.2	103.4	99.4	111.9	77.1	98.3	98.3	98.9	97.5	106.8	75.2	94.1	94.1	94.3	94.3	101.4	73.2
	90	107.6	107.6	107.7	107.7	112.5	94.8	103.5	103.5	103.6	103.6	107.4	92.9	99.1	99.1	99.3	99.3	102.2	91.0
3600	75	94.7	90.4	102.9	66.6	112.7	42.2	90.4	88.4	98.1	64.5	107.3	40.4	86.0	86.0	93.0	62.4	101.6	38.5
	80	99.1	99.1	103.5	85.7	112.5	61.9	95.2	95.2	98.7	83.7	107.1	60.2	91.0	91.0	93.7	81.6	101.5	58.3
	85	104.6	104.6	105.1	105.1	113.0	80.9	100.5	100.5	100.6	100.6	107.8	78.9	96.1	96.1	96.3	96.3	102.3	76.9
	90	110.1	110.1	110.3	110.3	113.8	100.2	105.8	105.8	106.0	106.0	108.6	98.3	101.3	101.3	101.5	101.5	103.3	96.3

CFM	Ent DB (°F)	Ambient Temperature (°F) 115						Ambient Temperature (°F) 120					
		Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
		MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC
2625	75	77.0	69.3	84.4	52.3	93.0	34.4	74.7	68.2	81.8	51.2	90.1	33.5
	80	79.6	79.6	84.9	66.1	92.8	48.9	77.6	77.6	82.3	65.1	90.0	47.9
	85	84.2	84.2	85.6	80.3	93.3	62.7	82.1	82.1	83.2	79.2	90.5	61.7
	90	88.7	88.7	88.9	88.9	93.8	76.8	86.6	86.6	86.7	86.7	91.0	75.7
3000	75	78.8	75.0	85.9	55.4	94.3	35.3	76.4	73.9	83.3	54.2	91.3	34.3
	80	82.7	82.7	86.5	71.3	94.1	51.8	80.5	80.5	83.9	70.2	91.1	50.8
	85	87.4	87.4	87.8	87.6	94.8	67.4	85.2	85.2	85.3	85.3	92.0	66.3
	90	92.2	92.2	92.4	92.4	95.5	83.5	89.9	89.9	90.1	90.1	92.7	82.5
3300	75	80.1	79.5	86.9	57.8	95.0	35.9	77.7	77.7	84.2	56.7	92.0	35.0
	80	84.7	84.7	87.6	75.4	94.9	54.1	82.5	82.5	84.9	74.3	91.9	53.1
	85	89.7	89.7	89.8	89.8	95.8	71.1	87.3	87.3	87.4	87.4	92.9	70.0
	90	94.6	94.6	94.7	94.7	96.7	88.9	92.2	92.2	92.3	92.3	93.8	87.8
3600	75	81.5	81.5	87.7	60.2	95.7	36.6	79.3	79.3	85.0	59.1	92.6	35.6
	80	86.5	86.5	88.6	79.5	95.5	56.4	84.2	84.2	85.9	78.3	92.5	55.4
	85	91.6	91.6	91.7	91.7	96.7	74.8	89.2	89.2	89.3	89.3	93.8	73.7
	90	96.6	96.6	96.7	96.7	97.8	94.3	94.1	94.1	94.2	94.2	95.0	93.2

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. MBh = Total Gross Capacity, SHC = Sensible Heat Capacity

Table 15. Gross cooling capacities (MBH) 7.5 tons TWA090K*D heat pump with 7.5 tons TWE090K*B air handler (IP)

CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb (°F) 61 MBH	SHC	67 MBH	SHC	73 MBH	SHC	Ambient Temperature (°F) 95 Entering Wet Bulb (°F) 61 MBH	SHC	67 MBH	SHC	73 MBH	SHC	Ambient Temperature (°F) 105 Entering Wet Bulb (°F) 61 MBH	SHC	67 MBH	SHC	73 MBH	SHC
2700	75	94.0	78.2	103.7	61.0	115.5	42.6	91.8	77.2	101.1	59.8	112.3	41.4	89.1	75.9	97.7	58.3	108.4	40.1
	80	95.3	93.0	104.5	75.3	115.5	57.5	93.2	92.0	101.9	74.1	112.2	56.3	90.8	90.0	98.5	72.7	108.4	54.9
	85	100.3	100.3	105.4	89.8	115.9	72.0	98.3	98.3	102.8	88.7	112.8	70.8	95.7	95.7	99.5	87.2	109.0	69.3
	90	106.9	104.7	106.9	104.7	116.6	86.5	103.8	103.8	104.4	103.4	113.5	85.3	101.1	101.1	101.5	100.6	109.8	83.8
3000	75	95.9	82.9	105.6	63.6	117.2	43.3	93.6	81.8	102.9	62.4	113.8	42.2	90.9	80.5	99.4	60.9	109.8	40.8
	80	98.1	98.1	106.5	79.5	117.2	59.9	96.0	96.0	103.7	78.3	113.8	58.7	93.4	93.4	100.3	76.8	109.8	57.3
	85	103.9	103.9	107.5	95.7	117.9	75.9	101.8	101.8	104.8	94.6	114.7	74.6	99.0	99.0	101.5	93.1	110.8	73.1
	90	109.9	109.9	110.1	110.1	118.7	92.0	107.5	107.5	107.7	107.7	115.5	90.7	104.7	104.7	104.9	104.9	111.7	89.3
3300	75	97.6	87.5	107.3	66.1	118.6	44.0	95.3	86.3	104.4	64.9	115.1	42.9	92.4	85.0	100.8	63.4	110.9	41.5
	80	101.0	101.0	108.2	83.7	118.6	62.2	98.9	98.9	105.3	82.5	115.3	60.9	96.1	96.1	101.8	81.0	111.3	59.4
	85	107.1	107.1	109.5	101.6	119.6	79.6	104.8	104.8	106.7	100.4	116.2	78.4	101.9	101.9	103.3	98.9	112.2	76.8
	90	113.3	113.3	113.5	113.5	120.6	97.5	110.8	110.8	111.0	111.0	117.2	96.2	107.8	107.8	108.0	108.0	113.2	94.7
3600	75	99.2	92.0	108.6	68.6	119.7	44.7	96.7	90.9	105.7	67.4	116.1	43.5	93.5	89.3	102.0	65.8	111.8	42.1
	80	103.6	103.6	109.6	87.8	120.0	64.3	101.4	101.4	106.7	86.6	116.6	63.0	98.5	98.5	103.1	85.1	112.5	61.4
	85	109.9	109.9	111.3	107.5	121.1	83.4	107.5	107.5	108.4	106.2	117.6	82.1	104.5	104.5	105.0	104.2	113.5	80.6
	90	116.3	116.3	116.5	116.5	122.2	102.9	113.7	113.7	113.9	113.9	118.7	101.6	110.5	110.5	110.7	110.7	114.6	100.0

CFM	Ent DB (°F)	Ambient Temperature (°F) 115 Entering Wet Bulb (°F) 61 MBH	SHC	67 MBH	SHC	73 MBH	SHC	Ambient Temperature (°F) 125 Entering Wet Bulb (°F) 61 MBH	SHC	67 MBH	SHC	73 MBH	SHC
2700	75	86.0	74.3	94.2	56.8	104.2	38.6	82.3	72.5	90.2	55.1	99.5	37.0
	80	87.8	87.6	95.1	71.2	104.2	53.5	84.8	84.8	91.1	69.4	99.6	51.8
	85	93.0	93.0	96.1	85.8	105.0	67.8	89.8	89.8	92.1	84.0	100.6	66.0
	90	98.3	98.3	98.4	98.4	105.8	82.3	94.9	94.9	95.1	95.1	101.4	80.6
3000	75	87.4	78.8	95.8	59.3	105.4	39.3	83.8	77.1	91.7	57.5	100.5	37.7
	80	90.7	90.7	96.7	75.3	105.7	55.7	87.5	87.5	92.6	73.5	101.0	53.8
	85	96.2	96.2	98.0	91.6	106.7	71.5	92.8	92.8	93.9	89.9	102.0	69.7
	90	101.6	101.6	101.8	101.8	107.5	87.7	98.1	98.1	98.2	98.2	103.0	85.9
3300	75	88.9	83.3	97.1	61.7	106.4	40.0	85.2	81.6	92.8	59.9	101.3	38.3
	80	93.2	93.2	98.1	79.4	107.0	57.7	89.8	89.8	93.9	77.6	102.2	55.9
	85	98.8	98.8	99.7	97.4	108.0	75.2	95.3	95.3	95.7	94.3	103.3	73.4
	90	104.5	104.5	104.7	104.7	109.0	93.1	100.8	100.8	100.9	100.9	104.4	91.3
3600	75	90.3	87.8	98.2	64.2	107.2	40.6	86.6	85.4	93.8	62.3	101.9	38.9
	80	95.4	95.4	99.3	83.5	108.1	59.7	91.9	91.9	95.0	81.6	103.3	57.9
	85	101.2	101.2	101.5	101.0	109.2	78.9	97.5	97.5	97.6	97.6	104.4	77.1
	90	107.0	107.0	107.2	107.2	110.4	98.4	103.1	103.1	103.3	103.3	105.6	96.6

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. MBh = Total Gross Capacity, SHC = Sensible Heat Capacity

Table 16. Gross cooling capacities (MBH) 10 tons TWA120K*A heat pump with 10 tons TWE120K*A air handler (IP)

CFM	Ent DB (°F)	Ambient Temperature (°F) 85						Ambient Temperature (°F) 95						Ambient Temperature (°F) 105					
		Entering Wet Bulb (°F)						Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73		61		67		73	
		MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC
3600	75	119.6	101.2	131.0	77.8	144.1	53.7	115.0	98.9	125.7	75.4	137.7	51.5	110.0	96.4	120.1	72.8	130.7	49.1
	80	121.5	121.1	132.2	96.9	143.7	73.5	117.3	117.3	127.0	94.5	137.2	71.4	113.1	113.1	121.4	92.0	132.0	68.3
	85	128.2	128.2	133.3	116.4	145.9	92.3	124.1	124.1	128.2	114.1	140.0	89.9	119.6	119.6	122.7	111.6	133.8	87.3
	90	135.6	135.6	135.6	135.6	146.9	111.7	130.9	130.9	131.1	131.1	141.1	109.4	126.2	126.2	126.5	126.5	134.9	106.8
4000	75	121.9	107.3	133.2	81.0	145.6	54.6	117.1	104.8	127.8	78.5	138.9	52.3	112.1	102.3	121.9	75.8	131.7	50.0
	80	125.4	125.4	134.5	102.4	145.2	76.7	121.2	121.2	129.2	99.9	140.5	73.5	116.6	116.6	123.4	97.3	134.0	70.8
	85	132.6	132.6	136.0	124.2	148.3	97.2	128.3	128.3	130.7	121.8	142.3	94.8	123.5	123.5	125.1	119.2	135.9	92.1
	90	140.0	140.0	140.2	140.2	149.4	118.9	135.4	135.4	135.7	135.7	143.5	116.5	130.5	130.5	130.7	130.7	137.1	113.9
4400	75	124.0	113.2	135.1	84.1	146.7	55.4	119.1	110.7	129.5	81.6	139.8	53.2	114.0	108.1	123.5	78.8	132.3	50.8
	80	129.0	129.0	136.6	107.8	148.6	78.6	124.5	124.5	131.1	105.3	142.4	76.1	119.7	119.7	125.2	102.6	135.6	73.3
	85	136.5	136.5	138.4	131.9	150.4	102.1	131.9	131.9	133.1	129.4	144.2	99.6	126.9	126.9	127.5	126.8	137.6	96.9
	90	144.2	144.2	144.4	144.4	151.7	126.0	139.4	139.4	139.6	139.6	145.6	123.6	134.1	134.1	134.4	134.4	139.1	121.0
4800	75	125.9	119.1	136.7	87.2	147.5	56.2	120.9	116.6	131.0	84.6	140.4	54.0	115.7	113.9	124.8	81.7	132.9	51.5
	80	132.1	132.1	138.3	113.1	150.3	81.2	127.5	127.5	132.7	110.6	143.9	78.6	122.5	122.5	126.7	107.9	137.0	75.7
	85	139.9	139.9	140.7	139.5	152.1	106.9	135.1	135.1	135.4	135.4	145.8	104.4	129.9	129.9	130.0	130.0	139.1	101.6
	90	147.9	147.9	148.1	148.1	153.6	133.1	142.8	142.8	143.1	143.1	147.5	130.7	137.4	137.4	137.6	137.6	140.9	128.0

CFM	Ent DB (°F)	Ambient Temperature (°F) 115						Ambient Temperature (°F) 125					
		Entering Wet Bulb (°F)						Entering Wet Bulb (°F)					
		61		67		73		61		67		73	
		MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC	MBH	SHC
3600	75	104.7	93.7	114.0	70.0	123.3	46.7	99.0	90.8	107.4	66.9	115.2	44.0
	80	108.4	108.4	115.5	89.3	125.2	65.5	104.8	104.8	109.0	86.3	117.9	62.4
	85	114.7	114.7	116.8	108.9	127.1	84.6	109.4	109.4	110.5	106.0	119.9	81.6
	90	121.1	121.1	121.4	121.4	128.3	104.1	115.5	115.5	115.7	115.7	121.1	101.2
4000	75	106.7	99.5	115.7	72.9	124.0	47.5	100.9	96.5	108.9	69.7	115.7	44.8
	80	111.7	111.7	117.3	94.5	127.0	67.9	106.3	106.3	110.7	91.5	119.5	64.7
	85	118.3	118.3	119.2	116.5	129.0	89.3	112.7	112.7	112.9	112.9	121.6	86.2
	90	125.1	125.1	125.3	125.3	130.3	111.2	119.1	119.1	119.3	119.3	123.0	108.2
4400	75	108.5	105.3	117.1	75.8	124.5	48.2	102.6	102.2	110.2	72.5	116.1	45.6
	80	114.6	114.6	118.9	99.7	128.5	70.2	108.9	108.9	112.2	96.6	120.7	66.9
	85	121.4	121.4	121.6	121.6	130.6	94.0	115.5	115.5	115.6	115.6	123.0	90.8
	90	128.5	128.5	128.7	128.7	132.2	118.2	122.2	122.2	122.4	122.4	124.7	115.1
4800	75	110.2	110.2	118.3	78.6	124.9	49.0	104.3	104.3	111.2	75.2	116.4	46.3
	80	117.1	117.1	120.3	104.9	129.7	72.5	111.1	111.1	113.5	101.7	121.8	69.1
	85	124.2	124.2	124.3	124.3	131.9	98.6	117.9	117.9	118.1	118.1	124.2	95.4
	90	131.4	131.4	131.6	131.6	133.8	125.1	124.9	124.9	125.1	125.1	126.3	122.0

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. MBh = Total Gross Capacity, SHC = Sensible Heat Capacity

Table 17. Gross cooling capacities (MBH) 10 tons TWA120K*D heat pump with 10 tons TWE120K*B air handler (IP)

CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb (°F) 61 MBH	SHC	67 MBH	SHC	73 MBH	SHC	Ambient Temperature (°F) 95 Entering Wet Bulb (°F) 61 MBH	SHC	67 MBH	SHC	73 MBH	SHC	Ambient Temperature (°F) 105 Entering Wet Bulb (°F) 61 MBH	SHC	67 MBH	SHC	73 MBH	SHC
3600	75	121.2	103.1	133.9	79.5	148.7	54.7	115.6	100.5	127.5	76.9	141.7	52.2	109.9	97.8	121.1	74.3	134.4	49.7
	80	123.0	122.9	134.3	98.9	148.4	74.6	118.1	118.1	128.0	96.2	141.4	72.1	113.2	113.2	121.6	93.5	134.1	69.6
	85	129.8	129.8	135.1	118.4	148.4	94.3	124.9	124.9	128.9	115.8	141.5	91.7	119.8	119.8	122.6	113.1	134.4	89.0
	90	137.2	137.2	137.2	137.2	148.9	113.7	131.8	131.8	132.0	132.0	142.1	111.1	126.5	126.5	126.7	126.7	135.0	108.5
4000	75	123.6	109.4	136.1	83.2	150.8	55.7	117.8	106.7	129.6	80.5	143.6	53.2	112.0	104.0	123.0	77.7	136.1	50.6
	80	127.0	127.0	136.6	104.6	150.6	77.8	122.0	122.0	130.2	101.9	143.3	75.3	116.8	116.8	123.6	99.2	135.8	72.7
	85	134.3	134.3	137.7	126.4	150.7	99.5	129.1	129.1	131.4	123.8	143.7	96.8	123.7	123.7	125.1	121.1	136.4	94.1
	90	141.7	141.7	141.9	141.9	151.4	121.1	136.3	136.3	136.6	136.6	144.4	118.5	130.7	130.7	130.9	130.9	137.2	115.8
4400	75	125.7	115.7	138.0	86.7	152.6	56.6	119.8	112.9	131.3	83.9	145.2	54.1	113.8	110.2	124.5	81.1	137.4	51.5
	80	130.7	130.7	138.6	110.3	152.3	81.0	125.4	125.4	132.0	107.6	144.9	78.4	120.0	120.0	125.3	104.8	137.4	75.7
	85	138.2	138.2	140.1	134.4	152.7	104.6	132.8	132.8	133.8	131.7	145.5	102.0	127.1	127.1	127.5	127.5	138.0	99.2
	90	145.9	145.9	146.1	146.1	153.5	128.5	140.3	140.3	140.5	140.5	146.4	125.9	134.4	134.4	134.6	134.6	139.0	123.2
4800	75	127.6	121.9	139.6	90.1	154.1	57.6	121.6	119.1	132.8	87.3	146.5	55.0	115.7	115.7	125.8	84.5	138.6	52.4
	80	133.8	133.8	140.3	115.9	153.8	84.1	128.4	128.4	133.6	113.2	146.4	81.4	122.7	122.7	126.8	110.4	138.7	78.6
	85	141.7	141.7	142.5	142.2	154.4	109.8	136.0	136.0	136.2	136.2	147.0	107.1	130.1	130.1	130.3	130.3	139.4	104.3
	90	149.6	149.6	149.8	149.8	155.4	135.9	143.8	143.8	144.0	144.0	148.2	133.3	137.6	137.6	137.8	137.8	140.8	130.6

CFM	Ent DB (°F)	Ambient Temperature (°F) 115 Entering Wet Bulb (°F) 61 MBH	SHC	67 MBH	SHC	73 MBH	SHC	Ambient Temperature (°F) 125 Entering Wet Bulb (°F) 61 MBH	SHC	67 MBH	SHC	73 MBH	SHC
3600	75	104.1	95.1	114.6	71.5	126.9	47.1	98.5	92.4	108.0	68.8	119.3	44.5
	80	108.2	108.2	115.1	90.8	126.6	67.0	103.1	103.1	108.6	88.1	119.2	64.3
	85	114.6	114.6	116.3	110.4	127.2	86.3	109.2	109.2	110.0	107.8	119.8	83.5
	90	121.0	121.0	121.3	121.3	127.8	105.8	115.4	115.4	115.6	115.6	120.6	103.1
4000	75	106.1	101.2	116.2	74.9	128.4	48.0	100.3	98.5	109.5	72.1	120.6	45.4
	80	111.5	111.5	116.9	96.4	128.3	70.0	106.2	106.2	110.3	93.6	120.8	67.2
	85	118.2	118.2	118.7	118.4	128.9	91.4	112.5	112.5	112.7	112.7	121.4	88.6
	90	125.0	125.0	125.2	125.2	129.8	113.1	119.0	119.0	119.2	119.2	122.4	110.4
4400	75	108.0	107.4	117.6	78.3	129.6	48.9	102.3	102.3	110.7	75.4	121.5	46.3
	80	114.4	114.4	118.5	102.0	129.8	72.9	108.8	108.8	111.7	99.2	122.0	70.0
	85	121.3	121.3	121.5	121.5	130.4	96.5	115.4	115.4	115.5	115.5	122.8	93.7
	90	128.3	128.3	128.5	128.5	131.6	120.5	122.1	122.1	122.3	122.3	124.1	117.7
4800	75	109.9	109.9	118.8	81.6	130.5	49.8	104.4	104.4	111.8	78.7	122.3	47.2
	80	117.0	117.0	119.9	107.6	131.0	75.7	111.1	111.1	113.0	104.7	123.1	72.8
	85	124.1	124.1	124.2	124.2	131.7	101.5	117.9	117.9	118.0	118.0	123.9	98.7
	90	131.3	131.3	131.5	131.5	133.3	127.8	124.8	124.8	124.9	124.9	125.7	125.0

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. MBh = Total Gross Capacity, SHC = Sensible Heat Capacity

Table 18. Gross cooling capacities (MBH) 15 tons TWA180K*D heat pump with 15 tons TWE180K*B air handler (IP)

CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb (°F) 61 MBH	61 SHC	67 MBH	67 SHC	73 MBH	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb (°F) 61 MBH	61 SHC	67 MBH	67 SHC	73 MBH	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb (°F) 61 MBH	61 SHC	67 MBH	67 SHC	73 MBH	73 SHC
5400	75	184.7	155.1	203.2	120.3	225.9	83.4	177.3	151.4	194.8	116.5	215.9	79.9	169.4	147.4	185.9	112.4	205.3	76.3
	80	187.2	184.7	204.8	148.9	225.5	113.3	180.1	180.1	196.4	145.2	215.5	109.9	172.9	172.9	187.6	141.2	205.1	106.0
	85	196.4	196.4	206.2	178.1	226.6	142.3	189.9	189.9	198.0	174.4	217.3	138.6	182.9	182.9	189.4	170.5	207.5	134.6
	90	208.9	207.8	208.9	207.8	227.8	171.3	200.4	200.4	201.4	200.3	218.6	167.6	193.2	193.2	193.6	193.6	208.9	163.7
6000	75	188.5	164.3	207.0	125.4	229.0	84.9	180.8	160.5	198.2	121.5	218.6	81.4	172.7	156.5	189.0	117.3	207.5	77.6
	80	192.3	192.3	208.6	157.3	228.4	118.1	185.6	185.6	200.0	153.5	218.7	114.3	178.5	178.5	190.9	149.4	208.4	110.2
	85	203.2	203.2	210.4	189.9	230.6	149.9	196.4	196.4	202.0	186.1	221.0	146.1	189.1	189.1	193.1	182.2	210.9	142.1
	90	214.5	214.5	214.9	214.9	231.9	182.3	207.4	207.4	207.8	207.8	222.5	178.5	199.8	199.8	200.2	200.2	212.5	174.6
6600	75	191.8	173.5	210.1	130.4	231.4	86.3	183.9	169.6	201.1	126.4	220.6	82.7	175.6	165.4	191.7	122.1	209.1	78.9
	80	197.7	197.7	211.8	165.7	231.7	122.4	190.8	190.8	203.0	161.8	221.7	118.4	183.4	183.4	193.7	157.6	211.2	114.2
	85	209.3	209.3	214.1	201.6	233.9	157.5	202.1	202.1	205.5	197.8	224.1	153.6	194.4	194.4	196.5	193.8	213.7	149.5
	90	221.1	221.1	221.4	221.4	235.5	193.2	213.6	213.6	214.0	214.0	225.8	189.4	205.6	205.6	205.9	205.9	215.6	185.4
7200	75	194.7	182.5	212.8	135.3	233.4	87.6	186.6	178.5	203.6	131.2	222.2	84.0	178.2	174.3	193.9	126.8	210.3	80.2
	80	202.6	202.6	214.6	173.9	234.5	126.6	195.4	195.4	205.6	169.9	224.3	122.5	187.7	187.7	196.1	165.7	213.6	118.2
	85	214.6	214.6	217.5	213.3	236.7	165.0	207.1	207.1	208.8	208.8	226.7	161.0	199.1	199.1	199.8	199.8	216.1	156.8
	90	226.9	226.9	227.2	227.2	238.5	204.1	219.1	219.1	219.4	219.4	228.7	200.2	210.7	210.7	211.0	211.0	218.3	196.1

CFM	Ent DB (°F)	Ambient Temperature (°F) 115 Entering Wet Bulb (°F) 61 MBH	61 SHC	67 MBH	67 SHC	73 MBH	73 SHC	Ambient Temperature (°F) 125 Entering Wet Bulb (°F) 61 MBH	61 SHC	67 MBH	67 SHC	73 MBH	73 SHC
5400	75	161.0	143.2	176.3	108.1	193.8	72.4	152.0	138.6	166.2	103.4	181.3	68.3
	80	165.6	165.6	178.3	137.0	194.5	101.8	157.8	157.8	168.3	132.4	183.2	97.1
	85	175.5	175.5	180.2	166.3	197.1	130.4	167.3	167.3	170.4	161.9	186.0	125.8
	90	185.5	185.5	185.8	185.8	198.7	159.6	177.1	177.1	177.4	177.4	187.7	155.2
6000	75	164.0	152.1	179.2	112.9	195.5	73.7	154.8	147.5	168.7	108.0	182.6	69.5
	80	170.8	170.8	181.3	145.1	197.6	105.8	162.6	162.6	171.0	140.5	185.9	101.0
	85	181.2	181.2	183.7	177.9	200.2	137.7	172.6	172.6	173.8	173.3	188.8	133.1
	90	191.7	191.7	192.0	192.0	202.0	170.4	182.8	182.8	183.0	183.0	190.7	165.8
6600	75	166.8	161.0	181.6	117.5	196.7	74.9	157.4	156.2	170.9	112.6	183.5	70.7
	80	175.4	175.4	183.9	153.2	200.1	109.7	166.7	166.7	173.4	148.4	188.2	104.8
	85	186.1	186.1	187.1	187.1	202.8	145.1	177.1	177.1	177.4	177.4	191.1	140.3
	90	197.0	197.0	197.3	197.3	204.8	181.1	187.7	187.7	188.0	188.0	193.4	176.5
7200	75	169.3	169.3	183.7	122.1	197.6	76.2	160.0	160.0	172.7	117.0	184.1	71.9
	80	179.4	179.4	186.1	161.2	202.2	113.5	170.4	170.4	175.4	156.4	190.1	108.5
	85	190.5	190.5	190.7	190.7	205.0	152.3	181.1	181.1	181.3	181.3	193.1	147.5
	90	201.8	201.8	202.0	202.0	207.4	191.8	192.0	192.0	192.3	192.3	195.8	187.1

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. MBh = Total Gross Capacity, SHC = Sensible Heat Capacity

Table 19. Gross cooling capacities (MBH) 20 tons TWA240K*D heat pump with 20 tons TWE240K*B air handler (IP)

CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb (°F) 61 MBH	61 SHC	67 MBH	67 SHC	73 MBH	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb (°F) 61 MBH	61 SHC	67 MBH	67 SHC	73 MBH	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb (°F) 61 MBH	61 SHC	67 MBH	67 SHC	73 MBH	73 SHC
7200	75	247.0	209.0	274.2	161.2	303.2	111.2	237.7	204.6	263.6	157.0	290.8	106.7	227.8	200.0	252.6	152.5	278.8	102.5
	80	247.5	247.3	272.9	200.2	301.6	150.5	238.6	238.6	262.4	195.8	289.7	146.3	229.4	229.4	251.5	191.2	277.6	142.0
	85	256.1	256.1	272.3	238.3	300.9	190.1	248.2	248.2	261.8	233.9	288.5	185.7	239.9	239.9	250.9	229.4	276.5	181.4
	90	273.4	273.4	273.4	273.4	299.3	228.6	260.5	260.5	263.4	263.4	287.8	224.3	251.8	251.8	253.3	253.3	275.2	219.6
8000	75	251.5	221.6	278.9	168.8	308.0	113.3	241.9	217.1	267.9	164.5	295.6	108.9	231.7	212.5	256.5	160.0	282.8	104.5
	80	253.1	253.1	277.7	211.8	306.8	157.2	244.1	244.1	266.8	207.3	294.4	152.9	234.9	234.9	255.5	202.7	281.6	148.5
	85	264.5	264.5	276.9	254.2	305.6	201.0	256.2	256.2	266.3	249.9	293.1	196.6	247.4	247.4	255.3	245.3	280.2	192.0
	90	277.6	277.6	279.6	279.6	304.1	243.6	268.9	268.9	269.6	269.6	292.3	239.2	259.5	259.5	259.9	259.9	279.6	234.6
8800	75	255.6	234.2	282.9	176.3	312.0	115.3	245.4	229.5	271.6	171.9	299.3	110.9	235.2	224.9	259.8	167.3	286.1	106.4
	80	258.6	258.6	281.8	223.3	310.8	163.7	249.9	249.9	270.6	218.8	298.1	159.3	241.2	241.2	258.9	214.1	284.9	154.8
	85	271.9	271.9	281.4	270.2	309.3	211.7	263.1	263.1	270.5	265.8	296.7	207.1	253.8	253.8	259.2	259.2	283.6	202.4
	90	285.4	285.4	286.0	286.0	308.7	258.6	276.0	276.0	276.3	276.3	296.1	254.1	266.5	266.5	266.8	266.8	282.9	249.4
9600	75	259.0	246.5	286.3	183.6	315.4	117.2	248.9	242.0	274.4	179.1	302.4	112.8	238.5	237.3	262.3	174.5	288.4	108.2
	80	264.5	264.5	285.3	234.8	314.2	170.1	255.8	255.8	273.8	230.2	301.2	165.7	246.6	246.6	261.7	225.3	287.2	161.0
	85	278.4	278.4	285.3	285.3	312.9	222.2	269.2	269.2	274.2	274.2	299.9	217.5	259.4	259.4	262.8	262.8	286.5	212.8
	90	292.1	292.1	292.4	292.4	312.2	273.4	282.4	282.4	282.7	282.7	299.2	268.8	272.5	272.5	272.8	272.8	285.4	263.9

CFM	Ent DB (°F)	Ambient Temperature (°F) 115 Entering Wet Bulb (°F) 61 MBH	61 SHC	67 MBH	67 SHC	73 MBH	73 SHC	Ambient Temperature (°F) 120 Entering Wet Bulb (°F) 61 MBH	61 SHC	67 MBH	67 SHC	73 MBH	73 SHC
7200	75	218.0	195.5	241.1	148.0	265.8	97.9	213.0	193.2	235.1	145.6	259.1	95.6
	80	220.2	220.2	240.1	186.5	264.6	137.5	215.7	215.7	234.2	184.1	257.9	135.2
	85	231.1	231.1	239.8	224.8	263.3	176.8	226.2	226.2	234.1	222.4	256.5	174.4
	90	242.6	242.6	242.9	242.9	262.6	215.0	237.7	237.7	238.0	238.0	256.0	212.6
8000	75	221.6	207.8	244.6	155.4	269.3	99.9	216.3	205.4	238.5	153.0	262.4	97.5
	80	226.1	226.1	243.8	197.9	268.2	143.9	221.6	221.6	237.7	195.4	261.2	141.5
	85	238.1	238.1	243.9	240.6	266.9	187.2	233.2	233.2	238.0	238.0	260.0	184.7
	90	249.7	249.7	250.1	250.1	266.2	229.8	244.7	244.7	244.8	244.8	259.4	227.3
8800	75	224.9	220.2	247.4	162.6	271.9	101.7	219.5	217.8	241.0	160.2	264.8	99.3
	80	231.8	231.8	246.8	209.2	270.7	150.1	226.8	226.8	240.6	206.7	263.6	147.7
	85	244.1	244.1	247.5	247.5	269.9	197.6	239.0	239.0	241.4	241.4	262.9	195.1
	90	256.2	256.2	256.2	256.2	268.9	244.3	250.5	250.5	250.8	250.8	261.8	241.8
9600	75	227.8	227.8	249.8	169.5	274.4	103.5	222.3	222.3	243.5	167.1	267.1	101.1
	80	236.9	236.9	249.2	220.4	273.2	156.4	231.9	231.9	243.1	217.9	265.9	154.0
	85	249.3	249.3	251.0	251.0	272.1	207.7	244.0	244.0	245.0	245.0	264.9	205.2
	90	261.7	261.7	262.0	262.0	271.6	259.0	256.1	256.1	256.3	256.3	264.5	256.5

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. MBh = Total Gross Capacity, SHC = Sensible Heat Capacity

Table 20. Gross cooling capacities (MBH) 6 tons TWA072K*A condensing unit only (IP)

Outdoor Temp (°F)		Saturation Suction Temperature (°F)					
		30	35	40	45	50	55
65	Head Press (psig)	237.2	243.4	249.9	256.8	264.1	271.8
	Capacity (Btuh/1000)	65.5	71.9	78.8	86.1	94.0	102.3
	Unit Power (kW)	4.0	4.0	4.0	4.1	4.1	4.1
75	Head Press (psig)	272.8	279.4	286.4	293.8	301.5	309.5
	Capacity (Btuh/1000)	62.5	68.6	75.1	82.1	89.5	97.5
	Unit Power (kW)	4.4	4.5	4.6	4.6	4.7	4.7
85	Head Press (psig)	312.0	319.0	326.4	334.1	342.2	350.6
	Capacity (Btuh/1000)	59.3	65.2	71.4	78.0	85.0	92.6
	Unit Power (kW)	4.9	5.0	5.1	5.2	5.2	5.3
95	Head Press (psig)	354.8	362.2	369.9	378.0	386.4	395.1
	Capacity (Btuh/1000)	56.1	61.6	67.5	73.8	80.5	87.6
	Unit Power (kW)	5.5	5.6	5.7	5.8	5.9	5.9
105	Head Press (psig)	401.3	409.0	417.0	425.4	434.0	443.0
	Capacity (Btuh/1000)	52.8	58.0	63.6	69.5	75.8	82.6
	Unit Power (kW)	6.1	6.2	6.3	6.4	6.5	6.6
115	Head Press (psig)	451.5	459.5	467.8	476.4	485.3	494.4
	Capacity (Btuh/1000)	49.2	54.2	59.5	65.1	71.0	77.4
	Unit Power (kW)	6.8	6.9	7.0	7.1	7.3	7.4
125	Head Press (psig)	505.6	513.9	522.4	531.1	540.0	549.2
	Capacity (Btuh/1000)	45.6	50.2	55.2	60.5	66.1	72.1
	Unit Power (kW)	7.6	7.7	7.8	7.9	8.0	8.2

Note: Performance data calculated at 15°F subcooling and 15°F superheat and does not include capacity loss due to refrigerant lines.

Figure 9. TWA072K*A capacity curves

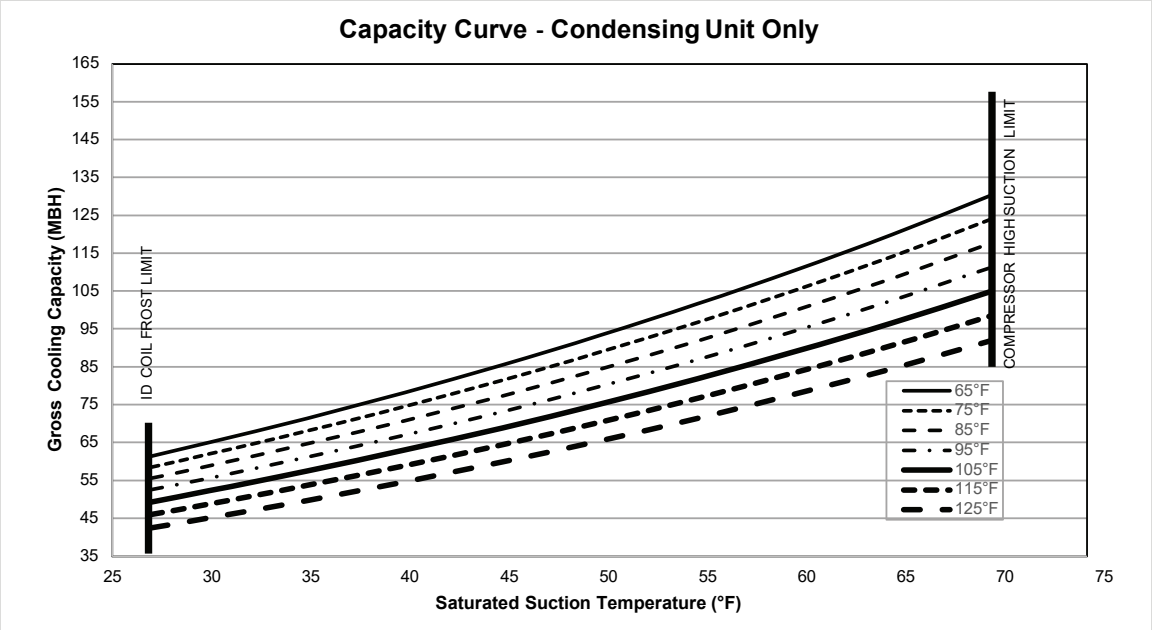


Table 21. Gross cooling capacities (MBH) 6 tons TWA072K*D condensing unit only (IP)

Outdoor Temp (°F)		Saturation Suction Temperature (°F)					
		30	35	40	45	50	55
65	Head Press (psig)	224.5	229.9	235.7	241.9	248.0	255.0
	Capacity (Btuh/1000)	64.2	70.5	77.2	84.4	92.2	100.4
	Unit Power (kW)	3.7	3.8	3.8	3.8	3.8	3.9
75	Head Press (psig)	259.1	264.9	271.0	277.1	284.0	292.2
	Capacity (Btuh/1000)	61.3	67.3	73.8	80.7	88.0	95.7
	Unit Power (kW)	4.2	4.2	4.2	4.3	4.3	4.4
85	Head Press (psig)	297.3	303.4	309.5	316.3	324.3	332.2
	Capacity (Btuh/1000)	58.3	64.0	70.2	76.7	83.6	91.0
	Unit Power (kW)	4.7	4.7	4.7	4.8	4.8	4.9
95	Head Press (psig)	339.1	345.5	352.0	359.7	367.5	375.7
	Capacity (Btuh/1000)	55.0	60.4	66.3	72.5	79.1	86.2
	Unit Power (kW)	5.2	5.3	5.3	5.4	5.4	5.5
105	Head Press (psig)	384.5	391.0	398.1	406.2	414.3	422.8
	Capacity (Btuh/1000)	51.4	56.7	62.3	68.2	74.5	81.2
	Unit Power (kW)	5.9	5.9	6.0	6.1	6.1	6.2
115	Head Press (psig)	433.6	440.5	448.4	456.3	464.7	473.5
	Capacity (Btuh/1000)	47.7	52.8	58.1	63.8	69.8	76.1
	Unit Power (kW)	6.7	6.7	6.8	6.8	6.9	6.9
125	Head Press (psig)	486.4	494.1	502.0	510.2	518.8	527.8
	Capacity (Btuh/1000)	43.8	48.6	53.7	59.1	64.8	70.8
	Unit Power (kW)	7.5	7.6	7.6	7.7	7.7	7.8

Note: Performance data calculated at 15°F subcooling and 15°F superheat and does not include capacity loss due to refrigerant lines.

Figure 10. TWA072K*D capacity curves

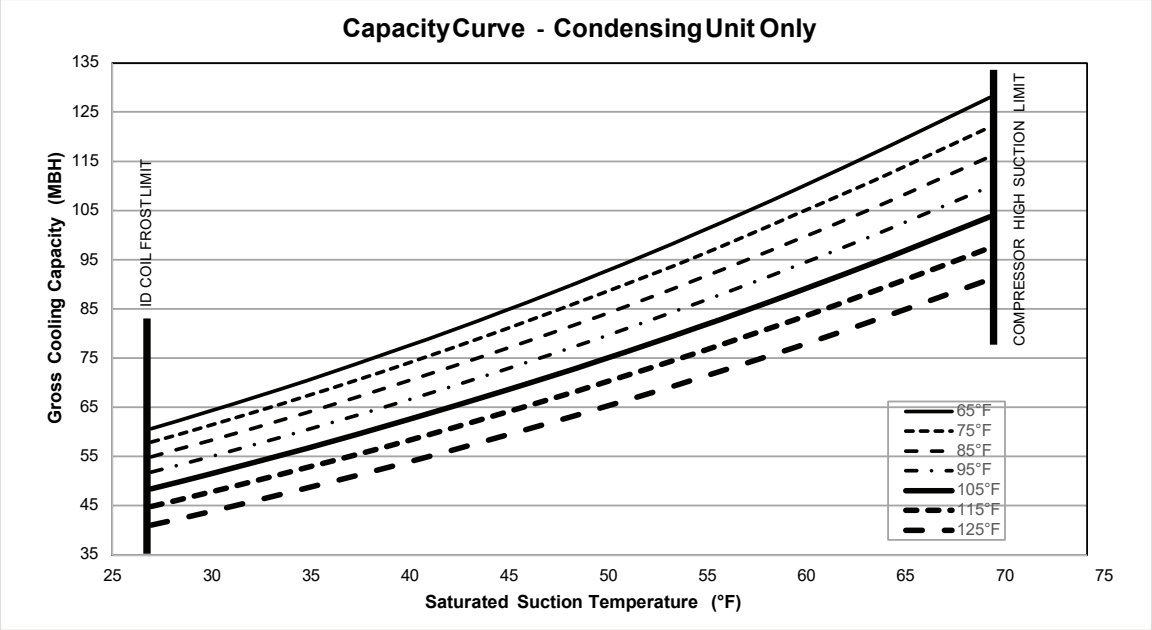


Table 22. Gross cooling capacities (MBH) 7.5 tons TWA090K*A condensing unit only (IP)

Outdoor Temp (°F)		Saturation Suction Temperature (°F)					
		30	35	40	45	50	55
65	Head Press (psig)	245.6	252.7	260.3	268.4	276.9	286.0
	Capacity (Btuh/1000)	79.9	87.7	95.9	104.5	113.8	123.6
	Unit Power (kW)	5.0	5.1	5.2	5.4	5.5	5.7
75	Head Press (psig)	281.3	288.8	296.8	305.3	314.2	323.7
	Capacity (Btuh/1000)	76.2	83.5	91.3	99.6	108.5	117.9
	Unit Power (kW)	5.5	5.6	5.7	5.9	6.1	6.2
85	Head Press (psig)	320.3	328.2	336.6	345.4	354.8	364.7
	Capacity (Btuh/1000)	72.2	79.2	86.7	94.6	103.1	112.2
	Unit Power (kW)	6.1	6.2	6.3	6.5	6.6	6.8
95	Head Press (psig)	362.7	371.0	379.7	389.0	398.8	409.1
	Capacity (Btuh/1000)	68.1	74.8	81.9	89.6	97.7	106.4
	Unit Power (kW)	6.7	6.8	7.0	7.1	7.3	7.5
105	Head Press (psig)	408.3	417.0	426.2	435.9	446.0	456.6
	Capacity (Btuh/1000)	63.7	70.2	77.0	84.3	92.2	100.6
	Unit Power (kW)	7.4	7.5	7.7	7.9	8.0	8.2
115	Head Press (psig)	457.3	466.5	476.0	486.1	496.6	507.6
	Capacity (Btuh/1000)	59.2	65.3	71.9	78.9	86.5	94.6
	Unit Power (kW)	8.2	8.3	8.5	8.7	8.8	9.0
120	Head Press (psig)	483.1	492.5	502.2	512.4	523.1	534.2
	Capacity (Btuh/1000)	56.8	62.8	69.3	76.2	83.6	91.5
	Unit Power (kW)	8.6	8.8	8.9	9.1	9.3	9.5

Note: Performance data calculated at 15°F subcooling and 15°F superheat and does not include capacity loss due to refrigerant lines.

Figure 11. TWA090K*A capacity curves

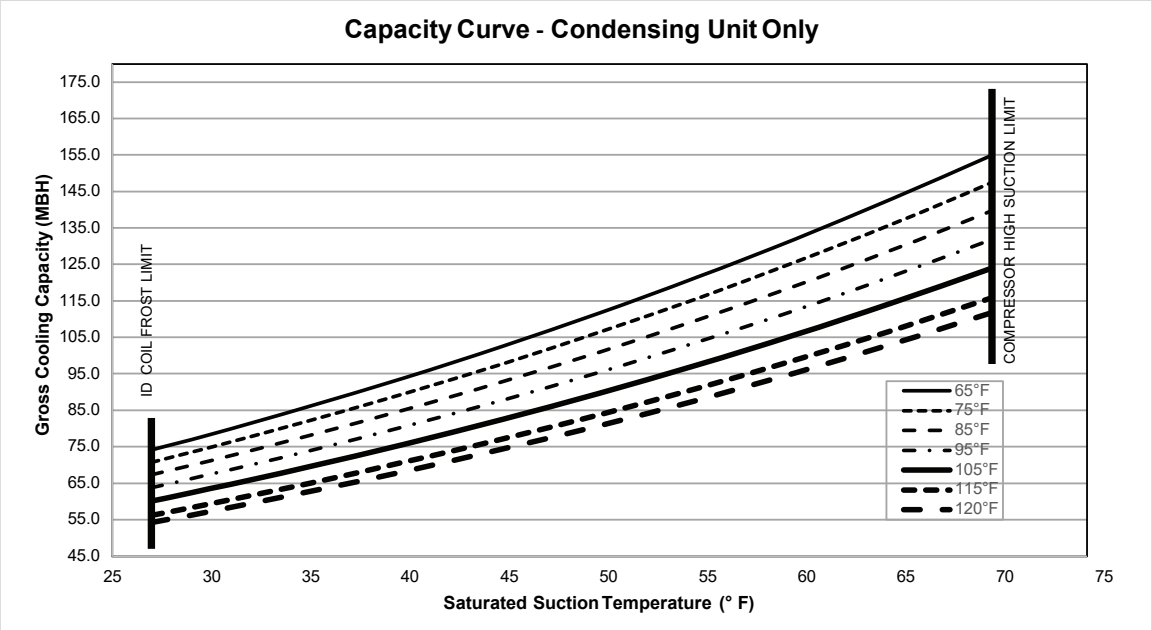


Table 23. Gross cooling capacities (MBH) 7.5 tons TWA090K*D condensing unit only (IP)

Outdoor Temp (°F)		Saturation Suction Temperature (°F)					
		30	35	40	45	50	55
65	Head Press (psig)	233.2	239.1	246.3	252.9	260.2	268.3
	Capacity (Btuh/1000)	83.4	91.5	100.0	109.2	119.0	129.4
	Unit Power (kW)	4.8	4.8	4.9	4.9	5.0	5.0
75	Head Press (psig)	267.7	274.9	282.2	288.6	296.9	305.3
	Capacity (Btuh/1000)	79.5	87.2	95.4	104.4	113.6	123.5
	Unit Power (kW)	5.3	5.4	5.5	5.5	5.6	5.6
85	Head Press (psig)	306.0	313.7	321.4	328.4	336.7	347.3
	Capacity (Btuh/1000)	75.4	82.8	90.6	99.1	108.0	117.0
	Unit Power (kW)	6.0	6.1	6.1	6.2	6.3	6.4
95	Head Press (psig)	348.3	355.8	362.6	372.4	381.3	390.6
	Capacity (Btuh/1000)	71.0	78.0	85.7	93.4	101.7	110.5
	Unit Power (kW)	6.7	6.8	6.9	7.0	7.1	7.2
105	Head Press (psig)	393.2	401.1	409.5	416.8	427.3	436.8
	Capacity (Btuh/1000)	66.2	72.9	79.9	87.6	95.2	103.5
	Unit Power (kW)	7.6	7.7	7.8	7.8	8.0	8.1
115	Head Press (psig)	441.3	448.3	458.1	466.9	474.4	485.7
	Capacity (Btuh/1000)	61.0	67.5	74.0	81.0	88.6	96.2
	Unit Power (kW)	8.6	8.7	8.8	8.9	8.9	9.1
125	Head Press (psig)	492.3	499.6	507.9	518.3	525.9	536.9
	Capacity (Btuh/1000)	55.4	61.5	67.8	74.3	81.4	88.5
	Unit Power (kW)	9.8	9.8	9.8	10.0	10.0	10.2

Note: Performance data calculated at 15°F subcooling and 15°F superheat and does not include capacity loss due to refrigerant lines.

Figure 12. TWA090K*D capacity curves

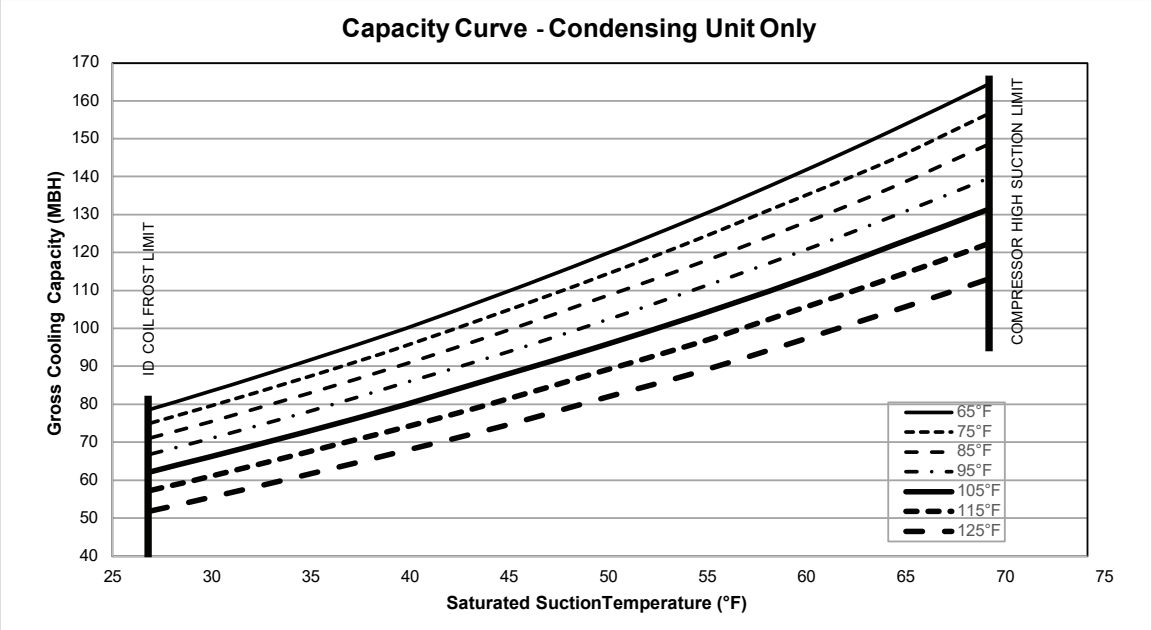


Table 24. Gross cooling capacities (MBH) 10 tons TWA120K*A condensing unit only (IP)

Outdoor Temp (°F)		Saturation Suction Temperature (°F)					
		30	35	40	45	50	55
65	Head Press (psig)	241.8	248.4	255.5	263.2	271.4	280.2
	Capacity (Btuh/1000)	100.1	109.5	119.7	130.5	142.1	154.6
	Unit Power (kW)	6.5	6.7	6.9	7.1	7.3	7.5
75	Head Press (psig)	277.1	284.2	291.8	299.8	308.4	317.6
	Capacity (Btuh/1000)	95.7	104.8	114.5	124.9	136.1	148.1
	Unit Power (kW)	7.1	7.3	7.5	7.7	7.8	8.1
85	Head Press (psig)	316	323.5	331.4	339.8	348.8	358.2
	Capacity (Btuh/1000)	91.1	99.8	109.1	119.1	129.9	141.4
	Unit Power (kW)	7.8	8	8.1	8.3	8.5	8.7
95	Head Press (psig)	358.6	366.4	374.6	383.3	392.5	402.3
	Capacity (Btuh/1000)	86.4	94.7	103.6	113.1	123.3	134.3
	Unit Power (kW)	8.5	8.7	8.9	9.1	9.3	9.5
105	Head Press (psig)	404.9	412.9	421.3	430.3	439.7	449.6
	Capacity (Btuh/1000)	81.6	89.4	97.8	106.8	116.5	126.9
	Unit Power (kW)	9.4	9.6	9.8	10	10.1	10.3
115	Head Press (psig)	454.8	463	471.6	480.8	490.3	500.4
	Capacity (Btuh/1000)	76.5	83.9	91.8	100.3	109.4	119.3
	Unit Power (kW)	10.3	10.5	10.7	10.9	11.1	11.3
125	Head Press (psig)	508.7	517	525.7	534.8	544.4	554.4
	Capacity (Btuh/1000)	71.2	78.1	85.5	93.5	102.1	111.3
	Unit Power (kW)	11.4	11.6	11.8	12	12.2	12.4

Note: Performance data calculated at 15°F subcooling and 15°F superheat and does not include capacity loss due to refrigerant lines.

Figure 13. TWA120K*A capacity curves

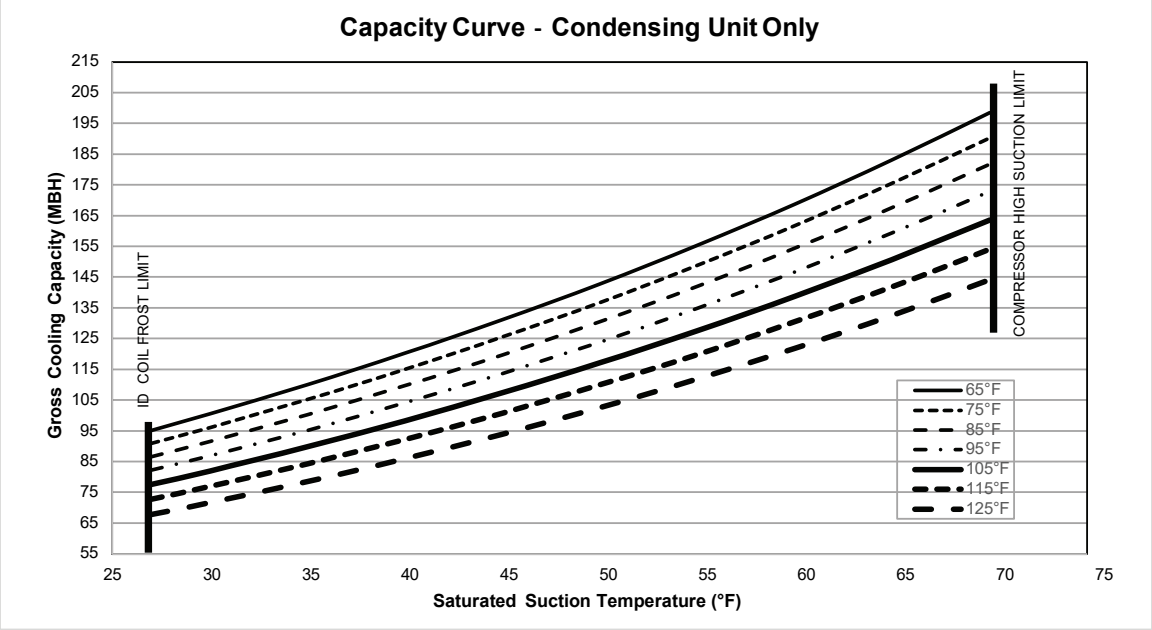


Table 25. Gross cooling capacities (MBH) 10 tons TWA120K*D condensing unit only (IP)

Outdoor Temp (°F)		Saturation Suction Temperature (°F)					
		30	35	40	45	50	55
65	Head Press (psig)	232.1	238.1	244.5	251.4	258.8	266.9
	Capacity (Btuh/1000)	101.4	111.4	122.3	134.0	146.5	160.0
	Unit Power (kW)	8.5	8.6	8.8	8.9	9.1	9.3
75	Head Press (psig)	267.3	273.5	280.2	287.5	295.2	303.5
	Capacity (Btuh/1000)	97.4	106.8	117.0	128.1	139.9	152.7
	Unit Power (kW)	9.3	9.5	9.6	9.8	10.0	10.2
85	Head Press (psig)	305.8	312.3	319.3	326.9	334.9	343.4
	Capacity (Btuh/1000)	92.6	101.6	111.3	121.7	132.9	145.0
	Unit Power (kW)	10.3	10.4	10.6	10.7	10.9	11.2
95	Head Press (psig)	347.8	354.6	362.0	369.8	378.1	386.9
	Capacity (Btuh/1000)	87.4	96.0	105.2	115.1	125.7	137.2
	Unit Power (kW)	11.4	11.5	11.7	11.8	12.1	12.3
105	Head Press (psig)	393.5	400.7	408.3	416.4	424.9	434.0
	Capacity (Btuh/1000)	82.0	90.2	98.9	108.4	118.5	129.3
	Unit Power (kW)	12.6	12.8	12.9	13.1	13.3	13.5
115	Head Press (psig)	443.1	450.7	458.6	467.0	475.8	485.1
	Capacity (Btuh/1000)	76.5	84.3	92.6	101.6	111.2	121.5
	Unit Power (kW)	14.1	14.2	14.4	14.6	14.8	15.0
125	Head Press (psig)	497.2	505.1	513.3	521.9	531.0	540.4
	Capacity (Btuh/1000)	70.9	78.4	86.4	94.9	104.0	113.8
	Unit Power (kW)	15.7	15.9	16.1	16.2	16.4	16.6

Note: Performance data calculated at 15°F subcooling and 15°F superheat and does not include capacity loss due to refrigerant lines.

Figure 14. TWA120K*D capacity curves

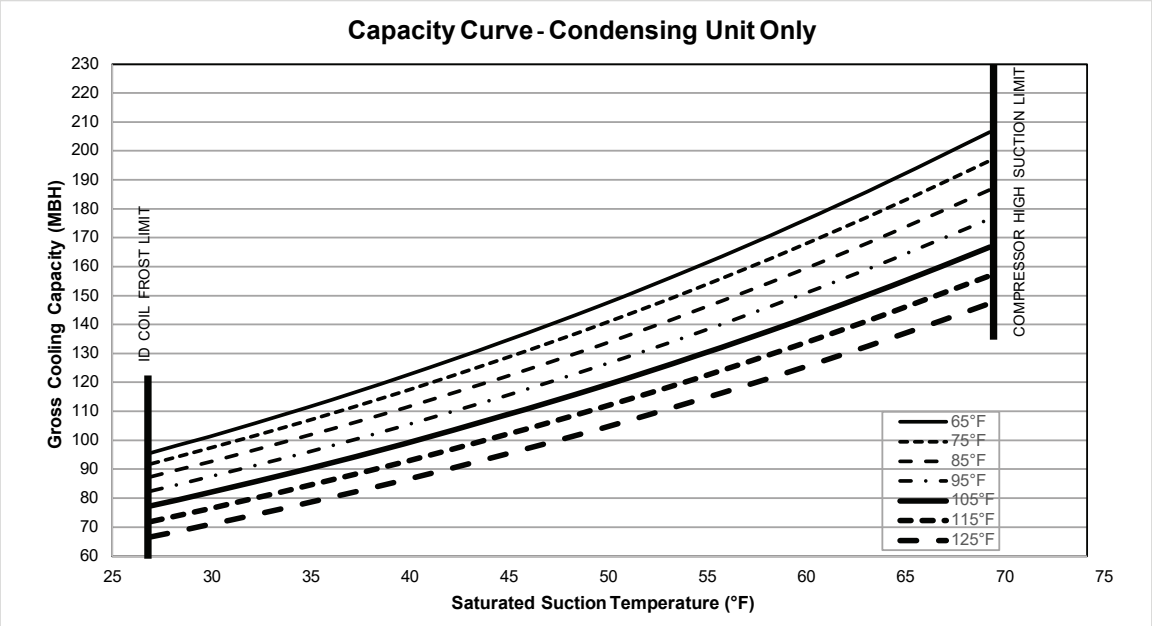


Table 26. Gross cooling capacities (MBH) 15 tons TWA180K*D condensing unit only (IP)

Outdoor Temp (°F)		Saturation Suction Temperature (°F)					
		30	35	40	45	50	55
65	Head Press (psig)	224.7	229.7	235.0	240.7	246.6	252.7
	Capacity (Btuh/1000)	164.4	180.6	197.9	216.4	236.1	257.2
	Unit Power (kW)	10.4	10.4	10.5	10.6	10.6	10.6
75	Head Press (psig)	258.8	264.2	269.9	275.9	282.1	288.7
	Capacity (Btuh/1000)	156.8	172.2	188.8	206.5	225.4	245.5
	Unit Power (kW)	11.4	11.5	11.6	11.7	11.8	11.9
85	Head Press (psig)	296.6	302.4	308.3	314.6	321.2	328.0
	Capacity (Btuh/1000)	148.9	163.7	179.5	196.4	214.4	233.6
	Unit Power (kW)	12.6	12.7	12.9	13.0	13.1	13.2
95	Head Press (psig)	338.1	344.1	350.4	357.0	363.8	370.9
	Capacity (Btuh/1000)	140.7	154.9	169.9	186.1	203.2	221.5
	Unit Power (kW)	13.9	14.0	14.2	14.4	14.5	14.7
105	Head Press (psig)	383.4	389.6	396.2	403.0	410.1	417.4
	Capacity (Btuh/1000)	132.3	145.7	160.1	175.5	191.8	209.2
	Unit Power (kW)	15.3	15.5	15.7	15.9	16.0	16.2
115	Head Press (psig)	432.5	439.0	445.8	452.8	460.1	467.6
	Capacity (Btuh/1000)	123.5	136.3	150.0	164.6	180.1	196.7
	Unit Power (kW)	16.9	17.1	17.3	17.5	17.7	17.9
125	Head Press (psig)	485.7	492.5	499.4	506.6	514.0	521.6
	Capacity (Btuh/1000)	114.4	126.5	139.5	153.3	168.1	183.8
	Unit Power (kW)	18.7	18.9	19.1	19.3	19.5	19.7

Note: Performance data calculated at 15°F subcooling and 15°F superheat and does not include capacity loss due to refrigerant lines.

Figure 15. TWA180K*D capacity curves

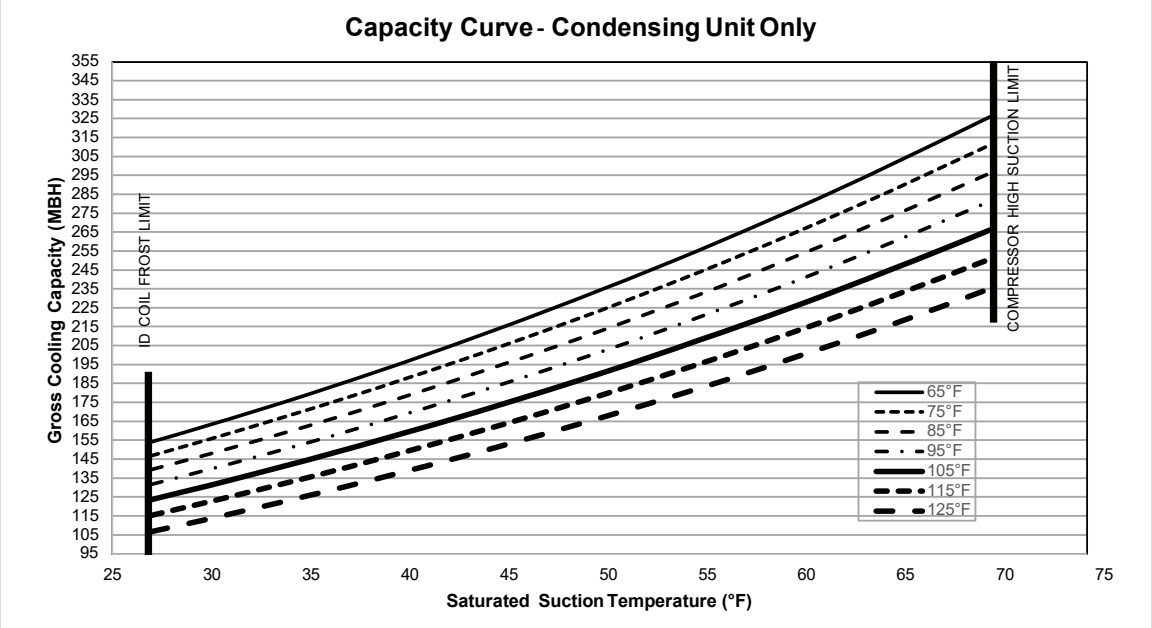
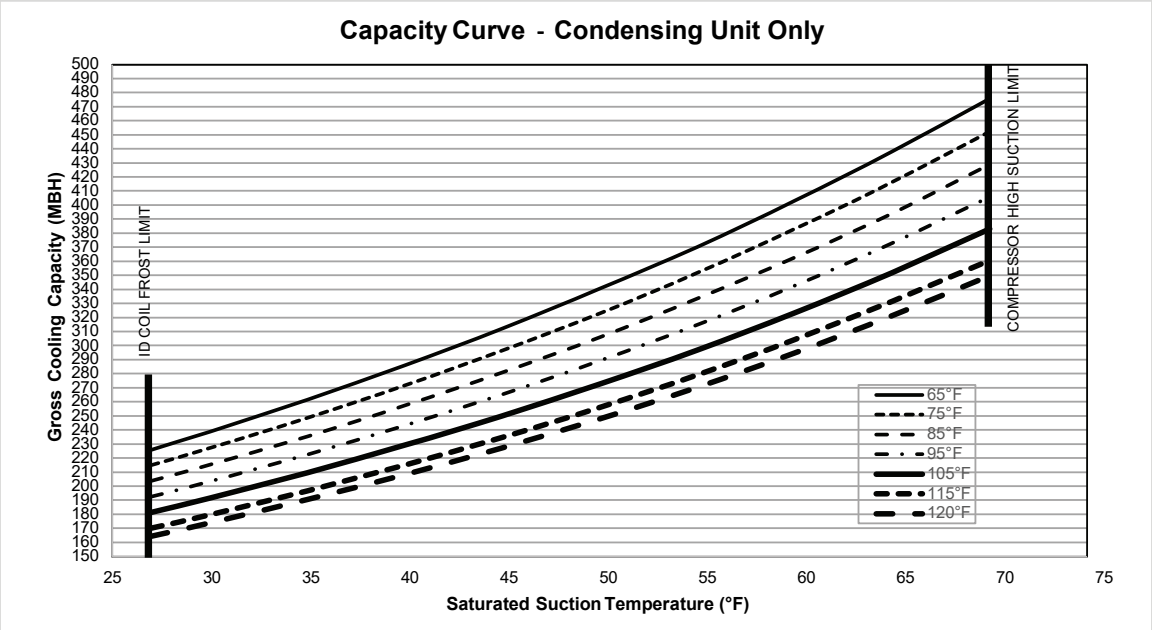


Table 27. Gross cooling capacities (MBH) 20 tons TWA240K*D condensing unit only (IP)

Outdoor Temp (°F)		Saturation Suction Temperature (°F)					
		30	35	40	45	50	55
65	Head Press (psig)	243.7	250.3	257.6	265.4	272.8	282.7
	Capacity (Btuh/1000)	239.0	261.7	286.1	312.2	340.6	370.4
	Unit Power (kW)	19.9	20.2	20.4	20.7	20.9	21.2
75	Head Press (psig)	278.9	285.9	293.6	301.8	310.5	319.7
	Capacity (Btuh/1000)	227.2	248.7	271.7	296.5	323.1	351.9
	Unit Power (kW)	22.1	22.4	22.8	23.1	23.5	23.8
85	Head Press (psig)	317.5	325.0	333.0	341.5	350.6	360.1
	Capacity (Btuh/1000)	215.3	235.6	257.4	280.9	306.2	333.5
	Unit Power (kW)	24.4	24.9	25.3	25.7	26.2	26.6
95	Head Press (psig)	359.7	367.6	375.9	384.7	393.5	404.1
	Capacity (Btuh/1000)	203.4	222.6	243.2	265.4	289.4	315.0
	Unit Power (kW)	27.0	27.5	28.0	28.5	29.0	29.5
105	Head Press (psig)	405.8	413.8	422.4	431.4	441.2	451.6
	Capacity (Btuh/1000)	191.6	209.7	229.2	250.2	272.7	296.9
	Unit Power (kW)	29.8	30.4	30.9	31.5	32.1	32.7
115	Head Press (psig)	455.6	463.8	472.8	482.3	492.0	502.0
	Capacity (Btuh/1000)	179.8	196.9	215.2	234.8	256.2	279.3
	Unit Power (kW)	32.8	33.5	34.1	34.8	35.4	36.0
120	Head Press (psig)	481.9	490.2	499.2	508.7	518.4	528.4
	Capacity (Btuh/1000)	174.0	190.6	208.3	227.4	248.1	270.6
	Unit Power (kW)	34.5	35.1	35.8	36.4	37.1	37.7

Note: Performance data calculated at 15°F subcooling and 15°F superheat and does not include capacity loss due to refrigerant lines.

Figure 16. TWA240K*D capacity curves



Gross Heating Capacities

Table 28. Gross heating capacities (MBH) 6 tons TWA072K*A heat pump with 7.5 tons TWE090K*A air handler at 2100 CFM (IP)

Outdoor Temp (°F)	Integrated Heating Capacity (MBH) at Indicated Indoor Dry Bulb Temp (°F)				Total Power (kW) at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	23.9	23.8	24.0	23.7	4.2	4.7	4.9	5.2
-3	27.4	27.1	27.0	27.0	4.3	4.7	5.0	5.3
2	31.2	30.9	30.7	30.7	4.4	4.8	5.1	5.3
7	34.5	34.3	34.3	34.2	4.5	4.9	5.1	5.4
12	38.2	37.7	37.5	37.4	4.5	5.0	5.3	5.5
17	41.9	41.3	41.1	40.9	4.6	5.1	5.4	5.6
22	45.8	45.1	44.8	44.6	4.7	5.2	5.5	5.7
27	49.9	49.0	48.6	48.2	4.8	5.3	5.6	5.9
32	54.2	53.0	52.5	52.1	4.9	5.4	5.7	6.0
37	58.1	57.0	56.5	55.9	5.0	5.5	5.8	6.1
42	62.4	61.1	60.4	59.8	5.1	5.6	5.9	6.2
47	66.8	65.3	64.5	63.8	5.2	5.8	6.1	6.4
52	71.4	69.7	68.8	67.9	5.3	5.9	6.2	6.5
57	76.2	74.2	73.3	72.3	5.4	6.0	6.3	6.6
62	81.3	79.0	77.8	76.7	5.6	6.1	6.5	6.8
67	86.8	83.9	82.6	81.2	5.7	6.3	6.6	6.9
72	92.1	89.1	87.6	86.0	5.8	6.4	6.7	7.1

Notes:

1. Net heating capacity and power include indoor fan heat at AHRI ESP. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.
2. Integrated heating capacities and power include the effects of defrost in the frost region. All heating capacities and power are at 70% outdoor relative humidity and demand defrost cycle.

Table 29. Gross heating capacities (MBH) 6 tons TWA072K*D heat pump with 6 tons TWE072K*B air handler at 2400 CFM (IP)

Outdoor Temp (°F)	Integrated Heating Capacity (MBH) at Indicated Indoor Dry Bulb Temp (°F)				Total Power (kW) at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	22.0	20.9	20.6	19.8	4.5	5.0	5.2	5.5
-3	25.4	24.5	24.0	23.4	4.5	5.0	5.3	5.6
2	28.8	27.9	27.4	26.9	4.6	5.1	5.3	5.6
7	32.3	31.5	31.0	30.4	4.6	5.1	5.4	5.7
12	36.1	35.1	34.6	34.1	4.7	5.2	5.5	5.8
17	39.9	38.9	38.4	37.8	4.7	5.3	5.5	5.8
22	44.0	42.9	42.3	41.7	4.8	5.3	5.6	5.9
27	48.2	47.0	46.4	45.8	4.9	5.4	5.7	6.0
32	52.7	51.3	50.7	50.0	5.0	5.5	5.8	6.1
37	57.2	55.8	55.1	54.2	5.0	5.6	0.0	6.2
42	61.8	60.2	59.4	58.7	5.1	5.7	6.0	6.3
47	66.8	65.0	64.2	63.3	5.2	5.8	6.1	6.4
52	72.3	70.1	69.2	68.2	5.3	5.9	6.2	6.5
57	77.9	75.8	74.7	73.4	5.4	6.0	6.3	6.6
62	83.7	81.4	79.9	78.8	5.5	6.1	6.4	6.8
67	90.4	87.3	85.6	84.4	5.7	6.3	6.6	6.9
72	96.1	92.9	91.5	90.2	5.8	6.4	6.7	7.1

Notes:

1. Net heating capacity and power include indoor fan heat at AHRI ESP. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.
2. Integrated heating capacities and power include the effects of defrost in the frost region. All heating capacities and power are at 70% outdoor relative humidity and demand defrost cycle.

Table 30. Gross heating capacities (MBH) 7.5 tons TWA090K*A heat pump with 7.5 tons TWE090K*A air handler at 2625 CFM (IP)

Outdoor Temp (°F)	Integrated Heating Capacity (MBH) at Indicated Indoor Dry Bulb Temp (°F)				Total Power (kW) at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	24.7	26.4	27.1	27.7	6.0	6.4	6.7	6.9
-3	29.3	30.6	31.3	31.7	5.9	6.4	6.6	6.9
2	33.8	35.1	35.4	35.5	5.9	6.4	6.6	6.9
7	38.6	39.4	39.6	39.5	5.8	6.4	6.6	6.9
12	43.0	43.5	43.6	43.7	5.9	6.4	6.7	7.0
17	47.9	48.0	48.1	48.1	5.9	6.4	6.7	7.0
22	52.9	52.8	52.7	52.6	5.9	6.5	6.8	7.1
27	58.0	57.7	57.6	57.3	6.0	6.5	6.8	7.2
32	63.4	62.9	62.6	62.3	6.0	6.6	6.9	7.3
37	68.7	68.0	67.6	67.2	6.1	6.7	7.0	7.4
42	74.2	73.2	72.7	72.2	6.2	6.8	7.2	7.5
47	79.8	78.6	78.0	77.4	6.4	7.0	7.3	7.7
52	85.7	84.3	83.6	82.9	6.5	7.1	7.5	7.8
57	92.2	90.5	89.7	88.9	6.7	7.3	7.7	8.0
62	99.0	97.0	96.1	95.2	6.9	7.5	7.9	8.3
67	106.1	103.9	102.8	101.8	7.1	7.8	8.1	8.5
72	113.4	110.9	109.7	108.5	7.4	8.0	8.4	8.8

Notes:

1. Net heating capacity and power include indoor fan heat at AHRI ESP. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.
2. Integrated heating capacities and power include the effects of defrost in the frost region. All heating capacities and power are at 70% outdoor relative humidity and demand defrost cycle.

Table 31. Gross heating capacities (MBH) 7.5 tons TWA090K*D heat pump with 7.5 tons TWE090K*B air handler at 3000 CFM (IP)

Outdoor Temp (°F)	Integrated Heating Capacity (MBH) at Indicated Indoor Dry Bulb Temp (°F)				Total Power (kW) at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	30.5	28.6	27.8	27.0	5.6	6.2	6.6	7.1
-3	34.9	33.2	32.5	31.9	5.7	6.4	6.7	7.2
2	39.3	37.8	37.2	36.6	5.8	6.5	6.9	7.3
7	43.8	42.3	41.8	41.3	5.9	6.6	7.0	7.4
12	48.4	46.9	46.4	45.9	6.0	6.7	7.1	7.5
17	53.1	51.7	51.1	50.6	6.1	6.8	7.2	7.6
22	58.1	56.6	56.0	55.5	6.2	6.9	7.3	7.7
27	63.3	61.7	61.1	60.5	6.3	7.0	7.4	7.8
32	68.7	67.1	66.4	65.7	6.4	7.1	7.5	7.9
37	74.1	72.5	71.8	71.0	6.4	7.2	7.6	8.1
42	80.0	78.2	77.4	76.5	6.6	7.4	7.8	8.2
47	86.0	84.1	83.1	82.2	6.8	7.5	7.9	8.3
52	92.5	90.3	89.2	88.2	6.9	7.6	8.0	8.5
57	99.2	96.8	95.6	94.4	7.0	7.8	8.2	8.7
62	106.2	103.6	102.3	100.8	7.2	8.0	8.4	8.9
67	113.5	110.6	109.1	107.7	7.3	8.2	8.6	9.1
72	121.2	117.9	116.3	114.3	7.5	8.4	8.8	9.3

Notes:

1. Net heating capacity and power include indoor fan heat at AHRI ESP. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.
2. Integrated heating capacities and power include the effects of defrost in the frost region. All heating capacities and power are at 70% outdoor relative humidity and demand defrost cycle.

Table 32. Gross heating capacities (MBH)10 tons TWA120K*A heat pump with 10 tons TWE120K*A air handler at 4000 CFM (IP)

Outdoor Temp (°F)	Integrated Heating Capacity (MBH) at Indicated Indoor Dry Bulb Temp (°F)				Total Power (kW) at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	32.9	32.9	33.1	33.3	6.9	7.5	7.8	8.0
-3	38.3	38.2	38.3	38.5	7.0	7.6	7.8	8.1
2	44.8	44.6	44.6	44.6	7.0	7.6	7.9	8.2
7	50.6	50.2	50.1	50.1	7.1	7.7	8.0	8.4
12	56.4	55.8	55.6	55.5	7.2	7.8	8.2	8.5
17	62.4	61.6	61.3	61.1	7.3	8.0	8.3	8.7
22	68.5	67.5	67.2	66.9	7.4	8.1	8.5	8.8
27	74.8	73.7	73.2	72.8	7.6	8.2	8.6	9.0
32	81.4	80.1	79.5	79.0	7.7	8.4	8.8	9.2
37	88.0	86.5	85.8	85.2	7.9	8.6	8.9	9.3
42	94.8	93.0	92.2	91.5	8.0	8.7	9.1	9.5
47	101.7	99.8	98.8	97.9	8.2	8.9	9.3	9.7
52	103.4	106.8	106.7	104.6	8.2	9.1	9.5	9.9
57	116.6	114.1	112.9	111.7	8.6	9.3	9.7	10.1
62	125.3	121.9	121.1	119.6	8.8	9.6	10.0	10.4
67	134.0	130.8	129.2	127.6	9.1	9.8	10.2	10.6
72	142.4	138.6	136.7	134.8	9.3	10.0	10.4	10.9

Notes:

1. Net heating capacity and power include indoor fan heat at AHRI ESP. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.
2. Integrated heating capacities and power include the effects of defrost in the frost region. All heating capacities and power are at 70% outdoor relative humidity and demand defrost cycle.

Table 33. Gross heating capacities (MBH)10 tons TWA120K*D heat pump with 10 tons TWE120K*B air handler at 4000 CFM (IP)

Outdoor Temp (°F)	Integrated Heating Capacity (MBH) at Indicated Indoor Dry Bulb Temp (°F)				Total Power (kW) at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	36.1	36.2	36.6	37.2	7.4	7.8	8.1	8.3
-3	41.2	41.5	41.6	41.9	7.5	8.0	8.2	8.5
2	46.7	46.6	46.7	46.7	7.6	8.1	8.4	8.7
7	52.3	52.0	51.9	51.9	7.6	8.2	8.5	8.9
12	57.8	57.2	57.0	56.9	7.7	8.4	8.7	9.0
17	63.8	63.0	62.6	62.4	7.8	8.5	8.8	9.2
22	70.2	69.1	68.6	68.2	7.9	8.6	9.0	9.4
27	76.9	75.5	74.9	74.4	8.0	8.7	9.1	9.5
32	84.0	82.3	81.6	80.9	8.1	8.9	9.3	9.7
37	91.0	89.1	88.2	87.4	8.2	9.0	9.4	9.8
42	98.2	96.0	95.0	94.1	8.3	9.1	9.6	10.0
47	105.6	103.3	102.1	101.0	8.5	9.3	9.7	10.2
52	113.7	111.1	109.8	108.5	8.6	9.5	9.9	10.4
57	122.2	119.2	117.7	116.5	8.8	9.7	10.1	10.6
62	131.2	127.6	125.9	124.3	9.0	9.9	10.3	10.8
67	140.1	136.4	134.5	132.7	9.2	10.1	10.5	11.0
72	149.5	145.4	143.4	141.3	9.5	10.3	10.8	11.3

Notes:

1. Net heating capacity and power include indoor fan heat at AHRI ESP. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.
2. Integrated heating capacities and power include the effects of defrost in the frost region. All heating capacities and power are at 70% outdoor relative humidity and demand defrost cycle.

Table 34. Gross heating capacities (MBH) 15 tons TWA180K*D heat pump with 15 tons TWE180K*B air handler at 6000 CFM (IP)

Outdoor Temp (°F)	Integrated Heating Capacity (MBH) at Indicated Indoor Dry Bulb Temp (°F)				Total Power (kW) at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	56.9	56.8	57.1	57.6	11.7	12.8	13.4	14.1
-3	66.0	66.4	66.4	65.6	11.9	13.0	13.6	14.3
2	76.0	75.6	75.4	75.4	12.1	13.3	13.9	14.6
7	85.7	84.9	84.7	84.5	12.4	13.5	14.1	14.8
12	95.2	94.2	93.8	93.5	12.6	13.8	14.4	15.1
17	105.3	104.0	103.5	103.1	12.9	14.0	14.6	15.3
22	115.8	114.2	113.5	113.0	13.1	14.3	14.9	15.6
27	126.8	125.0	124.1	123.4	13.3	14.5	15.1	15.8
32	138.1	135.8	134.8	133.9	13.6	14.8	15.5	16.2
37	149.3	146.8	145.5	144.4	13.8	15.1	15.7	16.5
42	160.7	157.6	156.2	155.3	14.0	15.3	16.0	16.7
47	172.8	169.4	167.9	166.4	14.3	15.6	16.3	17.0
52	185.0	181.4	179.6	177.9	14.6	15.9	16.6	17.4
57	198.2	193.9	191.9	189.9	14.9	16.2	16.9	17.7
62	212.9	208.0	205.7	203.2	15.2	16.6	17.3	18.1
67	227.9	222.4	219.7	217.0	15.6	17.0	17.7	18.5
72	243.4	237.4	234.3	231.4	16.0	17.4	18.2	19.0

Notes:

1. Net heating capacity and power include indoor fan heat at AHRI ESP. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.
2. Integrated heating capacities and power include the effects of defrost in the frost region. All heating capacities and power are at 70% outdoor relative humidity and demand defrost cycle.

Table 35. Gross heating capacities (MBH) 20 tons TWA240K*D heat pump with 20 tons TWE240K*B air handler at 8000 CFM (IP)

Outdoor Temp (°F)	Integrated Heating Capacity (MBH) at Indicated Indoor Dry Bulb Temp (°F)				Total Power (kW) at Indicated Indoor Dry Bulb Temp (°F)			
	60	70	75	80	60	70	75	80
-8	85.5	85.9	86.8	87.2	16.2	17.8	18.6	19.5
-3	97.8	98.3	98.6	99.1	16.6	18.1	19.0	19.9
2	110.2	110.2	110.3	110.5	16.9	18.5	19.3	20.2
7	121.5	121.0	120.9	120.9	17.2	18.8	19.7	20.6
12	135.6	133.5	133.1	132.9	17.6	19.2	20.1	21.0
17	147.9	146.3	145.8	145.3	17.9	19.6	20.5	21.4
22	161.7	159.6	158.8	158.1	18.3	20.0	20.9	21.9
27	176.0	173.4	172.4	171.4	18.7	20.4	21.4	22.3
32	191.0	188.0	186.7	185.4	19.1	20.9	21.8	22.8
37	206.5	202.9	201.4	199.9	19.5	21.3	22.3	23.3
42	222.3	218.2	216.2	214.5	19.9	21.8	22.8	23.9
47	238.7	234.0	231.8	229.7	20.4	22.3	23.3	24.4
52	256.0	250.6	248.1	245.7	20.9	22.8	23.9	25.0
57	273.9	267.8	265.7	262.9	21.3	23.4	24.5	25.6
62	293.4	286.6	283.3	280.2	21.9	24.0	25.1	26.2
67	313.2	305.5	301.9	298.3	22.5	24.6	25.7	26.9
72	333.9	325.3	321.2	315.1	23.1	25.3	26.4	27.5

Notes:

1. Net heating capacity and power include indoor fan heat at AHRI ESP. To obtain net heating at other conditions, subtract fan heat at this condition and add fan heat at new condition.
2. Integrated heating capacities and power include the effects of defrost in the frost region. All heating capacities and power are at 70% outdoor relative humidity and demand defrost cycle.

Fan Performance

Important: *Additional external static pressure from accessories must be added to the design static pressure from the accessory pressure tables.*

Table 36. Evaporator fan performance —TWE060 — constant volume air handler

External Static Pressure (Inches of Water Gauge)																						
	0.10"		0.20"		0.30"		0.40"		0.50"		0.60"		0.70"		0.80"		0.90"		1.00"		1.10"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
			3/4 HP Standard Motor																1.5 HP High Static Motor			
1600	—	—	738	0.33	790	0.38	840	0.44	888	0.50	936	0.56	980	0.62	1025	0.69	1070	0.76	1111	0.83	1152	0.91
1700	719	0.33	771	0.38	821	0.44	869	0.50	914	0.56	959	0.62	1003	0.68	1047	0.75	1089	0.82	1129	0.90	1170	0.98
1800	756	0.39	804	0.44	853	0.50	898	0.56	942	0.62	985	0.69	1028	0.75	1068	0.82	1109	0.89	1149	0.97	1187	1.05
1900	792	0.45	838	0.51	884	0.57	928	0.63	971	0.69	1012	0.76	1052	0.83	1092	0.90	1131	0.97	1170	1.05	1207	1.13
2000	829	0.52	873	0.58	917	0.64	959	0.71	1000	0.77	1040	0.84	1079	0.91	1117	0.98	1155	1.06	1192	1.14	1227	1.21
2100	866	0.60	908	0.66	950	0.72	991	0.79	1030	0.86	1069	0.93	1106	1.00	1144	1.08	1179	1.15	1215	1.23	1250	1.31
2200	903	0.68	944	0.74	983	0.81	1023	0.88	1061	0.95	1099	1.02	1134	1.10	1170	1.18	1206	1.26	1241	1.34	1274	1.42
2300	940	0.78	979	0.84	1017	0.90	1055	0.97	1093	1.05	1129	1.13	1164	1.21	1198	1.28	1232	1.37	1266	1.45	1299	1.53
2400	978	0.88	1015	0.94	1052	1.01	1089	1.08	1125	1.16	1160	1.24	1194	1.32	1227	1.40	1259	1.48	1292	1.57	—	—

External Static Pressure (Inches of Water Gauge)						
	1.20"		1.30"		1.40"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP
	1.5 HP High Static Motor					
1600	1191	0.99	1229	1.07	1264	1.14
1700	1208	1.06	1246	1.14	1281	1.22
1800	1226	1.13	1263	1.22	1300	1.30
1900	1245	1.21	1281	1.30	1317	1.39
2000	1265	1.30	1300	1.39	1335	1.48
2100	1285	1.39	1319	1.48	—	—
2200	1308	1.50	—	—	—	—
2300	—	—	—	—	—	—
2400	—	—	—	—	—	—

Notes:

1. Data includes pressure drop due to wet coil and 1" filter.
2. Fan motor heat (MBh) = 3.15 x BHP.
3. Check General Data for indoor fan motor HP availability.
4. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.
5. Field supplied high static motor.

Table 37. Evaporator fan performance - TWE072** - 2-speed VFD, SZVAV air handler

External Static Pressure (Inches of Water Gauge)

	0.10"			0.20"			0.30"			0.40"			0.50"			0.60"			0.70"			0.80"			0.90"			1.00"		
CFM	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP
	2 HP Standard Drive																													
1920	—	—	—	—	—	—	—	—	—	635	40	0.46	688	44	0.55	737	47	0.65	782	50	0.75	824	52	0.85	863	55	0.95	900	57	1.05
2040	—	—	—	—	—	—	592	38	0.41	648	41	0.50	700	44	0.60	748	47	0.70	793	50	0.80	835	53	0.91	874	56	1.02	911	58	1.12
2160	—	—	—	—	—	—	608	39	0.46	661	42	0.55	711	45	0.65	759	48	0.75	804	51	0.86	846	54	0.97	886	56	1.08	923	59	1.20
2280	—	—	—	—	—	—	625	40	0.51	675	43	0.60	724	46	0.70	771	49	0.81	815	52	0.92	857	54	1.03	896	57	1.15	934	59	1.27
2400	—	—	—	594	38	0.48	642	41	0.56	689	44	0.66	737	47	0.76	783	50	0.87	826	52	0.98	868	55	1.10	907	58	1.22	945	60	1.35
2520	—	—	—	614	39	0.54	661	42	0.63	705	45	0.72	751	48	0.82	795	51	0.94	838	53	1.05	879	56	1.18	918	58	1.30	955	42	1.43
2640	—	—	—	634	40	0.60	679	43	0.69	722	46	0.79	765	49	0.89	809	51	1.01	850	54	1.13	891	57	1.25	929	59	1.38	966	43	1.51
2760	597	38	0.55	651	41	0.66	698	44	0.76	740	47	0.86	780	50	0.96	822	52	1.08	863	55	1.21	903	57	1.33	941	60	1.46	978	43	1.60
2880	619	39	0.62	669	42	0.73	718	46	0.84	758	48	0.94	797	51	1.05	837	53	1.16	877	56	1.29	915	58	1.42	953	42	1.55	989	44	1.69

External Static Pressure (Inches of Water Gauge)

	1.10"			1.20"			1.30"			1.40"			1.50"			1.60"			1.70"			1.80"			1.90"			2.00"		
CFM	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP
	2 HP Standard Drive			3 HP High Static Drive																										
1920	934	59	1.15	967	43	1.25	998	44	1.36	1027	45	1.46	1056	47	1.56	1082	48	1.65	1108	49	1.75	1132	50	1.84	1156	51	1.94	1179	52	2.03
2040	946	60	1.23	979	43	1.34	1011	45	1.45	1041	46	1.55	1069	47	1.66	1097	49	1.77	1124	50	1.87	1148	51	1.98	1172	52	2.08	1195	53	2.18
2160	958	42	1.31	991	44	1.42	1023	45	1.54	1053	47	1.65	1082	48	1.77	1110	49	1.88	1137	50	1.99	1163	51	2.11	1188	53	2.22	1212	54	2.33
2280	969	43	1.39	1003	44	1.51	1035	46	1.63	1065	47	1.75	1095	48	1.87	1123	50	1.99	1150	51	2.11	1176	52	2.23	1202	53	2.35	1226	54	2.47
2400	980	43	1.47	1014	45	1.60	1046	46	1.72	1077	48	1.85	1107	49	1.98	1135	50	2.10	1163	51	2.23	1189	53	2.36	1215	54	2.48	1240	55	2.61
2520	991	44	1.56	1025	45	1.69	1057	47	1.82	1088	48	1.95	1118	49	2.08	1147	51	2.22	1175	52	2.35	1202	53	2.48	1227	54	2.61	1252	55	2.75
2640	1002	44	1.64	1036	46	1.78	1068	47	1.92	1099	49	2.05	1130	50	2.19	1158	51	2.33	1186	52	2.47	1213	54	2.61	1240	55	2.75	1265	56	2.89
2760	1013	45	1.74	1046	46	1.87	1079	48	2.02	1111	49	2.16	1140	50	2.30	1170	52	2.45	1198	53	2.59	1225	54	2.74	1251	55	2.89	1277	56	3.03
2880	1024	45	1.83	1057	47	1.97	1090	48	2.12	1121	50	2.27	1151	51	2.42	1181	52	2.57	1209	53	2.72	1236	55	2.87	1263	56	3.02	1288	57	3.17

External Static Pressure (Inches of Water Gauge)

	2.10"			2.20"			2.30"			2.40"		
CFM	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP
	3 HP High Static Drive											
1920	1202	53	2.13	1224	54	2.23	1246	55	2.33	1267	56	2.42
2040	1218	54	2.28	1240	55	2.38	1262	56	2.48	1283	57	2.59
2160	1234	55	2.43	1257	56	2.54	1278	57	2.65	1299	57	2.75
2280	1250	55	2.59	1273	56	2.71	1295	57	2.82	1316	58	2.93
2400	1264	56	2.74	1287	57	2.86	1310	58	2.99	1332	59	3.11
2520	1277	56	2.88	1300	58	3.01	1324	59	3.15	—	—	—
2640	1289	57	3.03	1313	58	3.17	—	—	—	—	—	—
2760	1302	58	3.18	—	—	—	—	—	—	—	—	—
2880	—	—	—	—	—	—	—	—	—	—	—	—

Notes:

1. 2-Speed VFD or SZVAV applications are capable of running below 320 cfm/ton during low speed airflow operation, but "full" airflow must be set to 320 cfm/ton or higher.
2. Check General Data for indoor fan motor HP availability.
3. Data includes pressure drop due to wet coil and 1-inch filter.

Table 38. Evaporator fan performance —TWE090K1B — constant volume air handler

External Static Pressure (Inches of Water Gauge)																				
	0.10"		0.20"		0.30"		0.40"		0.50"		0.60"		0.70"		0.80"		0.90"		1.00"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	1.5 HP Standard Motor with Field Supplied Sheave and Belt				1.5 HP Standard Motor										1.5 Hp Standard Motor with Field Supplied High Satic Sheave/Belt					
2400	532	0.38	594	0.48	642	0.56	689	0.66	737	0.76	783	0.87	826	0.98	868	1.10	907	1.22	945	1.35
2550	558	0.45	618	0.55	665	0.64	709	0.74	754	0.84	799	0.95	841	1.07	882	1.19	921	1.32	958	1.45
2700	587	0.52	643	0.63	689	0.73	731	0.82	773	0.93	816	1.04	857	1.17	897	1.29	935	1.42	972	1.55
2850	613	0.60	664	0.71	713	0.82	753	0.92	792	1.02	833	1.14	873	1.27	912	1.40	950	1.53	986	1.67
3000	643	0.70	688	0.80	737	0.92	777	1.03	814	1.14	852	1.25	891	1.38	928	1.51	965	1.65	1001	1.79
3150	671	0.79	711	0.90	762	1.04	800	1.15	837	1.26	872	1.37	909	1.50	945	1.63	981	1.78	1016	1.92
3300	701	0.91	736	1.01	786	1.15	824	1.27	860	1.39	894	1.51	928	1.63	963	1.77	998	1.91	1032	2.06
3450	729	1.03	763	1.13	808	1.27	849	1.41	883	1.53	916	1.65	949	1.78	982	1.91	1015	2.06	1049	2.21
3600	756	1.15	790	1.26	831	1.40	874	1.56	908	1.69	940	1.81	971	1.94	1002	2.07	1034	2.22	—	—

External Static Pressure (Inches of Water Gauge)										
	1.10"		1.20"		1.30"		1.40"		1.50"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	1.5 Hp Standard Motor with Field Supplied High Satic Sheave/Belt						2 HP High Static Motor			
2400	980	1.47	1014	1.60	1046	1.72	1077	1.85	1107	1.98
2550	994	1.58	1028	1.71	1060	1.84	1091	1.98	1121	2.11
2700	1007	1.69	1041	1.83	1074	1.97	1105	2.11	—	—
2850	1021	1.81	1055	1.95	1087	2.09	1119	2.24	—	—
3000	1035	1.93	1069	2.08	1101	2.23	—	—	—	—
3150	1050	2.07	1083	2.22	—	—	—	—	—	—
3300	1065	2.21	—	—	—	—	—	—	—	—
3450	—	—	—	—	—	—	—	—	—	—
3600	—	—	—	—	—	—	—	—	—	—

Notes:

1. Data includes pressure drop due to wet coil and 1" filter.
2. Fan motor heat (MBh) = 3.15 x BHP.
3. Check General Data for indoor fan motor HP availability.
4. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 39. Evaporator fan performance - TWE090K** - 2-speed VFD, SZVAV air handler

External Static Pressure (Inches of Water Gauge)																														
	0.10"			0.20"			0.30"			0.40"			0.50"			0.60"			0.70"			0.80"			0.90"			1.00"		
CFM	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP
	2 HP Standard Drive																													
2400	—	—	—	—	—	—	642	39	0.56	689	42	0.66	737	44	0.76	783	47	0.87	826	50	0.98	868	52	1.10	907	55	1.22	945	57	1.35
2550	—	—	—	618	38	0.55	665	40	0.64	709	43	0.74	754	45	0.84	799	48	0.95	841	51	1.07	882	53	1.19	921	55	1.32	958	58	1.45
2700	—	—	—	643	39	0.63	689	41	0.73	731	44	0.82	773	47	0.93	816	49	1.04	857	52	1.17	897	54	1.29	935	56	1.42	972	59	1.55
2850	—	—	—	664	40	0.71	713	43	0.82	753	45	0.92	792	48	1.02	833	50	1.14	873	53	1.27	912	55	1.40	950	57	1.53	986	59	1.67
3000	643	39	0.70	688	41	0.80	737	44	0.92	777	47	1.03	814	49	1.14	852	51	1.25	891	54	1.38	928	56	1.51	965	58	1.65	1001	44	1.79
3150	671	40	0.79	711	43	0.90	762	46	1.04	800	48	1.15	837	50	1.26	872	53	1.37	909	55	1.50	945	57	1.63	981	59	1.78	1016	45	1.92
3300	701	42	0.91	736	44	1.01	786	47	1.15	824	50	1.27	860	52	1.39	894	54	1.51	928	56	1.63	963	58	1.77	998	60	1.91	1032	46	2.06
3450	729	44	1.03	763	46	1.13	808	49	1.27	849	51	1.41	883	53	1.53	916	55	1.65	949	57	1.78	982	59	1.91	1015	45	2.06	1049	46	2.21
3600	756	46	1.15	790	48	1.26	831	50	1.40	874	53	1.56	908	55	1.69	940	42	1.81	971	43	1.94	1002	44	2.07	1034	46	2.22	1066	47	2.37

External Static Pressure (Inches of Water Gauge)																														
	1.10"			1.20"			1.30"			1.40"			1.50"			1.60"			1.70"			1.80"			1.90"			2.00"		
CFM	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP
	2 HP Standard Drive			3 HP High Static Drive																										
2400	980	59	1.47	1014	45	1.60	1046	46	1.72	1077	48	1.85	1107	49	1.98	1135	50	2.10	1163	51	2.23	1189	53	2.36	1215	54	2.48	1240	55	2.61
2550	994	60	1.58	1028	45	1.71	1060	47	1.84	1091	48	1.98	1121	50	2.11	1150	51	2.25	1178	52	2.38	1204	53	2.51	1230	54	2.65	1256	56	2.78
2700	1007	45	1.69	1041	46	1.83	1074	48	1.97	1105	49	2.11	1135	50	2.25	1164	52	2.39	1192	53	2.53	1219	54	2.67	1245	55	2.82	1271	56	2.96
2850	1021	45	1.81	1055	47	1.95	1087	48	2.09	1119	49	2.24	1149	51	2.39	1178	52	2.54	1206	53	2.69	1234	55	2.84	1260	56	2.99	1285	57	3.14
3000	1035	46	1.93	1069	47	2.08	1101	49	2.23	1132	50	2.38	1162	51	2.54	1192	53	2.69	1220	54	2.85	1247	55	3.00	1274	56	3.16	—	—	—
3150	1050	46	2.07	1083	48	2.22	1115	49	2.37	1146	51	2.53	1176	52	2.69	1205	53	2.85	1233	55	3.01	1261	56	3.17	—	—	—	—	—	—
3300	1065	47	2.21	1097	49	2.36	1129	50	2.52	1160	51	2.68	1190	53	2.85	1219	54	3.01	—	—	—	—	—	—	—	—	—	—	—	—
3450	1081	48	2.36	1113	49	2.52	1144	51	2.68	1174	52	2.85	1204	53	3.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3600	1098	49	2.53	1129	50	2.69	1159	51	2.86	1189	53	3.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

External Static Pressure (Inches of Water Gauge)									
	2.10"			2.20"			2.30"		
CFM	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP
	3 HP High Static Drive								
2400	1264	56	2.74	1287	57	2.86	1310	58	2.99
2550	1280	57	2.92	1304	58	3.05	1327	59	3.19
2700	1295	57	3.10	—	—	—	—	—	—
2850	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—
3150	—	—	—	—	—	—	—	—	—
3300	—	—	—	—	—	—	—	—	—
3450	—	—	—	—	—	—	—	—	—
3600	—	—	—	—	—	—	—	—	—

Notes:

1. 2-Speed VFD or SZVAV applications are capable of running below 320 cfm/ton during low speed airflow operation, but "full" airflow must be set to 320 cfm/ton or higher.
2. Check General Data for indoor fan motor HP availability.
3. Data includes pressure drop due to wet coil and 1-inch filter.

Table 40. Evaporator fan performance —TWE120K1B — constant volume air handler

External Static Pressure (Inches of Water Gauge)														
	0.10"		0.20"		0.30"		0.40"		0.50"		0.60"		0.70"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2 HP Standard Motor														
3200	570	0.60	616	0.69	657	0.80	695	0.90	731	1.00	766	1.10	800	1.21
3400	601	0.71	643	0.80	684	0.92	720	1.02	755	1.13	788	1.24	821	1.35
3600	631	0.84	670	0.92	710	1.04	746	1.16	779	1.27	812	1.39	843	1.50
3800	662	0.98	699	1.06	738	1.19	772	1.31	805	1.43	836	1.55	866	1.67
4000	695	1.14	728	1.21	765	1.34	799	1.47	831	1.60	861	1.72	890	1.85
4200	727	1.31	757	1.38	792	1.50	826	1.65	857	1.78	887	1.91	915	2.05
4400	757	1.49	788	1.58	820	1.69	853	1.84	884	1.98	913	2.12	940	2.26
4600	788	1.69	818	1.78	849	1.89	881	2.04	911	2.20	—	—	—	—
4800	824	1.93	849	2.01	877	2.11	908	2.26	—	—	—	—	—	—

External Static Pressure (Inches of Water Gauge)														
	0.80"		0.90"		1.00"		1.10"		1.20"		1.30"		1.40"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2 HP Standard Motor with Field Supplied Sheave/Belt														
3200	834	1.33	867	1.45	900	1.58	933	1.70	964	1.83	993	1.96	1022	2.09
3400	854	1.46	886	1.59	917	1.72	947	1.85	978	1.99	1008	2.12	1037	2.26
3600	874	1.62	905	1.74	935	1.87	965	2.01	993	2.15	1023	2.29	—	—
3800	896	1.79	925	1.91	954	2.05	983	2.19	—	—	—	—	—	—
4000	919	1.98	947	2.10	975	2.24	—	—	—	—	—	—	—	—
4200	943	2.18	970	2.31	—	—	—	—	—	—	—	—	—	—
4400	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4600	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4800	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Notes:

1. Data includes pressure drop due to wet coil and 1" filter.
2. Fan motor heat (MBh) = 3.15 x BHP.
3. Check General Data for indoor fan motor HP availability.
4. Factory supplied motors, in commercial equipment, are definite purpose motors, specifically designed and tested to operate reliably and continuously at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

Table 41. Evaporator fan performance - TWE120K** - 2-speed VFD, SZVAV air handler

External Static Pressure (Inches of Water Gauge)																														
	0.10"			0.20"			0.30"			0.40"			0.50"			0.60"			0.70"			0.80"			0.90"			1.00"		
CFM	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP
2 HP Standard Drive																														
3200	570	37	0.60	616	40	0.69	657	43	0.80	695	45	0.90	731	48	1.00	766	50	1.10	800	52	1.21	834	55	1.33	867	57	1.45	900	59	1.58
3400	601	39	0.71	643	42	0.80	684	45	0.92	720	47	1.02	755	49	1.13	788	52	1.24	821	54	1.35	854	56	1.46	886	58	1.59	917	60	1.72
3600	631	41	0.84	670	44	0.92	710	46	1.04	746	49	1.16	779	51	1.27	812	53	1.39	843	55	1.50	874	57	1.62	905	59	1.74	935	49	1.87
3800	662	43	0.98	699	46	1.06	738	48	1.19	772	50	1.31	805	53	1.43	836	55	1.55	866	57	1.67	896	59	1.79	925	60	1.91	954	51	2.05
4000	695	45	1.14	728	48	1.21	765	50	1.34	799	52	1.47	831	54	1.60	861	56	1.72	890	58	1.85	919	60	1.98	947	50	2.10	975	52	2.24
4200	727	47	1.31	757	50	1.38	792	52	1.50	826	54	1.65	857	56	1.78	887	58	1.91	915	60	2.05	943	50	2.18	970	51	2.31	996	53	2.44
4400	757	49	1.49	788	52	1.58	820	54	1.69	853	56	1.84	884	58	1.98	913	48	2.12	940	50	2.26	967	51	2.40	993	53	2.54	1019	54	2.67
4600	788	52	1.69	818	53	1.78	849	55	1.89	881	58	2.04	911	48	2.20	939	50	2.34	966	51	2.48	992	53	2.63	1018	54	2.78	1042	55	2.92
4800	824	54	1.93	849	55	2.01	877	57	2.11	908	48	2.26	937	50	2.42	966	51	2.58	992	53	2.73	1017	54	2.88	1042	55	3.03	1067	56	3.19

External Static Pressure (Inches of Water Gauge)																								
	1.10"			1.20"			1.30"			1.40"			1.50"			1.60"			1.70"			1.80"		
CFM	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP
3 HP High Static Drive																								
3200	933	49	1.70	964	51	1.83	993	53	1.96	1022	54	2.09	1050	56	2.22	1077	57	2.36	1103	58	2.49	1128	60	2.62
3400	947	50	1.85	978	52	1.99	1008	53	2.12	1037	55	2.26	1064	56	2.40	1091	58	2.54	1117	59	2.68	1142	60	2.82
3600	965	51	2.01	993	53	2.15	1023	54	2.29	1051	56	2.44	1079	57	2.58	1106	59	2.73	1132	60	2.88	—	—	—
3800	983	52	2.19	1011	54	2.33	1039	55	2.47	1066	56	2.62	1094	58	2.78	1120	59	2.93	—	—	—	—	—	—
4000	1002	53	2.38	1029	54	2.52	1056	56	2.67	1083	57	2.82	1109	59	2.98	1135	60	3.14	—	—	—	—	—	—
4200	1023	54	2.58	1049	56	2.73	1075	57	2.88	1101	58	3.04	1126	60	3.20	—	—	—	—	—	—	—	—	—
4400	1045	55	2.82	1069	57	2.96	1095	58	3.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4600	1067	56	3.07	1091	58	3.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Notes:

1. 2-Speed VFD or SZVAV applications are capable of running below 320 cfm/ton during low speed airflow operation, but "full" airflow must be set to 320 cfm/ton or higher.
2. Check General Data for indoor fan motor HP availability.
3. Data includes pressure drop due to wet coil and 1-inch filter.

Table 42. Evaporator fan performance - TWE180K** - 2-speed VFD, SZVAV air handler

External Static Pressure (Inches of Water Gauge)																								
	0.10"			0.20"			0.30"			0.40"			0.50"			0.60"			0.70"			0.80"		
CFM	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP
3 HP Standard Drive																								
4800	548	38	0.92	597	42	1.07	643	45	1.22	687	48	1.37	728	51	1.53	766	54	1.69	802	56	1.85	837	59	2.01
5100	576	40	1.08	623	44	1.24	667	47	1.40	709	50	1.56	749	53	1.72	787	55	1.89	822	58	2.06	856	60	2.23
5400	604	42	1.27	648	46	1.43	692	49	1.60	732	51	1.77	771	54	1.94	808	57	2.12	842	59	2.30	875	44	2.48
5700	633	44	1.47	674	47	1.64	716	50	1.82	756	53	2.00	793	56	2.18	829	58	2.36	863	61	2.55	895	45	2.74
6000	662	46	1.70	702	49	1.88	741	52	2.06	779	55	2.25	816	57	2.44	851	60	2.63	884	45	2.83	916	46	3.03
6300	690	49	1.95	728	51	2.12	767	54	2.32	804	56	2.52	839	59	2.72	873	44	2.92	905	46	3.12	937	47	3.33
6600	721	51	2.24	757	53	2.41	793	56	2.61	828	58	2.81	863	43	3.02	896	45	3.24	928	47	3.45	958	48	3.66
6900	748	53	2.51	784	55	2.71	819	58	2.92	853	43	3.14	887	45	3.36	919	46	3.57	950	48	3.79	980	49	4.02
7200	778	55	2.84	812	57	3.04	846	43	3.26	879	44	3.49	911	46	3.71	943	47	3.95	973	49	4.17	1002	50	4.40

External Static Pressure (Inches of Water Gauge)																								
	0.90"			1.00"			1.10"			1.20"			1.30"			1.40"			1.50"			1.60"		
CFM	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP
5 HP High Static Drive																								
4800	870	44	2.18	901	45	2.34	931	47	2.51	961	48	2.69	991	50	2.86	1020	51	3.04	1047	53	3.22	1074	54	3.40
5100	888	45	2.41	919	46	2.58	949	48	2.76	978	49	2.94	1006	51	3.12	1034	52	3.31	1062	53	3.50	1088	55	3.69
5400	907	46	2.66	938	47	2.84	967	49	3.03	996	50	3.22	1023	52	3.40	1050	53	3.59	1077	54	3.79	1103	56	3.99
5700	927	47	2.93	957	48	3.12	986	50	3.32	1014	51	3.51	1041	52	3.71	1067	54	3.91	1093	55	4.10	1118	56	4.31
6000	947	48	3.22	976	49	3.42	1005	51	3.63	1032	52	3.83	1059	53	4.04	1085	55	4.24	1111	56	4.45	1135	57	4.66
6300	967	49	3.54	996	50	3.75	1024	52	3.96	1052	53	4.17	1078	54	4.38	1104	56	4.60	1129	57	4.81	1153	58	5.03
6600	988	50	3.87	1016	51	4.09	1044	53	4.31	1071	54	4.53	1097	55	4.75	1123	57	4.98	1147	58	5.20	—	—	—
6900	1009	51	4.25	1037	52	4.47	1065	54	4.69	1091	55	4.92	1117	56	5.16	—	—	—	—	—	—	—	—	—
7200	1031	52	4.63	1059	53	4.86	1085	55	5.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

External Static Pressure (Inches of Water Gauge)															
	1.70"			1.80"			1.90"			2.00"			2.10"		
CFM	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP
5 HP High Static Drive															
4800	1099	55	3.58	1124	57	3.76	1148	58	3.94	1172	59	4.12	1194	60	4.30
5100	1114	56	3.88	1139	57	4.07	1163	59	4.26	1187	60	4.45	—	—	—
5400	1129	57	4.19	1154	58	4.39	1178	59	4.59	—	—	—	—	—	—
5700	1144	58	4.51	1169	59	4.72	1193	60	4.94	—	—	—	—	—	—
6000	1160	58	4.87	1184	60	5.08	—	—	—	—	—	—	—	—	—
6300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Notes:

1. 2-Speed VFD or SZVAV applications are capable of running below 320 cfm/ton during low speed airflow operation, but "full" airflow must be set to 320 cfm/ton or higher.
2. Check General Data for indoor fan motor HP availability.
3. Data includes pressure drop due to wet coil and 2-inch filter.

Table 43. Evaporator fan performance - TWE240K** - 2-speed VFD, SZVAV air handler

External Static Pressure (Inches of Water Gauge)																													
	0.10"			0.20"			0.30"			0.40"			0.50"			0.60"			0.70"			0.80"			0.90"			1.00"		
CFM	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP
	5 HP Standard Drive																												
6400	619	33	1.56	656	35	1.70	691	36	1.84	724	38	1.98	756	40	2.12	786	41	2.26	816	43	2.41	845	45	2.56	873	46	2.72	900	47	2.87
6800	654	34	1.86	688	36	2.00	722	38	2.15	754	40	2.30	784	41	2.44	814	43	2.59	842	44	2.74	869	46	2.90	897	47	3.07	924	49	3.23
7200	687	36	2.17	721	38	2.34	753	40	2.49	784	41	2.65	813	43	2.81	842	44	2.96	869	46	3.12	895	47	3.29	921	49	3.46	947	50	3.62
7600	721	38	2.54	754	40	2.72	784	41	2.87	814	43	3.04	843	44	3.21	870	46	3.38	896	47	3.53	922	49	3.71	947	50	3.88	972	51	4.06
8000	757	40	2.96	788	42	3.13	817	43	3.30	845	45	3.48	872	46	3.65	899	47	3.82	925	49	4.00	950	50	4.16	974	51	4.35	998	53	4.53
8400	790	42	3.37	820	43	3.57	849	45	3.76	877	46	3.95	903	48	4.13	929	49	4.32	953	50	4.49	978	52	4.67	1002	53	4.86	1025	47	5.05
8800	826	38	3.88	854	39	4.07	881	40	4.26	908	41	4.46	933	42	4.65	959	44	4.85	982	45	5.04	1006	46	5.22	1030	47	5.42	1052	48	5.61
9200	863	39	4.44	889	40	4.64	915	42	4.84	939	43	5.02	965	44	5.24	989	45	5.43	1012	46	5.62	1036	47	5.83	1058	48	6.02	1080	49	6.22
9600	897	41	5.01	922	42	5.20	948	43	5.44	971	44	5.63	996	45	5.84	1019	46	6.05	1042	47	6.27	1065	48	6.47	—	—	—	—	—	—

External Static Pressure (Inches of Water Gauge)																													
	1.10"			1.20"			1.30"			1.40"			1.50"			1.60"			1.70"			1.80"			1.90"			2.00"		
CFM	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP
	5 HP Standard Drive																					7.5 HP High Static Drive								
6400	927	49	3.03	952	50	3.19	977	51	3.34	1001	53	3.48	1024	54	3.63	1050	55	3.80	1075	57	3.98	1098	50	4.15	1120	51	4.31	1139	52	4.47
6800	949	50	3.40	974	51	3.57	999	53	3.74	1022	54	3.90	1045	55	4.05	1067	56	4.21	1090	50	4.36	1114	51	4.55	1138	52	4.74	1160	53	4.92
7200	972	51	3.80	997	53	3.97	1021	54	4.15	1044	55	4.34	1067	56	4.51	1089	49	4.68	1110	50	4.84	1131	51	5.00	1152	52	5.17	1175	53	5.36
7600	996	52	4.24	1020	54	4.42	1044	55	4.60	1067	56	4.80	1089	57	4.99	1111	50	5.18	1132	51	5.36	1153	52	5.53	1173	53	5.70	1193	54	5.88
8000	1021	54	4.72	1044	55	4.91	1067	48	5.10	1090	50	5.29	1112	51	5.49	1134	52	5.69	1155	52	5.89	1175	53	6.09	1195	54	6.28	1215	55	6.46
8400	1047	48	5.24	1069	49	5.43	1091	50	5.63	1113	51	5.83	1135	52	6.04	1156	53	6.24	1177	53	6.45	1198	54	6.67	1217	55	6.87	1237	56	7.08
8800	1074	49	5.81	1095	50	6.01	1117	51	6.22	1138	52	6.42	1159	53	6.63	1180	54	6.84	1200	55	7.06	1220	55	7.28	1240	56	7.49	1259	57	7.71
9200	1101	50	6.42	1122	51	6.63	1143	52	6.84	1163	53	7.05	1183	54	7.27	1204	55	7.49	1224	56	7.71	—	—	—	—	—	—	—	—	—
9600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

External Static Pressure (Inches of Water Gauge)												
	2.10"			2.20"			2.30"			2.40"		
CFM	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP	RPM	Hz	BHP
	7.5 HP High Static Drive											
6400	1158	53	4.62	1177	53	4.78	1195	54	4.93	1213	55	5.08
6800	1181	54	5.09	1200	55	5.26	1218	55	5.43	1236	56	5.59
7200	1198	54	5.56	1220	55	5.76	1240	56	5.95	1259	57	6.13
7600	1213	55	6.05	1234	56	6.25	1256	57	6.46	1277	58	6.67
8000	1234	56	6.64	1253	57	6.82	1272	58	7.01	1292	59	7.20
8400	1256	57	7.28	1275	58	7.48	1293	59	7.66	—	—	—
8800	—	—	—	—	—	—	—	—	—	—	—	—
9200	—	—	—	—	—	—	—	—	—	—	—	—
9600	—	—	—	—	—	—	—	—	—	—	—	—

Notes:

1. 2-Speed VFD or SZVAV applications are capable of running below 320 cfm/ton during low speed airflow operation, but "full" airflow must be set to 320 cfm/ton or higher.
2. Check General Data for indoor fan motor HP availability.
3. Data includes pressure drop due to wet coil and 2-inch filter.

Table 44. Standard fan motors - constant volume air handlers

Model	Motor	Motor Sheave Turns Open	Nominal RPM	Required Field Supplied Components		
				Motor Sheave	Blower Sheave	Belt
TWE060	Standard Motor 0.75 HP	0	1071	N/A	N/A	N/A
		1	1000			
		2	928			
		3	857			
		4	785			
		5	714			
TWE090	Standard Motor 1.5 HP	0	847	N/A	N/A	N/A
		1	791			
		2	734			
		3	678			
		4	621			
		5	565			
TWE090	Standard Motor with Field Supplied Components - 1.5 HP (Low Static)	1	406	Variable Pitch (2.0 - 3.0 Inch Pitch Diameter), 0.625 Inch Bore, Single Groove, Browning 1VP34	Fixed pitch (8.5 Inch Pitch Diameter), 1 Inch Bore, Single Groove, Browning BK95	Browning A52
		2	446			
		3	487			
		4	528			
		5	568			
		6	609			
TWE090	Standard Motor with Field Supplied Components - 1.5 HP (High Static)	1	863	Variable Pitch (3-4 Inch Pitch Diameter), 0.625 Inch Bore, Single Groove, Browning 1VP44	Fixed Pitch (6 Inch Pitch Diameter), 1 Inch Bore, Single Groove, Browning BK70	Browning A50
		2	920			
		3	978			
		4	1035			
		5	1093			
		6	1150			
TWE120	Standard Motor 2 HP	0	818	N/A	N/A	N/A
		1	773			
		2	727			
		3	682			
		4	636			
		5	591			
TWE120	Standard Motor with Field Supplied Components - 2 HP (High Static)	1	772	Variable Pitch (3-4 Inch Pitch Diameter), 0.875 Inch Bore, Single Groove, Browning 1VP44	Fixed Pitch (6.7 Inch Pitch Diameter), 1 Inch Bore, Single Groove, Browning AK71	Browning A51
		2	824			
		3	875			
		4	927			
		5	978			
		6	1030			

Table 45. High static fan motors - constant volume air handlers

Model	Motor	Motor Sheave Turns Open	Nominal RPM	Required Field Supplied Components		
				Motor Sheave	Blower Sheave	Belt
TWE060	High Static Motor 1.5 HP	0	1346	N/A	N/A	N/A
		1	1279			
		2	1212			
		3	1144			
		4	1077			
		5	1010			
TWE090	High Static Motor 2 HP	0	1094	N/A	N/A	N/A
		1	1039			
		2	984			
		3	930			
		4	875			
		5	820			

Table 46. Discharge plenum and grille assembly throw distance (ft) — air handler (60 Hz)

Tons	Model No.	CFM	Louver Angle Deflection Position			
			Straight	20°	40°	55°
5	TWE060K*A/B	1600	42	31	26	20
		1800	46	37	29	22
		2000	48	43	33	24
		2200	51	50	36	25
		2400	54	57	39	29
6	TWE072K*B	1920	48	33	30	27
		2160	50	38	32	28
		2400	52	43	35	29
		2640	54	47	38	30
		2880	57	51	41	32
7.5	TWE090K*A/B	2400	52	43	35	29
		2700	55	48	38	31
		3000	58	53	42	32
		3300	62	57	46	35
		3600	66	60	50	37
10	TWE120K*A/B	3200	56	46	38	30
		3600	62	51	42	33
		4000	66	57	47	35
		4400	71	62	52	38
		4800	76	67	56	42
15	TWE180K*B	4900	47	38	32	25
		5400	52	44	37	29
		6000	57	49	41	32
		6600	61	53	43	34
		7200	65	57	46	35
20	TWE240K*B	6400	56	46	38	30
		7200	62	51	42	33
		8000	66	57	47	35
		8800	71	62	52	38
		9600	76	67	56	42

Notes:

1. Assumes incompressible and adiabatic flow through grille.
2. Throw distance values are based on a terminal velocity of 75 FPM.
3. Throw distance values at other terminal velocities may be established by multiplying throw distances in the table above by throw factor as follows: for 50 FPM terminal velocity, multiply by 1.50 throw factor; for 100 FPM terminal velocity, multiply by 0.75 throw factor; for 150 FPM terminal velocity, multiply by 0.50 throw factor.
4. SZVAV/2-Speed VFD available for 6 to 25 ton only.

Table 47. Electric heat discharge plenum and grille airflow (CFM) - constant volume air handler (60Hz)

Tons	Unit Model No.	Electric Heater Model No.	Airflow (CFM)	
			Minimum	Maximum
5	TWE060K1A, B	BAYHTRT117*	2000	2400
	TWE060K3A, B	BAYHTRS315*	2000	2400
	TWE060K4A, B	BAYHTRS415*	2000	2400
6	TWE072K3B	BAYHTRS315*	2000	2880
	TWE072K3B	BAYHTRP325*	2000	2880
	TWE072K4B	BAYHTRS415*	2000	2880
	TWE072K4B	BAYHTRP425*	2000	2880
7.5	TWE090K1A, B	BAYHTRT117*	3000	3600
	TWE090K1A, B	BAYHTRS123*	3375	3600

Table 47. Electric heat discharge plenum and grille airflow (CFM) - constant volume air handler (60Hz) (continued)

Tons	Unit Model No.	Electric Heater Model No.	Airflow (CFM)	
			Minimum	Maximum
7.5	TWE090K3A, B	BAYHTRS315*	2625	3600
	TWE090K3A, B	BAYHTRP325*	3000	3600
	TWE090K4A, B	BAYHTRS415*	2625	3600
	TWE090K4A, B	BAYHTRP425*	2625	3600
10	TWE120K1A, B	BAYHTRT117*	3500	4800
	TWE120K1A, B	BAYHTRS123*	4000	4800
10	TWE120K3A, B	BAYHTRS315*	4000	4800
	TWE120K3A, B	BAYHTRP325*	3500	4800
	TWE120K4A, B	BAYHTRS415*	3500	4800
	TWE120K4A, B	BAYHTRP425*	3500	4800
15	TWE180K3B	BAYHTRR330*	5250	7200
	TWE180K4B	BAYHTRR430*	5250	7200
20	TWE240K3B	BAYHTRR330*	7000	9600
	TWE240K4B	BAYHTRR430*	7000	9600

Note: SZVAV/2-Speed VFD available for 6 to 25 ton only.

Table 48. Static pressure drop through accessories (inches of water column) - air handler (60Hz)

Tons	Unit Model No.	CFM	Return Grille	Discharge Plenum and Grille	2" MERV 13 Filter	Electric Heaters (kW)				Hydronic Coils	
						5–10	15–20	25–30	35–50	Steam	Hot Water
5	TWE060K*A/B	1600	0.12	0.21	0.22	0.08	0.08	0.14	—	0.44	0.31
		2000	0.18	0.33	0.29	0.13	0.13	0.19	—	0.62	0.44
		2400	0.28	0.47	0.36	0.19	0.19	0.37	—	0.80	0.59
6	TWE072K*B	1920	0.04	0.20	0.15	0.01	0.03	0.04	0.06	0.31	0.16
		2400	0.08	0.27	0.19	0.03	0.06	0.08	0.12	0.38	0.23
		2880	0.12	0.37	0.24	0.05	0.11	0.15	0.21	0.48	0.31
7.5	TWE090K*A/B	2400	0.08	0.27	0.19	0.03	0.06	0.08	0.12	0.38	0.23
		3000	0.13	0.40	0.25	0.06	0.12	0.17	0.23	0.50	0.33
		3600	0.18	0.58	0.31	0.08	0.16	0.24	0.32	0.66	0.44
10	TWE120K*A/B	3200	0.07	0.43	0.19	0.06	0.13	0.19	0.26	0.42	0.40
		4000	0.11	0.66	0.25	0.10	0.20	0.30	0.40	0.59	0.56
		4800	0.15	0.95	0.31	0.14	0.28	0.42	0.57	0.76	0.75
15	TWE180K*B	4800	0.09	0.23	0.19	0.03	0.03	0.06	0.08	0.46	0.38
		6000	0.15	0.34	0.25	0.06	0.06	0.12	0.17	0.64	0.54
		7200	0.20	0.49	0.31	0.08	0.08	0.16	0.24	0.82	0.72
20	TWE240K*B	6400	0.11	0.43	0.22	0.06	0.06	0.13	0.19	0.50	0.41
		8000	0.17	0.66	0.29	0.10	0.10	0.20	0.30	0.70	0.58
		9600	0.23	0.95	0.36	0.14	0.14	0.28	0.42	0.89	0.78

Notes:

1. SZVAV/2-Speed VFD available for 6 to 25 ton only.
2. Return air filter ESP included in Fan Performance Table data.
3. Discharge plenum and grille - at louver opening angle of 42 degrees. For ESP at other angle openings, see accessory installation instructions.

Table 49. Auxiliary electric heat capacity - air handler (60Hz)

Unit Model No.	Total kW	No. of Stages	Stage 1		Stage 2		Total	
			kW Input	BTUH Output	kW Input	BTUH Output	kW Input	BTUH Output
TWE060K1A, TWE060K1B	5.76	1	5.76	19659	–	–	5.76	19659
	11.52	1	11.52	39318	–	–	11.52	39318
	17.28	1	17.28	58977	–	–	17.28	58977
	23.04	2	11.52	39318	11.52	39318	23.04	78636
TWE060K3A, TWE060K4A, TWE060KWA, TWE060K3B, TWE060K4B, TWE072K3B, TWE072K4B, TWE072KWB	5.00	1	5.00	17065	–	–	5.00	17065
	9.96	1	9.96	33993	–	–	9.96	33993
	14.96	1	14.96	51058	–	–	14.96	51058
	24.92	2	14.96	51058	9.96	33993	24.92	85051
TWE090K1A, TWE090K1B, TWE120K1A, TWE120K1B	5.76	1	5.76	19659	–	–	5.76	19659
	11.52	1	11.52	39318	–	–	11.52	39318
	17.28	1	17.28	58977	–	–	17.28	58977
	23.04	2	11.52	39318	11.52	39318	23.04	78636
	28.80	2	17.28	58977	11.52	39318	28.80	98295
TWE090K3A, TWE090K3B, TWE090KWA, TWE090K3B, TWE090K4B, TWE090KWB, TWE120K3A, TWE120K4A, TWE120KWA, TWE120K3B, TWE120K4B, TWE120KWB	5.00	1	5.00	17065	–	–	5.00	17065
	9.96	1	9.96	33993	–	–	9.96	33993
	14.96	1	14.96	51058	–	–	14.96	51058
	24.92	2	14.96	51058	9.96	33993	24.92	85051
	34.88	2	19.92	67987	14.96	51058	34.88	119045
TWE180K3B, TWE180K4B, TWE180KWB	10.00	1	10.00	34130	–	–	10.00	34130
	19.92	1	19.92	67987	–	–	19.92	67987
	29.92	2	19.92	67987	10.00	34130	29.92	102117
	49.84	2	29.92	102117	19.92	67987	49.84	170104
TWE240K*B	10.00	1	10.00	34130	–	–	10.00	34130
	19.92	1	19.92	67987	–	–	19.92	67987
	29.92	2	19.92	67987	10.00	34130	29.92	102117
	49.84	2	29.92	102117	19.92	67987	49.84	170104

Notes:

1. Heaters are rated at 240V, 480V, and 600V. For other than rated voltage, capacity = (Voltage/Related Voltage)^2 x Rated Capacity.
2. SZVAV/2-Speed VFD available for 6 to 25 ton only.

Table 50. Steam heating coil capacity – air handler steam pressure (PSIG) (60Hz)

Unit Model No.	Airflow (CFM)	EAT (°F)	Steam Pressure (PSIG)														
			2 PSI			5 PSI			10 PSI			15 PSI			25 PSI		
			LAT	MBh	Cond. lb/hr	LAT	MBh	Cond. lb/hr	LAT	MBh	Cond. lb/hr	LAT	MBh	Cond. lb/hr	LAT	MBh	Cond. lb/hr
TWE060K*A, TWE060K*B	1600	40	97	99	103	100	104	108	104	111	117	108	117	124	113	127	136
		60	111	88	91	114	93	97	118	100	105	121	106	112	127	116	124
		80	125	77	80	127	82	85	131	89	94	135	95	101	140	105	112
	2000	40	90	108	112	93	114	118	96	122	128	99	129	136	104	139	149
		60	104	96	100	107	102	106	111	110	115	114	116	123	119	127	136
		80	119	84	87	121	90	93	125	98	102	128	104	110	133	115	123
	2400	40	85	116	120	87	123	127	90	131	137	93	138	146	98	150	160
		60	100	104	107	102	110	114	105	118	124	108	125	132	113	137	146
		80	115	91	94	117	97	100	120	105	110	123	112	118	127	123	132
TWE072K*B	1920	40	106	151	157	112	159	165	116	169	178	121	179	189	126	194	207
		60	120	134	139	124	141	147	128	153	160	133	162	172	139	177	189
		80	133	117	121	136	125	131	140	136	143	145	144	152	151	159	170
	2400	40	102	162	168	106	171	177	110	182	191	114	192	203	120	208	222
		60	115	144	149	119	152	158	123	164	172	127	174	184	133	190	203
		80	129	126	130	132	134	140	136	146	153	140	155	164	146	171	183
	2880	40	96	174	180	100	183	190	104	196	205	107	206	218	113	223	239
		60	110	154	159	113	163	170	117	176	184	121	186	197	126	204	218
		80	124	135	140	127	144	150	131	157	164	134	166	176	140	184	197

Table 50. Steam heating coil capacity – air handler steam pressure (PSIG) (60Hz) (continued)

Unit Model No.	Airflow (CFM)	EAT (°F)	Steam Pressure (PSIG)														
			2 PSI			5 PSI			10 PSI			15 PSI			25 PSI		
			LAT	MBh	Cond. lb/hr	LAT	MBh	Cond. lb/hr	LAT	MBh	Cond. lb/hr	LAT	MBh	Cond. lb/hr	LAT	MBh	Cond. lb/hr
TWE090K*A, TWE090K*B	2400	40	102	162	168	106	171	177	110	182	191	114	192	203	120	208	222
		60	115	144	149	119	152	158	123	164	172	127	174	184	133	190	203
		80	129	126	130	132	134	140	136	146	153	140	155	164	146	171	183
	3000	40	95	178	183	97	187	194	101	200	209	105	210	222	110	228	244
		60	109	158	163	111	167	174	115	180	188	119	190	201	124	208	222
		80	122	138	143	125	147	153	129	160	168	132	170	180	138	188	201
	3600	40	89	191	197	91	201	208	95	215	225	97	226	239	103	245	262
		60	103	170	175	106	180	187	110	193	203	112	205	216	117	224	239
		80	118	149	154	121	158	164	124	172	180	127	183	194	132	202	216
TWE120K*A, TWE120K*B	3200	40	99	203	210	102	214	222	106	229	240	109	241	254	115	261	279
		60	112	181	187	115	191	199	119	206	216	123	218	230	129	238	255
		80	126	158	164	129	169	175	133	183	192	136	195	206	142	215	230
	4000	40	91	222	229	94	234	243	98	250	262	101	264	278	106	286	306
		60	106	198	204	108	209	217	112	225	236	115	239	252	120	261	279
		80	120	173	179	123	184	192	126	200	210	129	214	226	134	236	252
	4800	40	86	239	246	88	251	261	92	269	282	94	284	299	99	307	329
		60	101	212	219	103	225	233	107	242	254	109	257	271	114	280	300
		80	116	186	192	118	198	206	121	215	226	124	230	243	129	253	271
TWE180K*B	4800	40	97	295	304	100	310	322	104	332	348	107	350	369	113	379	406
		60	110	262	271	113	278	288	117	299	313	121	317	334	126	346	370
		80	124	230	237	127	245	254	131	266	279	134	284	299	140	313	334
	6000	40	90	322	332	92	339	352	96	363	380	99	383	404	104	415	444
		60	104	287	296	107	303	315	110	327	343	113	347	366	118	379	405
		80	119	251	259	121	268	278	125	291	305	128	310	328	133	342	366
	7200	40	84	346	356	87	364	378	90	390	408	93	411	434	97	446	477
		60	99	308	318	102	326	338	105	351	368	108	373	393	112	407	435
		80	115	270	278	117	287	299	120	313	327	123	334	352	127	368	394
TWE240K*B	6400	40	95	379	391	97	399	414	102	427	447	105	450	475	110	488	522
		60	109	337	348	111	357	371	115	384	403	119	408	430	124	445	476
		80	123	295	305	125	315	327	129	342	358	133	365	385	138	402	430
	8000	40	88	414	426	90	436	452	94	467	488	97	492	519	102	534	571
		60	102	368	380	105	390	405	108	420	440	111	446	470	116	487	521
		80	117	322	333	120	344	357	123	374	392	126	399	421	131	440	471
	9600	40	83	443	457	85	468	485	88	501	524	91	529	558	95	574	613
		60	98	395	407	100	418	434	103	451	473	106	479	505	110	524	560
		80	113	346	357	115	369	383	119	402	421	121	429	453	125	473	506

Notes:

1. Type NS Coil, 1 Row, 1" OD, SF Fins, 132 Fins per Foot.
2. SZVAV/2-Speed VFD available for 6 to 25 ton only.
3. LAT = Leaving Air Temperature (°F)
4. MBh Capacity= BTU/HR/1000
5. Cond. Lb/Hr = Condensate pound per hour

Table 51. Hot water heating coil capacity - air handler (60Hz)

Tons	Unit Model No.	Airflow (CFM)	Enter Air Temp (° F)	Entering Water Temperature (°F)								
				180								
				Water Temperature Drop (°F)								
				20			30			40		
				GPM	MBh	LAT	GPM	MBh	LAT	GPM	MBh	LAT
5	TWE060K*A, TWE060K*B	1600	40	10.9	106.1	101.0	6.6	96.5	96.0	4.5	87.4	90.0
			60	9.0	88.3	111.0	5.4	79.1	106.0	3.6	70.3	100.0
			80	7.2	70.6	121.0	4.2	61.8	116.0	2.7	53.4	111.0
		2000	40	12.3	119.8	95.0	7.4	108.6	90.0	5.0	97.9	851.0
			60	10.2	99.6	106.0	6.1	88.8	101.0	4.0	78.6	96.0
			80	8.1	79.5	117.0	4.7	69.2	112.0	3.0	59.6	107.0
		2400	40	13.5	132.0	91.0	8.1	119.2	86.0	5.5	107.1	811.0
			60	11.2	109.6	102.0	6.6	97.4	97.0	4.4	85.9	931.0
			80	9.0	87.4	114.0	5.2	75.7	109.0	3.3	64.9	105.0
6	TWE072K*B	1920	40	15.4	150.3	112.5	9.4	137.6	106.4	6.4	124.9	100.2
			60	12.8	124.9	120.2	7.6	111.3	113.7	5.2	101.5	109.0
			80	10.2	99.6	128.0	6.0	87.8	122.4	3.9	76.1	116.7
		2400	40	17.0	165.9	104.0	10.4	152.3	98.0	7.1	139.2	93.0
			60	14.2	138.4	113.0	8.5	125.2	108.0	5.7	112.5	103.0
			80	11.4	111.1	123.0	6.7	98.3	118.0	4.4	86.1	113.0
		2880	40	18.7	182.5	98.7	11.5	168.4	94.1	7.7	150.3	88.3
			60	15.6	152.3	109.0	9.2	134.7	103.3	6.4	124.9	100.2
			80	12.5	122.0	119.2	7.2	105.4	113.9	4.7	91.7	109.5
7.5	TWE090K*A, TWE090K*B	2400	40	17.0	165.9	104.0	10.4	152.3	98.0	7.1	139.2	93.0
			60	14.2	138.4	113.0	8.5	125.2	108.0	5.7	112.5	103.0
			80	11.4	111.1	123.0	6.7	98.3	118.0	4.4	86.1	113.0
		3000	40	19.3	187.9	98.0	11.7	171.9	93.0	8.0	156.5	88.0
			60	16.1	156.7	108.0	9.6	141.1	103.0	6.4	126.3	991.0
			80	12.9	125.5	119.0	7.5	110.6	114.0	4.9	96.5	110.0
		3600	40	21.2	207.3	93.0	12.9	189.1	88.0	8.8	171.6	84.0
			60	17.7	172.7	104.0	10.6	155.0	100.0	7.1	138.3	95.0
			80	14.2	138.2	115.0	8.3	121.2	111.0	5.4	105.4	107.0
10	TWE120K*A, TWE120K*B	3200	40	24.5	239.1	109.0	14.3	210.0	100.0	9.1	178.7	91.0
			60	20.2	197.3	117.0	11.5	168.4	108.0	6.9	134.8	99.0
			80	15.9	155.6	125.0	8.6	126.1	116.0	4.0	78.7	103.0
		4000	40	27.8	271.7	103.0	16.2	237.5	95.0	10.3	201.9	86.0
			60	22.9	223.8	112.0	13.0	190.3	104.0	7.8	153.3	95.0
			80	18.1	176.2	121.0	9.7	142.6	113.0	5.0	97.3	102.0
		4800	40	30.7	300.0	98.0	17.8	261.3	90.0	11.3	221.7	82.0
			60	25.3	246.9	107.0	14.3	209.1	100.0	8.6	168.9	92.0
			80	19.9	194.0	117.0	10.7	156.7	110.0	5.6	110.2	101.0
15	TWE180K*B	4800	40	35.2	343.9	106.0	21.2	310.3	100.0	14.1	276.3	93.0
			60	29.3	285.7	115.0	17.2	252.7	108.0	11.2	218.5	102.0
			80	23.3	227.7	124.0	13.3	195.0	117.0	8.2	159.9	111.0
		6000	40	40.0	390.3	100.0	23.9	350.8	94.0	15.9	311.4	884.0
			60	33.3	323.9	110.0	19.5	285.3	104.0	12.6	246.2	98.0
			80	26.4	257.7	120.0	15.0	219.9	114.0	9.2	180.5	108.0
		7200	40	44.2	431.3	95.0	26.4	386.5	89.0	17.5	342.1	84.0
			60	36.6	357.6	106.0	21.4	313.9	100.0	13.8	270.6	95.0
			80	29.1	284.2	116.0	16.5	241.6	111.0	10.1	198.3	105.0

Table 51. Hot water heating coil capacity - air handler (60Hz) (continued)

Tons	Unit Model No.	Airflow (CFM)	Enter Air Temp (° F)	Entering Water Temperature (°F)								
				180								
				Water Temperature Drop (°F)								
				20			30			40		
				GPM	MBh	LAT	GPM	MBh	LAT	GPM	MBh	LAT
20	TWE2404K	6400	40	46.8	456.2	106.0	28.4	416.5	100.0	19.3	376.7	94.0
			60	39.0	380.2	115.0	23.3	341.2	109.0	15.4	301.7	103.0
			80	31.2	304.5	124.0	18.2	266.0	118.0	11.6	227.0	113.0
		8000	40	53.0	517.5	100.0	32.1	470.9	94.0	21.7	424.5	89.0
			60	44.2	430.9	110.0	26.3	385.2	104.0	17.4	339.6	99.0
			80	35.3	344.6	120.0	20.5	299.8	115.0	13.0	255.2	109.0
		9600	40	58.6	572.0	94.0	35.4	519.1	90.0	23.9	466.8	85.0
			60	48.8	475.9	106.0	28.9	424.2	101.0	19.1	373.3	96.0
			80	39.0	380.2	116.0	22.5	329.6	112.0	14.3	280.0	107.0
Tons	Unit Model No.	Airflow (CFM)	Enter Air Temp (° F)	Entering Water Temperature (°F)								
				200								
				Water Temperature Drop (°F)								
				20			30			40		
				GPM	MBh	LAT	GPM	MBh	LAT	GPM	MBh	LAT
5	TWE060K*A, TWE060K*B	1600	40	12.9	124.9	112.0	7.9	115.4	106.0	5.5	106.3	101.0
			60	11.0	107.0	122.0	6.7	97.8	116.0	4.6	88.9	111.0
			80	9.2	89.1	131.0	5.5	80.2	126.0	3.7	71.7	121.0
		2000	40	4.5	141.3	105.0	8.9	130.1	100.0	6.1	119.4	95.0
			60	12.4	120.9	116.0	7.5	110.1	111.0	5.1	99.7	106.0
			80	10.4	100.6	126.0	6.2	90.2	122.0	4.1	80.3	117.0
		2400	40	6.0	155.8	100.0	9.8	143.1	95.0	6.7	131.0	90.0
			60	3.7	133.3	111.0	8.3	120.9	106.0	5.6	109.2	102.0
			80	11.4	110.8	123.0	6.8	98.9	118.0	4.5	87.8	114.0
6	TWE072K*B	1920	40	17.9	174.7	124.3	11.2	164.0	119.1	7.9	154.2	114.4
			60	15.6	152.3	133.4	9.6	140.5	127.8	6.5	126.9	121.2
			80	13.0	126.9	141.2	8.0	117.1	136.5	5.4	105.4	130.8
		2400	40	20.0	194.8	115.0	12.4	181.2	110.0	8.6	168.2	105.0
			60	17.2	167.1	124.0	10.6	153.9	119.0	7.2	141.2	114.0
			80	14.4	139.6	134.0	8.7	126.8	129.0	5.9	114.3	124.0
		2880	40	21.9	213.7	108.7	13.7	200.6	104.5	9.6	187.4	100.2
			60	19.0	185.4	119.6	11.7	171.3	115.1	8.0	156.2	110.2
			80	15.8	154.2	129.6	9.7	142.0	125.7	6.5	126.9	120.8
7.5	TWE090K*A, TWE090K*B	2400	40	20.0	194.8	115.0	12.4	181.2	110.0	8.6	168.2	105.0
			60	17.2	167.1	124.0	10.6	153.9	119.0	7.2	141.2	114.0
			80	14.4	139.6	134.0	8.7	126.8	129.0	5.9	114.3	124.0
		3000	40	22.7	220.9	108.0	14.0	204.9	103.0	9.7	189.6	98.0
			60	9.5	189.4	118.0	11.9	173.9	113.0	8.2	159.0	109.0
			80	16.3	158.1	129.0	9.8	143.0	124.0	6.6	128.5	119.0
		3600	40	25.1	244.0	102.0	15.5	225.7	981.0	0.7	208.4	93.0
			60	21.5	209.1	113.0	13.1	191.4	109.0	9.0	174.4	105.0
			80	17.9	174.3	125.0	10.8	157.1	120.0	7.2	140.9	116.0

Table 51. Hot water heating coil capacity - air handler (60Hz) (continued)

Tons	Unit Model No.	Airflow (CFM)	Enter Air Temp (° F)	Entering Water Temperature (°F)								
				200								
				Water Temperature Drop (°F)								
				20			30			40		
				GPM	MBh	LAT	GPM	MBh	LAT	GPM	MBh	LAT
10	TWE120K*A, TWE120K*B	3200	40	29.3	284.7	122.0	17.6	256.8	114.0	11.7	228.6	106.0
			60	25.0	242.6	130.0	14.7	215.2	122.0	9.6	186.9	114.0
			80	20.6	200.6	138.0	11.9	173.6	130.0	7.4	144.3	122.0
		4000	40	33.4	324.1	115.0	19.9	291.0	107.0	13.3	258.2	99.0
			60	28.4	275.8	124.0	16.7	243.6	116.0	10.8	211.0	109.0
			80	23.4	227.7	132.0	13.4	196.2	125.0	8.4	163.2	118.0
		4800	40	36.9	358.3	109.0	22.0	320.7	102.0	14.6	283.7	94.0
			60	31.4	304.7	118.0	18.4	268.1	111.0	11.9	231.6	104.0
			80	25.9	251.3	128.0	14.8	215.6	121.0	9.2	179.4	114.0
15	TWE180K*B	4800	40	41.8	406.0	118.0	25.6	373.4	112.0	17.5	341.0	105.0
			60	35.8	347.5	127.0	21.6	315.4	121.0	14.6	283.4	114.0
			80	29.8	289.1	135.0	17.7	257.6	129.0	11.6	225.7	123.0
		6000	40	7.5	461.4	111.0	29.0	423.0	105.0	19.8	385.0	99.0
			60	40.6	394.6	121.0	24.5	356.9	115.0	16.4	319.6	109.0
			80	33.8	327.9	130.0	19.9	291.0	125.0	13.1	254.3	119.0
		7200	40	52.5	510.4	105.0	32.0	466.7	100.0	21.8	423.8	94.0
			60	44.9	436.3	116.0	27.0	393.5	110.0	18.0	351.4	105.0
			80	37.3	362.2	126.0	22.0	320.5	121.0	14.3	279.5	116.0
20	TWE2404K	6400	40	55.2	536.5	117.0	34.1	497.8	112.0	23.6	459.4	106.0
			60	47.4	460.2	126.0	28.9	422.1	121.0	19.7	384.2	115.0
			80	39.5	384.0	135.0	23.8	346.5	130.0	15.9	308.9	124.0
		8000	40	62.7	609.2	110.0	38.6	563.8	105.0	26.6	518.8	100.0
			60	53.8	522.2	120.0	32.7	477.6	115.0	22.2	433.3	110.0
			80	44.8	435.4	130.0	26.8	391.5	125.0	17.9	347.9	120.0
		9600	40	69.4	673.9	105.0	42.7	622.3	100.0	29.3	571.5	95.0
			60	59.4	577.4	115.0	36.1	526.8	111.0	24.5	476.7	106.0
			80	49.5	481.0	126.0	29.6	431.4	121.0	19.6	382.6	117.0

Table 51. Hot water heating coil capacity - air handler (60Hz) (continued)

Tons	Unit Model No.	Airflow (CFM)	Enter Air Temp (° F)	Entering Water Temperature (°F)								
				210								
				Water Temperature Drop (°F)								
				20			30			40		
				GPM	MBh	LAT	GPM	MBh	LAT	GPM	MBh	LAT
5	TWE060K*A, TWE060K*B	1600	40	13.9	134.3	117.0	8.6	124.8	112.0	6.0	115.8	107.0
			60	12.0	116.3	127.0	7.4	107.1	122.0	5.1	98.3	117.0
			80	10.2	98.4	137.0	6.1	89.5	132.0	4.2	80.9	127.0
		2000	40	15.7	152.0	110.0	9.7	140.9	105.0	6.7	130.2	100.0
			60	13.6	131.6	121.0	8.3	120.7	116.0	5.7	110.5	111.0
			80	11.5	111.2	131.0	6.9	100.7	126.0	4.7	90.7	122.0
		2400	40	17.3	167.7	104.0	10.6	155.0	99.0	7.4	142.9	95.0
			60	15.0	145.1	116.0	9.1	132.8	111.0	6.2	121.0	106.0
			80	12.6	122.6	127.0	7.6	110.6	122.0	5.1	99.3	118.0
6	TWE072K*B	1920	40	19.5	190.3	131.8	12.0	175.7	124.7	8.5	165.9	120.0
			60	16.8	164.0	139.1	10.4	152.3	133.4	7.3	142.5	128.7
			80	14.5	141.5	148.2	8.8	128.8	142.1	5.9	115.2	135.5
		2400	40	21.6	209.2	120.0	13.4	195.7	115.0	9.4	182.7	110.0
			60	18.7	181.5	130.0	11.6	168.3	125.0	8.0	155.6	120.0
			80	15.9	153.9	139.0	9.7	141.0	134.0	6.6	128.6	129.0
		2880	40	23.9	233.3	115.0	14.7	215.2	109.2	10.3	201.1	104.6
			60	20.6	201.1	124.6	12.7	185.9	119.8	8.8	171.8	115.2
			80	17.7	172.8	135.5	10.6	155.2	129.9	7.1	138.6	124.6
7.5	TWE090K*A, TWE090K*B	2400	40	21.6	209.2	120.0	13.4	195.7	115.0	9.4	182.7	110.0
			60	18.7	181.5	130.0	11.6	168.3	125.0	8.0	155.6	120.0
			80	15.9	153.9	139.0	9.7	141.0	134.0	6.6	28.6	129.0
		3000	40	24.5	237.4	113.0	15.2	221.5	108.0	10.6	206.2	103.0
			60	21.2	205.8	123.0	13.1	190.3	118.0	9.0	175.4	114.0
			80	18.0	174.4	134.0	10.9	159.2	129.0	7.4	144.7	124.0
		3600	40	27.1	262.3	107.0	16.8	244.1	102.0	11.7	226.8	98.0
			60	23.4	227.3	118.0	14.4	209.6	114.0	9.9	192.6	109.0
			80	19.8	192.4	129.0	12.0	175.2	125.0	8.2	158.7	121.0
10	TWE120K*A, TWE120K*B	3200	40	31.7	307.4	129.0	19.2	279.9	121.0	13.0	252.6	113.0
			60	27.4	265.1	136.0	16.4	238.2	129.0	10.9	211.0	121.0
			80	23.0	223.0	144.0	13.5	196.5	137.0	8.7	169.1	129.0
		4000	40	36.1	350.2	121.0	21.8	317.6	113.0	14.7	285.5	106.0
			60	31.1	301.7	130.0	18.5	269.9	122.0	12.3	238.2	115.0
			80	26.1	253.4	138.0	15.3	222.3	131.0	9.8	190.8	124.0
		4800	40	40.0	387.4	114.0	24.1	350.3	107.0	16.2	313.9	100.0
			60	34.4	333.6	124.0	20.4	297.3	117.0	13.5	261.7	110.0
			80	28.9	279.9	134.0	16.8	244.6	127.0	10.8	209.5	120.0
15	TWE180K*B	4800	40	45.1	437.0	124.0	27.8	404.7	118.0	19.2	372.9	112.0
			60	39.0	378.3	133.0	23.8	346.6	127.0	16.2	315.2	120.0
			80	33.0	319.8	141.0	19.8	288.6	135.0	13.3	257.5	129.0
		6000	40	51.3	496.8	116.0	31.5	458.9	110.0	21.7	421.5	105.0
			60	44.4	429.9	126.0	27.0	392.6	120.0	18.3	355.8	115.0
			80	37.5	363.0	136.0	22.4	326.5	130.0	14.9	290.3	125.0
		7200	40	56.7	549.8	110.0	34.8	506.7	105.0	23.9	464.3	99.0
			60	49.1	475.5	121.0	29.8	433.1	115.0	20.2	391.5	110.0
			80	41.4	401.3	131.0	24.7	359.8	126.0	16.4	319.0	121.0

Table 51. Hot water heating coil capacity - air handler (60Hz) (continued)

Tons	Unit Model No.	Airflow (CFM)	Enter Air Temp (° F)	Entering Water Temperature (°F)								
				210								
				Water Temperature Drop (°F)								
				20			30			40		
				GPM	MBh	LAT	GPM	MBh	LAT	GPM	MBh	LAT
20	TWE2404K	6400	40	59.5	576.5	123.0	37.0	538.3	118.0	25.8	500.5	112.0
			60	51.6	500.0	132.0	31.8	462.4	127.0	21.9	425.0	121.0
			80	43.7	423.7	141.0	26.6	386.6	136.0	18.0	349.7	130.0
		8000	40	67.6	654.9	115.0	41.9	610.0	110.0	29.1	565.7	105.0
			60	58.6	567.8	125.0	36.0	523.6	120.0	24.7	479.9	115.0
			80	49.6	480.7	135.0	30.0	437.3	130.0	20.3	394.2	125.0
		9600	40	74.8	724.6	110.0	46.3	673.8	105.0	32.1	623.6	100.0
			60	64.8	628.0	120.0	39.7	578.0	115.0	27.2	528.4	111.0
			80	54.8	531.4	131.0	33.1	482.2	126.0	22.3	433.5	122.0

Notes:

1. SZVAV/2-Speed VFD available for 6 to 25 ton only.
2. GPM = Gallons Per Minute
3. MBh Capacity: BTU/HR/1000
4. LAT = Leaving Air Temperature (°F)

Table 52. Hot water heating coil - water side pressure drop @ 180°F entering water temperature - air handler (60Hz)

Tons	Unit Model No.	Gallons Per Minute (GPM)																		
		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38
		Pressure Drop (Ft. of Water)																		
5	TWE060K*A,B	0.02	0.07	0.15	0.26	0.40	0.56	0.75	0.97	1.22	1.49	1.78	-	-	-	-	-	-	-	-
6	TWE072K*B	-	-	0.06	0.11	0.16	0.23	0.30	0.39	0.48	0.58	0.70	0.82	0.95	1.09	1.24	1.40	1.57	-	-
7.5	TWE090K*A,B	-	-	0.06	0.11	0.16	0.23	0.30	0.39	0.48	0.58	0.70	0.82	0.95	1.09	1.24	1.40	1.57	-	-
10	TWE120K*A,B	-	-	-	0.06	0.09	0.13	0.17	0.22	0.27	0.33	0.39	0.46	0.54	0.62	0.70	0.79	0.89	0.99	1.10
15	TWE180K*B	-	-	-	-	0.11	0.15	0.20	0.26	0.32	0.39	0.47	0.55	0.64	0.73	0.83	0.94	1.05	1.17	1.29
20	TWE240K*B	-	-	-	-	-	0.17	0.23	0.30	0.37	0.45	0.53	0.63	0.72	0.83	0.94	1.06	1.19	1.32	1.46
Tons	Unit Model No.	Gallons Per Minute (GPM)																		
		40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76
		Pressure Drop (Ft. of Water)																		
5	TWE060K*A,B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	TWE072K*B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.5	TWE090K*A,B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	TWE120K*A,B	1.21	1.32	1.44	1.57	1.70	1.84	-	-	-	-	-	-	-	-	-	-	-	-	-
15	TWE180K*B	1.42	1.56	1.70	1.85	2.00	2.16	2.33	2.50	2.67	2.86	3.04	3.24	3.44	3.64	3.85	4.07	-	-	-
20	TWE240K*B	1.61	1.76	1.92	2.09	2.26	2.44	2.63	2.82	3.02	3.22	3.43	3.65	3.87	4.10	4.34	4.58	4.83	5.08	5.34

Note: SZVAV/2-Speed VFD available for 6 to 25 ton only.

Zone Controls

Zone Sensors

Zone Sensors are the building occupant's comfort control devices. Zone sensors are required for SZVAV applications. The following zone sensor options are available for units with Symbio 700 control.

Manual Changeover	Heat, Cool or Off System Switch. Fan Auto or Off Switch. One temperature setpoint lever.
Manual/Automatic Changeover	Auto, Heat, Cool or Off System Switch. Fan Auto or Off Switch. Two temperature setpoint levers.
Manual/Automatic Changeover	Auto, Heat, Cool or Off System Switch. Fan Auto or Off Switch. Two temperature setpoint levers.
Integrated Comfort™ System	Sensor(s) available with optional temperature adjustment and override buttons to provide central control through a Trane Integrated Comfort™ system.
Remote Sensor	Sensor(s) available for all zone sensors to provide remote sensing capabilities.

Conventional Thermostats

Note: *All thermostats may be used with Symbio 700 units.*

Non-Programmable Thermostats	
TCONT102* (1H/1C) Common terminal not required	Auto-changeover Backlit Display and Keys Filter Reminder Keypad Lock
TCONT103* (2H/1C) Common terminal required	Auto-changeover Backlit Display & Keys Filter Reminder Keypad Lock Outdoor Temp Sensor Available
TCONT402* (3H/2C) Common terminal required	Auto-changeover Backlit Display & Keys Filter Reminder Keypad Lock Outdoor Temp Sensor Included
Programmable Thermostats	
TCONT202* (1H/1C) Common terminal preferred, not required	5/2 or 5/1/1 Programming Actual and Setpoint temps displayed simultaneously
TCONT203* (4H/2C) Common terminal preferred, not required	5/2 or 5/1/1 Programming Actual and Setpoint temps displayed simultaneously
TCONT302* (4H/2C) Common terminal preferred, not required	Interactive touchscreen Large display Real time clock
TCONT303* (4H/2C) Humidity Sensor Common terminal preferred, not required	Interactive touchscreen Large display Real time clock Built-in humidity sensor

Electrical Data

Heat Pump Condenser

Table 53. Electrical characteristics — compressor and condenser fan motors — heat pumps — 60Hz

Tons	Unit Model Number	Compressor Motors						Condenser Fan Motor				
		Volts	Phase	Compressor 1 Amps		Compressor 2 Amps		No.	Volts	Phase	Amps	
				RLA	LRA	RLA	LRA				FLA (Ea.)	LRA (Ea.)
6	TWA072K3A	208-230	3	25.8	166	N/A	N/A	1	208-230	3	2.3	8.4
	TWA072K4A	460	3	10.2	75	N/A	N/A	1	460	3	1.1	4.2
	TWA072KWA	575	3	8.3	54	N/A	N/A	1	575	3	1.0	3.6
6	TWA072K3D	208-230	3	14.8	103	13.2	98	1	208-230	3	2.3	8.4
	TWA072K4D	460	3	6.7	50	5.9	44	1	460	3	1.1	4.2
	TWA072KWD	575	3	5.9	41	5.2	27	1	575	3	1.0	3.6
7.5	TWA090K3A	208-230	3	27.1	179	N/A	N/A	1	208-230	3	2.3	8.4
	TWA090K4A	460	3	11.3	95	N/A	N/A	1	460	3	1.1	4.2
	TWA090KWA	575	3	10.6	65	N/A	N/A	1	575	3	1.0	3.6
7.5	TWA090K3D	208-230	3	13.8	120	13.8	120	1	208-230	3	2.3	8.4
	TWA090K4D	460	3	7.0	49	7.0	49	1	460	3	1.1	4.2
	TWA090KWD	575	3	6.7	41	6.7	41	1	575	3	1.0	3.6
10	TWA120K3A	208-230	3	31.1	255	N/A	N/A	1	208-230	3	4.3	19.4
	TWA120K4A	460	3	16.2	123	N/A	N/A	1	460	3	2.2	10.1
	TWA120KWA	575	3	13.2	94	N/A	N/A	1	575	3	1.8	8.0
10	TWA120K3D	208-230	3	14.6	150	14.6	150	1	208-230	3	4.3	19.4
	TWA120K4D	460	3	7.9	58	7.9	58	1	460	3	2.2	10.1
	TWA120KWD	575	3	6.7	48	6.7	48	1	575	3	1.8	8.0
15	TWA180K3D	208-230	3	28.5	179	28.5	179	2	208-230	3	4.3	19.4
	TWA180K4D	460	3	11.9	103	11.9	103	2	460	3	2.2	10.1
	TWA180KWD	575	3	10.4	78	10.4	78	2	575	3	1.8	8.0
20	TWA240K3D	208-230	3	36.8	255	36.8	255	2	208-230	3	4.3	19.4
	TWA240K4D	460	3	17.8	140	17.8	140	2	460	3	2.2	10.1
	TWA240KWD	575	3	13.6	108	13.6	108	2	575	3	1.8	8.0

Note: Electrical characteristics reflect nameplate values and are calculated in accordance with cULus specifications.

Table 54. Unit wiring — heat pumps — 60Hz

Tons	Unit Model Number	Volts	Minimum Circuit Ampacity	Maximum Fuse or Circuit Breaker Size
6	TWA072K3A	187-253	36	60
	TWA072K4A	414-506	15	25
	TWA072KWA	518-632	13	20
6	TWA072K3D	187-253	35	45
	TWA072K4D	414-506	17	20
	TWA072KWD	518-632	15	20
7.5	TWA090K3A	187-253	38	60
	TWA090K4A	414-506	17	25
	TWA090KWA	518-632	16	25
7.5	TWA090K3D	187-253	35	45
	TWA090K4D	414-506	18	20
	TWA090KWD	518-632	18	20

Table 54. Unit wiring — heat pumps — 60Hz (continued)

Tons	Unit Model Number	Volts	Minimum Circuit Ampacity	Maximum Fuse or Circuit Breaker Size
10	TWA120K3A	187-253	45	70
	TWA120K4A	414-506	24	35
	TWA120KWA	518-632	20	30
10	TWA120K3D	187-253	39	50
	TWA120K4D	414-506	21	25
	TWA120KWD	518-632	18	20
15	TWA180K3D	187-253	74	100
	TWA180K4D	414-506	33	40
	TWA180KWD	518-632	28	35
20	TWA240K3D	187-253	93	125
	TWA240K4D	414-506	46	60
	TWA240KWD	518-632	36	45

Air Handler

Table 55. Voltage operating range (all air handlers)

Model Number: Digit 8	Electrical Characteristics	Unit Operating Voltage Range
1	208-230/60/1	187-253
3	208-230/60/3	187-253
4	460/60/3	414-506
W	575/60/3	518-632

Table 56. Electrical characteristics — 5 to 20 ton standard motor — 60 Hz constant volume air handler

Tons	Unit Model Number	Standard Evaporator Fan Motor							
		No.	Volts	Phase	HP	Amps		MCA	MOP
						FLA	LRA		
5	TWE060K1A/B	1	208-230	1	0.75	6.0	43.0	8	15
	TWE060K3A/B	1	208-230	3	0.75	2.8	13.0	4	15
	TWE060K4A/B	1	460	3	0.75	1.4	6.0	2	15
	TWE060KWA	1	575	3	0.75	1.4	5.0	2	15
7.5	TWE090K1A/B	1	208-230	1	1.5	7.5	53.0	10	15
10	TWE120K1A/B	1	208-230	1	2	10.5	48.0	14	20

Notes:

1. For additional information contact product support.

2. (TWE072K3B, TWE090K3A/B, TWE120K3A/B, TWE150K3B and TWE180K3B are field wired for 460V.

Table 57. Electrical characteristics — 5 to 20 ton high static motor — 60 Hz constant volume air handler

Tons	Unit Model Number	High Static Evaporator Fan Motor							
		No.	Volts	Phase	HP	Amps		MCA	MOP
						FLA	LRA		
5	TWE060K1A/B	1	208-230	1	1.5	7.5	53.0	10	15
	TWE060K3A/B	1	208-230	3	1.5	6.4	33.0	8	15
	TWE060K4A/B	1	460	3	1.5	3.0	17.0	4	15
	TWE060KWA	1	575	3	1.5	1.9	14.0	3	15
7.5	TWE090K1A/B	1	208-230	1	2	10.5	48.0	14	20

Table 58. Electrical characteristics — standard and oversized motors — 6 to 20 ton SZVAV and 2-Speed VFD air handler — 60 Hz

Tons	Unit Model Number	Standard Evaporator Fan Motor								Oversized Evaporator Fan Motor							
		No.	Volts	Phase	HP	Amps		MCA	MOP	No.	Volts	Phase	HP	Amps		MCA	MOP
						FLA	LRA							FLA	LRA		
6	TWE072K3B	1	208-230	3	2	6.8	54.0	9	15	1	208-230	3	3	10.0	74.0	13	20
	TWE072K4B	1	460	3	2	3.3	27.2	5	15	1	460	3	3	4.9	37.0	7	15
	TWE072KWB	1	575	3	2	2.5	18.0	4	15	1	575	3	3	3.9	35.0	5	15
7.5	TWE090K3A/B	1	208-230	3	2	6.8	54.0	9	15	1	208-230	3	3	10.0	74.0	13	20
	TWE090K4A/B	1	460	3	2	3.3	27.2	5	15	1	460	3	3	4.9	37.0	7	15
	TWE090KWA/B	1	575	3	2	2.5	18.0	4	15	1	575	3	3	3.9	35.0	5	15
10	TWE120K3A/B	1	208-230	3	2	6.8	54.0	9	15	1	208-230	3	3	10.0	74.0	13	20
	TWE120K4A/B	1	460	3	2	3.3	27.0	5	15	1	460	3	3	4.9	37.0	7	15
	TWE120KWA/B	1	575	3	2	2.5	18.0	4	15	1	575	3	3	3.9	35.0	5	15
15	TWE180K3B	1	208-230	3	3	10.0	74.0	13	20	1	208-230	3	5	15.1	105.0	19	30
	TWE180K4B	1	460	3	3	4.9	37.0	7	15	1	460	3	5	7.1	52.0	9	15
	TWE180KWB	1	575	3	3	3.9	35.0	5	15	1	575	3	5	5.7	46.0	8	15
20	TWE240K3B	1	208-230	3	5	15.1	105.0	19	30	1	208-230	3	7.5	22.8	141.0	29	50
	TWE240K4B	1	460	3	5	7.1	52.0	9	15	1	460	3	7.5	10.0	62.0	13	20
	TWE240KWB	1	575	3	5	5.7	46.0	8	15	1	575	3	7.5	8.2	60.0	11	15

Note: For additional information contact product support.

Table 59. Unit wiring with electric heat (single point connection) — 5 to 20 ton constant volume air handlers — 60 Hz

Tons	Used With	Heater Model Number	Heater kW Rating	Unit Power Supply	Control Stages	Standard Evap Motor		High Static Evap Motor	
						MCA	MOP	MCA	MOP
5	TWE060K1A/B	BAYHTRP106*	4.33	208/1/60	1	34	35	36	40
		BAYHTRS112*	8.65		1	60	60	62	70
		BAYHTRT117*	12.98		1	86	90	88	90
		BAYHTRS123*	17.31		2	112	125	114	125
5	TWE060K1A/B	BAYHTRP106*	5.76	230/1/60	1	38	40	40	40
		BAYHTRS112*	11.52		1	68	70	70	70
		BAYHTRT117*	17.28		1	98	100	100	100
		BAYHTRS123*	23.04		2	128	150	130	150
5	TWE060K3A/B	BAYHTRP305*	3.76	208/3/60	1	17	20	22	25
		BAYHTRS310*	7.48		1	30	30	34	35
		BAYHTRS315*	11.24		1	43	45	48	50
		BAYHTRP325*	18.72		2	69	70	74	80
5	TWE060K3A/B	BAYHTRP305*	5	230/3/60	1	19	20	24	25
		BAYHTRS310*	9.96		1	34	35	38	40
		BAYHTRS315*	14.96		1	49	50	54	60
		BAYHTRP325*	24.92		2	79	80	84	90
5	TWE060K4A/B	BAYHTRP405*	5	460/3/60	1	10	15	12	15
		BAYHTRS410*	9.96		1	17	20	19	20
		BAYHTRS415*	14.96		1	25	25	27	30
		BAYHTRP425*	24.92		2	40	40	42	45
5	TWE060KWA	BAYHTRPW05*	5	575/3/60	1	8	15	9	15
		BAYHTRSW10*	9.96		1	14	15	15	15
		BAYHTRSW15*	14.96		1	20	20	21	25
		BAYHTRPW25*	24.92		2	32	35	33	35

Table 59. Unit wiring with electric heat (single point connection) — 5 to 20 ton constant volume air handlers — 60 Hz (continued)

Tons	Used With	Heater Model Number	Heater kW Rating	Unit Power Supply	Control Stages	Standard Evap Motor		High Static Evap Motor	
						MCA	MOP	MCA	MOP
7.5	TWE090K1A/B	BAYHTRP106*	4.33	208/1/60	1	36	40	40	40
		BAYHTRS112*	8.65		1	62	70	66	70
		BAYHTRT117*	12.98		1	88	90	92	100
		BAYHTRS123*	17.31		2	114	125	118	125
		BAYHTRP129*	21.63		2	140	150	144	150
7.5	TWE090K1A/B	BAYHTRP106*	5.76	230/1/60	1	40	40	44	45
		BAYHTRS112*	11.52		1	70	70	74	80
		BAYHTRT117*	17.28		1	100	100	104	110
		BAYHTRS123*	23.04		2	130	150	134	150
		BAYHTRP129*	28.8		2	160	175	164	175
10	TWE120K1A/B	BAYHTRP106*	4.33	208/1/60	1	40	40	N/A	N/A
		BAYHTRS112*	8.65		1	66	70	N/A	N/A
		BAYHTRT117*	12.98		1	92	100	N/A	N/A
		BAYHTRS123*	17.31		2	118	125	N/A	N/A
		BAYHTRP129*	21.63		2	144	150	N/A	N/A
10	TWE120K1A/B	BAYHTRP106*	5.76	230/1/60	1	44	45	N/A	N/A
		BAYHTRS112*	11.52		1	74	80	N/A	N/A
		BAYHTRT117*	17.28		1	104	110	N/A	N/A
		BAYHTRS123*	23.04		2	134	150	N/A	N/A
		BAYHTRP129*	28.8		2	164	175	N/A	N/A

Notes:

1. kW ratings are at: 208/240V for 208-230V air handlers; 480V for 460V air handlers; 600V for 575V air handlers. For other than rated voltage, capacity = (voltage/rated voltage)^2 x rated capacity.
2. Any power supply and circuits must be wired and protected in accordance with local codes.
3. Electric heat not available with 380/60 Hz models.

Table 60. Unit wiring with electric heat (single point connection) — 6 to 20 ton SZVAV and 2-Speed VFD air handlers — 60 Hz

Tons	Used With	Heater Model Number	Heater KW Rating	Unit Power Supply	Control Stages	MCA	Maximum Fuse or Circuit Breaker Size
6	TWE072K3*****BC0, D0	BAYHTRP305*	3.76	208/3/60	1	22	25
		BAYHTRS310*	7.48		1	35	35
		BAYHTRS315*	11.24		1	48	50
		BAYHTRP325*	18.72		2	74	80
6	TWE072K3*****BC0, D0	BAYHTRP305*	5.00	230/3/60	1	24	25
		BAYHTRS310*	9.96		1	39	40
		BAYHTRS315*	14.96		1	54	60
		BAYHTRP325*	24.92		2	84	90
6	TWE072K3*****BC4, D4	BAYHTRP305*	3.76	208/3/60	1	26	30
		BAYHTRS310*	7.48		1	39	40
		BAYHTRS315*	11.24		1	52	60
		BAYHTRP325*	18.72		2	78	80
6	TWE072K3*****BC4, D4	BAYHTRP305*	5.00	230/3/60	1	28	30
		BAYHTRS310*	9.96		1	43	45
		BAYHTRS315*	14.96		1	58	60
		BAYHTRP325*	24.92		2	88	90

Table 60. Unit wiring with electric heat (single point connection) — 6 to 20 ton SZVAV and 2-Speed VFD air handlers — 60 Hz (continued)

Tons	Used With	Heater Model Number	Heater KW Rating	Unit Power Supply	Control Stages	MCA	Maximum Fuse or Circuit Breaker Size
6	TWE072K4*****BC0, D0	BAYHTRP405*	5.00	460/3/60	1	12	15
		BAYHTRS410*	9.96		1	20	20
		BAYHTRS415*	14.96		1	27	30
		BAYHTRP425*	24.92		2	42	45
6	TWE072K4*****BC4, D4	BAYHTRP405*	5.00	460/3/60	1	14	15
		BAYHTRS410*	9.96		1	22	25
		BAYHTRS415*	14.96		1	29	30
		BAYHTRP425*	24.92		2	44	45
6	TWE072KW*****BC0, D0	BAYHTRPW05*	5.00	575/3/60	1	10	15
		BAYHTRSW10*	9.96		1	16	20
		BAYHTRSW15*	14.96		1	22	25
		BAYHTRPW25*	24.92		2	34	35
6	TWE072KW*****BC4, D4	BAYHTRPW05*	5.00	575/3/60	1	11	15
		BAYHTRSW10*	9.96		1	17	20
		BAYHTRSW15*	14.96		1	23	25
		BAYHTRPW25*	24.92		2	35	35
7.5	TWE090K3*****BC0, D0	BAYHTRP305*	3.76	208/3/60	1	22	25
		BAYHTRS310*	7.48		1	35	35
		BAYHTRS315*	11.24		1	48	50
		BAYHTRP325*	18.72		2	74	80
		BAYHTRP335*	26.20		2	100	100
7.5	TWE090K3*****BC0, D0	BAYHTRP305*	5.00	230/3/60	1	24	25
		BAYHTRS310*	9.96		1	39	40
		BAYHTRS315*	14.96		1	54	60
		BAYHTRP325*	24.92		2	84	90
		BAYHTRP335*	34.88		2	114	125
7.5	TWE090K3*****BC4, D4	BAYHTRP305*	3.76	208/3/60	1	26	30
		BAYHTRS310*	7.48		1	39	40
		BAYHTRS315*	11.24		1	52	60
		BAYHTRP325*	18.72		2	78	80
		BAYHTRP335*	26.20		2	104	110
7.5	TWE090K3*****BC4, D4	BAYHTRP305*	5.00	230/3/60	1	28	30
		BAYHTRS310*	9.96		1	43	45
		BAYHTRS315*	14.96		1	58	60
		BAYHTRP325*	24.92		2	88	90
		BAYHTRP335*	34.88		2	118	125
7.5	TWE090K4*****BC0, D0	BAYHTRP405*	5.00	460/3/60	1	12	15
		BAYHTRS410*	9.96		1	20	20
		BAYHTRS415*	14.96		1	27	30
		BAYHTRP425*	24.92		2	42	45
		BAYHTRP435*	34.88		2	57	60
7.5	TWE090K4*****BC4, D4	BAYHTRP405*	5.00	460/3/60	1	14	15
		BAYHTRS410*	9.96		1	22	25
		BAYHTRS415*	14.96		1	29	30
		BAYHTRP425*	24.92		2	44	45
		BAYHTRP435*	34.88		2	59	60

Table 60. Unit wiring with electric heat (single point connection) — 6 to 20 ton SZVAV and 2-Speed VFD air handlers — 60 Hz (continued)

Tons	Used With	Heater Model Number	Heater KW Rating	Unit Power Supply	Control Stages	MCA	Maximum Fuse or Circuit Breaker Size
7.5	TWE090KW*****BC0, D0	BAYHTRPW05*	5.00	575/3/60	1	10	15
		BAYHTRSW10*	9.96		1	16	20
		BAYHTRSW15*	14.96		1	22	25
		BAYHTRPW25*	24.92		2	34	35
		BAYHTRPW35*	34.88		2	46	50
7.5	TWE090KW*****BC4, D4	BAYHTRPW05*	5.00	575/3/60	1	11	15
		BAYHTRSW10*	9.96		1	17	20
		BAYHTRSW15*	14.96		1	23	25
		BAYHTRPW25*	24.92		2	35	35
		BAYHTRPW35*	34.88		2	47	50
10	TWE120K3*****BC0, D0	BAYHTRP305*	3.76	208/3/60	1	22	25
		BAYHTRS310*	7.48		1	35	35
		BAYHTRS315*	11.24		1	48	50
		BAYHTRP325*	18.72		2	74	80
		BAYHTRP335*	26.20		2	100	100
10	TWE120K3*****BC0, D0	BAYHTRP305*	5.00	230/3/60	1	24	25
		BAYHTRS310*	9.96		1	39	40
		BAYHTRS315*	14.96		1	54	60
		BAYHTRP325*	24.92		2	84	90
		BAYHTRP335*	34.88		2	114	125
10	TWE120K3*****BC4, D4	BAYHTRP305*	3.76	208/3/60	1	26	30
		BAYHTRS310*	7.48		1	39	40
		BAYHTRS315*	11.24		1	52	60
		BAYHTRP325*	18.72		2	78	80
		BAYHTRP335*	26.20		2	104	110
10	TWE120K3*****BC4, D4	BAYHTRP305*	5.00	230/3/60	1	28	30
		BAYHTRS310*	9.96		1	43	45
		BAYHTRS315*	14.96		1	58	60
		BAYHTRP325*	24.92		2	88	90
		BAYHTRP335*	34.88		2	118	125
10	TWE120K4*****BC0, D0	BAYHTRP405*	5.00	460/3/60	1	12	15
		BAYHTRS410*	9.96		1	20	20
		BAYHTRS415*	14.96		1	27	30
		BAYHTRP425*	24.92		2	42	45
		BAYHTRP435*	34.88		2	57	60
10	TWE120K4*****BC4, D4	BAYHTRP405*	5.00	460/3/60	1	14	15
		BAYHTRS410*	9.96		1	22	25
		BAYHTRS415*	14.96		1	29	30
		BAYHTRP425*	24.92		2	44	45
		BAYHTRP435*	34.88		2	59	60
10	TWE120KW*****BC0, D0	BAYHTRPW05*	5.00	575/3/60	1	10	15
		BAYHTRSW10*	9.96		1	16	20
		BAYHTRSW15*	14.96		1	22	25
		BAYHTRPW25*	24.92		2	34	35
		BAYHTRPW35*	34.88		2	46	50

Table 60. Unit wiring with electric heat (single point connection) — 6 to 20 ton SZVAV and 2-Speed VFD air handlers — 60 Hz (continued)

Tons	Used With	Heater Model Number	Heater KW Rating	Unit Power Supply	Control Stages	MCA	Maximum Fuse or Circuit Breaker Size
10	TWE120KW*****BC4, D4	BAYHTRPW05*	5.00	575/3/60	1	11	15
		BAYHTRSW10*	9.96		1	17	20
		BAYHTRSW15*	14.96		1	23	25
		BAYHTRPW25*	24.92		2	35	35
		BAYHTRPW35*	34.88		2	47	50
15	TWE180K3*****BC0, D0	BAYHTRT310*	7.51	208/3/60	1	39	40
		BAYHTRR320*	14.96		1	65	70
		BAYHTRR330*	22.47		2	91	100
		BAYHTRR350*	37.44		2	143	150
15	TWE180K3*****BC0, D0	BAYHTRT310*	10.00	230/3/60	1	43	45
		BAYHTRR320*	19.92		1	73	80
		BAYHTRR330*	29.92		2	103	110
		BAYHTRR350*	49.84		2	163	175
15	TWE180K3*****BC4, D4	BAYHTRT310*	7.51	208/3/60	1	45	50
		BAYHTRR320*	14.96		1	71	80
		BAYHTRR330*	22.47		2	97	100
		BAYHTRR350*	37.44		2	149	150
15	TWE180K3*****BC4, D4	BAYHTRT310*	10.00	230/3/60	1	49	50
		BAYHTRR320*	19.92		1	79	80
		BAYHTRR330*	29.92		2	109	110
		BAYHTRR350*	49.84		2	169	175
15	TWE180K4*****BC0, D0	BAYHTRT410*	10.00	460/3/60	1	22	25
		BAYHTRR420*	19.92		1	37	40
		BAYHTRR430*	29.92		2	52	60
		BAYHTRR450*	49.84		2	82	90
15	TWE180K4*****BC4, D4	BAYHTRT410*	10.00	460/3/60	1	24	25
		BAYHTRR420*	19.92		1	39	40
		BAYHTRR430*	29.92		2	54	60
		BAYHTRR450*	49.84		2	84	90
15	TWE180KW*****BC0, D0	BAYHTRTW10*	10.00	575/3/60	1	17	20
		BAYHTRRW20*	19.92		1	29	30
		BAYHTRRW30*	29.92		2	41	45
		BAYHTRRW50*	49.84		2	65	70
15	TWE180KW*****BC4, D4	BAYHTRTW10*	10.00	575/3/60	1	20	20
		BAYHTRRW20*	19.92		1	32	35
		BAYHTRRW30*	29.92		2	44	45
		BAYHTRRW50*	49.84		2	68	70
20	TWE240K3*****BC0, D0	BAYHTRT310*	7.51	208/3/60	1	45	50
		BAYHTRR320*	14.96		1	71	80
		BAYHTRR330*	22.47		2	97	100
		BAYHTRR350*	37.44		2	149	150
20	TWE240K3*****BC0, D0	BAYHTRT310*	10.00	230/3/60	1	49	50
		BAYHTRR320*	19.92		1	79	80
		BAYHTRR330*	29.92		2	109	110
		BAYHTRR350*	49.84		2	169	175
20	TWE240K3*****BC4, D4	BAYHTRT310*	7.51	208/3/60	1	55	70
		BAYHTRR320*	14.96		1	81	90
		BAYHTRR330*	22.47		2	107	110
		BAYHTRR350*	37.44		2	159	175

Table 60. Unit wiring with electric heat (single point connection) — 6 to 20 ton SZVAV and 2-Speed VFD air handlers — 60 Hz (continued)

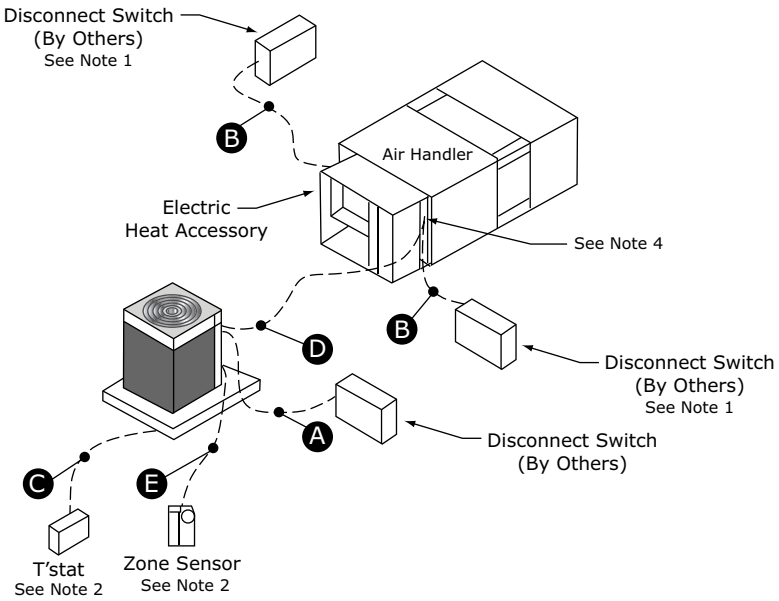
Tons	Used With	Heater Model Number	Heater KW Rating	Unit Power Supply	Control Stages	MCA	Maximum Fuse or Circuit Breaker Size
20	TWE240K3*****BC4, D4	BAYHTRT310*	10.00	230/3/60	1	59	70
		BAYHTRR320*	19.92		1	89	90
		BAYHTRR330*	29.92		2	119	125
		BAYHTRR350*	49.84		2	179	200
20	TWE240K4*****BC0, D0	BAYHTRT410*	10.00	460/3/60	1	24	25
		BAYHTRR420*	19.92		1	39	40
		BAYHTRR430*	29.92		2	54	60
		BAYHTRR450*	49.84		2	84	90
20	TWE240K4*****BC4, D4	BAYHTRT410*	10.00	460/3/60	1	28	30
		BAYHTRR420*	19.92		1	43	45
		BAYHTRR430*	29.92		2	58	60
		BAYHTRR450*	49.84		2	88	90
20	TWE240KW*****BC0, D0	BAYHTRTW10*	10.00	575/3/60	1	20	20
		BAYHTRRW20*	19.92		1	32	35
		BAYHTRRW30*	29.92		2	44	45
		BAYHTRRW50*	49.84		2	68	70
20	TWE240KW*****BC4, D4	BAYHTRTW10*	10.00	575/3/60	1	23	25
		BAYHTRRW20*	19.92		1	35	35
		BAYHTRRW30*	29.92		2	47	50
		BAYHTRRW50*	49.84		2	71	80

Jobsite Connections

Symbio™ Controls

Wiring shown with dashed lines is to be furnished and installed by the customer. All customer supplied wiring must be copper only and must conform to NEC and local electrical codes. Codes may require line of sight between disconnect switch and unit.

Figure 17. Symbio™ jobsite connections



Power Wires

A. 3 wires, line voltage for 3 phase, 1 grounding wire**

B. 3 wires, line voltage for 3 phase, (2 wires for single phase) 1 grounding wire**

Control Wires

C. Heat Pump thermostat: 6 to 9 wires depending on T'stat options and stages of cooling and heating

D. Wiring between indoor and outdoor unit: 5 to 11 wires depending on unit control options*

E. Zone Sensor: 4 to 7 wires depending on zone sensor model*

Communication signal wires require shielded twisted pairs.

Use Comlink cable with a PVC jacket, 18/1 PR, stranded shield, 25 PF/FT plenum rated for the field communication signal wiring.

Notes:

1. *When electric heater accessory is used, single point power entry or dual point power entry is field optional. Single point power entry option is through electric heater only.*
2. **Choose only one of the following; Thermostat, Mechanical Zone Sensor, Programmable Zone Sensor Panel or BAS Zone Sensor.*
3. ****

> **⚠ WARNING**
>
> ***Electrical Shock Hazard!***
>
> ***Failure to follow instructions below could result in death or serious injury.***
> ***Properly connect the system's oversized protective earthing (grounding) terminal(s).***

4. *Once power wire connections are complete inside the air handler control box, seal the sheet metal entry points of the control box by using parts (neoprene gasket, grommet, and plug) shipped along with the air handler unit package.*
5. *For detailed controls wiring instructions, see Split System Air Conditioners Odyssey™ with Symbio™ Controls Wiring and Start-Up Installation Guide (SS-SVN017*-EN)*

.

Important: *For the EDC switch to be functional and thereby facilitate reliable unit operation, make the EDC connections from the indoor to the outdoor control boxes.*

Table 61. Recommended thermostat wire size

Wire Size	Maximum Wire Length
(Gauge)	Physical distance between Unit and T'stat
22	30 Feet
20	50 Feet
18	75 Feet
16	125 Feet
14	200 Feet

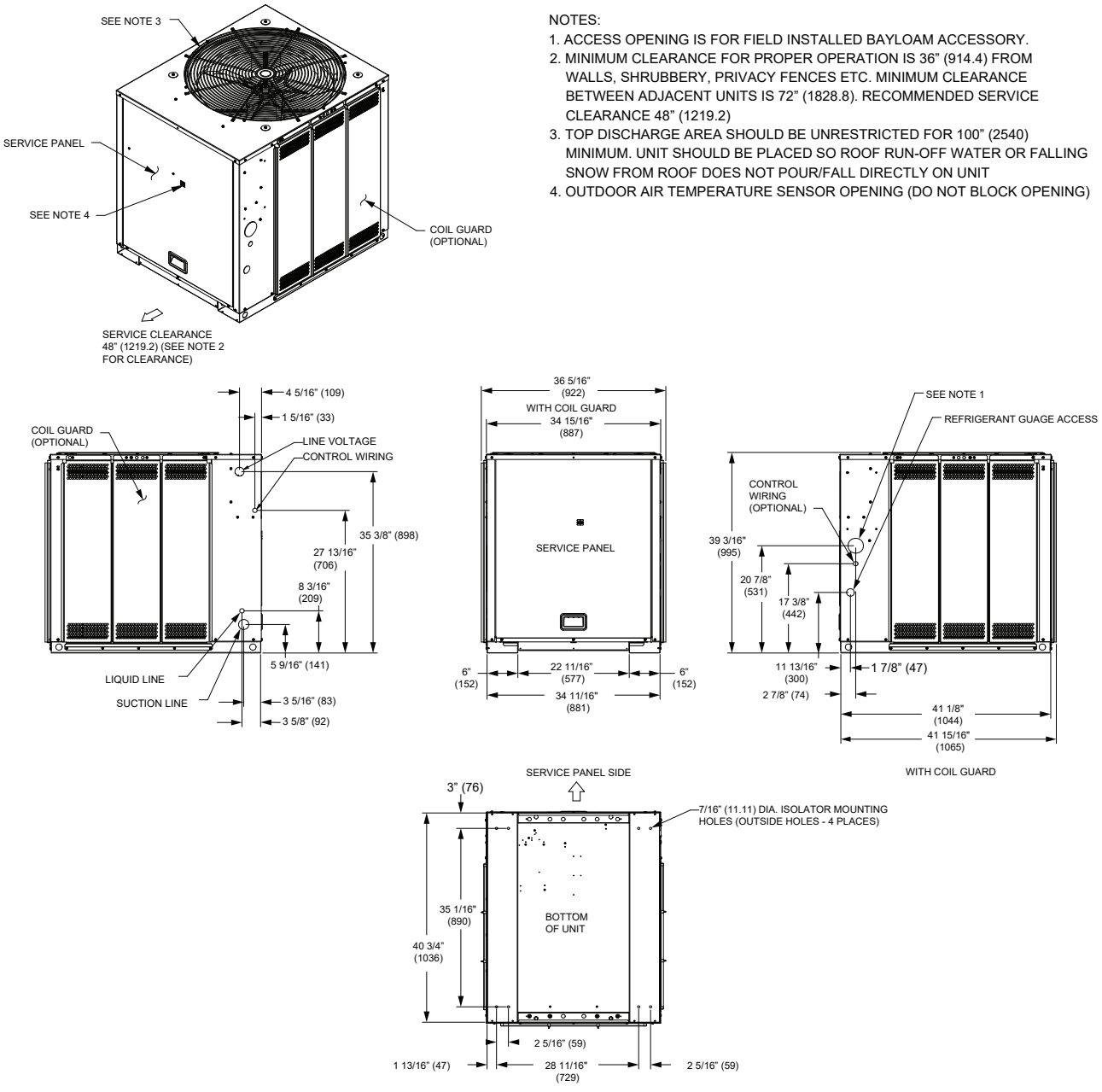
Table 62. Zone sensor module wiring

Distance from Unit to Control	Recommended Wire Size
0-150 feet (0-45.7 m)	22 gauge (0.33 mm^2)
151-240 feet (46-73.1 m)	20 gauge (0.50 mm^2)
241-305 feet (73.5-117.3 m)	18 gauge (0.75 mm^2)
386-610 feet (117.7-185.9 m)	16 gauge (1.31 mm^2)
611-970 feet (186.2-295.7 m)	14 gauge (2.08 mm^2)

Dimensional Data

Heat Pump

Figure 18. 6-7.5 ton heat pump, single compressor – in (mm)



NOTES:

1. ACCESS OPENING IS FOR FIELD INSTALLED BAYLOAM ACCESSORY.
2. MINIMUM CLEARANCE FOR PROPER OPERATION IS 36" (914.4) FROM WALLS, SHRUBBERY, PRIVACY FENCES ETC. MINIMUM CLEARANCE BETWEEN ADJACENT UNITS IS 72" (1828.8). RECOMMENDED SERVICE CLEARANCE 48" (1219.2)
3. TOP DISCHARGE AREA SHOULD BE UNRESTRICTED FOR 100" (2540) MINIMUM. UNIT SHOULD BE PLACED SO ROOF RUN-OFF WATER OR FALLING SNOW FROM ROOF DOES NOT POUR/FALL DIRECTLY ON UNIT
4. OUTDOOR AIR TEMPERATURE SENSOR OPENING (DO NOT BLOCK OPENING)

Figure 19. 6-7.5 ton heat pump, dual compressor – in (mm)

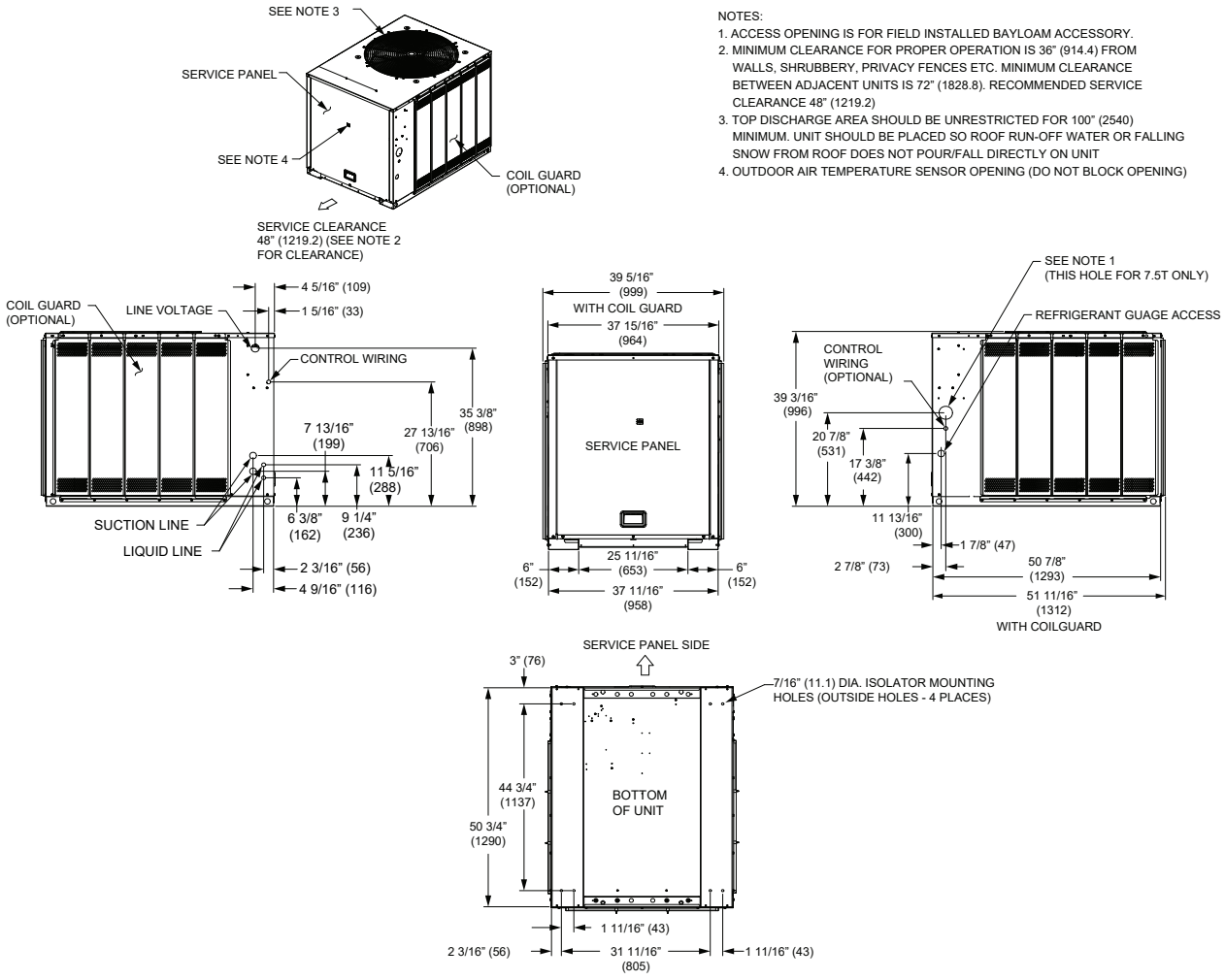


Figure 20. 10 ton heat pump, single compressor – in (mm)

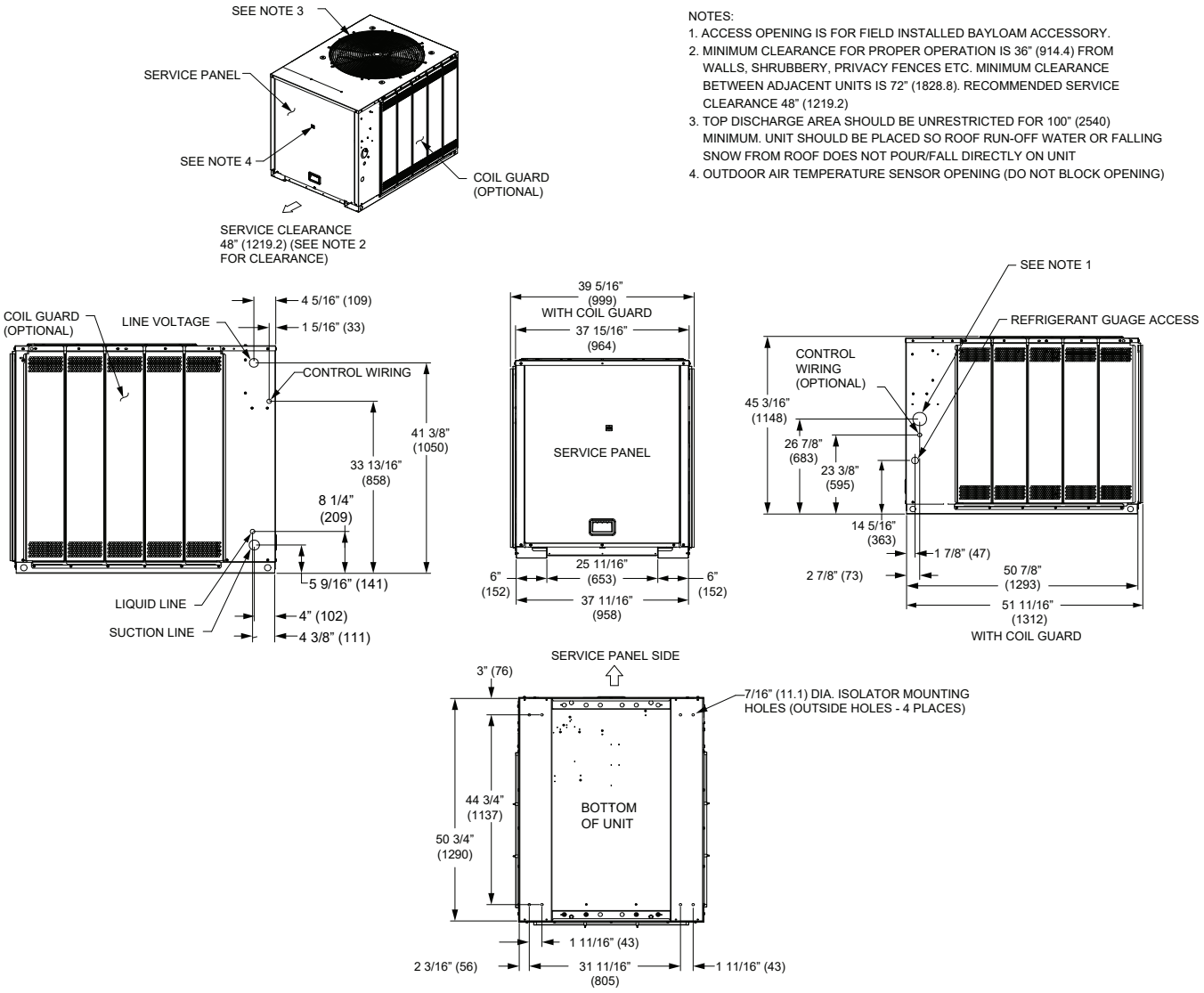


Figure 21. 10 ton heat pump, dual compressor – in (mm)

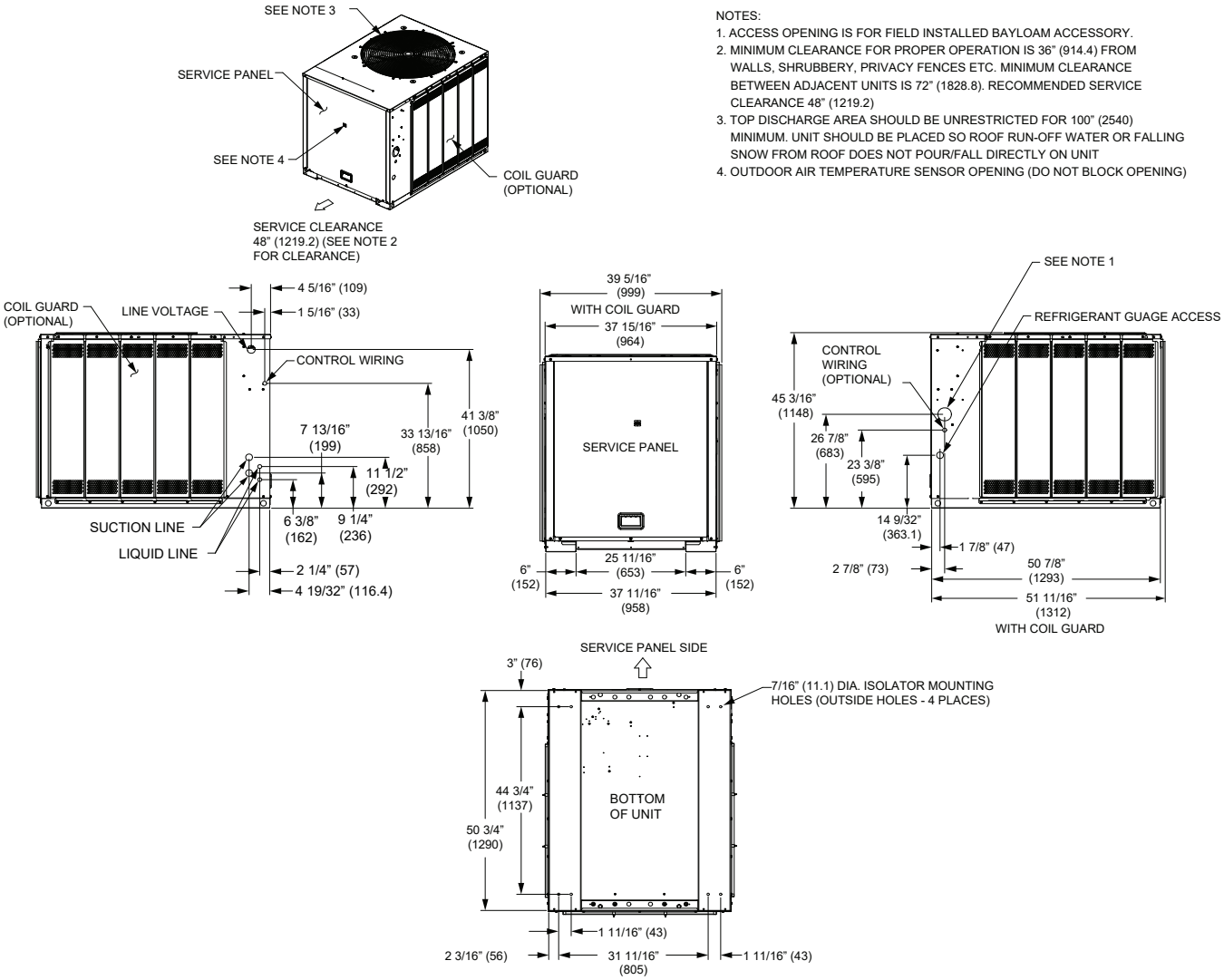
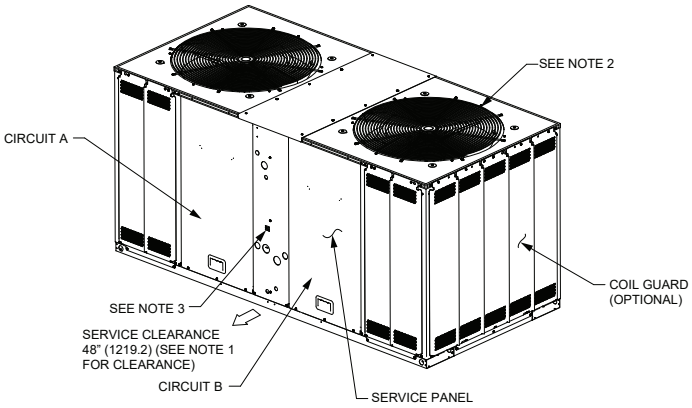
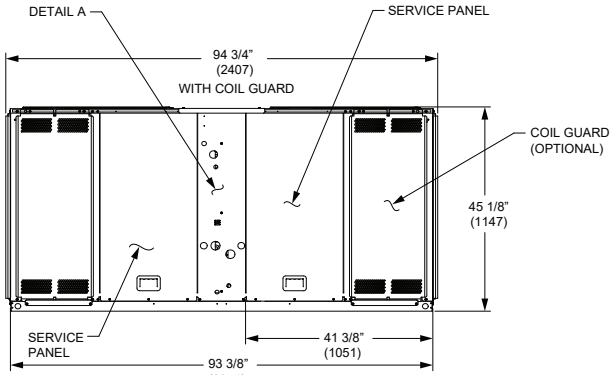


Figure 22. 15, 20 ton heat pump, dual compressor – in (mm)

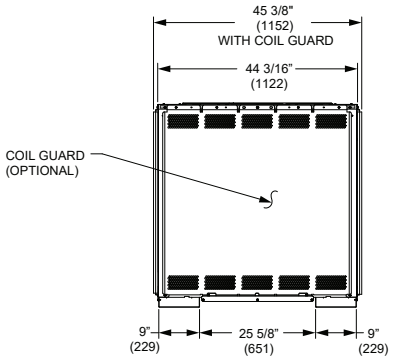


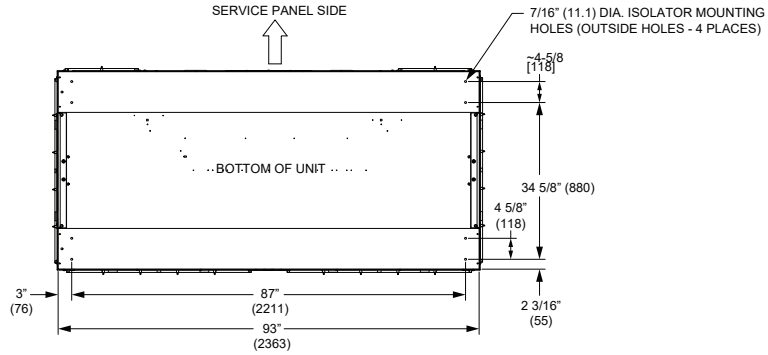
NOTES:

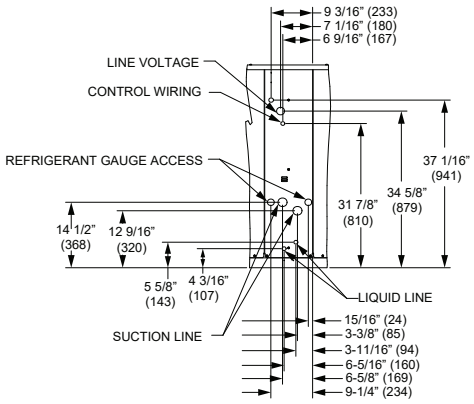
1. MINIMUM CLEARANCE FOR PROPER OPERATION IS 36" (914.4) FROM WALLS, SHRUBBERY, PRIVACY FENCES ETC. MINIMUM CLEARANCE BETWEEN ADJACENT UNITS IS 72" (1828.8). RECOMMENDED SERVICE CLEARANCE 48" (1219.2)
2. TOP DISCHARGE AREA SHOULD BE UNRESTRICTED FOR 100" (2540) MINIMUM. UNIT SHOULD BE PLACED SO ROOF RUN-OFF WATER OR FALLING SNOW FROM ROOF DOES NOT POUR/FALL DIRECTLY ON UNIT
3. OUTDOOR AIR TEMPERATURE SENSOR OPENING (DO NOT BLOCK OPENING)



OPTIONAL REAR ACCESS
DIMENSIONAL DETAIL







FRONT DETAIL A
DIMENSIONAL DEATIL

Air Handler

Figure 23. 5 ton air handler, single circuit – in. (mm)

Note: *Duct flange is a field-installed accessory.*

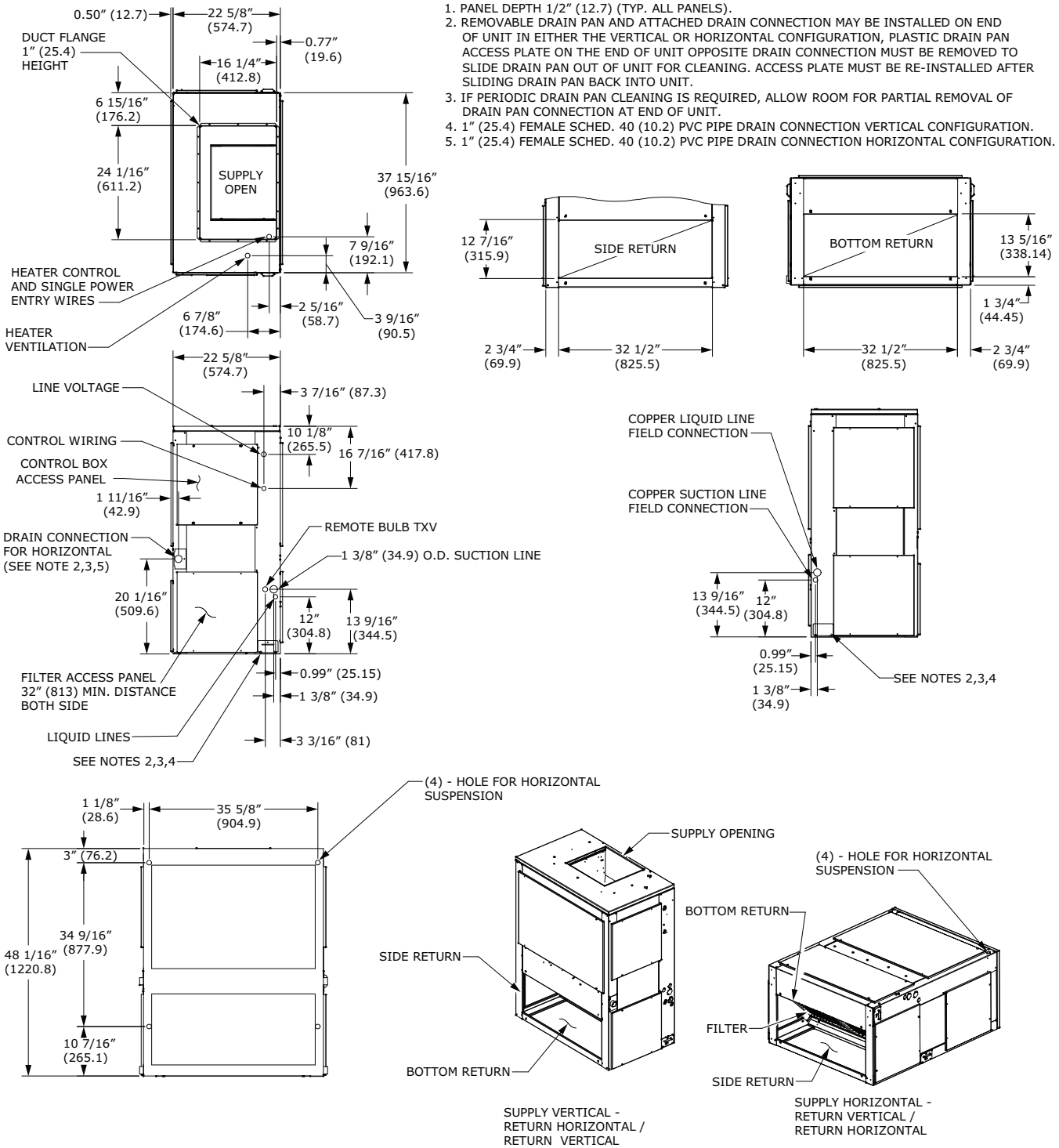


Figure 24. 5 ton air handler, dual circuit – in. (mm)

Note: *Duct flange is a field-installed accessory.*

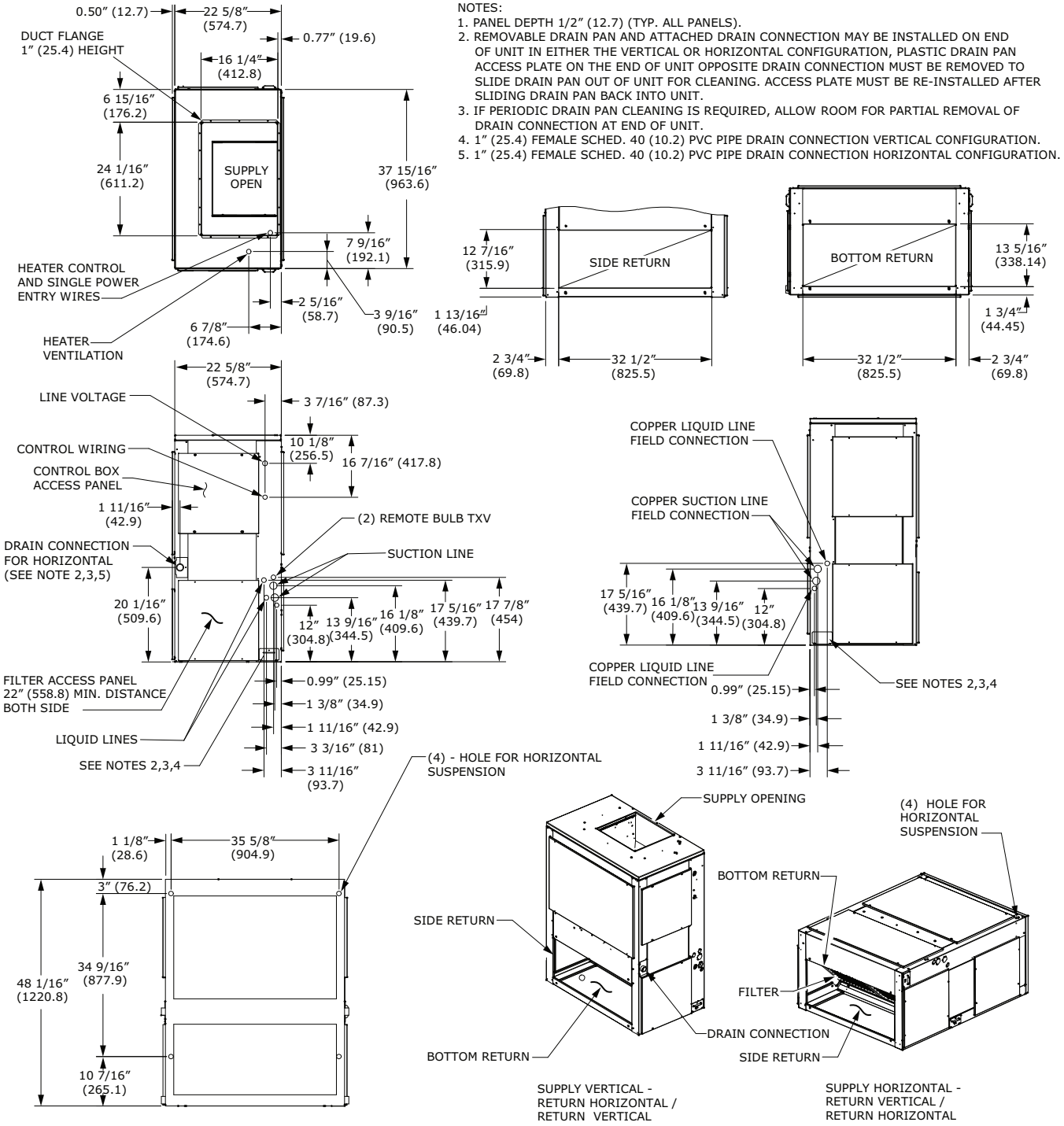


Figure 25. 7.5 ton air handler, single circuit – in. (mm)

Note: *Duct flange is a field-installed accessory.*

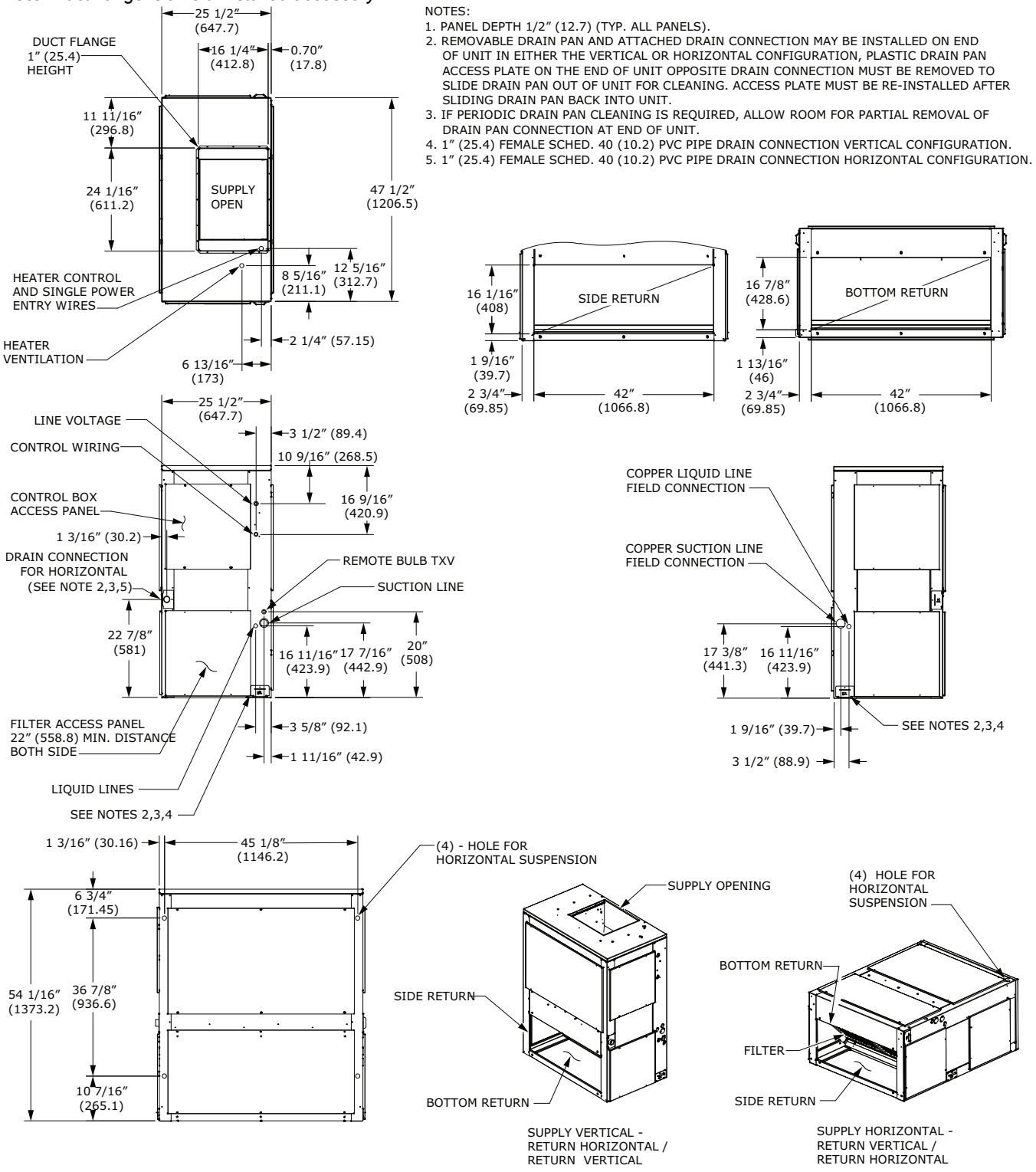


Figure 26. 6, 7.5 ton air handler, dual circuit – in. (mm)

Note: *Duct flange is a field-installed accessory.*

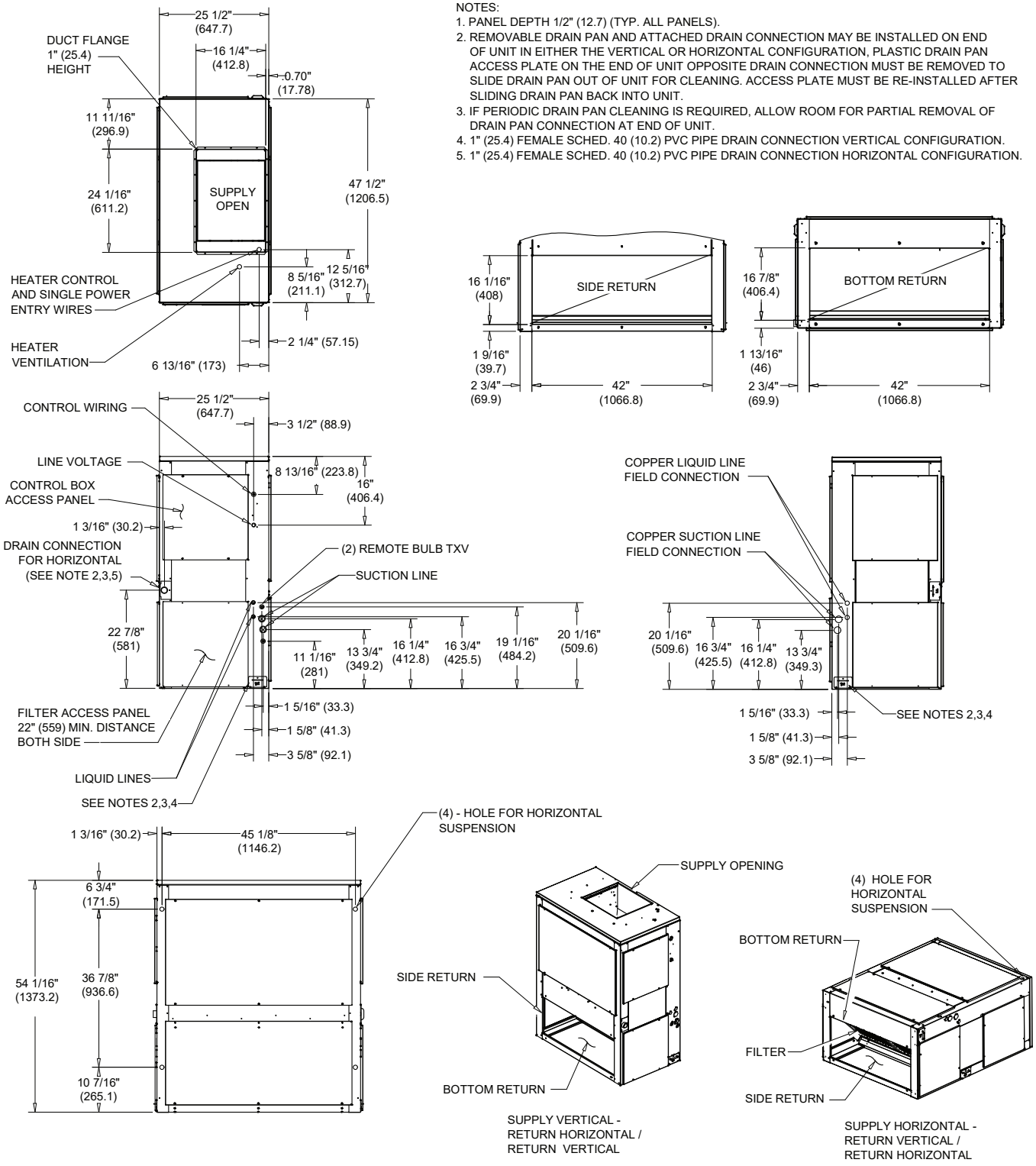


Figure 27. 10 ton air handler, single circuit – in. (mm)

Note: *Duct flange is a field-installed accessory.*

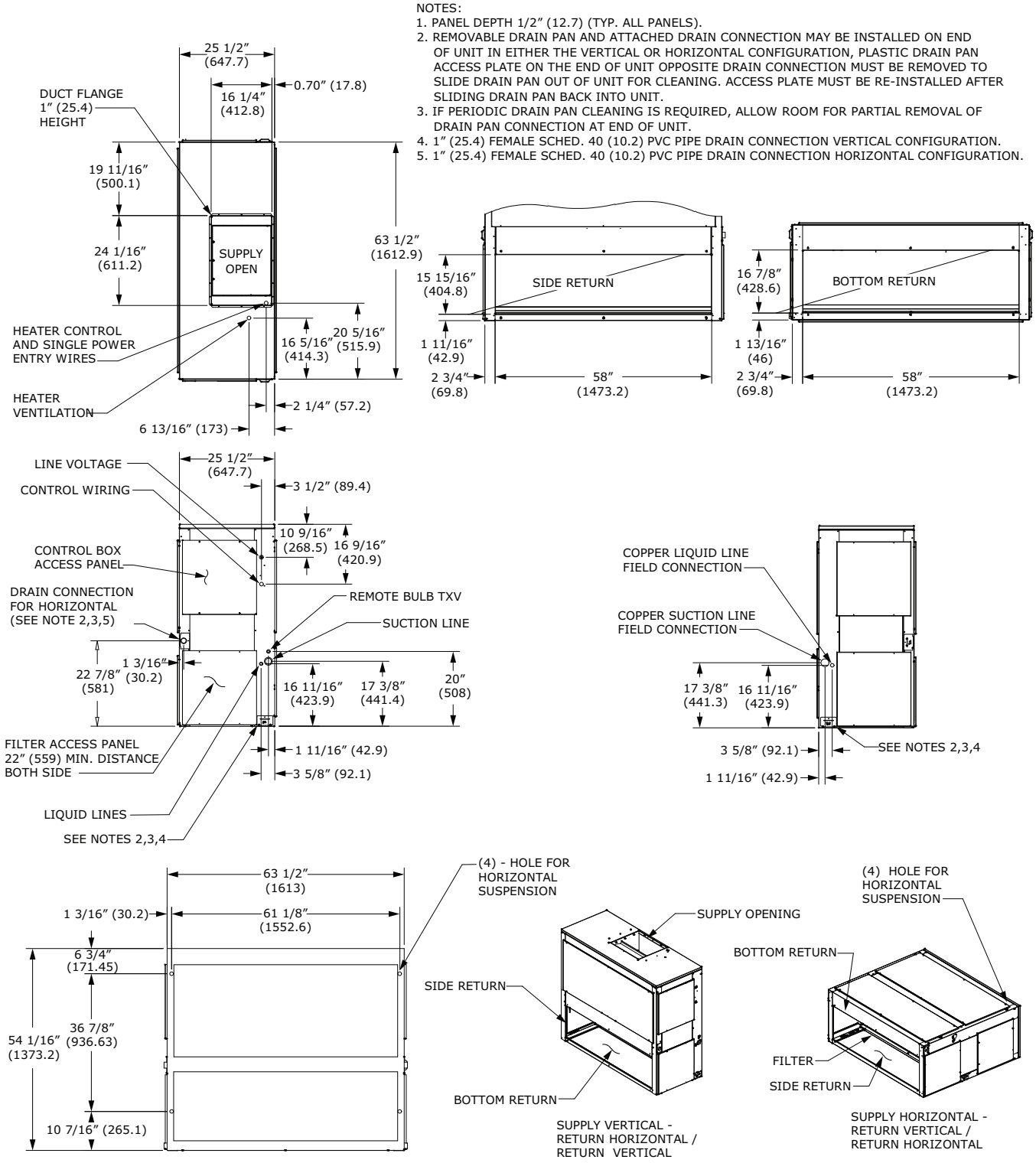


Figure 28. 10 ton air handler, dual circuit – in. (mm)

Note: *Duct flange is a field-installed accessory.*

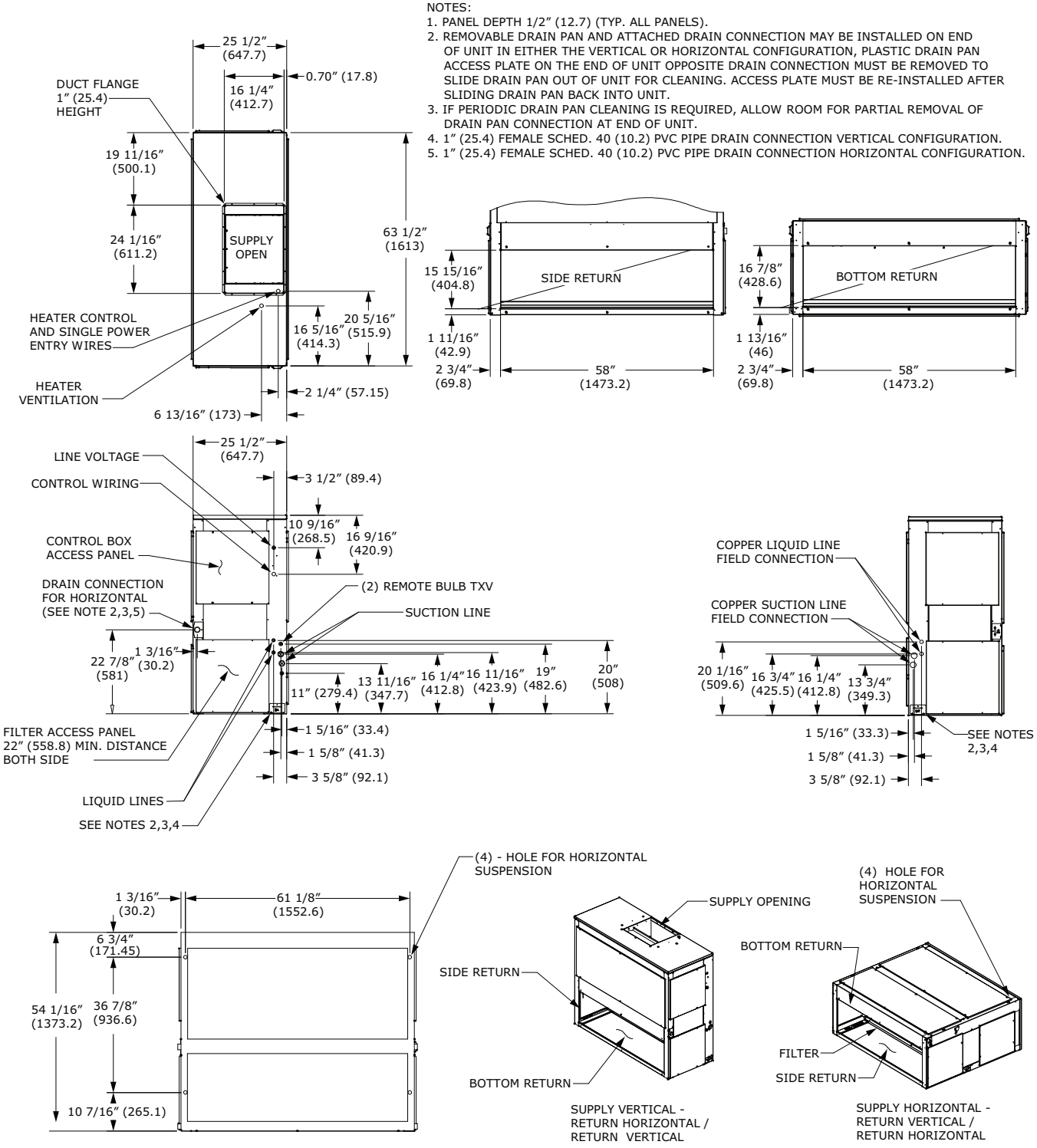


Figure 29. 15 ton air handler, dual circuit – in. (mm)

Note: *Duct flange is a field-installed accessory.*

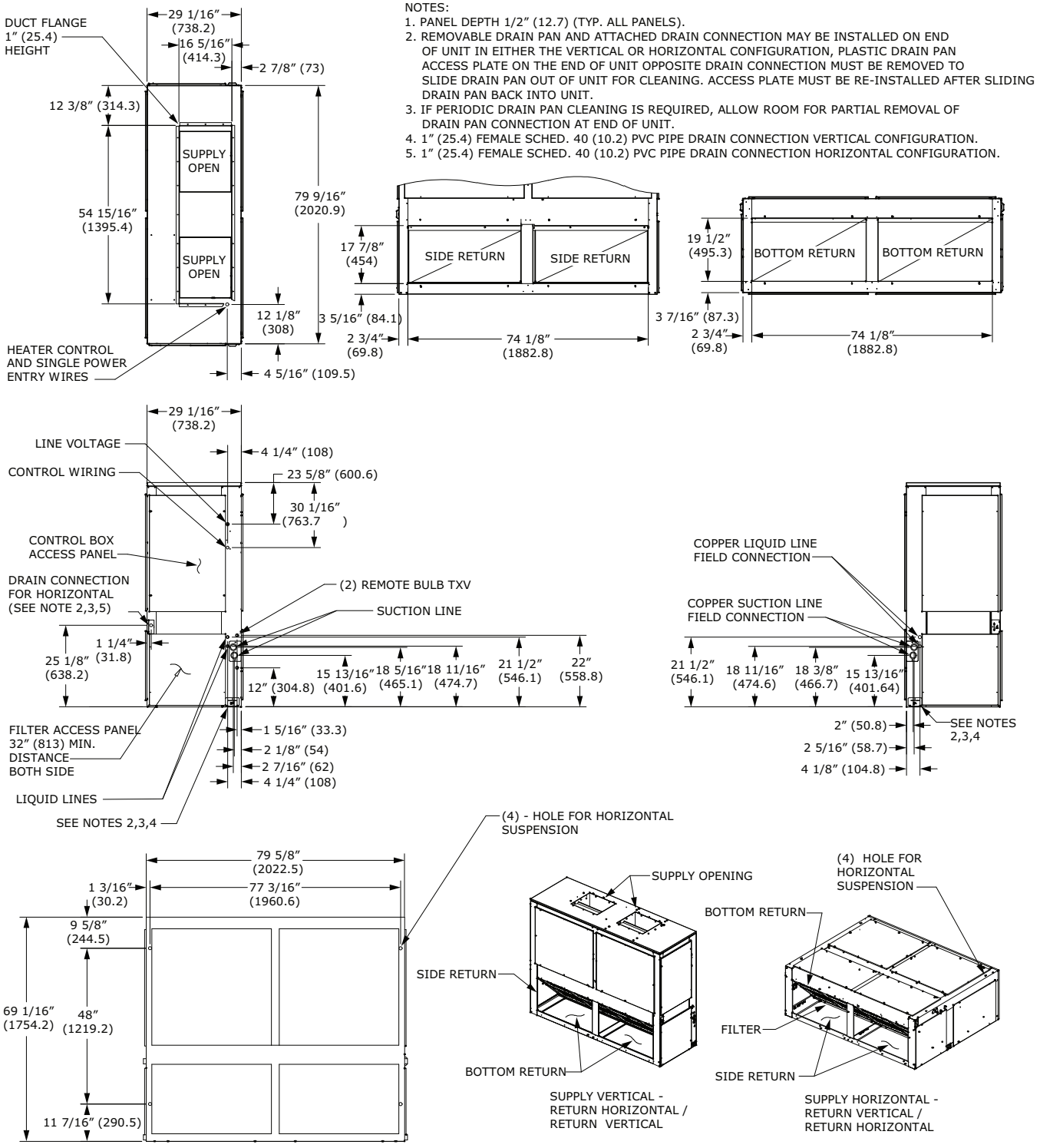
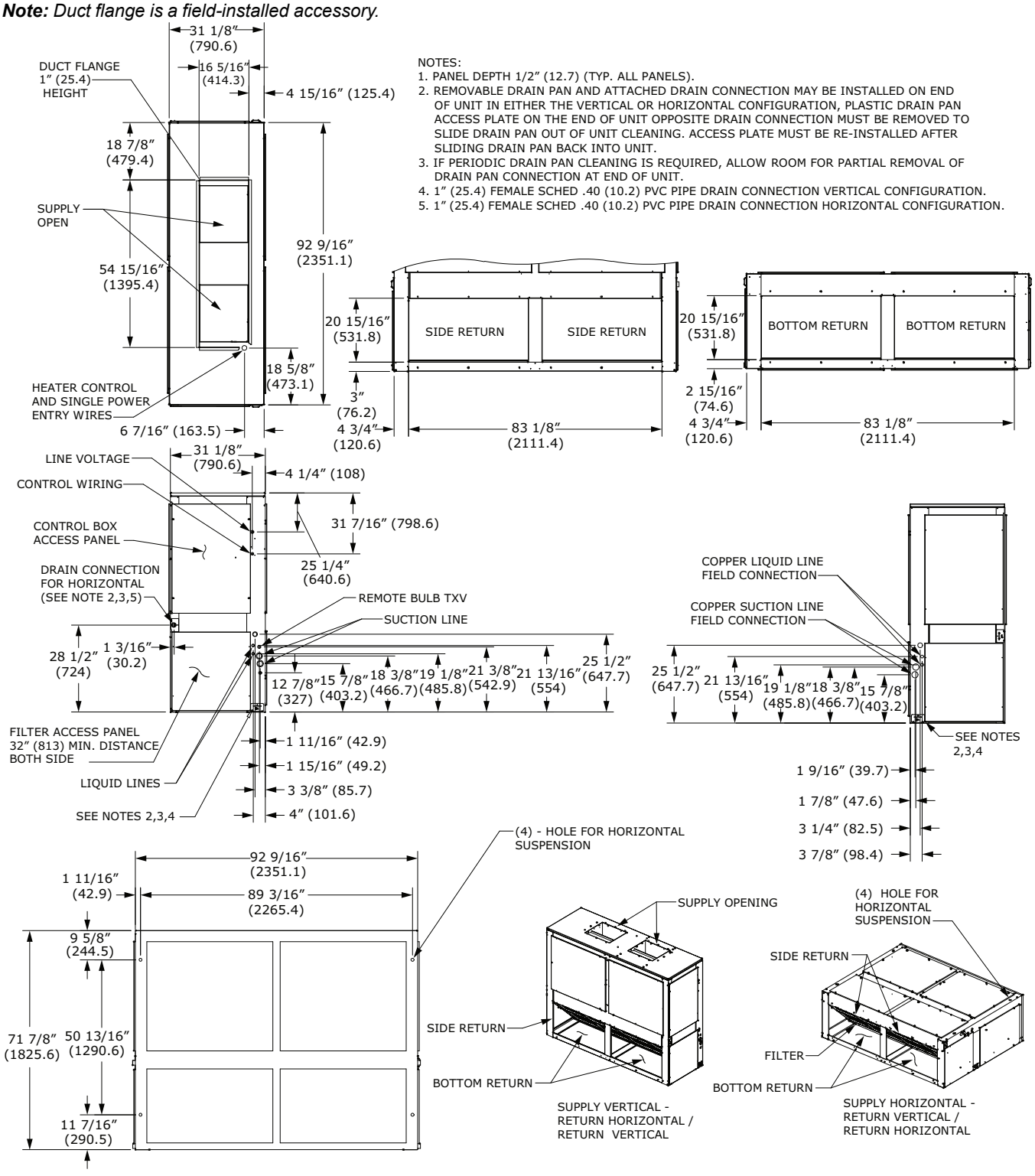


Figure 30. 20 ton air handler, dual circuit – in. (mm)

Note: *Duct flange is a field-installed accessory.*



Accessories

Figure 31. Rubber isolator accessory dimensions

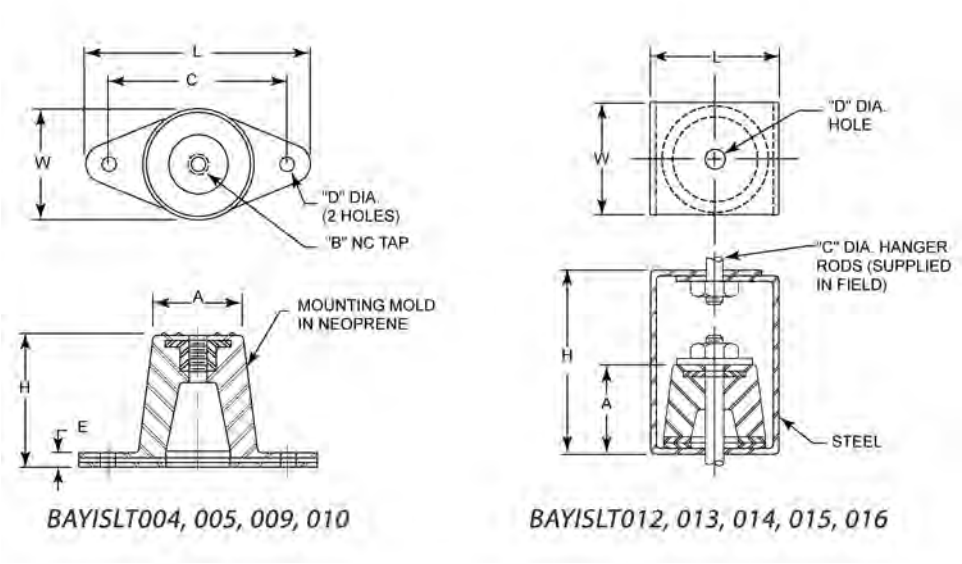


Table 63. Rubber isolator accessory dimensions – in (mm)

Model No.	L	W	H	A	B	C	D	E
BAYISLT004	3-1/8 (79.375)	1-3/4 (44.45)	1-1/4 (31.75)	1-1/4 (31.75)	3/8 (9.525)	2-3/8 (60.325)	3/8 (9.525)	1/4 (6.35)
BAYISLT005	3-7/8 (98.425)	2-3/8 (60.325)	1-3/4 (44.45)	1-3/4 (44.45)	3/8 (9.525)	3 (76.2)	3/8 (9.525)	1/4 (6.35)
BAYISLT009	3-7/8 (98.425)	2-3/8 (60.325)	1-3/4 (44.45)	1-3/4 (44.45)	3/8 (9.525)	3 (76.2)	3/8 (9.525)	1/4 (6.35)
BAYISLT010	3-7/8 (98.425)	2-3/8 (60.325)	1-3/4 (44.45)	1-3/4 (44.45)	3/8 (9.525)	3 (76.2)	3/8 (9.525)	1/4 (6.35)
BAYISLT013	2-1/4 (57.15)	2 (50.8)	3 (76.2)	1-3/8 (34.925)	3/4 (19.05)	3/8 (9.525)	1/2 (12.7)	—
BAYISLT014	2-1/4 (57.15)	2 (50.8)	3 (76.2)	1-3/8 (34.925)	3/4 (19.05)	3/8 (9.525)	1/2 (12.7)	—
BAYISLT015	2-1/4 (57.15)	2 (50.8)	3 (76.2)	1-3/8 (34.925)	3/4 (19.05)	3/8 (9.525)	1/2 (12.7)	—
BAYISLT012	3 (76.2)	2-1/4 (57.15)	4-1/2 (114.3)	1-7/8 (47.625)	1/4 (6.35)	5/8 (15.875)	3/4 (19.05)	—
BAYISLT015[(a)]	3 (76.2)	2-1/4 (57.15)	4-1/2 (114.3)	1-7/8 (47.625)	1/4 (6.35)	5/8 (15.875)	3/4 (19.05)	—
BAYISLT016	3 (76.2)	2-1/4 (57.15)	4-1/2 (114.3)	1-7/8 (47.625)	1/4 (6.35)	5/8 (15.875)	3/4 (19.05)	—

Note: BAYISLT015 contains a quantity 2 of the 2-1/4 x 2 x 3 isolators and quantity of 3 of the 3 x 2-1/4 x 4-1/2 isolators.

Figure 32. Spring isolator accessory dimensions – in (mm)

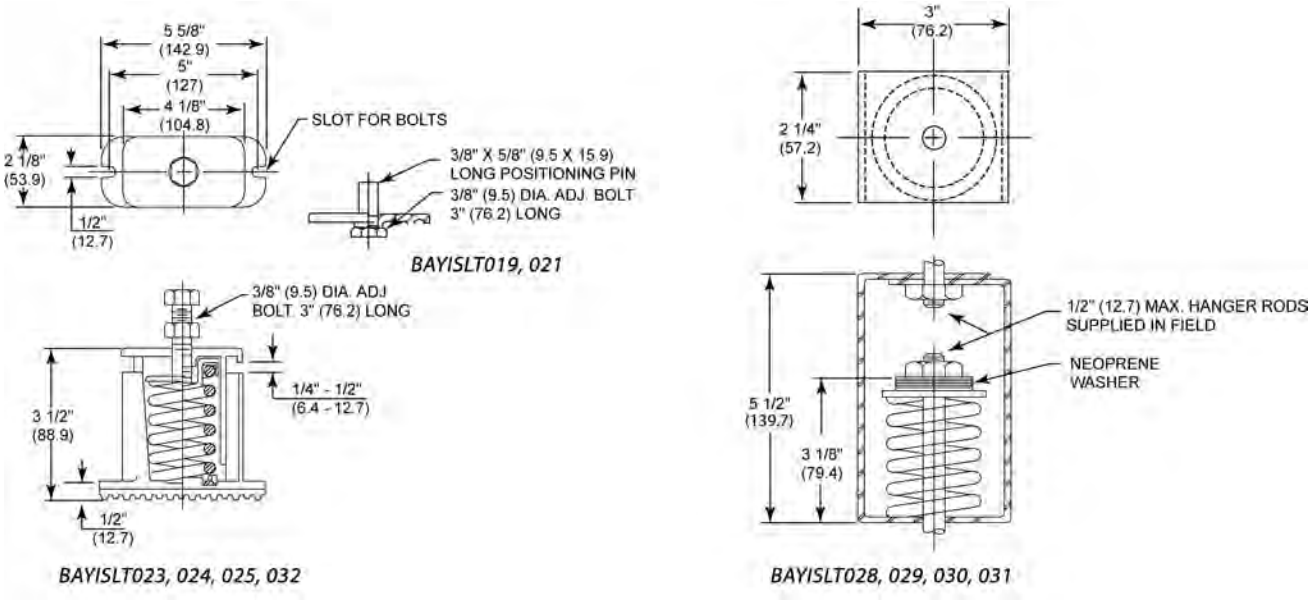


Figure 33. Electric heater accessory for 5-10 ton air handlers – in (mm)

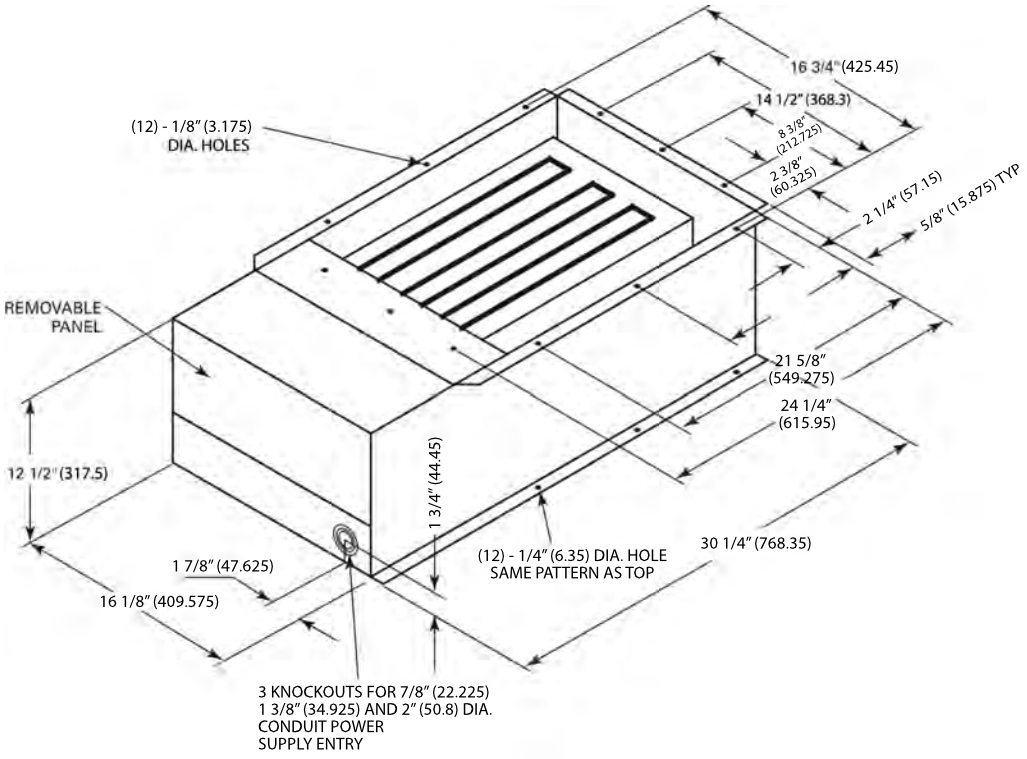


Figure 34. Electric heater accessory for 12.5-20 ton air handlers – in (mm)

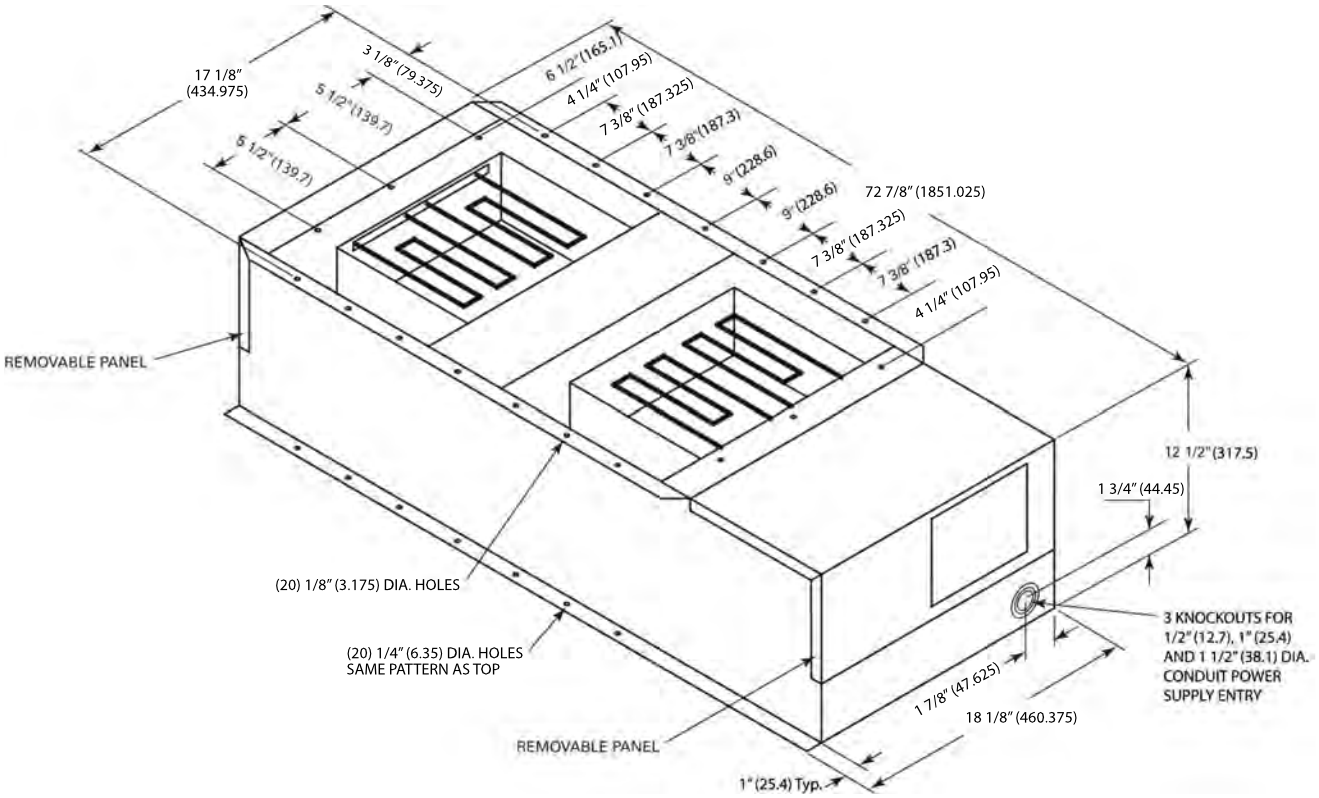
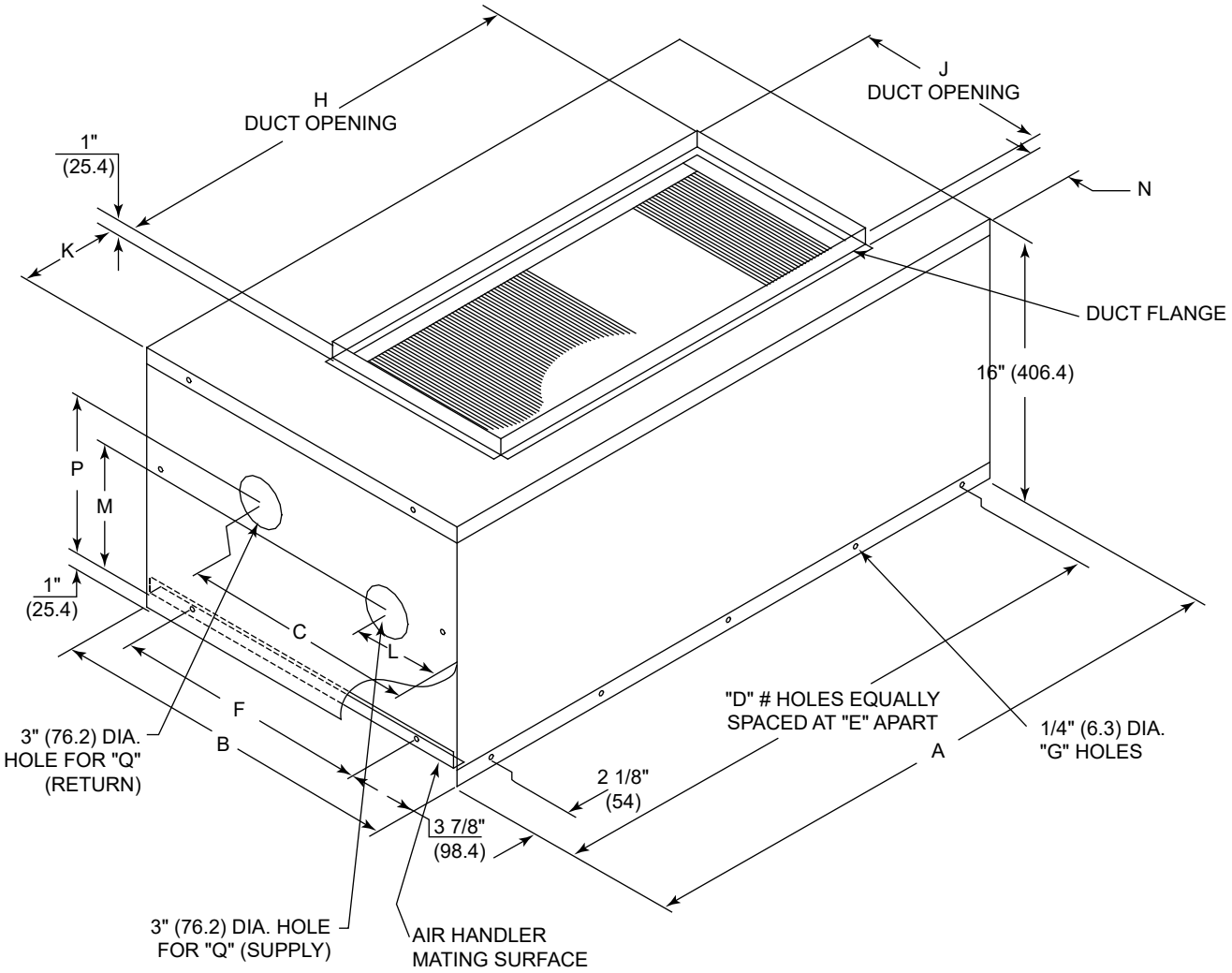


Figure 35. Hot water coil accessory – in (mm)



Note: *Duct flange available as kit. See accessories chapter for details.*

Table 64. Hot water coil accessory – in (mm)

Model No.	A	B	C	D	E	F	G	H
BAYWATR027	38.14 (969)	22.74 (576)	13.74 (349)	5 (127)	9 (229)	13.65 (347)	16 (406)	26 (660)
BAYWATR028	47.74 (1213)	25.74 (654)	15.95 (405)	5 (127)	10.84 (275)	17.17 (436)	16 (406)	30 (762)
BAYWATR029	63.84 (1621)	25.74 (654)	15.95 (405)	6 (152)	11.84 (301)	17.16 (436)	18 (457)	36 (914)
BAYWATR030	79.74 (2025)	29.18 (741)	14.36 (365)	8 (203)	10.85 (276)	19.67 (500)	22 (559)	51 (1295)
BAYWATR031	92.74 (2356)	31.24 (793)	16.48 (419)	8 (203)	10.85 (276)	19.67 (500)	22 (559)	64 (1626)

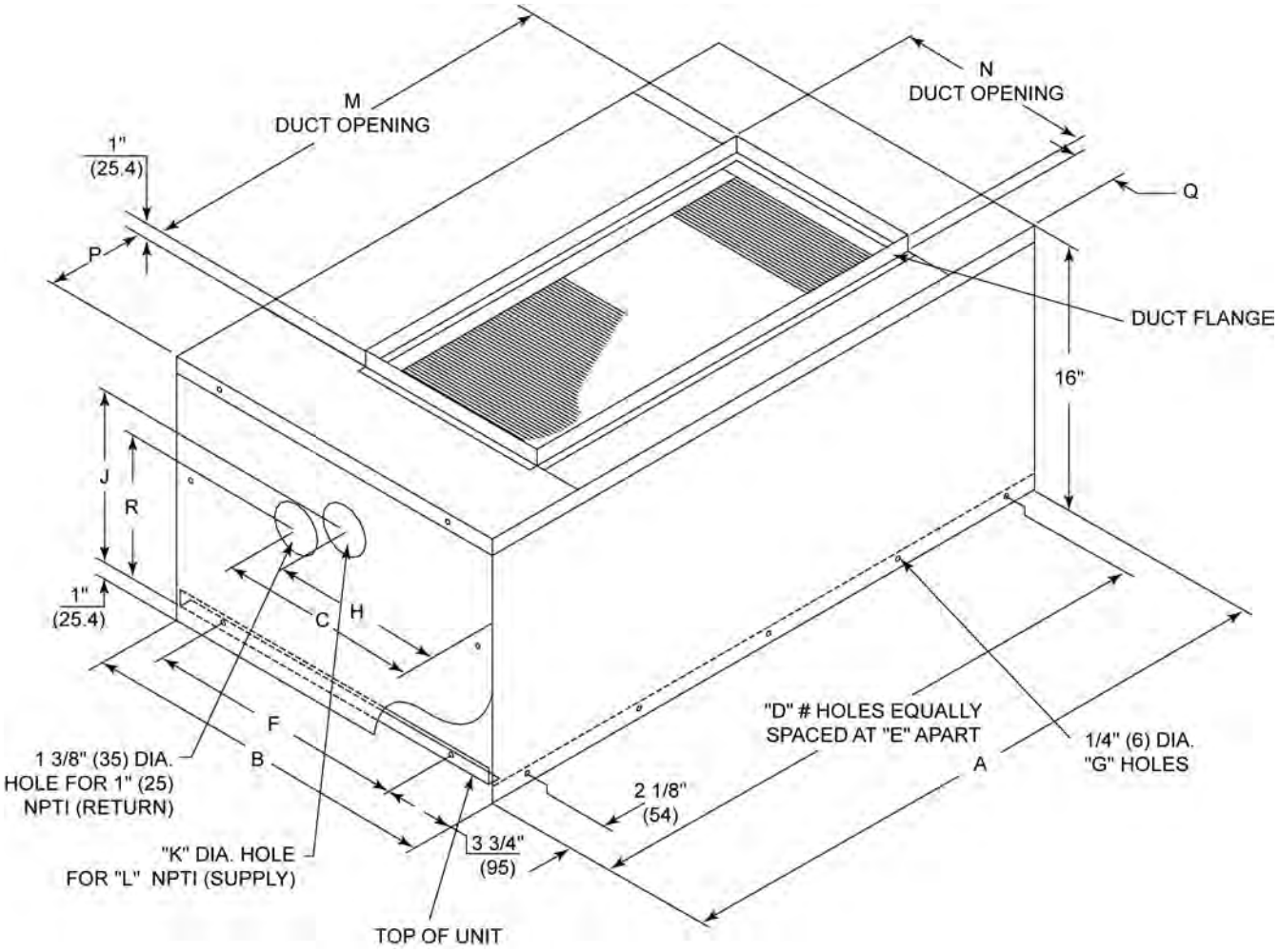
Model No.	J	K	L	M	N	P	Q
BAYWATR027	12 (305)	6 (152)	4.94 (125)	7.79 (198)	2.88 (73)	10.24 (260)	2 NPT (51) NPTI
BAYWATR028	18 (457)	8.88 (225)	8.45 (215)	10.27 (261)	2.88 (73)	7.77 (197)	2.5 NPTI (64) NPTI
BAYWATR029	18 (457)	13.88 (352)	8.45 (215)	10.03 (255)	2.88 (73)	7.58 (192)	2.5 NPTI (64) NPTI
BAYWATR030	18 (457)	14.25 (362)	6.86 (174)	9.91 (252)	1.88 (48)	7.41 (188)	2.5 NPTI (64) NPTI

Table 64. Hot water coil accessory – in (mm) (continued)

Model No.	J	K	L	M	N	P	Q
BAYWATR031	18 (457)	14.25 (362)	8.98 (228)	9.88 (251)	3.75 (95)	7.38 (187)	2.5 NPTI (64) NPTI

Note: Hot Water Coil Dimensions - inches (millimeters)

Figure 36. Steam coil accessory – in (mm)



Note: *Duct flange available as kit. See accessories chapter for details.*

Table 65. Steam coil accessory – in (mm)

Model No.	A	B	C	D	E	F	G	H	J	K
BAYWATR022	38.14 (969)	22.74 (577)	14.32 (364)	5 (127)	9 (229)	13.67 (347)	16 (406)	10.88 (276)	11.17 (284)	2 (51)
BAYWATR023	47.74 (1212)	25.74 (654)	20.14 (511)	5 (127)	10.84 (275)	17.17 (436)	16 (406)	10.88 (276)	11.17 (284)	2 (51)
BAYWATR024	63.84 (1621)	25.74 (654)	20.14 (511)	6 (152)	11.87 (301)	17.16 (436)	18 (457)	13.70 (348)	10.57 (268)	2.5 (64)
BAYWATR025	79.74 (2025)	29.18 (741)	18.55 (471)	8 (203)	10.85 (275)	19.67 (500)	22 (559)	12.11 (308)	10.05 (255)	2.5 (64)
BAYWATR026	92.74 (2355)	31.24 (793)	20.67 (525)	8 (203)	10.85 (275)	19.67 (500)	22 (559)	14.23 (361)	10.01 (254)	2.5 (64)

Table 65. Steam coil accessory – in (mm) (continued)

Model No.	L	M	N	P	Q	R
BAYWATR022	1.5 (38)	26 (660)	12 (305)	6 (152)	2.87 (73)	9.95 (253)
BAYWATR023	2 (51)	30 (762)	18 (457)	8.87 (225)	2.87 (73)	9.95 (253)
BAYWATR024	2 (51)	36 (914)	18 (457)	13.87 (352)	2.87 (73)	9.13 (232)
BAYWATR025	2 (51)	51 (1295)	18 (457)	14.12 (359)	1.87 (48)	8.61 (219)
BAYWATR026	2 (51)	64 (1626)	18 (457)	14.12 (359)	3.75 (95)	8.58 (218)

Figure 37. Discharge plenum and grille accessory

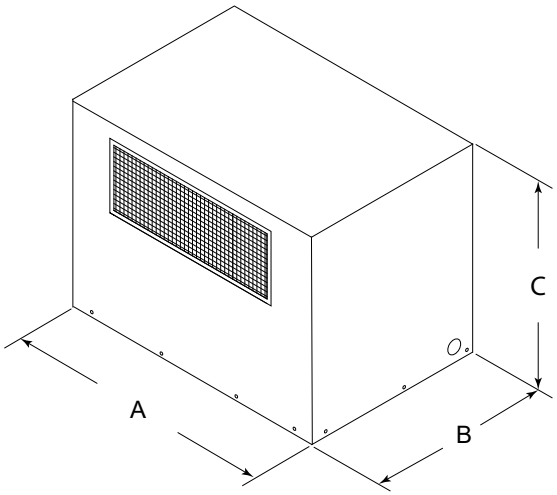


Table 66. Discharge plenum and grille dimensions – no heat – in (mm)

Unit	Model No.[a]	A	B	C
TWE060	BAYPLNM015	37.94 (963.6)	21.94 (557.2)	28 (711.2)
TWE072, TWE090	BAYPLNM016	47.5 (1206.5)	24.99 (634.7)	28 (711.2)
TWE120	BAYPLNM017	63.5 (1612.9)	24.99 (634.7)	28 (711.2)
TWE180	BAYPLNM018[b]	79.5 (2019.3)	27.63 (701.8)	22 (558.8)
TWE240	BAYPLNM019[b]	92.5 (2349.5)	30.43 (772.9)	24 (609.6)

[a] When installed horizontally, plenum/water coil must be self-supported.
[b] For use with hydronic heat or no heat.

Figure 38. Discharge plenum and grille accessory

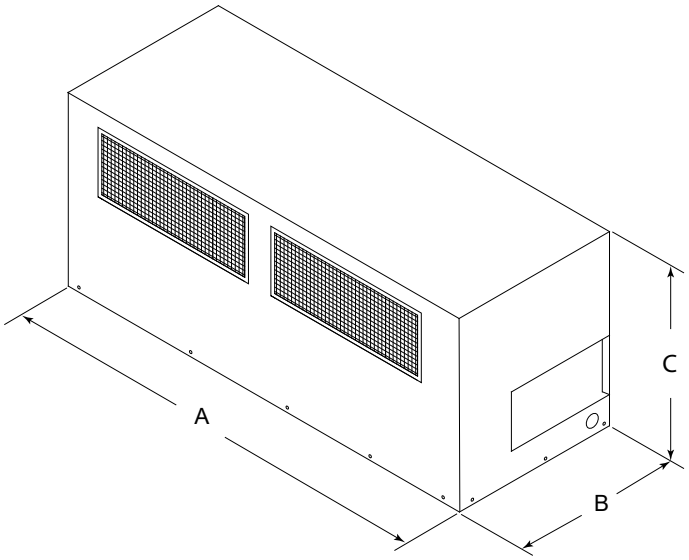


Table 67. Discharge plenum and grille dimensions (for use with electric heat) – in (mm)

Tons	Model No.	A	B	C
TWE060	BAYPLNM030	38.07 (967)	22.69 (576.3)	29.05 (738)
TWE072, TWE090	BAYPLNM031	47.86 (1216)	25.69 (652.5)	29.05 (738)
TWE120	BAYPLNM032	63.86 (1622)	25.69 (652.5)	29.05 (738)
TWE180	BAYPLNM033	80.14 (2036)	29.10 (739.1)	35.11 (892)
TWE240	BAYPLNM034	92.96 (2361)	31.10 (789.9)	35.05 (890)

Figure 39. Subbase accessory – in (mm)

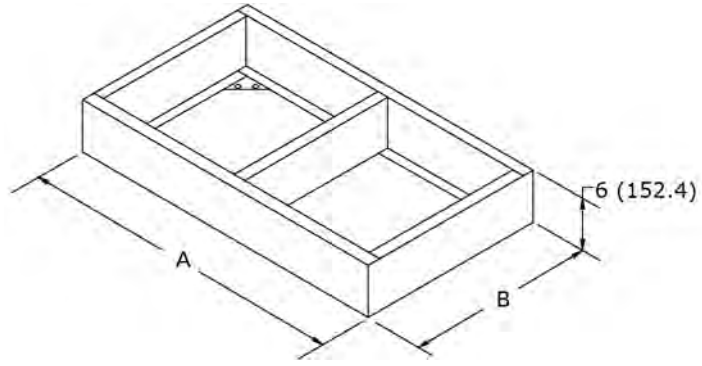


Table 68. Subbase dimensions – in (mm)

Tons	Model No.	A	B
TWE060	BAYBASE009	38 (965.2)	22.63 (574.8)
TWE072, TWE090	BAYBASE010	47.5 (1206.5)	25.51 (648.0)
TWE120	BAYBASE011	63.5 (1612.9)	25.52 (648.2)
TWE180	BAYBASE012	79.5 (2019.3)	29.04 (737.6)
TWE240	BAYBASE013	92.5 (2349.5)	31.14 (791.0)

Weights

Heat Pump Condenser

Table 69. TWA R-454B unit and corner weights — lbs (60 Hz)

Tons	Model No.	Shipping Max (lbs)	Net Max (lbs)	Corner Weights			
				1	2	3	4
6	TWA072K*A	360	325	112	83	56	76
	TWA072K*D	434	395	138	94	100	65
7.5	TWA090K*A	395	363	90	128	66	80
	TWA090K*D	484	445	156	105	113	73
10	TWA120K*A	495	440	156	103	110	72
	TWA120K*D	487	448	157	106	113	74
15	TWA180K*D	874	782	242	172	202	169
20	TWA240K*D	1004	914	274	287	160	196

Figure 40. TWA072, 090, 120

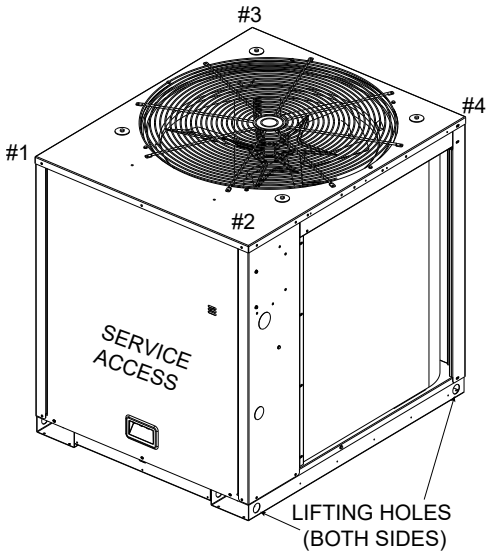
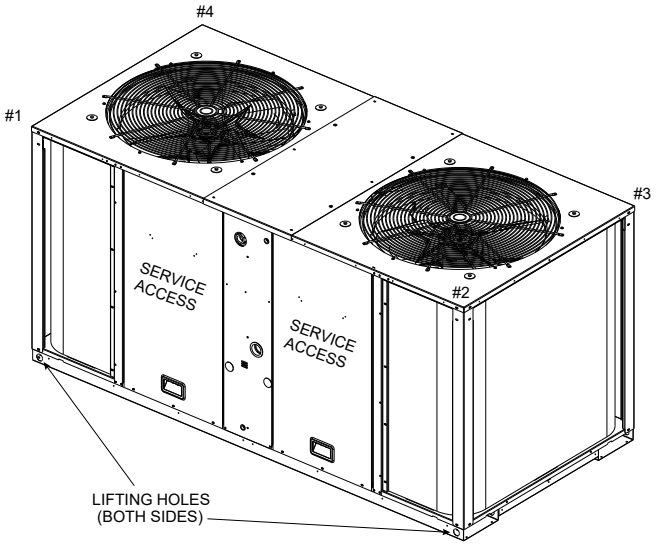


Figure 41. TWA180, 240



Air Handler

Table 70. Constant volume air handler (TWE) — unit and corner weights - (60 Hz)

Tons	Model Number	Shipping Max (lbs)	Net Max (lbs)	Corner Weights - Vertical				Corner Weights - Horizontal			
				1	2	3	4	1	2	3	4
5	TWE060K(3,4,W, 1)A TWE060K(3,4)B	285	232	55	71	51	55	54	67	50	61
7.5	TWE090K(1), A/B	385	323	67	99	75	82	56	92	87	88
10	TWE120K(1)A/B	441	393	77	121	110	85	79	118	77	119

Table 71. SZVAV and 2-Speed VFD air handler (TWE) — unit and corner weights - (60 Hz)

Tons	Model Number	Shipping Max (lbs)	Net Max (lbs)	Corner Weights - Vertical				Corner Weights - Horizontal			
				1	2	3	4	1	2	3	4
6	TWE072K*B	398	336	70	102	78	86	59	95	90	92
7.5	TWE090K*A/B	398	336	70	102	78	86	59	95	90	92
10	TWE120K*A/B	454	406	80	124	113	89	82	121	80	123
15	TWE180K*B	765	688	170	195	184	139	199	166	148	175
20	TWE240K*B	925	831	261	171	164	235	259	184	149	239

Figure 42. Vertical — TWE060, 072, 090, 120

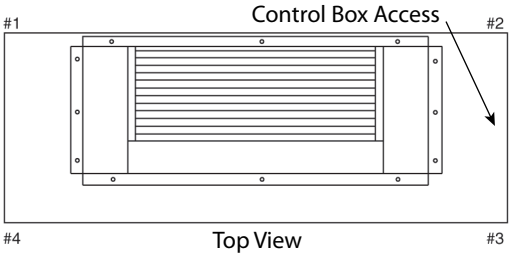


Figure 43. Vertical — TWE180, 240

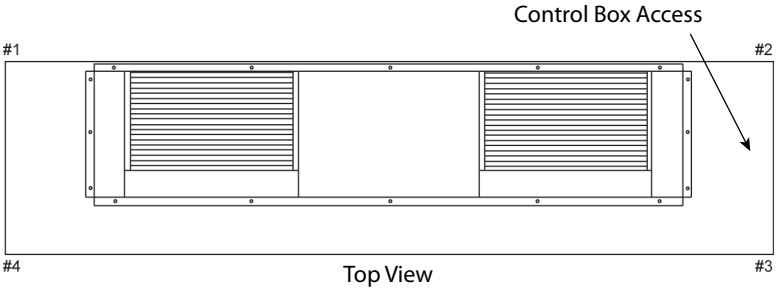


Figure 44. Horizontal — TWE060, 072, 090, 120

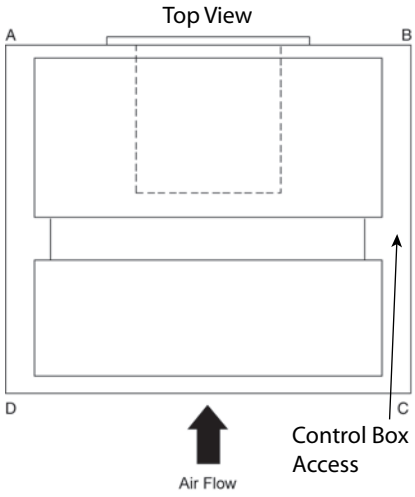
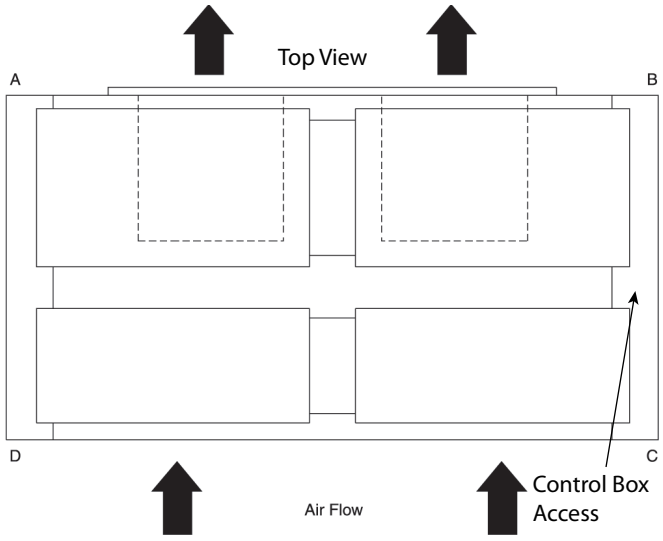


Figure 45. Horizontal — TWE180, 240



Accessories

Table 72. Accessory weights (net lbs.)

Unit Used w/ Tons	Hot Water Coil	Steam Coil	Discharge Plenum and Grille with Hydronic Heat	Discharge Plenum and Grille without Heat	Discharge Plenum and Grille with Electric Heat	Return Air Grille	Electric Heat Min/ Max	Subbase	Oversized Motor	RIS Isolator Floor Mount
6	116	131	78	73	160	5	27/45	19.4	48	2
7.5	116	131	78	73	160	5	27/45	19.4	48	2
10	165	148	97	92	195	7	27/45	23.5	50	2
15	211	234	—	230	235	10	79/100	28.4	80	2
20	242	261	—	145	265	12	79/100	31.7	88	2

Unit Used w/ Tons	RIS Isolator Suspended Mount	Steel Spring Isolator Floor Mount	Steel Spring Isolator Suspended Mount	Hail Guard	Control Transformer	Sensors	Expansion Module	Low Ambient	Service Valve
6	6	12	6	21	4	1	13	13	5
7.5	6	12	6	21	4	1	13	13	5
10	7	12	6	28	4	1	13	13	5
15	7	12	6	55	4	1	2	2	5
20	9	12	6	55	4	1	2	2	5

Mechanical Specifications

Condensing Units

Standard Features

General

- Weatherproofed steel mounting/lifting rails
- Hermetic scroll compressors
- Plate fin condenser coils
- Fans and motors
- Standard operating range 50-125°F (min. 0°F with low ambient accessory)
- Nitrogen holding charge
- Certified and rated in accordance with AHRI and DOE standards
- Certified to UL 60335-2-40
- Capacities and efficiencies for split systems are rated within the scope of the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) certification program and display the AHRI Standard 340-360 (I-P) mark. This standard applies to units between 65,000 and 250,000 btu/hr.

Casing

- Zinc coated, heavy gauge, galvanized steel
- Weather resistant baked enamel finish
- Meets ASTM B117, 672 hour salt spray test
- Removable single side maintenance access panels
- Lifting handles in maintenance access panels
- Unit base provisions for forklift and/or crane lifting

Refrigeration System - Single Compressor (TWA072**A, TWA090**A, TWA120**A)

- Single refrigeration circuit with integral subcooling circuit
- Single direct drive hermetic scroll compressor
- Suction gas-cooled motor w/ ± 10% voltage utilization range of unit nameplate voltage
- Reversing valve
- Crankcase heater
- Internal temperature and current sensitive motor overloads
- No compressor suction and/or discharge valves (reduced vibration/sound)
- Factory installed liquid line filter drier
- Phase loss/reverse rotation monitor
- External high pressure cutout device
- External low pressure cutout device
- Evaporator defrost control
- Loss of charge protection (discharge temperature limit)

Refrigeration System - Dual Compressor (TWA072**D, TWA090**D, TWA120**D, TWA180**D, TWA240**D)

- Two (2) separate and independent refrigerant circuits
- Each refrigeration circuit equipped with integral subcooling circuit
- Two (2) direct drive hermetic scroll compressor
- Suction gas-cooled motors w/ ± 10% voltage utilization range of unit nameplate voltage
- Reversing valves
- Crankcase Heaters
- Internal temperature and current sensitive motor overloads
- Factory installed liquid line filter driers
- Phase loss/reverse rotation monitor
- No compressor suction and/or discharge valves (reduced vibration/sound)

- External high pressure cutout devices
- External low pressure cutout devices
- Evaporator defrost control
- Loss of charge protection (discharge temperature limits)

Condenser Coil (Fin and Tube)

- 3/8–inch internally enhanced copper tube
- Mechanically bonded to lanced aluminum plate fins
- Factory pressure and leak tested to 660 psig
- Perforated steel hail guards available

Condenser Fan

- 26-inch or 28-inch propeller fan(s)
- Direct drive
- Statically and dynamically balanced

Condenser Motor(s)

- Permanently lubricated totally enclosed or open construction
- Built-in current and thermal overloads
- Ball or sleeve bearing type

Controls

- Centralized microprocessor
- Indoor and outdoor temperature sensors drive algorithms, making decisions for all heating, cooling, and ventilation
- Integrated anti-short cycle timer
- Integrated time delay between compressors
- Completely internally wired
- Colored and keyed connectors and colored wires
- Contactor pressure lugs or terminal block
- Unit external mounting location for disconnect device
- Single point power entry

Coil Guards

- Condenser coil protection from hail, vandals, etc.
- Perforated, painted galvanized steel
- Factory or field installed

Factory Installed Options

Black Epoxy Coated Condenser Coil (Fin and Tube)

- Thermoset vinyl coating
- Bonded to aluminum fin stock (prior to fin-stamping process)
- Economical protectant in mildly corrosive environments

BACnet Communication Options

- BACnet MS/TP -BACnet IP
- Allows unit communication with Trane or generic BACnet building automation controls

Advanced Diagnostics and LonTalk Communication Interface

- Factory or field installed
- Allows unit communication as a Tracer Lon® device
- Allows unit communication with generic LonTalk® Network building automation controls

Field Installed Options

Low Ambient (Fan ON/OFF)

- Provides unit cooling operation to outdoor ambient of 0°F
- Low cost solution
- Discharge pressure controls condenser fan operation

Service Valves

- Liquid line service valve (with gauge port)
- Suction line service valve (with gauge port)

Vibration Isolators

- Neoprene-in-shear or spring flex choice
- Reduce vibration transmission to building structures, equipment, and adjacent spaces
- Reduce noise transmission to building structures, equipment, and adjacent spaces

Zone Sensor

- Interfaces with microprocessor units
- Manual or automatic programmable
- System malfunction lights
- Remote sensor options

Thermostat

- 1H/1C available
- 2H/1C available
- Manual or automatic changeover available
- Programmable and non-programmable solutions available

LonTalk Communication Interface

- Factory or field installed
- Allows unit communication as a Tracer Lon® device
- Allows unit communication with generic LonTalk® Network building automation controls

Air Handlers

Standard Features

General

- Completely factory assembled
- Convertible for horizontal or vertical configuration
- Convertible for cooling only or heat pump application
- Convertible for left or right external connections (refrigerant and/or electrical)
- Convertible for front or bottom air return
- Nitrogen holding charge
- Certified to UL60335-2-40 for indoor blower coil units

Casing

- Zinc coated, heavy gauge, galvanized steel
- Weather resistant baked enamel finish
- Access panels with captive screws
- Completely insulated with foil faced, cleanable, fire retardant, permanent, odorless glass fiber material
- Captured or sealed insulation edges
- Electrical connection bushings or plugs
- Refrigerant connection bushings or plugs
- Withstand elevated internal static pressure

Refrigeration System

- Single or dual circuit
- Distributor(s)
- Thermal expansion valves (TXVs)

Evaporator Coil

- 3/8–inch internally enhanced copper tube mechanically bonded to lanced aluminum plate fins
- Factory pressure and leak tested to 449 psig.
- Draw-through airflow
- Dual circuits are interlaced/intertwined
- Double sloped, removable, cleanable, composite drain pan
- Four drain pan positions

Indoor Fan

- Double inlet, double width, forward curved, centrifugal type fan
- Dual fans on 15 to 20 ton air handlers
- Adjustable belt drive
- Permanently lubricated bearings

Indoor Motor

- Adjustable motor sheaves (constant volume units)
- Fixed motor sheaves (SZVAV and 2-Speed VFD)
- Thermal overload protection
- Permanently lubricated bearings
- Meet energy policy of 1992 (EPACT)
- Optional oversized motors for high static applications

Controls

- Completely internally wired
- Colored and keyed connectors, colored wires
- Magnetic indoor fan contactor
- Detachable low voltage connectors
- Single point power entry
- Evaporator defrost control

Filters

- Access from side coil panels
- Filters slide on rack
- One inch (1"), throwaway filters on 5 to 10 ton units
- Filter rack convertible to two inch (2") capability on 5 to 10 ton units
- Two inch (2"), throwaway filters on 15 to 20 ton units

Leak Detection System

- Added as per safety standard UL 60335-2-40
- Two refrigerant detection sensors are present
- Reduces the risk of improper installation in the field as well as bypassing the added cost in the field for installation.

Factory Installed Options

Constant Volume Airflow

Factory installed high static motor available

2-Speed VFD Control

- 2–Speed airflow
- Variable Frequency Drive (VFD)
- Motor soft start — avoids start up belt noise and increases belt life
- Programmable keypad accessible outside of airstream
- VFD rated motor
- Factory installed high static motor available

Single Zone Variable Air Volume/2–Speed Airflow

- Variable Frequency Drive (VFD)
- Motor soft start — avoids start up belt noise and increases belt life
- Programmable VFD keypad accessible outside of airstream
- Airflow adjustment via display/keypad on Symbio™ 700 controller in condenser
- Discharge air sensor
- Symbio 700 Options Module
- VFD rated motor
- Factory installed oversized motor available

Field Installed Options

Electric Heaters

- Heavy duty nickel chromium elements
- Agency approved
- Installs directly on fan discharge
- One or two stage control (dependent upon capacity)
- Single point power entry
- Terminal strip connections
- 460V Heaters
  - Internally wye connected
  - Automatic line break high limit controls with secondary single action disc limits
- 230V Heaters
  - Internally delta connected
  - Automatic reset of high limit controls through pilot duty with secondary backup fuse links

Hydronic Heat Coils

- One row steam
- Two row hot water
- Installs directly on fan discharge
- Heavy gauge sheet metal casing matches air handler
- Convertible for horizontal or vertical configurations

Discharge Plenums and Grilles

- Vertical, free discharge applications
- Heavy gauge sheet metal casing matches air handler
- Satin-finished, 4-way adjustable louver grilles

Return Air Grilles

- Vertical, free discharge applications
- Satin-finished, non-adjustable louver grilles
- Replaces front lower access panel

Mounting Sub-Base

- Vertical floor mount configuration requirement
- Heavy gauge sheet metal casing matches air handler
- Provides additional clearance for condensate drain trapping
- Required when isolators are used

Vibration Isolators

- Neoprene-in-shear or spring flex choice
- Floor or suspended applications
- Reduce vibration transmission to building structures, equipment, and adjacent spaces
- Reduce noise transmission to building structures, equipment, and adjacent spaces

Oversize Motors

- High static applications
- Motor, sheaves, belt included

Filters

- 2 inch, MERV 13 high efficiency filters

Notes





The AHRI Certified mark indicates Trane U.S. Inc. participation in the AHRI Certification program. For verification of individual certified products, go to ahridirectory.org.

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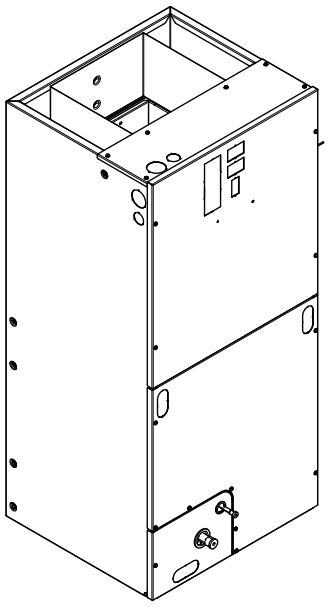
American Standard®

HEATING & AIR CONDITIONING

Product Data

Convertible Air Handlers
2 to 5 Tons

5TEM4B02AC21SA
5TEM4B03AC31SA
5TEM4B04AC31SA
5TEM4D04AC31SA
5TEM4D05AC41SA
5TEM4D06AC41SA
5TEM4D07AC51SA



Note: *Graphics in this document are for representation only. Actual model may differ in appearance.*

November 2025

AHR-PSD007B-EN

Introduction

The 5TEM4 series air handler is designed for installation in a closet, utility room, alcove, basement, crawlspace or attic. These versatile units are applicable to air conditioning and heat pump applications. Several models are available to meet the specific requirements of the outdoor equipment. Field installed electric resistance heaters are available.

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Revision History

- Updated model numbers across the document.
- Updated TEM Convertibility chapter name to Unit Convertibility.
- Updated dimensional data tables.

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Features and Benefits

- Galvanized metal cabinet with captured foil face insulation
- 2% or less air leakage
- R-4.2 Insulating Value
- Multi-Position UP/Down Flow, Horizontal Left /Right
- ALL Aluminum Coil
- Electric Heaters with polarized plug connections (sold as accessory)
- R-454B Thermal Expansion Valve
- ECM Motor
- Low Voltage Pigtail Connections
- Draw Through Design
- Horizontal Drain pan
- Fused 24v Power
- 5 Year Warranty
- Optional extended warranty available

Important: *Condensate management kit is required for all 5 ton air handler models installed in downflow applications.*

Optional Equipment

Table 1. Optional equipment

Accessory Number	Description	Fits Cabinet Size (in.)
BAYHTR1504BRK	Electric Heater, 4KW, Breaker, 24v Control, 1 Ph	18.5 and 23.5
BAYHTR1504LUG	Electric Heater, 4KW, Lug, 24v Control, 1 Ph	18.5 and 23.5
BAYHTR1505BRK	Electric Heater, 5KW, Breaker, 24v Control, 1 Ph	18.5 and 23.5
BAYHTR1505LUG	Electric Heater, 5KW, Lug, 24v Control, 1 Ph	18.5 and 23.5
BAYHTR1508BRK	Electric Heater, 8KW, Breaker, 24v Control, 1 Ph	18.5 and 23.5
BAYHTR1508LUG	Electric Heater, 8KW, Lug, 24v Control, 1 Ph	18.5 and 23.5
BAYHTR1510BRK	Electric Heater, 10KW, Breaker, 24v Control, 1 Ph	18.5 and 23.5
BAYHTR1510LUG	Electric Heater, 10KW, Lug, 24v Control, 1 Ph	18.5 and 23.5
BAYHTR3510LUG	Electric Heater, 10KW, Lug, 24v Control, 3 Ph	18.5 and 23.5
BAYHTR1517BRK	Electric Heater, 15KW, Breaker, 24v Control, 1 Ph	18.5 and 23.5
BAYHTR3517LUG	Electric Heater, 15KW, Lug, 24v Control, 3 Ph	18.5 and 23.5
BAYHTR1523BRK	Electric Heater, 20KW, Breaker, 24v Control, 1 Ph	23.5
BAYHTR1525BRK	Electric Heater, 25KW, Breaker, 24v Control, 1 Ph	23.5
BAYTEMDFKT1A	Downflow Condensate Management Kit	18.5 and 23.5
BAYTEMSPFG1A	Supply Duct Flange Kit	18.5 and 23.5
BAYSPEKT201A	Single Point Power Entry Kit	18.5 and 23.5
TAYBASE185	Air Handler Downflow Sub-Bases	18.5
TAYBASE235 (TAYBASE 100)	Air Handler Downflow Sub-Bases	23.5
BAYSF1185AAA	Slim Fit Filter Box	18.5
BAYSF1235AAA	Slim Fit Filter Box	23.5
TEMBRKSEALT01A	Breaker Seal Kit for sure with BAYHTR15 4kW — 20kW Heaters	18.5 and 23.5
TEMBRKSEALT25A	Breaker Seal Kit for use with 25 kW electric heaters & heater kits used with BAYSPEKT201	18.5 and 23.5

Product Specifications

Table 2. Models – 5TEM4B02AC21SA, 5TEM4B03AC31SA, 5TEM4B04AC31SA, and 5TEM4D04AC31SA

Model	5TEM4B02AC21SA	5TEM4B03AC31SA	5TEM4B04AC31SA	5TEM4D04AC31SA
Family	5TEM4	5TEM4	5TEM4	5TEM4
Brand	Trane, American Standard	Trane, American Standard	Trane, American Standard	Trane, American Standard
Family Description	R-454B Convertible Air Handler	R-454B Convertible Air Handler	R-454B Convertible Air Handler	R-454B Convertible Air Handler
Application Configuration	4-Way	4-Way	4-Way	4-Way
Rated Capacity Range (BTUH)	18K - 24K	18K - 30K	24K - 36K	24K - 42K
System Control Type	24V	24V	24V	24V
Power Conn. - V/Ph/Hz	208-230/1/60	208-230/1/60	208-230/1/60	208-230/1/60
Max Breaker Size, Without Electric Heater (Amps)	15	15	15	15
Max Breaker Size, With Electric Heater (Amps)[(a)]	60	60	60	60
Coil Type	All-Aluminum Plate Fin	All-Aluminum Plate Fin	All-Aluminum Plate Fin	All-Aluminum Plate Fin
Refrigerant Type	R-454B	R-454B	R-454B	R-454B
Refrigerant Control	TXV	TXV	TXV	TXV
Refrigerant Line Connection - Gas (in.)	3/4	3/4	7/8	7/8
Refrigerant Line Connection - Liquid (in.)	3/8	3/8	3/8	3/8
Blower Type	Direct Drive Centrifugal	Direct Drive Centrifugal	Direct Drive Centrifugal	Direct Drive Centrifugal
Configuration	Blow Through	Blow Through	Blow Through	Blow Through
Dimensions (Diameter x Width (in.))	11 x 8	11 x 8	11 x 8	11 x 8
Motor Type	Constant Torque	Constant Torque	Constant Torque	Constant Torque
Nominal CFM[(b)]	600	800	1200	1200
Speed (RPM)	1050	1050	1050	1050
Volts/Ph/Hz	208-230/1/60	208-230/1/60	208-230/1/60	208-230/1/60
Full Load Amps	2.6	3.9	3.9	3.9
Filter Rack (Yes, No)	No	No	No	No
Dimensions (Length x Width (in.))	–	–	–	–
Duct Connections	L x W	L x W	L x W	L x W
Supply (in.)	12.15 x 16.50	12.15 x 16.50	12.15 x 16.50	12.15 x 21.50
Return (in.)	18.75 x 16.75	18.75 x 16.75	18.75 x 16.75	18.75 x 21.75
Drain Conn. Size (in.)	3/4 NPT	3/4 NPT	3/4 NPT	3/4 NPT
Dimensions	H x W x D	H x W x D	H x W x D	H x W x D
Uncrated (in.)	45-1/8 x 18-1/2 x 21-1/8	46-3/4 x 18-1/2 x 21-1/8	51-3/4 x 18-1/2 x 21-1/8	51-3/8 x 23-1/2 x 21-1/8
Crated (in.)	46-1/2 x 22-1/2 x 25-1/2	48-1/4 x 22-1/2 x 25-1/2	53-1/4 x 22-1/2 x 25-1/2	52-3/4 x 27-1/2 x 25-1/2
Weight - Shipping/Net (lbs.)	116/110	126/117	138/132	145/138

[(a)] Maximum overcurrent protection is dependent on which electric heater is installed. See Electrical Data, p. 11.
[(b)] For CFM versus external static pressure (in. w.c.), see Airflow Performance Data, p. 9.

Product Specifications

Table 3. Models – 5TEM4D05AC41SA, 5TEM4D06AC41SA, and 5TEM4D07AC51SA

Model	5TEM4D05AC41SA	5TEM4D06AC41SA	5TEM4D07AC51SA
Family	5TEM4	5TEM4	5TEM4
Brand	Trane, American Standard	Trane, American Standard	Trane, American Standard
Family Description	R-454B Convertible Air Handler	R-454B Convertible Air Handler	R-454B Convertible Air Handler
Application Configuration	4-Way	4-Way	4-Way
Rated Capacity Range (BTUH)	36K - 48K	36K - 48K	42K - 60K
System Control Type	24V	24V	24V
Power Conn. - V/Ph/Hz	208-230/1/60	208-230/1/60	208-230/1/60
Max Breaker Size, Without Electric Heater (Amps)	15	15	15
Max Breaker Size, With Electric Heater (Amps)[a]	60	60	60
Coil Type	All-Aluminum Plate Fin	All-Aluminum Plate Fin	All-Aluminum Plate Fin
Refrigerant Type	R-454B	R-454B	R-454B
Refrigerant Control	TXV	TXV	TXV
Refrigerant Line Connection - Gas (in.)	7/8	7/8	7/8
Refrigerant Line Connection - Liquid (in.)	3/8	3/8	3/8
Blower Type	Direct Drive Centrifugal	Direct Drive Centrifugal	Direct Drive Centrifugal
Configuration	Blow Through	Blow Through	Blow Through
Dimensions (Diameter x Width (in.))	11 x 8	11 x 8	11 x 8
Motor Type	Constant Torque	Constant Torque	Constant Torque
Nominal CFM[b]	1400	1600	2000
Speed (RPM)	1050	1050	1050
Volts/Ph/Hz	208-230/1/60	208-230/1/60	208-230/1/60
Full Load Amps	3.9	6.0	6.0
Filter Rack (Yes, No)	No	No	No
Dimensions (Length x Width (in.))	–	–	–
Duct Connections	L x W	L x W	L x W
Supply (in.)	12.15 x 21.50	12.15 x 21.50	12.15 x 21.50
Return (in.)	18.75 x 21.75	18.75 x 21.75	18.75 x 21.75
Drain Conn. Size (in.)	3/4 NPT	3/4 NPT	3/4 NPT
Dimensions	H x W x D	H x W x D	H x W x D
Uncrated (in.)	51-3/8 x 23-1/2 x 21-1/8	51-3/8 x 23-1/2 x 21-1/8	57-3/8 x 23-1/2 x 21-1/8
Crated (in.)	52-3/4 x 27-1/2 x 25-1/2	52-3/4 x 27-1/2 x 25-1/2	58-1/8 x 25-7/8 x 25-1/2
Weight - Shipping/Net (lbs.)	145/138	155/144	185/174

[a] Maximum overcurrent protection is dependent on which electric heater is installed. See Electrical Data, p. 11.
[b] For CFM versus external static pressure (in. w.c.), see Airflow Performance Data, p. 9.

Heater Pressure Drop Table

Table 4. Heater pressure drop

Airflow CFM	Number of Racks					Heater Racks	
	1	2	3	4		Heater Model	No. of Racks
	Air Pressure Drop — Inches W.G.						
1800	0.02	0.04	0.06	0.14		BAYHTR1504	1
1700	0.02	0.04	0.06	0.14		BAYHTR1505	1
1600	0.02	0.04	0.06	0.13		BAYHTR1508	2
1500	0.02	0.04	0.06	0.12		BAYHTR1510	2
1400	0.02	0.04	0.06	0.12		BAYHTR1517	3
1300	0.02	0.04	0.05	0.11		BAYHTR3510	3
1200	0.01	0.04	0.05	0.10		BAYHTR3517	3
1100	0.01	0.03	0.05	0.09		BAYHTR1523	4
1000	0.01	0.03	0.04	0.09		BAYHTR1525	4
900	0.01	0.03	0.04	0.08		—	—
800	0.01	0.03	—	—		—	—
700	0.01	0.02	—	—		—	—
600	0.01	0.02	—	—		—	—

Minimum Airflow CFM

Table 5. Model — 5TEM4B02AC21SA

Heater	Minimum Heat Speed Tap	
	With Heat Pump	Without Heat Pump
BAYHTR1504BRK, BAYHTR1504LUG, BAYHTR1505BRK, BAYHTR1505LUG	Tap 2	Tap 2
BAYHTR1508BRK, BAYHTR1508LUG, BAYHTR1510BRK, BAYHTR1510LUG, BAYHTR3510LUG	Tap 5	Tap 5

Table 6. Model — 5TEM4B03AC31SA

Heater	Minimum Heat Speed Tap	
	With Heat Pump	Without Heat Pump
BAYHTR1504BRK, BAYHTR1504LUG, BAYHTR1505BRK, BAYHTR1505LUG	Tap 3	Tap 3
BAYHTR1508BRK, BAYHTR1508LUG, BAYHTR1510BRK, BAYHTR1510LUG	Tap 4	Tap 3
BAYHTR1517BRK, BAYHTR3517LUG, BAYHTR3510LUG	Tap 5	Tap 3

Table 7. Model — 5TEM4B04AC31SA and 5TEM4D04AC31SA

Heater	Minimum Heat Speed Tap	
	With Heat Pump	Without Heat Pump
BAYHTR1504BRK, BAYHTR1504LUG, BAYHTR1505BRK, BAYHTR1505LUG	Tap 2	Tap 2
BAYHTR1508BRK, BAYHTR1508LUG, BAYHTR1510BRK, BAYHTR1510LUG	Tap 5	Tap 3
BAYHTR1523BRK	Tap 5	Tap 3
BAYHTR1517BRK, BAYHTR3517LUG, BAYHTR3510LUG	Tap 5	Tap 3

Table 8. Models — 5TEM4D05AC41SA

Heater	Minimum Heat Speed Tap	
	With Heat Pump	Without Heat Pump
BAYHTR1504BRK, BAYHTR1504LUG, BAYHTR1505BRK, BAYHTR1505LUG	Tap 2	Tap 2
BAYHTR1508BRK, BAYHTR1508LUG, BAYHTR1510BRK, BAYHTR1510LUG	Tap 4	Tap 4
BAYHTR1523BRK	Tap 4	Tap 3
BAYHTR1517BRK, BAYHTR3517LUG, BAYHTR3510LUG	Tap 5	Tap 3

Table 9. Model — 5TEM4D06AC41SA

Heater	Minimum Heat Speed Tap	
	With Heat Pump	Without Heat Pump
BAYHTR1504BRK, BAYHTR1504LUG, BAYHTR1505BRK, BAYHTR1505LUG, BAYHTR1508BRK, BAYHTR1508LUG, BAYHTR1510BRK, BAYHTR1510LUG, BAYHTR3510LUG	Tap 2	Tap 2
BAYHTR1517BRK, BAYHTR3517LUG	Tap 4	Tap 4
BAYHTR1523BRK, BAYHTR1525BRK	Tap 5	Tap 4

Table 10. Model — 5TEM4D07AC51SA

Heater	Minimum Heat Speed Tap	
	With Heat Pump	Without Heat Pump
BAYHTR1504BRK, BAYHTR1504LUG, BAYHTR1505BRK, BAYHTR1505LUG, BAYHTR1508BRK, BAYHTR1508LUG, BAYHTR1510BRK, BAYHTR1510LUG, BAYHTR3510LUG	Tap 2	Tap 2
BAYHTR1517BRK, BAYHTR3517LUG	Tap 3	Tap 3
BAYHTR1523BRK, BAYHTR1525BRK	Tap 5	Tap 3

Performance and Electrical Data

Airflow Performance Data

Table 11. Model – 5TEM4B02AC21SA

External Static (in w.g)	Airflow			
	Speed Taps: 208-230 Volts			
	Tap 2	Tap 3[a]	Tap 4	Tap 5
0.1	874	978	1045	1134
0.2	824	934	1002	1096
0.3	746	881	955	1056
0.4	676	813	891	1009
0.5	606	746	828	943
0.6	551	681	762	888
0.7	481	627	702	830
0.8	404	578	653	771
0.9	328	519	606	722

Note: In horizontal and downflow applications, airflow should be limited to 1000 CFM due to condensate blowoff.

[a] Factory setting.

Table 12. Model – 5TEM4B03AC31SA

External Static (in w.g)	Airflow			
	Speed Taps: 208-230 Volts			
	Tap 2	Tap 3[a]	Tap 4	Tap 5
0.1	886	1027	1094	1196
0.2	844	989	1059	1164
0.3	791	947	1020	1130
0.4	719	896	978	1094
0.5	660	837	926	1053
0.6	584	778	864	1006
0.7	517	723	813	948
0.8	460	650	753	897
0.9	378	594	694	850

Note: In horizontal and downflow applications, airflow should be limited to 1000 CFM due to condensate blowoff.

[a] Factory setting.

Table 13. Model – 5TEM4B04AC31SA

External Static (in w.g)	Airflow			
	Speed Taps: 208-230 Volts			
	Tap 2	Tap 3[a]	Tap 4	Tap 5
0.1	1183	1267	1347	1390
0.2	1141	1230	1310	1346
0.3	1101	1189	1273	1309
0.4	1053	1149	1237	1275
0.5	1004	1105	1196	1236
0.6	957	1058	1155	1196
0.7	916	1016	1111	1153
0.8	870	974	1072	1113
0.9	828	935	1034	1073

Note: In horizontal and downflow applications, airflow should be limited to 1200 CFM due to condensate blowoff.

[a] Factory setting.

Table 14. Model – 5TEM4D04AC31SA

External Static (in w.g)	Airflow			
	Speed Taps: 208-230 Volts			
	Tap 2	Tap 3[a]	Tap 4	Tap 5
0.1	1230	1311	1385	1428
0.2	1187	1265	1342	1388
0.3	1140	1220	1299	1345
0.4	1089	1174	1256	1302
0.5	1036	1125	1210	1260
0.6	980	1070	1160	1211
0.7	909	1010	1110	1161
0.8	833	939	1053	1106
0.9	755	904	984	1041

[a] Factory setting.

Table 15. Model – 5TEM4D05AC41SA

External Static (in w.g)	Airflow			
	Speed Taps: 208-230 Volts			
	Tap 2	Tap 3[a]	Tap 4	Tap 5
0.1	1266	1340	1425	1577
0.2	1214	1286	1384	1535
0.3	1163	1242	1335	1494
0.4	1114	1195	1290	1452
0.5	1057	1144	1246	1410
0.6	996	1087	1187	1367
0.7	931	1026	1128	1319
0.8	853	961	1071	1268
0.9	779	889	1005	1211

[a] Factory setting.

Table 16. Model – 5TEM4D06AC41SA

External Static (in w.g)	Airflow			
	Speed TapAirflows: 208-230 Volts			
	Tap 2	Tap 3[a]	Tap 4	Tap 5
0.1	1550	1592	1804	1971
0.2	1511	1550	1767	1939
0.3	1470	1510	1734	1907
0.4	1426	1469	1697	1867
0.5	1379	1424	1656	1839
0.6	1324	1381	1615	1804
0.7	1278	1338	1575	1766
0.8	1229	1292	1536	1722
0.9	1173	1241	1492	1691

Note: In horizontal and downflow applications, airflow should be limited to 1700 CFM due to condensate blowoff.

[a] Factory setting.

Table 17. Model – 5TEM4D07AC51SA

External Static (in w.g)	Airflow			
	Speed Taps: 208-230 Volts			
	Tap 2	Tap 3[a]	Tap 4	Tap 5
0.1	1574	1648	1781	1935
0.2	1538	1608	1749	1900
0.3	1502	1577	1715	1872
0.4	1466	1542	1685	1842
0.5	1425	1506	1651	1814
0.6	1374	1466	1616	1784
0.7	1328	1423	1576	1749
0.8	1280	1377	1531	1712
0.9	1227	1329	1489	1674

Note: In horizontal and downflow applications, airflow should be limited to 1800 CFM due to condensate blowoff.

[a] Factory setting.

Notes:

- *Tap 1 is not an airflow selection. Black wire must always be on Tap 1.*
- *Values are with wet coil, no filter, and no heaters.*
- *CFM correction for dry coil = add 3%.*
- *First-stage airflow is approximately 75% of full-stage airflow setting.*

Electrical Data

Table 18. Model – 5TEM4B02AC21SA

Heater Model No.	No. of Circuits/ Phases	240 Volt					208 Volt				
		Capacity		Heater Amps per Circuit	Minimum Circuit Ampacity	Maximum Overload Protection	Capacity		Heater Amps per Circuit	Minimum Circuit Ampacity	Maximum Overload Protection
		kW	BTUH				kW	BTUH			
No Heater	—	—	—	2.6[a]	3	15	—	—	2.6[a]	3	15
BAYHTR1504BRK BAYHTR1504LUG	1/1	3.8	13100	16.0	23	25	2.9	9800	13.8	21	25
BAYHTR1505BRK BAYHTR1505LUG	1/1	4.8	16400	20.0	28	30	3.6	12300	17.3	25	25
BAYHTR1508BRK BAYHTR1508LUG	1/1	7.7	26200	32.0	43	45	5.8	19700	27.7	38	40
BAYHTR1510BRK BAYHTR1510LUG	1/1	9.6	32800	40.0	53	60	7.2	24600	34.6	47	50
BAYHTR3510LUG	1/3	9.6	32800	23.1	32	35	7.2	24600	20.0	28	30

[a] Motor Amps.

Table 19. Model – 5TEM4B03AC31SA

Heater Model No.	No. of Circuits/ Phases	240 Volt					208 Volt				
		Capacity		Heater Amps per Circuit	Minimum Circuit Ampacity	Maximum Overload Protection	Capacity		Heater Amps per Circuit	Minimum Circuit Ampacity	Maximum Overload Protection
		kW	BTUH				kW	BTUH			
No Heater	—	—	—	3.9[a]	5	15	—	—	3.9[a]	5	15
BAYHTR1504BRK BAYHTR1504LUG	1/1	3.8	13100	16.0	25	25	2.9	9800	13.8	22	25
BAYHTR1505BRK BAYHTR1505LUG	1/1	4.8	16400	20.0	30	30	3.6	12300	17.3	27	30
BAYHTR1508BRK BAYHTR1508LUG	1/1	7.7	26200	32.0	45	45	5.8	19700	27.7	39	40

Table 19. Model – 5TEM4B03AC31SA (continued)

Heater Model No.	No. of Circuits/ Phases	240 Volt					208 Volt				
		Capacity		Heater Amps per Circuit	Minimum Circuit Ampacity	Maximum Overload Protection	Capacity		Heater Amps per Circuit	Minimum Circuit Ampacity	Maximum Overload Protection
		kW	BTUH				kW	BTUH			
BAYHTR1510BRK BAYHTR1510LUG	1/1	9.6	32800	40.0	55	60	7.2	24600	34.6	48	50
BAYHTR1517BRK-Circuit 1[b]	2/1	9.6	32800	40.0	55	60	7.2	24600	34.6	48	50
BAYHTR1517BRK-Circuit 2		4.8	16400	20.0	25	25	3.6	12300	17.3	22	25
BAYHTR3510LUG	1/3	9.6	32800	23.1	33	35	7.2	24600	20.0	29	30
BAYHTR3517LUG	1/3	14.4	49100	34.6	48	50	10.8	36900	30.0	42	45

[a] Motor Amps.
[b] MCA and MOP for circuit 1 contains the motor amps.

Table 20. Models – 5TEM4B04AC31SA and 5TEM4D04AC31SA

Heater Model No.	No. of Circuits/ Phases	240 Volt					208 Volt				
		Capacity		Heater Amps per Circuit	Minimum Circuit Ampacity	Maximum Overload Protection	Capacity		Heater Amps per Circuit	Minimum Circuit Ampacity	Maximum Overload Protection
		kW	BTUH				kW	BTUH			
No Heater	—	—	—	3.9[a]	5	15	—	—	3.9[a]	5	15
BAYHTR1504BRK BAYHTR1504LUG	1/1	3.84	13100	16.0	25	25	2.88	9800	13.8	22	25
BAYHTR1505BRK BAYHTR1505LUG	1/1	4.80	16400	20.0	30	30	3.60	12300	17.3	27	30
BAYHTR1508BRK BAYHTR1508LUG	1/1	7.68	26200	32.0	45	45	5.76	19700	27.7	39	40
BAYHTR1510BRK BAYHTR1510LUG	1/1	9.60	32800	40.0	55	60	7.20	24600	34.6	48	50
BAYHTR1517BRK-Circuit 1[b]	2/1	9.60	32800	40.0	55	60	7.20	24600	34.6	48	50
BAYHTR1517BRK-Circuit 2		4.80	16400	20.0	25	25	3.60	12300	17.3	22	25
BAYHTR1523BRK-Circuit 1[b]	2/1	9.60	32800	40.0	55	60	7.20	24600	34.6	48	50
BAYHTR1523BRK-Circuit 2		9.60	32800	40.0	50	50	7.20	24600	34.6	43	45
BAYHTR3510LUG	1/3	9.60	32800	23.1	33	35	7.20	24600	20.0	29	30
BAYHTR3517LUG	1/3	14.40	49100	34.6	48	50	10.80	36900	30.0	42	45

[a] Motor Amps.
[b] MCA and MOP for circuit 1 contains the motor amps.

Table 21. Model – 5TEM4D05AC41SA

Heater Model No.	No. of Circuits/ Phases	240 Volt					208 Volt				
		Capacity		Heater Amps per Circuit	Minimum Circuit Ampacity	Maximum Overload Protection	Capacity		Heater Amps per Circuit	Minimum Circuit Ampacity	Maximum Overload Protection
		kW	BTUH				kW	BTUH			
No Heater	—	—	—	4.1[a]	5	15	—	—	4.1[a]	5	15
BAYHTR1504BRK BAYHTR1504LUG	1/1	3.8	13100	16.0	25	25	2.9	9800	13.8	22	25
BAYHTR1505BRK BAYHTR1505LUG	1/1	4.8	16400	20.0	30	30	3.6	12300	17.3	27	30
BAYHTR1508BRK BAYHTR1508LUG	1/1	7.7	26200	32.0	45	45	5.8	19700	27.7	40	40
BAYHTR1510BRK BAYHTR1510LUG	1/1	9.6	32800	40.0	55	60	7.2	24600	34.6	48	50

Table 21. Model – 5TEM4D05AC41SA (continued)

Heater Model No.	No. of Circuits/ Phases	240 Volt					208 Volt				
		Capacity		Heater Amps per Circuit	Minimum Circuit Ampacity	Maximum Overload Protection	Capacity		Heater Amps per Circuit	Minimum Circuit Ampacity	Maximum Overload Protection
		kW	BTUH				kW	BTUH			
BAYHTR1517BRK-Circuit 1[b]	2/1	9.6	32800	40.0	55	60	7.2	24600	34.6	48	50
BAYHTR1517BRK-Circuit 2		4.8	16400	20.0	25	25	3.6	12300	17.3	22	25
BAYHTR1523BRK-Circuit 1[b]	2/1	9.6	32800	40.0	55	60	7.2	24600	34.6	48	50
BAYHTR1523BRK-Circuit 2		9.6	32800	40.0	50	50	7.2	24600	34.6	43	45
BAYHTR3510LUG	1/3	9.6	32800	23.1	33	35	7.2	24600	20.0	30	30
BAYHTR3517LUG	1/3	14.4	49100	34.6	48	50	10.8	36900	30.0	42	45

[a] Motor Amps.
[b] MCA and MOP for circuit 1 contains the motor amps.

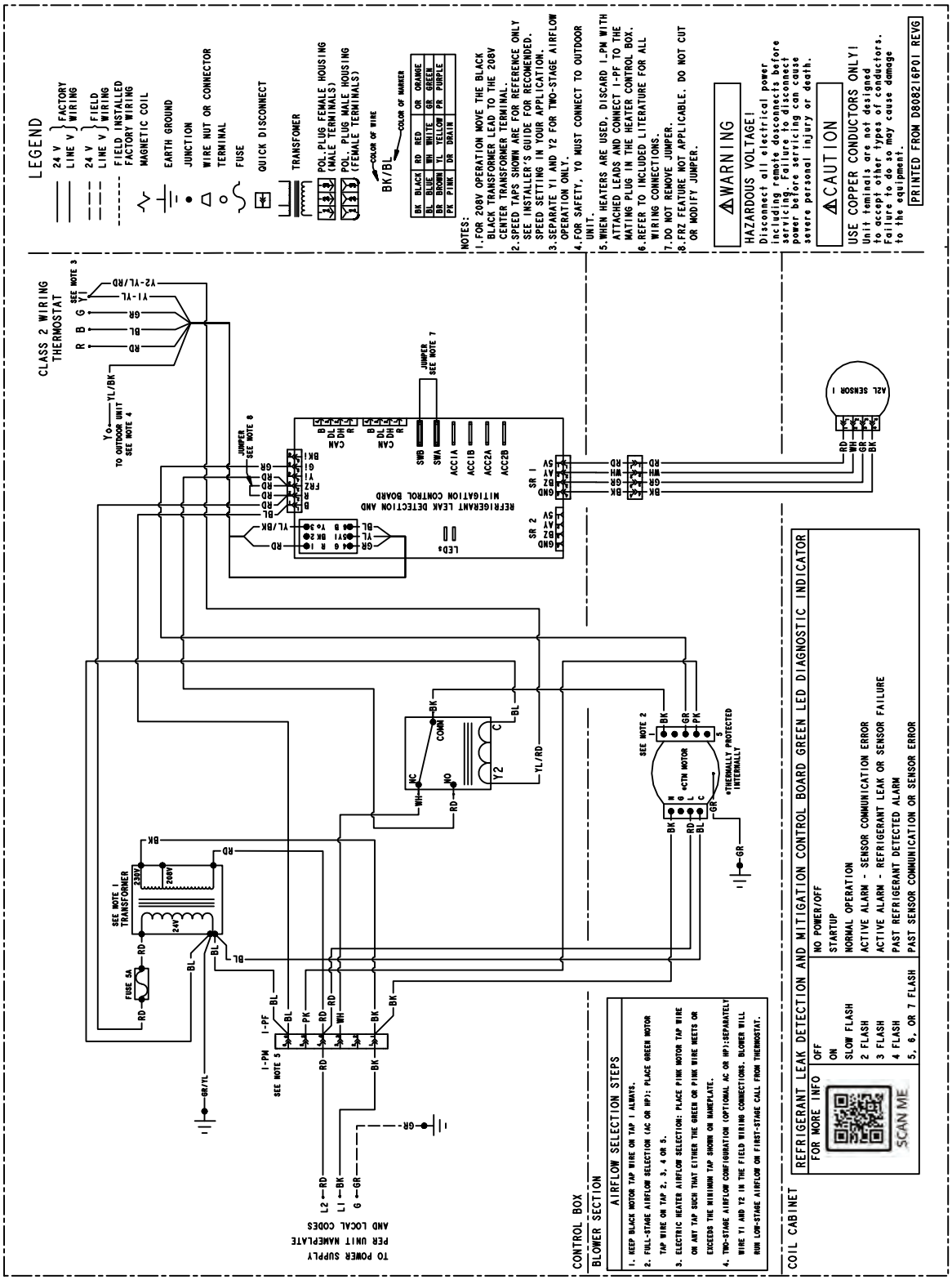
Table 22. Models – 5TEM4D06AC41SA and 5TEM4D07AC51SA

Heater Model No.	No. of Circuits/ Phases	240 Volt					208 Volt				
		Capacity		Heater Amps per Circuit	Minimum Circuit Ampacity	Maximum Overload Protection	Capacity		Heater Amps per Circuit	Minimum Circuit Ampacity	Maximum Overload Protection
		kW	BTUH				kW	BTUH			
No Heater	—	—	—	6.0[a]	8	15	—	—	6.0[a]	8	15
BAYHTR1504BRK BAYHTR1504LUG	1/1	3.8	13100	16.0	28	30	2.9	9800	13.8	25	25
BAYHTR1505BRK BAYHTR1505LUG	1/1	4.8	16400	20.0	33	35	3.6	12300	17.3	29	30
BAYHTR1508BRK BAYHTR1508LUG	1/1	7.7	26200	32.0	48	50	5.8	19700	27.7	42	45
BAYHTR1510BRK BAYHTR1510LUG	1/1	9.6	32800	40.0	58	60	7.2	24600	34.6	51	60
BAYHTR1517BRK-Circuit 1[b]	2/1	9.6	32800	40.0	58	60	7.2	24600	34.6	51	60
BAYHTR1517BRK-Circuit 2		4.8	16400	20.0	25	25	3.6	12300	17.3	22	25
BAYHTR1523BRK-Circuit 1[b]	2/1	9.6	32800	40.0	58	60	7.2	24600	34.6	51	60
BAYHTR1523BRK-Circuit 2		9.6	32800	40.0	50	50	7.2	24600	34.6	43	45
BAYHTR1525BRK-Circuit 1[b]	4/1	6.0	20500	25.0	39	40	4.5	15400	21.6	35	35
BAYHTR1525BRK-Circuit 2		6.0	20500	25.0	31	35	4.5	15400	21.6	27	30
BAYHTR1525BRK-Circuit 3		6.0	20500	25.0	31	35	4.5	15400	21.6	27	30
BAYHTR1525BRK-Circuit 4		6.0	20500	25.0	31	35	4.5	15400	21.6	27	30
BAYHTR3510LUG	1/3	9.6	32800	23.1	36	40	7.2	24600	20.0	32	35
BAYHTR3517LUG	1/3	14.4	49100	34.6	50	50	10.8	36900	30.0	44	45

[a] Motor Amps.
[b] MCA and MOP for circuit 1 contains the motor amps.

Wiring Diagram

Figure 1. Wiring diagram



Field Wiring Diagrams

Figure 2. Single stage, cooling only

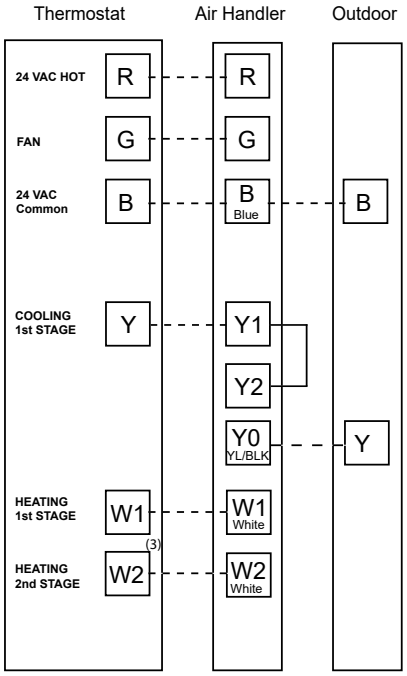
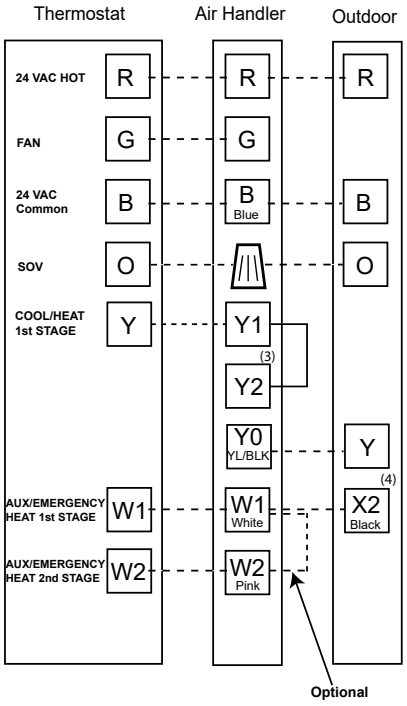


Figure 3. Single stage, HP



Field Wiring Diagrams

Figure 4. 2 Stage indoor airflow, cooling only

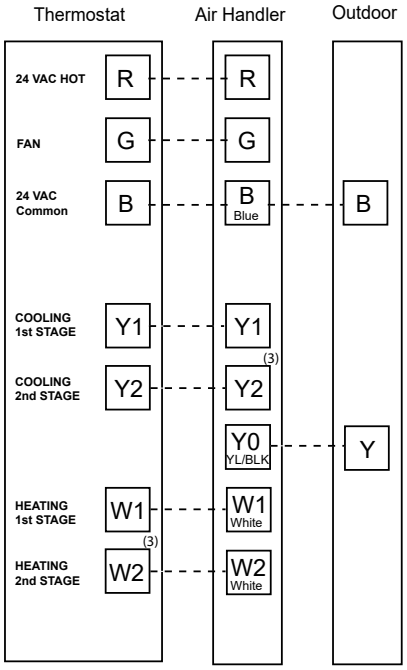
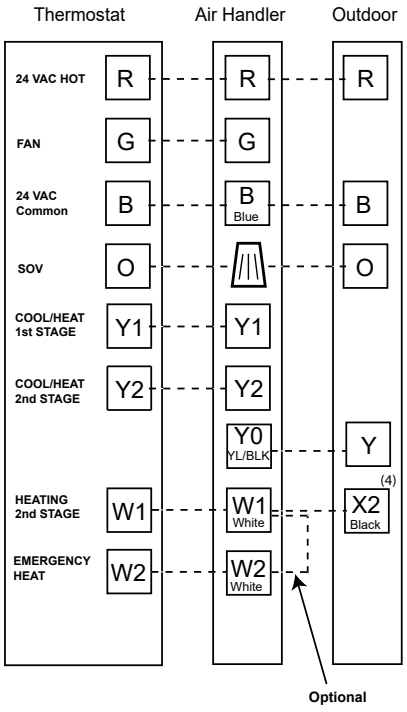


Figure 5. 2 Stage indoor airflow, HP



Notes:

1. *Units with pigtails require wirenuts for connections.*
2. *Cap all unused wires.*
3. *In AC systems for multiple stages of electric heat, jumper W1 and W2 together if comfort control has only one stage of heat.*
4. *X2 is only needed if not using certain Trane or American Standard thermostats.*

External Switches and Accessories

The following optional connections are available on the mitigation control board (see connection diagrams Figure 6, p. 17):

- ACC1 and ACC2 accessory connections. Use when connecting an accessory to the air handler that could be considered a source of ignition (ex. electronic air cleaner).
- Aoa/Aob audible alarm connections. Use when configuring an audible alarm on the refrigerant detection system of the air handler.

ACC1, ACC2, and Aoa/Aob are dry contacts and need source voltage provided from either the accessory or the unit's control wiring.

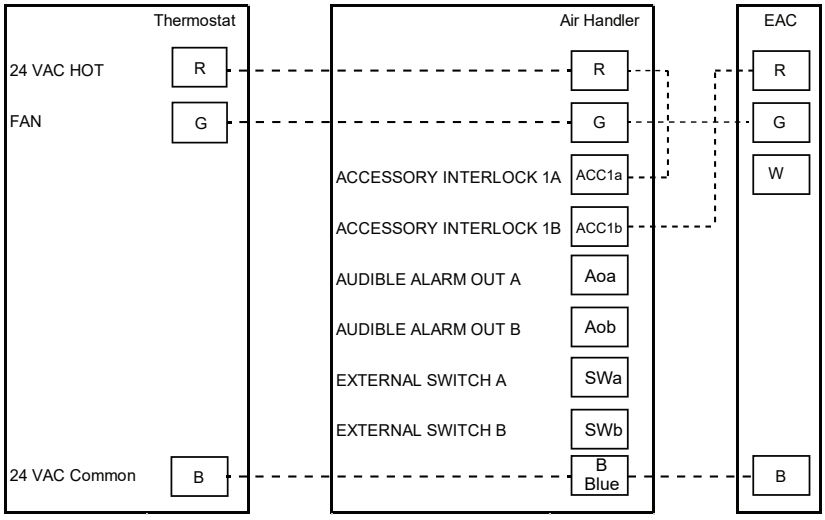
Connect using field-supplied 3/16-inch (Aoa/Aob) or 1/4-inch (ACC1, ACC2) female spade connections.

Figure 6. Accessories diagram

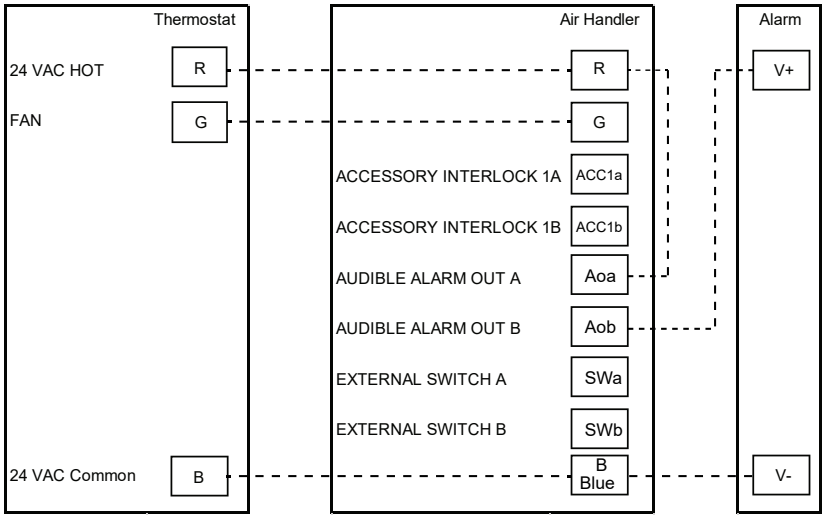
SCAN ME

Scan QR code to view instructional videos on field wiring for CleanEffects or AccuClean electronic air cleaners.

Electronic Air Cleaner, typical

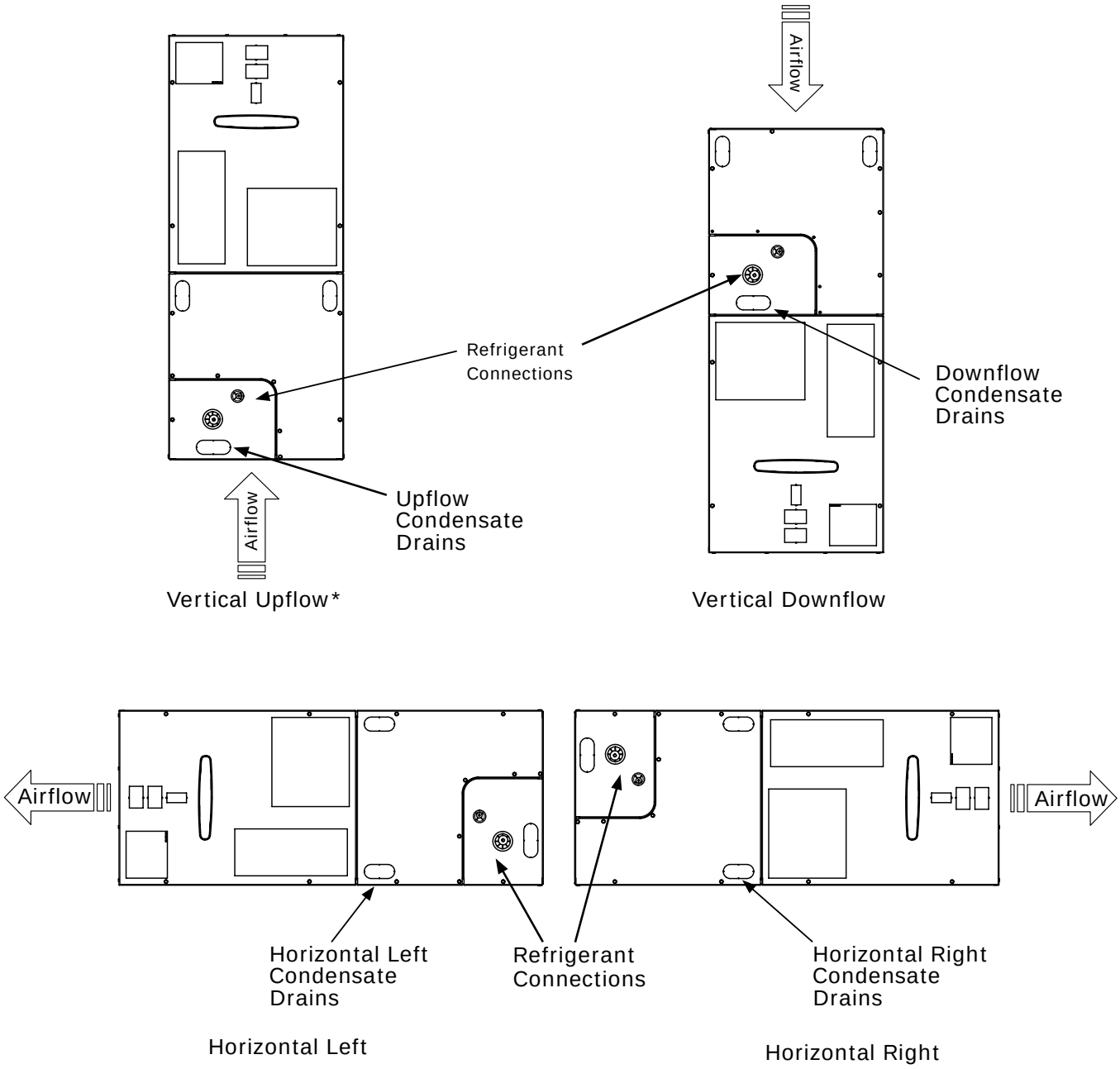


24VAC Audible Alarm, typical



Unit Convertibility

Figure 7. Multi-position air handler



Note: ** = No internal modifications required.*

Dimensional Data

Figure 8. Dimensional data

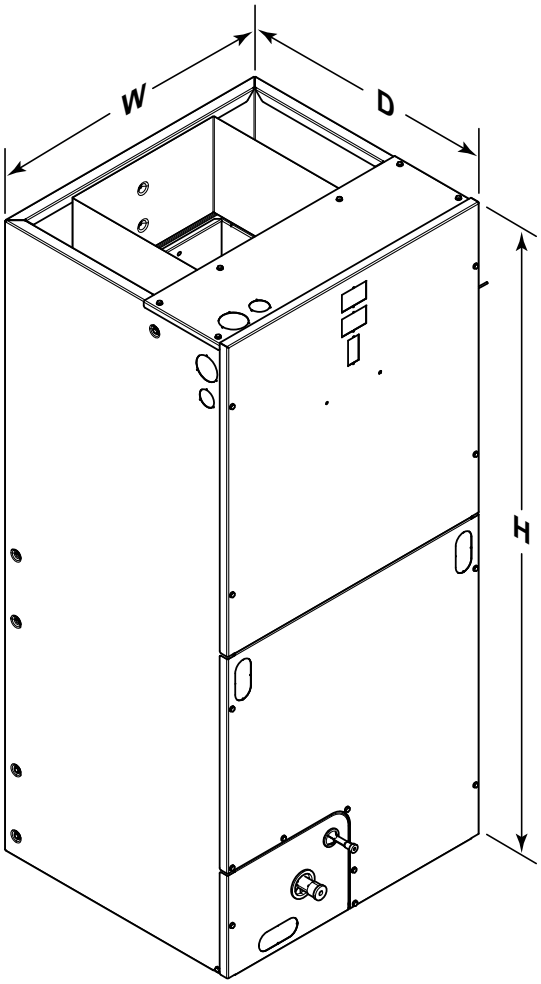
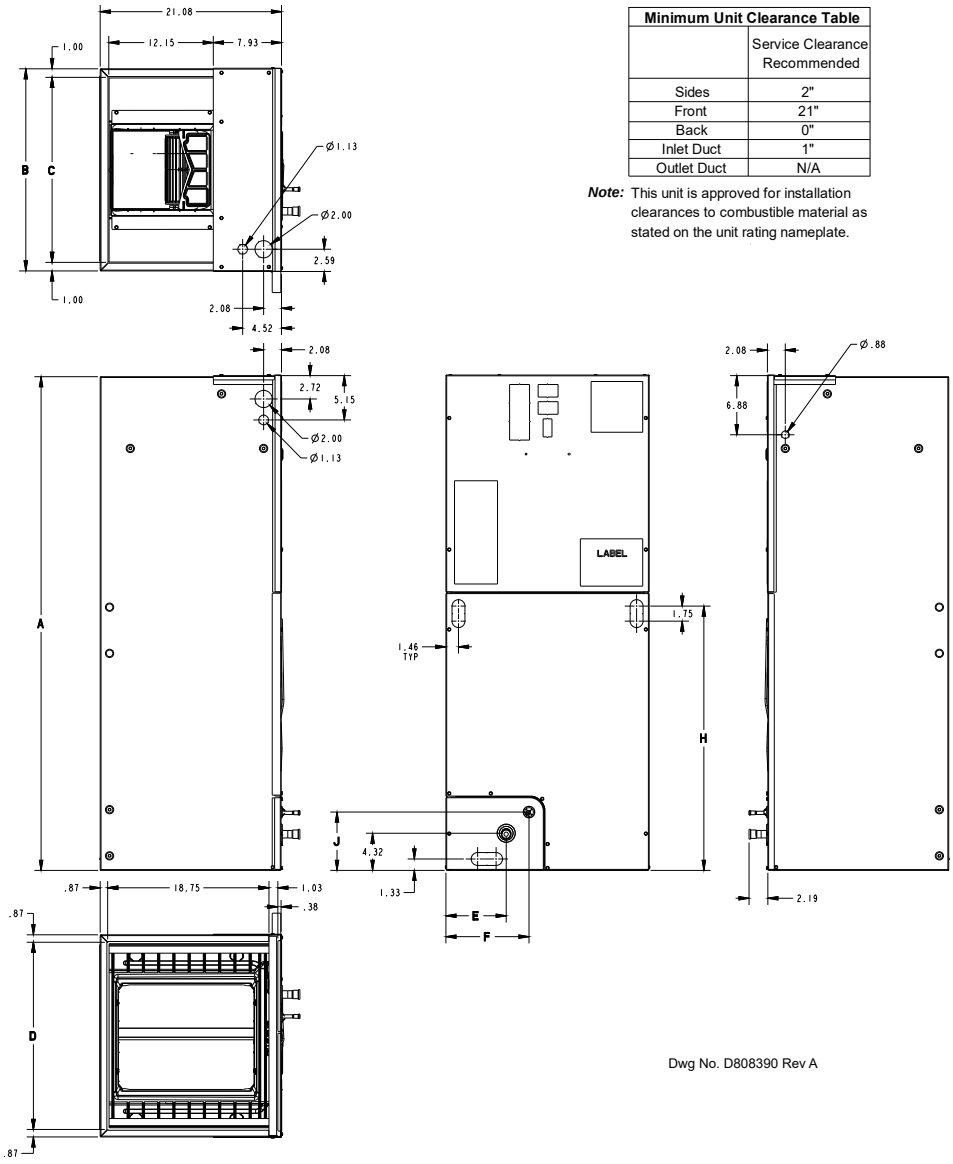


Table 23. Dimensions (inch)

Model No.	H	W	D
5TEM4B02	45.02	18.50	21.08
5TEM4B03	46.77	18.50	21.08
5TEM4B04	51.76	18.50	21.08
5TEM4D04, 05, 06	51.27	23.50	21.08
5TEM4D07	57.40	23.50	21.08

Dimensional Data

Figure 9. Dimensional data



Minimum Unit Clearance Table	
	Service Clearance Recommended
Sides	2"
Front	21"
Back	0"
Inlet Duct	1"
Outlet Duct	N/A

Note: This unit is approved for installation clearances to combustible material as stated on the unit rating nameplate.

Dwg No. D808390 Rev A

Note: *All dimensions are reference dimensions.*

Table 24. Product Dimensions (inch)

Air Handler Model	A	B	C	D	E	F	H	J	Flow Control	Gas Line Braze
5TEM4B02	45.02	18.50	16.50	16.75	5.43	7.08	18.32	5.76	TXV	3/4
5TEM4B03	46.77	18.50	16.50	16.75	5.43	7.08	20.07	5.76	TXV	3/4
5TEM4B04	51.76	18.50	16.50	16.75	5.43	7.08	24.58	5.76	TXV	7/8
5TEM4D04, 05, 06	51.27	23.50	21.50	21.75	7.01	9.66	24.58	6.76	TXV	7/8
5TEM4D07	57.40	23.50	21.50	21.75	7.01	9.66	30.71	6.76	TXV	7/8

Notes

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AHR-PSD007B-EN 05 Nov 2025
Supersedes AHR-PSD007A-EN (June 2025)

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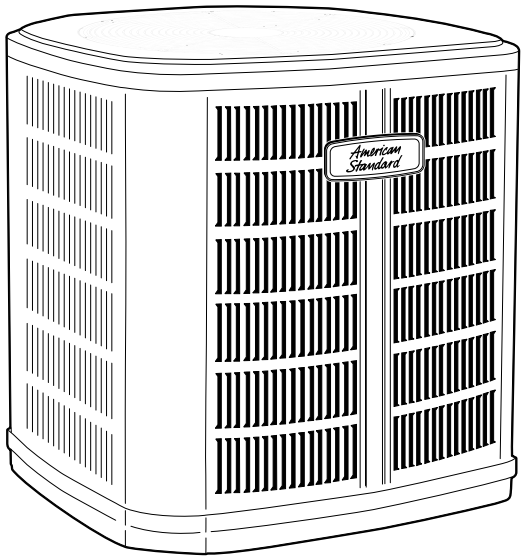
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HEATING & AIR CONDITIONING

Product and Submittal Data

Split System Cooling

5A7A4018A1000A
5A7A4024A1000A
5A7A4030A1000A/B
5A7A4036A1000A/B
5A7A4042A1000A/B
5A7A4048A1000A/B
5A7A4060A1000A/B



Note: *Graphics in this document are for representation only. Actual model may differ in appearance.*

September 2025

ODR-PSD014B-EN

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Revision History

Updated Product Specification tables.

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Product Specifications

Table 1. Models — 5A7A4018A1000A, 5A7A4024A1000A, 5A7A4030A1000A/B, and 5A7A4036A1000A/B

Outdoor Unit [a] [b]	**5A7A4018A1000**	**5A7A4024A1000**	**5A7A4030A10000**		**5A7A4036A1000**	
14th Digit of the Model Number	A	A	A	B	A	B
Power Conns. - V/Ph/Hz [c]	208/230/1/60	208/230/1/60	208/230/1/60		208/230/1/60	
Min. BRCH. CIR. Ampacity	9	14	16	17	18	
BR. CIR. PROT. RTG. - Max. (Amps)	20	20	25		30	
Compressor	DURATION® - Scroll	DURATION® - Scroll	DURATION® - Scroll		DURATION® - Scroll	
No. Used - No. Stages	1 - 1	1 - 1	1 - 1		1 - 1	
Volts/Ph/Hz	208/230/1/60	208/230/1/60	208/230/1/60		208/230/1/60	
RL Amps[d] - LR Amps	6.9 - 45	10.9 - 60	12.5 - 72.1	12.7 - 76	13.5 - 75	13.5 - 83
Factory Installed						
Start Components [e]	No	No (Uses BAYKSKT263)	No		No (Uses BAYKSKT263)	
Insulation/Sound Blanket	No	No	No		No	
Compressor Heat	No	No	No		No	
Outdoor Fan	Propeller	Propeller	Propeller		Propeller	
Dia. (in.) - No. Used	23.02 - 1	23 - 1	23.0 - 1		23 - 1	
Type Drive - No. Speeds	Direct - 1	Direct - 1	Direct - 1		Direct - 1	
CFM @ 0.0 (in.) W.G. [f]	2992	3068	3243		3124	
No. Motors - HP	1 - 1/8	1 - 1/8	1 - 1/8		1 - 1/8	
Motor Speed – rpm	825	825	825		1100	
Volts/Ph/Hz	208/230/1/60	208/230/1/60	208/230/1/60		208/230/1/60	
FL Amps	0.71	0.71	0.77		0.85	
Outdoor Coil - Type	Spine Fin™	Spine Fin™	Spine Fin™		Spine Fin™	
Rows - F.P.I.	1 - 24	1 - 24	1 - 24		1 - 24	
Face Area (Sq. Ft.)	21.25	18.75	21.25		18.75	
Tube Size (In.)	3/8	3/8	3/8		3/8	
Refrigerant						
lb - R-454B (O.D. Unit) [g]	3 lb, 12 oz	3 lb, 10 oz	3 lb, 8 oz		3 lb, 8 oz	
Factory Supplied	Yes	Yes	Yes		Yes	
Valve Connection Size - (in.) O. D. Gas	3/4	3/4	3/4		3/4	
Valve Connection Size - (in.) O. D. Liq	5/16	5/16	5/16		5/16	
Line Size - (in.) O.D. Gas [h]	3/4	3/4	3/4		7/8	
Line Size - (in.) O.D. Gas	5/16	5/16	5/16		5/16	
Charging Specifications						
Subcooling	10°F	10°F	10°F		10°F	
Dimensions	H X W X D					
Crated (In.)	42 x 30 x 33	38 x 30 x 33	42 x 30 x 33		38 x 30 x 33	
Weight						
Shipping (lb)	220	183	220		183	

Table 1. Models — 5A7A4018A1000A, 5A7A4024A1000A, 5A7A4030A1000A/B, and 5A7A4036A1000A/B (continued)

Outdoor Unit [a] [b]	5A7A4018A1000	5A7A4024A1000	5A7A4030A10000	5A7A4036A1000
Net (lb)	184	156	184	156
Optional Accessories:				
Anti-short Cycle Timer	TAYASCT501A	TAYASCT501A	TAYASCT501A	TAYASCT501A
Evaporator Defrost Control	AY28X079	AY28X079	AY28X079	AY28X079
Rubber Isolator Kit	BAYISLT101	BAYISLT101	BAYISLT101	BAYISLT101
Extreme Condition Mount Kit	BAYECMT023	BAYECMT023	BAYECMT023	BAYECMT023
Start Kit	BAYKSKT263	BAYKSKT263	BAYKSKT263	BAYKSKT263
Crankcase Heater Kit	BAYCCHT302	BAYCCHT302	BAYCCHT302	BAYCCHT302
Seacoast Kit	BAYSEAC001	BAYSEAC001	BAYSEAC001	BAYSEAC001
Low Ambient Kit	BAYLOAM107A	BAYLOAM107A	BAYLOAM107A	BAYLOAM107A
Service Valve Panel Cover	TAYSVPAN-L0032AA	TAYSVPAN-L0032AA	TAYSVPANL0044AA	TAYSVPANL0044AA
Refrigerant Lineset [i]				

[a] Certified in accordance with the Unitary Air-conditioner equipment certification program which is based on AHRI standard 210/240.
[b] Rated in accordance with AHRI standard 270.
[c] Calculated in accordance with N.E.C. Only use HACR circuit breakers or fuses.
[d] This value shown for compressor RLA on the unit nameplate and on this specification sheet is used to compute minimum branch circuit ampacity and max. fuse size. The value shown is the branch circuit selection current.
[e] Use start components only when compressor is found to enter locked rotor condition and will not start or when lights dim at compressor start. No means no start components. Yes means quick start kit components. PTC means positive temperature coefficient starter. Optional kit shown.
[f] Standard Air - Dry Coil - Outdoor.
[g] This value approximate. For more precise value see unit nameplate.
[h] Reference the outdoor unit ship-with literature for refrigerant piping length and lift guidelines. Reference the refrigerant piping software pub # 32-3312-xx or *Refrigerant Piping Manual for Small Split Cooling and Heat Pump Systems Application Guide* (SS-APG006*-EN) for long line sets or specialty applications (xx denotes latest revision).
[i] 25, 30, 35 and 50 foot linesets available. For a complete listing of lineset options available from equipment or supply stores, refer to the Trane Residential and Light Commercial Product Handbook.

Table 2. Models — 5A7A4042A1000A/B, 5A7A4048A1000A/B, and 5A7A4060A1000A/B

Outdoor Unit [a] [b]	5A7A4042A1000		5A7A4048A1000		5A7A4060A1000	
14th Digit of the Model Number	A	B	A	B	A	B
Power Conns. - V/Ph/Hz [c]	208/230/1/60		208/230/1/60		208/230/1/60	
Min. BRCH. CIR. Ampacity	19	23	23	26	28	30
BR. CIR. PROT. RTG. - Max. (Amps)	30	40	35	45	50	
Compressor	DURATION® - Scroll		DURATION® - Scroll		DURATION® - Scroll	
No. Used - No. Stages	1 - 1		1 - 1		1 - 1	
Volts/Ph/Hz	208/230/1/60		208/230/1/60		208/230/1/60	
RL Amps[d] - LR Amps	14.7 - 109	17.9 - 95.9	17.3 - 126	19.6 - 118	21.8 - 143	23.4 - 134
Factory Installed						
Start Components [e]	No		No (Uses BAYKSKT263)		No (Uses BAYKSKT263)	
Insulation/Sound Blanket	No		No		No	
Compressor Heat	No		No		No	
Outdoor Fan	Propeller		Propeller		Propeller	
Dia. (in.) - No. Used	27.5 - 1		27.5 - 1		27.5 - 1	
Type Drive - No. Speeds	Direct - 1		Direct - 1		Direct - 1	
CFM @ 0.0 (in.) W.G. [f]	4841		5165		5255	
No. Motors - HP	1 - 1/5		1 - 1/5		1 - 1/5	
Motor Speed – rpm	850		850		850	
Volts/Ph/Hz	208/230/1/60		208/230/1/60		208/230/1/60	
FL Amps	1.05		1.05		0.93	

Table 2. Models — 5A7A4042A1000A/B, 5A7A4048A1000A/B, and 5A7A4060A1000A/B (continued)

Outdoor Unit [a] [b]	5A7A4042A1000	5A7A4048A1000	5A7A4060A1000
Outdoor Coil - Type	Spine Fin™	Spine Fin™	Spine Fin™
Rows - F.P.I.	1 - 24	1 - 24	1 - 24
Face Area (Sq. Ft.)	24.93	30.8	30.8
Tube Size (In.)	3/8	3/8	3/8
Refrigerant			
lb - R-454B (O.D. Unit) [g]	5 lb, 1 oz	6 lb, 10 oz	5 lb, 15 oz
Factory Supplied	Yes	Yes	Yes
Valve Connection Size - (in.) O.D. Gas	7/8	7/8	7/8
Valve Connection Size - (in.) O.D. Liq	5/16	5/16	5/16
Line Size - (in.) O.D. Gas [h]	7/8	7/8	7/8
Line Size - in.) O.D. Liq.	5/16	5/16	5/16
Charging Specifications			
Subcooling	10°F	10°F	10°F
Dimensions		H x W X D	
Crated (In.)	42.5 x 35 x 38	50.5 x 35 x 38	50.5 x 35 x 38
Weight			
Shipping (lb)	246	307	302
Net (lb)	212	257	252
Optional Accessories:			
Anti-short Cycle Timer	TAYASCT501A	TAYASCT501A	TAYASCT501A
Evaporator Defrost Control	AY28X079	AY28X079	AY28X079
Rubber Isolator Kit	BAYISLT101	BAYISLT101	BAYISLT101
Extreme Condition Mount Kit	BAYECMT004	BAYECMT004	BAYECMT004
Start Kit	BAYKSKT263	BAYKSKT263	BAYKSKT263
Crankcase Heater Kit	BAYCCHT301	BAYCCHT301	BAYCCHT301
Seacoast Kit	BAYSEAC001	BAYSEAC001	BAYSEAC001
Low Ambient Kit	BAYLOAM107A	BAYLOAM107A	BAYLOAM107A
Service Valve Panel Cover	TAYSVPANL0046AA	TAYSVPANL0046AA	TAYSVPANL0046AA
Refrigerant Lineset [i]			

[a] Certified in accordance with the Unitary Air-conditioner equipment certification program which is based on AHRI standard 210/240.
[b] Rated in accordance with AHRI standard 270.
[c] Calculated in accordance with N.E.C. Only use HACR circuit breakers or fuses.
[d] This value shown for compressor RLA on the unit nameplate and on this specification sheet is used to compute minimum branch circuit ampacity and max. fuse size. The value shown is the branch circuit selection current.
[e] Use start components only when compressor is found to enter locked rotor condition and will not start or when lights dim at compressor start. No means no start components. Yes means quick start kit components. PTC means positive temperature coefficient starter. Optional kit shown.
[f] Standard Air - Dry Coil - Outdoor.
[g] This value approximate. For more precise value see unit nameplate.
[h] Reference the outdoor unit ship-with literature for refrigerant piping length and lift guidelines. Reference the refrigerant piping software pub # 32-3312-xx or *Refrigerant Piping Manual for Small Split Cooling and Heat Pump Systems Application Guide* (SS-APG006*-EN) for long line sets or specialty applications (xx denotes latest revision).
[i] 25, 30, 35 and 50 foot linesets available. For a complete listing of lineset options available from equipment or supply stores, refer to the Trane Residential and Light Commercial Product Handbook.

Sound Power Level

Table 3. Sound power level

Model	A-Weighted Sound Power Level [dB(A)]	Full Octave Sound Power(dB)							
		63 Hz [(a)]	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
5A7A4018A	73	79	69	67	70	70	64	59	53
5A7A4024A	71	78	72	69	68	66	61	58	53
5A7A4030A	73	79	69	67	70	70	64	59	53
5A7A4036A	71	78	72	69	68	66	61	58	53
5A7A4042A	71	78	72	69	68	66	61	58	53
5A7A4048A	71	81	75	71	70	68	63	58	53
5A7A4060A	71	81	75	71	70	68	63	58	53

Note: Rated in accordance with AHRI Standard 270–2008.

[(a)] * For reference only.

Accessory Description and Usage

Anti-Short Cycle Timer — Solid state timing device that prevents compressor recycling until five (5) minutes have elapsed after satisfying call or power interruptions. Use in area with questionable power delivery, commercial applications, long lineset, etc.

Evaporation Defrost Control — SPST Temperature actuated switch that cycles the condenser off as indoor coil reaches freeze-up conditions. Used for low ambient cooling to 30°F with TXV.

Rubber Isolators — Five (5) large rubber donuts to isolate condensing unit from transmitting energy into mounting frame or pad. Use on any application where sound transmission needs to be minimized.

Hard Start Kit — Start capacitor and relay to assist compressor motor start-up. Use in areas with marginal power supply, on long linesets, low ambient conditions, etc.

Extreme Condition Mount Kit — Bracket kits to securely mount condensing unit to a frame or pad without removing any panels. Use in areas with high winds, or on commercial roof tops, etc.

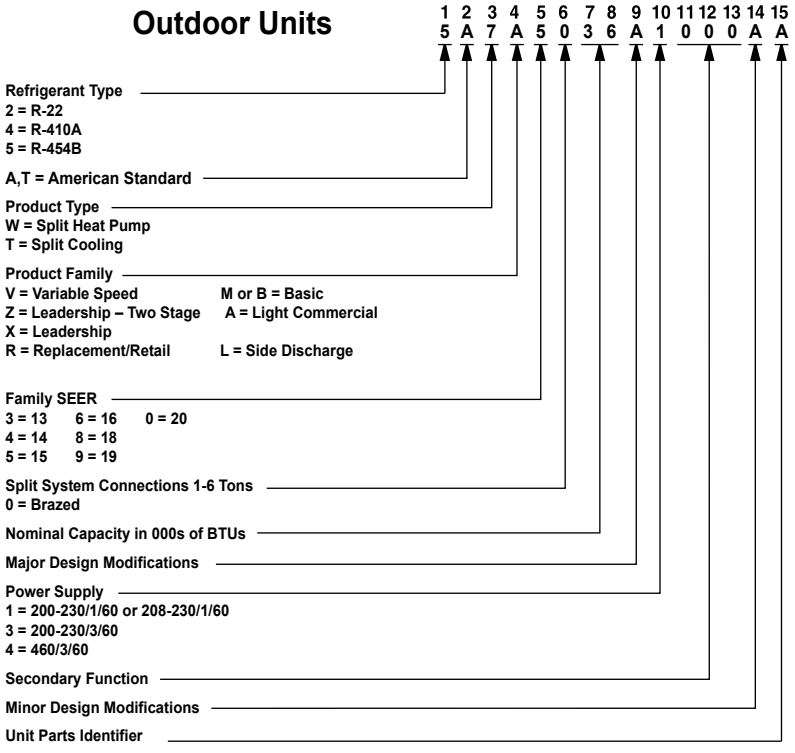
AHRI Standard Capacity Rating Conditions

AHRI Standard 210/240 Rating Conditions

1. Cooling 80°F DB, 67°F WB air entering indoor coil, 95°F DB air entering outdoor coil.
2. High Temperature Heating 47°F DB, 43°F WB air entering outdoor coil, 70°F DB air entering indoor coil.
3. Low Temperature Heating 17°F DB air entering indoor coil.
4. Rated indoor airflow for heating is the same as for cooling.

AHRI Standard 270 Rating Conditions — (Noise rating numbers are determined with the unit in cooling operations.) Standard Noise Rating number is at 95°F outdoor air.

Model Nomenclature



Wiring Diagrams

Figure 1. Models — 5A7A4018A, 024A, 030A, 036A, 042A, and 048A

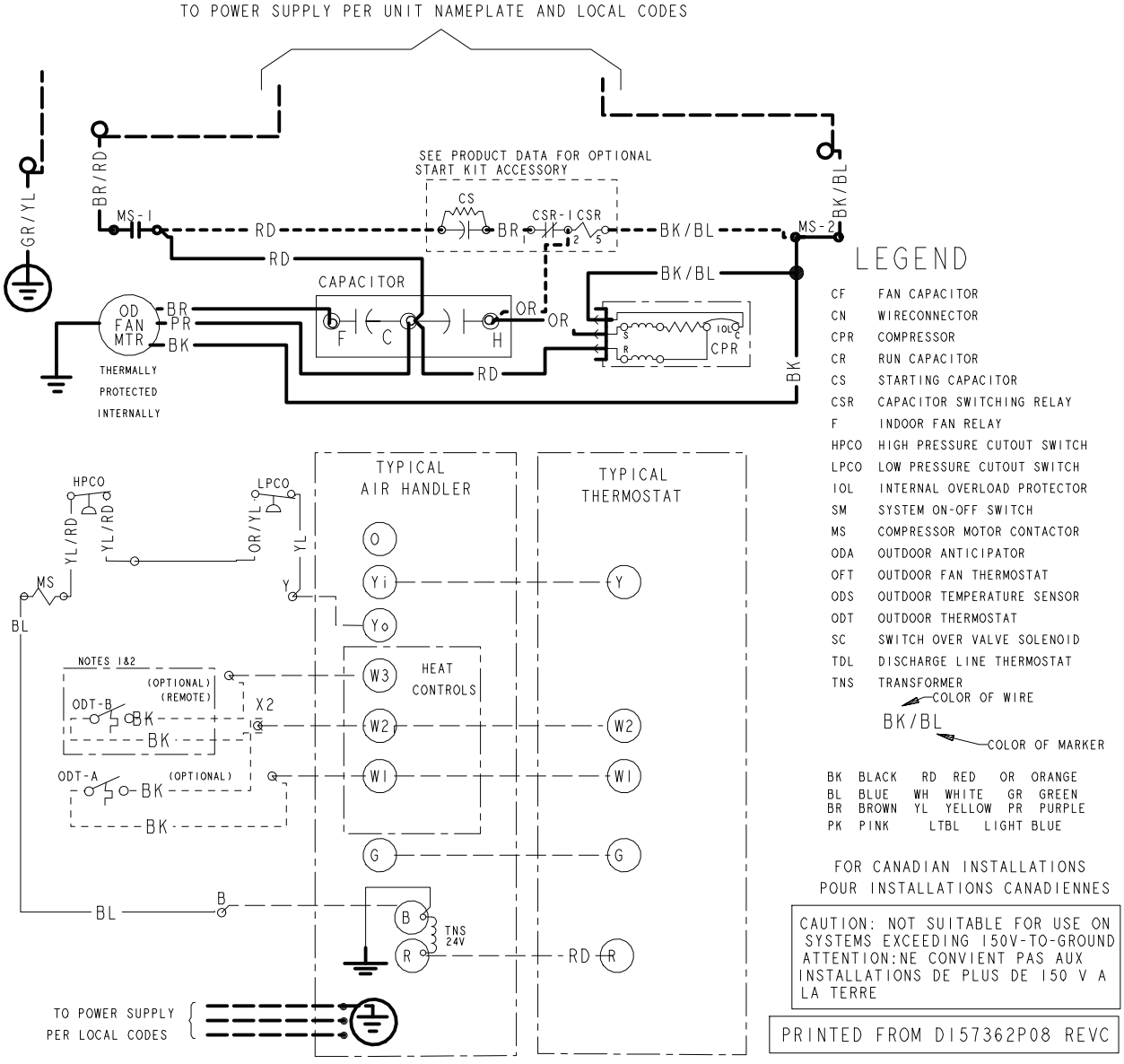


Figure 2. Models — 5A7A4018A, 024A, 030A, 036A, 042A, and 048A

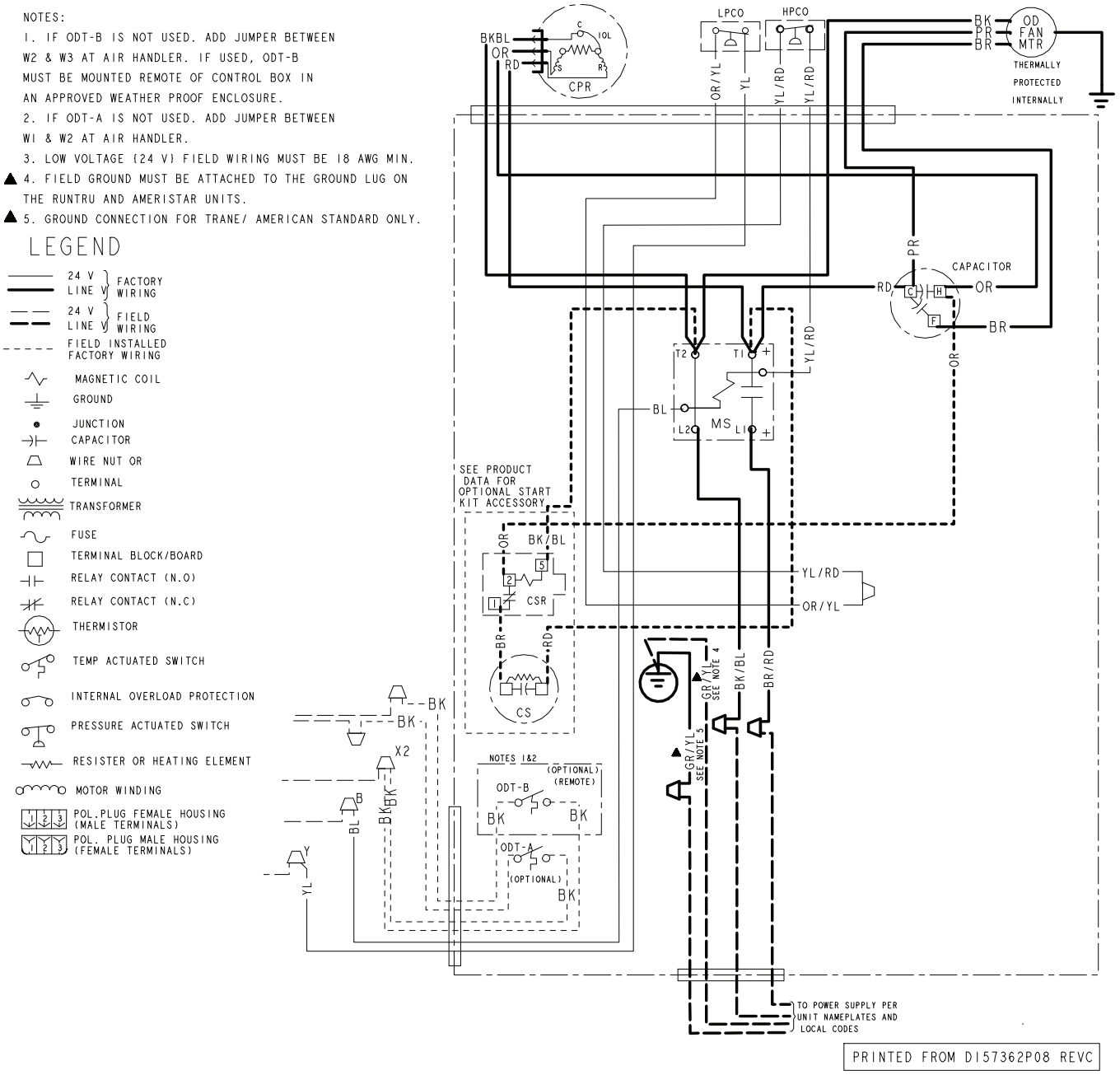


Figure 3. Model — 5A7A4060A

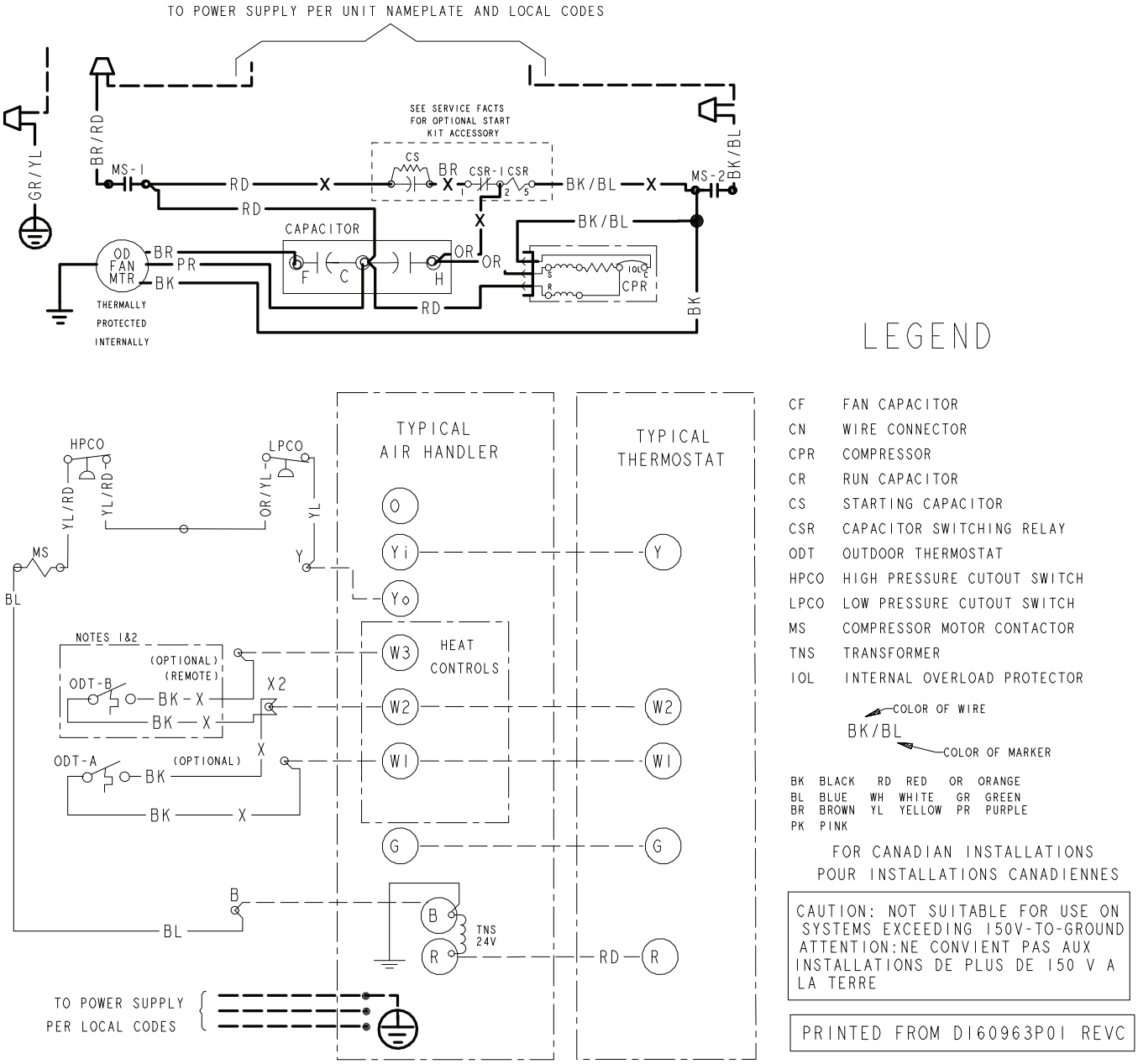


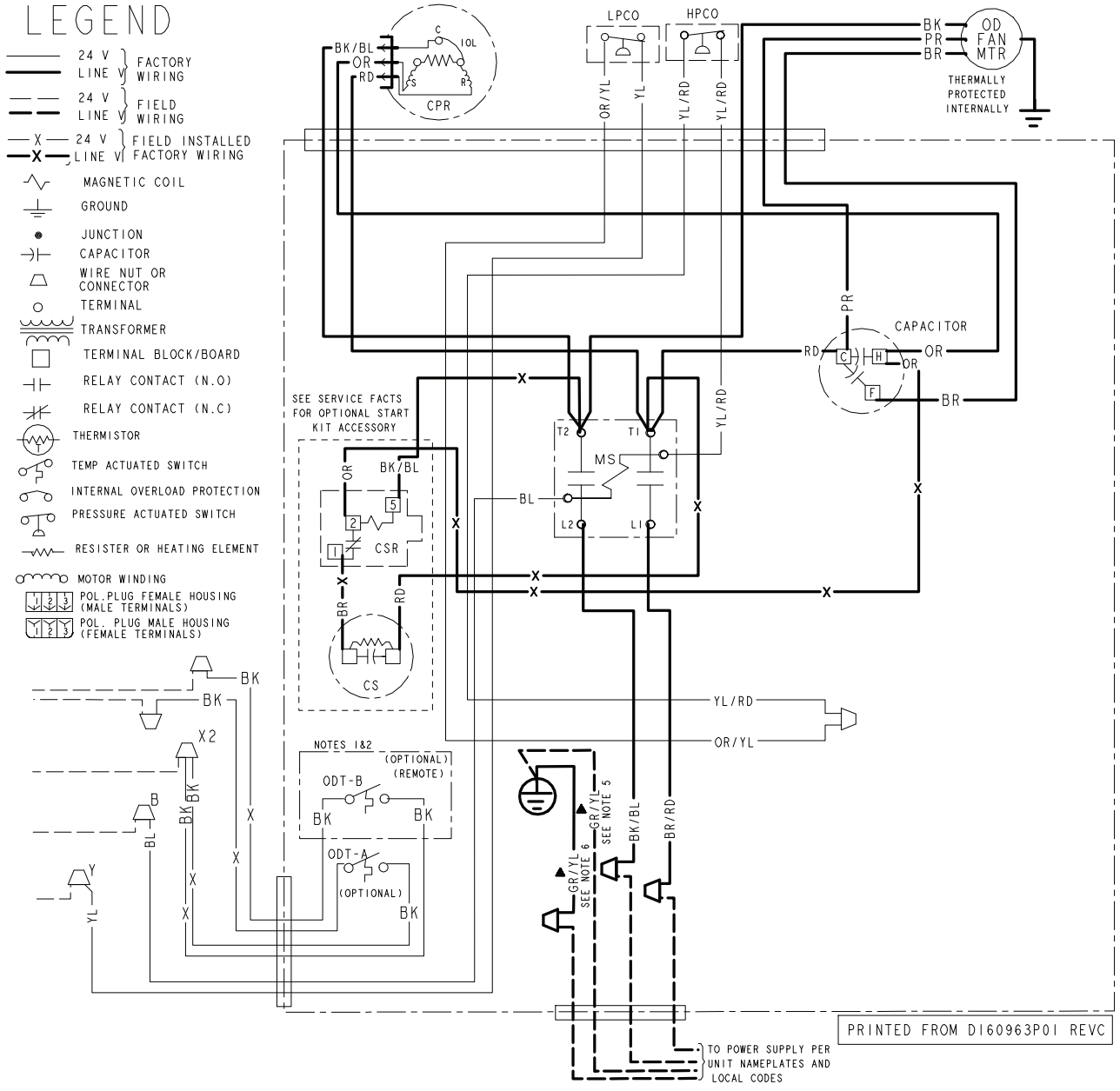
Figure 4. Model — 5A7A4060A

NOTES:

1. IF ODT-B IS NOT USED. ADD JUMPER BETWEEN W2 & W3 AT AIR HANDLER. IF USED, ODT-B MUST BE MOUNTED REMOTE OF CONTROL BOX IN AN APPROVED WEATHER PROOF ENCLOSURE.
2. IF ODT-A IS NOT USED. ADD JUMPER BETWEEN W1 & W2 AT AIR HANDLER.
3. LOW VOLTAGE (24 V) FIELD WIRING MUST BE 18 AWG MINIMUM.
4. USE COPPER CONDUCTORS ONLY!

▲5. FIELD GROUND MUST BE ATTACHED TO THE GROUND LUG ON THE RUNTRU AND AMERISTAR UNITS.

▲6. GROUND CONNECTION FOR TRANE/ AMERICAN STANDARD ONLY.



Dimensional Data

Figure 5. Dimensional drawing

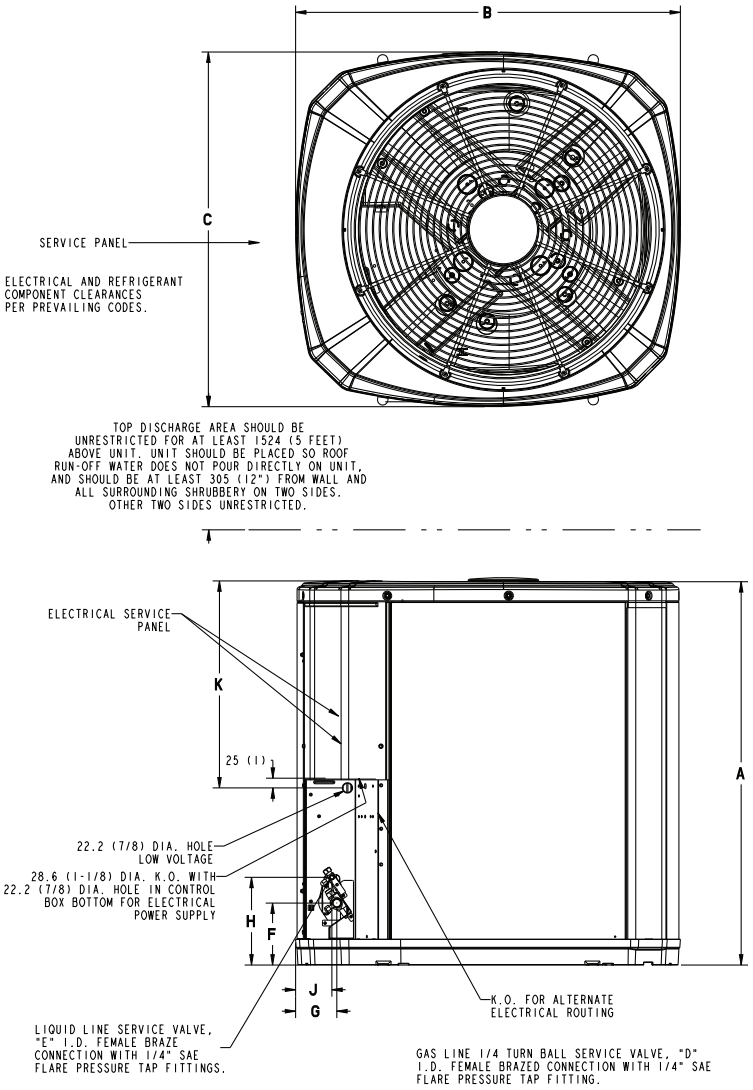


Table 4. Unit dimensions (mm (inch))

Model	Base	A	B	C	D	E	F	G	H	J	K
5A7A4018A	3	933 (36-3/4)	829 (32-5/8)	756 (29-3/4)	3/4	5/16	143 (5-5/8)	92 (3-5/8)	210 (8-1/4)	79 (3-1/8)	508 (20)
5A7A4024A	3	832 (32-3/4)	829 (32-5/8)	756 (29-3/4)	3/4	5/16	127 (5)	76 (3)	197 (7-3/4)	60 (2-3/8)	508 (20)
5A7A4030A	3	933 (36-3/4)	829 (32-5/8)	756 (29-3/4)	3/4	5/16	143 (5-5/8)	92 (3-5/8)	210 (8-1/4)	79 (3-1/8)	508 (20)
5A7A4036A	3	832 (32-3/4)	829 (32-5/8)	756 (29-3/4)	3/4	5/16	127 (5)	76 (3)	197 (7-3/4)	60 (2-3/8)	508 (20)
5A7A4042A	4	943 (37-1/8)	946 (37-1/4)	870 (34-1/4)	7/8	5/16	143 (5-5/8)	98 (3-7/8)	219 (8-5/8)	86 (3-3/8)	508 (20)
5A7A4048A	4	1147 (45-1/8)	946 (37-1/4)	870 (34-1/4)	7/8	5/16	152 (6)	98 (3-7/8)	219 (8-5/8)	86 (3-3/8)	813 (32)
5A7A4060A	4	1147 (45-1/8)	946 (37-1/4)	870 (34-1/4)	7/8	5/16	152 (6)	98 (3-7/8)	219 (8-5/8)	86 (3-3/8)	813 (32)

Mechanical Specification Options

General

The outdoor condensing units are factory charged with the system charge required for the outdoor condensing unit, ten (10) feet of tested connecting line, and the smallest rated indoor evaporative coil match. This unit is designed to operate at outdoor ambient temperatures as high as 115°F. Cooling capacities are matched with a wide selection of air handlers and furnace coils that are AHRI certified. The unit is certified to UL 60335-2-40. Exterior is designed for outdoor application.

Casing

Unit casing is constructed of heavy gauge, galvanized steel and painted with a weather-resistant powder paint finish. The corner panels are prepainted. All panels are subjected to our 1,000 hour salt spray test.

Refrigerant Controls

Refrigeration system controls include condenser fan, compressor contactor and low and high pressure switches. A factory supplied, field installed liquid line drier is standard.

Compressor

The compressor features internal over temperature and pressure protection. Other features include: Centrifugal oil pump and low vibration and noise.

Condenser Coil

The outdoor coil provides low airflow resistance and efficient heat transfer. The coil is protected on all four sides by louvered panels.

Low Ambient Cooling

As manufactured, this system has a cooling capacity to 55°F. The addition of an evaporator defrost control permits operation to 40°F. The addition of an evaporator defrost control with TXV permits low ambient cooling to 30°F.

The addition of the BAYLOAM107A low ambient kit permits ambient cooling to 20°F.

Thermostats – Cooling only and heat/cooling (manual and automatic change over). Sub-base to match thermostat and locking thermostat cover.

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AHRI Standard 210/240
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c UL us LISTED

The AHRI Certified mark indicates company participation in the AHRI Certification program. For verification of individual certified products, go to ahridirectory.org.

The manufacturer has a policy of continuous data improvement and it reserves the right to change design and specifications without notice. We are committed to using environmentally conscious print practices.

ODR-PSD014B-EN 20 Sep 2025
Supersedes ODR-PSD014A-EN (June 2025)

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SURFSIL

www.surfsil.com

HVAC/R Coils, Components, and Cabinetry

R-10 (CLEAR) – TECHNICAL DATA SHEET

PURPOSE:

Custom-designed and engineered coating material for the HVAC/R market to protect equipment and its components from the environmental agents that corrode and degrade the equipment efficiency, capacity, and longevity.

APPLICABILITY:

All HVAC/R equipment components can be protected -- Condenser Coils, Evaporator Coils, Re-heat Coils, Piping, Compressor Casing, Structural Components, Cabinet, Liner, etc. Compatible with different materials like Copper, Aluminum, Stainless Steel, Galvanized Metal, Cast Iron, Pre-painted Surfaces, and some types of Plastics.

CHARACTERISTICS:

- Transparent, anti-corrosive, UV resistant, hybrid-polymer with a uniform dry-film-thickness (DFT) of 15 microns.
- Negligible effect on thermal conductivity – allowing the protected equipment to perform and maintain efficiency as design intended.
- Tolerates material expansion and contraction without damage and also provides a robust surface to resist mechanical damage caused by impact or abrasion.
- An extremely low viscosity (0.97 centipoise (@20ºC).
- High-pressure infusion application system to guarantee 100% coil penetration without bridging, regardless of coil type (Fin & tube or Microchannel).
- Hydrophobic surface to reduce the accumulation of pollutants and debris on the equipment surfaces. Cured surface does not support the growth of mold, fungus, or algae - reducing maintenance costs and allowing the equipment to operate efficiently.

TYPE OF TEST	TEST STANDARD	MINIMUM RATING
Salt Spray	ASTM B-117	10,000 hours*
Water Immersion	ASTM D870	1,000 hours*
SWAAT (seawater acidified)	ASTM G85 - A3	5,000 hours*
UV Resistance	ASTM D4587	1,000 hours*
Impact	ASTM D2794	150 in-lb no cracking
Hardness	ASTM D3363	5H
Adhesion	ASTM D3359	Pass 5B with 0% peeling
Flexibility (Mandrel Bend)	ASTM D522	Pass with no cracking
Mold Resistance	ASTM G21	Pass 0% growth

Numbers were rounded down, all tests are based on 24 hour cycles (417 days x 24 hours = 10,008 hour test). Test coupons were compared using ASTM B537 to rate defects (e.g. crater rusting, pinhole rusting, blisters, stains, crack patterns). All test coupons passed with "zero" defects and listed hours indicate when tests were terminated. Failure points were never determinate so listed tests are listed as minimum rating. All test coupons have pass with no defects "zero" rating.

advancoat
CORROSION SPECIALISTS

KER CONSTRUCTION

Licensed and Insured CGC1532889

Dear Sir/Madam,

Thank you for the opportunity to further clarify our proposal. In response to the Request for Information (RFI) regarding Section 3 – Project Management Plan / Technical Approach, please find our detailed responses below. We appreciate the Village's effort to ensure a fair and consistent evaluation process.

---

1. List specifically the type, make, and model of the equipment being proposed. Provide cut sheets.

7.5-Ton Systems

- Manufacturer: American Standard
- Type: Split System
- Condenser Model: TWA090K3DAAE02Q
- Air Handler Model: TWE090K3BAAP01L
- Electric Heater: 15 kW – Model BAYHTRS315A
- Cut sheets: Attached

Note: The condensers specified in the plans are American Standard units that are manufactured with microchannel coils. Per discussion with the distributor, copper coil replacements can be sourced from a third-party vendor after equipment purchase; this would require a separate quotation. At this time, Rheem is the only manufacturer offering factory-installed copper condenser coils. Please advise if the Village would like pricing submitted for (a) copper coil replacement on American Standard units or (b) alternate Rheem equipment.

5-Ton Systems

- Manufacturer: American Standard (Trane-family equipment)
- Refrigerant: R-454B
- Condenser Model: 5A7A4060A1000A
- Air Handler Model: 5TEM4D07AC51SA
- Electric Heater: 10 kW
- Coil Type: Aluminum fin-tube
- Cut sheets: Attached

---

2. What type of coils and coatings are being proposed?

(Note: No microchannel units will be used; hail guard will be present.)

- 7.5-Ton Systems: Standard factory coils per manufacturer design; alternate copper coil solutions are available upon request and pricing clarification.
- 5-Ton Systems: Aluminum fin-tube coils as supplied by the manufacturer.

All exposed condenser coils will receive a Surf Sil® protective coil coating, designed for coastal and high-corrosion environments. This coating provides resistance against salt air, moisture, and airborne contaminants, and is intended to extend equipment service life while maintaining heat transfer efficiency. Application will be performed in accordance with manufacturer and Surf Sil recommendations.

---

3. What is the procurement lead time for delivery of this equipment?

- HVAC equipment: Approximately 6 weeks
- Surf Sil coating application (if required): Additional 2 weeks

Lead times are based on current distributor information and availability.

---

4. What is your organization's proposed scheduled duration for project completion (calendar days)? Provide a timeline/sequence of events.

The anticipated construction duration is approximately 3 calendar weeks, following equipment delivery. The general sequence of work is as follows:

1. Removal of existing HVAC equipment
2. Installation of new copper refrigerant piping
3. Installation of 5-ton units, including required duct modifications
4. Installation of 7.5-ton systems
5. System startup, testing, and verification of proper operation

All work will be coordinated with the General Contractor to align with overall project scheduling.

---

5. What is your proposed library access plan to achieve construction completion while maintaining library access?

Access will be required only through the service stairwell to the second floor. The active work area on the second floor will be physically separated and secured from public library spaces.

Temporary partitions and safety barriers will be installed by the General Contractor (Ker Construction) to isolate construction activities. Books and shelving located within the work zone will be removed as required. The intent is to maintain library operations to the greatest extent possible while ensuring safety and efficiency.

---

6. Please detail the type of service access being provided for the 5-ton units.

Service access for the 5-ton units will be provided in full compliance with manufacturer requirements, applicable mechanical codes, and standard HVAC serviceability practices.

Each air-handling unit will be installed with adequate clearance to allow safe and unobstructed access to filters, coils, blower assemblies, heaters, electrical components, and condensate systems. Access will be provided through removable ceiling panels or service hatches coordinated with the General Contractor. No permanent building elements will need to be removed for routine maintenance or future servicing.

---

7. What type of floor protection will be provided (carpet is new)?

All floor protection will be provided and maintained by the General Contractor in accordance with industry standards for work in occupied facilities.

Protection will include heavy-duty temporary coverings over all carpeted areas and designated access routes. Materials may include commercial-grade floor protection boards, reinforced protective mats, and/or breathable carpet protection film to prevent damage from foot traffic, tools, and equipment.

Protective coverings will be installed prior to the start of work, maintained throughout construction, and removed upon completion. All affected areas will be inspected to confirm the carpet remains free from damage, stains, or residue.

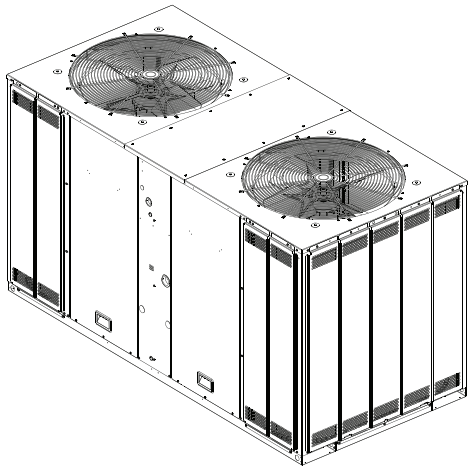
Please let us know if any additional clarification, alternate pricing, or supplemental documentation is required. We appreciate the opportunity to further support the Village's evaluation process.

Respectfully,

Installation, Operation, and Maintenance

Split System Air Conditioners Odyssey™ with Symbio™ Controls

Heat Pump Condenser, R-454B 6 to 20 Tons



(60 Hz)
TWA072K*A
TWA072K*D
TWA090K*A
TWA090K*D
TWA120K*A
TWA120K*D
TWA180K*D
TWA240K*D

⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

March 2025 **SS-SVX015D-EN**

Introduction

Read this manual thoroughly before operating or servicing this unit.

Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.
NOTICE	Indicates a situation that could result in equipment or property-damage only accidents.

Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants.

Important Responsible Refrigerant Practices

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

⚠ WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury.

All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

⚠ WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury.

Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, MUST follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- **Before installing/servicing this unit, technicians MUST put on all PPE required for the work being undertaken (Examples; cut resistant gloves/ sleeves, butyl gloves, safety glasses, hard hat/ bump cap, fall protection, electrical PPE and arc flash clothing). ALWAYS refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.**
- **When working with or around hazardous chemicals, ALWAYS refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.**
- **If there is a risk of energized electrical contact, arc, or flash, technicians MUST put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, PRIOR to servicing the unit. NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

©2025

⚠ WARNING

Follow EHS Policies!

Failure to follow instructions below could result in death or serious injury.

- **All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.**
- **Non-Trane personnel should always follow local regulations.**

⚠ WARNING

R-454B Flammable A2L Refrigerant!

Failure to use proper equipment or components as described below could result in equipment failure, and possibly fire, which could result in death, serious injury, or equipment damage.
The equipment described in this manual uses R-454B refrigerant which is flammable (A2L). Use ONLY R-454B rated service equipment and components. For specific handling concerns with R-454B, contact your local representative.

⚠ WARNING

Refrigerant under High Pressure!

Failure to follow instructions below could result in an explosion which could result in death or serious injury or equipment damage.
System contains refrigerant under high pressure. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or refrigerant additives.

⚠ WARNING

Explosion Hazard!

Failure to follow instructions below could result in an explosion which could result in death or serious injury, and equipment damage.
NEVER bypass system safeties in order to pump down the unit component's refrigerant into the microchannel heat exchanger (MCHE) coil. Do NOT depress the compressor contactor since it effectively bypasses the high-pressure control.

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Product Safety Information

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

Maximum altitude of use 3000 meters.

This appliance incorporates an earth connection for functional purposes only.

Revision History

Updated A2L chapter.

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Model Number Description

Heat Pump Condenser

Digit 1, 2, 3 — Unit Function

TWA = Split System Heat Pump

Digit 4, 5, 6 — Tonnage

072 = 6 Tons (60 Hz)
090 = 7.5 Tons (60 Hz)
120 = 10 Tons (60 Hz)
180 = 15 Tons (60 Hz)
240 = 20 Tons (60 Hz)

Digit 7 — Refrigerant

K = R-454B

Digit 8 — Voltage

3 = 208-230 Vac - 3 PH (60Hz)
4 = 460 Vac - 3 PH (60Hz)
W = 575 Vac - 3 PH (60Hz)

Digit 9 — Refrigeration Circuit/Stage

A = 1 Compressor/1 Line/1 Stage (Single)
D = 2 Compressors/2 Line/2 Stage (Dual)

Digit 10 — Major Design Sequence

A = Rev A

Digit 11 — Minor Design Sequence

A = Rev A

Digit 12, 13 — Service Digits

**

Digit 14 — Efficiency Generation

B = Generation B

Digit 15 — Controls

S = Symbio™

Digit 16 — None

0 = None

Digit 17 — Coil Protection

0 = Standard Coil
1 = Standard Coil w/ Coil Guard
2 = Black Epoxy Pre-Coated Condenser Coil (FIN/TUBE)
3 = Black Epoxy Pre-Coated Condenser Coil with Coil Guard (FIN/TUBE)

Digit 18, 19, 20 — None

0 = None

Digit 21 — Communications Options

0 = No Option
1 = Advanced Diagnostics and BACnet® BAS
2 = Advanced Diagnostics and LonTalk® Communications Interface (LCI)

Digit 22 to 40 — None

0 = None

General Information

This manual describes proper installation, operation, and maintenance procedures for air-cooled systems. By carefully reviewing the information within this manual and following the instructions, the risk of improper operation and/or component damage will be minimized. It is important that periodic maintenance be performed to help assure trouble free operation. Should equipment failure occur, contact a qualified service organization with qualified, experienced HVAC technicians to properly diagnose and repair this equipment.

Important: *All phases of this installation must comply with the NATIONAL, STATE and LOCAL CODES. In addition to local codes, the installation must conform with National Electric Code -ANSI/ NFPA NO. 70 LATEST REVISION.*

Any individual installing, maintaining, or servicing this equipment must be properly trained, licensed and qualified.

Important: *Do not remove the VFD without first contacting technical support! For performance-related questions and diagnostic VFD support in North America, request Live Tech Support via the link: https://support.trane.com/hc/en-us. Any return or escalation to the VFD manufacturer requires a Trane Technical Support ticket number FIRST. Removal of the VFD prior to this step will void the unit's warranties.*

Installation procedures should be performed in the sequence that they appear in this manual. Do not destroy or remove the manual from the unit. The manual should remain weather-protected with the unit until all installation procedures are complete.

Note: *It is not the intention of this manual to cover all possible variations in systems that may occur or to provide comprehensive information concerning every possible contingency that may be encountered during an installation. If additional information is required or if specific problems arise that are not fully discussed in this manual, contact your local sales office.*

Use the "Installation Checklist," p. 15 provided in this manual to verify that all necessary installation procedures have been completed. Do not use the checklist as a substitute for reading the information contained in this manual. Read this entire manual before beginning installation procedures.

Unit Description

These condensers come with single and dual compressor options. Single compressor outdoor units feature a single refrigeration circuit requiring only one set of refrigerant lines. Dual compressor/dual circuit models give true stand-by protection; if one compressor fails, the second will automatically start-up. During light load conditions, only one compressor will operate to save energy.

A2L Information and Installation Requirements

Installation/Code Compliance Requirements

Building level controls may need to be upgraded/modified to demand leak mitigation actions as described in “Leak Detection System (Refrigerant charge greater than 3.91 lb per circuit),” p. 12. Those actions include, but are not limited to, fully opening damper and VAV boxes (if present), and disabling electric heat in VAV boxes (if present).

Verify the equipment refrigerant charge is in accordance with the room area limitation as described in Minimum Room Area Limits section.

Ensure that there are labels on the equipment stating it contains a flammable refrigerant.

A2L Work Procedures

⚠ WARNING

Risk of Fire — Flammable Refrigerant!

Failure to follow instructions below could result in death or serious injury, and equipment damage.

- **To be repaired only by trained service personnel.**
- **Do not puncture refrigerant tubing.**
- **Dispose of properly in accordance with federal or local regulations.**
- **The equipment shall be stored in a room without continuously operating ignition sources.**

⚠ WARNING

Refrigerant under High Pressure!

Failure to follow instructions below could result in an explosion which could result in death or serious injury or equipment damage.

System contains refrigerant under high pressure. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or refrigerant additives.

⚠ WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

The units described in this manual use R-454B refrigerant. Use ONLY R-454B rated service equipment or components with these units. For specific handling concerns with R-454B, contact your local Trane representative.

Installation, repair, removal, or disposal should be performed by trained service personnel.

At all times, Trane’s maintenance and service guidelines shall be followed. If in doubt, contact Trane technical support for assistance.

Servicing

Prior to initiating work on equipment, check the area with an appropriate refrigerant detector. Ensure the service personnel are properly trained regarding work in potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed, or intrinsically safe. Be aware that the refrigerant does not contain an odor.

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available on hand. A dry powder or CO_2 fire extinguisher should be located adjacent to the charging area.

At all times, Trane’s maintenance and service guidelines shall be followed. If in doubt, contact Trane technical support for assistance.

All maintenance staff and others working in the local area shall be instructed on the nature of the work being carried out. Work in confined spaces shall be avoided.

Ignition Source Mitigation

Do not use any sources of ignition when working on the refrigeration system.

Keep all ignition sources, including cigarette smoking, away from the site of installation, repair, removal or disposal, during which refrigerant can potentially be released to the surrounding space.

Survey the area around the equipment before initiating work to ensure no flammable hazards or ignition risks are present.

“No Smoking” signs shall be displayed.

Do not use devices that can be a source of ignition to accelerate defrosting of components. Use only defrost and cleaning procedures recommended by Trane. Do not pierce or burn.

Ventilation

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere. If present, check that the ventilation system, including outlets, are operating adequately and are not obstructed.

Refrigerating Equipment

Refrigerant piping or components should not be installed in locations where substances which may corrode them are present.

Check that equipment hazard markings are visible and legible. Replace them if they are not.

For equipment using secondary fluids, like water or glycol, check that refrigerant is not present in the secondary fluid loop before conducting any hot work.

Electrical Devices

Do not apply power to the circuit if a fault exists which compromises safety. If the fault cannot be corrected immediately, but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment, so all parties are advised.

Initial safety checks shall include:

- Cabling is not subject to wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects. Account for the effects of aging or continual vibration from sources such as compressors or fans.
- Capacitors are discharged. This shall be done in a safe manner to avoid possibility of sparking.
- No live electrical components and wiring are exposed while charging, recovering, or purging the system.
- Verify continuity of earth bonding.
- Replace electrical components with Trane replacement parts, or those meeting the same ratings and qualified for flame arrest protection, UL LZGH2 category.

Leak Detection

Never use an open flame to detect leaks. A halide torch should not be used. Use only approved leak detection methods per this instruction manual.

The following leak detection methods are deemed acceptable for all refrigerant systems.

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL gas (25% maximum) is confirmed.

Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

Examples of leak detection fluids are:

- Bubble method
- Fluorescent method agents

If a leak is suspected, all naked flames shall be removed/ extinguished.

If a refrigerant leak is found which requires brazing, all refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

Refrigerant Removal and Evacuation

Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (special cylinders for the recovery of refrigerant, for example). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration.

The following procedure shall be adhered to:

1. Safely remove refrigerant following local and national regulations.
2. Evacuate.
3. Purge the circuit with inert gas.
4. Evacuate (optional for A2L).
5. Continuously flush or purge with inert gas when using flame to open circuit.
6. Open the circuit.

Prior to refrigerant removal, open all appropriate valves, including solenoid and electronic expansion valves (EXVs). Use control settings, where available. When not available, manually open all electronically controlled valves using acceptable service procedures.

The recovery equipment shall be in good working order with instructions available. Equipment shall be suitable for the recovery of the flammable refrigerant. For specific handling concerns, contact the manufacturer. Ensure all hose connections are checked for tightness to avoid refrigerant leaks.

In addition, a set of calibrated weighing scales shall be available and in good working order.

The refrigerant shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. Do not mix refrigerants in recovery unit and especially not in cylinders.

Refrigerant recovery unit should be purged with an inert gas after each use or before using with a different refrigerant Class – for example, A2L to A1.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

The system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

The system shall be vented down to atmospheric pressure to enable work to take place.

The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

Refrigerant Charging

In addition to conventional charging procedures, the following requirements shall be followed.

- Ensure that contamination of different refrigerants does not occur when using charging equipment.
- Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the refrigerating system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigerating system.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

Prior to refrigerant charging, open all appropriate valves, including solenoid and electronic expansion valves (EXVs). Use control settings, where available. When not available, manually open all electronically controlled valves using acceptable service procedures.

Verify the equipment refrigerant charge is in accordance with the room area limitation as described in Minimum Room Area Limits section.

Decommissioning

Before carrying out the decommissioning procedure, it is essential that the trained service personnel is completely familiar with the equipment and all its details. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

1. Become familiar with the equipment and its operation.
2. Isolate system electrically.
3. Before attempting the procedure, ensure that:
    a. Mechanical handling equipment is available, if required, for handling refrigerant cylinders.
    b. All personal protective equipment is available and being used correctly.
    c. The recovery process is supervised at all times by a competent person.
    d. Recovery equipment and cylinders conform to the appropriate standards.
4. Pump down refrigerant system, if possible.
5. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
6. Make sure that cylinder is situated on the scales before recovery takes place.
7. Start the recovery machine and operate in accordance with instructions.
8. Do not overfill cylinders (no more than 80% volume liquid charge).
9. Do not exceed the maximum working pressure of the cylinder, even temporarily.
10. When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
11. Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked.
12. When equipment has been decommissioned, attach a signed and dated label stating it has been decommissioned and emptied of refrigerant.
13. Ensure that there are labels on the equipment stating it contains flammable refrigerant.

A2L Application Considerations

This product is listed to UL standard 60335-2-40, Household and Similar Electrical Appliances – Safety – Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers, which defines safe design and use strategies for equipment using A2L

refrigerants. This standard limits the refrigerant concentration in a space in the event of a refrigerant leak. To meet the requirements, the UL standard defines minimum room area, refrigerant charge limit, minimum circulation airflow and/or ventilation airflow requirements, and limits the use of ignition sources in spaces. The standard may require a unit refrigerant leak detection system.

For equipment with R-454B and charge amounts less than or equal to 3.91 lbs per circuit, this UL standard does not prescribe a room area limit and does not require a refrigerant leak detection system or any circulation airflow or ventilation airflow mitigation strategies. However, ignition sources in ductwork must be evaluated.

Depending on the application, a specific requirement of ANSI/ASHRAE Standard 15, Safety Standard for Refrigeration Systems, could be more stringent than UL 60335-2-40 requirements. See *Refrigeration Systems and Machinery Rooms Application Considerations for Compliance with ASHRAE® Standard 15-2022 Application Engineering Manual* (APP-APM001*-EN) for more information.

Ignition Sources in Ductwork

Do not install open flames in the ductwork. Hot surfaces exceeding 700°C (1290°F) should not be installed in the ductwork unless the average airflow velocity is not less than 1.0 m\s (200 ft\min) across the heater and proof of airflow is verified before system is energized.

Electric heaters can exceed the surface temperature limit if airflow distribution is poor, or insufficient airflow is provided over the heater.

Surface temperatures of most gas heaters do not exceed the surface temperature limits due to ANSI construction requirements.

Ignition Sources in Unit

This unit does not contain any ignition sources. All potential ignition sources, (including factory or field installed accessory electric heaters, gas heaters, relays, and contactors) were evaluated during product UL listing.

Minimum Room Area Limits (Refrigerant charge greater than 3.91 lb per circuit)

Equipment with R–454B charge amounts greater than 3.91 lb per circuit may require additional circulation or ventilation airflow mitigation strategies. In this case, there are two minimum room area (A_{min}) thresholds.

- The first threshold defines when equipment serving a single room is required to provide circulation airflow, either continuous or activated by a leak detection system. A ducted system requires circulation airflow unless the smallest room it serves is larger than the adjusted A_{min} threshold. This product contains a leak detection system if a circuit charge is greater than 3.91 lbs. As a result, no further leak detection system evaluation is needed.
- The second threshold defines when additional ventilation airflow is required. If the room area, A or TA, is below the adjusted A_{min} or TA_{min} threshold, additional ventilation is required to remove refrigerant in the event of a leak. Refer to UL 60335-2-40 Clause GG.8 and ANSI\ASHRAE Standard 15 Section 7 for natural and mechanical ventilation requirements. See equipment nameplate and table below for minimum room area.

Split systems minimum room area requirements need to be determined after final field charging. Use the following figures and the largest final circuit charge to determine the systems A_{min} value. Record the final charge value on the label provided on the condensing unit.

Figure 1. Charge vs min room area (IP)

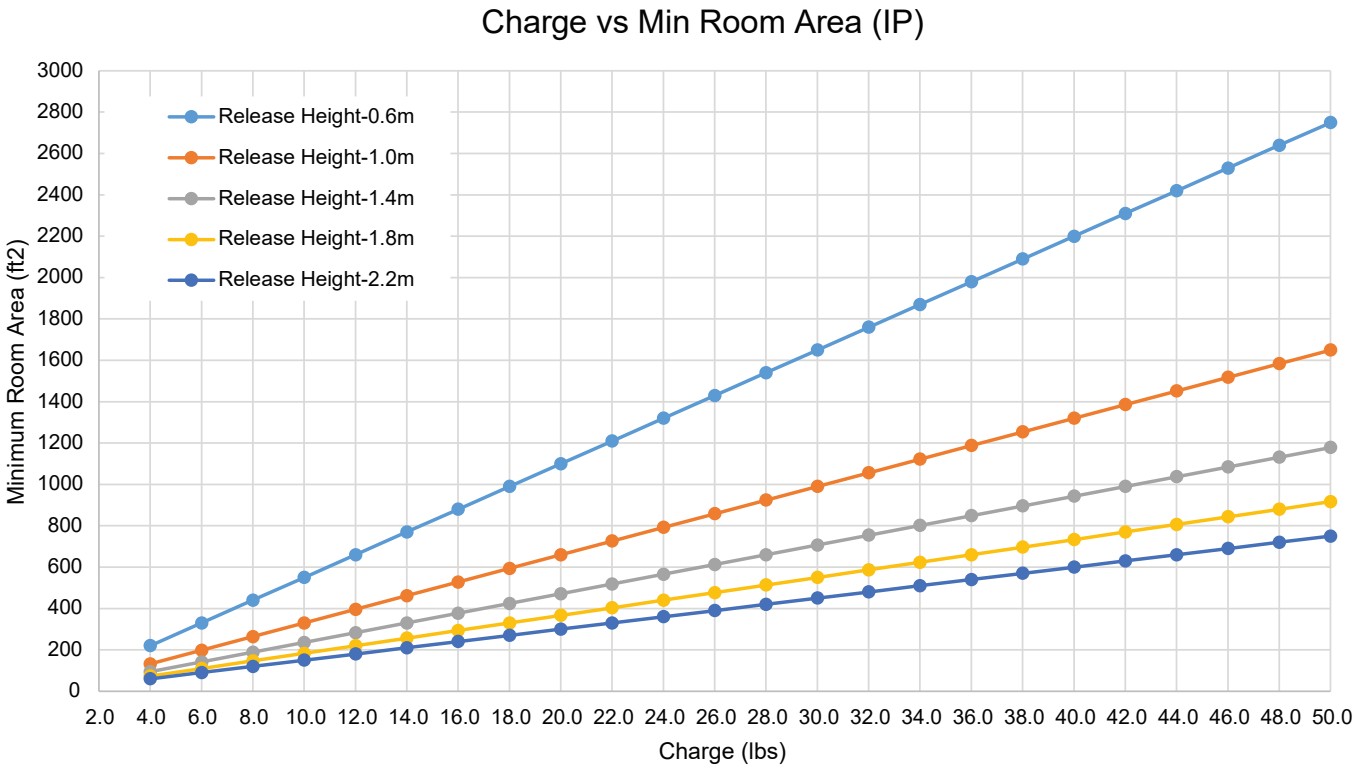
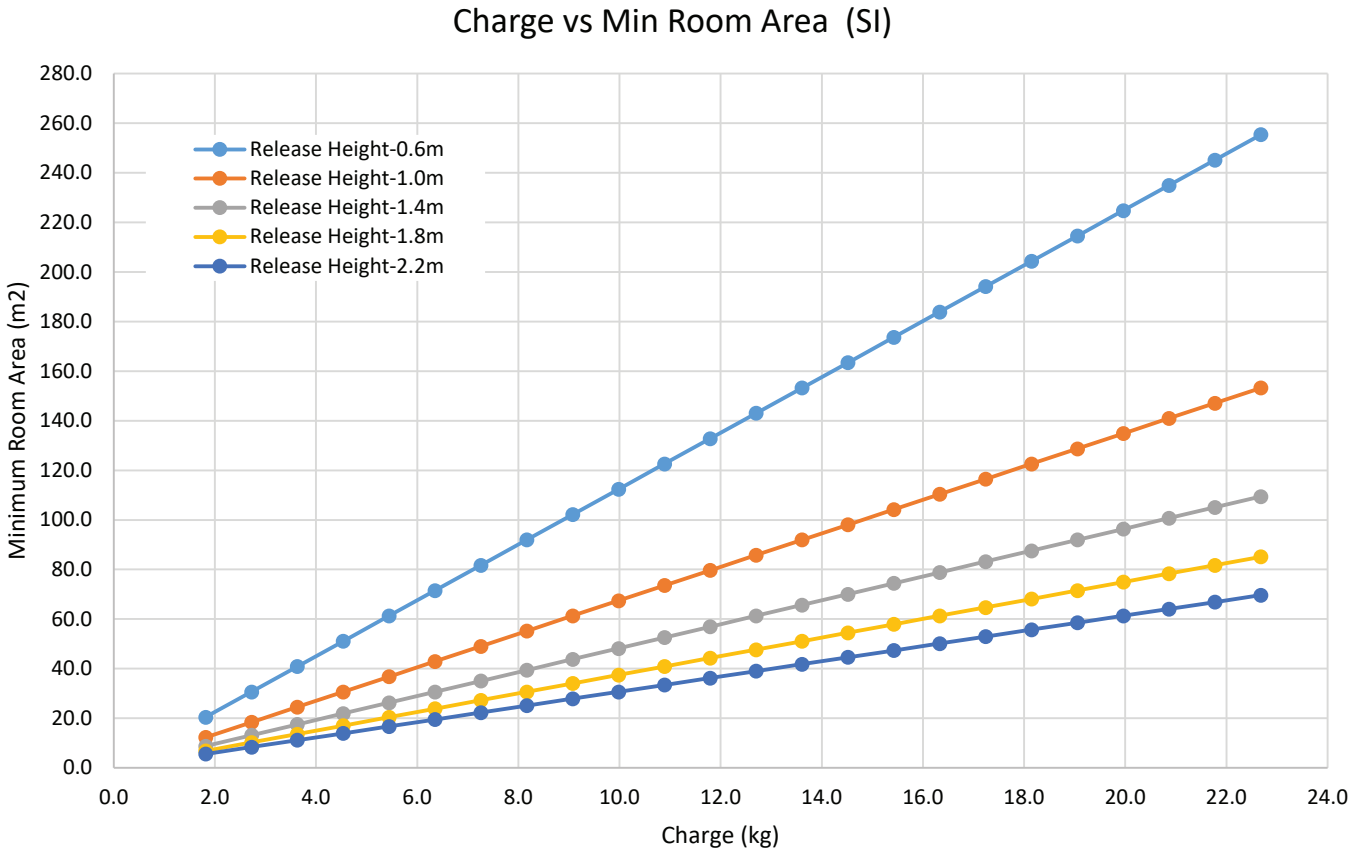


Figure 2. Charge vs min room area (SI)



Release height is the vertical distance from the floor to the lowest point in a space refrigerant would leak from first. The minimum value is 0.6 m from the floor. This point is typically the bottom of free return openings or supply diffusers. For fully ducted units, the release height is 2.2 meters.

Minimum Room Area (A_{min}) Adjustments

Use equation below to adjust the minimum room area, as applicable, based on the unit's installation height, altitude, and occupancy level it serves.

$$A_{min.adj} = \text{Nameplate } A_{min} \times \text{Altitude Adj} \times \text{Height Adj} \times F_{occ}$$

Multiply the altitude adjustment factor in the table below by A_{min} listed on the unit nameplate or in the Installation, Operation, and Maintenance (IOM) manual.

Table 1. Altitude adjustment factor

Altitude (ft)	Sea Level to 2000	2001 to 4000	4001 to 6000	6001 to 8000	8001 to 10000	10001 to 12000	12001 to 14000	14001 to 15000	Over 15000
A_{min} Adjustment	1	1.05	1.11	1.17	1.24	1.32	1.41	1.51	1.57

In addition, A_{min} can be adjusted if the unit is installed in a room at a height that is higher than the minimum height shown on the unit. To adjust A_{min}, multiply by the ratio of the unit minimum release height (in meters) / actual release height (in meters). Use 0.6 m in the ratio for unit minimum installation heights less than or equal to 0.6 m.

For institutional occupancies, ASHRAE Standard 15 applies an additional adjustment factor F_{occ} to the amount of a charge allowed in a space. To calculate the adjusted A_{min} for institutional occupancies, multiply the A_{min} on the nameplate by two.

EXAMPLE 1: 20 Ton Packaged Rooftop Multi-Zone VAV System Serving an Institutional Occupancy Space

The packaged unit serves 7600 ft^2 of a nursing home located at an attitude of 4000 ft. The unit has two equally charged 10 ton refrigeration circuits. Each circuit has 12 lbs of refrigerant with a minimum room area requirement of 180 ft^2 with a 2.2 m release height.

$$TA_{min.adj} = 180\ ft^2 \times 1.05 \times 2 = 378\ ft^2$$

No additional ventilation is required.

EXAMPLE 2: 10 Ton Split System Serving a Single Commercial Occupancy Space

The split system serves a 1500 ft^2 manufacturing space at 5000 ft altitude. The final installed charge of the single circuit 10 ton unit is 20 lb. The unit has an open return with a release height of 1 m and ducted supply air. The unit A_{min} is 660 ft^2.

$$A_{min.adj} = 660\ ft^2 \times 1.11 = 733\ ft^2$$

No additional ventilation is required.

Determining Room Area (A or TA)

The room area (A) is the room area enclosed by the projection to the floor of the walls, partitions, and doors of the space that the equipment serves. For ducted systems, total room area (TA) of all rooms connected by ducts, may be used instead of A.

Rooms connected by drop ceilings only are not considered a single room.

Rooms on the same floor of the building, and connected by an open passageway, can be considered part of the same room if the passageway is a permanent opening, extends to the floor and is intended for people to walk through.

Adjacent rooms on the same floor of the building and connected by permanent openings in the walls and/or doors between rooms (including gaps between the wall and the floor), can be considered part of the same room if the openings meet the following criteria.

- The opening is permanent and cannot be closed.
- Openings extending to the floor, such as door gaps, need to be at least 20 mm above the floor covering surface.
- Natural ventilations opening areas must meet the requirements of ANSI\ASHRAE Standard 15-2022, Section 7.2.3.2.

Rooms that are connected by a mechanical ventilation system can be considered a single room area if the mechanical ventilation system meets the requirements of ANSI\ASHRAE Standard 15-2022, Section 7.6.4.

Leak Detection System (Refrigerant charge greater than 3.91 lb per circuit)

The leak detection system consists of one or more refrigerant detection sensors. When the system detects a leak, the following mitigation actions will be initiated until refrigerant has not been detected for at least 5 minutes:

- Energize the supply fan(s) to deliver a required minimum amount of circulation airflow.
- Disable compressor operation.

- Provide an output signal that can be used to fully open zone dampers and/or VAV boxes and disable electric heat in VAV boxes.
- Provide an output signal that can be used to energize additional mechanical ventilation (if needed).
- Units without airflow proving will disable electric heat sources.

Building fire and smoke systems may override this function.

If the refrigerant sensor has a fault, is at the end of its life, or is disconnected, the unit will initiate the mitigation actions. Mitigation actions may be verified by disconnecting the sensor.

The refrigerant sensors do not need service. Use only manufacturer-approved sensors when replacement is required.

Field Piping Installation and Charging

When refrigerant piping is routed indoors, protect from physical damage in operation or service, and verify installation complies with national and local codes. All joints must be accessible for inspection prior to being covered.

Follow the Refrigerant Charging procedure. Prior to refrigerant charging, check field-made indoor joints for leaks using an instrument with a sensitivity of 5 grams per year refrigerant. Pressurize the system to 25% of the maximum allowable pressure. Verify no leaks are detected.

Pre-Installation

Unit Inspection

Inspect material carefully for any shipping damage. If damaged, it must be reported to, and claims made against the transportation company. Compare the information that appears on the unit nameplate with ordering and submittal data to ensure the proper unit was shipped. Available power supply must be compatible with electrical characteristics specified on component nameplates. Replace damaged parts with authorized parts only.

Important: *Units ordered with a VFD cannot be field converted to 460 V from 208-230 or from 208-230 V to 460 V.*

Inspection Checklist

To protect against loss due to damage incurred in transit, complete the following checklist upon receipt of the unit.

- ☐ Inspect individual pieces of the shipment before accepting the unit. Check for obvious damage to the unit or packing material.
- ☐ Inspect the unit for concealed damage before it is stored and as soon as possible after delivery. Concealed damage must be reported within 15 days. If concealed damage is discovered, stop unpacking the shipment. Do not remove damaged material from the receiving location. Take photos of the damage if possible. The owner must provide reasonable evidence that the damage did not occur after delivery.
- ☐ Notify the carrier's terminal of damage immediately by phone and by mail. Request an immediate joint inspection of the damage by the carrier and the consignee.
- ☐ Notify the sales representative and arrange for repair. Do not repair the unit until the damage is inspected by the carrier's representative.

Lifting Recommendations

⚠ WARNING

Improper Unit Lift!

Failure to properly lift unit in a LEVEL position could result in unit dropping and possibly crushing operator/technician which could result in death or serious injury, and equipment or property-only damage.

Test lift unit approximately 24 inches (61 cm) to verify proper center of gravity lift point. To avoid dropping of unit, reposition lifting point if unit is not level.

NOTICE

Equipment Damage!

Use spreader bars to prevent straps from damaging the unit. Install the bars between lifting straps, both underneath the unit and above the unit to prevent the straps from crushing the unit cabinet or damaging the finish.

Before preparing the unit for lifting, estimate the approximate center of gravity for lifting safety. Because of placement of internal components, the unit weight may be unevenly distributed. See "Weights," p. 22 for approximate unit weights.

The crated unit can be moved using a forklift of suitable capacity. For lifting the unit, attach lifting straps or slings securely to the lifting holes at each corner (see unit drawings in "Weights," p. 22). Use spreader bars to protect the unit casing from damage. Test lift the unit to determine proper balance and stability.

Clearances

Provide enough space around the unit to allow unrestricted access to all service points. Refer to the "Dimensional Data," p. 16 for unit dimensions and minimum required service and free air clearances. Observe the following points to ensure proper unit operation.

1. Do not install the unit under a low overhang. Condenser discharge must not be restricted—refer to notes in "Dimensional Data," p. 16.

   Note: *Do not obstruct condenser discharge air. This can result in warm air recirculation through the coil.*

2. Do not locate the unit in a position where runoff water, or falling snow from roof, can fall into the fan discharge openings.
3. Condenser intake air is supplied from three or four sides of the unit. Adhere to the minimum required clearances given in unit dimensional drawings (see "Dimensional Data," p. 16).

Unit Mounting

⚠ WARNING

Risk of Roof Collapsing!

Failure to ensure proper structural roof support could cause the roof to collapse, which could result in death or serious injury and property damage.

Confirm with a structural engineer that the roof structure is strong enough to support the combined weight of the roofcurb, the unit, and any accessories.

Structural Preparation

NOTICE

Roof Damage!

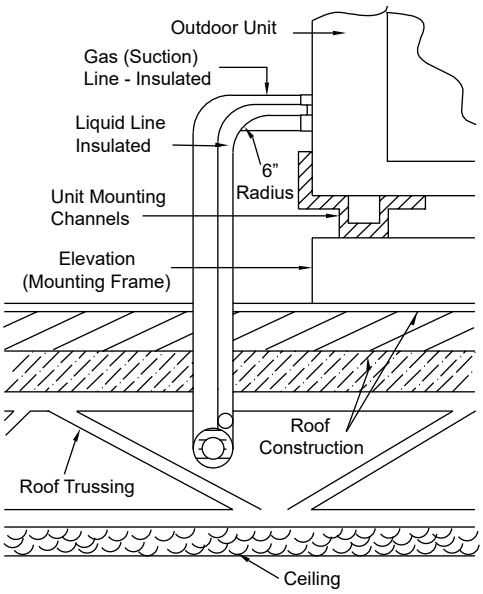
System contains oil and refrigerant under high pressure. Roofs should be protected from exposure to oils and refrigerant in the system. If rooftop is not protected, damage to the roof may occur.

Important: *Refer to local building codes for proper installation. All installation must comply with local building codes.*

Rooftop Mounting

If the unit will be roof mounted, determine for certain that the structure is strong enough to support the unit and any required accessories, see "Weights," p. 22. The unit should be elevated on a level, field fabricated four-inch steel or wood 4-inch x 4-inch mounting frame. Complete the frame and secure it into position before lifting the unit to the roof. The mounting frame must support a minimum of three of the unit's four sides and should span roof supports to distribute the load on the roof.

Figure 3. Roof mounted unit



Ground Level Mounting

For ground level installation, the unit base should be adequately supported and hold the unit near level. The installation must meet the guidelines set forth in local codes. The support should extend two inches beyond the unit base channels at all points. The unit and support must be isolated from any adjacent structure to prevent possible noise or vibration problems. Any ground level location must comply with required clearances given in the unit dimensional drawings (see "Dimensional Data," p. 16).

Snow Belt Recommendations

In regions where deep snow is encountered, raise the unit a minimum distance of 8 to 12 inches above the mounting surface. This will reduce the risk of snow blocking the coil and improves runoff of water produced during the defrost cycle. Avoid locating the unit where snow tends to drift. Snow accumulations must be removed from around the unit immediately to prevent drastic efficiency reduction. A snow drift barrier may be constructed around the unit to prevent snow blockage. Clearance between the snow barrier and the unit must comply with the clearances given in "Dimensional Data," p. 16.

Installation Checklist

Complete this checklist once the unit is installed to verify that all recommended procedures have been accomplished before starting the system. Do not operate the system until all items covered by this checklist are complete.

- ☐ Inspect unit location for proper required service clearances.
- ☐ Inspect unit location for proper free air clearances.
- ☐ Inspect unit location for secure, level mounting position.
- ☐ Remove coil protection boards on microchannel units.
- ☐ Verify condenser fans turn freely without rubbing and are properly tightened on the shafts.

Refrigerant Piping

- ☐ Properly sized/constructed liquid and suction lines connected to stubs at both the indoor and outdoor units?
- ☐ Insulated the entire suction line?
- ☐ Insulated portions of liquid line exposed to extremes in temperature?
- ☐ Performed initial leak test?
- ☐ Evacuated each refrigerant circuit to 500 microns?
- ☐ Charged each circuit with proper amount of R-454B?

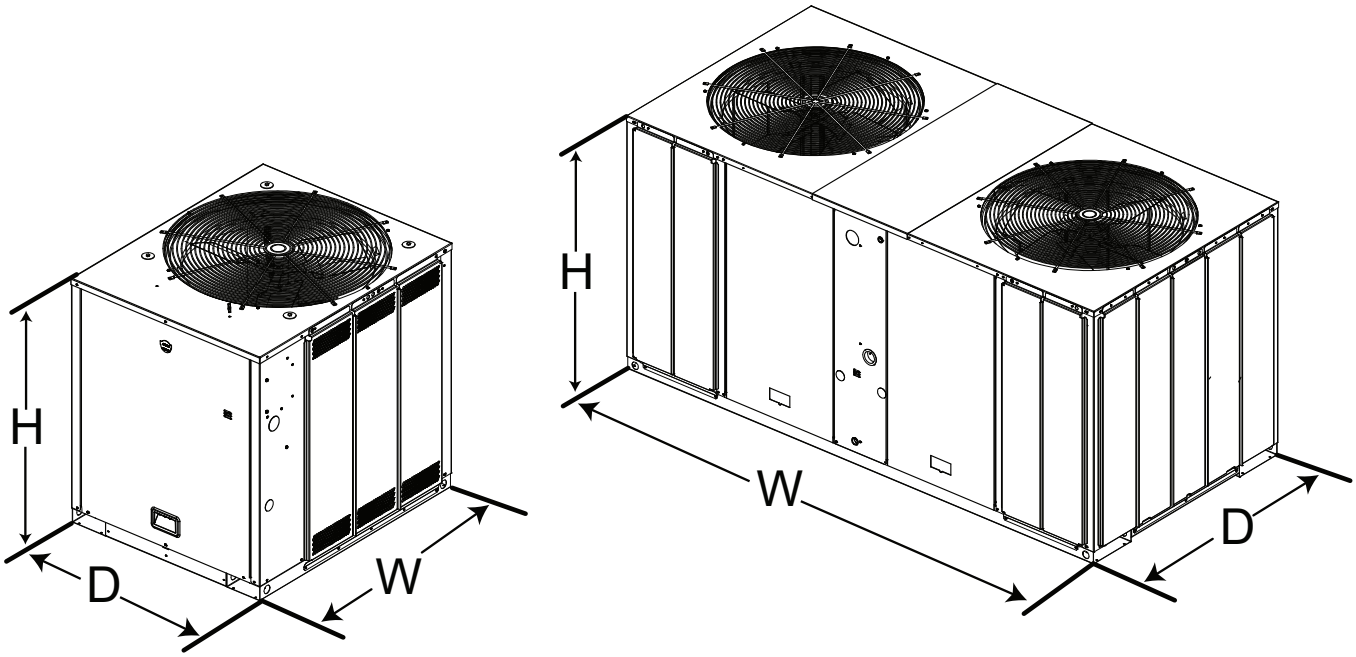
Electrical Wiring

- ☐ Provided unit power wiring (with disconnect) to proper terminals in the unit control enclosure?
- ☐ Installed system indoor thermostat or zone sensor?
- ☐ Installed system low voltage interconnecting wiring to proper terminals of outdoor unit, indoor unit and system thermostat or zone sensor?
- ☐ Checked all electrical connections to verify all are properly tightened and connected?
- ☐ Verified operation of crankcase heaters?

Dimensional Data

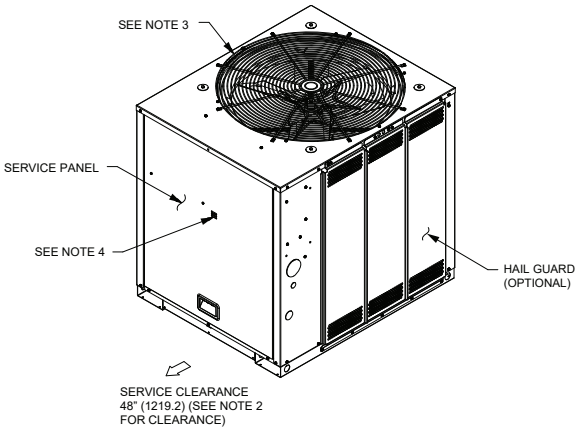
Heat Pump

Figure 4. Height, width and depth measurements



	H - in. (mm)	W - in. (mm)	D - in. (mm)
TWA072K*A, 090K*A	39.2 (996)	42.1 (1070)	36.3 (922)
TWA072K*D, 090K*D	39.2 (996)	51.9 (1317)	39.3 (999)
TWA120	45.2 (1150)	51.9 (1317)	39.3 (999)
TWA180, 240	45.2 (1150)	94.8 (2407)	45.4 (1152)

Figure 5. 6 and 7.5 ton heat pump, single compressor – in (mm)



NOTES:
1. ACCESS OPENING IS FOR FIELD INSTALLED BAYLOAM ACCESSORY.
2. MINIMUM CLEARANCE FOR PROPER OPERATION IS 36" (914.4) FROM WALLS, SHRUBBERY, PRIVACY FENCES ETC. MINIMUM CLEARANCE BETWEEN ADJACENT UNITS IS 72" (1828.8). RECOMMENDED SERVICE CLEARANCE 48" (1219.2)
3. TOP DISCHARGE AREA SHOULD BE UNRESTRICTED FOR 100" (2540) MINIMUM. UNIT SHOULD BE PLACED SO ROOF RUN-OFF WATER OR FALLING SNOW FROM ROOF DOES NOT POUR/FALL DIRECTLY ON UNIT
4. OUTDOOR AIR TEMPERATURE SENSOR OPENING (DO NOT BLOCK OPENING)

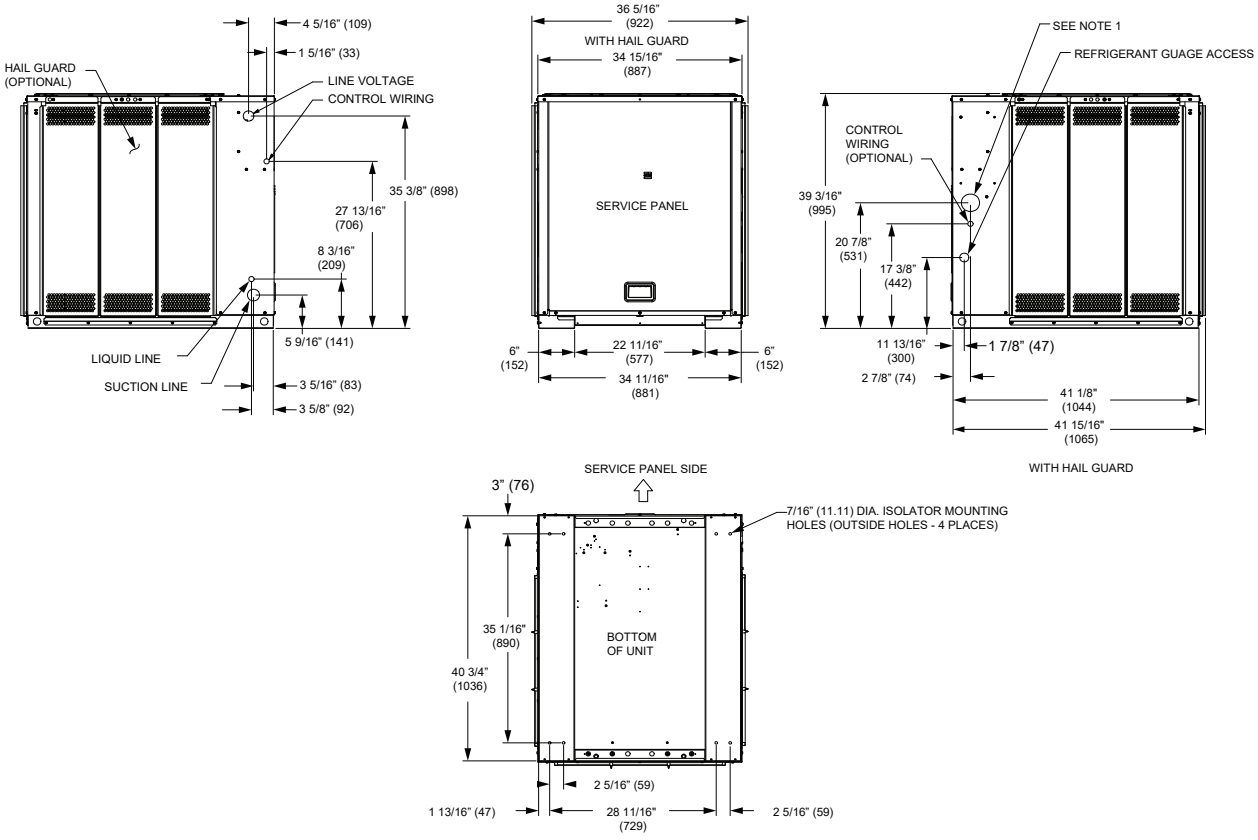


Figure 6. 6 and 7.5 ton heat pump, dual compressor – in (mm)

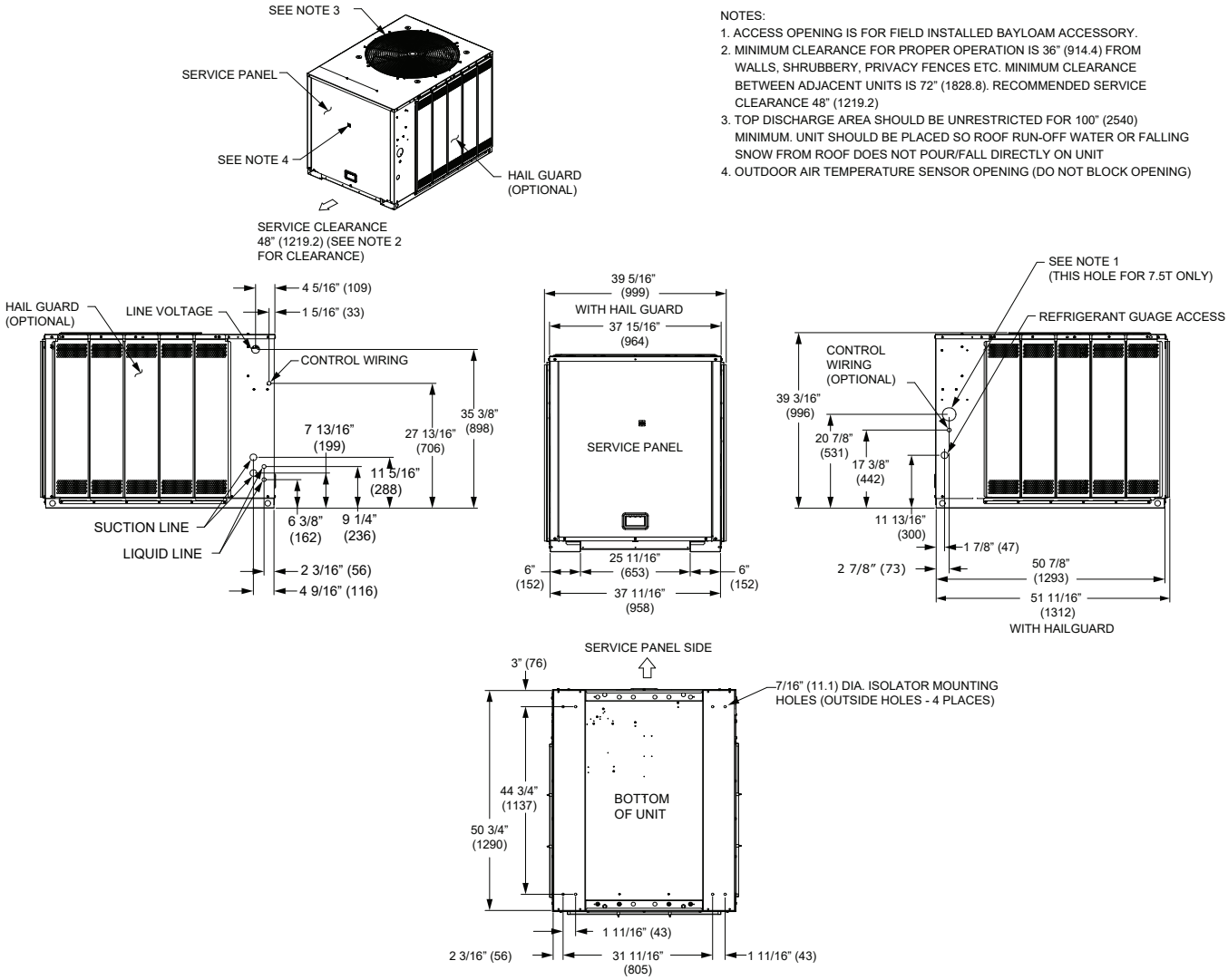


Figure 7. 10 ton heat pump, single compressor – in (mm)

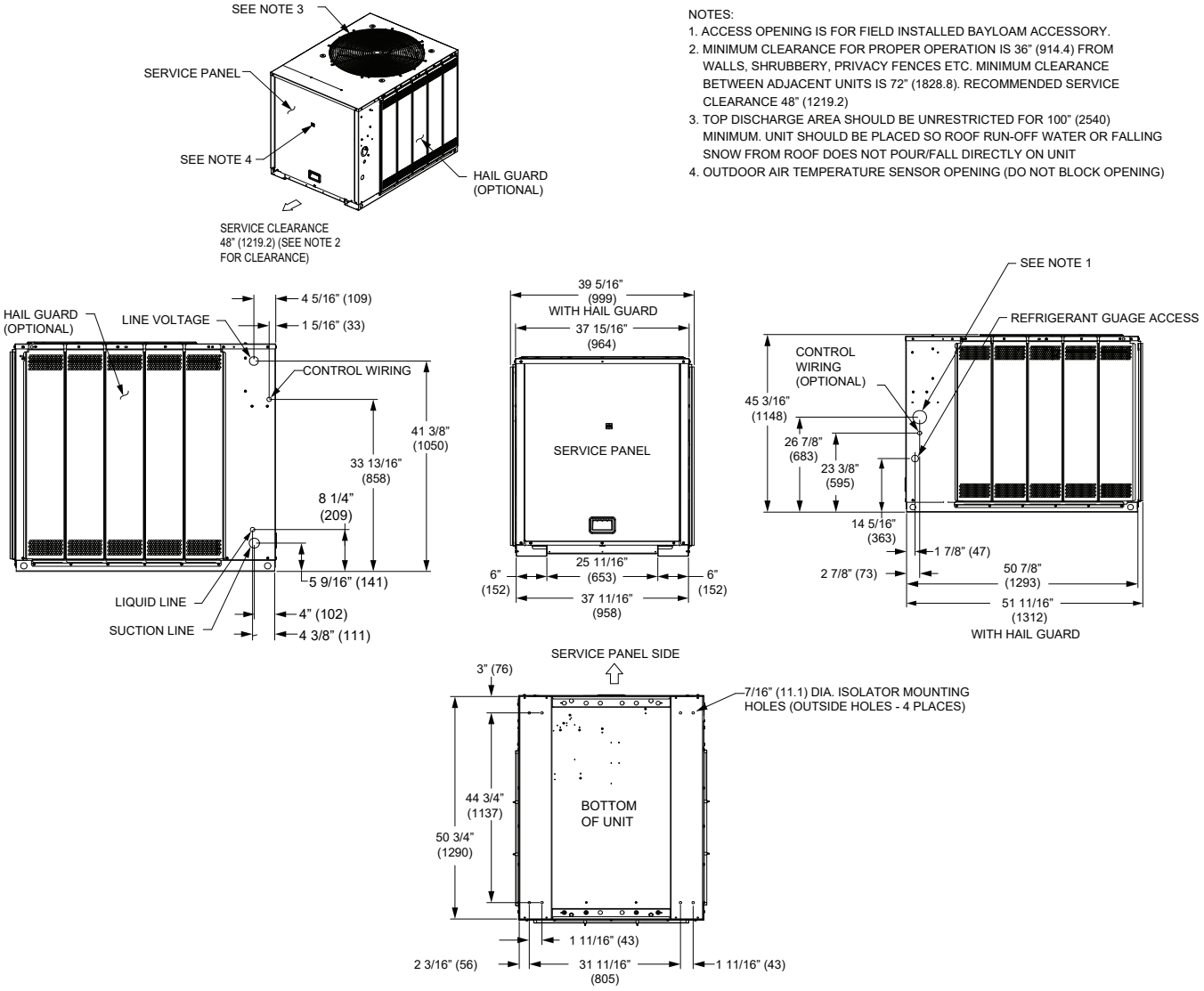


Figure 8. 10 ton heat pump, dual compressor – in (mm)

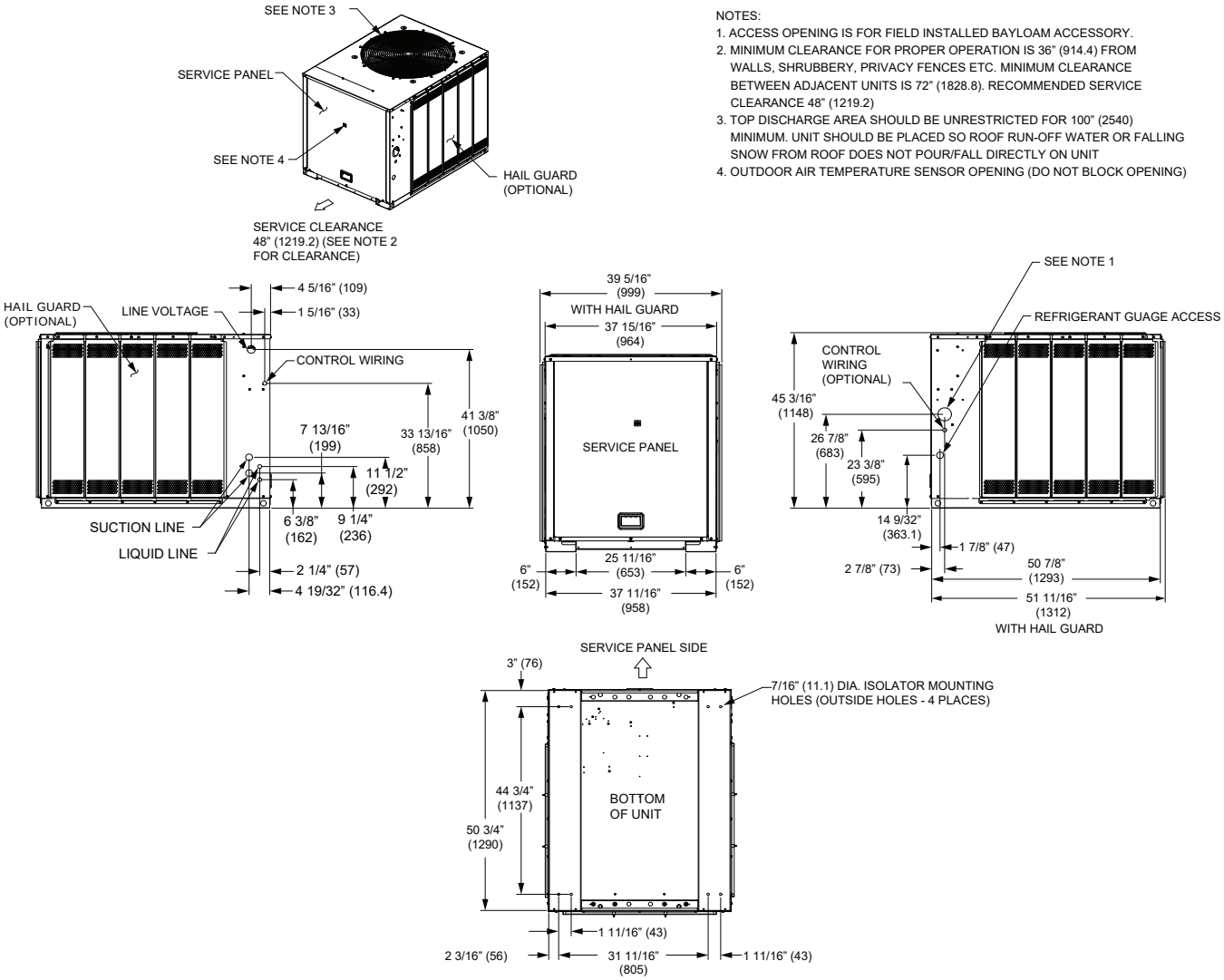
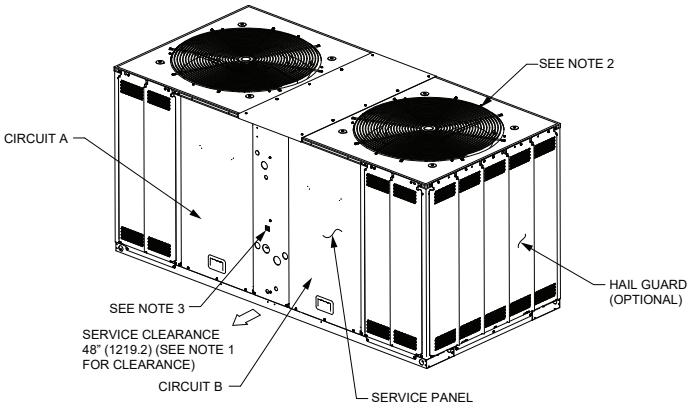
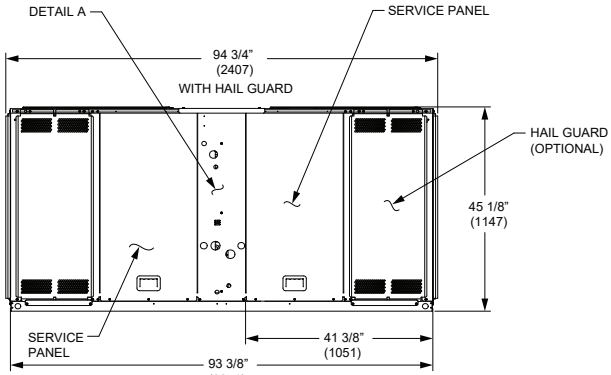


Figure 9. 15 and 20 ton heat pump, dual compressor – in (mm)

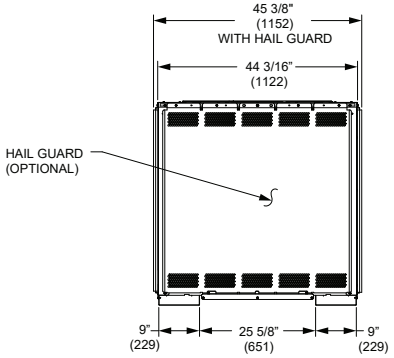


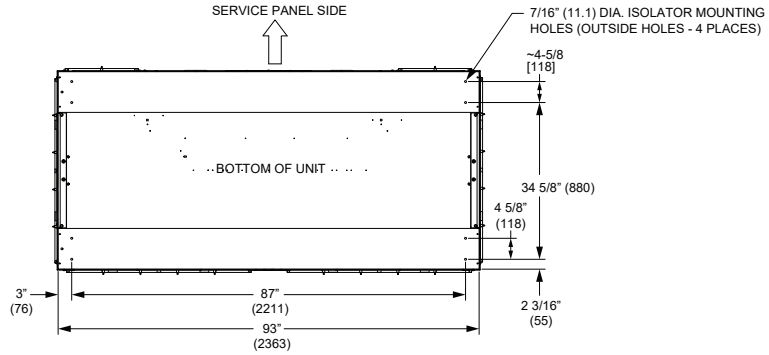
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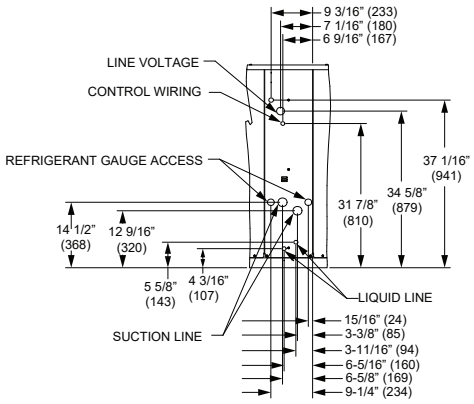
1. MINIMUM CLEARANCE FOR PROPER OPERATION IS 36" (914.4) FROM WALLS, SHRUBBERY, PRIVACY FENCES ETC. MINIMUM CLEARANCE BETWEEN ADJACENT UNITS IS 72" (1828.8). RECOMMENDED SERVICE CLEARANCE 48" (1219.2)
2. TOP DISCHARGE AREA SHOULD BE UNRESTRICTED FOR 100" (2540) MINIMUM. UNIT SHOULD BE PLACED SO ROOF RUN-OFF WATER OR FALLING SNOW FROM ROOF DOES NOT POUR/FALL DIRECTLY ON UNIT
3. OUTDOOR AIR TEMPERATURE SENSOR OPENING (DO NOT BLOCK OPENING)



OPTIONAL REAR ACCESS
DIMENSIONAL DETAIL







FRONT DETAIL A
DIMENSIONAL DEATIL

Weights

Heat Pump Condenser

Table 2. TWA R-454B unit and corner weights — lbs (60 Hz)

Tons	Model No.	Shipping Max (lbs)	Net Max (lbs)	Corner Weights			
				1	2	3	4
6	TWA072K*A	360	325	112	83	56	76
	TWA072K*D	434	395	138	94	100	65
7.5	TWA090K*A	395	363	90	128	66	80
	TWA090K*D	484	445	156	105	113	73
10	TWA120K*A	495	440	156	103	110	72
	TWA120K*D	487	448	157	106	113	74
15	TWA180K*D	874	782	242	172	202	169
20	TWA240K*D	1004	914	274	287	160	196

Figure 10. TWA072, 090, 120

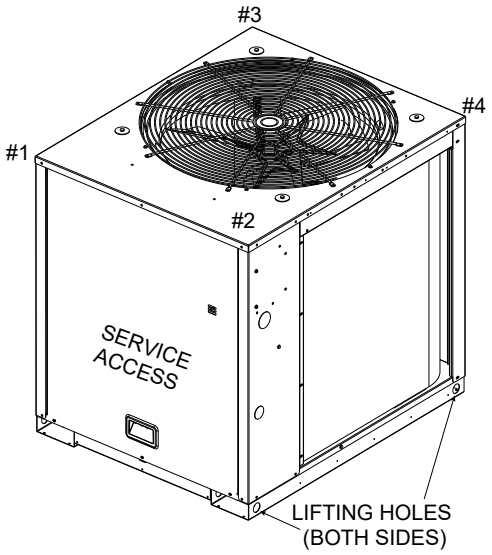
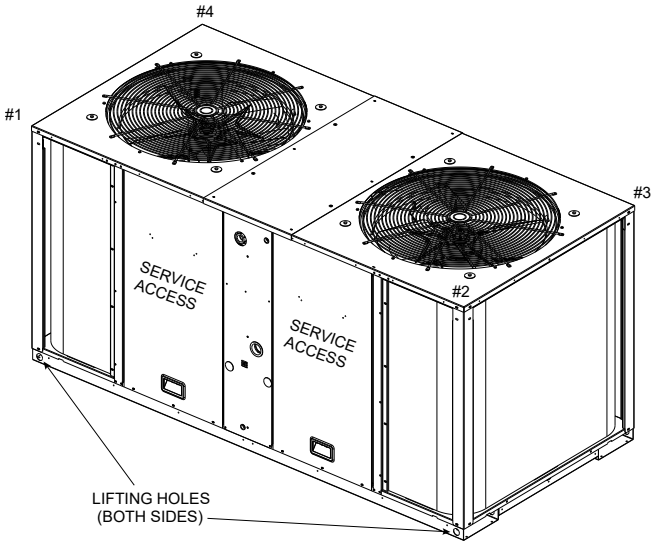


Figure 11. TWA180, 240



Installation

Refrigerant Piping Guidelines

Figure 12. Allowable elevation difference: TWA above indoor unit

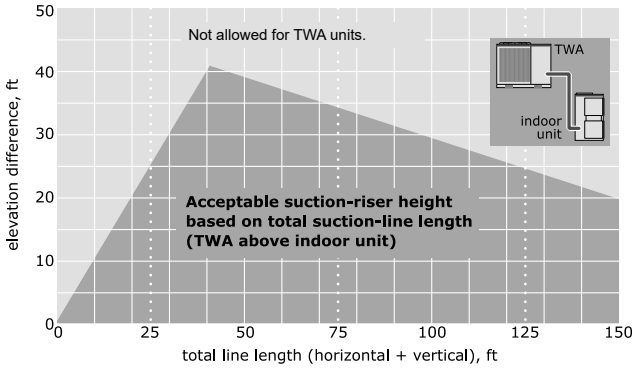
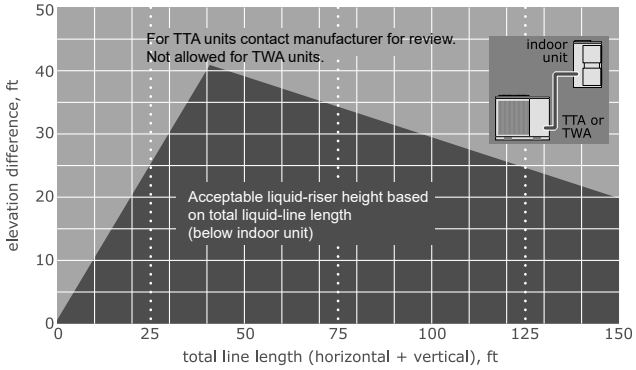


Figure 13. Allowable elevation difference: TTA or TWA below indoor unit



Note: *Route refrigerant piping for minimum linear length, minimum number of bends and fittings.*

Important: *Read Split System Air Conditioners Odyssey Application Guide SS-APG017*-EN thoroughly before installing this unit.*

Refrigerant Piping Procedures (Outdoor Units)

⚠ WARNING

R-454B Flammable A2L Refrigerant!

Failure to use proper equipment or components as described below could result in equipment failure, and possibly fire, which could result in death, serious injury, or equipment damage.

The equipment described in this manual uses R-454B refrigerant which is flammable (A2L). Use ONLY R-454B rated service equipment and components. For specific handling concerns with R-454B, contact your local representative.

⚠ WARNING

Refrigerant under High Pressure!

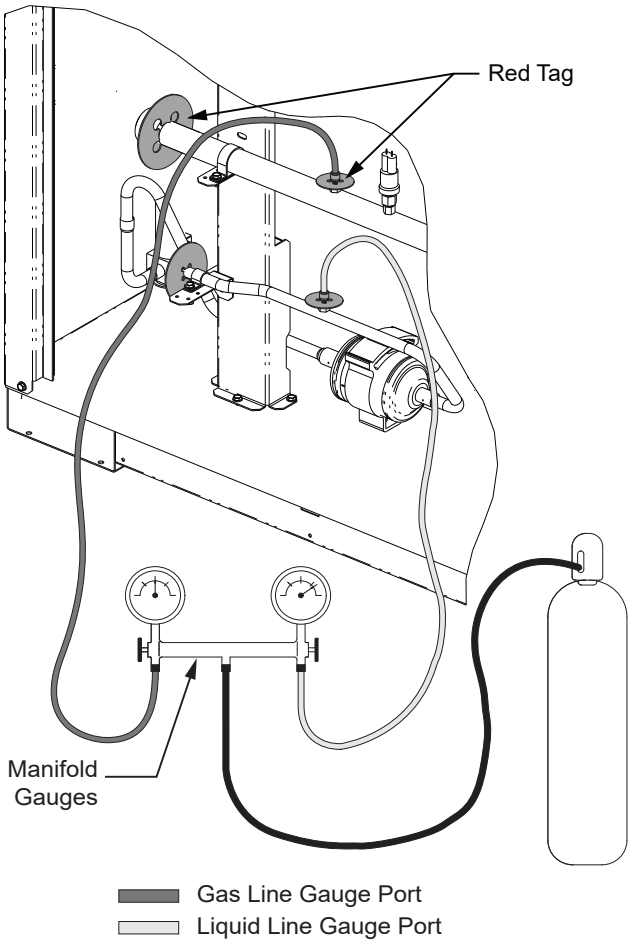
Failure to follow instructions below could result in an explosion which could result in death or serious injury or equipment damage.

System contains refrigerant under high pressure. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or refrigerant additives.

Each unit ships with a holding charge of dry nitrogen. The nitrogen should be removed and the entire system evacuated (at the proper time) to avoid possible contamination.

1. Remove the compressor service access panel.
2. Locate the liquid and suction line access valves. Check that the piping connection stubs (Figure 14, p. 23) line up properly with the holes in the unit cabinet.

Figure 14. Outdoor units - refrigerant piping (with dry nitrogen)



3. Install gauges to determine if the circuits are still pressurized. If not, the charge has escaped and should be repaired as required to obtain a leak-free circuit. If the circuits are still pressurized, use the gauges to slowly release the nitrogen charge to the atmosphere and remove both seal caps from the outdoor unit connection stubs.

NOTICE

System Component Damage!

Do not remove the seal caps from refrigerant connections until prepared to braze refrigerant lines to the connections. Excessive exposure to atmosphere (> 5 min.) may allow moisture or dirt to contaminate the system, damaging valve seals and causing ice formation in system components.

⚠ WARNING

Explosion Hazard and Deadly Gases!

Failure to follow all proper safe refrigerant handling practices could result in death or serious injury. Never solder, braze or weld on refrigerant lines or any unit components that are above atmospheric pressure or where refrigerant may be present. Always remove refrigerant by following the guidelines established by the EPA Federal Clean Air Act or other state or local codes as appropriate. After refrigerant removal, use dry nitrogen to bring system back to atmospheric pressure before opening system for repairs. Mixtures of refrigerants and air under pressure may become combustible in the presence of an ignition source leading to an explosion. Excessive heat from soldering, brazing or welding with refrigerant vapors present can form highly toxic gases and extremely corrosive acids.

4. Cut, fit and braze tubing, starting at the outdoor unit and work toward the indoor unit. See “Charging Levels,” p. 26.

   Note: *Use long radius ells for all 90° bends.*

   All brazing should be done using a 2 to 3 psig dry nitrogen purge flowing through the pipe being brazed, see Figure 14, p. 23.

NOTICE

System Component Damage!

Install a regulating valve between the nitrogen source and the gauge manifold. Unregulated pressure can damage system components.

NOTICE

System Component Damage!

Wet-wrap all valves and protect painted surfaces from excessive heat. Heat can damage system components and the unit finish.

5. Shut off nitrogen supply. Shut off the manifold valve for the line that is connected to the suction line access valve. Disconnect the line from the access valve.
6. Reinstall the red tags, if they are removed during brazing.

Refrigerant Piping Procedures (Indoor Unit)

Once liquid and suction lines are complete to the refrigerant connections on the indoor unit, remove the gauge port core(s) on the indoor unit connection stubs to release the dry nitrogen charge.

NOTICE

Unit Damage!

Do not apply heat to remove seal caps until the gauge port cores have been removed. If seal caps are intact, application of heat may generate excessive pressure in the unit and result in damage to the coil or expansion valve.

1. Remove both seal caps from the indoor unit connection stubs.

NOTICE

Unit Damage!

Failure to follow instructions below could result in damaging the unit.

Do not remove the seal caps from refrigerant connections until prepared to braze refrigerant lines to the connections. Due to the high hygroscopic properties of the POE oil, excessive exposure to atmosphere will allow moisture to contaminate the system, damaging the compressor.

2. Turn on nitrogen supply. Nitrogen enters through the liquid line gauge port.
3. Braze the liquid line connections.
4. Open the gauge port on the suction line and then braze the suction line to the connection stub. Nitrogen will bleed out the open gauge port on the suction line.
5. Shut off nitrogen supply.
6. Reinstall the red tags, if they are removed during brazing.

Leak Check

⚠ WARNING

Explosion Hazard!

Failure to follow these instructions could result in death or serious injury or equipment or property-only damage.

Use only dry nitrogen with a pressure regulator for pressurizing unit. Do not use acetylene, oxygen or compressed air or mixtures containing them for pressure testing. Do not use hydrogen mixtures containing refrigerant and air above atmospheric pressure for pressure testing as they may become flammable and could result in an explosion.

Refrigerant, when used as a trace gas should only be mixed with dry nitrogen for pressurizing units.

⚠ WARNING

Explosion Hazard!

Failure to follow safe leak test procedures below could result in death or serious injury or equipment or property-only-damage.

Never use an open flame to detect gas leaks. Use a leak test solution for leak testing.

After the brazing operation of refrigerant lines to both the outdoor and indoor unit is completed, the field brazed connections must be checked for leaks. Pressurize the system through the gauge port with dry nitrogen to 200 psi. Use soap bubbles or other leak-checking methods listed under A2L Work Procedures section to ensure that all field joints are leak free. If not, release pressure, repair and repeat leak test.

System Evacuation

1. After completion of leak check, evacuate the system.
2. Attach appropriate hoses from manifold gauge to gas and liquid line pressure taps.

   Note: *Unnecessary switching of hoses can be avoided and complete evacuation of all lines leading to sealed system can be accomplished with manifold center hose and connecting branch hose to a cylinder of R-454B and vacuum pump.*
3. Attach center hose of manifold gauges to vacuum pump.

NOTICE

Operating Under Vacuum!

Failure to follow these instructions will result in compressor failure.

Do not operate or apply power to the compressor while under a vacuum.

4. Evacuate the system to hold a 500 micron vacuum.
5. Close off valve to vacuum pump and observe the micron gauge. If gauge pressure rises above 500 microns in one minute, then evacuation is incomplete or the system has a leak.
6. If vacuum gauge does not rise above 500 microns in 10 minutes, the evacuation should be complete.

NOTICE

Equipment Damage!

Charge with access port on the liquid line only.

Insulating and Isolating Refrigerant Lines

Insulate the entire suction line with refrigerant piping insulation. Also insulate any portion of the liquid line exposed to temperature extremes. Insulate and isolate liquid and suction lines from each other. Isolate refrigerant lines from the structure and any duct work.

Important:

1. *To prevent possible noise or vibration problems, be certain to isolate refrigerant lines from the building.*
2. *All suction and hot gas bypass piping (if installed) should be insulated from the termination in the air handler to the condensing unit cabinet entry. Failure to do so can cause condensate drip off and performance degradation.*
3. *Prior to starting a unit, it is advisable to have the approved oils available in the event oil needs to be added to the system.*
4. *Refer to Split System Air Conditioners Odyssey Application Guide SS-APG017*-EN for units needing additional oil and for oil amounts.*

NOTICE

Equipment Damage!

This is POE oil, which readily absorbs moisture. Always use new oil and never leave containers open to atmosphere while not in use.

Table 3. R-454B TWA approved oils

Unit Model Number	Approved Oils
TWA072K*A, TWA072K*D, TWA090K*A, TWA090K*D, TWA120K*A, TWA120K*D, TWA180K*D, TWA240K*D	Trane Oil Part Number OIL00094 (1 quart container)

For units equipped with compressors containing site glasses, the oil level must be visible through the sight glass when the compressor is running under stabilized conditions and a few minutes after the compressor has stopped.

Refrigerant Charging Procedure

If charging by weight, refer to"Charging Levels," p. 26 for starting change. If refrigerant adjustments are needed because of length of line, refer to the Charging Charts and Superheat values available on unit access panels.

Charge by weight through the gauge port on the liquid line. Follow the requirements listed under A2L Work Procedures section.

Notes:

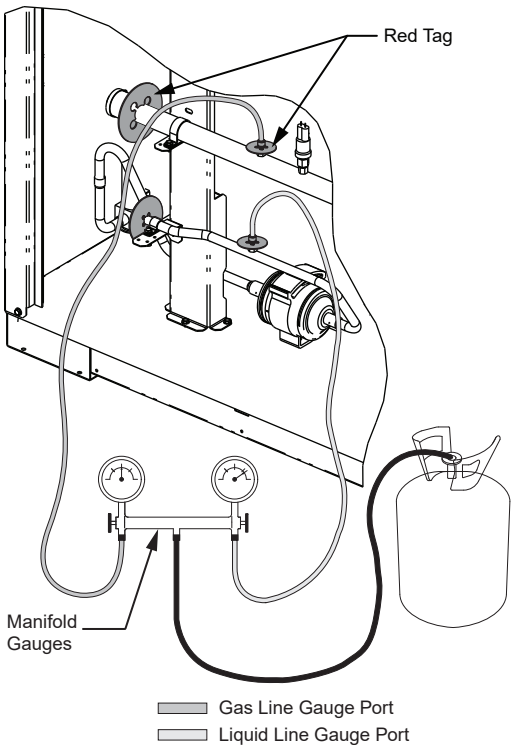
- *Refrigerant should only be charged in the liquid state.*
- *When possible, always charge the refrigerant into the liquid line of the unit.*
- *If the entire charge can't be charged into the liquid line, the balance of the unit charge can be metered through a charging manifold set as liquid — preferably through a schrader valve into the suction line to the compressor — only while the compressor is running.*
- *Check and adjust superheat using the superheat table, then re-check charging charts to determine if charge corrections are necessary. Refer to Charging Data for list of super heat tables available in e-Library.*

NOTICE

Equipment Damage!

Never charge liquid refrigerant into the suction line of the unit with the compressor off.

Figure 15. Outdoor units - refrigerant piping



Charging Levels

Important: *For the correct line diameter, for line lengths greater than 25 feet, see the Split System Air Conditioners Odyssey Application Guide (SS-APG017*-EN).*

Table 4. Estimated charge levels at ARI rated line lengths (25 feet)

Matched Set	Refrigerant Charge		Per Circuit	
	Circuit 1	Circuit 2	Liquid Line Diameter	Vapor Line Diameter
TWA072K*A w/ TWE090K*A	17.3	-	0.5 (1/2”)	1.375 (1 3/8”)
TWA072K*D w/ TWE072K*B	9.1	9.5	0.5 (1/2”)	0.875 (7/8")
TWA090K*A w/ TWE090K*A	16.2		0.625 (5/8”)	1.375 (1 3/8")
TWA090K*D w/ TWE090K*B	9.3	9.6	0.5 (1/2”)	1.125 (1 1/8")
TWA120K*A w/ TWE120K*A	23.2	-	0.5 (1/2”)	1.375 (1 3/8”)
TWA120K*D w/ TWE120K*B	12.6	12.6	0.5 (1/2")	1.125 (1 1/8”)
TWA180K*D w/ TWE180K*B	21.2	21.2	0.5 (1/2”)	1.125 (1 1/8”)
TWA240K*D w/ TWE240K*B	19.9	19.9	0.625 (5/8”)	1.375 (1 3/8”)

Notes:

1. For line lengths other than 25-feet, refer to the Split System Air Conditioners Odyssey Application Guide (SS-APG017*-EN) for charge levels, oil addition and line sizes.
2. For additional support with line lengths or refrigerant charge, refer to the Application Guide or contact Product Support.
3. TWA180K*D need a reducer for vapor line (1.375 to 1.125 inch) (1 3/8-inch to 1 1/8-inch) ,and a reducer for liquid line (0.625 to 0.5 inch) (5/8-inch to 1/2-inch).
4. TWA072K*D need a reducer for vapor line (1.125 to 0.875) (1 1/8-inch to 7/8-inch).

Liquid Charging

This procedure is accomplished with the unit operating. Electrical connections must be complete. Do not proceed until the system is ready to operate.

Note: *The compressor access panel must be installed when the unit is running and being charged. Manifold hoses must be routed through refrigerant gauge access hole(s). See"Dimensional Data," p. 16 for specific locations.*

⚠ WARNING

Live Electrical Components!

Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

When it is necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks.

1. Turn on power to the unit. Allow the system to run for 15 minutes to stabilize operating conditions.
2. Measure airflow across the indoor coil. Compare the measurements with the fan performance data in the Data/Submittal. Once proper airflow is established, compare discharge pressure and liquid temperature to the charging charts. Add or remove refrigerant (liquid only) as required to obtain correct discharge pressure and liquid temperature.
3. Check suction line superheat and condenser sub-cooling to ensure the unit is operating properly.
4. Disconnect all power to the unit.

   Important: *If the unit is charged and left without power until a later date, the crankcase heater should be energized for a minimum of 8 hours prior to powering the compressor(s).*

⚠ WARNING

Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

5. Remove the charging system from the unit.
6. Reinstall the red tags on the schrader valves, if they were removed while charging.
7. Replace all panels.

Electrical Wiring

⚠ WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury.

All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

Field wiring consists of providing power supply to the unit, installing the system indoor thermostat or zone sensor and providing low voltage system interconnecting wiring. Access to electrical connection locations is shown in "Dimensional Data," p. 16. Determine proper wire sizes and unit protective fusing requirements by referring to the unit nameplate. Field wiring diagrams for accessories are shipped with the accessory.

Unit Power Supply

The installer must provide line voltage circuit(s) to the unit main power terminals as shown by the unit wiring diagrams. Adhesive backed diagrams are affixed inside the control box cover panel. Wiring diagrams are also available through e-Library or by contacting a local sales office. Power supply must include a disconnect switch in a location convenient to the unit. Ground the unit according to local codes and provide flexible conduit if codes require and/or if vibration transmission may cause noise problems.

Important: *All wiring must comply with applicable local and national (NEC) codes. Type and location of disconnect switches must comply with all applicable codes.*

⚠ WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury.

All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

NOTICE

Use Copper Conductors Only!

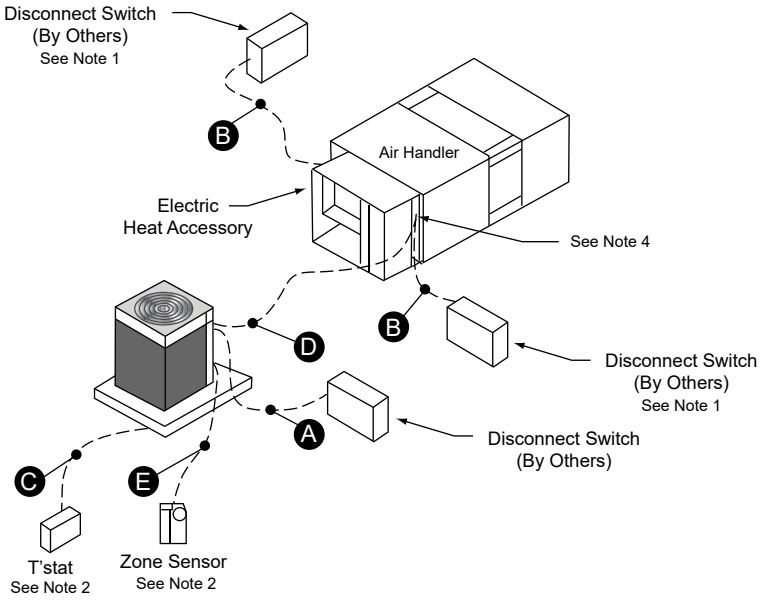
Failure to use copper conductors could result in equipment damage as the equipment was not designed or qualified to accept other types of conductors.

Low Voltage Wiring

Mount the indoor thermostat, zone sensor, or programmable zone sensor in accordance with the corresponding thermostat installation instructions. Install color-coded, weather-proof, multi-wire cable according to the *Split System Air Conditioners Odyssey with Symbio™ Controls Wiring and Start-up* (SS-SVN017*-EN).

Note: *Refer to thermostat or zone sensor wire installation guide for proper wire gauge.*

Figure 16. Symbio™ jobsite connections



Power Wires

A. 3 wires, line voltage for 3 phase, 1 grounding wire**

B. 3 wires, line voltage for 3 phase, (2 wires for single phase) 1 grounding wire**

Control Wires

C. Heat Pump thermostat: 6 to 9 wires depending on T'stat options and stages of cooling and heating

D. Wiring between indoor and outdoor unit: 5 to 11 wires depending on unit control options*

E. Zone Sensor: 4 to 7 wires depending on zone sensor model*

Communication signal wires require shielded twisted pairs.

Use Comlink cable with a PVC jacket, 18/1 PR, stranded shield, 25 PF/FT plenum rated for the field communication signal wiring. Refer to wiring diagram schematics for identification of shielded twisted pairs.

Symbio™ Controls

Wiring shown with dashed lines is to be furnished and installed by the customer. All customer supplied wiring must be copper only and must conform to NEC and local electrical codes. Codes may require line of sight between disconnect switch and unit.

Notes:

1. *When electric heater accessory is used, single point power entry or dual point power entry is field optional. Single point power entry option is through electric heater only.*
2. **Choose only one of the following; Thermostat, Mechanical Zone Sensor, Programmable Zone Sensor Panel or BAS Zone Sensor.*
3. ****

> **⚠ WARNING**
>
> ***Electrical Shock Hazard!***
>
> ***Failure to follow instructions below could result in death or serious injury.***
> ***Properly connect the system's oversized protective earthing (grounding) terminal(s).***

4. *Once power wire connections are complete inside the air handler control box, seal the sheet metal entry points of the control box by using parts (neoprene gasket, grommet, and plug) shipped along with the air handler unit package.*
5. *For detailed controls wiring instructions, see Split System Air Conditioners Odyssey™ with Symbio™ Controls Wiring and Start-Up Installation Guide (SS-SVN016*-EN).*

Important: *For the EDC switch to be functional and thereby facilitate reliable unit operation, make the EDC connections from the indoor to the outdoor control boxes.*

Table 5. Recommended thermostat wire size

Wire Size	Maximum Wire Length
(Gauge)	Physical distance between Unit and T'stat
22	30 Feet
20	50 Feet
18	75 Feet
16	125 Feet
14	200 Feet

Table 6. Zone sensor module wiring

Distance from Unit to Control	Recommended Wire Size
0-150 feet (0-45.7 m)	22 gauge (0.33 mm^2)
151-240 feet (46-73.1 m)	20 gauge (0.50 mm^2)
241-305 feet (73.5-117.3 m)	18 gauge (0.75 mm^2)
386-610 feet (117.7-185.9 m)	16 gauge (1.31 mm^2)
611-970 feet (186.2-295.7 m)	14 gauge (2.08 mm^2)

Field Wiring

Refer to the latest version of *Split System Air Conditioners Odyssey with Symbio Controls Wiring and Start-up* (SS-SVN017*-EN) for instructions on field wiring connections.

Refrigerant Circuit

Figure 17. Typical split system heat pump - cooling - refrigerant circuit

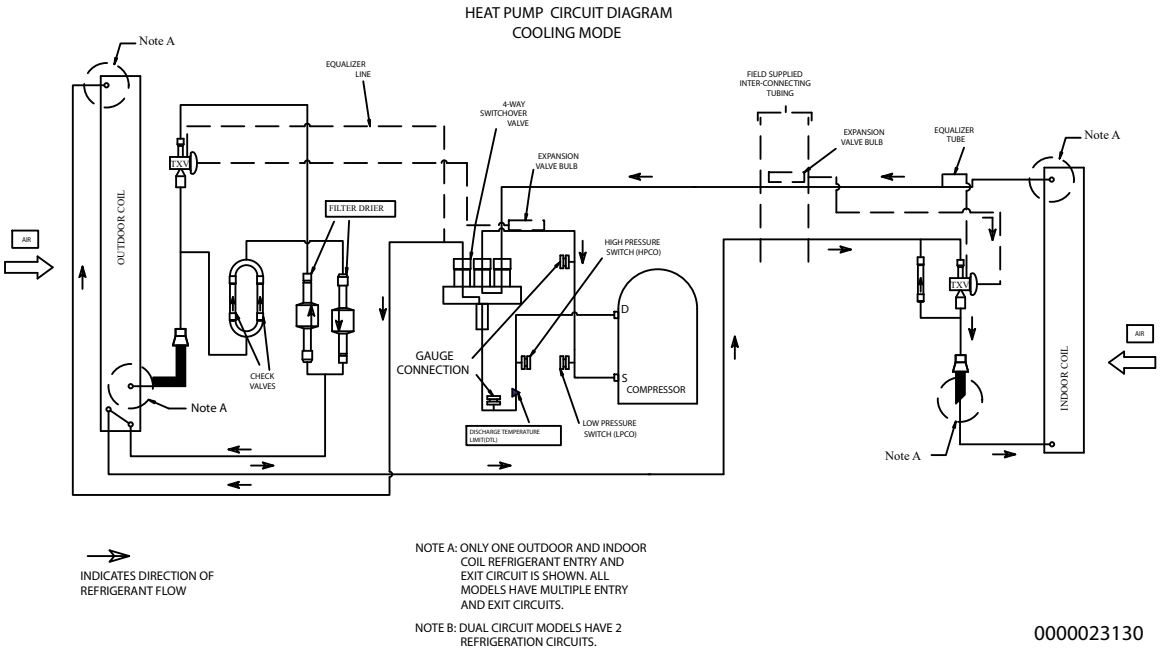
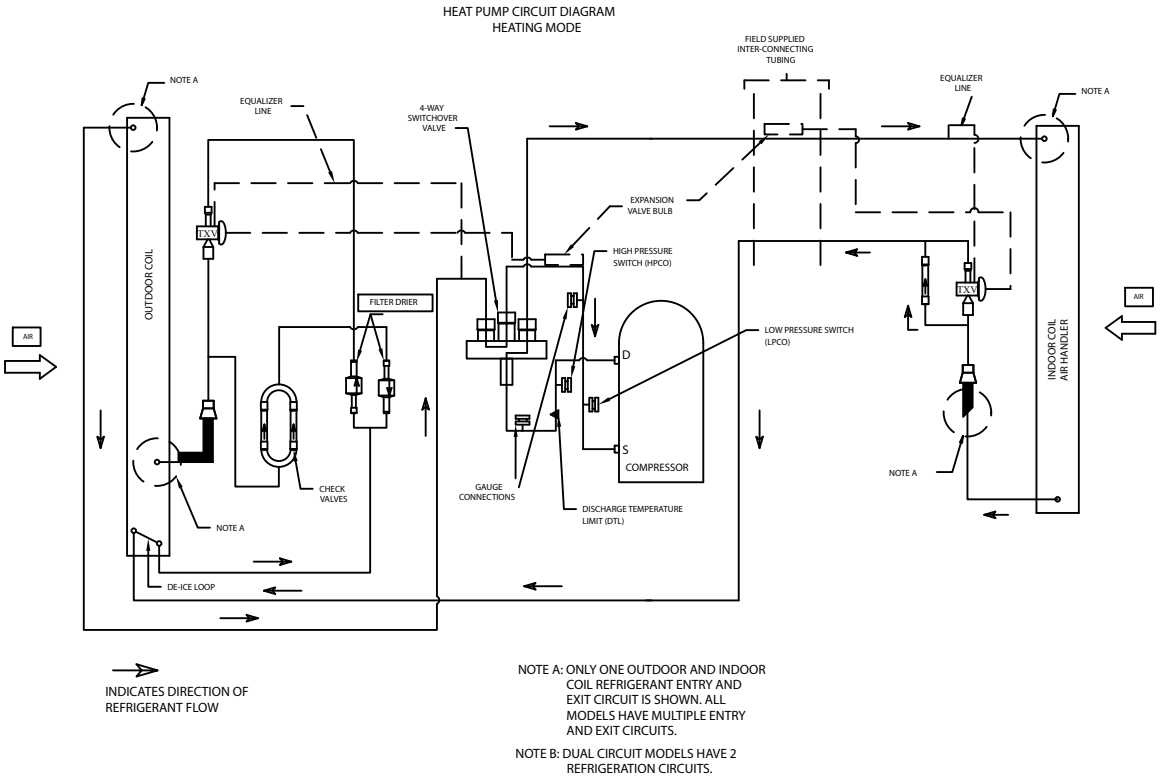


Figure 18. Typical split system heat pump - heating - refrigerant circuit



Pre-Start

Control Circuit Features

Note: *Not all of these features may be required for your unit, check electrical schematic.*

Discharge Temperature Limit (DTL)

The control's sensor is located on the discharge line. This device will shut off the compressor and the outdoor fan(s) if the discharge temperature exceeds the DTL setting. Once the discharge temperature has returned to normal, the compressor will cycle back on.

Low Outdoor Ambient Cooling

All Odyssey units with Symbio™ 700 controls have cooling capabilities down to 0°F as standard. At temperatures below 55ºF, some reduction in cooling capacity can be expected. When the optional Low Ambient Accessory kit is field installed, the full capacity of the unit is available down to 0°F.

Evaporator Defrost Control (EDC)

This control is located in the Air Handler. The control's sensing tube is embedded vertically in the evaporator coil, near the center. This device will stop the compressor if the indoor coil temperature drops below its setting. The indoor air will still circulate across the coil bringing the temperature of the coil back up to the cut-in temperature of the evaporator defrost control.

Low Pressure Cut-Out (LPC)

This control's sensor is located in the suction (gas) line, near the compressor. This control will stop the compressor and the outdoor fans if suction pressure drops below the Low Pressure Cut-Out setting. Once the suction pressure has returned to normal, the compressor and outdoor fans will cycle back on.

High Pressure Cut-Out (HPCO)

This control's sensor is located in the discharge line. This device will shut off the compressor and the outdoor fan(s) if the discharge pressure exceeds the High Pressure Cut-Out's setting. Once the discharge pressure has returned to normal, the compressor will cycle back on.

⚠ WARNING

Prevent Injury!

Due to agency safety requirements, no schrader core is to be installed beneath the HPCO. Removal of the HPCO without evacuating the system charge could cause injury and release of refrigerant.

Internal Overload Protector (IOL)

This device is embedded in the compressor. It will shut off the compressor if the discharge temperature of the compressor exceeds its design trip temperature.

Note: *The IOL will put the compressor back in operation once the compressor motor heat has dropped below the trip setting; however, a check of the refrigerant and electrical systems should be made to determine the cause and be corrected.*

Refrigerant Leak Detector Input

All Odyssey units with Symbio™ 700 controls have a dedicated binary input for notification of a refrigerant leak event. This input will receive a normally closed 24VAC source and when open, triggers a refrigerant leak diagnostic allowing the Symbio 700 to take mitigation actions.

Troubleshooting

⚠ WARNING

Live Electrical Components!

Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

When it is necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks.

Refer to the latest version of the Symbio™ 700 Controller with Odyssey Split Systems Applications Guide (ACC-APG001*-EN) for details on troubleshooting the control system.

Leak Detection System

Note: *The leak detection system referenced in this document refers specifically to a matched system containing only a TTA/TWE matched combination. If the installed system utilizes condensing units or AHUs other than listed above, it is the installers responsibility to ensure all necessary leak detection system hardware and communication is provided and installed for safe equipment installation and operation.*

The leak detection sensor offers a visual diagnostic status in the form of one green and one red LED to indicate diagnostic error state.

Table 7. Leak detection system LED status

State	Green LED	Red LED
Power up initiate	ON	OFF
Failure resulting in a 'Power-UP Self-Test' Fail-safe State	ON	ON
Warm Up Delay	ON	OFF
Normal Runtime Mode	Heartbeat	OFF
LFL Alarm	OFF	ON
Failure resulting in a Fail-safe State	OFF	Blinking
Near end of life	Blinking	Heartbeat
Warning	ON	Heartbeat

Service Test Mode

The Symbio™ 700 supports a Service Test Mode that can be used to energize the various components of the system, either to support general system startup tasks or to support troubleshooting. The user can initiate Service Test Mode through the controller user interfaces, including the Symbio Service and Installation mobile application.

The modes shown below can be initiated. Depending on the equipment configuration, the controller will energize the appropriate outputs. A user-selected timeout value will determine how long the controller will remain in any given state once initiated. For detailed information on how each Service Test State is interpreted based on the equipment's configuration, refer to the *Symbio™ 700 Controller Application Guide* (ACC-APG001*-EN).

Figure 19. Symbio 700 service test mode



Maintenance

⚠ WARNING

Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

NOTICE

Operating Under Vacuum!

Failure to follow these instructions will result in compressor failure.

Do not operate or apply power to the compressor while under a vacuum.

Perform all of the indicated maintenance procedures at the intervals scheduled. This will prolong the life of the unit and reduce the possibility of costly equipment failure.

Monthly

Conduct the following maintenance inspections once per month.

- ☐ Check unit wiring to ensure all connections are tight and that the wiring insulation is intact.
- ☐ Inspect the condenser coils for dirt and debris. If the coils appear dirty, clean them.
- ☐ With the unit operating in the cooling mode, check the suction and discharge pressures and compare them with Pressure Curve values. Record these readings on the "Maintenance Log," p. 36.

Annually (Cooling Season)

The following maintenance procedures must be performed at the beginning of each cooling season to ensure efficient unit operation.

- ☐ Perform all of the monthly maintenance inspections.
- ☐ With the unit operating, check unit superheat and record the reading in the "Maintenance Log," p. 36.
- ☐ Remove any accumulation of dust and/or dirt from the unit casing.
- ☐ Remove corrosion from any surface and repaint. Check the gasket around the control panel door to ensure it fits correctly and is in good condition to prevent water leakage.
- ☐ Inspect the control panel wiring to ensure that all connections are tight and that the insulation is intact.

  Note: *Condenser fan motors are permanently lubricated.*
- ☐ Check refrigerant piping and fittings for leaks
- ☐ Inspect the condenser coils for dirt and debris. If the coils appear dirty, clean them.

Coil Cleaning

Regular coil maintenance, including annual cleaning-enhances the unit's operating efficiency by minimizing:

- compressor head pressure and amperage draw
- water carryover
- fan brake horsepower
- static pressure losses

At least once each year — or more often if the unit is located in a **dirty** environment — clean the coil using the instructions outlined below. Be sure to follow these instructions as closely as possible to avoid damaging the coils.

Tube and Fin

Note: *To clean refrigerant coils, use a soft brush and a sprayer. Contact your local Parts Center for appropriate detergents.*

1. Remove enough panels from the unit to gain safe access to coil.
2. Straighten any bent coil fins with a fin comb.
3. Remove loose dirt and debris from both sides of the coil with a soft brush.
4. Mix the detergent with water according to the manufacturer's instructions. If desired, heat the solution to 150°F maximum to improve its cleansing capability.
5. Pour the cleaning solution into the sprayer.
6. Spray the leaving-airflow side of the coil first; then spray the opposite side of the coil. Allow the cleaning solution to stand on the coil for five minutes.
7. Rinse both sides of the coil with cool, clean water.
8. Inspect both sides of the coil; if it still appears to be dirty, repeat Step 7 and Step 8.
9. Reinstall all of the components and panels removed in Step 1; then restore power to the unit.
10. Using a fin comb, straighten any coil fins that were inadvertently bent during the cleaning process.

Maintenance Log

Date	Ambient Temp. (°F)	Evaporator Entering Air		Compressor				Superheat (°F) (at compressor)		Subcooling (°F) (at liquid line)	
		Dry Bulb	Wet Bulb	Suction Pressure		Discharge Pressure		Circuit #1	Circuit #2	Circuit #1	Circuit #2
				(C1)	(C2)	(C1)	(C2)				

Charging Data and Pressure Curves

Table 8. TWA Charging data and pressure curves

Condenser	Air Handler	Refrigerant Charging Curve Superheat and Charge Table	Pressure Curves
TWA072K*A	TWE090K*A	436768330001	436768450001
TWA072K*D	TWE072K*B	436768340001	436768460001
TWA090K*A	TWE090K*A	436768350001	436768470001
TWA090K*D	TWE090K*B	436768360001	436768480001
TWA120K*A	TWE120K*A	436768370001	436768490001
TWA120K*D	TWE120K*B	436768380001	436768500001
TWA180K*D	TWE180K*B	436768390001	436768390001
TWA240K*D	TWE240K*B	436768400001	436768400001

Wiring Diagram Matrix and Device Location

Table 9. TTA wiring diagrams

Part Number	Description	Applicability
1213-4781	Power Schematic (Wiring Diagram) for units with Dual Compressors and Dual Fans	All Units with Digit 4-6 = 180/240
1213-4782	Power Schematic (Wiring Diagram) for units with Dual Compressors and Single Fans	All Units with Digit 4-6 = 072/090/120 and Digit 9 = "D"
1213-4780	Power Schematic (Wiring Diagram) for units with Single Compressors and Single Fan	All Units with Digit 4-6 = 072/090/120 and Digit 9 = "A"
1213-4771	Control Schematic (Wiring Diagram) for units with Single compressor and Single Fan	All TWA Units with Digit 4-6 = 072/090/120 and Digit 9 = "A"
1213-4773	Control Schematic (Wiring Diagram) for units with Dual compressor and Single Fan	All TWA Units with Digit 4-6 = 072/090 and Digit 9 = "D"
1213-4775	Control Schematic (Wiring Diagram) for units with Dual compressor and Dual Fan	All TWA Units with Digit 4-6 = 180/240 and Digit 9 = "D"
1213-4772	Control Schematic (Wiring Diagram) for units with Single Compressor (Unloading) and Single Fan	All TWA Units with Digit 4-6 = 090/120 and Digit 9 = "A"
1213-4774	Control Schematic (Wiring Diagram) for units with Dual compressor (Unloading) and Single Fan	All TWA Units with Digit 4-6 = 120 and Digit 9 = "D"

Table 10. TWA device location

Part Number	Description	Applicability
1213-4823	Device Location Print	All TWA Units with Digit 4-6 = 072/090/120/150
1213-4824	Device Location Print	All TWA Units with Digit 4-6 = 180/240/300

Warranty

For Commercial Unitary Equipment Rated 25 Tons and Under and Related Accessories

Products Covered — This warranty is extended by Trane, and applies to the following products:

- All packaged and split system air conditioners and heat pumps have a rated capacity of 25 tons and under.
- All packaged combinations gas/electric air conditioners having a rated capacity of 25 tons and under.
- All packaged combination gas/electric air conditioners having a rated capacity of 1.5 through 5 tons single phase electric power and used for commercial applications. (As used in this warranty, a commercial application is any application where the end purchaser uses the product for other than personal, family or household purposes.)
- All accessories for the above products which are sold by Trane and applied in accordance with Trane specifications.

Basic Warranty

The warrantor warrants for a period of twelve (12) months from the initial start-up or eighteen (18) months from date of shipment, whichever is sooner, that the products covered by this warranty (1) are free from defects in material and manufacture, and (2) have the capacities and ratings set forth in the warrantor's catalogs and bulletins. If any part of your air conditioner fails because of a manufacturing defect, Warrantor will furnish without charge the required replacement part.

Any local transportation, related service labor and diagnosis calls are not included. In addition, if the sealed motor-compressor fails because of a manufacturing defect within the second through fifth year from the date of original purchase, Warrantor will furnish without charge the required replacement compressor.

Exclusions and Limitations

The warrantor's obligations and liabilities under this warranty are limited to furnishing F.O.B. factory or warehouse at the warrantor-designated shipping point, freight allowed to Buyer's city (or port of export for shipments outside the conterminous United States) a replacement product or, at the option of the warrantor, parts for the repair of the product not conforming to this warranty and which have been returned to the warrantor.

The warrantor's warranty is conditional on the Customer providing written notice to the warrantor within thirty (30) days of the discovery of the defect. No product shall be returned to the warrantor without the warrantor's written permission. No liability whatever shall attach to warrantor until said products have been fully paid for and then said liability shall be limited to the purchase price of the equipment shown to be defective.

The warranty does not apply to any compressor or gas-fired heat exchanger which has been repaired or altered in such manner as, in the judgement of the warrantor, affects its stability or reliability. This warranty does not cover (1) any heat exchanger which has been fired with an improper type of fuel (2) a heat exchanger which is installed in a beauty parlor, dry cleaning establishment, de-greasing plant or in any corrosive atmosphere; or (3) any heat exchanger which is not shown to be defective by the warrantor's inspection.

This warranty does not cover damage due to accident, abuse, improper use, external causes, freezing, corrosion, erosion or deterioration. Local transportation, related service labor, air filters, diagnosis calls, refrigerant and related items are not covered.

THE WARRANTY AND LIABILITY SET FORTH HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, WHETHER IN CONTRACT OR IN NEGLIGENCE, EXPRESS OR IMPLIED, IN LAW OR IN FACT, INCLUDING IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ANY IMPLIED WARRANTIES OTHERWISE ARISING FROM THE COURSE OF DEALING OR TRADE. IN NO EVENT SHALL THE WARRANTOR BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

The warrantor makes certain further warranty protection available on an optional, extra-cost basis. Any further warranty must be in writing. If you wish further help or information concerning this warranty, contact: Trane — Warrantor, 2701 Wilma Rudolph Blvd., Clarksville, TN 37040

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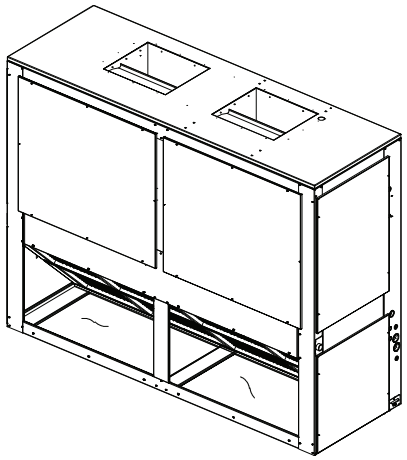
SS-SVX015D-EN 09 Mar 2025
Supersedes SS-SVX015C-EN (February 2025)

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Installation, Operation, and Maintenance

Split System Air Conditioners Odyssey™ with Symbio™ Controls

Air Handler — 5 to 25 Tons



(60 Hz)
TWE060K*A/B
TWE072K*B
TWE090K*A/B
TWE120K*A/B
TWE150K*B
TWE180K*B
TWE240K*B
TWE300K*B

⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

February 2025 **SS-SVX016C-EN**

Introduction

Read this manual thoroughly before operating or servicing this unit.

Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.
NOTICE	Indicates a situation that could result in equipment or property-damage only accidents.

Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants.

Important Responsible Refrigerant Practices

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

⚠ WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury.

All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

⚠ WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury.

Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, MUST follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- **Before installing/servicing this unit, technicians MUST put on all PPE required for the work being undertaken (Examples; cut resistant gloves/ sleeves, butyl gloves, safety glasses, hard hat/ bump cap, fall protection, electrical PPE and arc flash clothing). ALWAYS refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.**
- **When working with or around hazardous chemicals, ALWAYS refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.**
- **If there is a risk of energized electrical contact, arc, or flash, technicians MUST put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, PRIOR to servicing the unit. NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

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⚠ WARNING

Follow EHS Policies!

Failure to follow instructions below could result in death or serious injury.

- **All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.**
- **Non-Trane personnel should always follow local regulations.**

⚠ WARNING

R-454B Flammable A2L Refrigerant!

Failure to use proper equipment or components as described below could result in equipment failure, and possibly fire, which could result in death, serious injury, or equipment damage.
The equipment described in this manual uses R-454B refrigerant which is flammable (A2L). Use ONLY R-454B rated service equipment and components. For specific handling concerns with R-454B, contact your local representative.

⚠ WARNING

Refrigerant under High Pressure!

Failure to follow instructions below could result in an explosion which could result in death or serious injury or equipment damage.
System contains refrigerant under high pressure. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or refrigerant additives.

⚠ WARNING

Explosion Hazard!

Failure to follow instructions below could result in an explosion which could result in death or serious injury, and equipment damage.
NEVER bypass system safeties in order to pump down the unit component refrigerant into the microchannel heat exchanger (MCHE) coil. Do NOT depress the compressor contactor since it effectively bypasses the high-pressure control.

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Product Safety Information

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

Maximum altitude of use 3000 meters.

This appliance incorporates an earth connection for functional purposes only.

Revision History

Updated A2L chapter.

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Model Number Description

Air Handler

Digit 1, 2, 3 — Unit Function

TWE = Air Handler

Digit 4, 5, 6— Tonnage

060 = 5 Tons (60 Hz)
072 = 6 Tons (60 Hz)
090 = 7.5 Tons (60 Hz)
120 = 10 Tons (60 Hz)
150 = 12.5 Tons (60 Hz)
180 = 15 Tons (60 Hz)
240 = 20 Tons (60 Hz)
300 = 25 Tons (60 Hz)

Digit 7 — Refrigerant

K = R-454B

Digit 8 — Voltage

1 = 208-230 Vac - 1 PH (60 Hz)
3 = 208-230 Vac - 3 PH (60 Hz)
4 = 460 Vac - 3 PH (60 Hz)
W = 575 Vac - 3 PH (60Hz)

Digit 9 — Refrigeration Circuit/Stage

A = Single Circuit
B = Dual Circuit

Digit 10 — Major Design Sequence

A = Rev A

Digit 11 — Minor Design Sequence

A = Rev A

Digit 12, 13 — Service Digits

**

Digit 14 — Efficiency Generation

B = Generation B

Digit 15 — Controls

1 = Constant Volume
C = 2 Stage Airflow (Electromechanical Cond Only)
D = 2 Stage Airflow/Single Zone VAV (Symbio Cond Only)

Digit 16 — Indoor Fan Sizes

0 = Standard Motor
4 = High Static – (Oversized Motor for VFD Units)

Digit 17 to 40 — None

0 = None

General Information

This manual describes proper installation, operation, and maintenance procedures for air cooled systems. By carefully reviewing the information within this manual and following the instructions, the risk of improper operation and/or component damage will be minimized. It is important that periodic maintenance be performed to help assure trouble free operation. Should equipment failure occur, contact a qualified service organization with qualified, experienced HVAC technicians to properly diagnose and repair this equipment.

Important: *All phases of this installation must comply with the NATIONAL, STATE and LOCAL CODES. In addition to local codes, the installation must conform with National Electric Code -ANSI/ NFPA NO. 70 LATEST REVISION.*

Any individual installing, maintaining, or servicing this equipment must be properly trained, licensed and qualified.

Important: *Do not remove the VFD without first contacting technical support! For performance-related questions and diagnostic VFD support in North America, request Live Tech Support via the link: https://support.trane.com/hc/en-us. Any return or escalation to the VFD manufacturer requires a Trane Technical Support ticket number FIRST. Removal of the VFD prior to this step will void the unit's warranties.*

Installation procedures should be performed in the sequence that they appear in this manual. Do not destroy or remove the manual from the unit. The manual should remain weather-protected with the unit until all installation procedures are complete.

Note: *It is not the intention of this manual to cover all possible variations in systems that may occur or to provide comprehensive information concerning every possible contingency that may be encountered during an installation. If additional information is required or if specific problems arise that are not fully discussed in this manual, contact your local sales office.*

Use the installation checklist provided In this manual to verify that all necessary installation procedures have been completed. Do not use the checklist as a substitute for reading the information contained in the manual. Read the entire manual before beginning installation procedures.

Unit Description

These air handler models incorporate a single slab coil assembly, improved application flexibility, servicing, maintenance accessibility and an improved accessory line. They are fully convertible, (vertical to horizontal discharge) without field removal of the coil assembly. They are shipped ready for horizontal installation.

All units have one drain pan that can be installed in any one of four positions. This allows for vertical or horizontal applications and right or left exit.

Important: *All dual circuit (digit 9 = B) have an intertwined coil, except for the 25 ton TWE300 unit.*

A2L Information and Installation Requirements

Installation/Code Compliance Requirements

Building level controls may need to be upgraded/modified to demand leak mitigation actions as described in “Leak Detection System (Refrigerant charge greater than 3.91 lb per circuit),” p. 12. Those actions include, but are not limited to, fully opening damper and VAV boxes (if present), and disabling electric heat in VAV boxes (if present).

Verify the equipment refrigerant charge is in accordance with the room area limitation as described in Minimum Room Area Limits section.

Ensure that there are labels on the equipment stating it contains a flammable refrigerant.

A2L Work Procedures

⚠ WARNING

Risk of Fire — Flammable Refrigerant!

Failure to follow instructions below could result in death or serious injury, and equipment damage.

- **To be repaired only by trained service personnel.**
- **Do not puncture refrigerant tubing.**
- **Dispose of properly in accordance with federal or local regulations.**
- **The equipment shall be stored in a room without continuously operating ignition sources.**

⚠ WARNING

Refrigerant under High Pressure!

Failure to follow instructions below could result in an explosion which could result in death or serious injury or equipment damage.

System contains refrigerant under high pressure. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or refrigerant additives.

⚠ WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

The units described in this manual use R-454B refrigerant. Use ONLY R-454B rated service equipment or components with these units. For specific handling concerns with R-454B, contact your local Trane representative.

Installation, repair, removal, or disposal should be performed by trained service personnel.

At all times, Trane’s maintenance and service guidelines shall be followed. If in doubt, contact Trane technical support for assistance.

Servicing

Prior to initiating work on equipment, check the area with an appropriate refrigerant detector. Ensure the service personnel are properly trained regarding work in potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed, or intrinsically safe. Be aware that the refrigerant does not contain an odor.

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available on hand. A dry powder or CO_2 fire extinguisher should be located adjacent to the charging area.

At all times, Trane’s maintenance and service guidelines shall be followed. If in doubt, contact Trane technical support for assistance.

All maintenance staff and others working in the local area shall be instructed on the nature of the work being carried out. Work in confined spaces shall be avoided.

Ignition Source Mitigation

Do not use any sources of ignition when working on the refrigeration system.

Keep all ignition sources, including cigarette smoking, away from the site of installation, repair, removal or disposal, during which refrigerant can potentially be released to the surrounding space.

Survey the area around the equipment before initiating work to ensure no flammable hazards or ignition risks are present.

“No Smoking” signs shall be displayed.

Do not use devices that can be a source of ignition to accelerate defrosting of components. Use only defrost and cleaning procedures recommended by Trane. Do not pierce or burn.

Ventilation

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere. If present, check that the ventilation system, including outlets, are operating adequately and are not obstructed.

Refrigerating Equipment

Refrigerant piping or components should not be installed in locations where substances which may corrode them are present.

Check that equipment hazard markings are visible and legible. Replace them if they are not.

For equipment using secondary fluids, like water or glycol, check that refrigerant is not present in the secondary fluid loop before conducting any hot work.

Electrical Devices

Do not apply power to the circuit if a fault exists which compromises safety. If the fault cannot be corrected immediately, but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment, so all parties are advised.

Initial safety checks shall include:

- Cabling is not subject to wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects. Account for the effects of aging or continual vibration from sources such as compressors or fans.
- Capacitors are discharged. This shall be done in a safe manner to avoid possibility of sparking.
- No live electrical components and wiring are exposed while charging, recovering, or purging the system.
- Verify continuity of earth bonding.
- Replace electrical components with Trane replacement parts, or those meeting the same ratings and qualified for flame arrest protection, UL LZGH2 category.

Leak Detection

Never use an open flame to detect leaks. A halide torch should not be used. Use only approved leak detection methods per this instruction manual.

The following leak detection methods are deemed acceptable for all refrigerant systems.

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL gas (25% maximum) is confirmed.

Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

Examples of leak detection fluids are:

- Bubble method
- Fluorescent method agents

If a leak is suspected, all naked flames shall be removed/ extinguished.

If a refrigerant leak is found which requires brazing, all refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

Refrigerant Removal and Evacuation

Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (special cylinders for the recovery of refrigerant, for example). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration.

The following procedure shall be adhered to:

1. Safely remove refrigerant following local and national regulations.
2. Evacuate.
3. Purge the circuit with inert gas.
4. Evacuate (optional for A2L).
5. Continuously flush or purge with inert gas when using flame to open circuit.
6. Open the circuit.

Prior to refrigerant removal, open all appropriate valves, including solenoid and electronic expansion valves (EXVs). Use control settings, where available. When not available, manually open all electronically controlled valves using acceptable service procedures.

The recovery equipment shall be in good working order with instructions available. Equipment shall be suitable for the recovery of the flammable refrigerant. For specific handling concerns, contact the manufacturer. Ensure all hose connections are checked for tightness to avoid refrigerant leaks.

In addition, a set of calibrated weighing scales shall be available and in good working order.

The refrigerant shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. Do not mix refrigerants in recovery unit and especially not in cylinders.

Refrigerant recovery unit should be purged with an inert gas after each use or before using with a different refrigerant Class – for example, A2L to A1.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

The system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

The system shall be vented down to atmospheric pressure to enable work to take place.

The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

Refrigerant Charging

In addition to conventional charging procedures, the following requirements shall be followed.

- Ensure that contamination of different refrigerants does not occur when using charging equipment.
- Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the refrigerating system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigerating system.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

Prior to refrigerant charging, open all appropriate valves, including solenoid and electronic expansion valves (EXVs). Use control settings, where available. When not available, manually open all electronically controlled valves using acceptable service procedures.

Verify the equipment refrigerant charge is in accordance with the room area limitation as described in Minimum Room Area Limits section.

Decommissioning

Before carrying out the decommissioning procedure, it is essential that the trained service personnel is completely familiar with the equipment and all its details. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

1. Become familiar with the equipment and its operation.
2. Isolate system electrically.
3. Before attempting the procedure, ensure that:
    a. Mechanical handling equipment is available, if required, for handling refrigerant cylinders.
    b. All personal protective equipment is available and being used correctly.
    c. The recovery process is supervised at all times by a competent person.
    d. Recovery equipment and cylinders conform to the appropriate standards.
4. Pump down refrigerant system, if possible.
5. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
6. Make sure that cylinder is situated on the scales before recovery takes place.
7. Start the recovery machine and operate in accordance with instructions.
8. Do not overfill cylinders (no more than 80% volume liquid charge).
9. Do not exceed the maximum working pressure of the cylinder, even temporarily.
10. When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
11. Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked.
12. When equipment has been decommissioned, attach a signed and dated label stating it has been decommissioned and emptied of refrigerant.
13. Ensure that there are labels on the equipment stating it contains flammable refrigerant.

A2L Application Considerations

This product is listed to UL standard 60335-2-40, Household and Similar Electrical Appliances – Safety – Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers, which defines safe design and use strategies for equipment using A2L

refrigerants. This standard limits the refrigerant concentration in a space in the event of a refrigerant leak. To meet the requirements, the UL standard defines minimum room area, refrigerant charge limit, minimum circulation airflow and/or ventilation airflow requirements, and limits the use of ignition sources in spaces. The standard may require a unit refrigerant leak detection system.

For equipment with R-454B and charge amounts less than or equal to 3.91 lbs per circuit, this UL standard does not prescribe a room area limit and does not require a refrigerant leak detection system or any circulation airflow or ventilation airflow mitigation strategies. However, ignition sources in ductwork must be evaluated.

Depending on the application, a specific requirement of ANSI/ASHRAE Standard 15, Safety Standard for Refrigeration Systems, could be more stringent than UL 60335-2-40 requirements. See *Refrigeration Systems and Machinery Rooms Application Considerations for Compliance with ASHRAE® Standard 15-2022 Application Engineering Manual* (APP-APM001*-EN) for more information.

Ignition Sources in Ductwork

Do not install open flames in the ductwork. Hot surfaces exceeding 700°C (1290°F) should not be installed in the ductwork unless the average airflow velocity is not less than 1.0 m\s (200 ft\min) across the heater and proof of airflow is verified before system is energized.

Electric heaters can exceed the surface temperature limit if airflow distribution is poor, or insufficient airflow is provided over the heater.

Surface temperatures of most gas heaters do not exceed the surface temperature limits due to ANSI construction requirements.

Ignition Sources in Unit

This unit does not contain any ignition sources. All potential ignition sources, (including factory or field installed accessory electric heaters, gas heaters, relays, and contactors) were evaluated during product UL listing.

Minimum Room Area Limits (Refrigerant charge greater than 3.91 lb per circuit)

Equipment with R–454B charge amounts greater than 3.91 lb per circuit may require additional circulation or ventilation airflow mitigation strategies. In this case, there are two minimum room area (A_{min}) thresholds.

- The first threshold defines when equipment serving a single room is required to provide circulation airflow, either continuous or activated by a leak detection system. A ducted system requires circulation airflow unless the smallest room it serves is larger than the adjusted A_{min} threshold. This product contains a leak detection system if a circuit charge is greater than 3.91 lbs. As a result, no further leak detection system evaluation is needed.
- The second threshold defines when additional ventilation airflow is required. If the room area, A or TA, is below the adjusted A_{min} or TA_{min} threshold, additional ventilation is required to remove refrigerant in the event of a leak. Refer to UL 60335-2-40 Clause GG.8 and ANSI\ASHRAE Standard 15 Section 7 for natural and mechanical ventilation requirements. See equipment nameplate and table below for minimum room area.

Split systems minimum room area requirements need to be determined after final field charging. Use the following figures and the largest final circuit charge to determine the systems A_{min} value. Record the final charge value on the label provided on the condensing unit.

Figure 1. Charge vs min room area (IP)

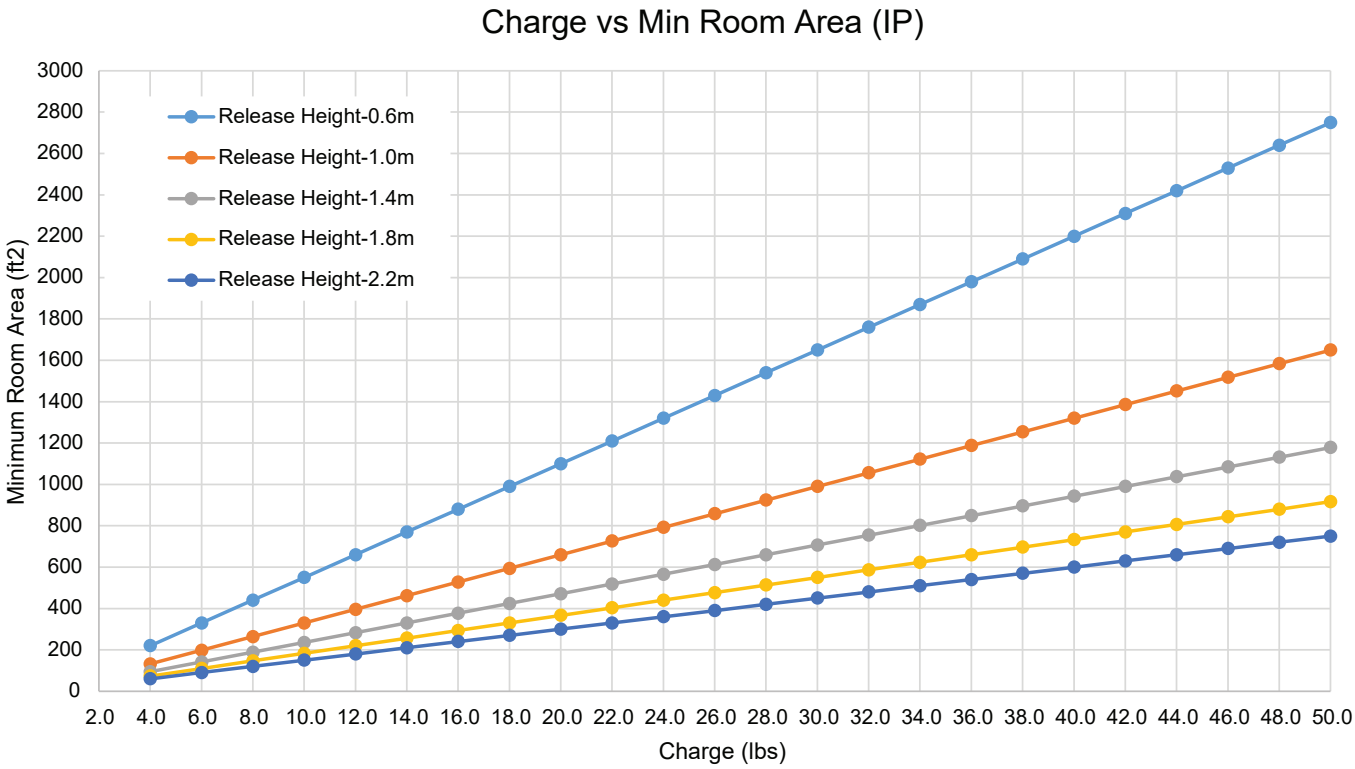
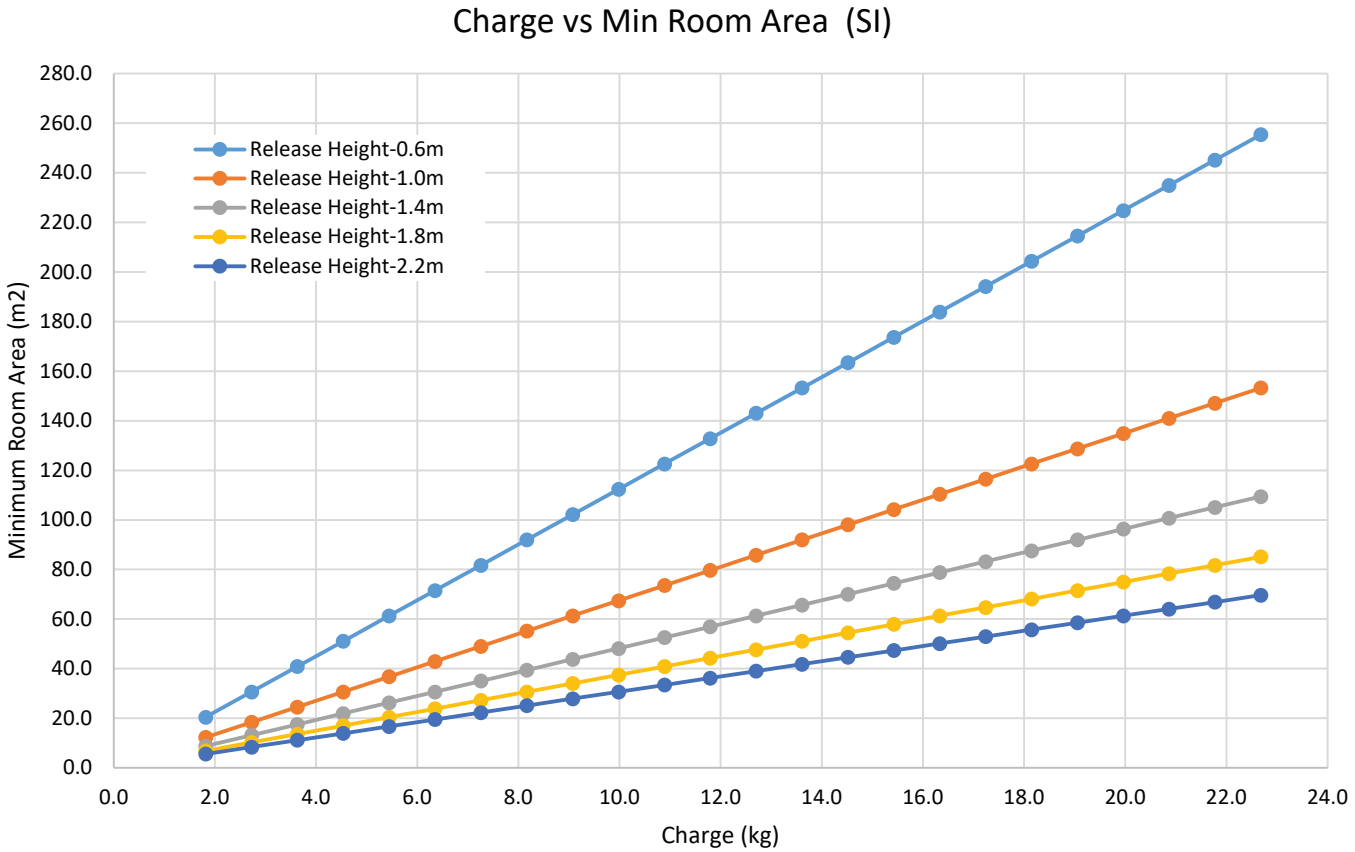


Figure 2. Charge vs min room area (SI)



Release height is the vertical distance from the floor to the lowest point in a space refrigerant would leak from first. The minimum value is 0.6 m from the floor. This point is typically the bottom of free return openings or supply diffusers. For fully ducted units, the release height is 2.2 meters.

Minimum Room Area (A_{min}) Adjustments

Use equation below to adjust the minimum room area, as applicable, based on the unit's installation height, altitude, and occupancy level it serves.

$$A_{min.adj} = \text{Nameplate } A_{min} \times \text{Altitude Adj} \times \text{Height Adj} \times F_{occ}$$

Multiply the altitude adjustment factor in the table below by A_{min} listed on the unit nameplate or in the Installation, Operation, and Maintenance (IOM) manual.

Table 1. Altitude adjustment factor

Altitude (ft)	Sea Level to 2000	2001 to 4000	4001 to 6000	6001 to 8000	8001 to 10000	10001 to 12000	12001 to 14000	14001 to 15000	Over 15000
A_{min} Adjustment	1	1.05	1.11	1.17	1.24	1.32	1.41	1.51	1.57

In addition, A_{min} can be adjusted if the unit is installed in a room at a height that is higher than the minimum height shown on the unit. To adjust A_{min}, multiply by the ratio of the unit minimum release height (in meters) / actual release height (in meters). Use 0.6 m in the ratio for unit minimum installation heights less than or equal to 0.6 m.

For institutional occupancies, ASHRAE Standard 15 applies an additional adjustment factor F_{occ} to the amount of a charge allowed in a space. To calculate the adjusted A_{min} for institutional occupancies, multiply the A_{min} on the nameplate by two.

EXAMPLE 1: 20 Ton Packaged Rooftop Multi-Zone VAV System Serving an Institutional Occupancy Space

The packaged unit serves 7600 ft² of a nursing home located at an attitude of 4000 ft. The unit has two equally charged 10 ton refrigeration circuits. Each circuit has 12 lbs of refrigerant with a minimum room area requirement of 180 ft² with a 2.2 m release height.

$$TA_{min.adj} = 180\ ft^2 \times 1.05 \times 2 = 378\ ft^2$$

No additional ventilation is required.

EXAMPLE 2: 10 Ton Split System Serving a Single Commercial Occupancy Space

The split system serves a 1500 ft² manufacturing space at 5000 ft altitude. The final installed charge of the single circuit 10 ton unit is 20 lb. The unit has an open return with a release height of 1 m and ducted supply air. The unit A_{min} is 660 ft².

$$A_{min.adj} = 660\ ft^2 \times 1.11 = 733\ ft^2$$

No additional ventilation is required.

Determining Room Area (A or TA)

The room area (A) is the room area enclosed by the projection to the floor of the walls, partitions, and doors of the space that the equipment serves. For ducted systems, total room area (TA) of all rooms connected by ducts, may be used instead of A.

Rooms connected by drop ceilings only are not considered a single room.

Rooms on the same floor of the building, and connected by an open passageway, can be considered part of the same room if the passageway is a permanent opening, extends to the floor and is intended for people to walk through.

Adjacent rooms on the same floor of the building and connected by permanent openings in the walls and/or doors between rooms (including gaps between the wall and the floor), can be considered part of the same room if the openings meet the following criteria.

- The opening is permanent and cannot be closed.
- Openings extending to the floor, such as door gaps, need to be at least 20 mm above the floor covering surface.
- Natural ventilations opening areas must meet the requirements of ANSI\ASHRAE Standard 15-2022, Section 7.2.3.2.

Rooms that are connected by a mechanical ventilation system can be considered a single room area if the mechanical ventilation system meets the requirements of ANSI\ASHRAE Standard 15-2022, Section 7.6.4.

Leak Detection System (Refrigerant charge greater than 3.91 lb per circuit)

The leak detection system consists of one or more refrigerant detection sensors. When the system detects a leak, the following mitigation actions will be initiated until refrigerant has not been detected for at least 5 minutes:

- Energize the supply fan(s) to deliver a required minimum amount of circulation airflow.
- Disable compressor operation.

- Provide an output signal that can be used to fully open zone dampers and/or VAV boxes and disable electric heat in VAV boxes.
- Provide an output signal that can be used to energize additional mechanical ventilation (if needed).
- Units without airflow proving will disable electric heat sources.

Building fire and smoke systems may override this function.

If the refrigerant sensor has a fault, is at the end of its life, or is disconnected, the unit will initiate the mitigation actions. Mitigation actions may be verified by disconnecting the sensor.

The refrigerant sensors do not need service. Use only manufacturer-approved sensors when replacement is required.

Field Piping Installation and Charging

When refrigerant piping is routed indoors, protect from physical damage in operation or service, and verify installation complies with national and local codes. All joints must be accessible for inspection prior to being covered.

Follow the Refrigerant Charging procedure. Prior to refrigerant charging, check field-made indoor joints for leaks using an instrument with a sensitivity of 5 grams per year refrigerant. Pressurize the system to 25% of the maximum allowable pressure. Verify no leaks are detected.

Pre-Installation

The final position for the air handler must be dictated by required service access to it, weight distribution over structural supports, and by the locations of electrical, refrigerant and condensate drainage connections. After this is determined, the following preparations should be made.

Unit Inspection

Inspect material carefully for any shipping damage. If damaged, it must be reported to, and claims made against the transportation company. Compare the information that appears on the unit nameplate with ordering and submittal data to ensure the proper unit was shipped. Available power supply must be compatible with electrical characteristics specified on component nameplates. Replace damaged parts with authorized parts only.

Important: *Units ordered with a VFD cannot be field converted to 460 V from 208-230 or from 208-230 V to 460 V.*

Inspection Checklist

To protect against loss due to damage incurred in transit, complete the following checklist upon receipt of the unit.

- ☐ Inspect individual pieces of the shipment before accepting the unit. Check for obvious damage to the unit or packing material.
- ☐ Inspect the unit for concealed damage before it is stored and as soon as possible after delivery. Concealed damage must be reported within 15 days. If concealed damage is discovered, stop unpacking the shipment. Do not remove damaged material from the receiving location. Take photos of the damage if possible. The owner must provide reasonable evidence that the damage did not occur after delivery.
- ☐ Notify the carrier's terminal of damage immediately by phone and by mail. Request an immediate joint inspection of the damage by the carrier and the consignee.
- ☐ Notify the sales representative and arrange for repair. Do not repair the unit until the damage is inspected by the carrier's representative.

Testing for Leaks

All TWE units are shipped with a holding charge of nitrogen in each circuit and should be leak tested before installation.

1. Remove the access panel.
2. Locate the liquid line or suction line access valve for each circuit.
3. Install gauges to determine if the circuits are still pressurized. If not, the charge has escaped and should be repaired as required to obtain a leak-free circuit.

Lifting Recommendations

⚠ WARNING

Improper Unit Lift!

Failure to properly lift unit in a LEVEL position could result in unit dropping and possibly crushing operator/technician which could result in death or serious injury, and equipment or property-only damage.

Test lift unit approximately 24 inches (61 cm) to verify proper center of gravity lift point. To avoid dropping of unit, reposition lifting point if unit is not level.

NOTICE

Equipment Damage!

Use spreader bars to prevent straps from damaging the unit. Install the bars between lifting straps, both underneath the unit and above the unit to prevent the straps from crushing the unit cabinet or damaging the finish.

Before preparing the unit for lifting, estimate the approximate center of gravity for lifting safety. Because of placement of internal components, the unit weight may be unevenly distributed. See "Weights," p. 27 for approximate unit weights.

The crated unit can be moved using a forklift of suitable capacity. For lifting the unit into an elevated mounting position, run lifting straps or slings under the unit and attach securely to the lifting device.

Repositioning Drain Pan

Air handlers come with one drain pan that can be installed in any one of four positions; this allows for vertical or horizontal application and right or left condensate line connection.

Note: *Important! All air handlers are shipped with the drain pan installed in the horizontal position and the connection on the left side (as shown in Figure 3, p. 15. If an alternate position is required, the drain pan should be repositioned before setting the air handler. Ensure there is enough clearance to the sides of the unit for repositioning the drain pan after installation.*

1. Remove the access plate at the opposite end of the drain connection. This plate secures and lifts the back end of the drain pan for sloping. It must be removed before the drain pan can be removed. This is done as follows:
   a. Remove the screw
   b. Lift the access plate up
   c. Pull the plate out. If the drain pan is to be moved to the vertical position also remove the other two access plates.

2. Remove the screw securing the drain pan.
   a. Lift the pan up
   b. Slide the pan out
3. Install the drain pan into the new position.
   a. Slide the drain pan into the opening
   b. Lift the drain pan up
   c. Push it in all the way
   d. Drop it down over the lip of the opening, secure with screw
4. Install the access plate on the opposite end of the drain pain.
   a. Slide the edge of the access plate under the drain pan
   b. Lift the access plate and drain pan up
   c. Push the access plate in
   d. Drop the access plate down over the lip of the opening, secure with screw

   Note: *If the drain pan is being moved to the vertical position, install the other access plates over the horizontal position opening*

Figure 3. Drain pan location

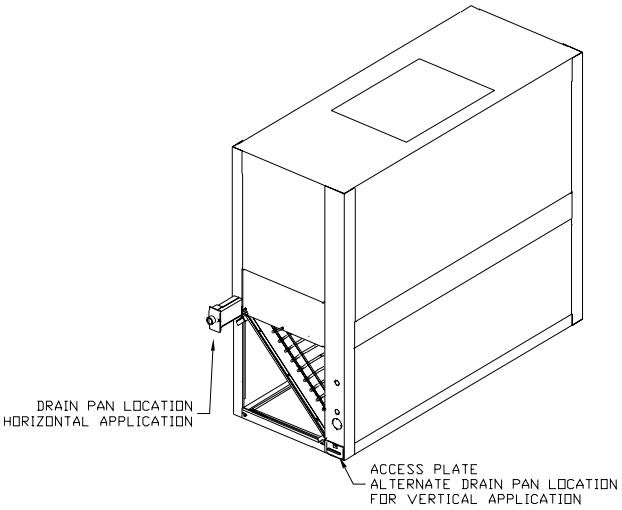
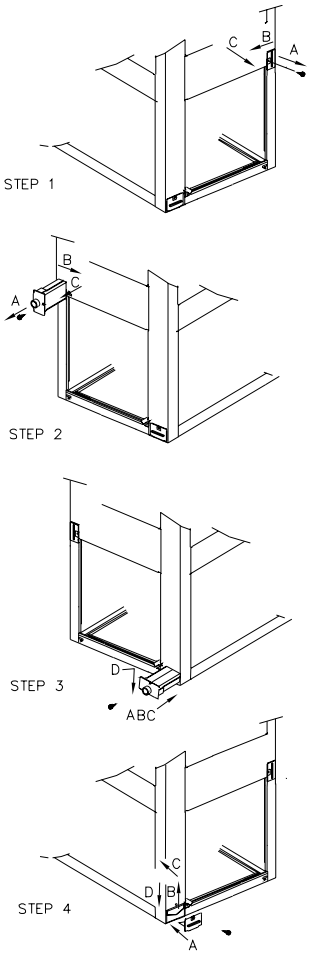


Figure 4. Drain pan relocation



NOTICE

System Component Damage!

These air handlers are shipped with a dry nitrogen holding charge in the coil. Depress or remove the access valve cone to bleed off the nitrogen prior to brazing. Temporarily cap off tubes if the refrigerant line connections are to be made later.

Refrigerant Piping

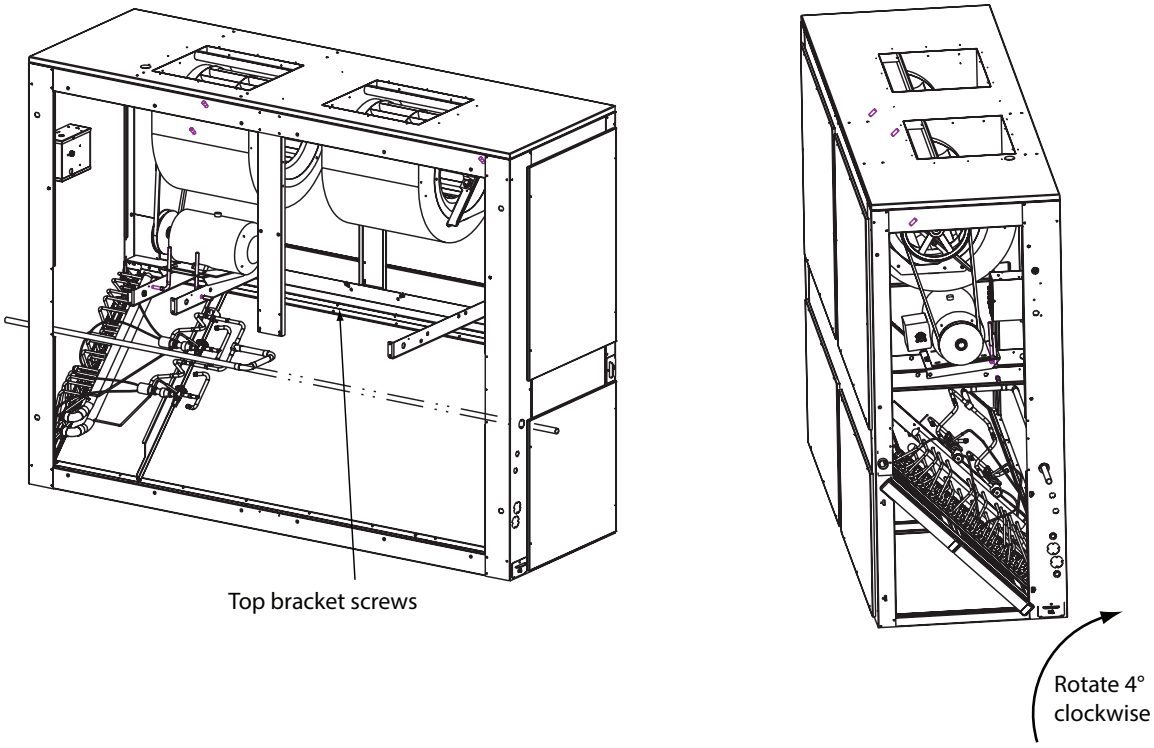
Reorienting Evaporator Coil (TWE150 and 180)

Important: *Applies to TWE150 and 180 when positioned for vertical upflow. Unit is shipped in the horizontal position. If installing in the* ***vertical position****, the coil* ***must be*** *reoriented by rotating the coil 4 degrees (control box side) from the shipped position.*

1. Remove screws from top evaporator coil bracket (bracket that attaches coil to cabinet and runs the length of the unit). See Figure 5, p. 16.

2. Rotate evaporator coil approximately 4 degrees clockwise - looking from the control box end. When the evaporator coil is rotated, the lower set of evaporator coil bracket holes will align with the support bracket (from which it was originally fastened).
3. Reinsert screws in evaporator coil bracket.

Figure 5. Evaporator coil reorientation for TWE150, 180



Preparation for Refrigerant Piping

NOTICE

Equipment Damage!

Do not apply heat to remove seal caps until the gauge port cores have been removed. If seal caps are intact, application of heat may generate excessive pressure in the unit and result in damage to the coil or expansion valve.

The air handler is designed so that refrigerant piping can enter from either the right or left hand side. It is shipped with the intent that the refrigerant lines will enter from the left hand side. To convert to right hand entry, unbraze the elbow on the suction line and rotate 180° and rebraze.

Important: *Access to refrigerant lines is limited in all horizontal and some vertical applications. Therefore, refrigerant lines should be stubbed out and temporarily capped prior to setting the air handler. Protect adjacent surfaces from heat damage when brazing in and around the air handler. See Figure 6, p. 18.*

Installations, Limitations and Recommendations

NOTICE

System Component Damage!

Properly insulate all refrigerant gas piping to prevent possible water damage due to condensation and to prevent capacity loss and possible compressor damage.

The general location of the air handler is normally selected by the architect, contractor and/or buyer. For proper installation, the following items must be considered:

- Available power supply must agree with electrical data on component nameplate.

  Note: *Unit voltage cannot be changed on units ordered with a VFD.*
- If external accessories are installed on the unit, additional clearances must be provided.
- All duct work should be properly insulated to prevent condensation and heat loss.
- Refrigerant gas piping must be insulated.

It is recommended that the outline drawings in the Dimensional Data section be studied and dimensions

properly noted and checked against the selected installation site. By noting in advance which features are to be used, proper clearance allowances can be made for installation and possible future service.

Important: *When installing these units* ***free standing*** *with discharge grills and isolators, a top support with isolator should be added to prevent tipping. Support and isolator can be attached to a wall or other appropriate structure.*

If adding external accessories to the unit, additional clearances must be considered for the overall space needed.

For installation of accessories available for this air handler, follow the installation instructions that are shipped with each accessory.

Clearances

Allow the following minimum clearances for serviceability:

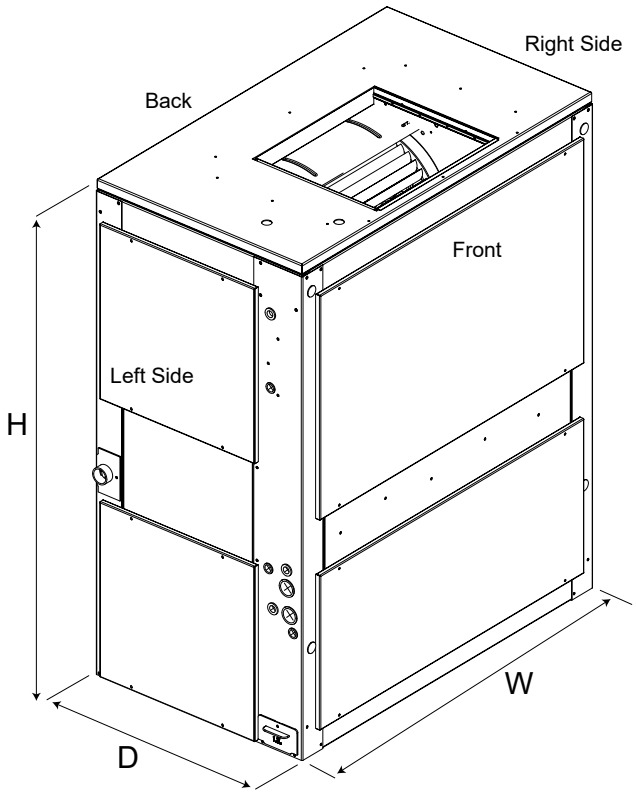
- Front and Back – 24 in. (610 mm)
- Sides – 22 in. (559 mm) for 5 - 10 ton units and 32 in. (813 mm) for 12.5 - 25 ton units

Note: *See Dimensional Data for additional reference.*

Dimensional Data

Air Handler

Figure 6. Height, width and depth measurements



Model Number	H - in. (mm)	W - in. (mm)	D - in. (mm)
TWE060	48-1/8 (1222.4)	39-5/8 (1006.5)	23-5/8 (600.0)
TWE072, 090	54-1/8 (1374.8)	49-1/8 (1247.8)	26-1/2 (673.1)
TWE120	54-1/8 (1374.8)	65-1/8 (1654.2)	26-1/2 (673.1)
TWE150, 180	69-1/8 (1756.0)	81-1/4 (2063.7)	30 (762.0)
TWE240, 300	71-7/8 (1806.6)	94-1/4 (2394.0)	32-1/8 (816.0)

Note: Full dimensional data is available on the following pages.

Figure 7. 5 ton air handler, single circuit – in. (mm)

Note: *Duct flange is a field-installed accessory.*

NOTES:
1. PANEL DEPTH 1/2" (12.7) (TYP. ALL PANELS).
2. REMOVABLE DRAIN PAN AND ATTACHED DRAIN CONNECTION MAY BE INSTALLED ON END OF UNIT IN EITHER THE VERTICAL OR HORIZONTAL CONFIGURATION, PLASTIC DRAIN PAN ACCESS PLATE ON THE END OF UNIT OPPOSITE DRAIN CONNECTION MUST BE REMOVED TO SLIDE DRAIN PAN OUT OF UNIT FOR CLEANING. ACCESS PLATE MUST BE RE-INSTALLED AFTER SLIDING DRAIN PAN BACK INTO UNIT.
3. IF PERIODIC DRAIN PAN CLEANING IS REQUIRED, ALLOW ROOM FOR PARTIAL REMOVAL OF DRAIN PAN CONNECTION AT END OF UNIT.
4. 1" (25.4) FEMALE SCHED. 40 (10.2) PVC PIPE DRAIN CONNECTION VERTICAL CONFIGURATION.
5. 1" (25.4) FEMALE SCHED. 40 (10.2) PVC PIPE DRAIN CONNECTION HORIZONTAL CONFIGURATION.

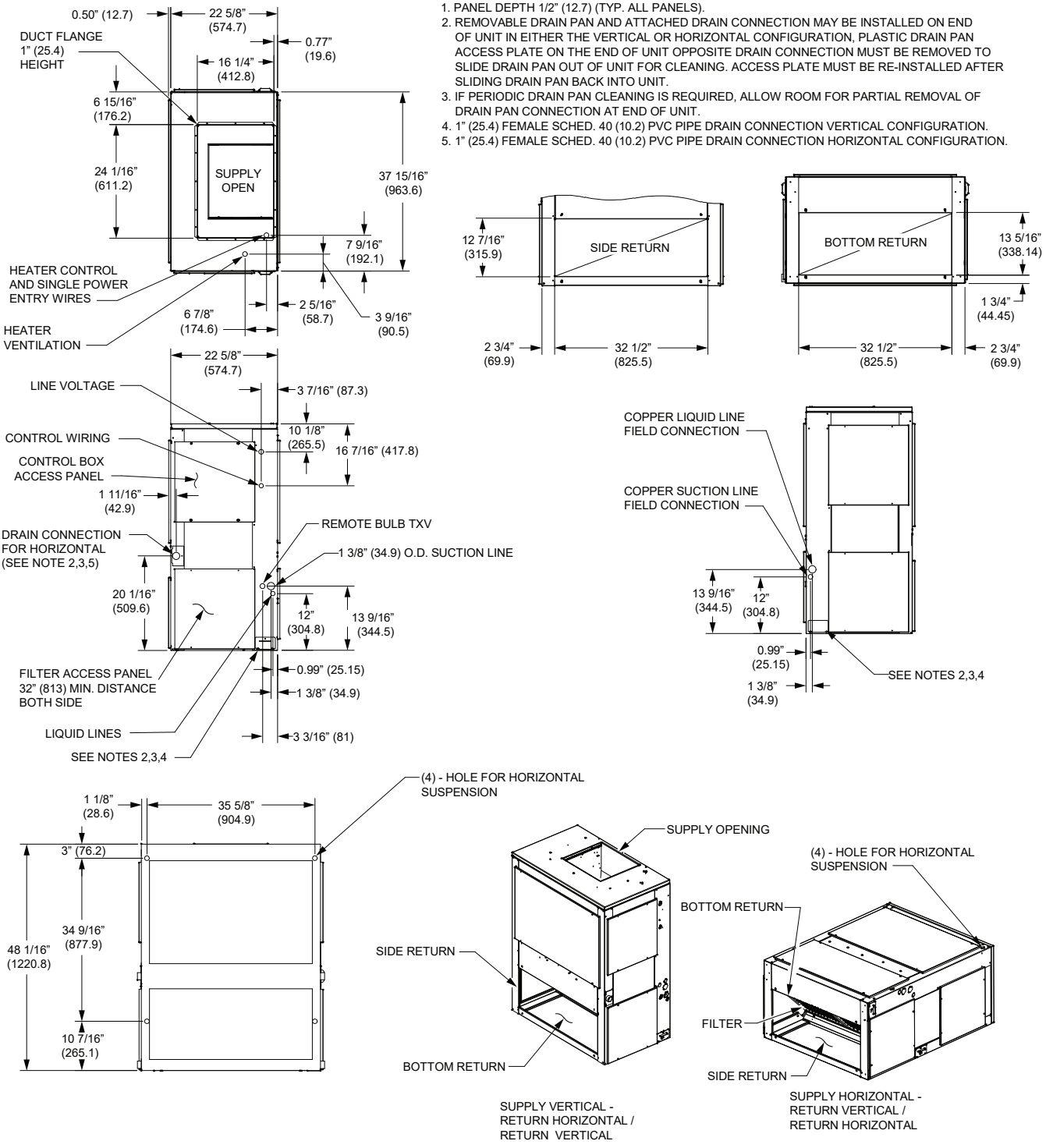


Figure 8. 5 ton air handler, dual circuit – in. (mm)

Note: *Duct flange is a field-installed accessory.*

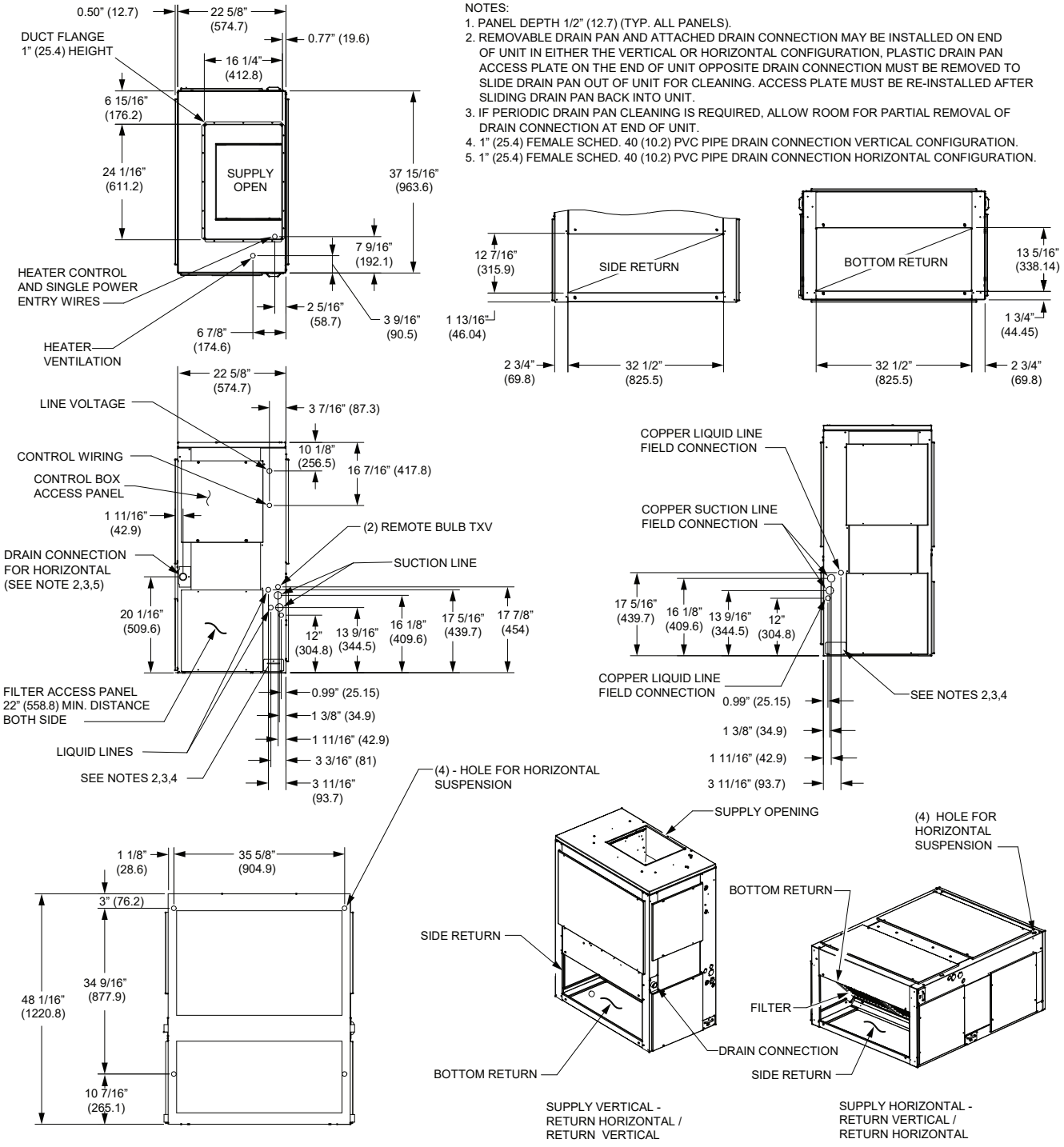


Figure 9. 7.5 ton air handler, single circuit – in. (mm)

Note: *Duct flange is a field-installed accessory.*

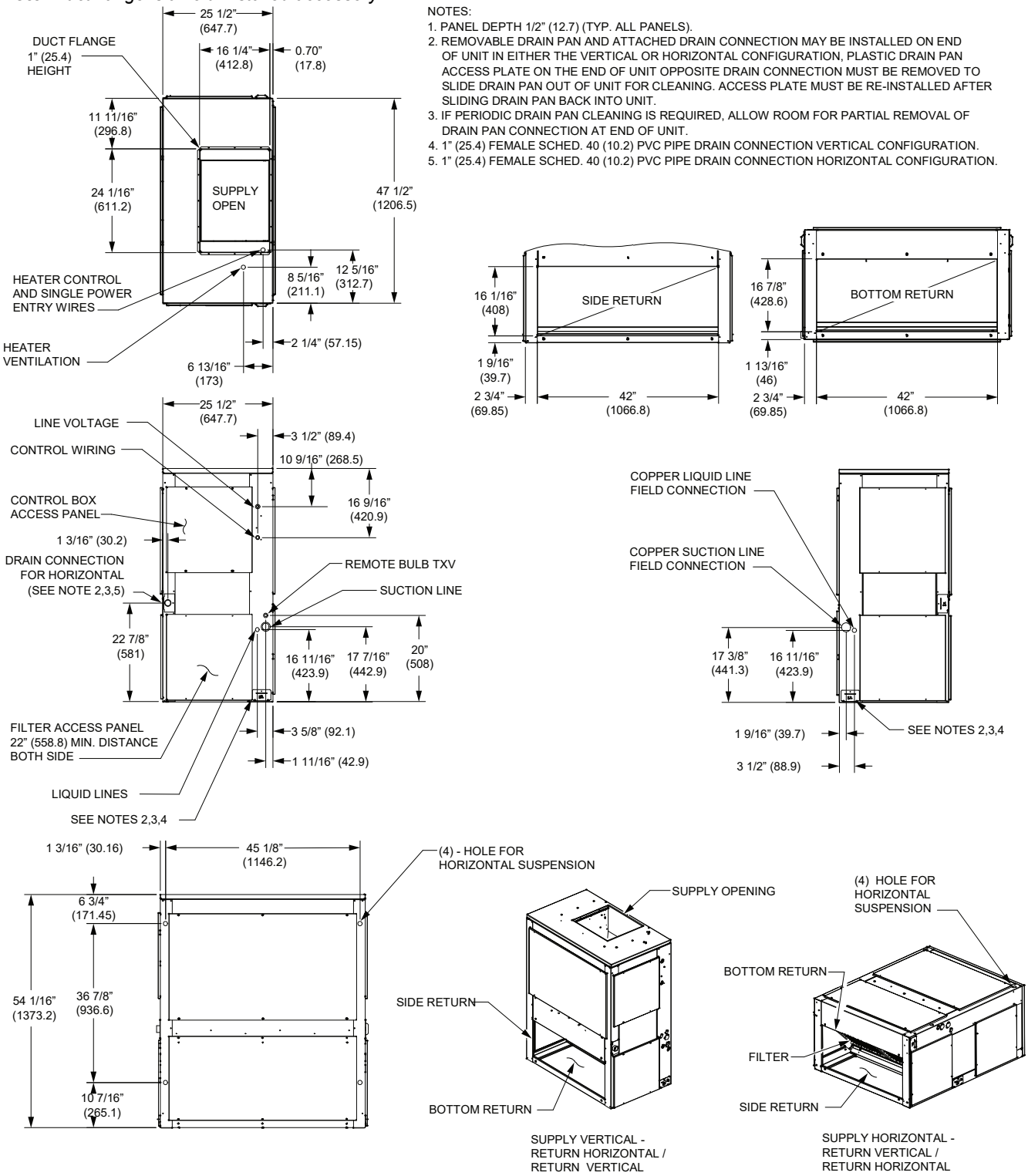


Figure 10. 6, 7.5 ton air handler, dual circuit – in. (mm)

Note: *Duct flange is a field-installed accessory.*

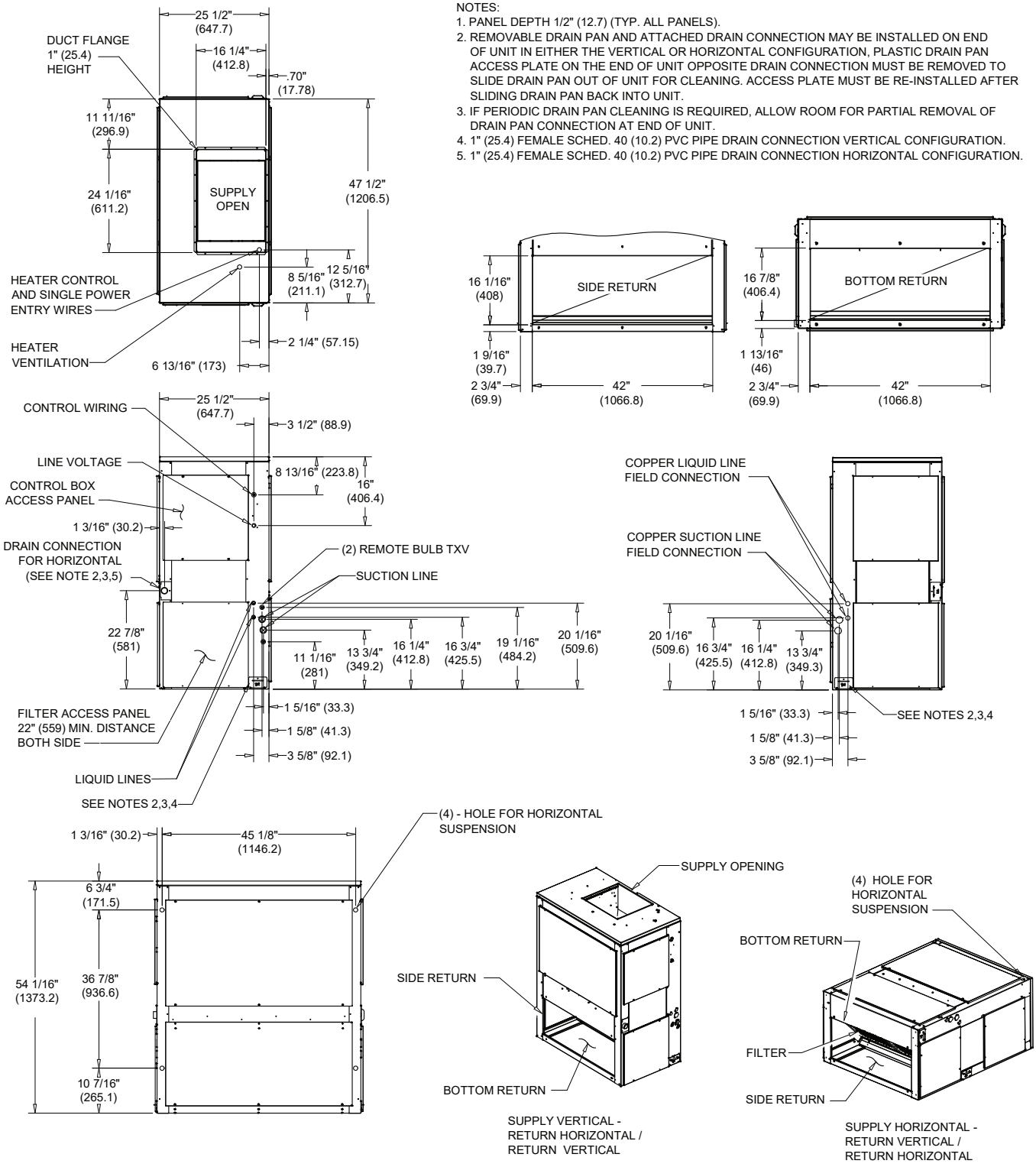


Figure 11. 10 ton air handler, single circuit – in. (mm)

Note: *Duct flange is a field-installed accessory.*

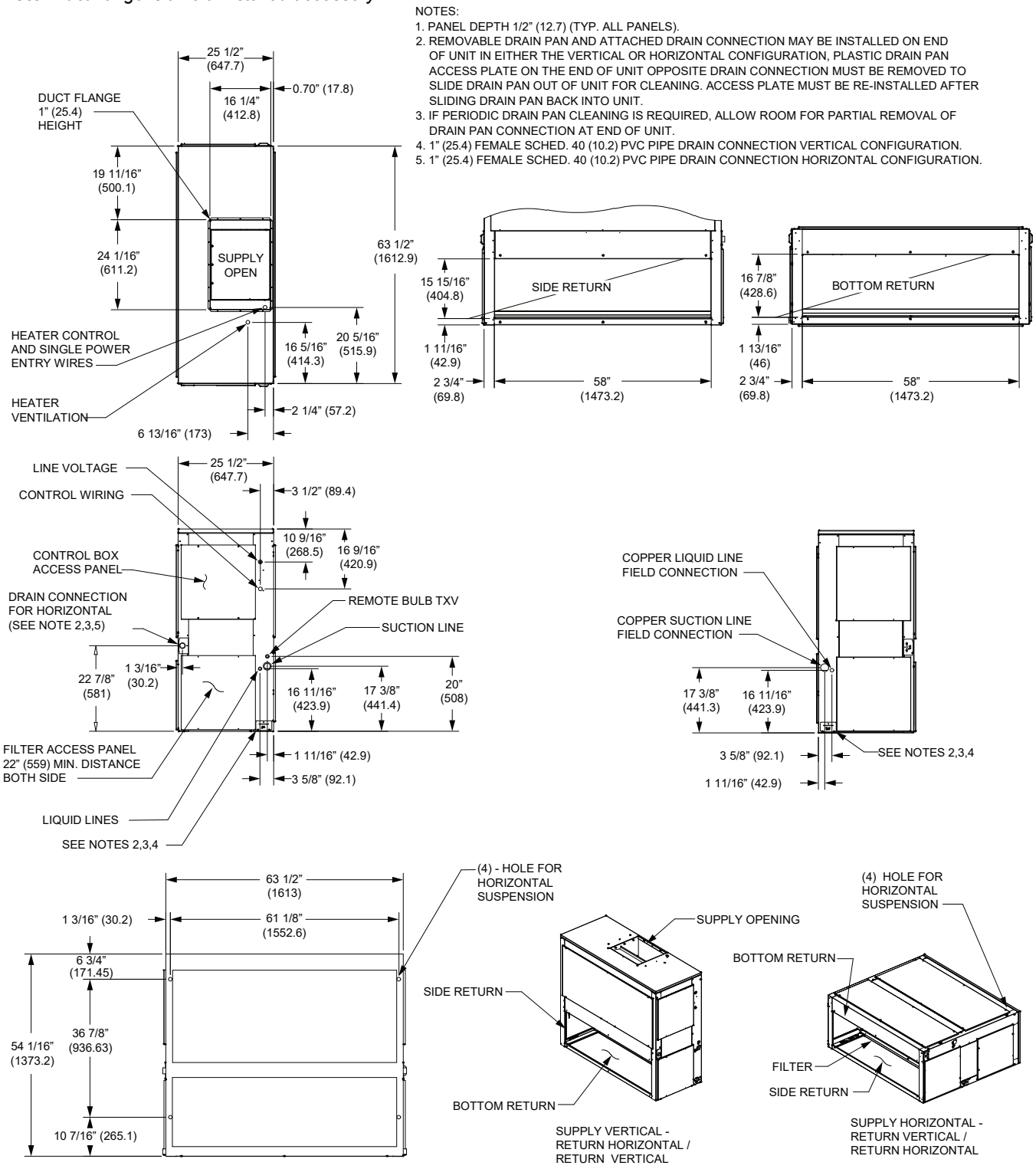


Figure 12. 10 ton air handler, dual circuit – in. (mm)

Note: *Duct flange is a field-installed accessory.*

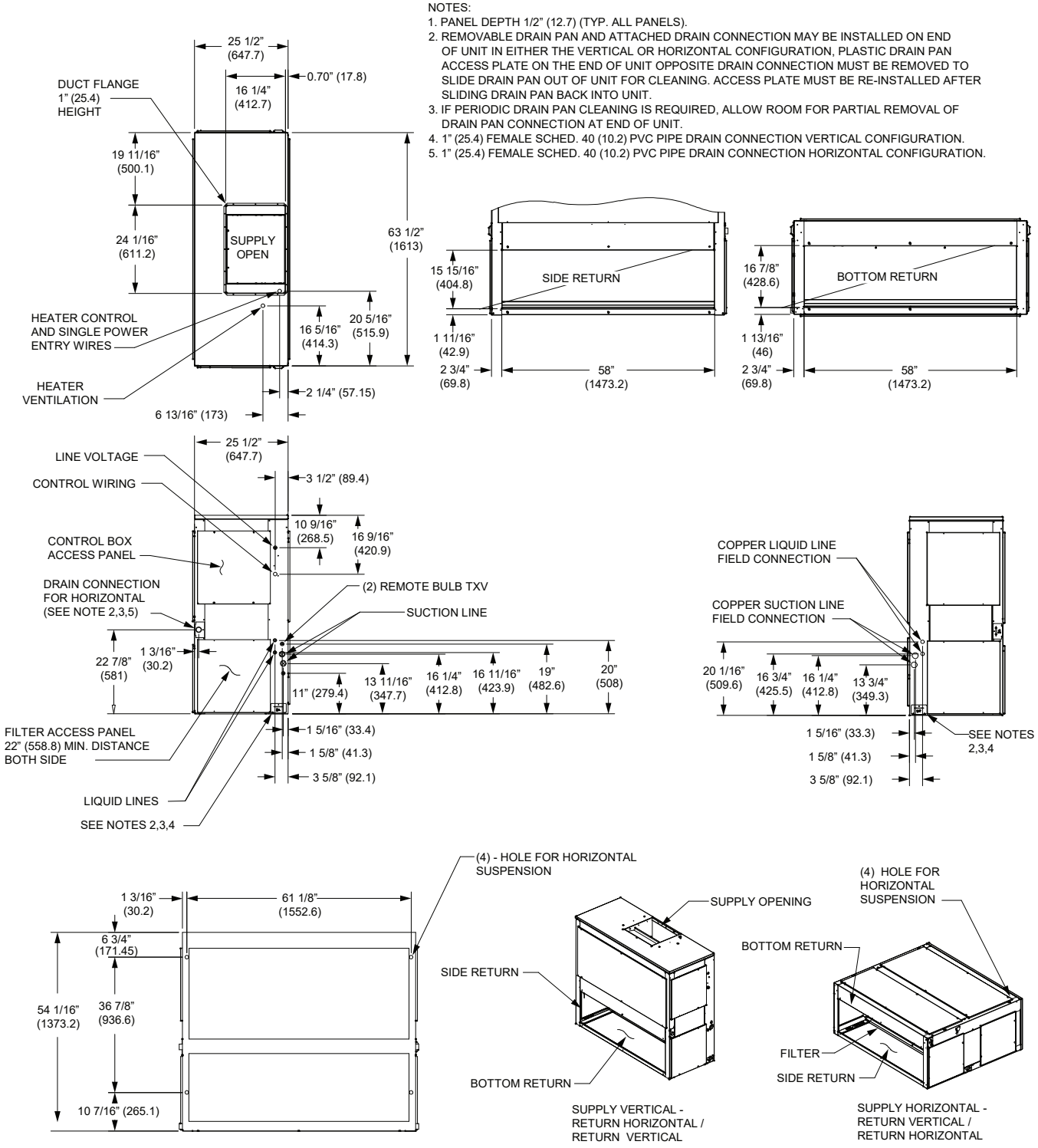


Figure 13. 12.5, 15 ton air handler, dual circuit – in. (mm)

Note: *Duct flange is a field-installed accessory.*

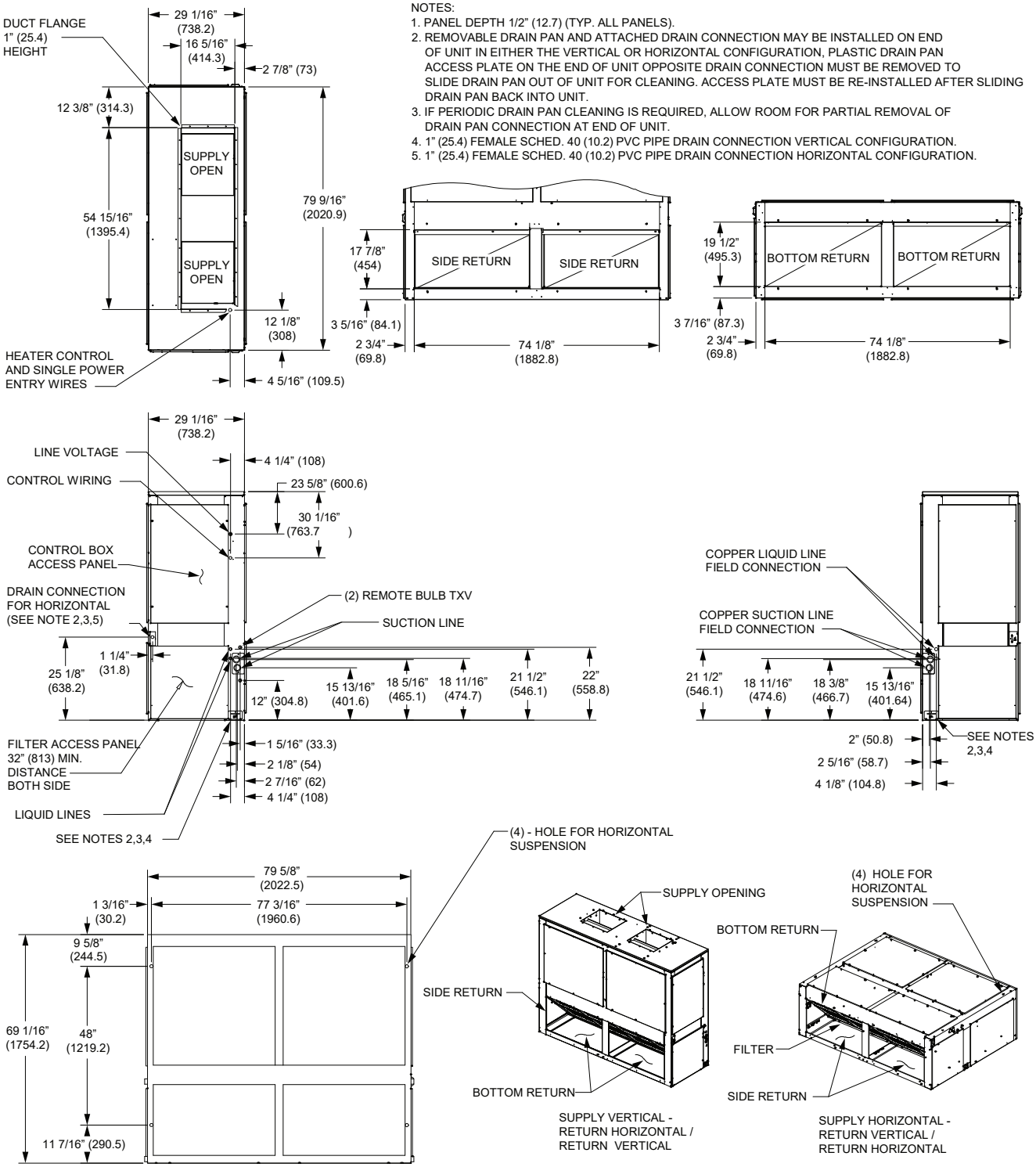
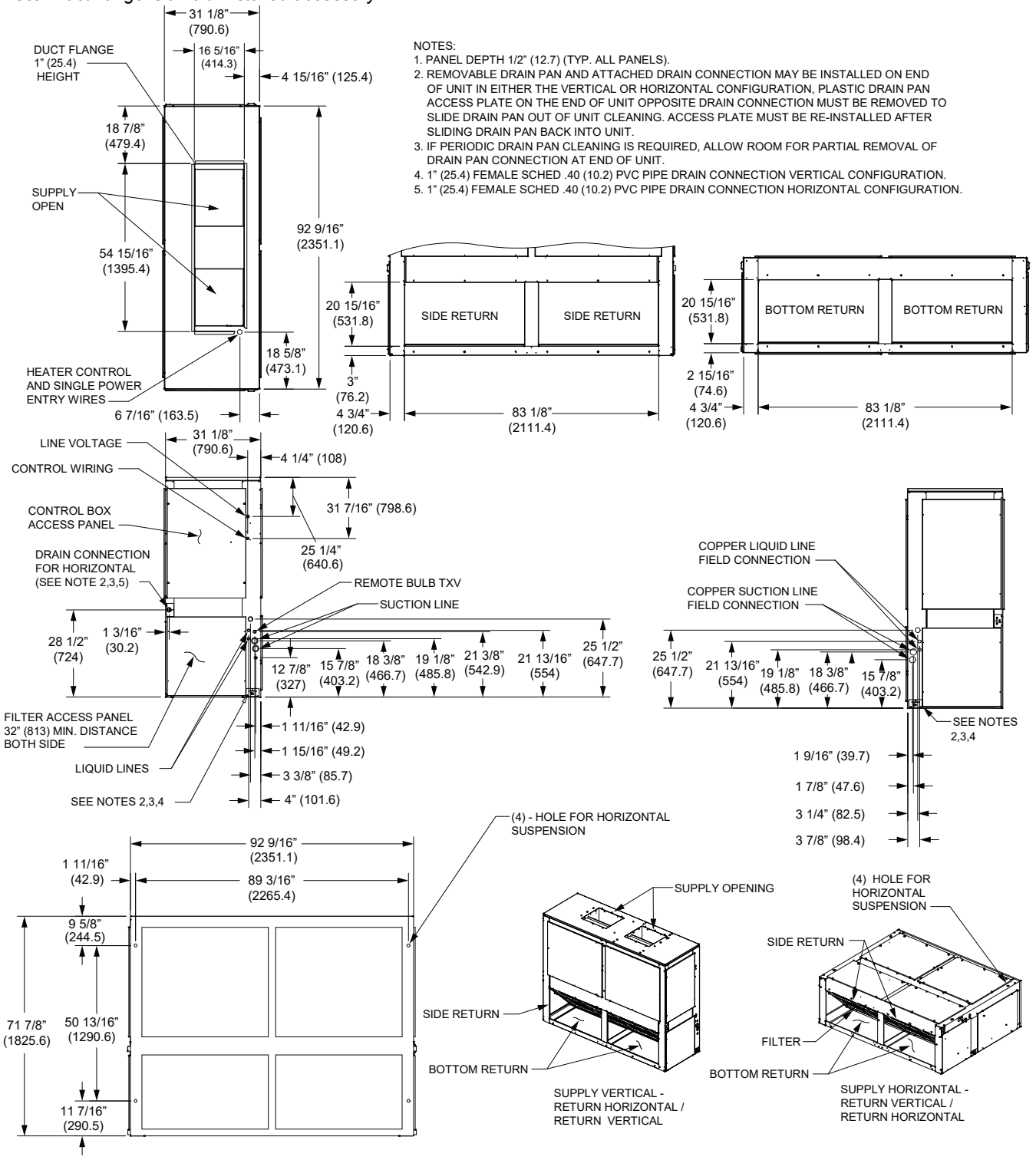


Figure 14. 20, 25 ton air handler, dual circuit – in. (mm)

Note: *Duct flange is a field-installed accessory.*



Weights

Air Handler

Table 2. Constant volume air handler (TWE) — unit and corner weights - (60 Hz)

Tons	Model Number	Shipping Max (lbs)	Net Max (lbs)	Corner Weights - Vertical				Corner Weights - Horizontal			
				1	2	3	4	1	2	3	4
5	TWE060K(3,4,W, 1)A TWE0604(3,4, 1)B	285	232	55	71	51	55	54	67	50	61
7.5	TWE090K(1)A/B	385	323	67	99	75	82	56	92	87	88
10	TWE120K(1)A/B	441	393	77	121	110	85	79	118	77	119

Table 3. SZVAV and 2-Speed VFD air handler (TWE) — unit and corner weights - (60 Hz)

Tons	Model Number	Shipping Max (lbs)	Net Max (lbs)	Corner Weights - Vertical				Corner Weights - Horizontal			
				1	2	3	4	1	2	3	4
6	TWE072K*B	398	336	70	102	78	86	59	95	90	92
7.5	TWE090K*A/B	398	336	70	102	78	86	59	95	90	92
10	TWE120K*A/B	454	406	80	124	113	89	82	121	80	123
12.5	TWE150K*B	766	689	171	195	184	139	199	167	148	175
15	TWE180K*B	765	688	170	195	184	139	199	166	148	175
20	TWE240K*B	925	831	261	171	164	235	259	184	149	239
25	TWE300K*B	1015	921	217	235	189	280	278	182	233	228

Figure 15. Vertical — TWE060, 072, 090, 120

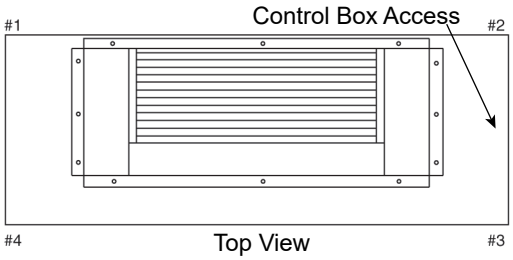


Figure 16. Vertical — TWE 150, 180, 240, 300

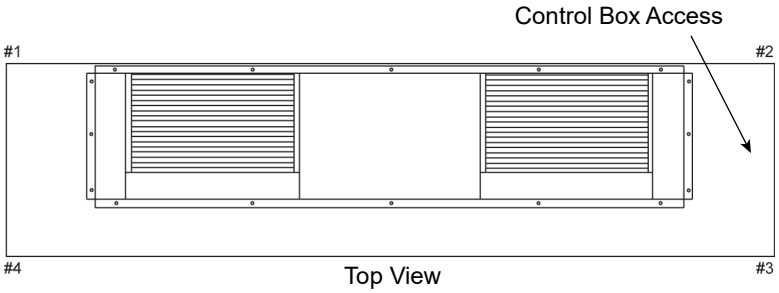


Figure 17. Horizontal — TWE 060, 072, 090, 120

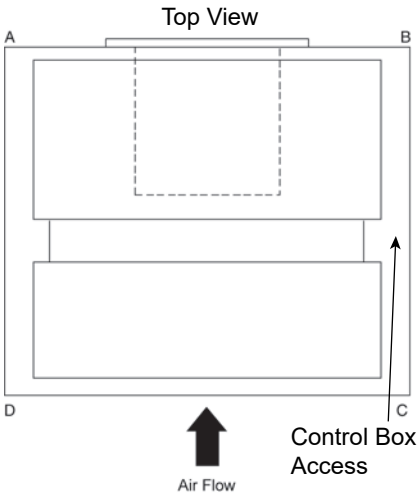
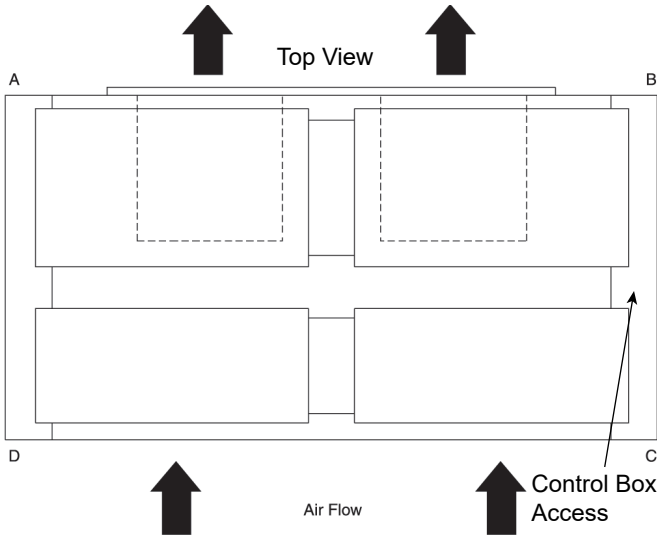


Figure 18. Horizontal — TWE 150, 180, 240, 300



Accessories

Table 4. Accessory weights (net lbs.)

Unit Used w/ Tons	Hot Water Coil	Steam Coil	Discharge Plenum and Grille with Hydronic Heat	Discharge Plenum and Grille without Heat	Discharge Plenum and Grille with Electric Heat	Return Air Grille	Electric Heat Min/ Max	Subbase	Oversized Motor	RIS Isolator Floor Mount
6	116	131	78	73	160	5	27/45	19.4	48	2
7.5	116	131	78	73	160	5	27/45	19.4	48	2
10	165	148	97	92	195	7	27/45	23.5	50	2
12.5	211	234	—	230	235	10	79/100	28.4	80	2
15	211	234	—	230	235	10	79/100	28.4	80	2
20	242	261	—	145	265	12	79/100	31.7	88	2
25	242	261	—	145	265	12	79/100	31.7	129	2

Unit Used w/ Tons	RIS Isolator Suspended Mount	Steel Spring Isolator Floor Mount	Steel Spring Isolator Suspended Mount	Hail Guard	Control Transformer	Sensors	Expansion Module	Low Ambient	Service Valve
6	6	12	6	21	4	1	13	13	5
7.5	6	12	6	21	4	1	13	13	5
10	7	12	6	28	4	1	13	13	5
12.5	7	12	6	33	4	1	13	13	5
15	7	12	6	55	4	1	2	2	5
20	9	12	6	55	4	1	2	2	5
25	9	12	6	71	4	1	2	2	5

Installation

Horizontal Suspension

If the air handler will be suspended, use a suspension mounting kit to isolate the unit from the structure. This is usually accomplished with spring or rubber isolators, which are offered as an accessory.

Mounting rods must be field supplied. Isolator selection is dependent upon total unit weight including accessories — see "Weights," p. 27 for approximate unit and accessory weights.

NOTICE

Equipment Damage!

Before hanging the unit on suspension rods, reinforce the cabinet around the suspension holes by using a large washer inside the cabinet. Washers should be between the skin of the air handler and the nut on the suspension rod.

Align holes in the cabinet with structural supports and secure suspension rods to the structure, then to the air handler cabinet. If hole locations do not permit proper alignment with existing structure, it may be necessary to field fabricate cross members on existing structural beams.

Note: *When other than bottom return is to be used, side panel removal for return duct installation must be secured over the bottom opening.*

Leveling

This air handler has a double sloped drain pan. In order to assure proper drainage along the length of the drain pan, it is important to have the unit properly leveled. Be sure the air handler is level.

Auxiliary Drain Pan

A field fabricated, auxiliary drain pan should be installed under the unit for all horizontal applications and when air handlers are installed above ceilings or in other locations where condensate overflow may cause damage.

This drain pan will eliminate any excess condensation that may be due to extreme humidity or an obstructed drain in the primary drain pan. Drain lines from this pan must be installed, but should not be connected to the primary drain line from the unit. Isolate the auxiliary drain pan from both the air handler and the structure.

Refrigerant Piping

Installation, brazing, leak testing and evacuation of refrigerant lines are covered in the installation instructions that shipped with the outdoor unit. Read the instructions before beginning installation of refrigerant lines.

NOTICE

Equipment Damage!

Ensure that the refrigerant lines passing through the cabinet are not resting on sharp sheet metal edges and that the bulb(s) are attached to the suction line of the same circuit.

1. Locate cloth bag(s) that contains a stainless steel clamp and insulation material (approximately 9-inch long by 4-inch wide) for each refrigerant circuit. This is for attaching and insulating the expansion valve bulb(s) to the suction line(s).
2. Attach the expansion valve bulb(s)

   On air handlers that will have refrigerant lines entering the cabinet from the left side:

   a. Remove the split rubber grommet from the knockout in the end of the air handler. Uncoil the cap tube with the bulb attached at the expansion valve and place the grommet on the cap tube.

   b. With the grommet around the tube, push the bulb through the hole and position the grommet back into its original position (one bulb and cap tube on single circuit units, and two bulbs and cap tubes on dual circuit units).

   On air handlers that will have refrigerant lines entering the cabinet from the right side:

   a. Attach the bulb(s) to the suction tube(s) inside the cabinet, approximately 10-inch from the right end of the unit.
3. Attach the bulb(s) on a horizontal section of tube where the entire length of the bulb is in contact with the tube (see Figure 19, p. 31), approximately 45 degrees off vertical (a 10 or 2 o'clock position).
4. After attaching to the suction line(s), either inside or outside of the cabinet, wrap the insulation around the bulb(s) and suction tube(s).

Note: *Suction piping should be insulated.*

⚠ WARNING

Fiberglass Wool!

Exposure to glass wool fibers without all necessary PPE equipment could result in cancer, respiratory, skin or eye irritation, which could result in death or serious injury. Disturbing the insulation in this product during installation, maintenance or repair will expose you to airborne particles of glass wool fibers and ceramic fibers known to the state of California to cause cancer through inhalation.

You MUST wear all necessary Personal Protective Equipment (PPE) including gloves, eye protection, a NIOSH approved dust/mist respirator, long sleeves and pants when working with products containing fiberglass wool.

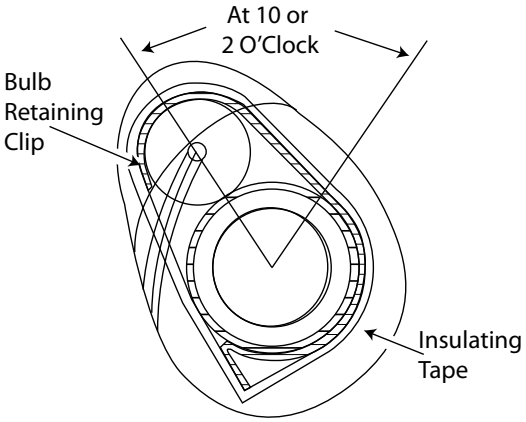
Precautionary Measures:

- **Avoid breathing fiberglass dust.**
- **Use a NIOSH approved dust/mist respirator.**
- **Avoid contact with the skin or eyes. Wear long-sleeved, loose-fitting clothing, gloves, and eye protection.**
- **Wash clothes separately from other clothing; rinse washer thoroughly.**
- **Operations such as sawing, blowing, tear-out, and spraying may generate fiber concentrations requiring additional respiratory protection. Use the appropriate NIOSH approved respirator.**

First Aid Measures:

- **Eye Contact - Flush eyes with water to remove dust. If symptoms persist, seek medical attention.**
- **Skin Contact - Wash affected areas gently with soap and warm water after handling.**

Figure 19. Remote bulb installation

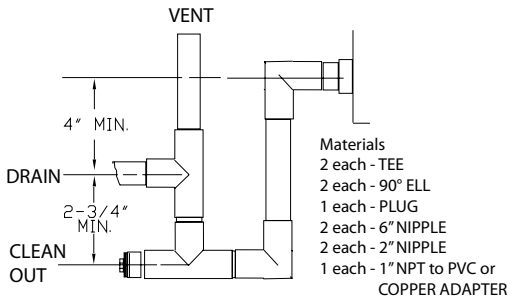


Condensate Piping

The drain pan condensate connection is a female slip joint type for 1" Schedule 40 PVC pipe. Use PVC cement and tubing as required (field supplied) to construct a trap. A union or flexible tubing and clamps may be installed if the drain pan is to be removed periodically for cleaning.

Note: *When air handler is installed in the vertical position and close proximity trapping of condensate is required, use of a subbase accessory to raise the air handler for clearance of the drain trap is recommended. See Figure 20, p. 31 for a typical drain trap assembly.*

Figure 20. Typical drain trap assembly



Important: *Properly support the drain line to prevent the drain pan connection from cracking.*

Filter Replacement

⚠ WARNING

Fiberglass Wool!

Exposure to glass wool fibers without all necessary PPE equipment could result in cancer, respiratory, skin or eye irritation, which could result in death or serious injury. Disturbing the insulation in this product during installation, maintenance or repair will expose you to airborne particles of glass wool fibers and ceramic fibers known to the state of California to cause cancer through inhalation.

You MUST wear all necessary Personal Protective Equipment (PPE) including gloves, eye protection, a NIOSH approved dust/mist respirator, long sleeves and pants when working with products containing fiberglass wool.

Precautionary Measures:

- **Avoid breathing fiberglass dust.**
- **Use a NIOSH approved dust/mist respirator.**
- **Avoid contact with the skin or eyes. Wear long-sleeved, loose-fitting clothing, gloves, and eye protection.**
- **Wash clothes separately from other clothing; rinse washer thoroughly.**
- **Operations such as sawing, blowing, tear-out, and spraying may generate fiber concentrations requiring additional respiratory protection. Use the appropriate NIOSH approved respirator.**

First Aid Measures:

- **Eye Contact - Flush eyes with water to remove dust. If symptoms persist, seek medical attention.**
- **Skin Contact - Wash affected areas gently with soap and warm water after handling.**

Air handlers are shipped with throwaway filters installed.

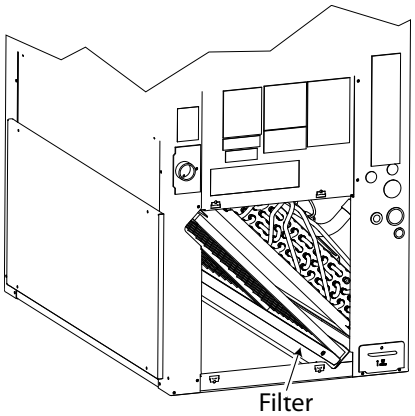
Note: *2-inch Merv13 filters are available for field install option only.*

To replace filters from the end of the unit, remove lower access panel (either end) and slide old filters out and replace with new ones.

To replace from the front of the unit, remove one **L** shaped angle. Remove and replace filters and reinstall **L** shaped angle. See Figure 21, p. 32.

To convert from 1-inch filter to a 2-inch filter on units so equipped, remove lower access panels from both ends of the air handler. Remove screws and rotate the **L** shaped angles from both the top and bottom of the filter track 180° to increase the width of the filter opening.

Figure 21. Filter location



Duct Connections

The supply and return ducts should be connected to the unit with flame retardant duct connectors to reduce vibration transmission. The return duct should be sized to the same dimensions as the return inlet of the unit.

Important: *Duct flanges are provided for attachment of the duct work and are packaged on the outside of the cabinet for TWE150, 180, 240, and 300 . The duct flanges are fastened to the pallet below the coil (bottom return) on the TWE060, 072, 090, and 120 models.*

Air Flow Settings

Airflow options for this unit can be set to Constant Volume, Two Speed Fan, and Single Zone VAV Fan. Correct configuration and airflow adjustment instructions can be found in the Startup section of this manual.

Electrical Wiring

⚠ WARNING

Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

⚠ WARNING

Proper Field Wiring and Grounding Required!

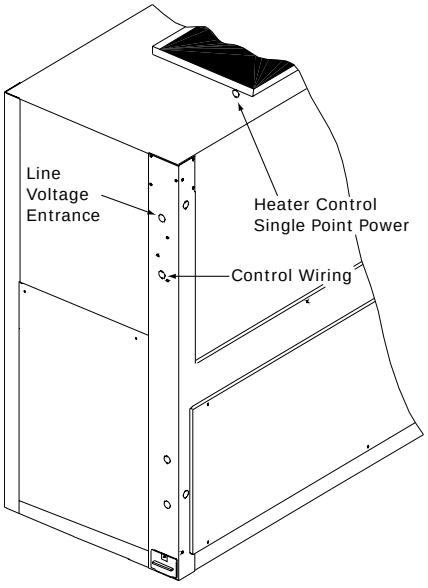
Failure to follow code could result in death or serious injury.

All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

1. All electrical lines, sizing, protection, and grounding must be in accordance with the National Electric Code and local codes.
2. Isolate conduit whenever vibration transmission may cause a noise problem within the building structure.
3. Ensure all connections are tight and no wires exposed.
4. All accessories must be installed and wired according to the instructions packaged with that accessory.

   For air handler power entry only, or for dual power entry (power entry for air handler and power entry for electric heat), the electrical connections are made in the fan control box located in the right side of the air handler and electric heater respectively. Wiring entrance is through holes provided in the end of the air handler cabinet, Figure 22, p. 33. Breaker or fuse size can be selected using the nameplates attached to the unit and electric heater.

Figure 22. Electrical entries



Unit Power Supply

The installer must provide line voltage circuit(s) to the unit main power terminals as shown by the unit wiring diagrams. Adhesive backed diagrams are affixed inside the control box cover panel. Wiring diagrams are also available through e-Library or by contacting a local sales office. Power supply must include a disconnect switch in a location convenient to the unit. Ground the unit according to local codes and provide flexible conduit if codes require and/or if vibration transmission may cause noise problems.

Important: *All wiring must comply with applicable local and national (NEC) codes. Type and location of disconnect switches must comply with all applicable codes.*

⚠ WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury.

All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

NOTICE

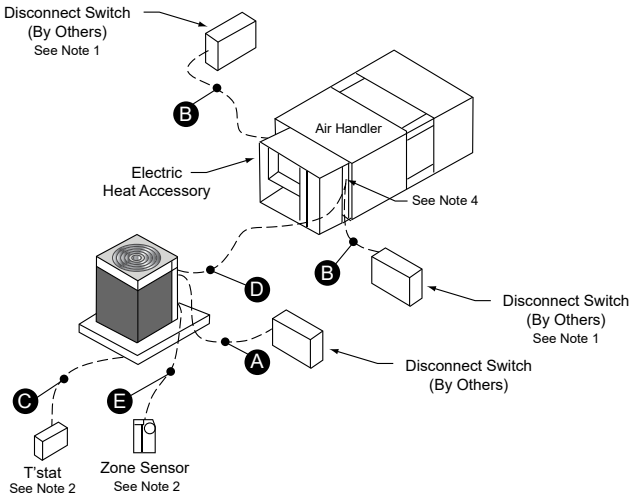
Use Copper Conductors Only!

Failure to use copper conductors could result in equipment damage as the equipment was not designed or qualified to accept other types of conductors.

Symbio™ Controls

Wiring shown with dashed lines is to be furnished and installed by the customer. All customer supplied wiring must be copper only and must conform to NEC and local electrical codes. Codes may require line of sight between disconnect switch and unit.

Figure 23. Symbio jobsite connections



Power Wires

A. 3 wires, line voltage for 3 phase, 1 grounding wire**

B. 3 wires, line voltage for 3 phase, (2 wires for single phase) 1 grounding wire**

Control Wires

C. Cooling only (or Cooling with Heat) thermostat: 4 to 7 wires depending on stages of cooling and electric heat

C. Heat Pump thermostat: 6 to 9 wires depending on T'stat options and stages of cooling and heating

D. Wiring between indoor and outdoor unit: 5 to 11 wires depending on unit control options*

E. Wiring between indoor and outdoor units: 2 wires are required between the Relay board and Symbio 700 module to allow the controls to receive notification of a refrigerant leak event.

F. Zone Sensor: 4 to 7 wires depending on zone sensor model*

Communication signal wires require shielded twisted pairs.

Use Comlink cable with a PVC jacket, 18/1 PR, stranded shield, 25 PF/FT plenum rated for the field communication signal wiring. Refer to wiring diagram schematics for identification of shielded twisted pairs.

Notes:

1. *When electric heater accessory is used, single point power entry or dual point power entry is field optional. Single point power entry option is through electric heater only.*
2. **Choose only one of the following; Thermostat, Mechanical Zone Sensor, Programmable Zone Sensor Panel or BAS Zone Sensor.*
3. ****

> **⚠ WARNING**
>
> ***Electrical Shock Hazard!***
>
> ***Failure to follow instructions below could result in death or serious injury.***
>
> ***Properly connect the system's oversized protective earthing (grounding) terminal(s).***

4. *Once power wire connections are complete inside the air handler control box, seal the sheet metal entry points of the control box by using parts (neoprene gasket, grommet, and plug) shipped along with the air handler unit package.*
5. *For detailed controls wiring instructions, see Split System Air Conditioners Odyssey™ with Symbio™ Controls Wiring and Start-Up Installation Guide (SS-SVN016*-EN).*

Important: *For the EDC switch to be functional and thereby facilitate reliable unit operation, make the EDC connections from the indoor to the outdoor control boxes.*

Table 5. Recommended thermostat wire size

Wire Size	Maximum Wire Length
(Gauge)	Physical distance between Unit and T'stat
22	30 Feet
20	50 Feet
18	75 Feet
16	125 Feet
14	200 Feet

Table 6. Zone sensor module wiring

Distance from Unit to Control	Recommended Wire Size
0-150 feet (0-45.7 m)	22 gauge (0.33 mm^2)
151-240 feet (46-73.1 m)	20 gauge (0.50 mm^2)
241-305 feet (73.5-117.3 m)	18 gauge (0.75 mm^2)
386-610 feet (117.7-185.9 m)	16 gauge (1.31 mm^2)
611-970 feet (186.2-295.7 m)	14 gauge (2.08 mm^2)

Installation Checklist

⚠ WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

Complete this checklist once the unit is installed to verify that all recommended procedures have been accomplished before the system is started. Operational checks cannot be performed until the outdoor unit is installed and system interconnection is complete.

☐ Verify that the unit electrical power is disconnected.

☐ Inspect all field wiring connections. All connections should be clean and tight.

☐ Inspect unit ground connection(s). Ground must comply with all applicable codes.

☐ Inspect unit suspension arrangement (if used). Unit position must be secure. Remove any tools or debris found in or near the unit.

☐ Inspect duct outlets. Outlets must be open and unrestricted.

☐ Inspect unit drain lines. Pipe connections must be tight and drain line unrestricted.

☐ Inspect fan assembly to insure all moving parts move freely.

☐ If unit is horizontally mounted, make sure secondary drain pan has been installed.

☐ Inspect unit for proper filters, securely installed and not touching the coil surface. All cabinet panels must be secure.

☐ Instruct owner/operator on proper system operating and maintenance procedure.

☐ Inspect blower assembly to make sure all bolts and screws are tight.

☐ Inspect blower pulley alignment.

☐ Inspect factory high and low voltage wiring to make sure all connections are tight and clean.

Low Voltage Wiring

Mount the indoor thermostat, zone sensor, or programmable zone sensor in accordance with the corresponding thermostat installation instructions. Install color-coded, weather-proof, multi-wire cable according to the *Split System Air Conditioners Odyssey™ with Symbio™ Controls Wiring and Start-Up, Installation Guide* (SS-SVN017*-EN).

Note: *Refer to thermostat or zone sensor wire installation guide for proper wire gauge.*

Field Wiring

Refer to the latest version of *System Air Conditioners Odyssey™ with Symbio™ Controls Wiring and Start-Up, Installation Guide* (SS-SVN017*-EN) for instructions on field wiring connections.

EDC Switch Wiring

The Evaporator Defrost Control Switch is wired from the factory Normally Open to operate with Symbio™ condensers. For operation with legacy Reliatel™ or Electromechanical condensers, change the wiring on the switch to the Normally Closed position and connect the wires from the switch to the wires from the legacy condenser that control this function.

Checkout Procedure

Complete the “Installation Checklist,” p. 35 once installation of field wiring connections is complete. All operational checks (unit running) must be made after the outdoor unit is installed and system interconnection is complete.

Start-Up

Heating and Cooling Setpoint Arbitration

All control function setpoints are set through one of the Symbio™ 700 user interfaces. If no changes are made, the controller will operate, as configured, based on the default settings. Refer to the Symbio 700 Controller with Odyssey Split Systems Application Guide for details about which setpoints are required per application.

Constant Volume Units

(Unit model number digit 15 = "1")

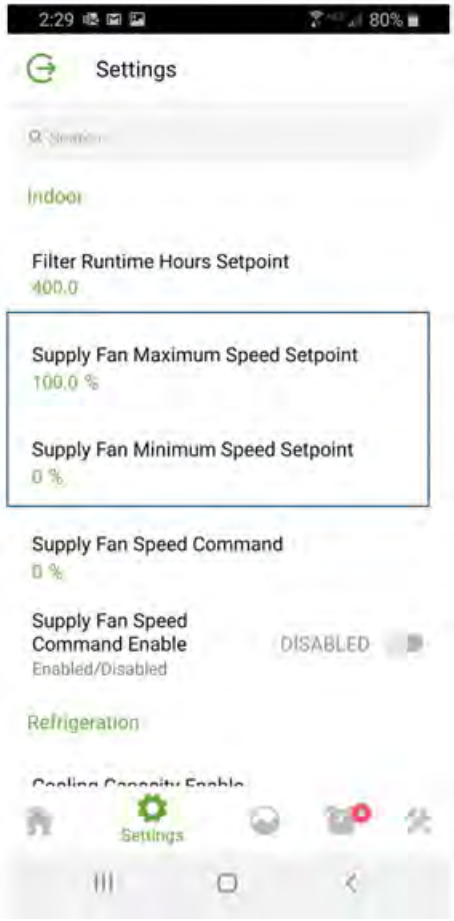
Unit is shipped for nominal airflow with nominal static pressure. Please refer to the fan performance table in the product catalog and select the proper drive package for each application. Failure to do so could result in improper airflow causing coil frosting or condensate management problems. Condensate management problems such as water blow off could be the result of too great of air face velocity across the coil. To ensure proper operation refer to “Fan Belt Adjustment,” p. 49

SZVAV and Two Speed Air-Handling Units with Symbio™ Condenser Units

(Unit Model Number Digit 15 = “D”)

The Symbio 700 controller provides integrated Supply Fan speed setpoint control for paired air handler units with VFDs for SZVAV and Two Speed fan operation. These setpoints can be manipulated through the Symbio 700 user interface (including the Symbio Service and Installation app) or through a connected BAS if required.

Figure 24. Supply Fan speed setpoints



Each setpoint operates as described below.

Supply Fan Maximum Speed Setpoint (Range: 67-100%, Default: 100%)

The Supply Fan Maximum Speed Setpoint correlates to the maximum reference setting in the VFD (defaulted to 60Hz from the factory). With the Supply Fan Maximum Speed Setpoint at its default value of 100%, and parameter 6-15 in the VFD at its default value of 60Hz, the maximum VFD output will be 60Hz. If the user chooses to reduce the Supply Fan Maximum Speed Setpoint, it will effectively reduce the maximum VFD output from its configured value. See the example below:

Example:

Parameter 6-15 in the VFD = 60Hz

Supply Fan Maximum Speed Setpoint = 80%

Effective Supply Fan Maximum VFD Output = 80% x 60Hz =48Hz

The VFD is preset from the factory to a default of 25 Hz for the lower limit and does not need to be reprogrammed.

Supply Fan Minimum Speed Setpoint (Range: 0-100%, Default: 0%)

The Supply Fan Minimum Speed Setpoint correlates to the minimum reference setting in the VFD (25Hz from the factory). With the Supply Fan Minimum Speed Setpoint at its default value of 0%, and parameter 6-14 in the VFD at its default value of 25hz, the minimum VFD output will be 25Hz. If the user chooses to increase the supply Fan Minimum Speed Setpoint, it will effectively increase the minimum VFD output from its configured value, up to the Effective Supply Fan Maximum VFD Output as determined by the Supply Fan Maximum Speed Setpoint. See the example below:

Example:

Parameter 6-14 in the VFD = 25Hz

Effective Supply Fan Maximum VFD Output (based on Supply Fan Maximum Speed Setpoint) = 60Hz

Supply Fan Minimum Speed Setpoint = 50%

Effective Supply Fan Minimum VFD Output =

(Effective Supply Fan Maximum VFD Output – VFD Parameter 6-14) x 50% + 25Hz = 42.5Hz

Table 7. Maximum fan speed setpoints and effective supply fan maximum VFD output

When VFD Parameter 6-15 = 60Hz			
Supply Fan Maximum Speed Setpoint	**Effective Supply Fan Maximum VFD Output (Hz)**	**Supply Fan Maximum Speed Setpoint**	**Effective Supply Fan Maximum VFD Output (Hz)**
100%	60	83%	49.8
99%	59.4	82%	49.2
98%	58.8	81%	48.6
97%	58.2	80%	48
96%	57.6	79%	47.4
95%	57	78%	46.8
94%	56.4	77%	46.2
93%	55.8	76%	45.6
92%	55.2	75%	45
91%	54.6	74%	44.4
90%	54	73%	43.8
89%	53.4	72%	43.2
88%	52.8	71%	42.6
87%	52.2	70%	42
86%	51.6	69%	41.4
85%	51	68%	40.8
84%	50.4	67%	40.2

Table 8. Minimum VFD speed ranges

Effective Supply Fan Maximum VFD Output (Hz)	Minimum Speed Range (60 Hz)		Effective Supply Fan Maximum VFD Output (Hz)	Minimum Speed Range (60 Hz)	
	Min	Max		Min	Max
60	25	60	49.8	25	49.8
59.4	25	59.4	49.2	25	49.2
58.8	25	58.8	48.6	25	48.6
58.2	25	58.2	48	25	48
57.6	25	57.6	47.4	25	47.4
57	25	57	46.8	25	46.8
56.4	25	56.4	46.2	25	46.2
55.8	25	55.8	45.6	25	45.6
55.2	25	55.2	45	25	45
54.6	25	54.6	44.4	25	44.4
54	25	54	43.8	25	43.8
53.4	25	53.4	43.2	25	43.2
52.8	25	52.8	42.6	25	42.6
52.2	25	52.2	42	25	42
51.6	25	51.6	41.4	25	41.4
51	25	51	40.8	25	40.8
50.4	25	50.4	40.2	25	40.2

Symbio™ Condenser Configuration Management

The Symbio™ 700 controller in the Odyssey condenser must be properly configured to integrate appropriately with various air handler configurations. As shipped from the factory, the Symbio 700 in the condenser is configured to be integrated with a single-speed, constant volume air handler. If the air handler paired with the condenser is a two-speed or SZVAV configuration, the Symbio 700 configuration must be updated in the condenser. This configuration update can be made through either of the user interfaces on the Symbio 700, including the Mobile Service and Installation app.

Two-Speed Air Handler Systems

To configure the Symbio 700 for two-speed air handler systems use the following steps and refer to through :

1. In the Mobile Service and Installation app, tap **Settings**.
2. Tap **Configuration**.
3. Tap **Edit**.
4. Tap **Indoor Fan Type**.
5. Select **Multi Speed**.
6. Tap **Apply**.
7. Verify that all settings are correct.

Figure 25. Edit configuration

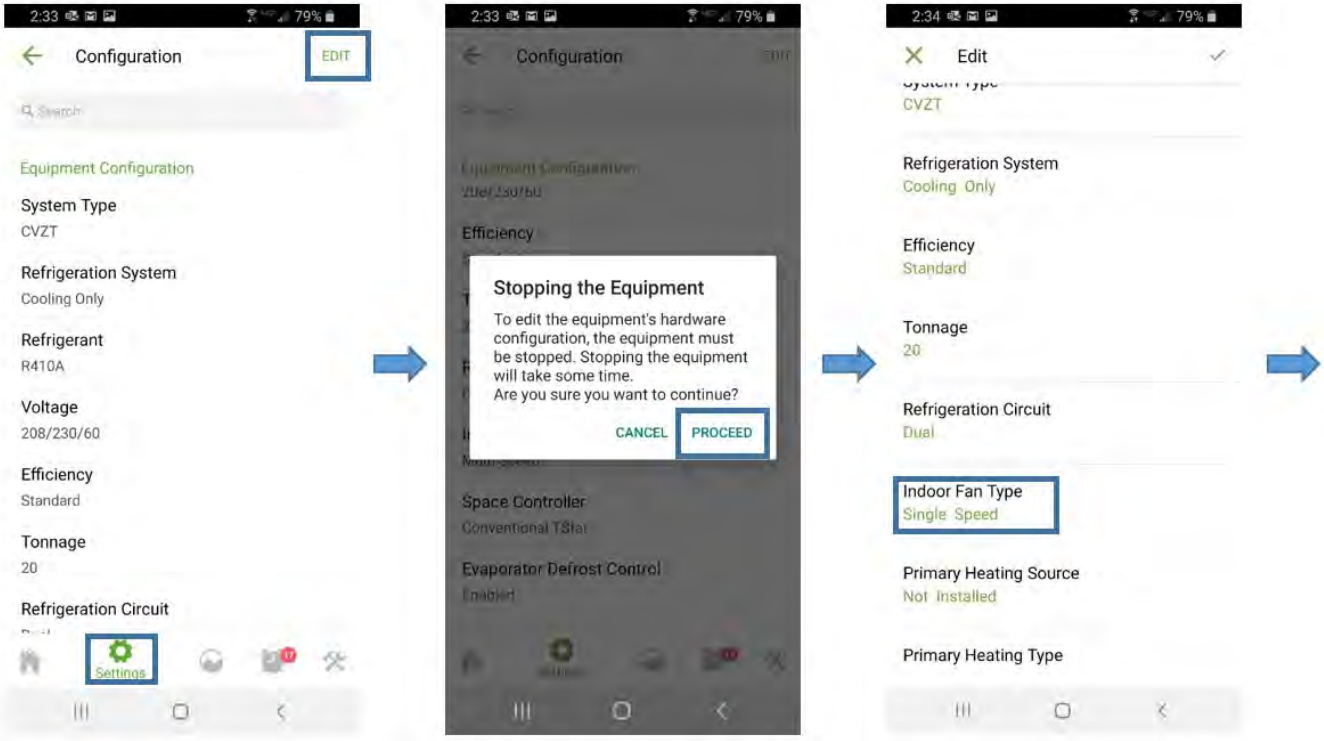


Figure 26. Select multi speed and apply changes

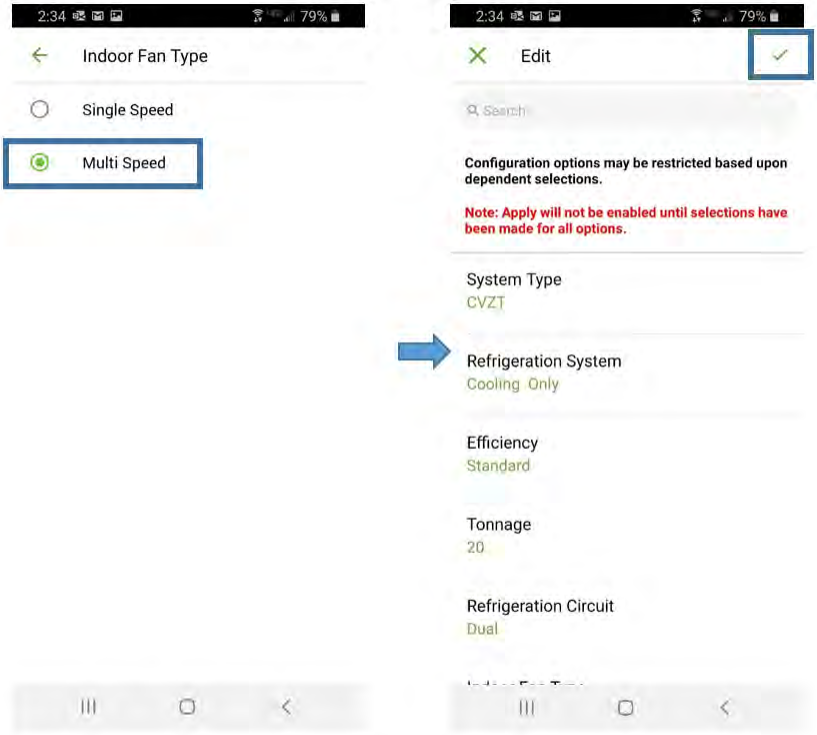
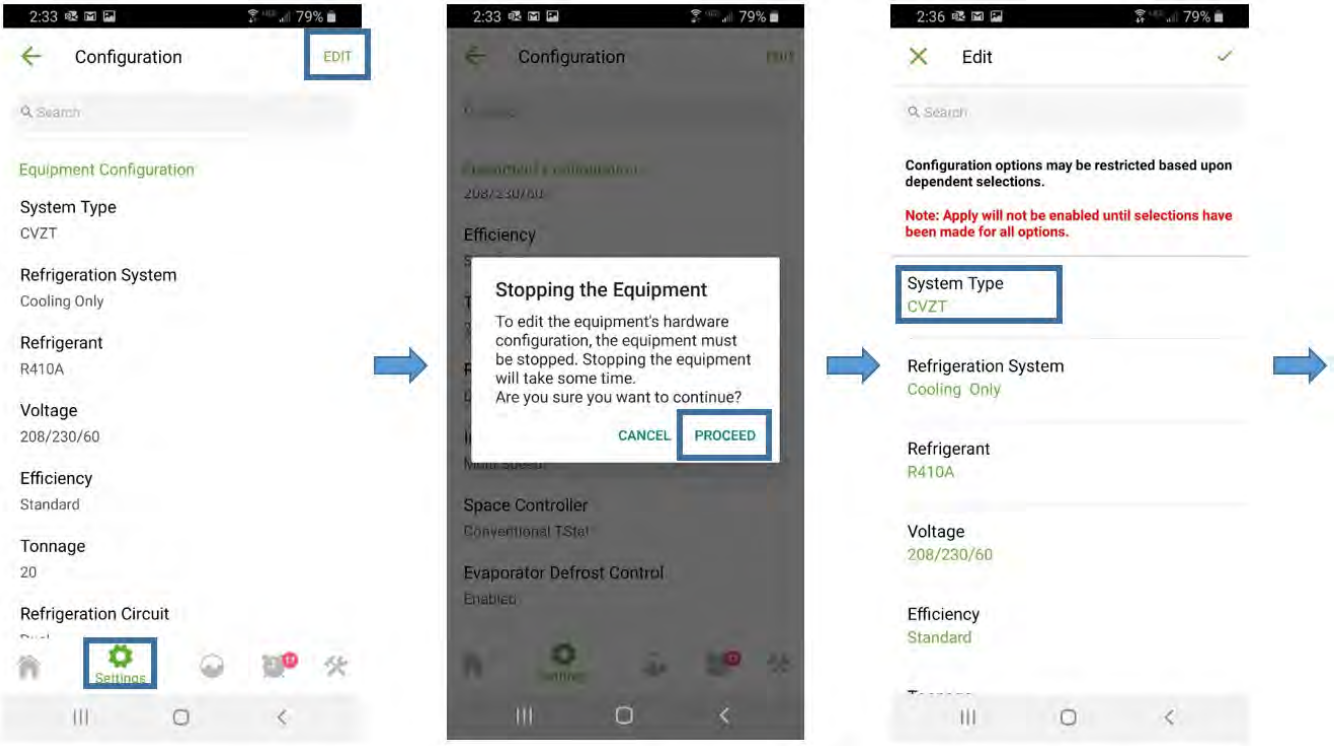


Figure 27. Verify changes



Figure 28. Edit configuration



SZVAV Air Handler Systems

To configure the Symbio 700 for SZVAV air handler systems use the following steps and refer to through Figure 30, p. 42:

1. In the Mobile Service and Installation app, tap **Settings**.
2. Tap **Configuration**.
3. Tap **Edit**.
4. Tap **System Type**.
5. Select **VVZT**.
6. Tap **Apply**.
7. Verify that all settings are correct.

Figure 29. System type

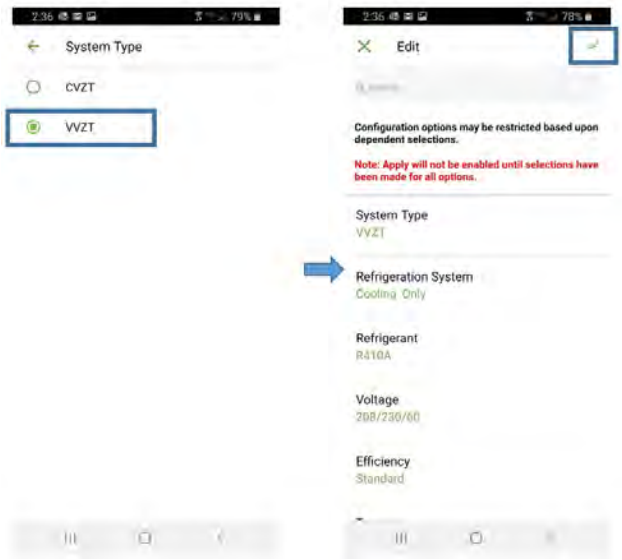


Figure 30. Verify changes



Field Installed Electric Heat Kits

When Electric Heat Kits are installed into an Odyssey Air Handler paired with a Symbio 700 controlled condenser, configure the Symbio 700 controller so that the electric heat control sequences and output signals will be generated. Use the following steps and refer to through .

1. In the Mobile Service and Installation app, tap **Settings**.
2. Tap **Configuration**.
3. Tap **Edit**.
4. Tap **Primary Heating Source**.
5. Tap **Electric**.
6. Tap **Primary Heating Source**.
7. Select **1 or 2**.
8. Tap **Apply**.
9. Verify that all settings are correct.

Figure 31. Edit configuration

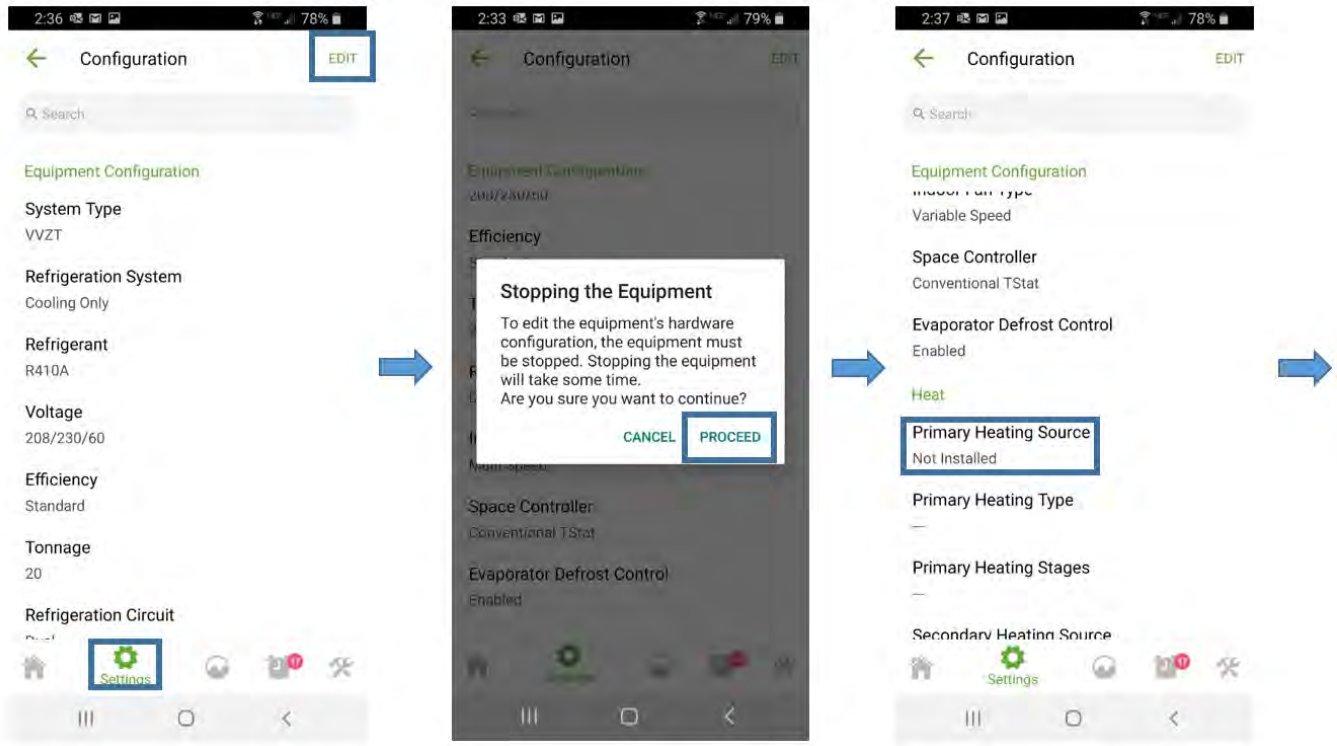


Figure 32. Select primary heating source

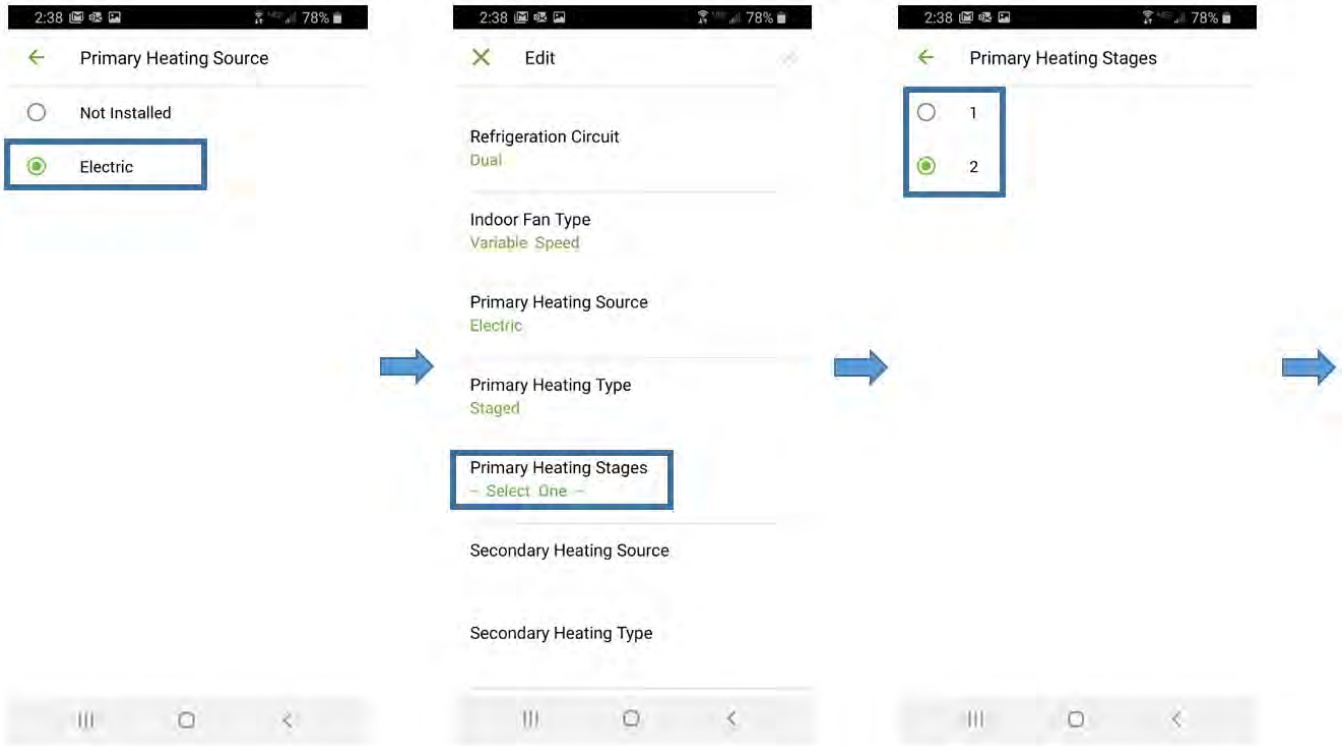


Figure 33. Apply edits

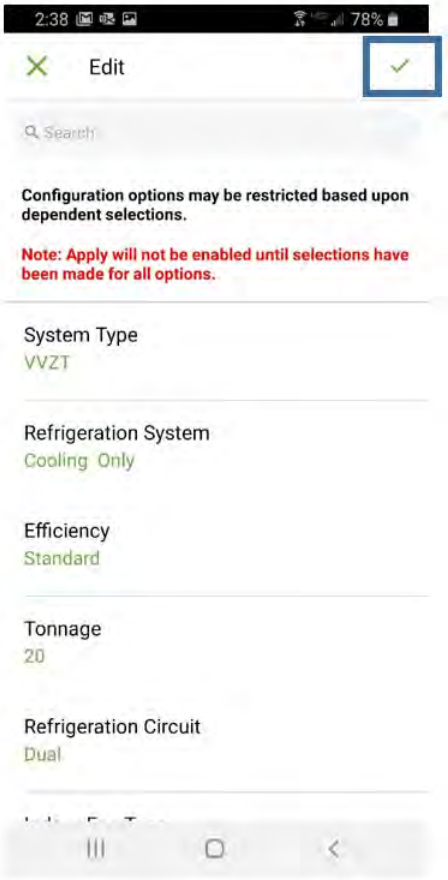
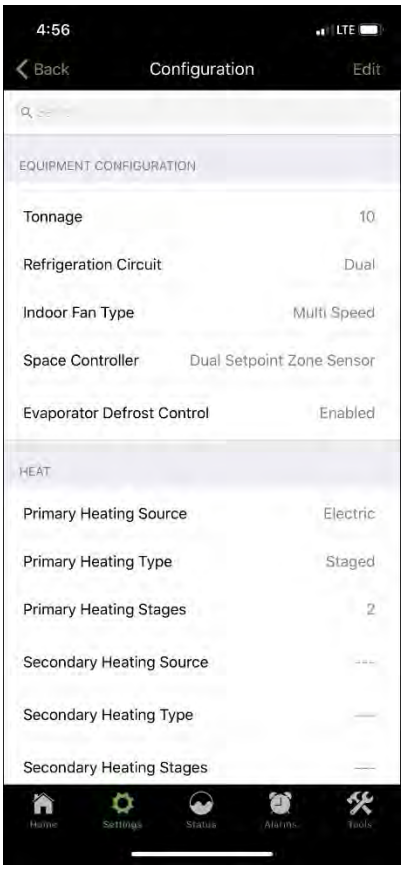


Figure 34. Verify changes



Electric Heat as Secondary Heat (Heat Pump Systems)

To configure Electric Heat as Secondary Heat (Heat Pump Systems) use the following steps and refer to Figure 35, p. 45 through Figure 38, p. 47:

1. In the Mobile Service and Installation app, tap **Settings**.
2. Tap **Configuration**.
3. Tap **Edit**.
4. Tap **Secondary Heating Source**.
5. Tap **Electric**.
6. Tap **Secondary Heating Source**.
7. Select **1 or 2**.
8. Tap **Apply**.
9. Verify that all settings are correct.

Figure 35. Edit configuration

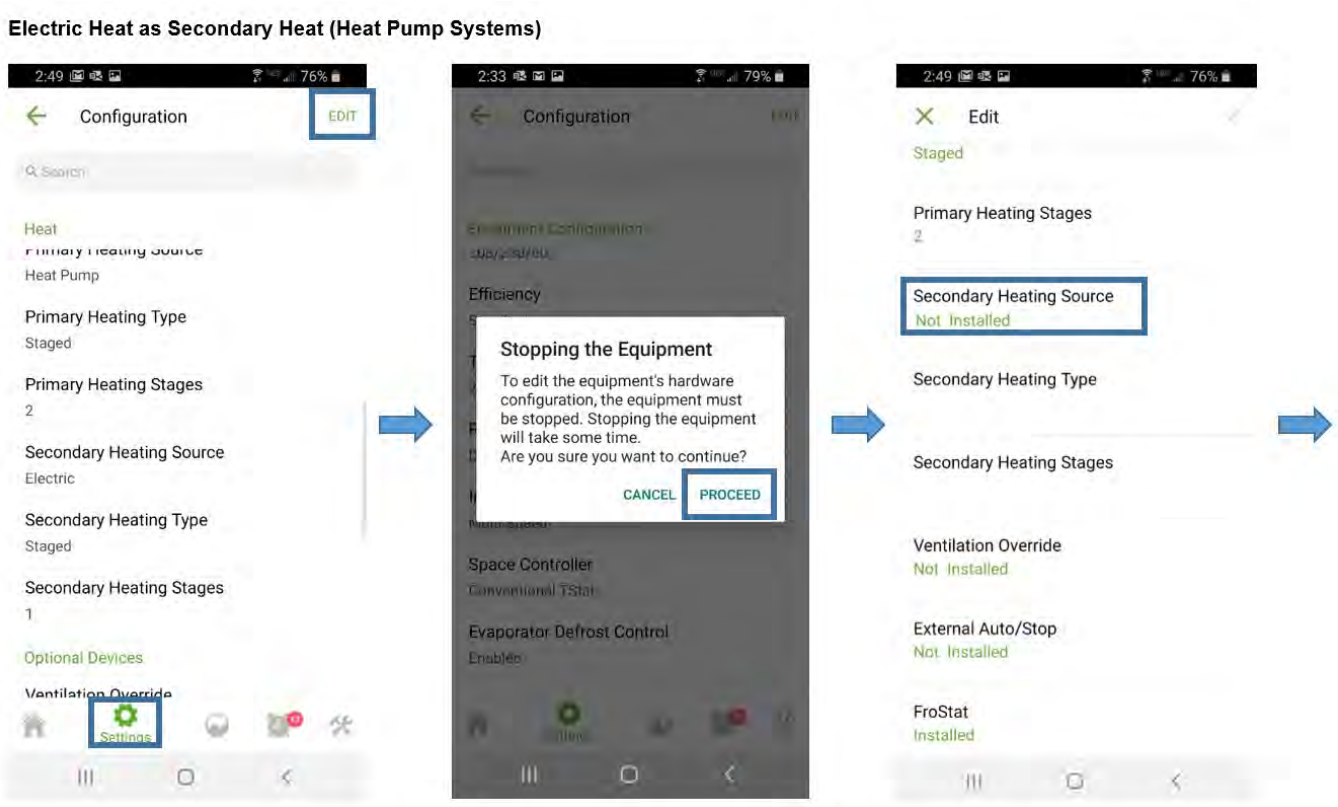


Figure 36. Select secondary heating source

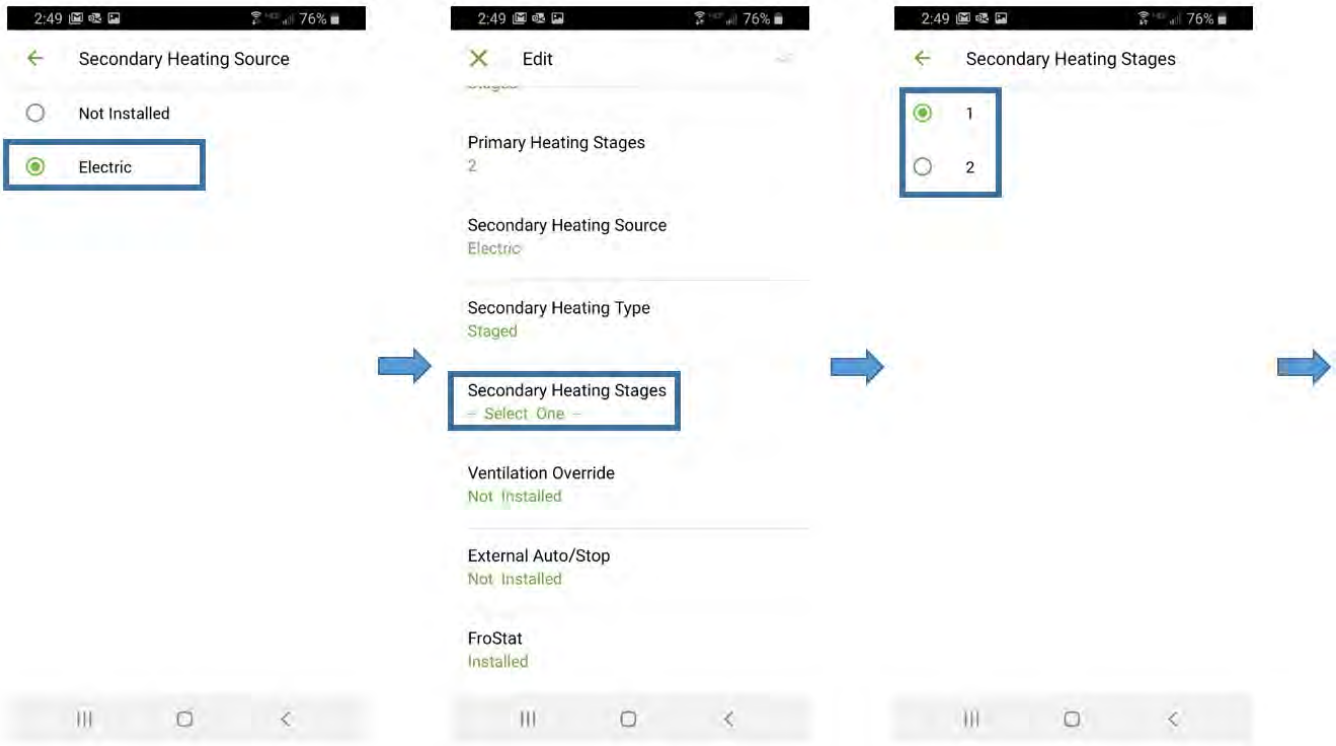


Figure 37. Apply changes

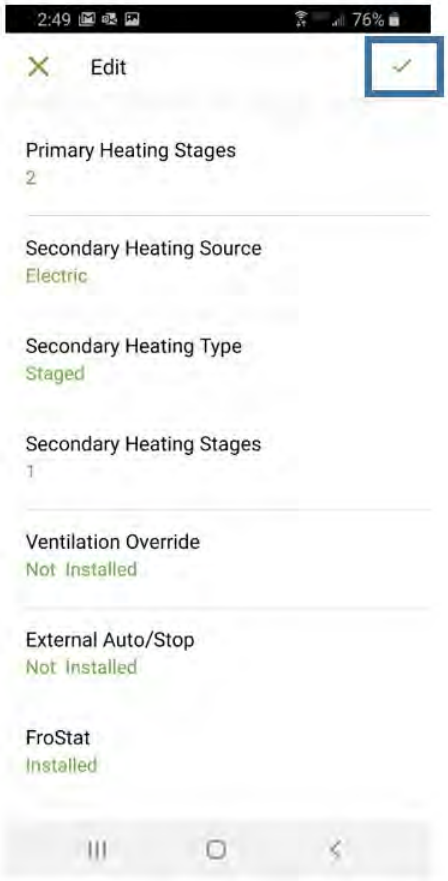
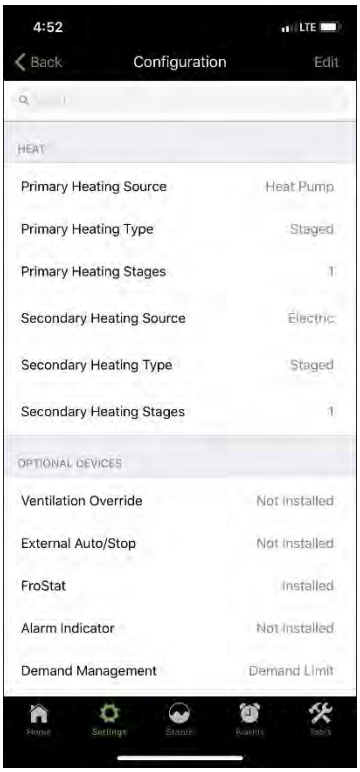


Figure 38. Verify changes



Troubleshooting

⚠ WARNING

Live Electrical Components!

Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

When it is necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks.

Refer to the latest version of the Symbio™ 700 Controller with Odyssey Split Systems Applications Guide (ACC-APG001*-EN) for details on troubleshooting the control system.

Leak Detection System

Note: *The leak detection system referenced in this document refers specifically to a matched system containing only a TTA/TWE matched combination. If the installed system utilizes condensing units or AHUs other than listed above, it is the installers responsibility to ensure all necessary leak detection system hardware and communication is provided and installed for safe equipment installation and operation.*

The leak detection sensor offers a visual diagnostic status in the form of one green and one red LED to indicate diagnostic error state.

Table 9. Leak detection system LED status

State	Green LED	Red LED
Power up initiate	ON	OFF
Failure resulting in a 'Power-UP Self-Test' Fail-safe State	ON	ON
Warm Up Delay	ON	OFF
Normal Runtime Mode	Heartbeat	OFF
LFL Alarm	OFF	ON
Failure resulting in a Fail-safe State	OFF	Blinking
Near end of life	Blinking	Heartbeat
Warning	ON	Heartbeat

Maintenance

Perform all of the indicated maintenance procedures at the intervals scheduled. This will prolong the life of the unit and reduce the possibility of costly equipment failure.

Fan Belt Adjustment

⚠ WARNING

Rotating Components!

Failure to disconnect power before servicing could result in rotating components cutting and slashing technician which could result in death or serious injury.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Indoor fan can rotate unexpectedly if Air Handler has high voltage power and any Leak Detection Sensor is disconnected.

The fan belts must be inspected periodically to assure proper unit operation. Replacement is necessary if the belts appear frayed or worn.

When removing or installing the new belts, do not stretch them over the sheaves. Loosen the belts using the belt tension adjustment bolts on the motor mounting base.

Once the new belts are installed, using a Browning or Gates tension gauge (or equivalent), adjust the belt tension as follows:

1. To determine the appropriate belt deflection:
   a. Measure the center-to-center shaft distance (in inches) between the fan and motor sheaves.
   b. Divide the distance measured in Step 1a by 64; the resulting value represents the amount of belt deflection that corresponds to the proper belt tension.
2. Set the large O-ring on the belt tension gauge at the deflection value determined in Step 1b.
3. Set the small O-ring at zero on the force scale of the gauge plunger.
4. Place the large end of the gauge at the center of the belt span; then depress the gauge plunger until the large O-ring is even with the top of the next belt or even with a straightedge placed across the fan and motor sheaves.
5. Remove the belt tension gauge. The small O-ring now indicates a number other than zero on the plunger force scale. This number represents the force (in pounds) required to give the needed deflection.
6. Compare the force scale reading (Step 5) with the appropriate force value listed in the Belt tension table. If the force reading is outside the range, readjust the belt tension.

   Note: *Actual belt deflection force must not exceed the maximum force value shown in Figure 39, p. 49.*

   Recheck the belt tension at least twice during the first 2 to 3 days of operation. Belt tension may decrease until the new belts are **run in**.

Figure 39. Belt tension gauge

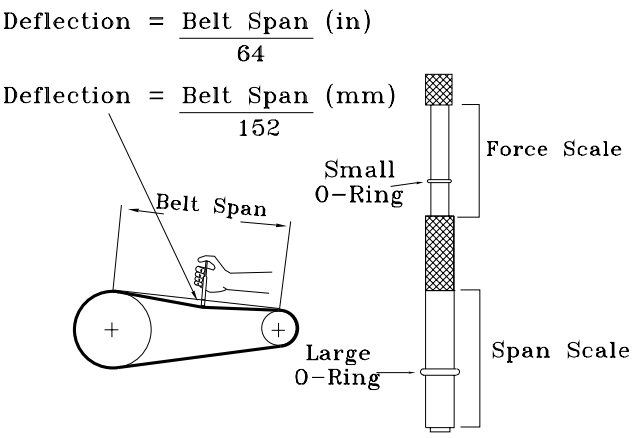


Table 10. Belt tension measurement and deflection

Belts Cross Section	Small Pitch Diameter Range	Deflection Force (Lbs)			
		Standard V-Belt		V-Belt with Molded Notches	
		Min.	Max.	Min.	Max.
A	3.0 - 3.6	3	4-1/2	3-7/8	5-1/2
	3.8 - 4.8	3-1/2	5	4-1/2	6-1/4
	5.0 - 7.0	4	5-1/2	5	6-7/8
B	3.4 - 4.2	4	5-1/2	5-3/4	8
	4.4 - 5.6	5-1/8	7-1/8	6-1/2	9-1/8
	5.8 - 8.8	6-3/8	8-3/4	7-3/8	10-1/8

Monthly

The following warning complies with State of California law, Proposition 65.

⚠ WARNING

Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

NOTICE

Operating Under Vacuum!

Failure to follow these instructions will result in compressor failure.

Do not operate or apply power to the compressor while under a vacuum.

⚠ WARNING

Fiberglass Wool!

Exposure to glass wool fibers without all necessary PPE equipment could result in cancer, respiratory, skin or eye irritation, which could result in death or serious injury. Disturbing the insulation in this product during installation, maintenance or repair will expose you to airborne particles of glass wool fibers and ceramic fibers known to the state of California to cause cancer through inhalation.

You MUST wear all necessary Personal Protective Equipment (PPE) including gloves, eye protection, a NIOSH approved dust/mist respirator, long sleeves and pants when working with products containing fiberglass wool.

Precautionary Measures:

- **Avoid breathing fiberglass dust.**
- **Use a NIOSH approved dust/mist respirator.**
- **Avoid contact with the skin or eyes. Wear long-sleeved, loose-fitting clothing, gloves, and eye protection.**
- **Wash clothes separately from other clothing; rinse washer thoroughly.**
- **Operations such as sawing, blowing, tear-out, and spraying may generate fiber concentrations requiring additional respiratory protection. Use the appropriate NIOSH approved respirator.**

First Aid Measures:

- **Eye Contact - Flush eyes with water to remove dust. If symptoms persist, seek medical attention.**
- **Skin Contact - Wash affected areas gently with soap and warm water after handling.**

Conduct the following maintenance inspections once per month:

- ☐ Inspect air filters and clean (or replace) if necessary.
- ☐ Check unit wiring to ensure all connections are tight and that the wiring insulation is intact.
- ☐ Check drain pans and condensate piping to insure they are free of obstacles.
- ☐ Manually rotate the indoor fan to ensure proper operation.
- ☐ Inspect the evaporator coils for dirt and debris. If the coils appear dirty, clean them.
- ☐ Observe indoor fan operation and correct any unusual or excessive vibration. Clean blower wheels as needed.

Annually (Cooling Season)

The following maintenance procedures must be performed at the beginning of each cooling season to ensure efficient unit operation:

- ☐ Perform all of the monthly maintenance inspections.
- ☐ With the unit operating, check unit superheat and record the reading in the “Maintenance Log,” p. 52.
- ☐ Remove any accumulation of dust and/or dirt from the unit casing.
- ☐ Remove corrosion from any surface and repaint. Check the gasket around the control panel door to ensure it fits correctly and is in good condition to prevent water leakage.
- ☐ Inspect the evaporator fan belt. If it is worn or frayed, replace it.
- ☐ Inspect the control panel wiring to ensure that all connections are tight and that the insulation is intact.
- ☐ Check refrigerant piping and fittings for leaks.
- ☐ Inspect the evaporator coils for dirt and debris. If the coils appear dirty, clean them.

Coil Cleaning

Regular coil maintenance, including annual cleaning-enhances the unit's operating efficiency by minimizing:

- compressor head pressure and amperage draw
- water carryover
- fan brake horsepower
- static pressure losses

At least once each year — or more often if the unit is located in a **dirty** environment — clean the coil using the instructions outlined below. Be sure to follow these instructions as closely as possible to avoid damaging the coils.

Maintenance Log

Date	Ambient Temp. (°F)	Evaporator Entering Air		Compressor				Superheat (°F) (at compressor)		Subcooling (°F) (at liquid line)	
		Dry Bulb	Wet Bulb	Suction Pressure		Discharge Pressure		Circuit #1	Circuit #2	Circuit #1	Circuit #2
				(C1)	(C2)	(C1)	(C2)				

Wiring Diagram Matrix and Device Location

Table 11. Wiring schematics and device location

Part Number	Description	Applicability
Wiring Schematics		
1213-4779	Schematics; TWE - SZVAV/2-Speed Fan	All TWE Units with Digit 15 = "D"
1213-4777	Schematics; TWE - Constant Volume (3-Phase)	All TWE Units with Digit 8 = 3, 4, W and Digit 15 = "1"
1213-4778	Schematics; TWE - 2 Speed Fan	All TWE Units with Digit 15 = "C"
1213-4776	Schematics; TWE - Constant Volume (1-Phase)	All TWE Units with Digit 8 = 1
Device Location		
1213-4821	Device Location; TWE - SZVAV/2-Speed	All TWE Units with Digit 15 = "C" or "D"
1213-4822	Device Location; TWE - Constant Volume	All TWE Units with Digit 15 = "1"

Warranty

Central Air Conditioner

This warranty is extended by Trane to the original purchaser and to any succeeding owner of the real property to which the Air Conditioner is originally affixed, and applies to products purchased and retained for use within the U.S.A. and Canada. There is no warranty against corrosion, erosion or deterioration.

Warrantor warrants for a period of 12 months from initial start-up or 18 months from date of shipment, whichever is less, that the products covered by this warranty (1) are free from defects in material and manufacture, and (2) have the capacities and ratings set forth in catalogs and bulletins; provided, that no warranty is made against corrosion, erosion or deterioration. Warrantor's obligations and liabilities under this warranty are limited to furnishing, F.O. B. factory replacement parts (or equipment at the option of Warrantor) for all Warrantor's products not conforming to this warranty. Warrantor shall not be obligated to pay for the cost of lost refrigerant. No liability whatever shall attach to Warrantor until said products have been paid for and then said liability shall be limited to the purchase price of the equipment shown to be defective.

THE WARRANTY AND LIABILITY SET FORTH HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, WHETHER IN CONTRACT OR IN NEGLIGENCE, EXPRESS OR IMPLIED, IN LAW OR IN FACT, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR USE, AND IN NO EVENT SHALL WARRANTOR BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Some states do not allow limitations on how long an implied warranty lasts or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Trane, 2701 Wilma Rudolph Blvd., Clarksville, TN 37040-1008 Attention: Manager, Product Service TW-338-0597

*This warranty is for commercial usage of said equipment and not applicable when the equipment is used for a residential application. Commercial use is any application where the end purchaser uses the product for other than personal, family or household purposes.

Trane and American Standard create comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit trane.com or americanstandardair.com.

Trane and American Standard have a policy of continuous product and product data improvement and reserve the right to change design and specifications without notice. We are committed to using environmentally conscious print practices.

SS-SVX016C-EN 28 Feb 2025
Supersedes SS-SVX016B-EN (January 2025)

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ELIMINATING CORROSION, ONE JOB AT A TIME



SURFSIL

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SURFSIL

Choosing the Right Solution for the Job

Choosing the most appropriate coil coating for the application could save the project thousands of dollars and eliminate repeat treatments. Choosing the wrong coil coating could reduce heat transfer properties and lead to higher energy bills, premature failure, and unnecessary costs.

Description of Solution

SURFSIL is a hybrid compound using the latest nano-silane technology to incorporate organic and inorganic properties allowing the coating to chemically adhere to the substrate (ig metal) via a covalent bond. This technology has allowed us to design a solution tailored specifically for the HVAC/R industry and has proven its performance, showing NO SIGN OF CORROSION after 10,008 hours of testing following the ASTM B-117 Salt Spray (Fog) Standard.

Durability

- Chemically bonded - does not allow corrosion to grow under the coating
- Flexible and scratch resistant - it will not crack or peel off
- Resistant to chemicals found in HVAC/R environments

Energy Savings

- Thin DFT (dry film thickness) – no bridging & will not insulate unit
- Preserves original equipment efficiency throughout its life time
- Improves heat transfer by filling microcavities

Improves Indoor Air Quality

- Hydrophobic surface – inhibits mold and bacteria growth
- Seals HVAC/R components from the environment

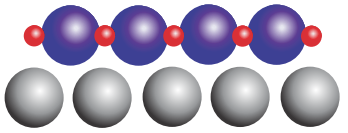
Reduce Equipment Replacement Costs

- Extends the useful life of HVAC/R equipment
- No harsh chemicals required for maintenance
- 5 year standard warranty with an option for a 10 year extended warranty

How it Works

PROBLEM

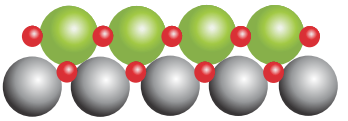
Mechanical Bonding



All epoxy, phenolic, and polymer based coatings adhere to the surface via mechanical bonding and attach to the micro-imperfections of the surface. This bonding results in a lower adhesion strength. Combining this flaw with the added pressure created by corrosion (~ 2,200 psi), the coating can start to blister or peel off the surface of the substrate.

SOLUTION

Chemical Bonding



Chemical bonding provides unmatched surface adhesion. **SURFSIL** chemically (covalently) bonds with the substrate and cures with an adhesion strength of over 4,000 psi to become, in a sense, a NEW material.

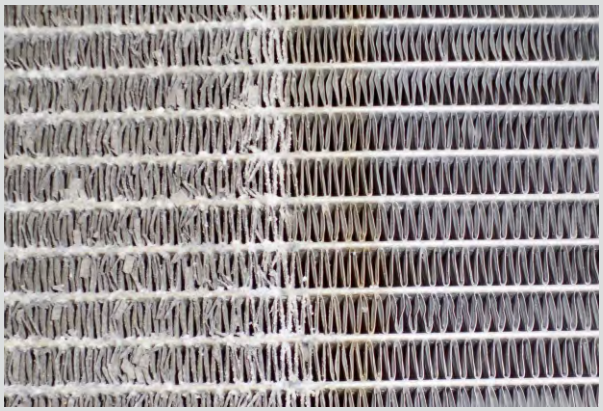
Which Side Would You Like Your Coil to Look Like?

PROBLEM / SOLUTION



Test performed for 5,000 hours using ASTM G85 A3 (a more aggressive, modified ASTM B117 using acidified sea water). The image above compares the performance of a bare coil, half of which has been treated with SURFSIL and half left untreated.

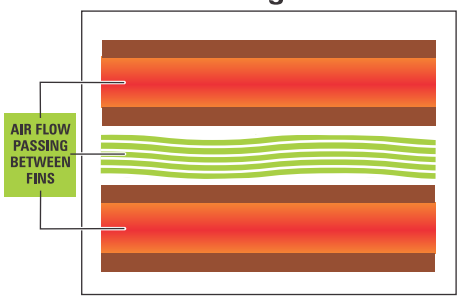
PROBLEM / SOLUTION



As the image above shows, even the micro-channel coils tested, using the ASTM G85 A3, shows how our intelligent coating design is able to penetrate into all the cavities of the coil, essentially sealing it from its environment and protecting it from corroding.

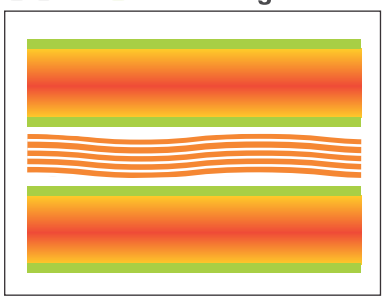
Heat Transfer

Thick Coating



Thicker coatings can increase your energy consumption up to 3-5% instantly, which raises cost, over works the unit, and most importantly, decreases equipment capacity leading to a reduction of space comfort.

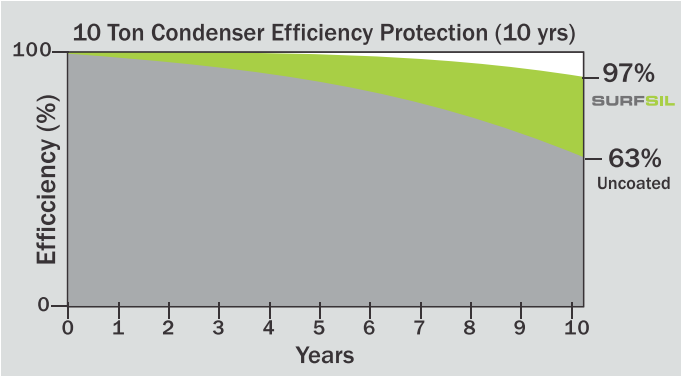
SURFSIL Coating



With a thickness of 0.5 mils and its silane properties, SURFSIL will negligibly affect heat transfer properties, keep energy costs down, and allow the unit to work as efficiently as it was designed to be.

Energy Savings

Based on studies conducted by FPL and other power companies, HVAC/R equipment lose an average 5% in heat transfer properties each year due to environmental deterioration. This percentage fluctuates with different environmental variables and in fact, most units will fail within ten years due to high pressure refrigerant alarm (a unit cannot properly function at an efficiency of 63%).



By applying SURFSIL, you will not only lower energy consumption and extend the equipment's life-span, you will also more than payback your initial investment to protect the unit from corrosion!

PAYBACK WITHIN 3 YEARS OF INVESTMENT!

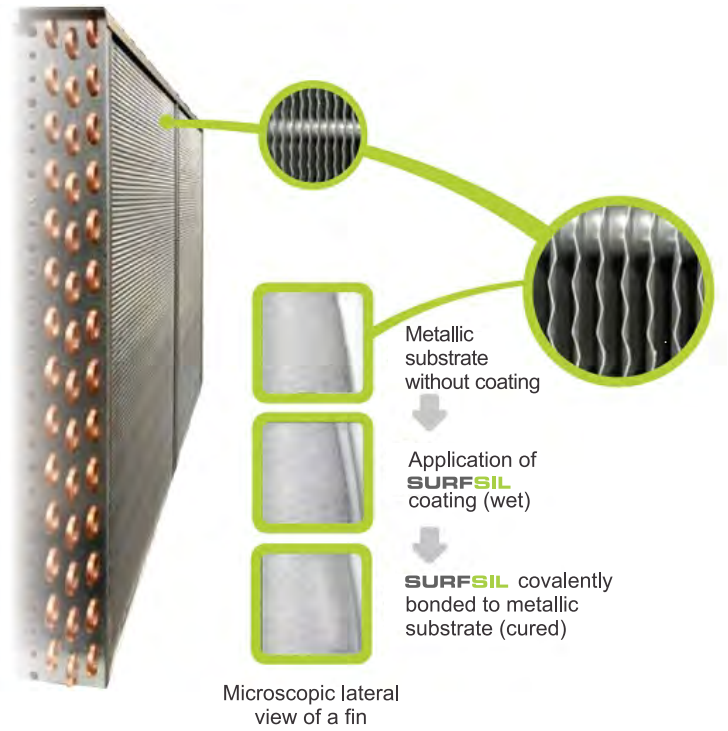
Energy Savings Table:

Savings of a 10-ton Condensing Unit				
Yr	$0.15/kwh	$0.20/kwh	$0.25/kwh	$0.30/kwh
1	~	~	~	~
2	$96.30	$128.40	$160.50	$192.60
3	$199.34	$265.79	$332.24	$398.68
4	$309.50	$412.66	$515.83	$619.00
5	$427.17	$569.56	$711.95	$854.34
6	$552.76	$737.02	$921.27	$1,105.53
7	$686.73	$915.63	$1,144.54	$1,373.45
8	$829.51	$1,106.02	$1,382.52	$1,659.02
9	$981.61	$1,308.81	$1,636.01	$1,963.21
10	$1,143.52	$1,524.69	$1,905.86	$2,287.03
Tot	$5,226.43	$6,968.57	$8,710.72	$10,452.86

LIFE TIME SAVINGS!

Characteristics Table

SURFSIL Characteristics	
Color	Clear, Glossy
Dry Film Thickness	10-15 microns
Temperature Range	-100˚F-1,000˚F



Microscopic lateral view of a fin

Test Performed

CORROSION & ULTRA-VIOLET RESISTANCE		HOURS TESTED
ASTM B117	SALT WATER (FOG) TEST	10,008 (No Sign of Corrosion)
ASTM G85	ACIDIFIED SEA WATER TEST	10,008 (No Sign of Corrosion)
ASTM D5894	CYCLIC SALT FOG/UV EXPOSURE TEST	6,048 (No Sign of Damage)
ASTM G154	ACCELERATED WEATHERING/UV EXPOSURE	1,008 (No Sign of Damage)

ABRASION, IMPACT RESISTANCE & FLEXIBILITY		RESULTS
ASTM D2794	RESISTANCE OF COATINGS TO IMPACT	39.56 lb/in^2 Without Peeling or Cracking
ASTM D522	MANDREL BEND TEST	No Peeling or Cracking
ASTM D3359	ADHESION BY TAPE TEST	(5B) 0% Removed
ASTM D3363	PENCIL HARDNESS TEST	5H

MOLD & BACTERIA RESISTANCE		RESULTS
ASTM G21	RESISTANCE OF MATERIALS TO FUNGI, MOLD, ETC	Pass

Authorized Dealer Contact Information

advancoat
CORROSION SPECIALISTS

Authorized Distributors

U.S.A.
Mailing Address:
7050 W Palmetto Park Road
Suite # 15-555
Boca Raton, FL 33433

SHIPPING ADDRESS
7900 NW 68 Street
Miami, FL 33166
Phone: 561-367-0320
Fax: 305-647-0786
Mobile: 305-790-9925

MEXICO
Av. Prolongación Alamos 47-2
Santiago Occipaco,
Naucalpan Estado de México,
C.P. 53250
Phone: 554-612-4112

SHIPPING ADDRESS
Prol. Circuito La Carambada S/N
Col. Modelo
Querétaro, Qro.
C.P. 76206
Mexico

SURFSIL

Coil & Fin Clear Protective Treatment

R-5 CLEANING INSTRUCTIONS

Proper periodic post cleaning of the coils will help maintain the original efficiency of the HVAC/R unit for a prolonged period of time. It is required that units protected with **SURFSIL™** is cleaned at least every 60 days by following the manufacturer's recommended cleaning instructions.

CLEANING INSTRUCTIONS:

- Always wear safety gear for protection.
- Disconnect power to the unit to avoid electrical shock.
- Disassemble the unit to have access to the coil from both sides.
- USE ONLY TAP WATER. Only in cases where tap water will not remove the dirt on the coil, you may use PLC-1 cleaner diluted at a ratio of 1 part cleaner to 20 parts water.
- Apply the cleaner liberally on both sides of the coils with the "Detergent Application System" as recommended by the manufacturer.*
- Wait 3-5 minutes before rinsing the unit with clean water. Do not allow the detergent to dry on the coil before rinsing. If that happens, reapply more detergent and rinse it before it dries.
- Rinse both sides of the coil with liberal quantities of clean water. It is preferred to rinse the inside surface of coil first to "push out" the dirt and debris that accumulated on the outer surface of the coil.
- Assemble the unit.
- Reconnect power to the unit.
- Record the cleaning maintenance service call by filling out the quarterly maintenance form at: **http://www.advancoat.com/warranty.html**



Apply detergent



Wait 3-5 minutes



Rinse with clean water

IMPORTANT:

- DO NOT USE OTHER DETERGENTS/CLEANERS:
  - The use of harsh coil cleaners over a period of time may deteriorate the protective layer.
- Do not use a high pressure washer.
- Always disconnect the power to the unit before performing any work.
- Always wear safety gear for protection.

* Contact us for pricing and availability of the "Detergent Application System" and PLC-1

SURFSIL

Coil & Fin Clear Protective Treatment

5 YEAR LIMITED WARRANTY

Warranty Terms & Conditions

Standard Warranty: **Surfsil ™** provides a standard workmanship warranty on R5 coated coils against defects of the coating that occur due to failure of the coating or workmanship in the application of the coating for a period of five (5) years from the date of application. Should coating failure occur within the warranty period and is determined to be caused from exterior corrosion, or by improper application or workmanship, **Surfsil ™** agrees to either repair the coating at no additional cost to the customer, or to refund the original invoice amount, or recoat a replacement coil at no cost; **Surfsil ™** reserves the right to choose which of the 3 options is best applicable for each coil/equipment. For refund of the original invoice amount the coil must have a widespread corrosion over 25% of its face area. This warranty does not include protection from corrosive conditions other than those atmospheres which the coating has been formulated to protect against, nor from failure due to improper or lack of maintenance and care by the owner. **Surfsil ™** is to be notified by coil/equipment supplier when any problem is observed during a routine cleaning inspection. Warranty is issued to the coil/equipment supplier, not the end user.
User must adhere to coil maintenance practices and complete the online form quarterly maintenance form at **http://www.advancoat.com/warranty.html** Failure to complete and submit online this form within the quarterly period will result in this warranty being nullified. End User must follow Surfsil's *"Quarterly Maintenance Instructions Sheet"* provided with the coil/equipment as the guideline and must perform the proper maintenance and care every 3 months. End users may use only cleaning materials recommended and/or approved by **Surfsil ™**. Use of any materials applied by others or incompatible cleaning materials will void the warranty. Owner must not remove **Surfsil ™** identification tag attached to coil or equipment as it is required to process the warranty. If removed the warranty is void. All warranty claims must be submitted in a timely fashion to **Surfsil ™**. Timely means exercise of prudent judgment and observation of corrosion to allow sufficient time for corrective/preventive action to be taken.
Surfsil ™ will not accept claims where the end user has neglected the coil/equipment and places a complaint when the corrosion on the coil has reached a point that Is not repairable by re-coating.

If a coil fails due to corrosion in the fin pack and all conditions listed in the standard warranty are met, **Surfsil™** agrees to either repair the coating at no additional cost to the customer or recoat a replacement coil at no cost. Any warranty claim must be for corrosion that is significant across the general face area of the coil, as compared to minor cosmetic superficial wear/corrosion. Costs not covered are downtime, replacement equipment, cost of a replacement coil, refrigerant charge, freight, crane, installation labor, and temporary equipment rental.