Installation, Controls, and Start-up Instructions

IMPORTANT: Read the entire instruction manual before starting the installation.

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SAFETY CONSIDERATIONS

Installation and servicing of air-conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair, or service air-conditioning equipment.

Untrained personnel can perform basic maintenance functions of cleaning coils and filters and replacing filters. All other operations should be performed by trained service personnel. When working on air-conditioning equipment, observe precautions in the literature, tags and labels attached to the unit, and other safety precautions that may apply.

Follow all local building codes and appropriate national electrical codes (in USA, ANSI/NFPA 70, National Electrical Code (NEC); in Canada, CSA C22.1) for special requirements. Wear safety glasses and work gloves. Use quenching cloth for unbrazing operations. Have fire extinguisher available for all brazing operations.

It is important to recognize safety information. This is the safety-alert symbol ⚠. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, CAUTION, and NOTE. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices, which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

⚠ WARNING

PERSONAL INJURY AND ENVIRONMENTAL HAZARD

Failure to follow this warning could cause personal injury or death.

Relieve pressure and recover all refrigerant before system repair or final unit disposal.

Wear safety glasses and gloves when handling refrigerants. Keep torches and other ignition sources away from refrigerants and oils.

The following symbols may be seen on the equipment:

SYMBOL	CODE	MEANING
	GHS02: Flammable	Flammable gas
	ISO 7000-0790 (2004-01)	Read operator's manual.
	ISO 7000-1659 (2004-01)	Service indicator: read technical manual.
	ISO 7000-1641 (2004-01)	Operator's manual: operating instructions

⚠ WARNING

Before performing service or maintenance operations on unit, turn off main power switch to unit. Electrical shock could cause personal injury.

⚠ DANGER

Disconnect gas piping from units when leak testing at pressures greater than 0.5 psig. Pressures greater than 0.5 psig will cause gas valve damage resulting in a hazardous condition. If gas valve is subjected to pressure greater than 0.5 psig, it must be replaced. When pressure testing field-supplied gas piping at pressures of 0.5 psig or less, the unit connected to such piping must be isolated by manually closing the gas valve.

⚠ DANGER

Si vous sentez une odeur de gaz, n'essayez pas d'allumer un appareil. Ne touchez aucun interrupteur ou prise électrique. Évacuez immédiatement le bâtiment et appelez le fournisseur de gaz. Suivez les instructions du fournisseur de gaz. Si vous ne parvenez pas à joindre votre fournisseur de gaz, appelez les pompiers.

⚠ DANGER

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

⚠ WARNING

RISK OF FIRE OR EXPLOSION

If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Leave the building immediately.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

Installation and service must be performed by a qualified installer, service agency or the gas supplier.

⚠ AVERTISSEMENT

RISQUE D´INCENDIE OU D´EXPLOSION

Si les consignes de sécurité ne sont pas suivies à la lettre, cela peut entraîner la mort, de graves blessures ou des dommages matériels.

Ne pas entreposer ni utiliser d´essence ni autres vapeurs ou liquides inflammables à proximité de cet appareil ou de tout autre appareil.

QUE FAIRE SI UNE ODEUR DE GAZ EST DÉTECTÉE

- Ne mettre en marche aucun appareil.
- Ne toucher aucun interrupteur électrique; ne pas utiliser de téléphone dans le bâtiment.
- Quitter le bâtiment immédiatement.
- Appeler immédiatement le fournisseur de gaz en utilisant le téléphone d´un voisin. Suivre les instructions du fournisseur de gaz.
- Si le fournisseur de gaz n´est pas accessible, appeler le service d´incendie.

L´installation et l´entretien doivent être effectués par un installateur ou une entreprise d´entretien qualifié, ou le fournisseur de gaz.

⚠ WARNING

CARBON-MONOXIDE POISONING HAZARD

Failure to follow instructions could result in severe personal injury or death due to carbon-monoxide poisoning, if combustion products infiltrate into the building.

Check that all openings in the outside wall around the vent (and air intake) pipe(s) are sealed to prevent infiltration of combustion products into the building.

Check that furnace vent (and air intake) terminal(s) are not obstructed in any way during all seasons.

⚠ AVERTISSEMENT

RISQUE D'INTOXICATION AU MONOXYDE DE CARBONE

Si ces directives ne sont pas suivies, cela peut entraîner des blessures graves ou une intoxication au monoxyde de carbone pouvant causer la mort, si des produits de combustion s'infiltrent dans le bâtiment.

Vérifier que toutes les ouvertures pratiquées dans le mur extérieur autour du ou des tuyaux d'évent (et de la prise d'air) sont scellées de manière à empêcher l'infiltration de produits de combustion dans le bâtiment.

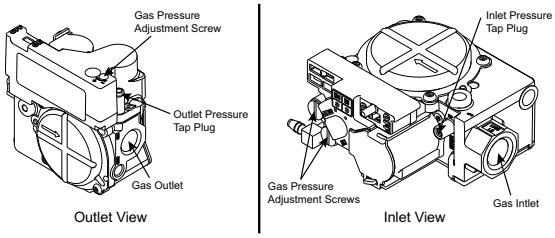
Veiller à ce que la ou les sorties de l'évent de l'appareil de chauffage (et la prise d'air) ne soient, en aucune façon, obstruées, quelle que soit la saison.

⚠ WARNING

FIRE HAZARD

Failure to follow this warning could result in severe personal injury and/or property damage.

Inlet and outlet pressure tap plugs must be tightened and 1/8 in. NPT pipe plug must be installed to prevent gas leaks.

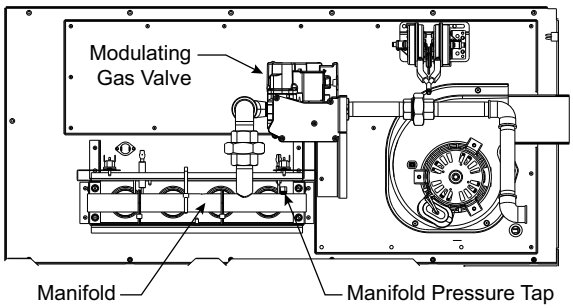


⚠ WARNING

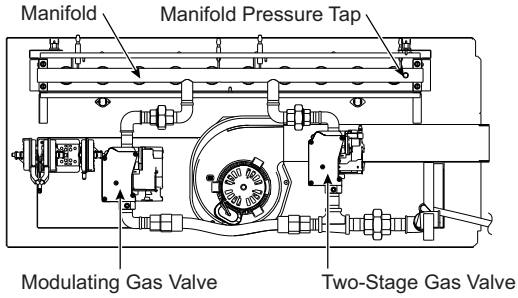
FIRE HAZARD

Failure to follow this warning could result in severe personal injury and/or property damage.

Manifold pressure tap set screw must be tightened and 1/8 in. NPT pipe plug must be installed to prevent gas leaks.



5:1 Turndown Unit — Typical Heat Assembly



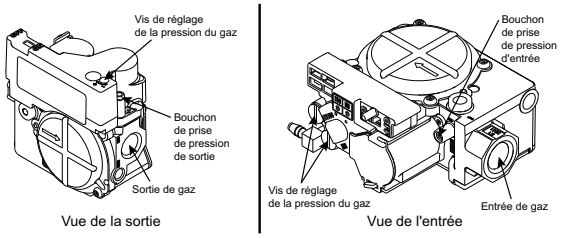
10:1 Turndown Unit — Typical Heat Assembly

⚠ ADVERTISSEMENT

RISQUE D'INCENDIE

Le non-respect de cet avertissement pourrait entraîner des blessures graves et/ou des dommages matériels.

Les bouchons des prises de pression d'entrée et de sortie doivent être serrés et un bouchon de tuyau NPT de 1/8 po doit être installé pour éviter les fuites de gaz.

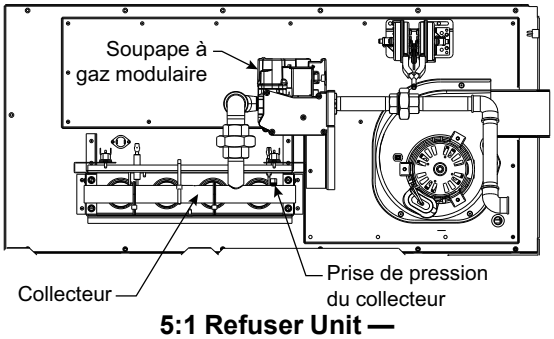


⚠ ADVERTISSEMENT

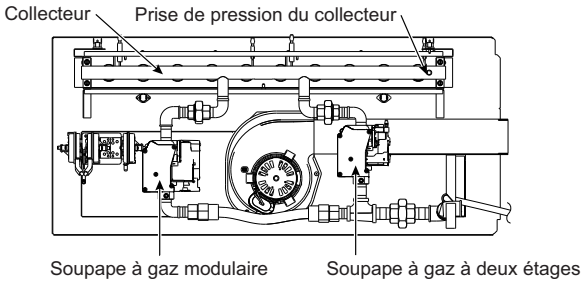
RISQUE D'INCENDIE

Le non-respect de cet avertissement pourrait entraîner des blessures graves et/ou des dommages matériels.

La vis de réglage du robinet de pression du collecteur doit être serrée et un bouchon de tuyau NPT de 1/8 po doit être installé pour éviter les fuites de gaz.



5:1 Refuser Unit — Assemblage Thermique Typique



10:1 Refuser Unit — Assemblage Thermique Typique

⚠ WARNING

ELECTRICAL SHOCK HAZZARD

Failure to follow this warning could result in personal injury or death.

Before performing installation, service, or maintenance on this unit, turn off the main power disconnect to the unit and install lock and lockout tag. Some equipment may have multiple power disconnects.

⚠ ADVERTISSEMENT

RISQUE DE CHOC ÉLECTRIQUE

Le non-respect de cet avertissement pourrait entraîner des blessures corporelles, voire la mort.

Avant d'effectuer l'installation, l'entretien ou la maintenance de cet appareil, coupez l'alimentation principale de l'appareil et installez des verrous et des étiquettes de verrouillage. Certains équipments peuvent avoir plusieurs alimentations de courant.

⚠ WARNING

This equipment 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.

⚠ ADVERTISSEMENT

Cet équipement n'est pas destiné à être utilisé par des personnes (y compris des enfants) ayant des capacités physiques, sensorielles ou mentales réduites, ou un manque d'expérience et de connaissances, à moins qu'elles n'aient reçu une supervision ou des instructions concernant l'utilisation de l'appareil par une personne responsable de leur sécurité. Les enfants doivent être surveillés pour s'assurer qu'ils ne jouent pas avec l'appareil.

⚠ CAUTION

PERSONAL INJURY HAZARD

Failure to follow this caution may result in personal injury.

Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing, safety glasses and gloves when handling parts and servicing air conditioning equipment.

⚠ ADVERTISSEMENT

RISQUE DE BLESSURE CORPORELLE

Le non-respect de cette mise en garde peut entraîner des blessures corporelles.

Les pièces en tôle peuvent présenter des bords tranchants ou des bavures. Soyez prudent et portez des vêtements de protection appropriés, des lunettes de sécurité et des gants lors de la manipulation des pièces et de l'entretien des équipements de climatisation.

A2L REFRIGERATION INFORMATION

This equipment contains R-454B, a mildly flammable refrigerant classified as A2L. Read all instructions prior to transporting, storing, installing, or servicing this equipment.

⚠ WARNING

Only use equipment and components that are designed for use with R-454B refrigerant.

⚠ ADVERTISSEMENT

Utilisez uniquement les équipements et les composants conçus pour être utilisés avec le réfrigérant R-454B.

Transportation

Follow all local, state, or federal regulations when transporting equipment containing A2L refrigerant. Carrier applied RTUs are designed to be transported on a flatbed trailer or flatbed rail car. Ensure the proper safety equipment, driver training, and any required trailer markings are in place prior to transporting equipment containing an A2L refrigerant. Units with an A2L refrigerant charge are not approved for air or cargo vessel transportation.

Minimum Conditioned Space Area

The space area served by ducted equipment with A2L refrigerant is restricted by building code based on refrigerant volume that the releasable to the conditioned space served by the duct system.

Determine the conditioned space area by calculating the floor area (room length x room width) of all spaces served by a common duct system and adding them all together to get the total conditioned space area.

Compare the calculated total conditioned space area to the minimum conditioned space area (TA_{min}) listed in Table 1, based on the unit size and configuration (with or without Humidi-MiZer).

Table 1 — Minimum Conditioned Space Area (MCSA or TA_{min})

UNIT SIZE 48WE*H	(TA_{MIN})[a]	
	Sq Ft	Sq Meter
07	646	60.0
08	734	68.2
12	851	79.1

NOTE(S):

a. TA_{min} is based on a minimum ceiling height of 7.2 ft (2.2 m) and the worst-case unit refrigerant charge.

If the space area is above the minimum conditioned space area listed in Table 1 based on unit size and configuration, no action is needed.

If the conditioned space area is below the minimum conditioned space area listed in Table 1 based on unit size and configuration, then additional ventilation may be required. Refer to local code, UL-60335-2-40, or ASHRAE standard 15.

⚠ CAUTION

Do not install an ignition source or potential ignition source in a space where the total conditioned area is below the minimum total conditioned area (TA_{min}), unless a flame arresting device has been installed.

⚠ ADVERTISSEMENT

N'installez pas de source d'inflammation ou de source d'inflammation potentielle dans un espace où la surface totale conditionnée est inférieure à la surface totale conditionnée minimale (TA_{min}), à moins qu'un dispositif pare-flamme n'ait été installé.

GENERAL

Overview

APPLICATION RANGE

Table 2 lists the typical application ranges for the equipment covered in this document. This document contains guidance for the mechanical and basic electrical installation for the 48WE*H packaged high outdoor air system. See Fig. 1 for model number nomenclature. See Fig. 2-4 for unit dimensional drawings and service clearances, and Fig. 5 for unit leveling tolerances.

Additional control setup and sensor installation is required before equipment start-up and operation can be performed. See “CONTROLS OPERATION AND QUICK SETUP” on page 56 for additional instruction.

Table 2 — Application Ranges

DESCRIPTION	48WE*H UNIT SIZE		
	07	08	12
Min. Airflow (cfm)	780	975	1,300
Min. Full Load Airflow (cfm)	780	975	1,300
AHRI Rated Airflow (cfm)	2,100	2,625	3,400
Cool Max. Ambient	125°F	125°F	125°F
Cool Min. Ambient	40°F	40°F	40°F
Cool Max. Entering	115°F	115°F	115°F
Cool Min. Entering	60°F	60°F	60°F
Dehum Max. Ambient	115°F	115°F	115°F
Dehum Min. Ambient	60°F	60°F	60°F
Dehum Max. Entering	115°F	115°F	115°F
Dehum Min. Entering	60°F	60°F	60°F
Heat Max. Entering	70°F	70°F	70°F
Heat Min. Entering	10°F	10°F	10°F

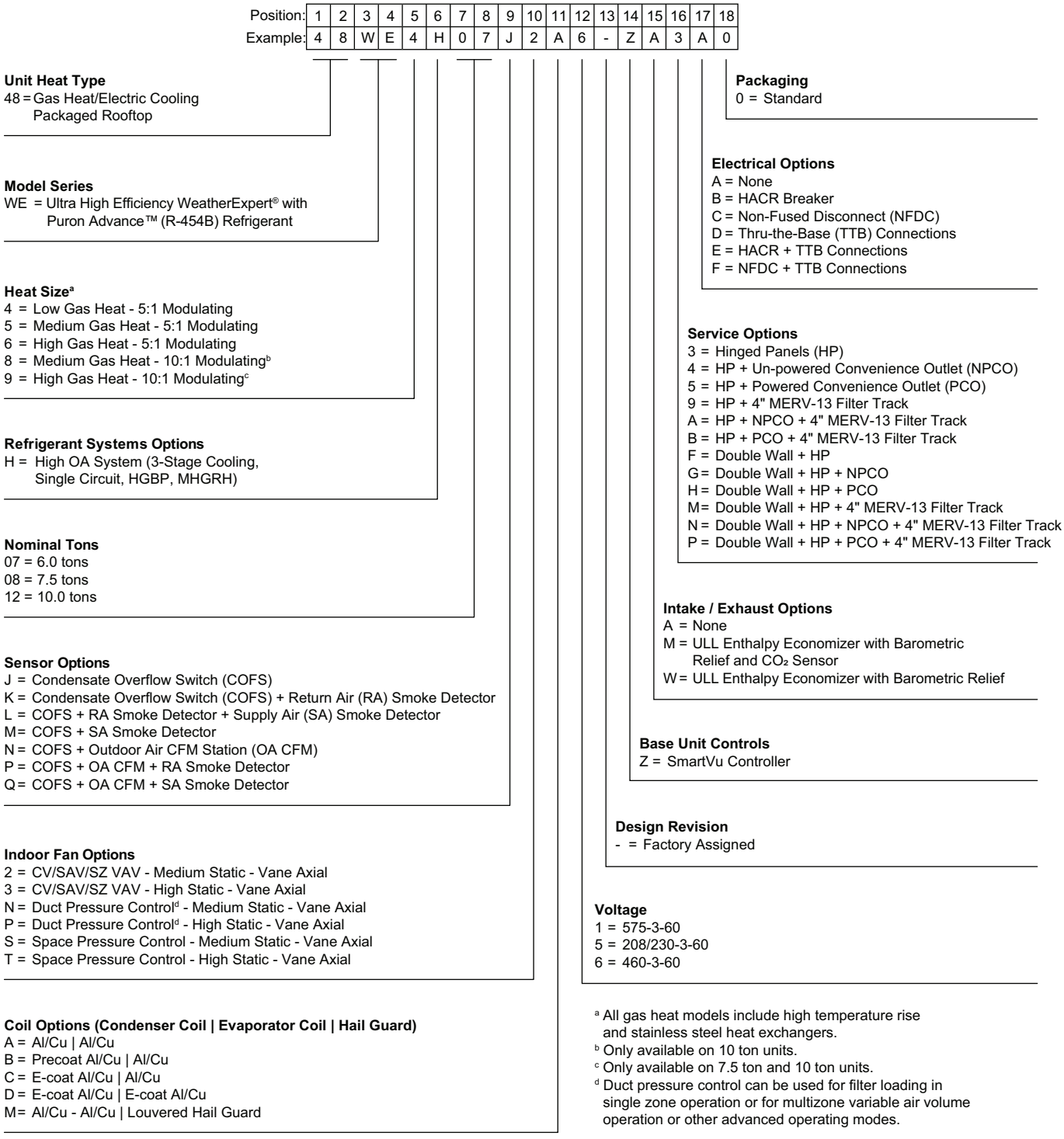


Fig. 1 — 48WE*H07-12 Model Number Nomenclature

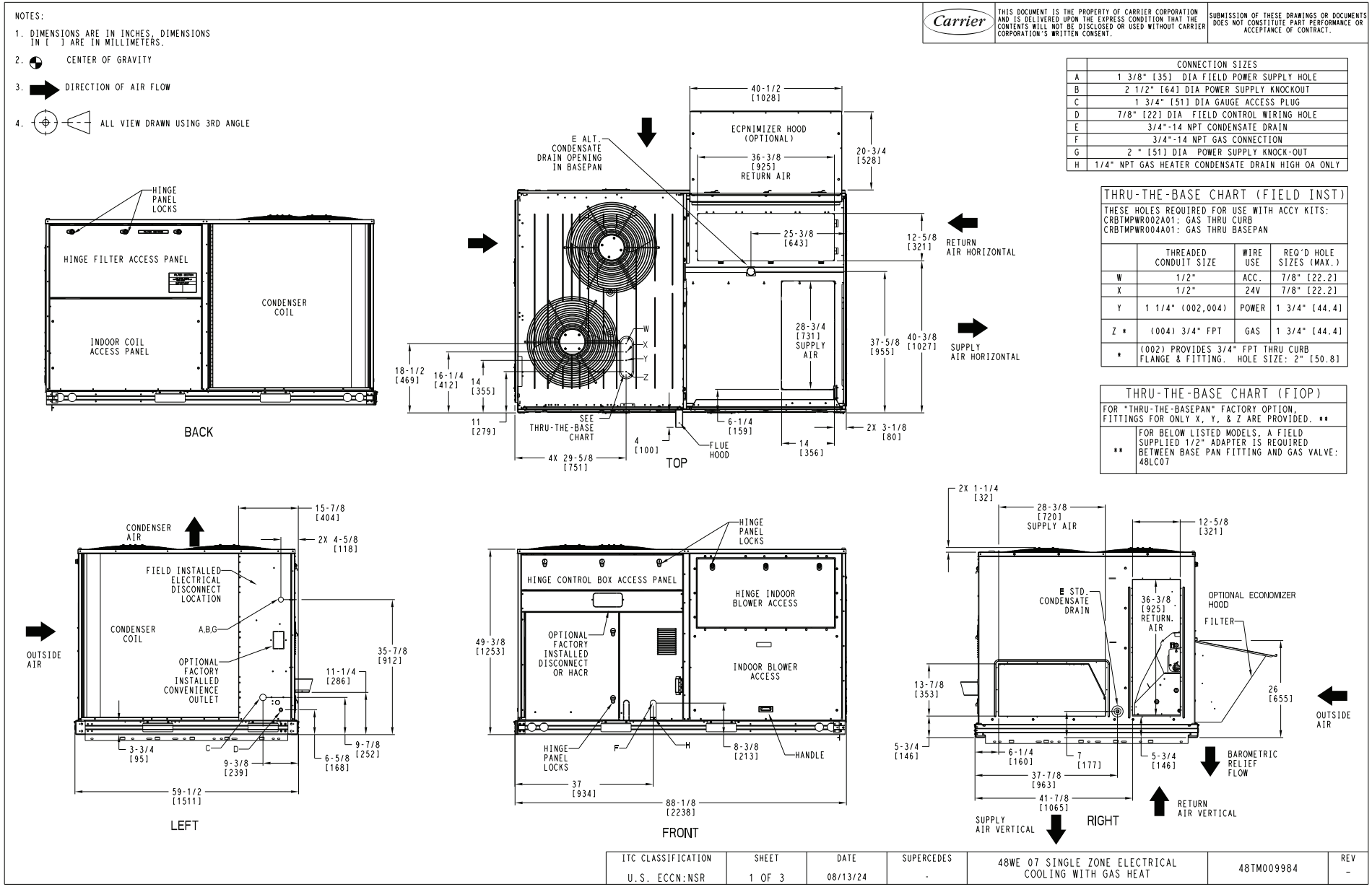
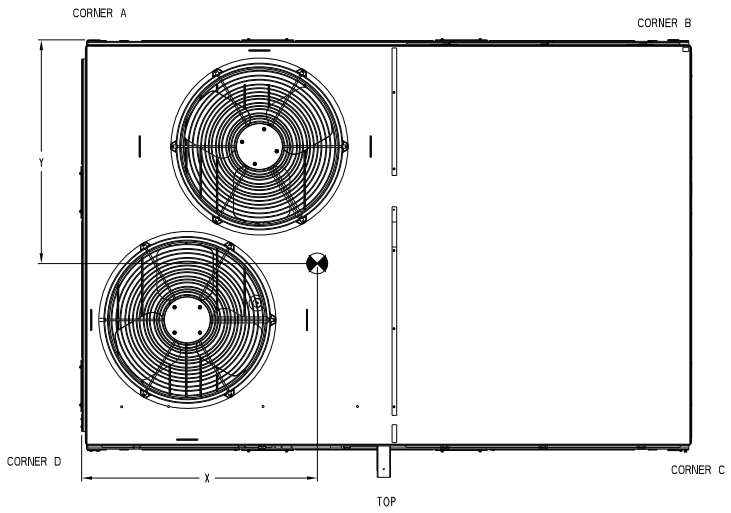
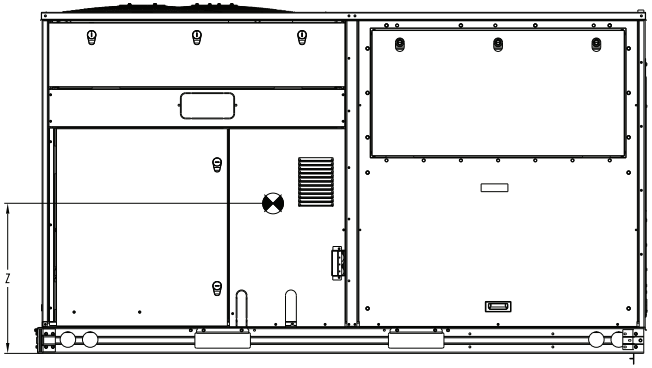


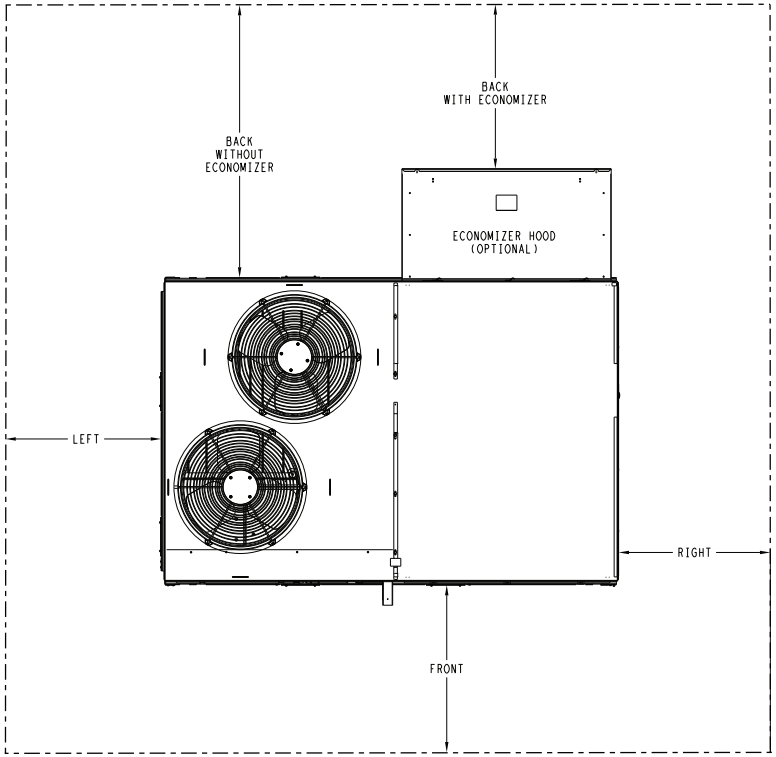
Fig. 2 — Unit Dimensional Drawing, 48WE*H07, Single-Zone Electric Cooling with Gas Heat

UNIT	INSULATION	OUTDOOR COIL TYPE	STD. UNIT WEIGHT ***		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.			TOTAL		
			LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z	LENGTH	WIDTH	HEIGHT
48WE**07	FOIL FACE	RTPF	1059	481	326.1	147.9	207.8	94.3	296.9	134.7	228.2	103.5	42.0	24.5	20.8	88.1	59.5	50.6
48WE**07	DOUBLE WALL	RTPF	1203	546	346.3	157.1	252.9	114.7	361.4	163.9	242.4	110.0	45.0	24.5	20.8	88.1	59.5	50.6

*** STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.







CLEARANCE		
	SERVICE WITH:	SERVICE WITH:
SURFACE	CONDUCTIVE BARRIER	NONCONDUCTIVE BARRIER
FRONT	48 [1219mm]	36 [914mm]
LEFT	48 [1219mm]	42 [1067mm]
BACK W/O ECON	48 [1219mm]	42 [1067mm]
BACK W/ECON	36 [914mm]	36 [914mm]
RIGHT	36 [914mm]	36 [914mm]
TOP	72 [1829mm]	72 [1829mm]

NOTE:

1. FOR ALL MINIMUM CLEARANCES LOCAL CODES OR JURISDICTIONS MAY PREVAIL.

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES		
U.S. ECCN:NSR	2 OF 3	08/13/24	-	48WE 07 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	48TM009984	REV -

Fig. 2 — Unit Dimensional Drawing, 48WE*H07, Single-Zone Electric Cooling with Gas Heat (cont)

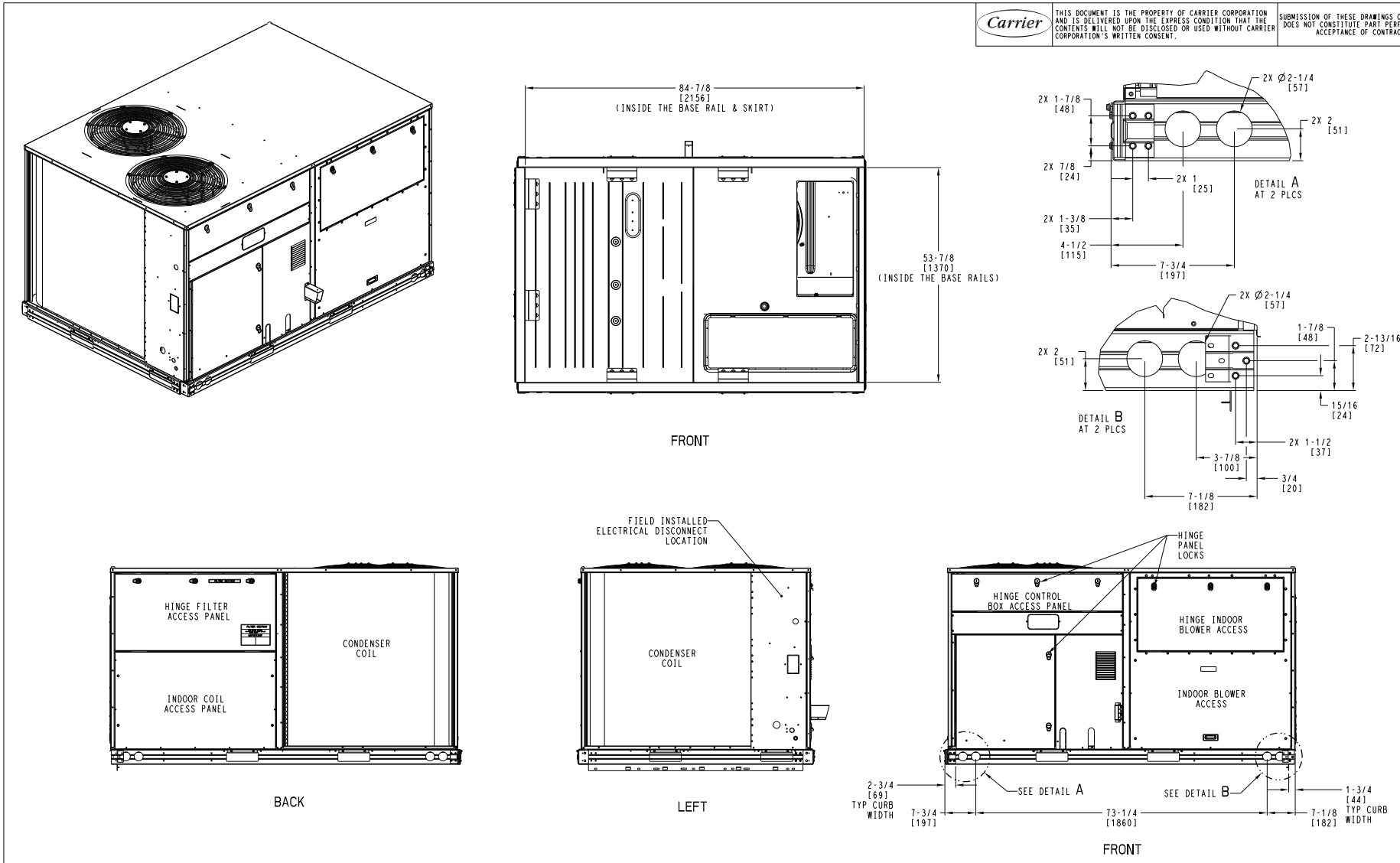


Fig. 2 — Unit Dimensional Drawing, 48WE*H07, Single-Zone Electric Cooling with Gas Heat (cont)

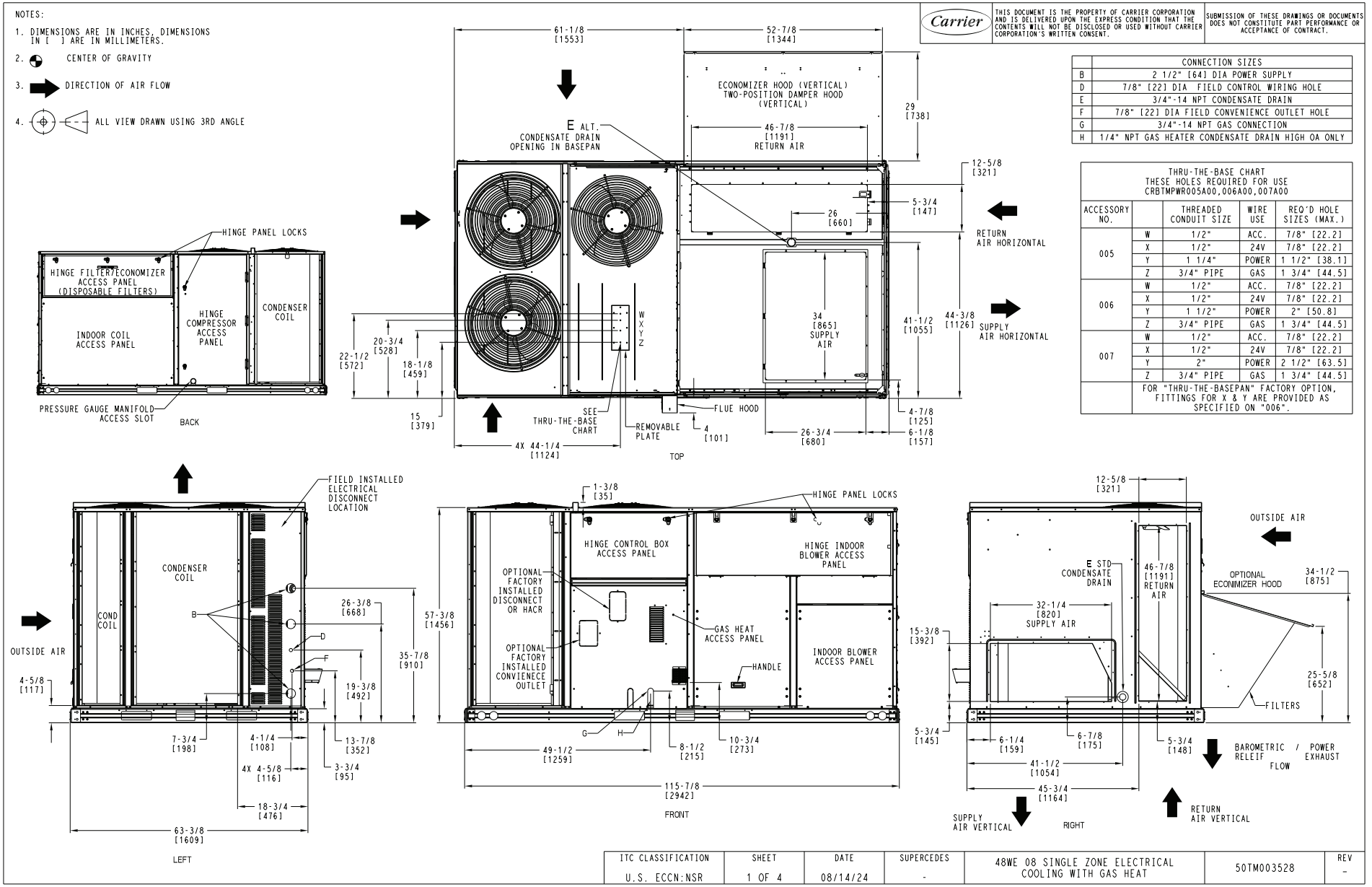
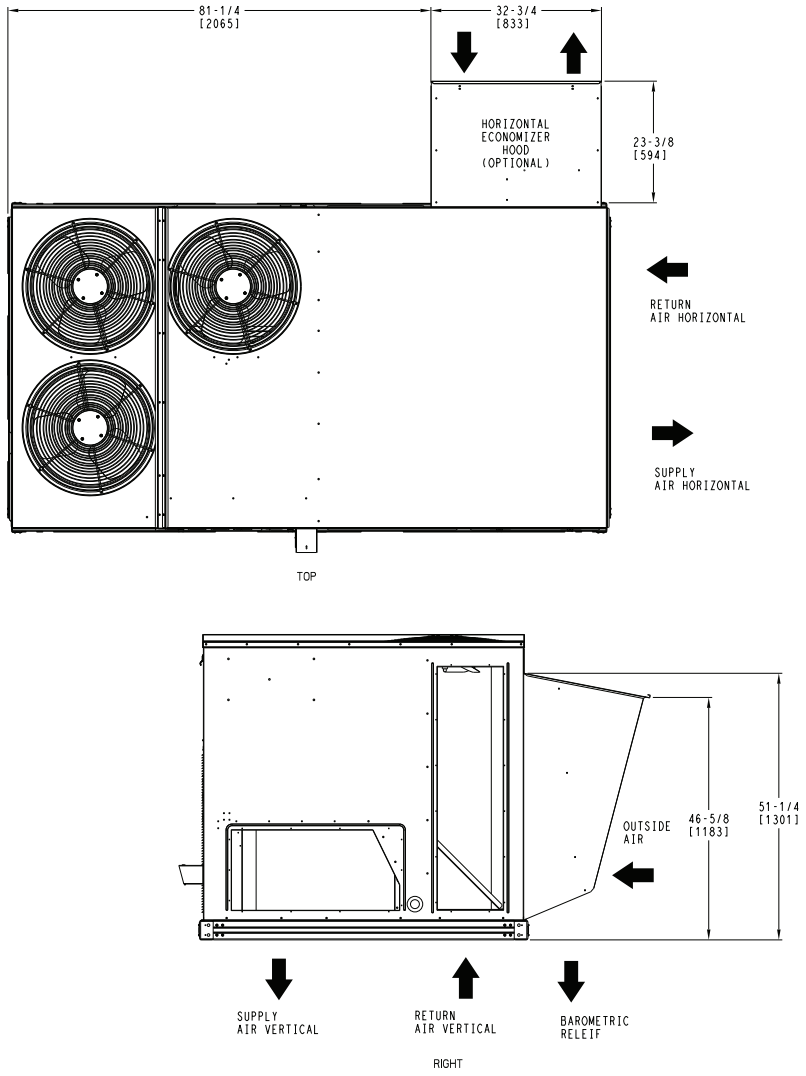


Fig. 3 — Unit Dimensional Drawing, 48WE*H08, Single-Zone Electric Cooling with Gas Heat



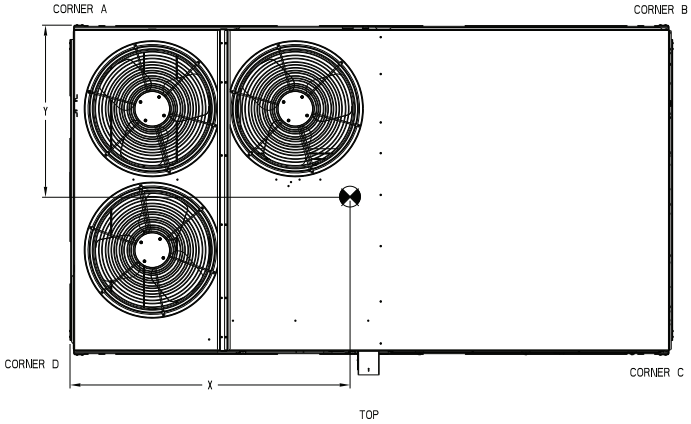
HORIZONTAL ECONOMIZER

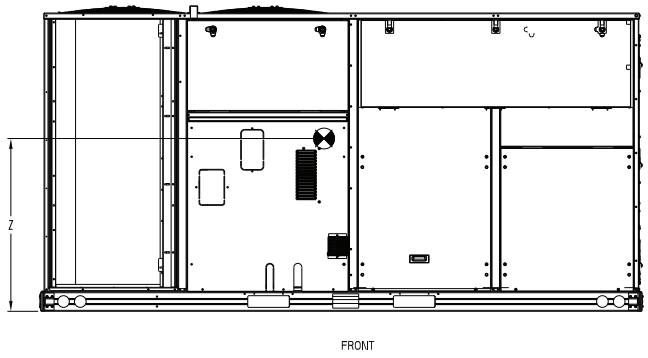
ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	48WE 08 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	50TM003528	REV
U.S. ECCN:NSR	2 OF 4	08/14/24	-			-

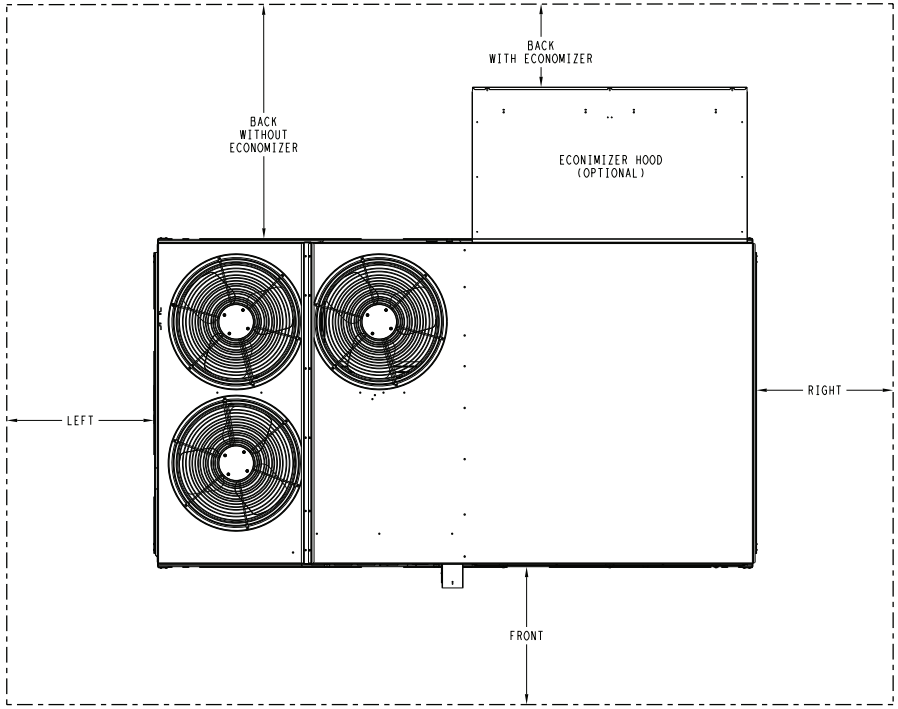
Fig. 3 — Unit Dimensional Drawing, 48WE*H08, Single-Zone Electric Cooling with Gas Heat (cont)

UNIT	INSULATION	OUTDOOR COIL TYPE	STD. UNIT WEIGHT ***		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.			TOTAL		
			LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z	LENGTH	WIDTH	HEIGHT
48WE**08	FOIL FACE	RTPF	1516.0	688.0	396.2	179.7	362.0	164.2	390.2	177.0	367.6	166.7	57.5	30.5	20.6	115.9	63.4	58.8
48WE**08	DOUBLE WALL	RTPF	1707.0	774.0	423.2	191.9	428.9	194.6	462.3	209.7	392.6	178.1	60.5	30.5	20.6	115.9	63.4	58.8

*** STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.







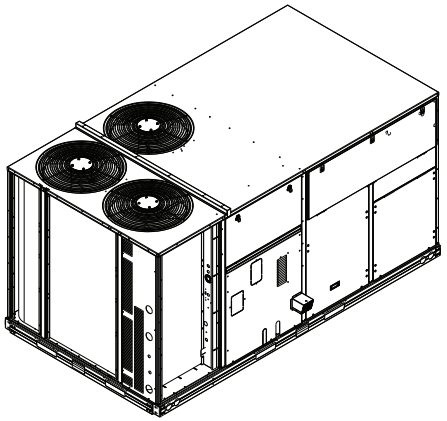
CLEARANCE		
	SERVICE WITH:	SERVICE WITH:
SURFACE	CONDUCTIVE BARRIER	NONCONDUCTIVE BARRIER
FRONT	48 [1219mm]	36 [914mm]
LEFT	48 [1219mm]	42 [1067mm]
BACK W/O ECON	48 [1219mm]	42 [1067mm]
BACK W/ECON	36 [914mm]	36 [914mm]
RIGHT	36 [914mm]	36 [914mm]
TOP	72 [1829mm]	72 [1829mm]

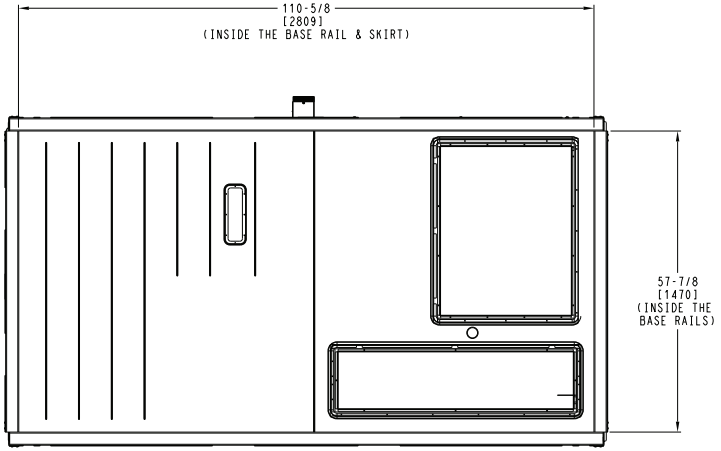
NOTE:

1. FOR ALL MINIMUM CLEARANCES LOCAL CODES OR JURISDICTIONS MAY PREVAIL.

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES			REV
U.S. ECCN:NSR	3 OF 4	08/14/24	-	48WE 08 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	50TM003528	-

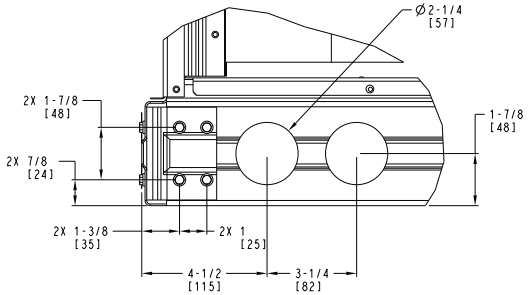
Fig. 3 — Unit Dimensional Drawing, 48WE*H08, Single-Zone Electric Cooling with Gas Heat (cont)



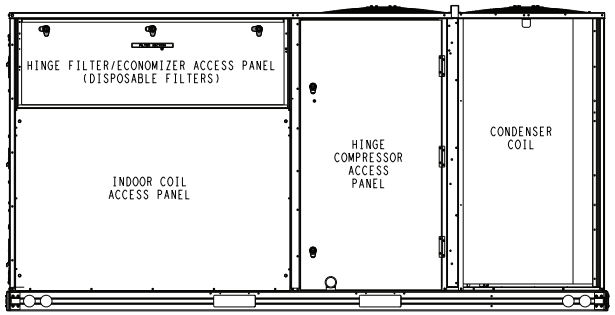


INSIDE BASERAIL DIMENSIONS

BOTTOM



DETAIL A
TYP 4 PLCS



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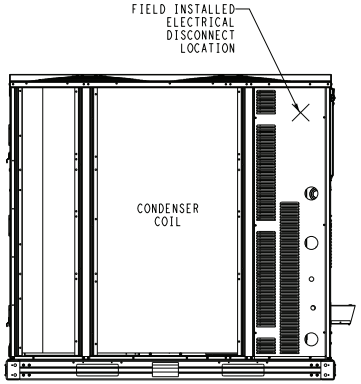
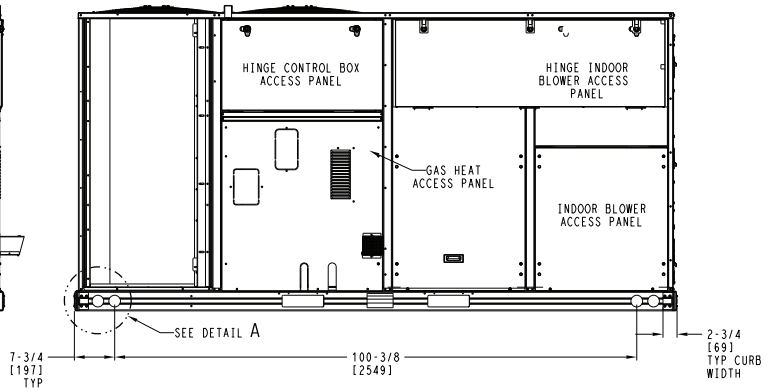


LEFT



FRONT

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES			REV
U.S. ECCN:NSR	4 OF 4	08/14/24	-	48WE 08 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	50TM003528	-

Fig. 3 — Unit Dimensional Drawing, 48WE*H08, Single-Zone Electric Cooling with Gas Heat (cont)

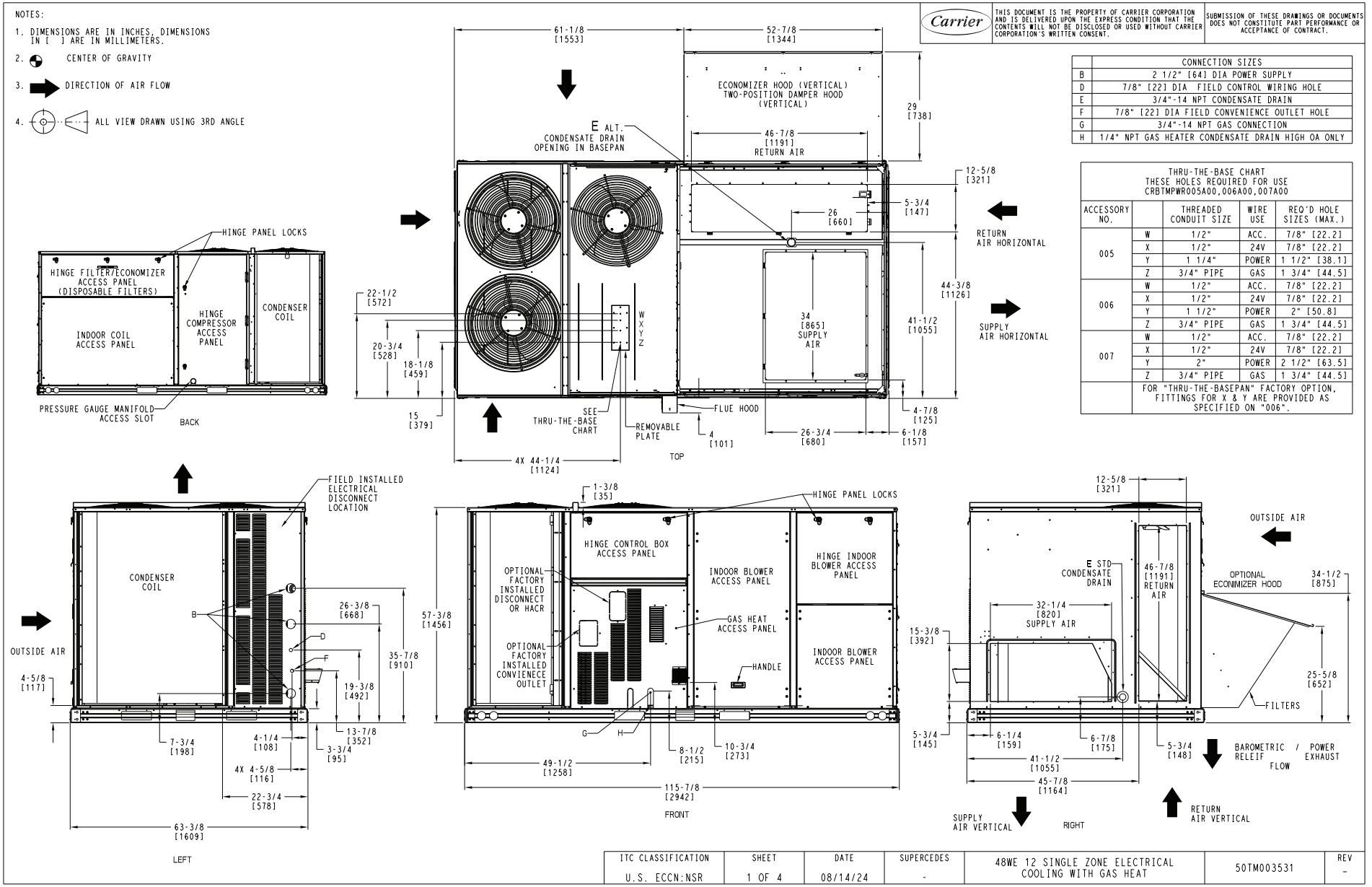
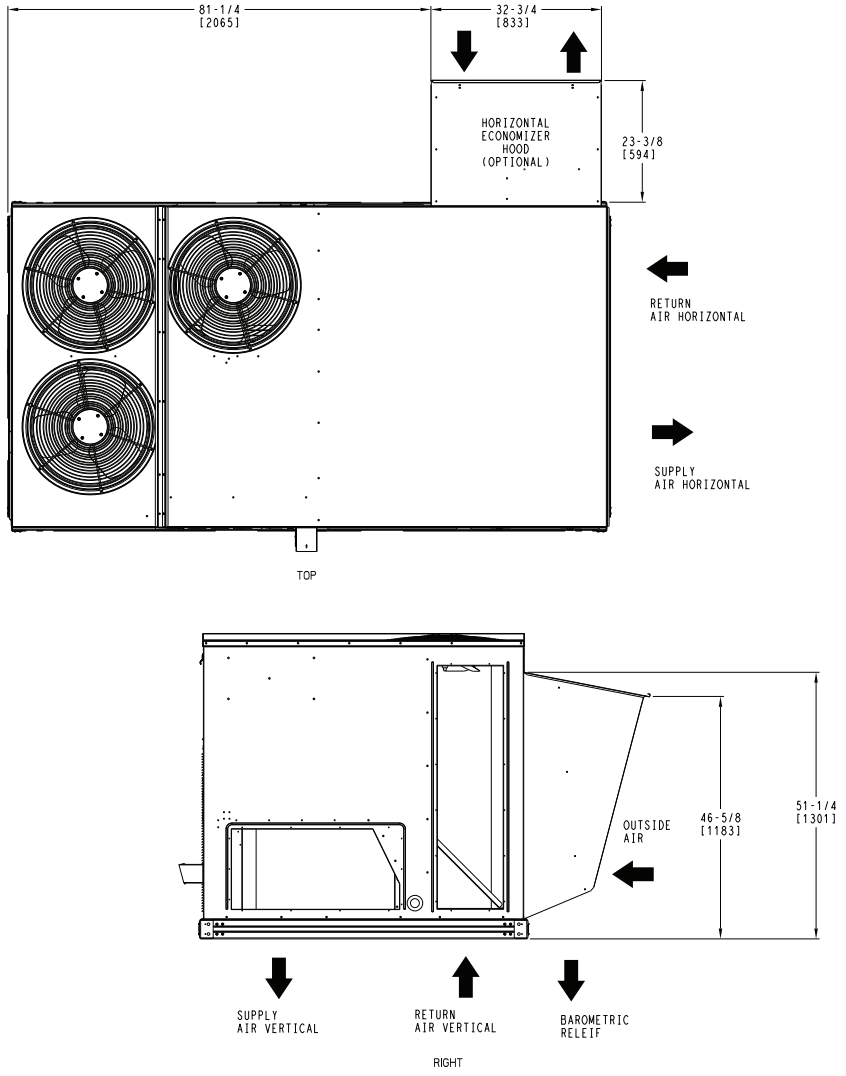


Fig. 4 — Unit Dimensional Drawing, 48WE*H12, Single-Zone Electric Cooling with Gas Heat

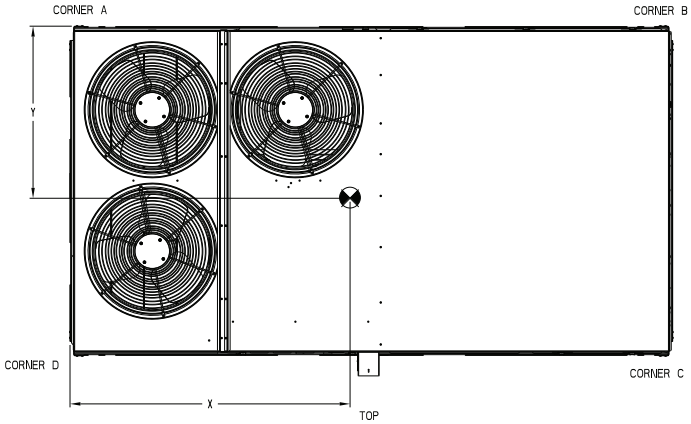


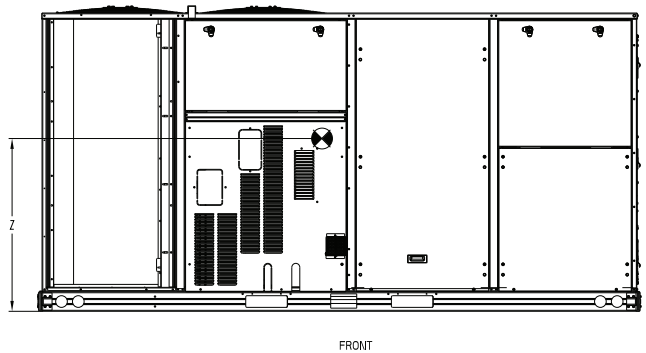
ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	48WE 12 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	50TM003531	REV
U.S. ECCN:NSR	2 OF 4	08/14/24	-			-

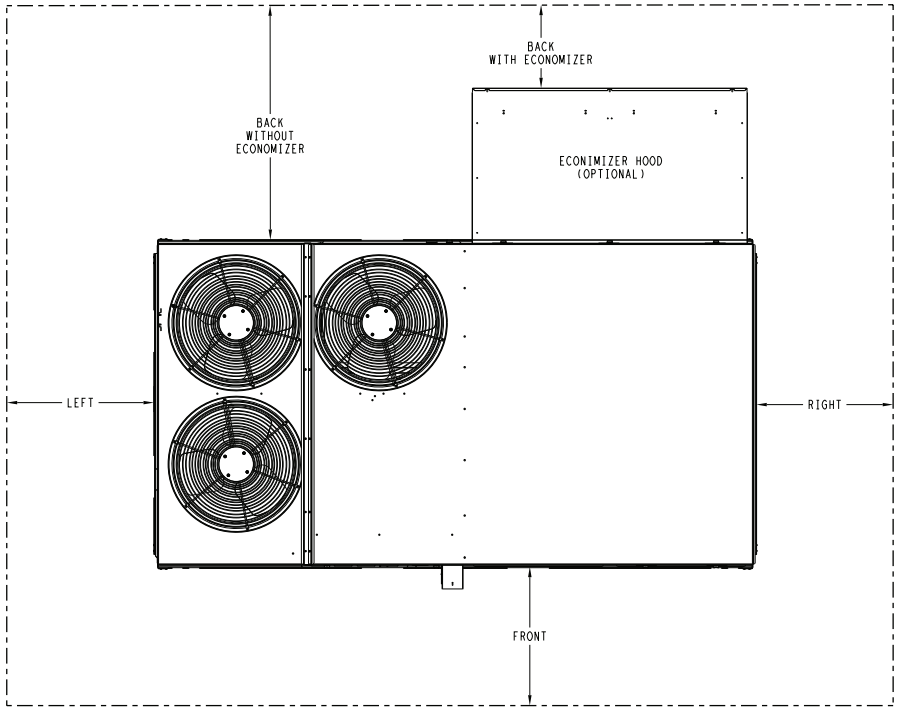
Fig. 4 — Unit Dimensional Drawing, 48WE*H12, Single-Zone Electric Cooling with Gas Heat (cont)

UNIT	INSULATION	OUTDOOR COIL TYPE	STD. UNIT WEIGHT ***		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.			TOTAL		
			LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z	LENGTH	WIDTH	HEIGHT
48WE**12	FOIL FACE	RTPF	1596.0	724.0	422.4	191.6	375.1	170.1	430.7	195.4	367.8	166.9	58.5	29.5	20.6	115.9	63.4	58.8
48WE**12	DOUBLE WALL	RTPF	1787.0	811.0	450.3	204.2	439.7	199.4	504.9	229.0	392.1	177.9	61.3	29.5	20.6	115.9	63.4	58.8

*** STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.







CLEARANCE		
	SERVICE WITH:	SERVICE WITH:
SURFACE	CONDUCTIVE BARRIER	NONCONDUCTIVE BARRIER
FRONT	48 [1219mm]	36 [914mm]
LEFT	48 [1219mm]	42 [1067mm]
BACK W/O ECON	48 [1219mm]	42 [1067mm]
BACK W/ECON	36 [914mm]	36 [914mm]
RIGHT	36 [914mm]	36 [914mm]
TOP	72 [1829mm]	72 [1829mm]

NOTE:

1. FOR ALL MINIMUM CLEARANCES LOCAL CODES OR JURISDICTIONS MAY PREVAIL.

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES			REV
U.S. ECCN:NSR	3 OF 4	08/14/24	-	48WE 12 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	50TM003531	-

Fig. 4 — Unit Dimensional Drawing, 48WE*H12, Single-Zone Electric Cooling with Gas Heat (cont)

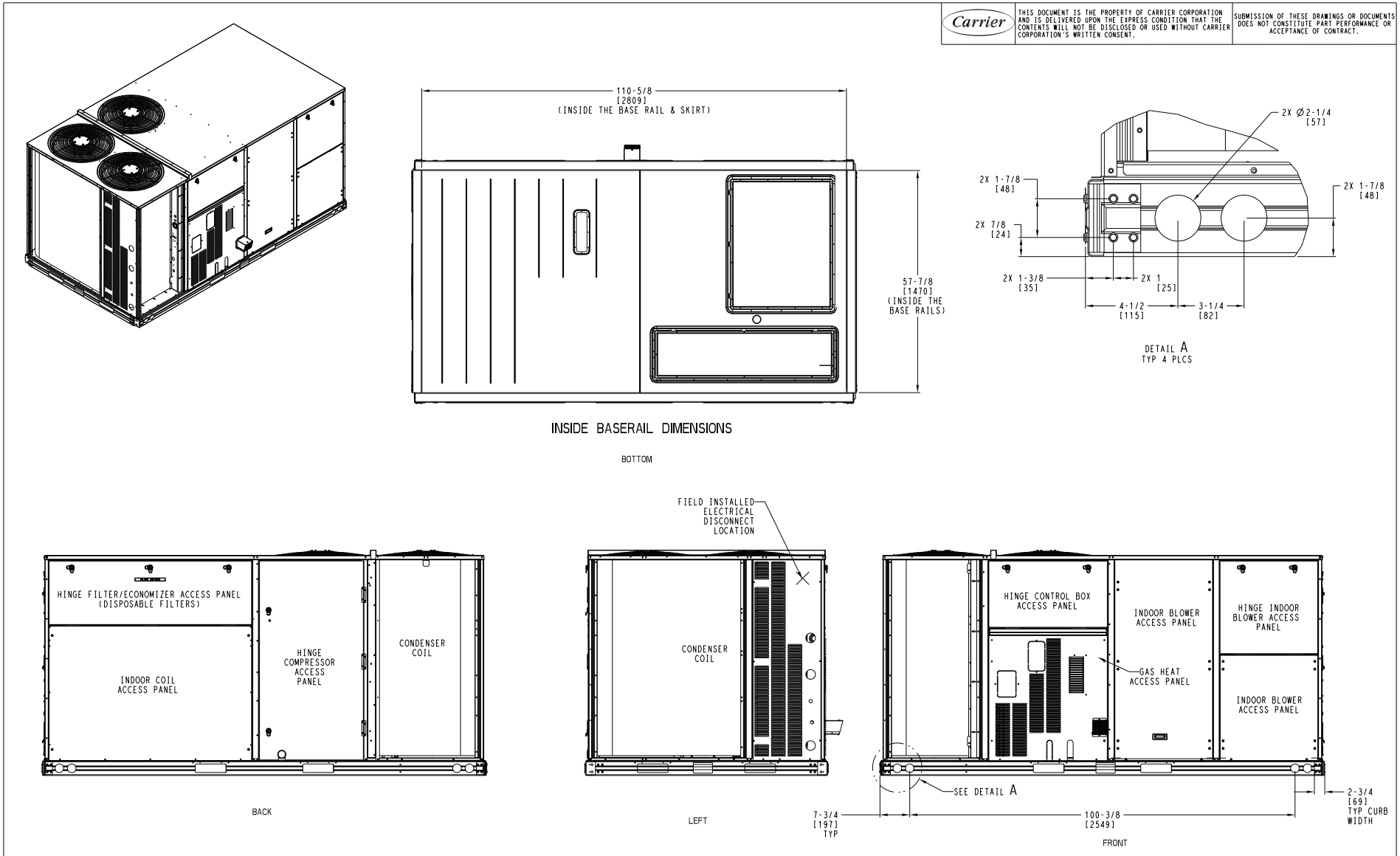


Fig. 4 — Unit Dimensional Drawing, 48WE*H12, Single-Zone Electric Cooling with Gas Heat (cont)

INSTALLATION

Jobsite Survey

Complete the following checks before installation.

1. Consult local building codes and the NEC (National Electrical Code) ANSI/NFPA 70 for special installation requirements.
2. Determine unit location (from project plans) or select unit location.
3. Check for possible overhead obstructions which may interfere with unit lifting or rigging.

IMPORTANT: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Step 1 — Plan for Unit Location

Select a location for the unit and its support system (curb or other) that provides for at least the minimum clearances required for safety. This includes the clearance to combustible surfaces, unit performance and service access below, around and above unit as specified in unit drawings. Refer to Fig. 2-4.

NOTE: Consider the effect of adjacent units. Unit may be installed directly on wood flooring or on Class A, B, or C roof-covering material when roof curb is used.

Do not install unit in an indoor location. Do not locate air inlets near exhaust vents, relief valves, or other sources of contaminated air.

Although unit is weatherproof, avoid locations that permit water from higher level runoff and overhangs to fall onto the unit.

Select a unit mounting system that provides adequate height to allow installation of condensate trap per requirements. Refer to Install External Condensate Trap and Line on page 28 for required trap dimensions.

ROOF MOUNT

Check building codes for weight distribution requirements. Unit operating weight is shown in Table 3.

Table 3 — Operating Weights

48WE*H	UNIT SIZE lb (kg)		
	07	08	12
BASE UNIT	1539 (698)	2084 (945)	2164 (982)
ECONOMIZER	75 (34)	135 (61)	135 (61)
POWERED OUTLET[a]	36 (16)	36 (16)	36 (16)
CURB			
14 in. (356 mm)	180 (82)	180 (82)	180 (82)
24 in. (610 mm)	255 (116)	255 (116)	255 (116)

NOTE(S):

a. The weight listed includes the convenience outlet transformer as well as the convenience outlet hardware.

Step 2 — Plan for Sequence of Unit Installation

The support method used for this unit will dictate different sequences for the steps of unit installation. For example, on curb-mounted units, some accessories must be installed on the unit before the unit is placed on the curb. Review the following for recommended sequences for installation steps.

TYPICAL CURB-MOUNTED INSTALLATION (VERTICAL SUPPLY/RETURN)

1. Inspect unit.
2. Install curb.
3. Install field-fabricated ductwork inside curb.
4. Relocate supply air temperature sensor (recommended, as required by application).
5. Install accessory Thru-the-Base service connection package (optional – affects curb and unit). Refer to accessory installation instructions for details.
6. Prepare bottom condensate drain connection to suit planned condensate line routing (optional – refer to Install External Condensate Trap and Line on page 28 for details).
7. Rig and place unit.
8. Install return air opening cover (optional – 100% outdoor air applications only).
9. Install outdoor air hood.
10. Install condensate line trap and piping.
11. Make electrical connections.
12. Setup unit options.
13. Install other accessories.
14. Complete controls setup and equipment start-up (not covered in this manual).

TYPICAL PAD-MOUNTED INSTALLATION (HORIZONTAL SUPPLY/RETURN)

1. Inspect unit.
2. Prepare pad and unit supports.
3. Check and tighten the bottom condensate drain connection.
4. Plan for condensate drain piping.
5. Rig and place unit.
6. Convert unit to side duct connection arrangement.
7. Install the return air opening cover (100% outdoor air applications only).
8. Install field-fabricated ductwork at unit duct openings.
9. Relocate supply air temperature sensor (recommended, as required by application).
10. Install outdoor air hood.
11. Install condensate line trap and piping.
12. Make electrical connections.
13. Setup unit options.
14. Install other accessories.
15. Complete controls setup and equipment start-up (not covered in this manual).

FRAME-MOUNTED INSTALLATION

Frame-mounted applications generally follow the sequence for a curb installation. Adapt as required to suit specific installation plan.

Step 3 — Inspect Unit

Inspect unit for transportation damage. File any claim with transportation agency.

Confirm before installation of unit that voltage, amperage and circuit protection requirements listed on unit data plate agree with power supply provided.

On units with hinged panel option, check to be sure all latches are snug and in closed position.

Locate the carton containing the outside air hood parts. See Fig. 19 on page 27 for package location. Do not remove carton until unit has been rigged and located in final position.

Step 4 — Provide Unit Support

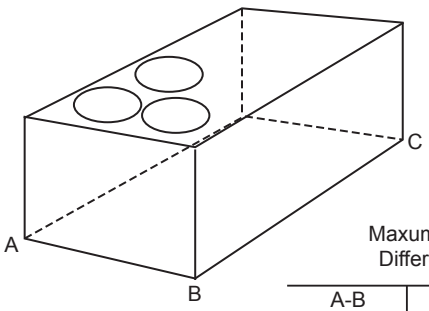
ROOF CURB MOUNT

Accessory roof curb details and dimensions are shown in Fig. 6 and 7. Assemble and install accessory roof curb in accordance with instructions shipped with the curb.

NOTE: The gasketing of the unit to the roof curb is critical for a watertight seal. Install gasket supplied with the roof curb as shown in Fig. 6 and 7. Improperly applied gasket can also result in air leaks and poor unit performance.

Curb should be level. This is necessary for unit drain to function properly. Unit leveling tolerances are shown in Fig. 5. Refer to Accessory Roof Curb Installation Instructions for additional information as required. Install insulation, cant strips, roofing felt, and counter flashing as shown.

NOTE: Ductwork must be attached to curb and not to the unit.



Maxumum Allowable Difference in. (mm)

A-B	B-C	A-C
0.5 (13)	1.0 (25)	1.0 (25)

Fig. 5 — Unit Leveling Tolerances

IMPORTANT: If the unit's electric and control wiring is to be routed through the basepan and the unit is equipped with the factory-installed thru-the-base service option, see the following section:

- Factory-Option Thru-the-Base Connections on page 30.

If using the field-installed Thru-the-Base accessory, follow the instructions provided with the accessory kit.

NOTE: If electrical connection is not going to occur at this time, tape or otherwise cover the fittings so that moisture does not get into the building or conduit in the interim.

SLAB MOUNT (HORIZONTAL UNITS ONLY)

Provide a level concrete slab that extends a minimum of 6 in. (150 mm) beyond unit cabinet. Install a gravel apron in front of condenser coil air inlet to prevent grass and foliage from obstructing airflow.

NOTE: Horizontal units may be installed on a roof curb if required.

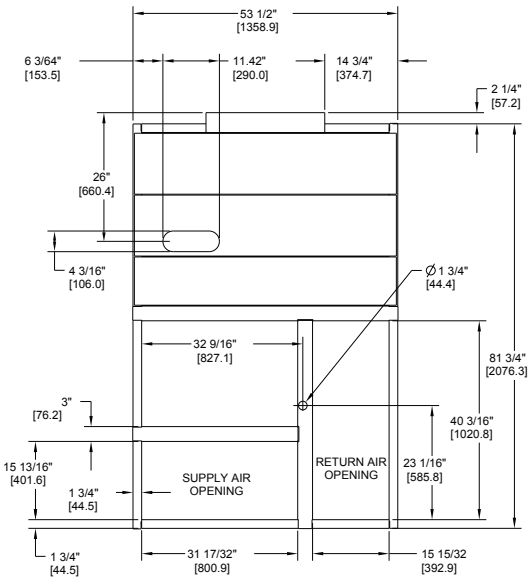
ALTERNATE UNIT SUPPORT (IN LIEU OF CURB OR SLAB MOUNT)

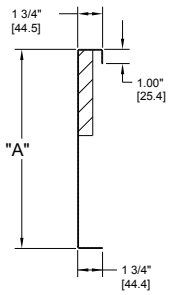
A non-combustible sleeper rail can be used in the unit curb support area. If sleeper rails cannot be used, support the long sides of the unit with a minimum of 3 equally spaced 4 in. x 4 in. (102 mm x 102 mm) pads on each side.

ROOF CURB ACCESSORY #	A
CRRFCURB003A01	14" [356]
CRRFCURB004A01	24" [610]

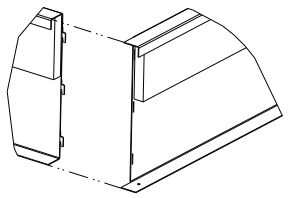
NOTES:
1. ROOFCURB ACCESSORY IS SHIPPED DISASSEMBLED.
2. INSULATED PANELS: 25.4 [1"] THK. POLYURETHANE FOAM, 44.5 [1-3/4] # DENSITY.
3. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
4. ROOFCURB: 18 GAGE STEEL.
5. ATTACH DUCTWORK TO CURB. (FLANGES OF DUCT REST ON CURB).
6. SERVICE CLEARANCE 4 FEET ON EACH SIDE.
7. ▨ DIRECTION OF AIR FLOW.
8. CONNECTOR PACKAGE CRBTMPWR002A01 IS FOR THRU-THE-CURB GAS TYPE. PACKAGE CRBTMPWR004A01 IS FOR THRU-THE-BOTTOM TYPE GAS CONNECTIONS.

CONNECTOR PKG. ACC.	GAS CONNECTION TYPE	GAS FITTING	POWER WIRING FITTING	CONTROL WIRING FITTING	ACCESSORY CONVENIENCE OUTLET WIRING CONNECTOR
CRBTMPWR002A01	THRU THE CURB	3/4" [19] NPT	1 1/4" [31.7] NPT	1/2" [12.7] NPT	1/2" [12.7] NPT
CRBTMPWR004A01	THRU THE BOTTOM				

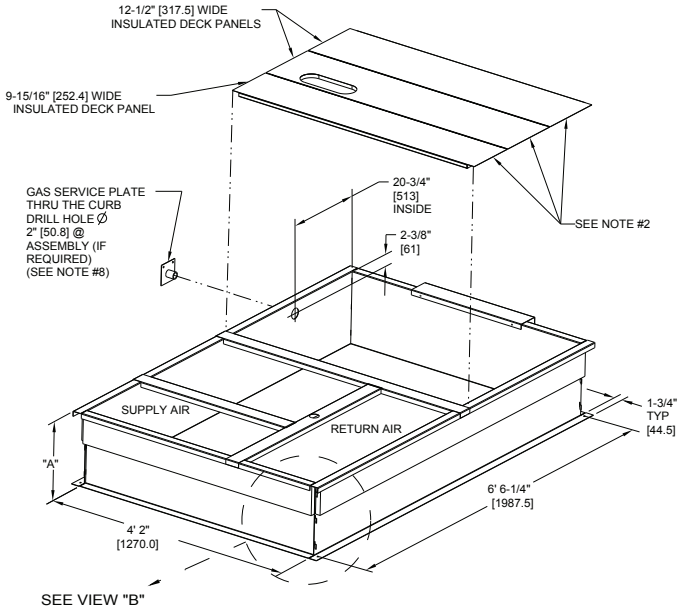




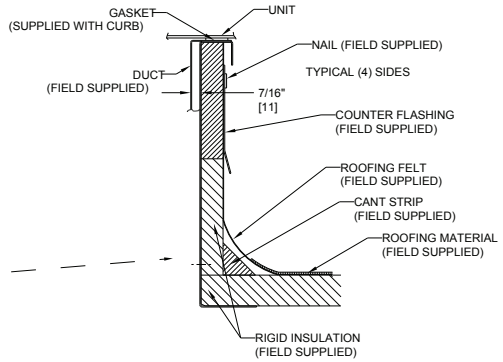
SECTION THRU SIDE

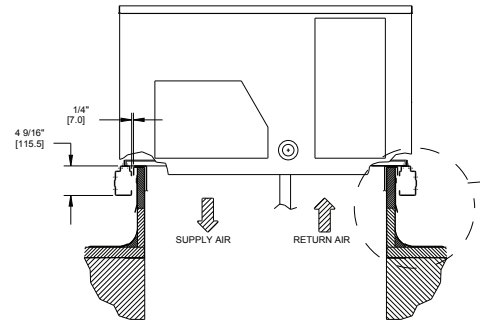


VIEW "B"
CORNER DETAIL



CERTIFIED DRAWING





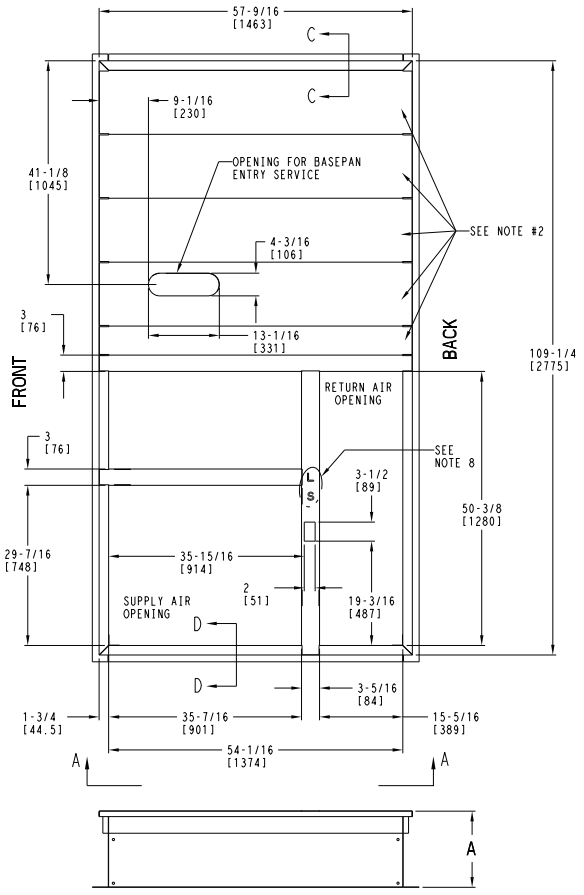
REV	REVISION RECORD	DATE	BY	CHK'D	APP'D	ECN NO.
C	6' 61/4" WAS 6' 7 1/6", 4'2" WAS 4' 2 13/16"; 18 GA WAS 16 GA.; 15 13/16" WAS 15 15/16"; NAIL FIELD SUPPLIED WAS WITH CURB	4/22/13	MMC	-	-	1067898

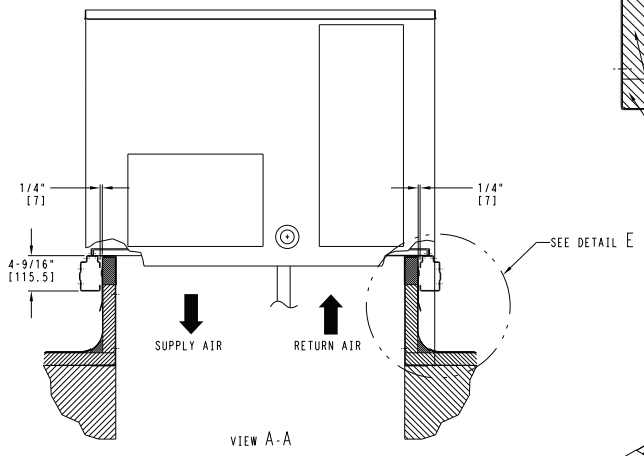
DRAWING RELEASE LEVEL: PRODUCTION			
THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON: 1 DEC ± - 2 DEC ± - 3 DEC ± - ANG ± ° -	THIS DOCUMENT AND THE INFORMATION CONTAINED THEREIN IS PROPRIETARY TO CARRIER CORPORATION AND SHALL NOT BE USED OR DISCLOSED TO OTHERS, IN WHOLE OR IN PART, WITHOUT THE WRITTEN AUTHORIZATION OF CARRIER CORPORATION.	
MATERIAL - - -	AUTHORIZATION NUMBER 1029120	TITLE CURB ASY, ROOF	
ENGINEERING REQUIREMENTS -	ENGINEERING - MANUFACTURING -	SIZE D	DRAWING NUMBER 50HJ405012 SHEET 5 OF 5 REV C
WEIGHT: -	DRAFTER MMC 12/16/09 CHECKER -		
SURFACE FINISH -	MFG/PURCH PURCH	MODEL (INTERNAL USE ONLY)	NEXT DRAWING - SCALE N/A DISTRIBUTION -

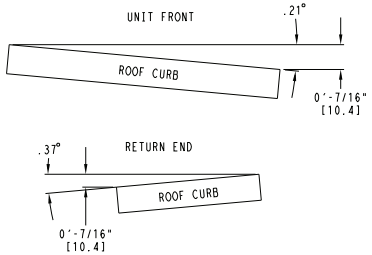
Fig. 6 — Roof Curb Details, 48WE*H07 Units

ROOF CURB ACCESSORY #	A
CRRFCURB074A00	14" [356]
CRRFCURB075A00	24" [610]

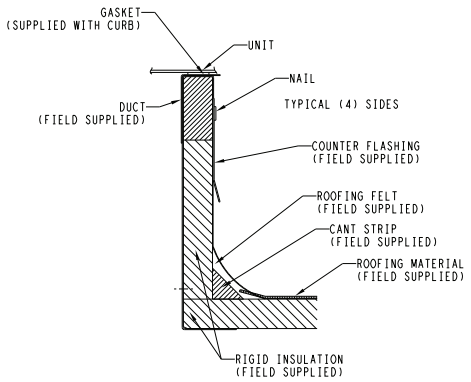
NOTES:
1. ROOFCURB ACCESSORY IS SHIPPED DISASSEMBLED.
2. INSULATED PANELS: 1/2" THK. NEOPRENE FOAM, 1.0# DENSITY.
3. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
4. ROOFCURB SIDEWALLS: 16 GAGE STEEL.
5. ATTACH DUCTWORK TO CURB. (FLANGES OF DUCT REST ON CURB).
6. SERVICE CLEARANCE 4 FT ON EACH SIDE.
7. ➡ DIRECTION OF AIR FLOW.
8. "L" & "S" DESIGNATIONS DENOTE LOCATION OF COMMON CROSS RAIL. (POSITION "L" FOR LARGE DUCT OPENING CURB).



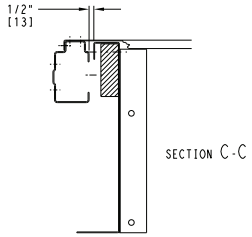


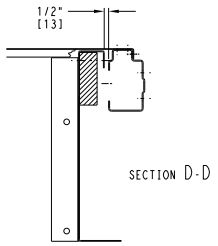


MAX CURB LEVELING TOLERANCES



DETAIL E





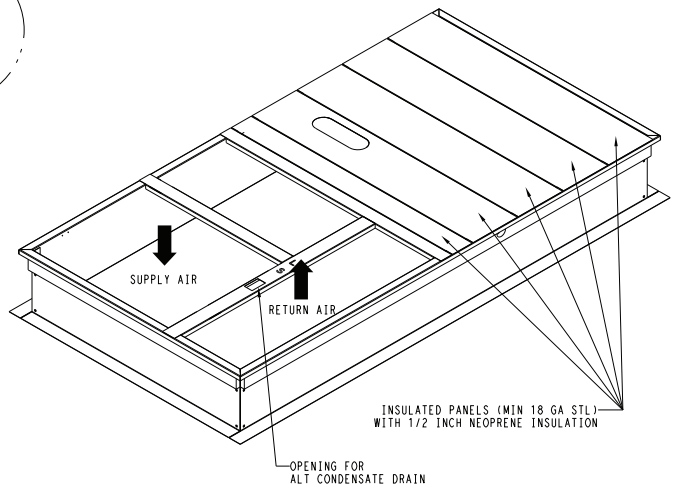


Fig. 7 — Roof Curb Details, 48WE*H08-12 Units

Step 5 — Field Fabricate Ductwork

Cabinet return-air static pressure (a negative condition) shall not exceed 0.35 in. wg (87 Pa) with economizer or 0.45 in. wg (112 Pa) without economizer.

For vertical ducted applications, secure all ducts to roof curb and building structure.

NOTE: Do not connect ductwork to unit. Fabricate supply ductwork so that the cross sectional dimensions are equal to or greater than the unit supply duct opening dimensions for the first 18 in. (458 mm) of duct length from the unit basepan.

Insulate and weatherproof all external ductwork, joints, and roof openings with counter flashing and mastic in accordance with applicable codes.

Ducts passing through unconditioned spaces must be insulated and covered with a vapor barrier.

If a plenum return is used on a vertical unit, the return should be ducted through the roof deck to comply with applicable fire codes.

FOR UNITS WITH OPTIONAL ELECTRIC HEATERS

All installations require a minimum clearance to combustible surfaces of 1 in. (25 mm) from duct for first 12 in. (305 mm) away from unit. Outlet grilles must not lie directly below unit discharge.

⚠ WARNING

PERSONAL INJURY HAZARD

Failure to follow this warning could cause personal injury.

For vertical supply and return units, tools or parts could drop into ductwork and cause an injury. Install a 90 degree turn in the return ductwork between the unit and the conditioned space. If a 90 degree elbow cannot be installed, then a grille of sufficient strength and density should be installed to prevent objects from falling into the conditioned space. Due to electric heater, supply duct will require 90 degree elbow.

⚠ CAUTION

PROPERTY DAMAGE HAZARD

Failure to follow this caution may result in damage to roofing materials.

Membrane roofs can be cut by sharp sheet metal edges. Be careful when placing any sheet metal parts on such roof.

Step 6 — Rig and Place Unit

When the unit is ready to be rigged and no longer will be lifted by a fork truck, the wood protector under the basepan must be removed. Remove 4 screws from each base rail. Wood protector will drop to the ground. See instructions on the unit base rails.

Keep unit upright and do not drop. Spreader bars are not required. Rollers may be used to move unit across a roof. Level by using unit frame as a reference. Refer to Table 3 and Fig. 8 for additional information.

Lifting holes are provided in base rails as shown in Fig. 8. Refer to rigging instructions on unit.

Rigging materials under unit (cardboard or wood) must be removed PRIOR to placing the unit on the roof curb.

When using the standard side drain connection, ensure the red plug in the alternate bottom connection is tight. Do this before setting the unit in place. The red plug can be tightened with a 1/2 in. square socket drive extension. For further details, see Step 9 on page 28. Before setting the unit onto the curb, recheck gasketing on curb.

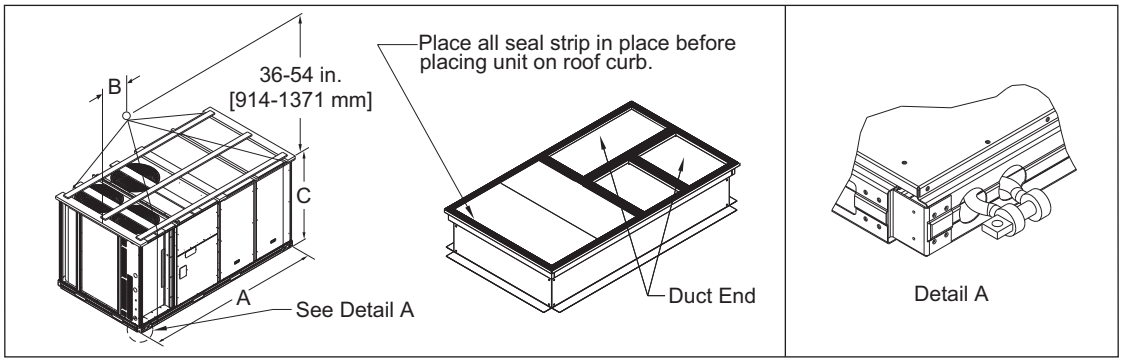
⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

All panels must be in place when rigging. Unit is not designed for handling by fork truck when packaging is removed.

If using top crate as spreader bar, once unit is set, carefully lower wooden crate off building roof top to ground. Ensure that no people or obstructions are below prior to lowering the crate.



48WE*H UNIT SIZE[a,b]	MAX WEIGHT		DIMENSIONS in. [mm]		
	lb	kg	A	B	C
07	1539	698	88 [2235]	45 [1145]	49.5 [1255]
08	2084	945	116 [2945]	60.5 [1535]	59.5 [1510]
12	2164	982	116 [2945]	61.5 [1560]	59.5 [1510]

NOTE(S):

a. Hook rigging shackles through holes in base rail, as shown in detail "A." Holes in base rails are centered around the unit center of gravity.
b. Use wooden top to prevent rigging straps from damaging unit.

Fig. 8 — Rigging Details

POSITIONING ON CURB

For full perimeter curbs CRRFCURB074A00 and CRRFCURB075A00, the clearance between the roof curb and the front and rear base rails should be 1/4 in. (6.4 mm). The clearance between the curb and the end base rails should be 1/2 in. (13 mm).

NOTE: Although the unit is weatherproof, guard against water from higher level runoff and overhangs.

IMPORTANT: If the unit has the factory-installed thru-the-base option, make sure to complete installation of the option before placing the unit on the roof curb.

See the following section:

- Factory-Option Thru-the-Base Connections on page 43.

NOTE: If electrical connection is not going to occur at this time, tape or otherwise cover the fittings so that moisture does not get into the building or conduit in the interim.

Remove all shipping materials and top skid. Remove extra center post from the condenser end of the unit so that the condenser end of the unit matches. Refer to page 33 for conduit options. Recycle or dispose of all shipping materials.

Step 7 — Convert to Horizontal or 100% Outdoor Air and Connect Ductwork (when required)

All units are shipped in the vertical duct configuration. Units without factory-installed economizer or return-air smoke detector option may be field converted to horizontal ducted configuration. All units with an economizer may be used for 100% outdoor air applications without a return air duct.

HORIZONTAL TO VERTICAL SUPPLY CONVERSION (6 TON UNITS)

Remove the screws from the horizontal supply duct cover (see Fig. 9) and save. Remove the horizontal supply duct cover and place the cover over the vertical supply air opening with the painted gray sheet metal side facing up (towards the sky).

HORIZONTAL TO VERTICAL SUPPLY CONVERSION (7.5 TO 10 TON UNITS)

The accessory CRDUCTCV002A00 supply duct cover is required to covert from vertical to horizontal supply. Remove the screws from the horizontal supply duct cover (see Fig. 9) and save. Remove the horizontal supply duct cover and discard it. Place the CRDUCTCV002A00 accessory supply duct cover over the vertical supply air opening with the painted gray sheet metal side facing up (towards the sky).

HORIZONTAL TO VERTICAL RETURN CONVERSION (FOR ALL UNITS)

Remove the screws from the horizontal return duct cover (see Fig. 9) and save. Remove the return duct cover and place it over the vertical return air opening with the painted gray sheet metal side facing up (towards the sky).

100% OUTDOOR AIR RETURN BLOCK OFF

For 100% outdoor air units without return air ductwork, the vertical return air opening must be blocked off using replacement cover (size 07 part no. single wall: 50DK400833, double-wall: 48TM006195) and (size 08-12 part no. single wall: 50TM400305, double-wall: 50TM002157). Place the return air opening cover over the vertical return air opening with the painted gray sheet metal side facing up (towards the sky).

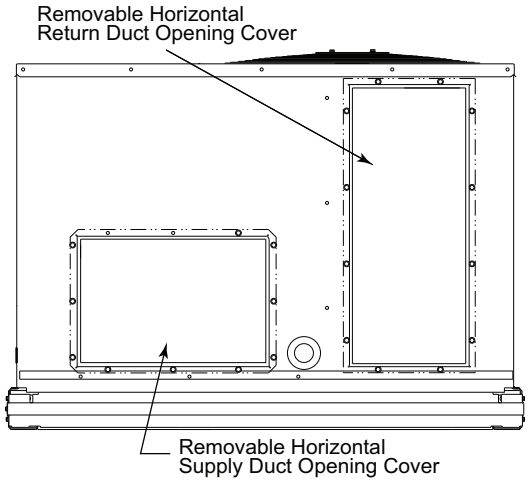


Fig. 9 — Horizontal Conversion Panels

FOR ALL CONVERTED UNITS

Ensure the covers are inserted into the notches on the base pan. The notches are covered by the tape used to secure the insulation to the basepan and are not easily seen. See Fig. 10 for position of the notches in the basepan. Use the saved screws or replacement screws to secure the cover to the base as shown in Fig. 11. Check seals around duct openings to ensure they are tight. Adjust as needed. Cover all seams with foil tape.

Field-supplied flanges should be attached to horizontal duct openings and all ductwork should be secured to the flanges. Insulate and weatherproof all external ductwork, joints, and roof or building openings with counter flashing and mastic in accordance with applicable codes.

Do not cover or obscure visibility to the unit's informative data plate when insulating horizontal ductwork.

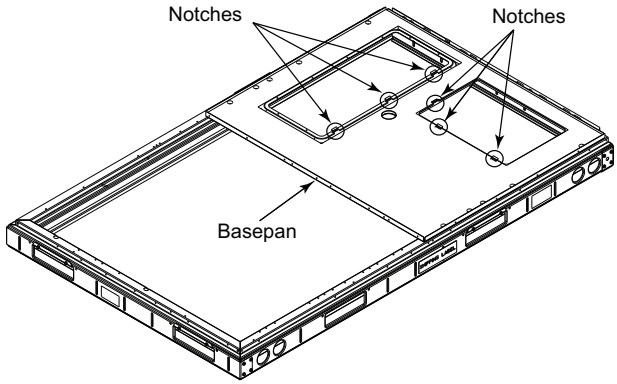


Fig. 10 — Location of Notches

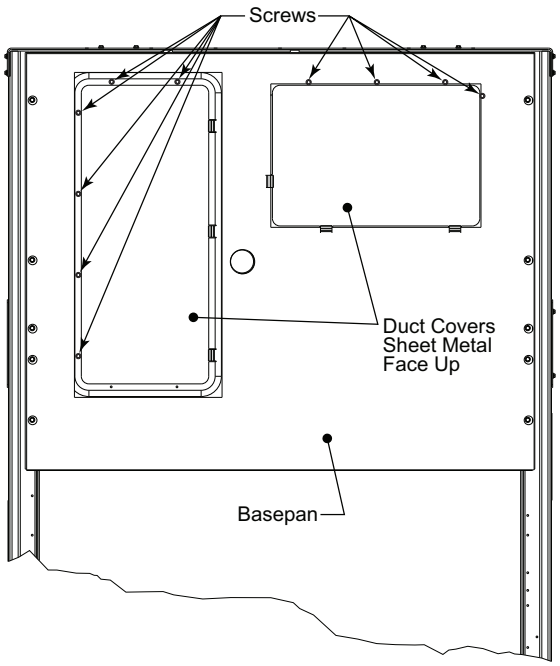


Fig. 11 — Horizontal Duct Panels In Place

Optional Duct-Mounted SAT Sensor Relocation

It is recommended, but not required, to relocate the supply air temperature (SAT) sensor on 48WE*H units to a duct-mounted location, depending on application requirements. The SAT sensor is factory supplied in the supply section of the unit (see Fig. 12). A field-supplied and installed, 10k Type II duct thermistor can be used instead of a factory sensor.

If relocation of the SAT sensor is required by the application specifications, disconnect lever nuts located in fan access section to factory SAT sensor. Pull SAT wires back into control box and reuse lever nuts to connect duct sensor to unit. Ensure enough wire length is left at the sensor for field wire connection.

Identify a location for the SAT sensor to be installed. The sensor should be at least 10 linear ft away from the unit and in the middle of the side of the supply duct to ensure proper readings. Do not install the sensor more than 100 ft (linear and vertical) away from the unit. Identify a location that is away from duct heaters, turning vanes, duct filters, or smoke dampers.

Once the SAT sensor location is identified, drill or punch a 1/2 in. (1.5 cm) hole into the side of the duct. Insert the 6-in. sensor probe into the duct work. Ensure that the probe is not touching any part of the duct, any duct insulation, or any duct accessories. Ensure the SAT sensor is reading within the air stream.

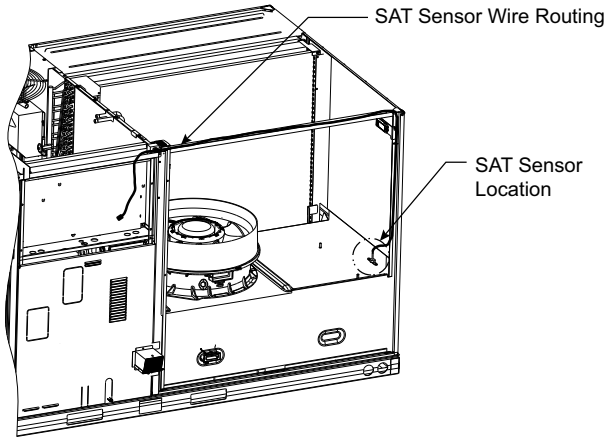


Fig. 12 — SAT Sensor Factory-Install Location and Wire Routing

Step 8 — Install Outside Air Hood

48WE*H07

The hood is shipped in knock-down form and must be field assembled. The indoor coil access panel is used as the hood top while the hood sides, divider and filter are packaged together, attached to a metal support tray using plastic stretch wrap, and shipped in the return air compartment behind the indoor coil access panel. The hood assembly's metal tray is attached to the basepan and also attached to the damper using two plastic tie-wraps.

1. To gain access to the hood, remove the filter access panel. (See Fig. 13.)

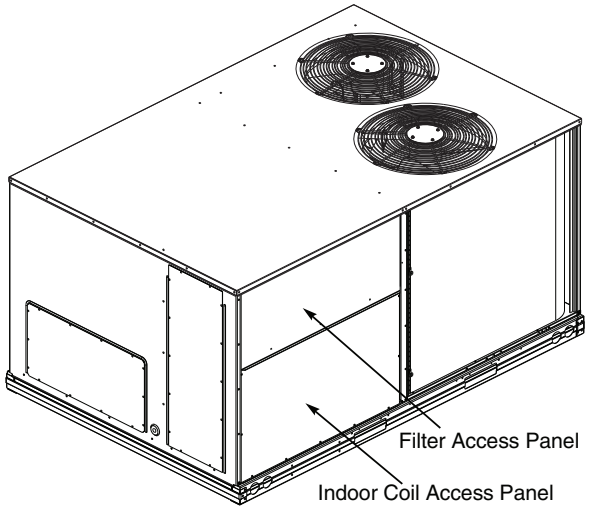


Fig. 13 — Typical Access Panel Locations

2. Locate the (2) screws holding the metal tray to the basepan and remove. Locate and cut the (2) plastic tie-wraps securing the assembly to the damper. (See Fig. 14.) Be careful to not damage any wiring or cut tie-wraps securing any wiring.

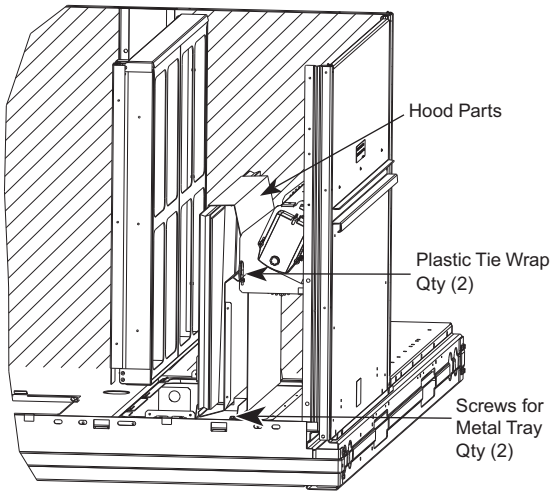


Fig. 14 — Economizer Hood Parts Location

3. Carefully lift the hood assembly (with metal tray) through the filter access opening and assemble per the steps outlined in Economizer Hood Setup in the following section.

Economizer Hood Setup

NOTE: If the power exhaust accessory is to be installed on the unit, the hood shipped with the unit will not be used and must be discarded. Save the aluminum filter for use in the power exhaust hood assembly.

1. The indoor coil access panel will be used as the top of the hood. Remove the screws along the sides and bottom of the indoor coil access panel. See Fig. 15.

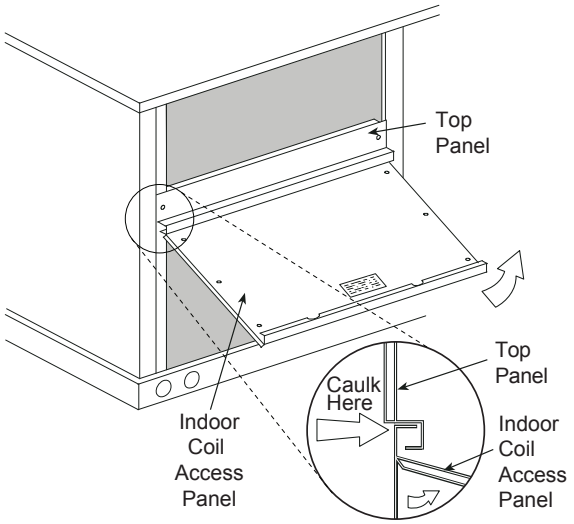


Fig. 15 — Indoor Coil Access Panel Relocation

2. Swing out indoor coil access panel and insert the hood sides under the panel (hood top). Use the screws provided to attach the hood sides to the hood top. Use screws provided to attach the hood sides to the unit. See Fig. 16.

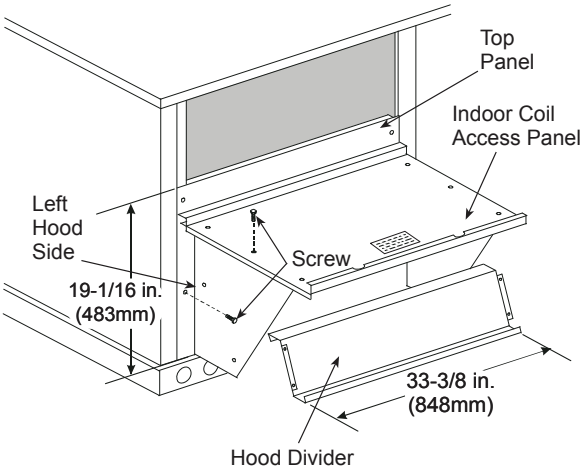


Fig. 16 — Economizer Hood Construction

3. Remove the shipping tape holding the economizer barometric relief damper in place (economizer only).
4. Insert the hood divider between the hood sides. See Fig. 16 and 17. Secure hood divider with 2 screws on each hood side. The hood divider is also used as the bottom filter rack for the aluminum filter.
5. Open the filter clips which are located underneath the hood top. Insert the aluminum filter into the bottom filter rack (hood divider). Push the filter into position past the open filter clips. Close the filter clips to lock the filter into place. See Fig. 17.
6. Caulk the ends of the joint between the unit top panel and the hood top.
7. Replace the filter access panel.

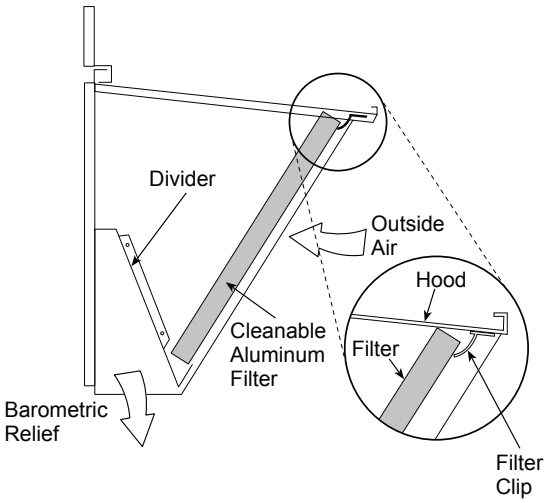


Fig. 17 — Economizer Filter Installation

48WE*H08/12

ECONOMIZER HOOD REMOVAL AND SETUP (FACTORY OPTION)

The hood is shipped in knock-down form and located in the return air compartment. It is attached to the economizer using 2 plastic tie-wraps.

1. To gain access to the hood, remove the filter access panel. (See Fig. 18.)
2. Locate and cut the 2 plastic tie-wraps, being careful to not damage any wiring. (See Fig. 19.)
3. Carefully lift the hood assembly through the filter access opening and assemble per the steps outlined in the Economizer Hood Assembly section on page 27.

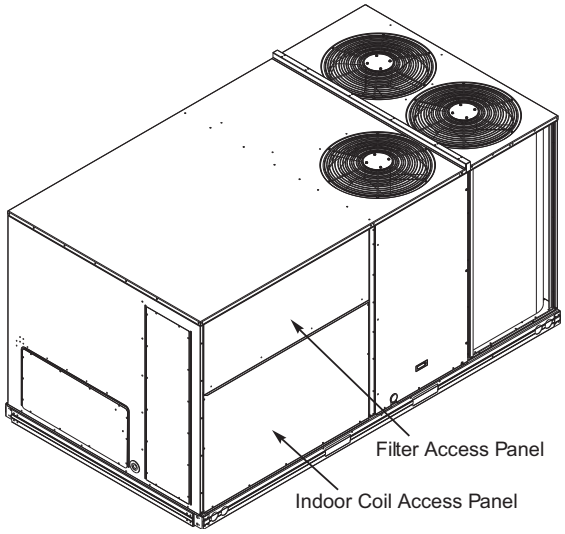


Fig. 18 — Typical Access Panel Locations

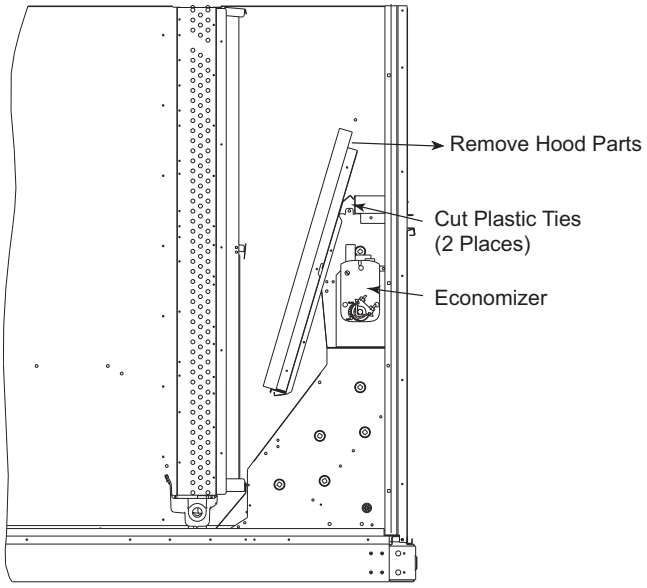


Fig. 19 — Economizer Hood Package Location

ECONOMIZER HOOD ASSEMBLY

NOTE: If the power exhaust accessory is to be installed on the unit, the hood shipped with the unit will not be used and must be discarded. Save the aluminum filter for use in the power exhaust hood assembly.

1. The indoor coil access panel will be used as the top of the hood. If the panel is still attached to the unit, remove the screws along the sides and bottom of the panel. See Fig. 20.
2. Swing out indoor coil access panel and insert the hood sides under the panel (hood top). Be careful not to lift the panel too far as it might fall out. Use the screws provided to attach the hood sides to the hood top and to attach the hood sides to the unit. See Fig. 21.
3. Remove the shipping tape holding the economizer barometric relief damper in place.
4. Insert the hood divider between the hood sides. See Fig. 21 and 22 for construction and installation. Secure hood divider with 3 screws on each hood side. The hood divider is also used as the bottom filter rack for the aluminum filter.
5. Attach the post that separates the filters with the screws provided.
6. Open the filter clips which are located underneath the hood top. Insert the aluminum filters into the bottom filter rack (hood divider). Push the filter into position past the open filter clips. Close the filter clips to lock the filters into place. See Fig. 22.
7. Install the 2 rain deflectors on the edge of the hood top as shown in Fig. 20.
8. Caulk the ends of the joint between the unit top panel and the hood top as shown in Fig. 20.
9. Replace the filter access panel.

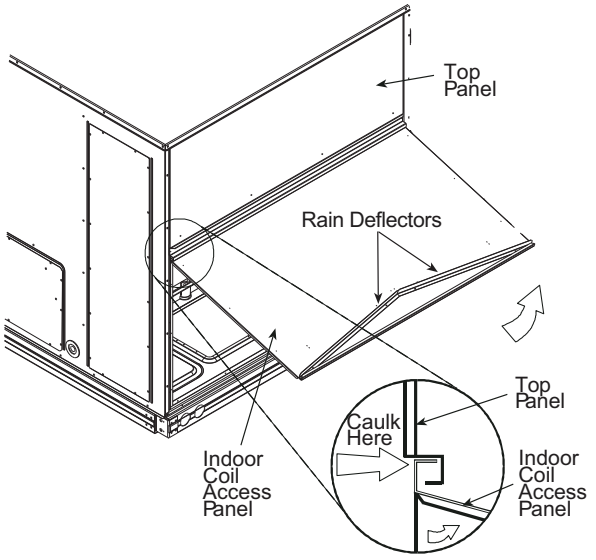


Fig. 20 — Indoor Coil Access Panel Relocation

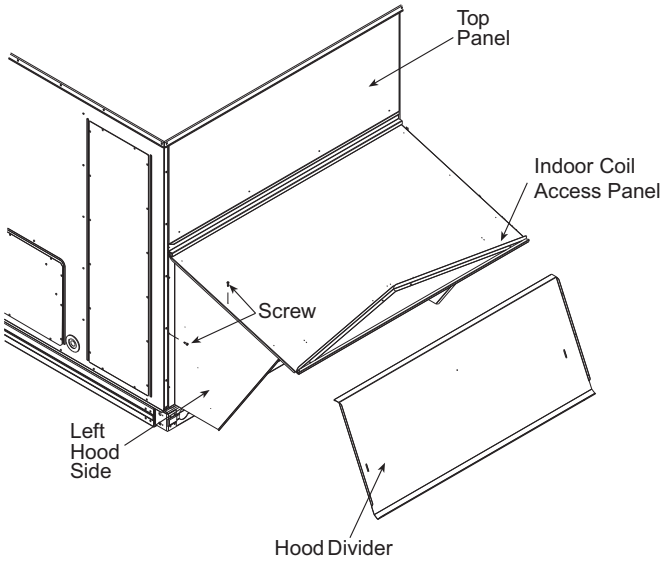


Fig. 21 — Economizer Hood Construction

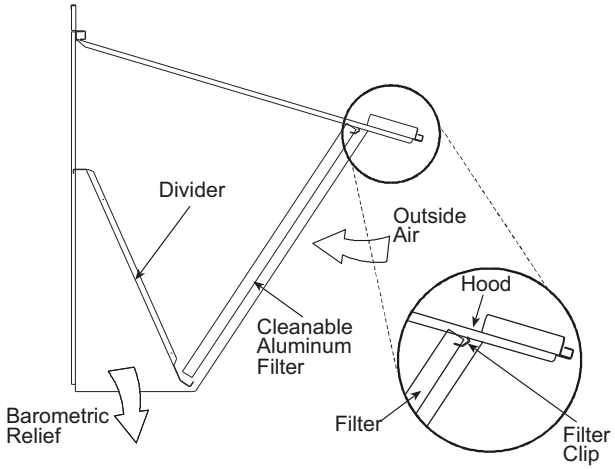


Fig. 22 — Economizer Filter Installation

Step 9 — Install External Condensate Trap and Line

The unit has one 3/4 in. condensate drain connection on the end of the condensate pan and an alternate connection on the bottom. See Fig. 23. Unit airflow configuration does not determine which drain connection to use. Either drain connection can be used with vertical or horizontal applications.

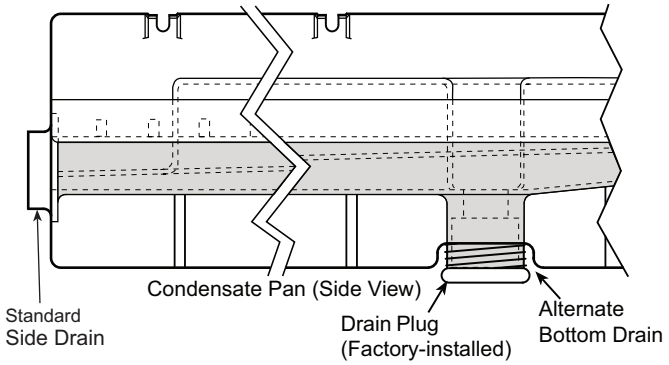
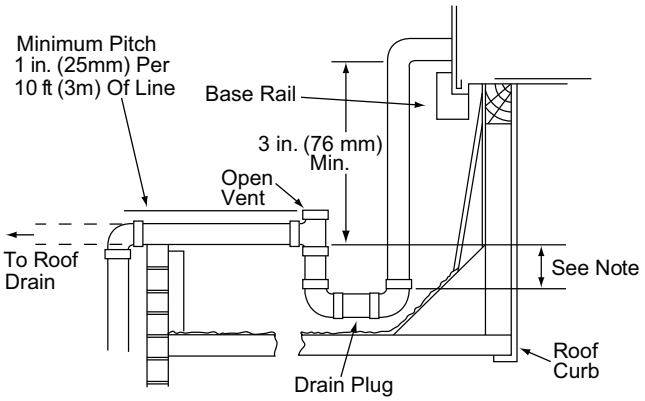


Fig. 23 — Condensate Drain Pan (Side View)

To use the alternate bottom drain connection, remove the red drain plug from the bottom connection (use a 1/2 in. square socket drive extension) and install it in the side drain connection.

The piping for the condensate drain and external trap can be completed after the unit is in place. See Fig. 24.

All units must have an external trap for condensate drainage. Install a trap at least 4 in. (102 mm) deep and protect against freeze-up. If drain line is installed downstream from the external trap, pitch the line away from the unit at 1 in. per 10 ft (25 mm in 3 m) of run. Do not use a pipe size smaller than the unit connection (3/4 in.).



NOTE: Trap should be deep enough to offset maximum unit static difference. A 4 in. (102 mm) trap is recommended.

Fig. 24 — Condensate Drain Piping Details

Step 10 — Install Flue Hood

The flue hood is shipped screwed to the basepan beside the burner compartment access panel. Remove the panel below the control box access panel to access the flue hood shipping location. Using screws provided, install flue hood and screen in location shown in Fig. 25 and 26.

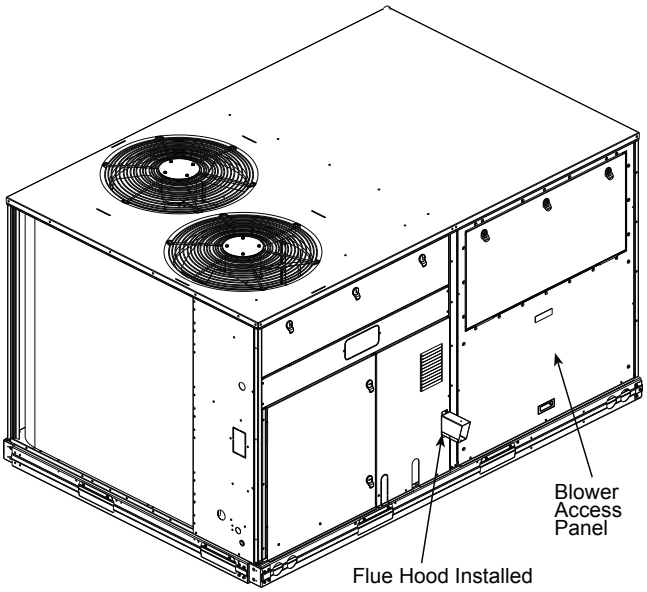


Fig. 25 — Flue Hood Installed (Size 07 Shown)

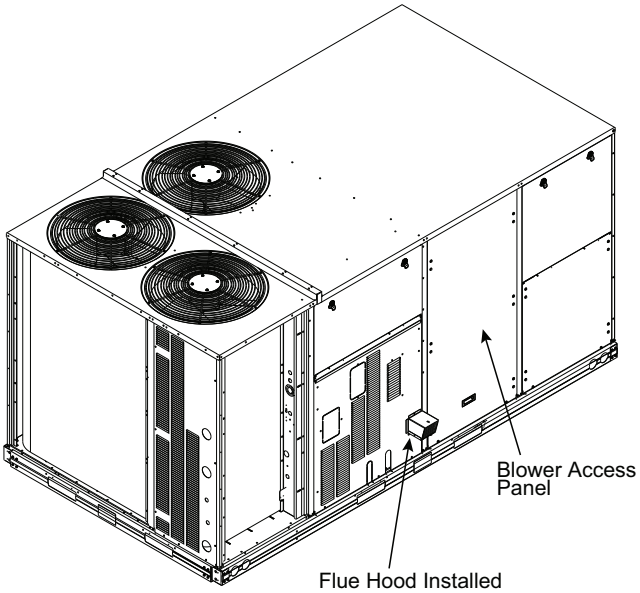


Fig. 26 — Flue Hood Installed (Sizes 08-12 Shown)

Step 11 — Install Gas Piping

Installation of the gas piping must be accordance with local building codes and with applicable national codes. In U.S.A., refer to NFPA 54/ANSI Z223.1 National Fuel Gas Code (NFGC). In Canada, installation must be accordance with the CAN/CSA B149.1 and CAN/CSA B149.2 installation codes for gas burning appliances.

This unit is factory equipped for use with natural gas fuel at elevations up to 2000 ft (610 m) above sea level. Unit may be field converted for operation at elevations above 2000 ft (610 m) and/or for use with liquefied petroleum fuel. See accessory kit installation instructions regarding these accessories.

NOTE: In U.S.A. the input rating for altitudes above 2000 ft (610 m) must be derated by 4% for each 1000 ft (305 m) above sea level.

For natural gas applications, gas pressure at unit gas connection must not be less than 5 in. wg (1244 Pa) or greater than 13 in. wg (3240 Pa) while the unit is operating (see Table 4). For liquified petroleum applications, the gas pressure must not be less than 11 in. wg (2740 Pa) or greater than 13 in. wg (3240 Pa) at the unit connection (see Table 5).

The gas supply pipe enters the unit at the burner access panel on the front side of the unit, through the long slot at the bottom of the access panel. The gas connection to the unit is made to the FPT gas inlet port on the unit gas valve(s). See Table 8 for gas connection sizes and quantities. See Fig. 27 for single connection location and Fig. 27 for dual connection locations.

Table 4 — Natural Gas Supply Line Pressure Ranges

UNIT SIZES	MIN	MAX
48WE*H07-12	5.0 in. wg (1244 Pa)	13.0 in. wg (3240 Pa)

Table 5 — Liquid Propane Supply Line Pressure Ranges

UNIT SIZES	MIN	MAX
48WE*H07-12	11.0 in. wg (2740 Pa)	13.0 in. wg (3240 Pa)

Manifold pressure is factory-adjusted for natural gas fuel use. Adjust as required to obtain best flame characteristics. See Table 6.

Manifold pressure for liquid propane fuel must be adjusted to specified range. Follow instructions in the accessory kit to make initial readjustment. See Table 7.

Install a gas supply line that runs to the unit heating section. Refer to the NFPA 54/NFGC or equivalent code for gas pipe sizing data.

The gas supply line can approach the unit in three ways: horizontally from outside the unit (across the roof), thru-the-curb/under unit basepan (accessory kit required) or through unit basepan (factory-option or accessory kit required). Consult accessory kit installation instructions for details on these installation methods. Observe clearance to gas line components per Fig. 27.

Table 6 — Natural Gas Manifold Pressure Ranges

UNIT MODEL	HIGH FIRE	LOW FIRE
48WE*H07-12	3.5 in. wg (872 Pa)	0.2 in. wg (49.8 Pa)

Table 7 — Liquid Propane Manifold Pressure Ranges

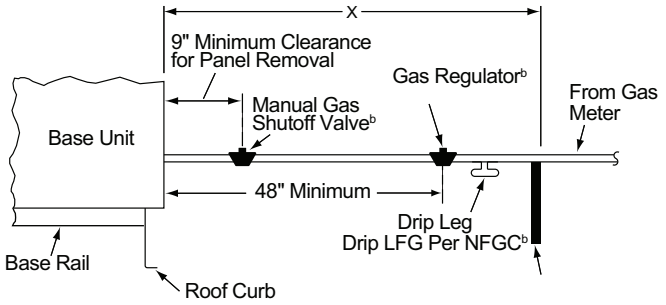
UNIT MODEL	HIGH FIRE	LOW FIRE
48WE*H07-12	10.0 in. wg (2491 Pa)	1 in. wg (249 Pa)

⚠CAUTION

EQUIPMENT DAMAGE

Failure to follow this caution may result in equipment damage.

When connecting the gas line to the unit gas valve, the installer MUST use a backup wrench to prevent damage to the valve.



LEGEND

NFGC — National Fuel Gas Code

NOTES:

a. Follow all local codes.

b. Field-supplied.

STEEL PIPE NOMINAL DIAMETER (in.)	SPACING OF SUPPORTS X DIMENSION (ft)
1/2	6
3/4 or 1	8
1-1/4 or larger	10

Fig. 27 — Gas Piping Guide

Table 8 — Gas Connection Quantity and Size

HEAT SIZE	TURNDOWN	NO. CONNECTION	48WE*H07	48WE*H08	48WE*H12
LOW	Standard (5:1)	1	1/2 in.	3/4 in.	3/4 in.
MEDIUM	Standard (5:1)	1	1/2 in.	3/4 in.	3/4 in.
HIGH	Standard (5:1)	1	1/2 in.	3/4 in.	3/4 in.
MEDIUM	High (10:1)	1	N/A	N/A	3/4 in.
HIGH	High (10:1)	2	N/A	3/4 in.	3/4 in.

FACTORY-OPTION THRU-THE-BASE CONNECTIONS (GAS CONNECTION)

48WE*H07

This service connection kit consists of a 1/2 in. NPT gas adapter fitting (brass), a 1/2 in. electrical bulkhead connector and a 3/4 in. electrical bulkhead connector, all factory-installed in the embossed (raised) section of the unit basepan in the condenser section. See Fig. 28.

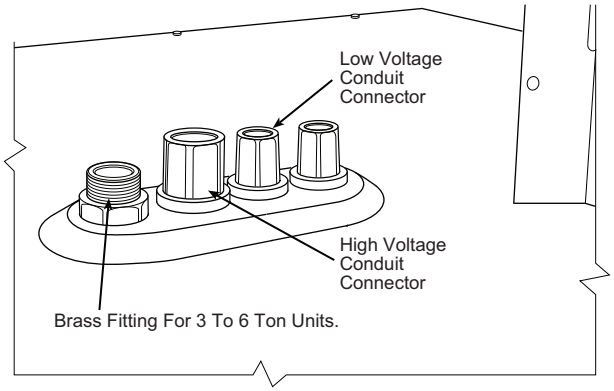


Fig. 28 — 48WE*H07 Thru-the-Base Connection Fittings

Check tightness of connector lock nuts before connecting electrical conduits.

Field-supplied and field-installed liquid tight conduit connectors and conduit may be attached to the connectors on the basepan. Pull correctly rated high voltage through appropriate conduits. Connect the power conduit to the internal disconnect (if unit is so equipped) or to the external disconnect (through unit side panel). A hole must be field cut in the main control box bottom on the left side so the 24-v control connections can be made. Connect the control power conduit to the unit control box at this hole.

48WE*H08/12

This service connection kit consists of a 3/4 in. NPT gas adapter fitting (stainless steel), a 1/2 in. electrical bulkhead connector and a 1-1/2 in. electrical bulkhead connector, connected to an "L" bracket covering the embossed (raised) section of the unit basepan in the condenser section. See Fig. 29.

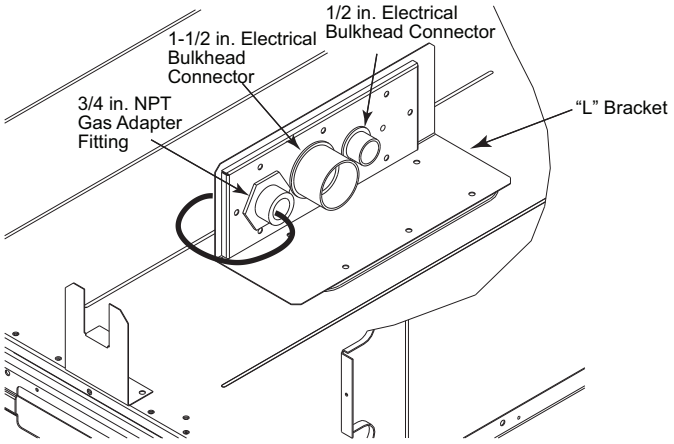


Fig. 29 — 48WE*H08/12 Thru-the-Base Option, Shipping Position

1. Remove the "L" bracket assembly from the unit (see Fig. 29).
2. Cut and discard the wire tie on the gas fitting. Hand tighten the fitting if it has loosened in transit.
3. Remove connector plate assembly from the "L" bracket and discard the "L" bracket, but retain the washer head screws and the gasket (located between the "L" bracket and the connector plate assembly.

   NOTE: Take care not to damage the gasket, as it is reused in the following step.
4. Place the gasket over the embossed area in the basepan, aligning the holes in the gasket to the holes in the basepan. See Fig. 30.
5. Install the connector plate assembly to the basepan using 8 of the washer head screws.

   NOTE: If gas and/or electrical connections are not going to occur at this time, tape or otherwise cover the fittings so that moisture does not get into the building or conduit in the interim.

The thru-the-base gas connector has male and female threads. The male threads protrude above the basepan of the unit; the female threads protrude below the basepan.

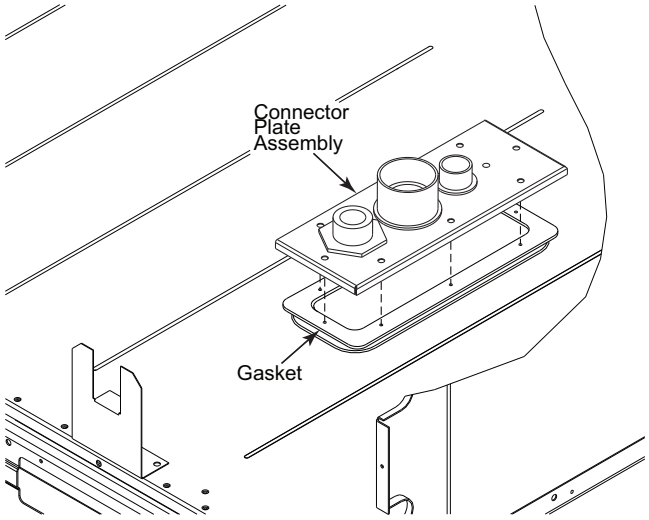


Fig. 30 — Completing Installation of Thru-the-Base Option

Check tightness of connector lock nuts before connecting gas piping. Install a 3/4 in. NPT street elbow on the thru-the-base gas fitting. Attach a 3/4 in. pipe nipple with minimum length of 16 in. (406 mm) (field-supplied) to the street elbow and extend it through the access panel at the gas support bracket. See Fig. 31.

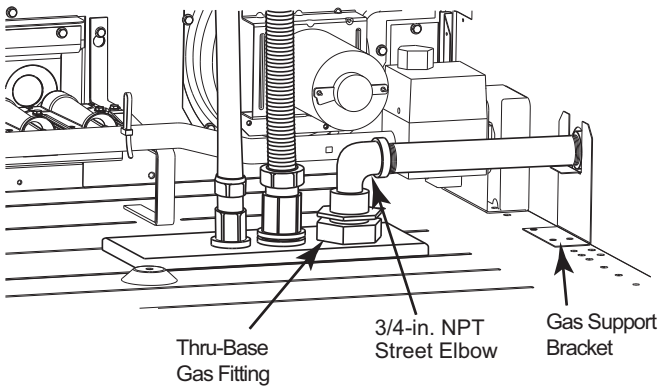


Fig. 31 — Gas Line Piping

Other hardware required to complete the installation of the gas supply line will include a manual shutoff valve, a sediment trap (drip leg) and a ground-joint union. A pressure regulator valve may also be required (to convert gas pressure from pounds to inches of pressure). The manual shutoff valve must be located within 6 ft (1.83 m) of the unit. The union, located in the final leg entering the unit, must be located at least 9 in. (230 mm) away from the access panel to permit the panel to be removed for service. If a regulator valve is installed, it must be located a minimum of 4 ft (1220 mm) away from the unit's flue outlet. Some municipal codes require that the manual shutoff valve be located upstream of the sediment trap. See Fig. 32 and 33 for typical piping arrangements for gas piping that has been routed through the sidewall of the curb. See Fig. 34 for typical piping arrangement when thru-the-base is used. Ensure that all piping does not block access to the unit's main control box or limit the required working space in front of the control box.

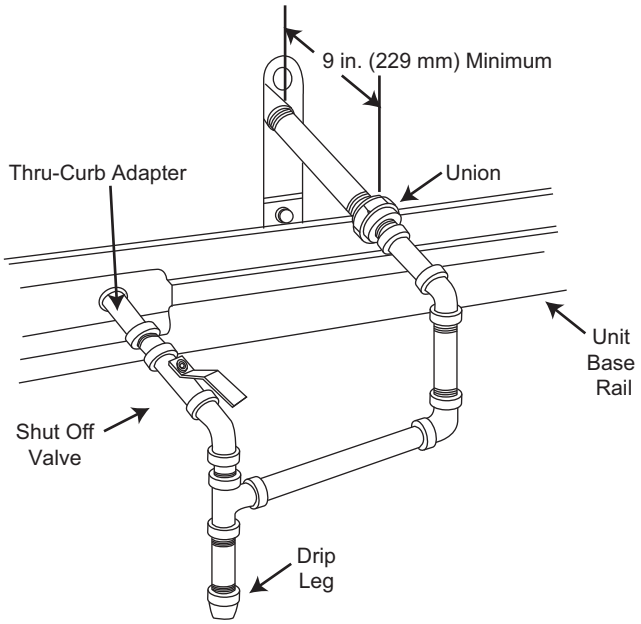


Fig. 32 — Gas Piping with Direct Drip Leg

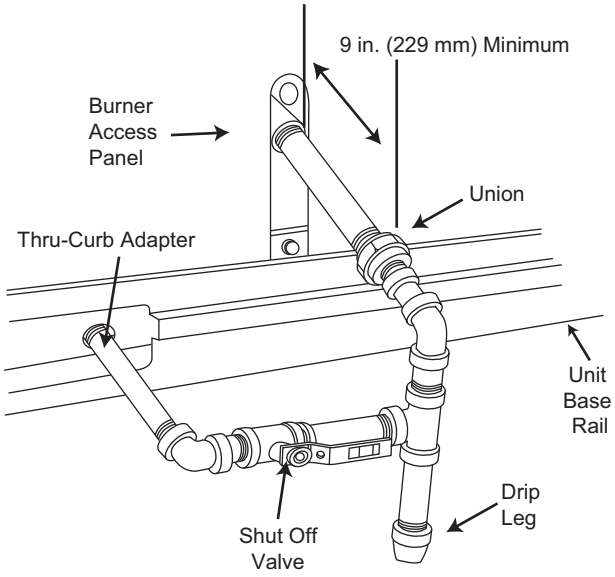


Fig. 33 — Gas Piping with Offset Drip Leg

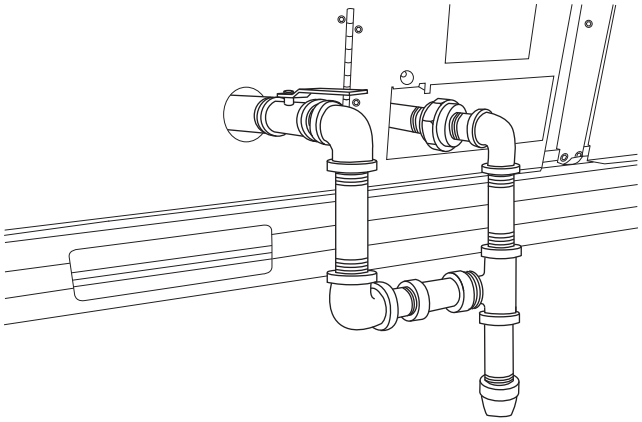


Fig. 34 — Gas Piping Thru-the-Base Connections

When installing the gas supply line, observe local codes pertaining to gas pipe installations. Refer to the NFPA 54/ANSI Z223.1 NFGC latest edition (in Canada, CAN/CSA B149.1). In the absence of local building codes, adhere to the following pertinent recommendations:

1. Avoid low spots in long runs of pipe. Grade all pipe 1/4 in. in every 15 ft (7 mm in every 5 m) to prevent traps. Grade all horizontal runs downward to risers. Use risers to connect to heating section and to meter.
2. Protect all segments of piping system against physical and thermal damage. Support all piping with appropriate straps, hangers, etc. Use a minimum of one hanger every 6 ft (1.8 m). For pipe sizes larger than 1/2 in., follow recommendations of national codes.
3. Apply joint compound (pipe dope) sparingly and only to male threads of joint when making pipe connections. Use only pipe dope that is resistant to action of liquefied petroleum gases as specified by local and/or national codes. If using PTFE (Teflon[1]) tape, ensure the material is Double Density type and is labeled for use on gas lines. Apply tape per manufacturer's instructions.
4. Pressure-test all gas piping in accordance with local and national plumbing and gas codes before connecting piping to unit.

NOTE: Pressure test the gas supply system after the gas supply piping is connected to the gas valve. The supply piping must be disconnected from the gas valve during the testing of the piping systems when test pressure is in excess of 0.5 psig (3450 Pa). Pressure test the gas supply piping system at pressures equal to or less than 0.5 psig (3450 Pa). The unit heating section must be isolated from the gas piping system by closing the external main manual shutoff valve and slightly opening the ground-joint union.

Check for gas leaks at the field-installed and factory-installed gas lines after all piping connections have been completed. Use soap-and-water solution (or method specified by local codes and/or regulations).

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⚠ WARNING

Failure to follow this warning could result in personal injury, death and/or property damage.

- Connect gas pipe to unit using a backup wrench to avoid damaging gas controls.
- Never purge a gas line into a combustion chamber.
- Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections.
- Use proper length of pipe to avoid stress on gas control manifold.

NOTE: If orifice hole appears damaged or it is suspected to have been re-drilled, check orifice hole with a numbered drill bit of correct size. Never re-drill an orifice. A burr-free and squarely aligned orifice hole is essential for proper flame characteristics. See Fig. 35.

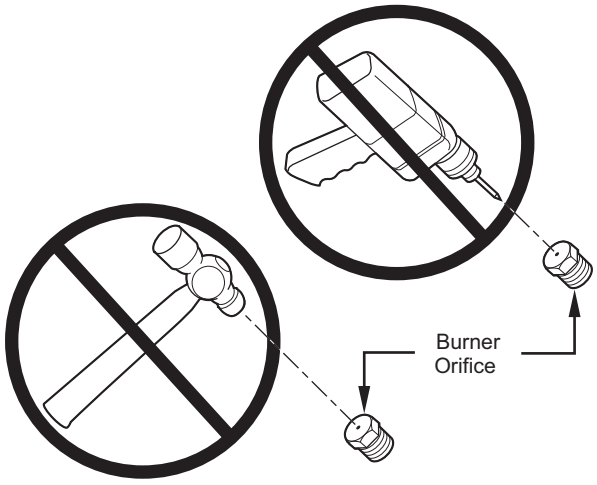


Fig. 35 — Orifice Hole

Step 12 — Install Gas Heating Condensate Drain

Condensation in the heater can occur during heating operation in applications with modulating heat or in 100% outdoor air applications. Condensation in the heater section can also occur during cooling operation, as the heater is downstream of the cooling coil. In these applications, connection of the drain line is required to prevent condensate buildup and possible heat exchanger damage. A 1/4 in. NPT condensate drain connection is provided in the flue box to remove condensate from inside the heat exchanger. See Fig. 36 for condensate drain fitting location.

The condensate drain must be connected to a drain. A P-trap is recommended in the drain, as the system operates under a negative pressure. The use of a "Tee" fitting is recommended to allow for priming and cleaning the trap. Use a plug in the cleanout opening. See Fig. 37 for typical condensate drain piping example.

NOTE: Flue gas condensate freeze protection kit is available as an accessory.

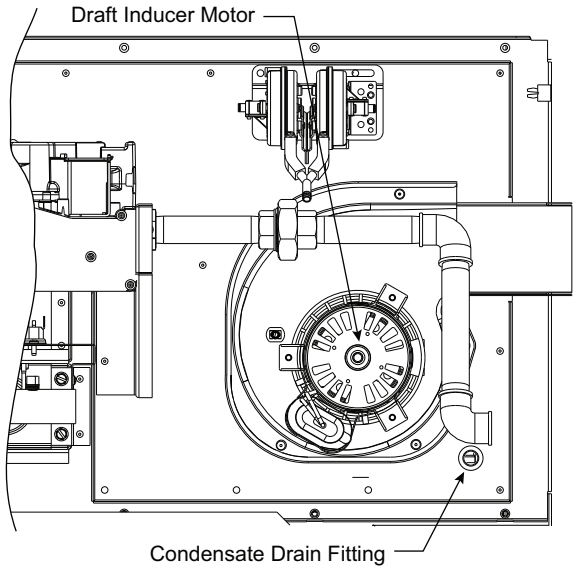


Fig. 36 — Gas Heater Condensate Drain Fitting

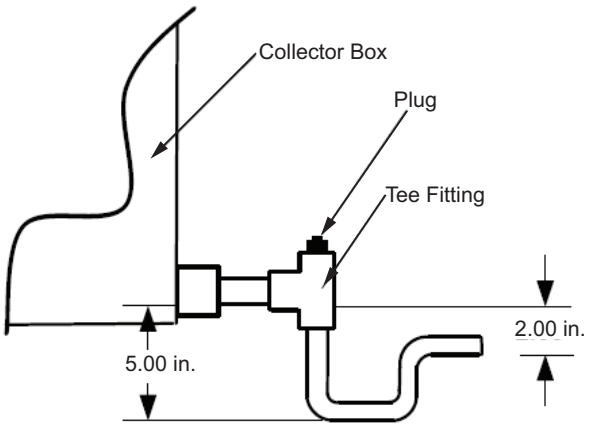


Fig. 37 — Gas Heater Condensate Drain Example

IMPORTANT: Flue gas condensate generated during heating is corrosive and may result in shortened heat exchanger life. Use corrosion resistant metal tubing or composite tubing. Metal condensate drain lines should have corrosion resistance at least equal to that of 304 SS. Copper tubing is not suitable for flue gas condensate. Disposal of flue gas condensate is subject to local codes and ordinances. Some municipalities require that the acidic condensate produced be neutralized before being discharged into the sanitary sewer. Acidic condensate can cause damage to roofing material and may void the roof warranty.

IMPORTANT: Disposal of flue gas condensate is subject to local codes and ordinances. Some municipalities require that the acidic condensate produced be neutralized before being discharged into the sanitary sewer.

IMPORTANT: Flue gas condensate can damage roofing material and may void the roof warranty. Consult with the roof installer or material manufacturer for guidance.

NOTE: A flue gas condensate neutralizer kit is available as an accessory.

Step 13 — Make Electrical Connections

⚠ WARNING

ELECTRIC SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Unit cabinet must have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur. This ground may consist of electrical wire connected to unit ground lug in control compartment, or conduit approved for electrical ground when installed in accordance with NEC; ANSI/NFPA 70, latest edition (in Canada, Canadian Electrical Code CSA [Canadian Standards Association] C22.1), and local electrical codes.

NOTE: Field-supplied wiring shall conform with the limitations of minimum 63°F (33°C) rise.

FIELD POWER SUPPLY

For those units without thru-the-curb power, conduit must be used to route the main power from the condenser end, via the power entry in the corner post of the unit (see Fig. 38-40) to either the factory option disconnect or the bottom of the control box. A 1 in. conduit is provided (wrapped around compressor). A second conduit is provided with factory-installed powered convenience outlet. For those units that require conduit larger than 1 in., it must be field supplied. Figures 38-40 show the various wire routings. See Fig. 41-43 for wiring information.

If the field disconnect is larger than 100A, it must be attached to the unit using accessory CRDISBKT001A00 (disconnect switch bracket). See Fig. 44. Follow the instructions provided with this accessory. For smaller field disconnects, be sure to use 1/2 in. screws to mount the disconnect directly to the end panel, following the instructions on the Field Disconnect Warning Label (see Fig. 45). In either case, set the disconnect vertical location on the unit so that a 90 degree fitting can be used to connect the conduit to the disconnect.

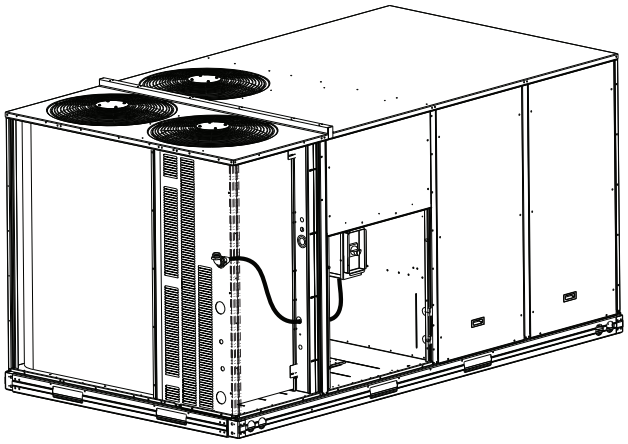


Fig. 38 — Conduit into Factory Option Non-Fused Disconnect (NFD) or HACR

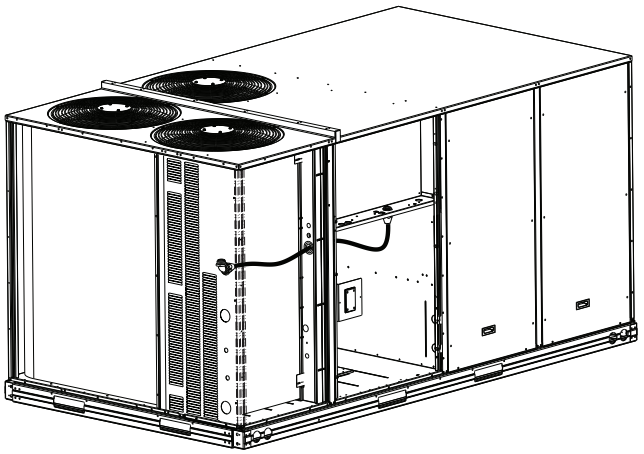


Fig. 39 — Conduit into Control Box

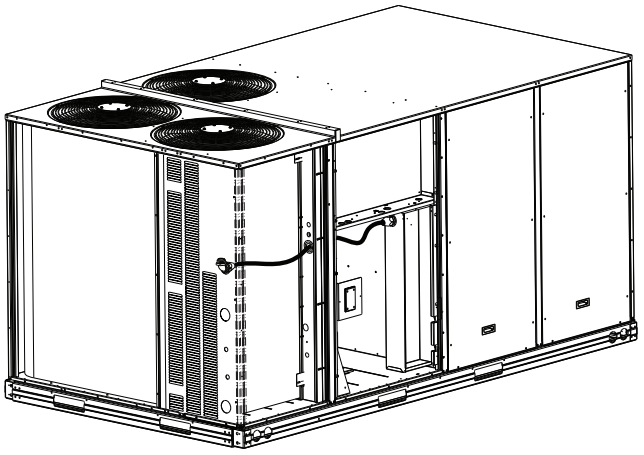


Fig. 40 — Conduit into Single Point Box

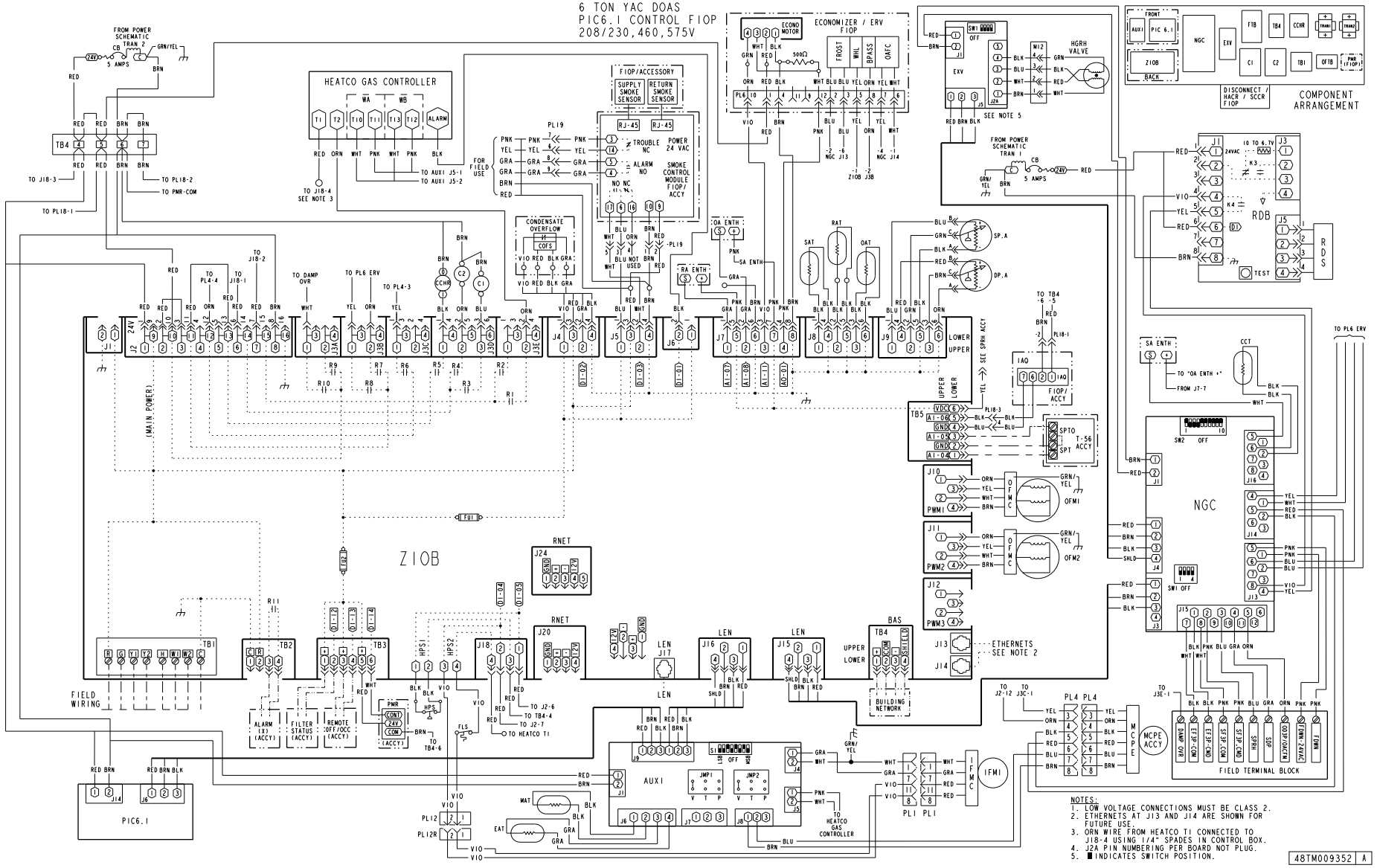


Fig. 41 — 48WE*H07 SmartVu™ Control Wiring Diagram (208/230-v, 460-v, 575-v Units)

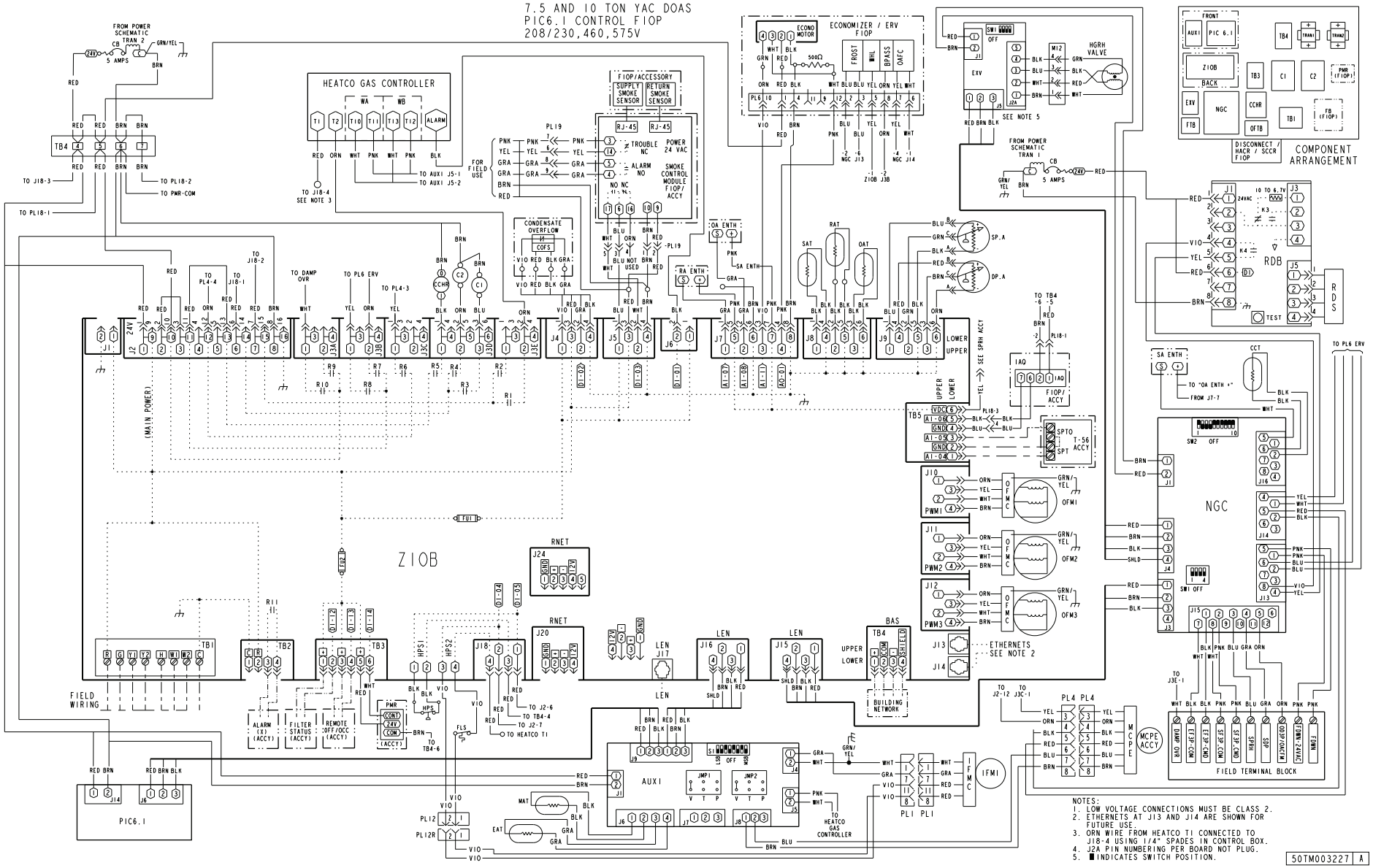
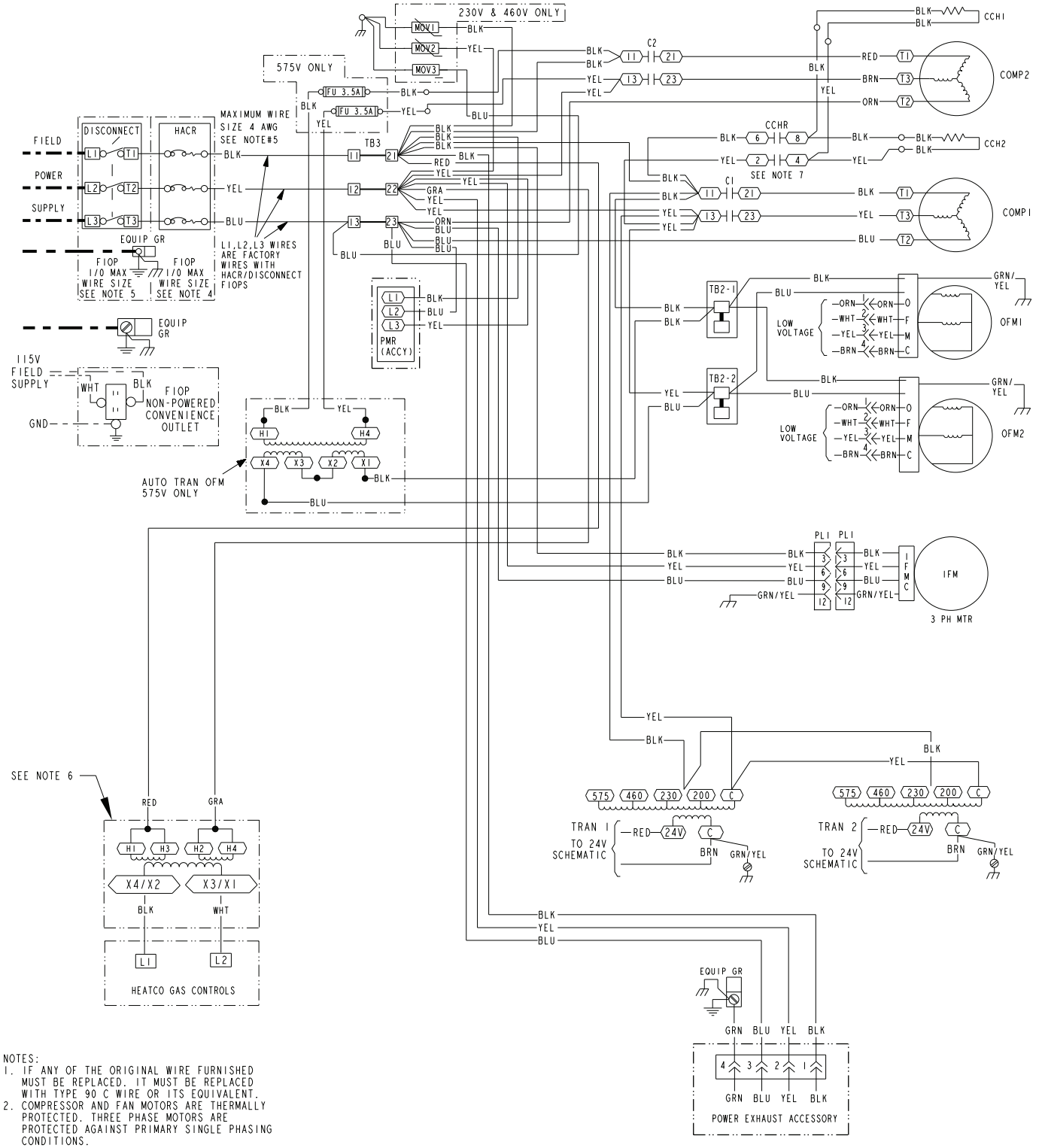


Fig. 42 — 48WE*H08-12 SmartVu™ Control Wiring Diagram (208/230-v, 460-v, 575-v Units)



NOTES:
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. 208/230V UNIT TRAN IS WIRED FOR 230V UNIT. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS.
5. USE COPPER CONDUCTOR ONLY.
6. H3 AND H2 ARE CONNECTED INTERNALLY FOR 460V USING WIRE NOT. THEY ARE NOT PRESENT ON 575V.
7. CCHR WIRES FOR LC MODELS TO BE CONNECTED TO TERMINALS 3 AND 7.

YAC POWER DOAS - 6 TON 208/230, 460V,575V 3Ø

48TM007145 B

Fig. 43 — 48WE*H07 Power Wiring Diagram (208/230-v, 460-v, 575-v Units)

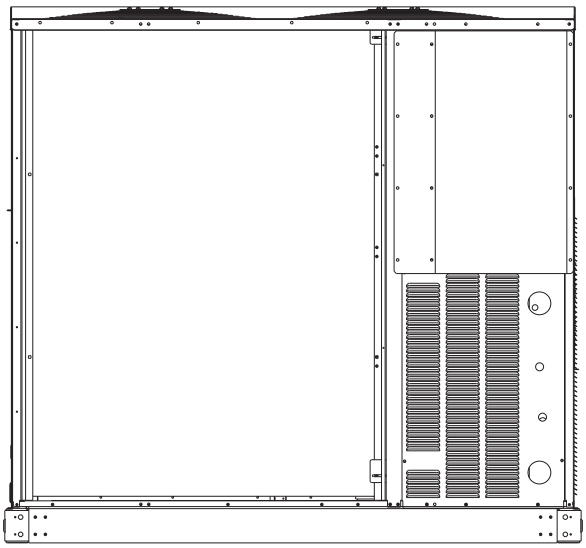


Fig. 44 — Mounting Position for Field Disconnects (over 100A)

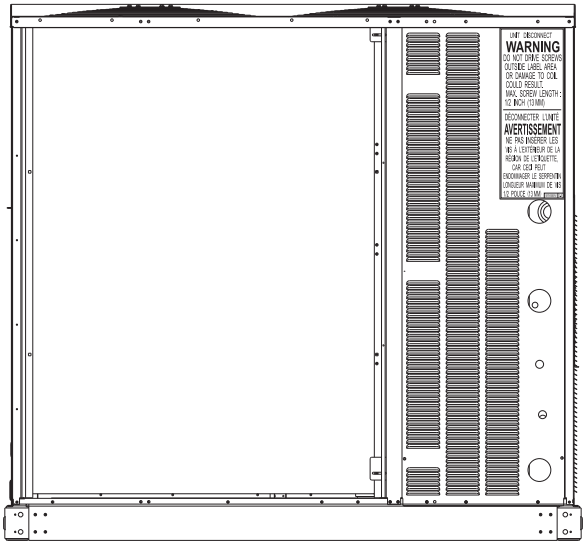
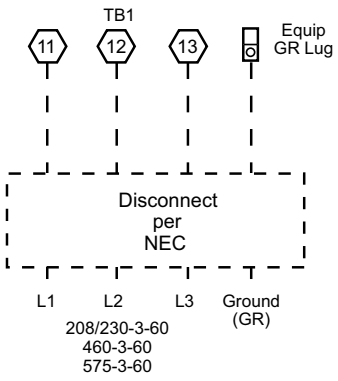


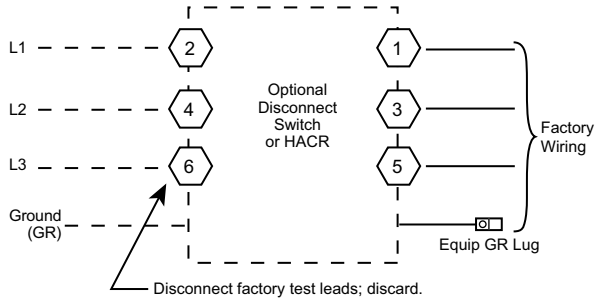
Fig. 45 — Mounting Position for Field Disconnects (up to 100A)

Field power wires are connected to the unit at line-side pressure lugs at the main terminal block (TB1), at factory-installed option non-fused disconnect switch or HACR, or field or factory-installed single point box for electric heat. See Table 9 for maximum wire size at connection lugs. Use copper wire only. See Fig. 46.

Units Without Single Point Box, Disconnect or HACR Option



Units With Disconnect or HACR Option



Units With Electric Heat Option with Single Point Box and Without Disconnect or HACR Option

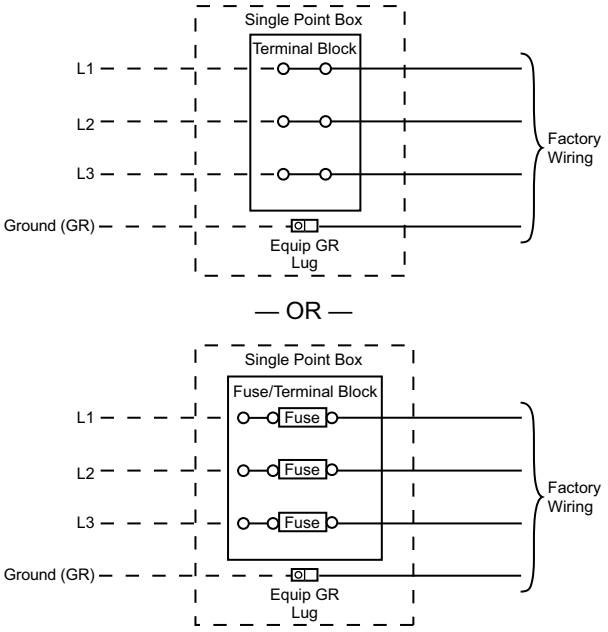


Fig. 46 — Power Wiring Connections

Table 9 — Connection Lug Min/Max Wire Sizes

CONNECTION	MINIMUM	MAXIMUM
TB1 in unit control box	No. 14	No. 1
Terminal/fuse block in single point box for electric heat	No. 8	3/0
80A Disconnect Option	No. 14	No. 4
100A Disconnect Option	No. 8	1/0
200A Disconnect Option	No. 4	300 kcmil
25A HACR Option	No. 14	1/0
30A HACR Option	No. 14	1/0
35A HACR Option	No. 14	1/0
40A HACR Option	No. 14	1/0
50A HACR Option	No. 14	1/0
60A HACR Option	No. 14	1/0
70A HACR Option	No. 14	1/0
80A HACR Option	No. 14	1/0
90A HACR Option	No. 14	1/0
100A HACR Option	No. 14	1/0
110A HACR Option	No. 4	300 kcmil
125A HACR Option	No. 4	300 kcmil
150A HACR Option	No. 4	300 kcmil
175A HACR Option	No. 4	300 kcmil
200A HACR Option	No. 4	300 kcmil

NOTE: Test Leads – unit may be equipped with short leads (pigtails) on the field line connection points off the optional non-fused disconnect switch or HACR. These leads are for factory run-test purposes only; remove and discard before connecting field power wires to unit connection points. Make field power connections directly to line connection pressure lugs only.

⚠ WARNING

FIRE HAZARD

Failure to follow this warning could result in personal injury, death, or property damage.

Do not connect aluminum wire between disconnect switch and unit. Use only copper wire.

ALL UNITS

All field wiring must comply with the NEC and local requirements. Size wire based on MCA (Minimum Circuit Amps) on the unit informative plate. Refer to Fig. 46 and the unit label diagram for power wiring connections to the unit power terminal blocks and equipment ground. Refer to Table 9 for maximum wire size at connection lugs. See Fig. 47.

Provide a ground-fault and short-circuit over-current protection device (fuse or breaker) per NEC Article 440 (or local codes). Refer to unit informative data plate for MOCP (Maximum Overcurrent Protection) device size.

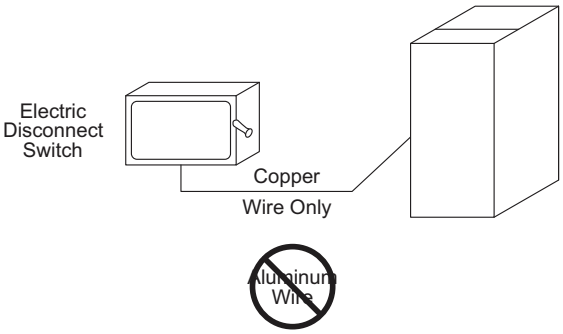


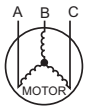
Fig. 47 — Disconnect Switch and Unit

NOTE: Units ordered with factory-installed HACR do not need an additional ground-fault and short-circuit over-current protection device unless local codes require.

Voltage to compressor terminals during operation must be within voltage range indicated on unit nameplate. On 3-phase units, voltages between phases must be balanced within 2% and the current within 10%. Use the formula shown below to determine the percent of voltage imbalance.

$$\text{\% Voltage Imbalance} = 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 230-3-60



AB = 224-v
BC = 231-v
AC = 226-v

$$\text{Average Voltage} = \frac{(224 + 231 + 226)}{3} = \frac{681}{3} = 227$$

Determine maximum deviation from average voltage.

(AB) 227-224 = 3-v

(BC) 231-227 = 4-v

(AC) 227-226 = 1-v

Maximum deviation is 4-v.

Determine percent of voltage imbalance.

$$\text{\% Voltage Imbalance} = 100x \frac{4}{227} = 1.76\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

All units except 208/230-v units are factory wired for the voltage shown on the nameplate. If the 208/230-v unit is to be connected to a 208-v power supply, the control transformer must be rewired by moving the black wire with the 1/4 in. female spade connector from the 230-v connection and moving it to the 200-v, 1/4 in. male terminal on the primary side of the transformer. Refer to unit label diagram for additional information.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

Operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components. Such operation would invalidate any applicable Carrier warranty.

UNITS WITHOUT FACTORY-INSTALLED NON-FUSED DISCONNECT OR HACR

When installing units, provide a disconnect switch of adequate size per NEC (National Electrical Code). Disconnect sizing data is provided on the unit informative plate. Locate on unit cabinet or within sight of the unit per national or local codes. Do not cover unit informative plate if mounting the disconnect on the unit cabinet.

UNITS WITH FACTORY-INSTALLED NON-FUSED DISCONNECT OR HACR

The factory-installed option disconnect switch is located in a weatherproof enclosure located under the main control box (see Fig. 48-50). The manual switch handle is shipped in the disconnect or HACR enclosure. Assemble the shaft and handle to the switch or HACR at this point. Discard the factory test leads (refer to Fig. 46). The factory disconnect is a 200A disconnect on 230-3-60 units and a 100A disconnect on 460-3-60 and 575-3-60 units. On units with factory-installed non-fused disconnect, without factory-installed electric heat, the factory-supplied load side wires may be of insufficient size for accessory electric heat applications. If so, remove the load side factory wiring. Re-size wires per unit nameplate data provided with accessory electric heat. See Fig. 51-53 for NFD and HACR shaft and handle installation.

To field install the NFD shaft and handle:

1. Remove the unit front panel (refer to Fig. 2-4).
2. Remove 3 hex screws on the NFD enclosure (2 on the face of the cover and 1 on the bottom).
3. Remove the front cover of the NFD enclosure.
4. Make sure the NFD shipped from the factory is at OFF position (the arrow on the black handle knob should be set to OFF).
5. Insert the shaft with the cross pin on the top of the shaft in the horizontal position.
6. Measure the tip of the shaft to the top surface of the pointer to be 3.75 in..-3.88 in. (95 mm-99 mm) for 80A and 100A NFD and 3.43 in.-3.56 in. (87 mm-90 mm) for 200A NFD.
7. Tighten the locking screw to secure the shaft to the NFD.
8. Turn the handle to the OFF position with red arrow pointing at OFF.
9. Install the handle on to the painted cover horizontally with the red arrow pointing to the left.
10. Secure the handle to the painted cover with 2 screws and lock washers supplied.
11. Engaging the shaft into the handle socket, re-install 3 hex screws on the NFD enclosure.
12. Re-install the unit front panel.

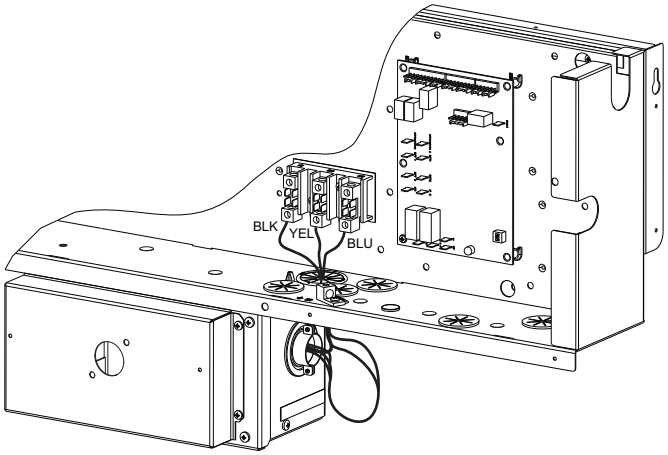


Fig. 48 — 48WE*H07 NFD Enclosure Location

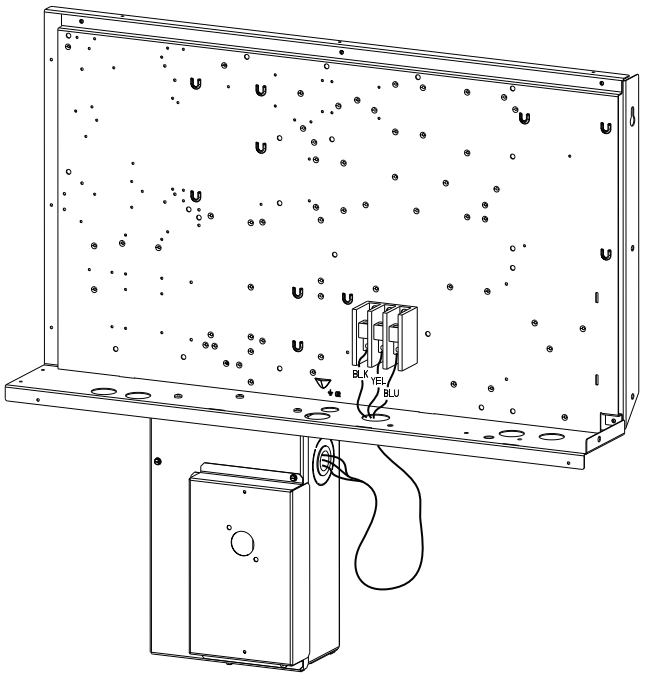


Fig. 49 — 48WE*H08/12 Location of Non-Fused Disconnect (NFD) Enclosure

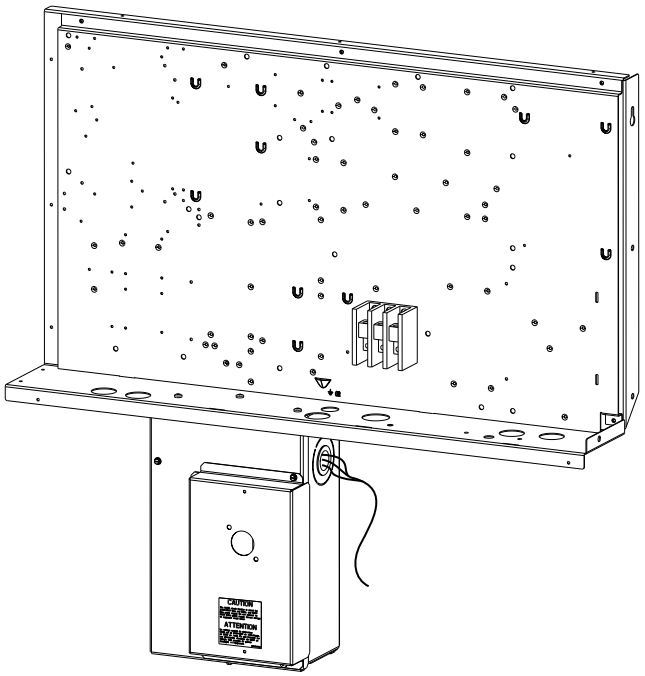


Fig. 50 — 48WE*H08/12 Location of HACR Enclosure

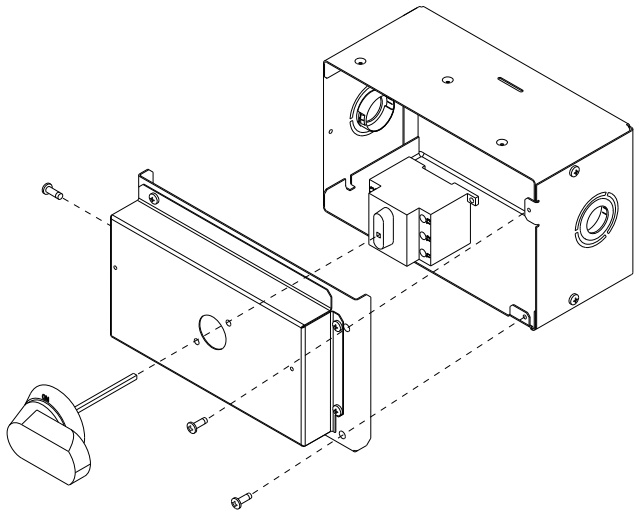


Fig. 51 — 48WE*H07 NFD Handle and Shaft Assembly

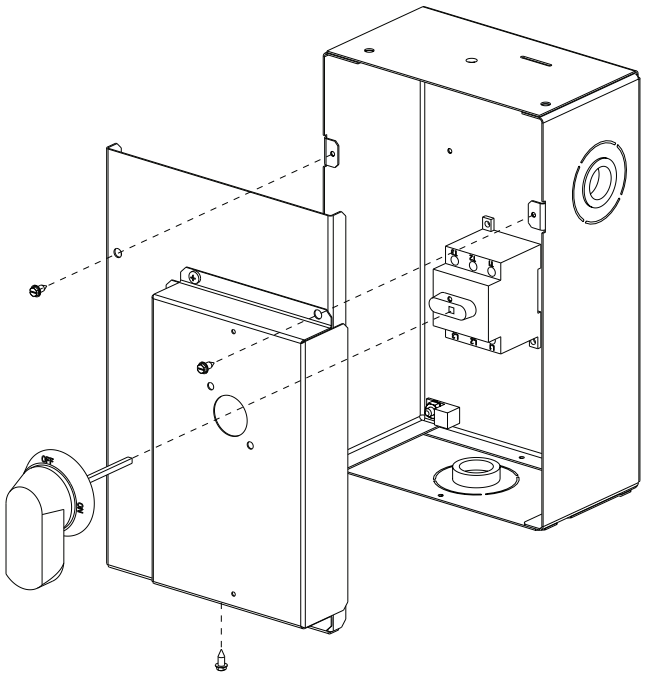


Fig. 52 — 48WE*H08/12 Handle and Shaft Assembly for NFD

To field install the HACR shaft and handle:

1. Remove the unit front panel (refer to Fig. 2-4).
2. Remove 3 hex screws on the HACR enclosure (2 on the face of the cover and 1 on the bottom).
3. Remove the front cover of the HACR enclosure.
4. Make sure the HACR shipped from the factory is at OFF position (the white arrow pointing to the OFF position).
5. Insert the shaft all the way with the cross pin on the top of the shaft in the horizontal position.
6. Tighten the locking screw to secure the shaft to the HACR.
7. Turn the handle to the OFF position with red arrow pointing at OFF.
8. Install the handle on to the painted cover horizontally with the red arrow pointing to the left.
9. Secure the handle to the painted cover with 2 screws and lock washers supplied.
10. Engaging the shaft into the handle socket, re-install 3 hex screws on the HACR enclosure.
11. Re-install the unit front panel.

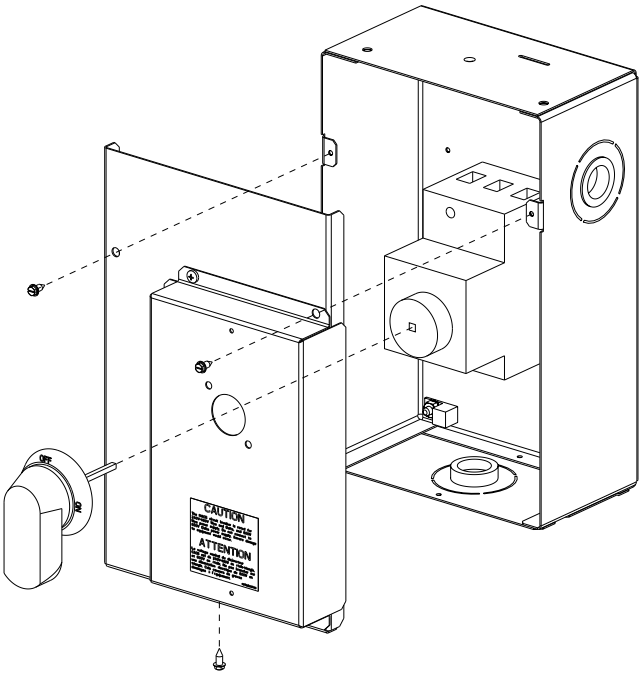


Fig. 53 — Handle and Shaft Assembly for HACR

CONVENIENCE OUTLETS

⚠ WARNING

ELECTRICAL OPERATION HAZARD

Failure to follow this warning could result in personal injury or death.

Units with convenience outlet circuits may use multiple disconnects. Check convenience outlet for power status before opening unit for service. Locate its disconnect switch, if appropriate, and open it. Lock-out and tag-out this switch, if necessary.

Two types of convenience outlets are offered on the 48WE*H07-12 units: non-powered and unit-powered. Both types provide a 125-v GFCI (ground-fault circuit-interrupter) duplex receptacle rated at 15-A behind a hinged waterproof access cover, located on the panel beneath the control box. See Fig. 54 and 55.

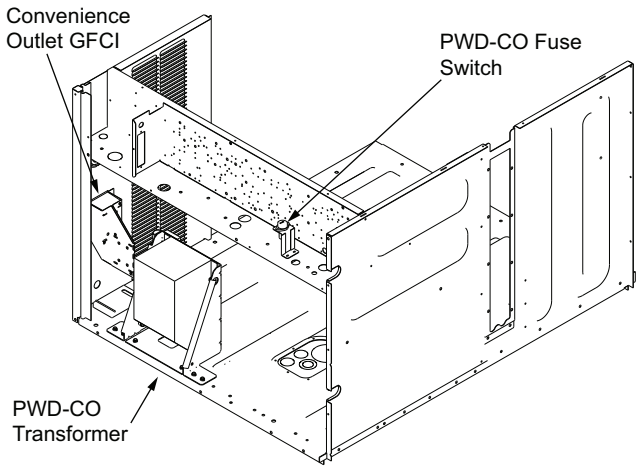


Fig. 54 — 48WE*H07 Convenience Outlet Location

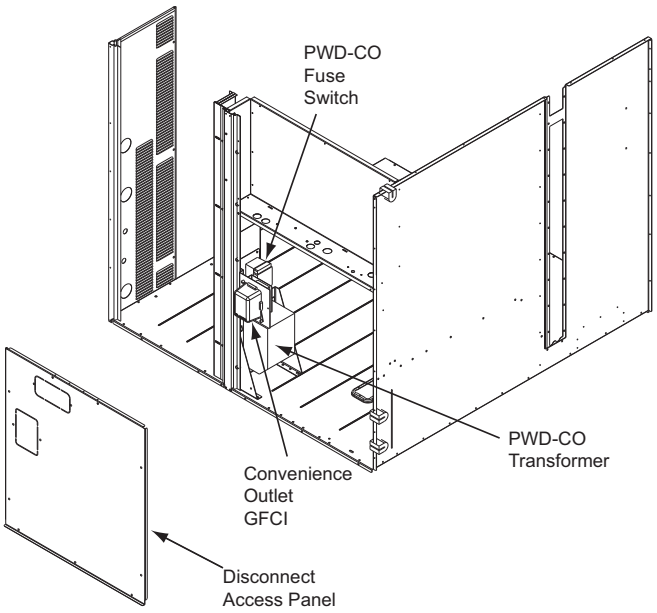


Fig. 55 — 48WE*H08/12 Convenience Outlet Location

Non-powered type

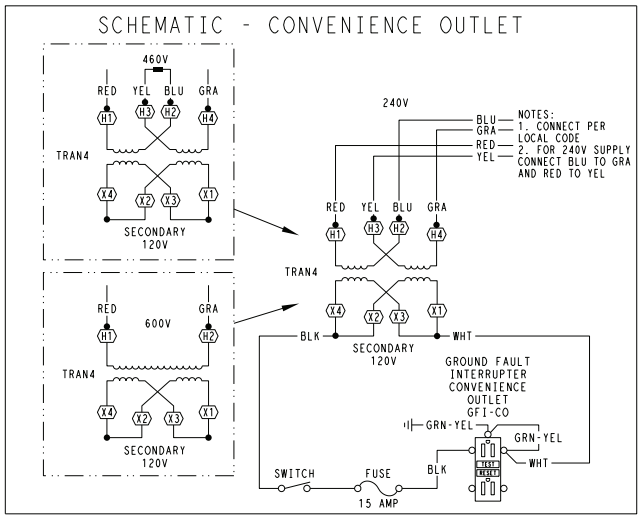
This type requires the field installation of a general-purpose 125-v 15-A circuit powered from a source elsewhere in the building. Observe national and local codes when selecting wire size and conduit requirements, fuse or breaker requirements and disconnect switch size and location. Route 125-v power supply conductors into the bottom of the utility box containing the duplex receptacle.

Unit-powered type

A unit-mounted transformer is factory-installed to stepdown the main power supply voltage to the unit to 115-v at the duplex receptacle. This option also includes a manual switch with fuse, located in a utility box and mounted on a bracket behind the convenience outlet; access is through the panel beneath the control box. See Fig. 56.

The primary leads to the convenience outlet transformer are not factory-connected. Selection of primary power source is a customer option. If local codes permit, the transformer primary leads can be connected at the line-side terminals on the unit-mounted nonfused disconnect switch; this will provide service power to the unit when the unit disconnect switch is open. Other connection methods will result in the convenience outlet circuit being de-energized when the unit disconnect switch is open. (See Fig. 57.) On a unit without a unit-mounted disconnect, connect the source leads to the main terminal block (TB1).

If the convenience outlet transformer is connected to the line side of a field disconnect, the conduit provided with the unit must be used to protect the wire as they are routed from the transformer to the field disconnect. The end of the conduit with the straight connector attaches to the field disconnect. The other end does not need to connect to the transformer; however, the conduit must be routed so that all wiring is either in the conduit or behind the access panel.



UNIT VOLTAGE	CONNECT AS	PRIMARY CONNECTIONS	TRANSFORMER TERMINALS
208/230	240	L1: RED +YEL L2: BLU + GRA	H1 + H3 H2 + H4
460	480	L1: RED Splice BLU + YEL L2: GRA	H1 H2 + H3 H4
575	600	L1: RED L2: GRA	H1 H2

Fig. 56 — Unit Powered Convenience Outlet

If the convenience outlet transformer is connected to the line side of the factory disconnect option, route the wires through the web bushing located on the bottom of the disconnect box. For the load side wiring to the factory option disconnect, route the wires through the hole on the right side of the disconnect. Be sure to create a drip loop at least 6-in. long.

Test the GFCI receptacle by pressing the TEST button on the face of the receptacle to trip and open the receptacle. Check for proper grounding wires and power line phasing if the GFCI receptacle does not trip as required. Press the RESET button to clear the tripped condition.

Fuse on power type

The factory fuse is a Bussman™[1] "Fusetron" T-15, non-renewable screw-in (Edison base) type plug fuse. (See Fig. 57.)

On 48WE*H units, the transformer is provided factory-installed to the load size of the disconnect to supply power to the modulating heat controls. This load limits the continuous and intermittent use of the transformer. Temporarily removing the fuse to the modulating heat controls removes this load from the transformer supplying the power convenience outlet and permits 15A use. The fuse is to be replaced after outlet use to return the unit to normal operation.

1. Third-party trademarks and logos are the property of their respective owners.

Fig. 57 — Convenience Outlet Utilization Notice

⚠ WARNING

ELECTRICAL OPERATION HAZARD

Failure to follow this warning could result in personal injury or death.

Using unit-mounted convenience outlets: Units with unit-mounted convenience outlet circuits will often require that two disconnects be opened to de-energize all power to the unit. Treat all units as electrically energized until the convenience outlet power is also checked and de-energization is confirmed. Observe National Electrical Code Article 210, Branch Circuits, for use of convenience outlets.

Installing Weatherproof Cover

IMPORTANT: A weatherproof while-in-use cover for the factory-installed convenience outlets is now required by UL standards. This cover cannot be factory-mounted due to its depth; it must be installed at unit installation. For shipment, the convenience outlet is covered with a blank cover plate.

The weatherproof cover kit is shipped in the unit's control box. The kit includes the hinged cover, a backing plate, and gasket.

DISCONNECT ALL POWER TO UNIT AND CONVENIENCE OUTLET.

IMPORTANT: Lock-out and tag-out all power.

Remove the blank cover plate at the convenience outlet; discard the blank cover.

Loosen the 2 screws at the GFCI duplex outlet, until approximately 1/2 in. (13 mm) under screw heads are exposed. Press the gasket over the screw heads. Slip the backing plate over the screw heads at the keyhole slots and align with the gasket; tighten the 2 screws until snug (do not over-tighten).

Mount the weatherproof cover to the backing plate as shown in Fig. 58. Remove 2 slot fillers in the bottom of the cover to permit service tool cords to exit the cover. Check for full closing and latching.

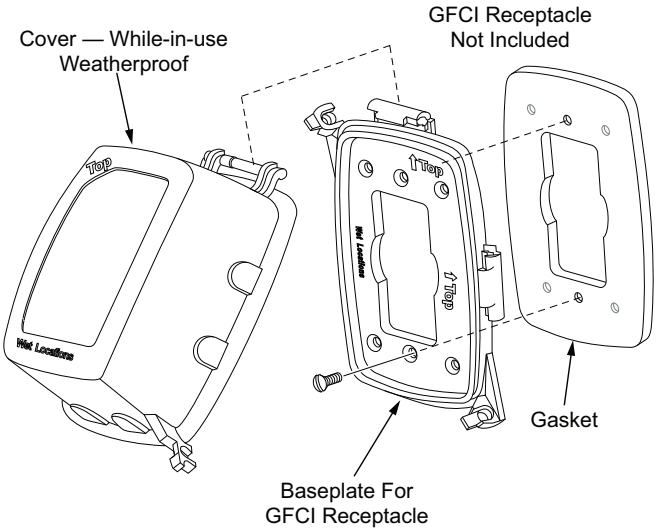


Fig. 58 — Weatherproof Cover Installation

HACR BREAKER (OPTION)

The amp rating of the HACR factory-installed option is based on the size, voltage, indoor motor, and other electrical options of the unit as shipped from the factory. If field-installed accessories are added or changed in the field (e.g., electric heat, power exhaust), the HACR may no longer be of the proper amp rating and therefore will need to be removed from the unit. See unit nameplate and label on factory-installed HACR for the amp rating of the HACR that was shipped with the unit from the factory. See unit nameplates for the proper fuse, HACR or maximum over-current protection device required on the unit with field-installed accessories. (See Fig. 59.)

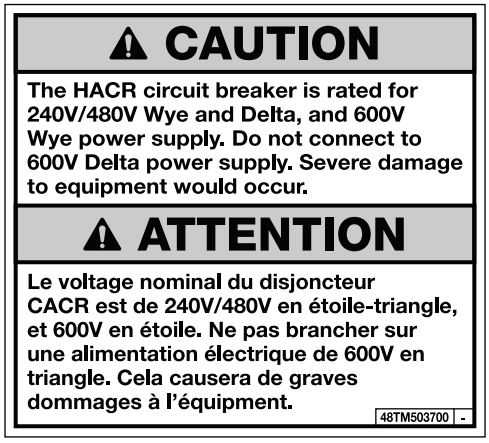


Fig. 59 — HACR Caution Label

FACTORY-OPTION THRU-THE-BASE CONNECTIONS (ELECTRICAL CONNECTIONS)

48WE*H07

This service connection kit consists of a 1/2 in. NPT gas adapter fitting (brass), a 1/2 in. electrical bulkhead connector and a 3/4 in. electrical bulkhead connector, all factory-installed in the embossed (raised) section of the unit basepan in the condenser section. See Fig. 28 on page 30.

Check tightness of connector lock nuts before connecting electrical conduits.

Field-supplied and field-installed liquid tight conduit connectors and conduit may be attached to the connectors on the basepan. Pull correctly rated high voltage through appropriate conduits. Connect the power conduit to the internal disconnect (if unit is so equipped) or to the external disconnect (through unit side panel). A hole must be field cut in the main control box bottom on the left side so the 24-v control connections can be made. Connect the control power conduit to the unit control box at this hole.

48WE*H08/12

This service connection kit consists of a 1/2 in. electrical bulkhead connector and a 1-1/2 in. electrical bulkhead connector, connected to an "L" bracket covering the embossed (raised) section of the unit basepan in the condenser section. (See Fig. 29 on page 30.) The 1/2 in. bulkhead connector enables the low-voltage control wires to pass through the basepan. The 1-1/2 in. electrical bulkhead connector allows the high-voltage power wires to pass through the basepan.

1. Remove the "L" bracket assembly from the unit.
2. Remove connector plate assembly from the "L" bracket and discard the "L" bracket, but retain the washer head screws and the gasket (located between the "L" bracket and the connector plate assembly).

   NOTE: Take care not to damage the gasket, as it is reused in the following step.
3. Place the gasket over the embossed area in the basepan, aligning the holes in the gasket to the holes in the basepan. (See Fig. 30 on page 30.)
4. Install the connector plate assembly to the basepan using 8 of the washer head screws.

   NOTE: If electrical connections are not going to occur at this time, tape or otherwise cover the fittings so that moisture does not get into the building or conduit in the interim.

Check tightness of connector lock nuts before connecting electrical conduits.

Field-supplied and field-installed liquid tight conduit connectors and conduit may be attached to the connectors on the basepan. Pull correctly rated high voltage and low voltage wires through appropriate conduits. Connect the power conduit to the internal disconnect (if unit is equipped) or to the external disconnect (through unit side panel). Remove one of the two knockouts located on the bottom left side of the unit control box. Use this hole for the control conduit.

UNITS WITHOUT THRU-THE-BASE CONNECTIONS

1. Install power wiring conduit through side panel openings. Install conduit between disconnect and control box.
2. Install power lines to terminal connections as shown in Fig. 46.

FIELD CONTROL WIRING

For 48WE*H units it is recommended, but not required, to relocate, or field install, the supply air temperature sensor in a duct mounted location. See "Optional Duct-Mounted SAT Sensor Relocation" on page 25 for more information. Additional control and communication wiring for space sensors, thermostat, or a building automation system (BAS), may be needed based on project requirements. See the "CONTROLS OPERATION AND QUICK SETUP" section on page 56 for additional details on sensor usage. Refer to the sensor Installation Instructions for wiring and installation details.

NOTE: Unit controls are not compatible with Rnet sensors or interfaces.

NOTE: Ensure all low and high voltage wiring are separated in accordance with UL and NEC requirements.

UNIT WITHOUT THRU-THE-BASE CONNECTION KIT

Pass the control and communication control wires through the bushing on the unit end panel. Route the wire through the snap-in wire tie and up to the web bushing near the control box. Route the wire through the bushing and into the bottom left side of the control box after removing one of the two knockouts in the corner of the box. Using a connector at the control box to protect the wire as it passes into the control box, pull the wires over to the required connection points in the control box. Use the connector at the control box and the wire tie to ensure that the control and communicating wire is tight and will not be damaged by contact with the condenser coil. (See Fig. 60 and 61.)

NOTE: If Thru-the-Base connections accessory is used, refer to the accessory installation instructions for information on routing power and control wiring.

NOTE: Using the bushings and wire ties will ensure all low and high voltage wiring are separated in accordance with UL and NEC requirements.

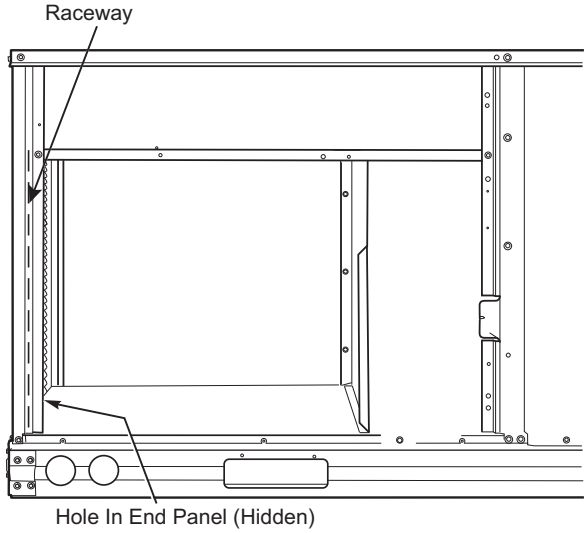


Fig. 60 — 48WE*H07 Field Control Wiring Raceway

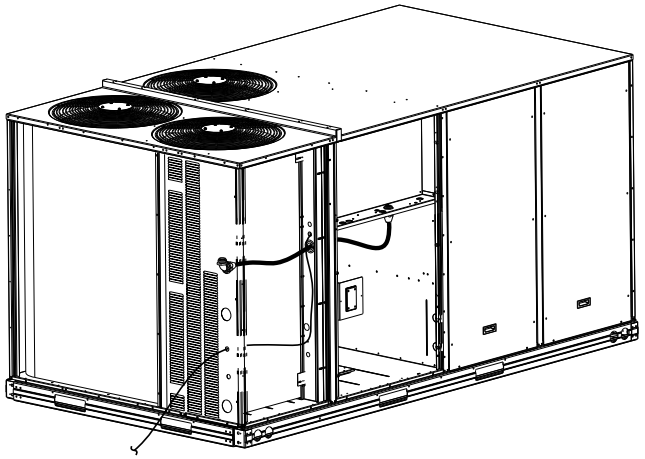


Fig. 61 — 48WE*H08/12 Field Control Wire Routing

Step 14 — Adjust Factory-Installed Options

SMOKE DETECTORS

Smoke detectors are available as factory-installed options on all unit sizes. Smoke detectors may be specified for supply air only, for return air with or without economizer, or in combination of supply air and return air. Return-air smoke detectors are arranged for vertical return configurations only. All components necessary for operation are factory-provided and mounted. The unit is factory-configured for 30 second smoke detector shutdown operation; additional wiring or modifications to the SmartVu™ control may be necessary to complete the unit and smoke detector configuration to meet project requirements.

Units equipped with factory-optional return-air smoke detectors require a relocation of the sensor module at unit installation. See Fig. 62 for the as-shipped location.

Completing Installation of Return Air Smoke Sensor

1. Unscrew the two screws holding the return air smoke detector assembly. See Fig. 63, Step 1. Save the screws.
2. Turn the assembly 90 degrees and then rotate end to end. Make sure that the elbow fitting is pointing down. See Fig. 63, Step 2.
3. Screw the sensor and detector plate into its operating position using screws from Step 1. See Fig. 63, Step 3.
4. Connect the flexible tube on the sampling inlet to the sampling tube on the basepan.

Additional Application Data

Refer to installation instructions for Factory-Installed Smoke Detectors for Small and Medium Rooftop Units 2 to 25 Tons for instruction and explanation on additional control features of these smoke detectors including multiple unit coordination.

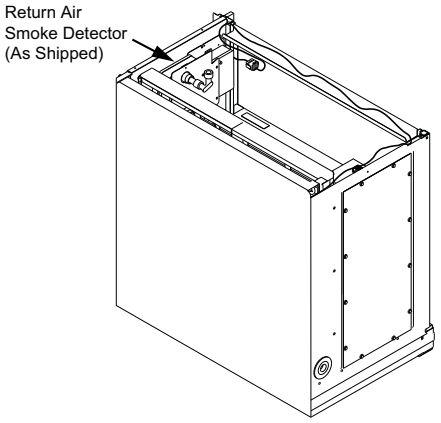


Fig. 62 — Return-Air Smoke Detector (Shipping Position)

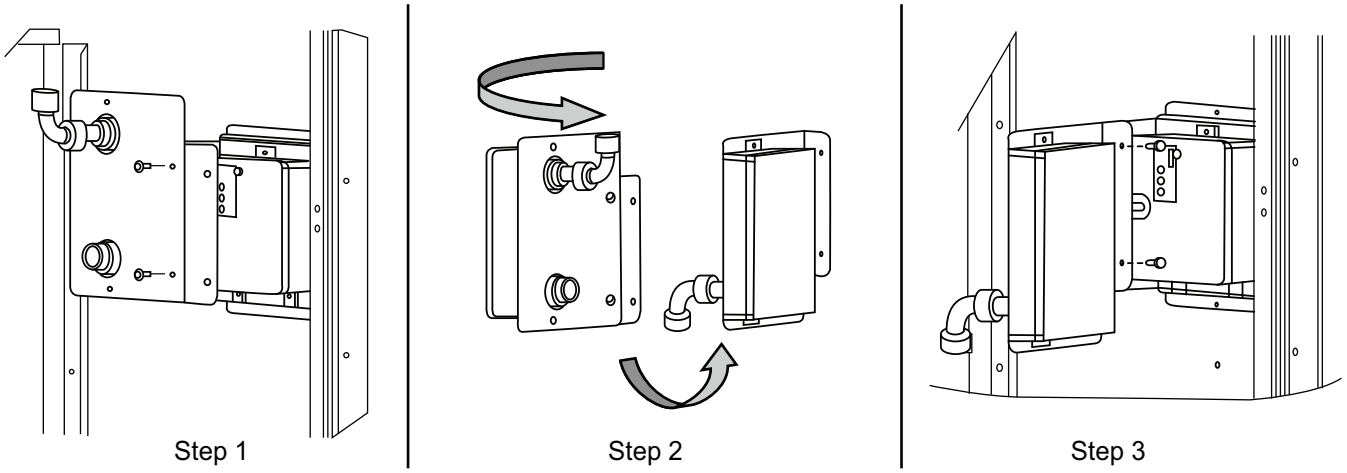


Fig. 63 — Completing Installation of Return-Air Smoke Sensor

DUCT PRESSURE TRANSDUCER

The unit can be equipped with factory wired and installed duct pressure transducer for variable speed fan operation based on duct static pressure. (See Fig. 64.) The 1/4 in. OD (outside dimensions) high pressure pickup port must be piped to the supply duct for pressure measurement.

First, identify a location in the supply ductwork for pressure measuring. The sensing location should be 1/3 to 2/3 of the way down the ductwork, if possible. Make sure the pressure sensing location is away from any duct accessories that would cause pressure disturbances, such as turning vanes, duct tees or wyes, VAV (Variable Air Volume) boxes, or smoke dampers. Install a static pressure probe for best results.

Identify the total length between the unit and the pressure measuring location. For applications up to 100 ft, use 3/16 in. ID (inside dimensions) pneumatic tubing. For applications up to 200 ft, use 1/4 in. ID pneumatic tubing. Connect the pneumatic tubing to the pressure pickup port in the duct and route it to the high side pressure pickup port of the transducer. Ensure the tubing is not pinched or kinked.

Prior to connecting the pneumatic tubing to the high pressure port, verify that the sensor is reading 0. With the sensor powered and both the high and low port open to atmosphere, check the current output between +EXC and OUT. The reading should be 4mA. If the reading is not 4 mA, turn the zero adjustment screw to adjust the output to 4 mA. Connect the pneumatic tubing to the high side pressure port on the sensor. Verify the review the sensor output and verify the reading.

NOTE: The low side pickup port can be left open inside the control box. If the low side pressure is not reading properly, connect it to pneumatic tubing to a pressure pickup port outside the control box to measure atmospheric pressure.

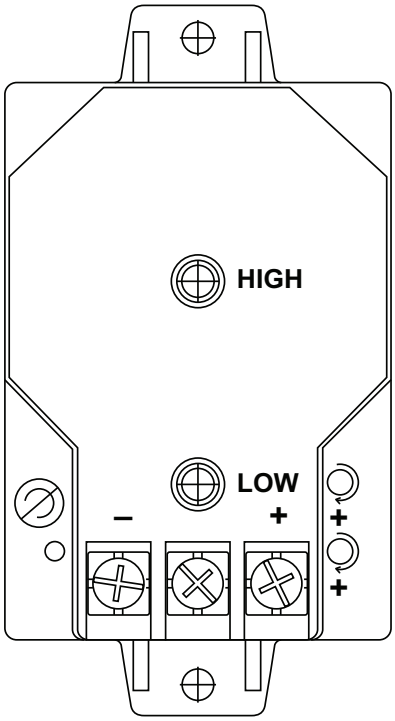


Fig. 64 — Duct Pressure Transducer

BUILDING PRESSURE TRANSDUCER

The unit can be equipped with factory wired and installed building pressure transducer for variable speed supply fan operation based on zone static pressure (100% OA only) or variable speed exhaust fan operation based on building pressure. The 1/4 in. OD (outside dimensions) high pressure pickup port must be piped to the building or zone for pressure measurement.

First, identify a location in the building or zone for pressure measuring. The pressure measuring location can be on a wall or on the ceiling. Make sure the pressure sensing location is away from any devices that would affect the pressure reading, such as exhaust fan intakes or supply diffusers. Install a static pressure probe for best results.

Identify the total length between the unit and the pressure measuring location. For applications up to 100 ft, use 3/16 in. ID (inside dimensions) pneumatic tubing. For applications up to 200 ft, use 1/4 in. ID pneumatic tubing. Connect the pneumatic tubing to the pressure pickup port in the space and route it to the high side pressure pickup port of the transducer. Ensure the tubing is not pinched or kinked.

Prior to connecting the pneumatic tubing to the high pressure port, verify that the sensor is reading 0. With the sensor powered and both the high and low port open to atmosphere, check the current output between +EXC and OUT. The reading should be 12 mA. If the reading is not 12 mA, turn the zero adjustment screw to adjust the output to 12 mA. Connect the pneumatic tubing to the high side pressure port on the sensor. Verify the review sensor output and verify the reading.

NOTE: The low side pickup port can be left open inside the control box. If the low side pressure is not reading properly, connect it to pneumatic tubing to a pressure pickup port outside the control box to measure atmospheric pressure.

Step 15 — Install Accessories

Available accessories include:

- Smoke Detectors
- Roof Curb (must be installed before unit)
- Thru-the-Base Connection Kit (must be installed before unit is set on curb)
- LP conversion kit
- EconoMi$er® 2
- Power Exhaust
- CO_2 Sensor
- Space Temperature and Humidity Sensors
- Louvered Hail Guard
- Phase Monitor Control
- Differential Pressure Transmitter
- Return Duct Cover
- Thermostat and Humidistat
- Filter Status Switch
- Filter Kits

Refer to separate installation instructions for information on installing these accessories. See price pages for a complete list of field-installed accessories.

Step 16 — Controls Setup, Pre-Start-up Checklist, Start-up Checklist

The mechanical installation of the unit is now complete. Prior to operating the unit, the controls setup, pre-start-up checklist, and start-up checklist must be completed. Refer to the unit Controls, Operation, Start-up, Troubleshooting, and Maintenance manual for further instruction. Refer to HVAC Partners (HVACPartners.com) to obtain the latest manual.

Temporary Construction Operation

OPERATION

If the unit will be used for temporary cooling or heating for a building under construction, consider the following guidance. Consult your local Carrier sales office for additional details on temporary operation.

Prior to temporary operation

1. The unit shall not operate during interior finishing. Return air and supply air vent openings shall be covered during installation and construction to minimize penetration of dust and debris at all times prior to the finishing stages of construction.
2. Interior drywall installation shall be completed and covered with paint or primer and premises shall be substantially free of debris and dust prior to unit operation.
3. The installation shall comply with all manufacturer's installation instructions and operating guidance.
4. Air filters must be in place. A minimum filter rating of MERV 11 is recommended during final completion.
5. Cooling and heating (if equipped) – pre-start-up and start-up checks shall be performed prior to unit operation.
6. Configure controls for temporary operating control.

During temporary operation

1. The system must be checked daily to ensure proper system operation.
2. Cooling and heating operating conditions and airflows must be in accordance with manufacturer's guidance.
3. The system must be maintained in accordance with manufacturer's recommendations and timelines.

Prior to normal operation

1. Clean unit, duct work, and components upon substantial completion of the construction process, and verify unit operating conditions are in accordance with the manufacturer's instructions.
2. Install a new, clean air filter.
3. Perform Cooling and Heating (if equipped) – pre-start-up and start-up checks.

NOTE: Equipment damage or failures caused by improper application, operation, or lack of maintenance is excluded from warranty coverage. Consult the Carrier Warranty certification for the applicable equipment details.

ADDITIONAL CONTROLS TROUBLESHOOTING

For additional troubleshooting information for the SmartVu™ Controls PIC 6.1 Interface settings, see the following. See Appendix C for a description of Warnings, Alerts and Alarms. See Appendix D for Thermistor Values and see Appendix E for Transducer Values.

GAS HEAT TROUBLESHOOTING

The 48WE*H units use a specialized gas heat train. Figure 65 shows the basic component locations for the standard turndown (5:1) gas heat train, including the gas valve, controllers, gas inlet connection and the draft inducer motor. Figure 66 shows the basic component locations for the high turndown (10:1) gas heat train, including the gas valves, controllers, gas inlet connection and the draft inducer motor.

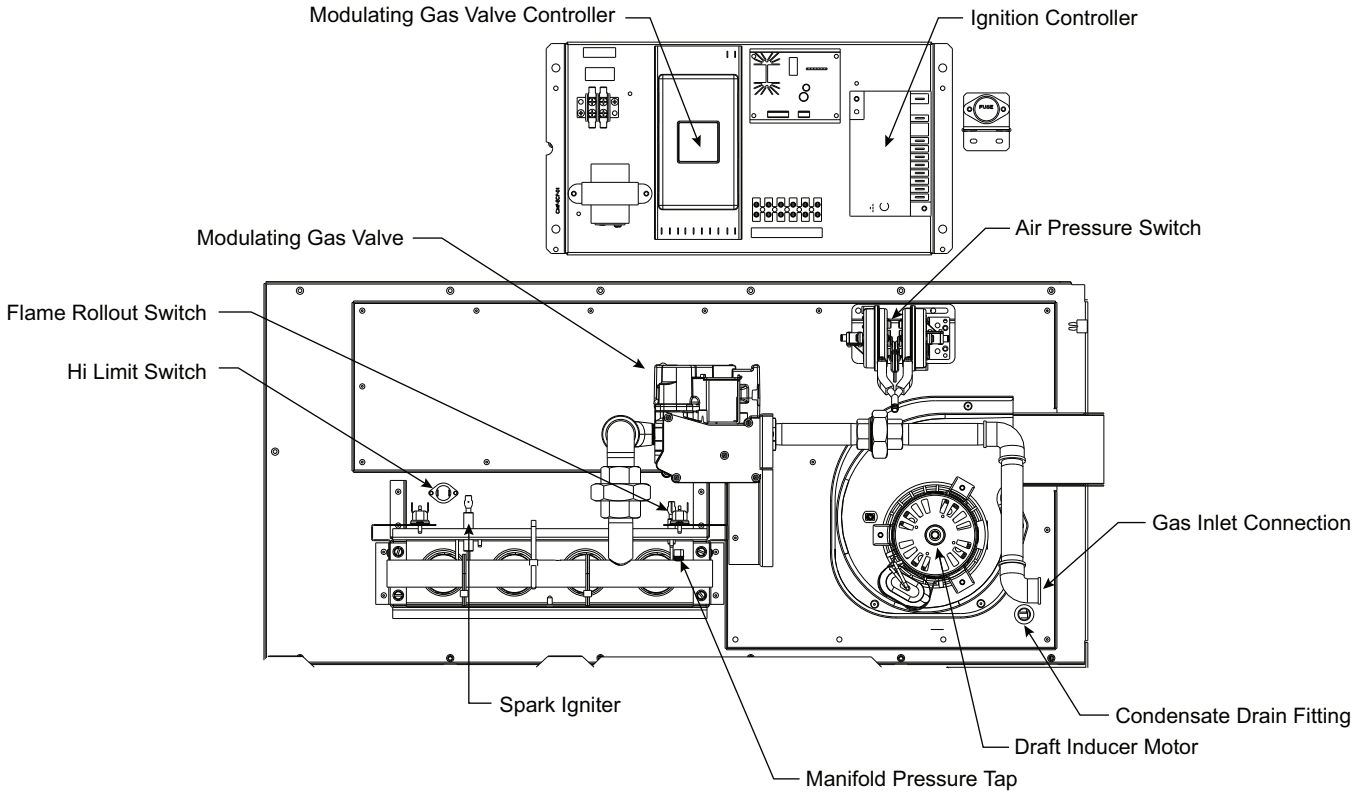


Fig. 65 — 48WE(4,5,6)H — Gas Heat Component Location and Identification (Size 07 Shown)

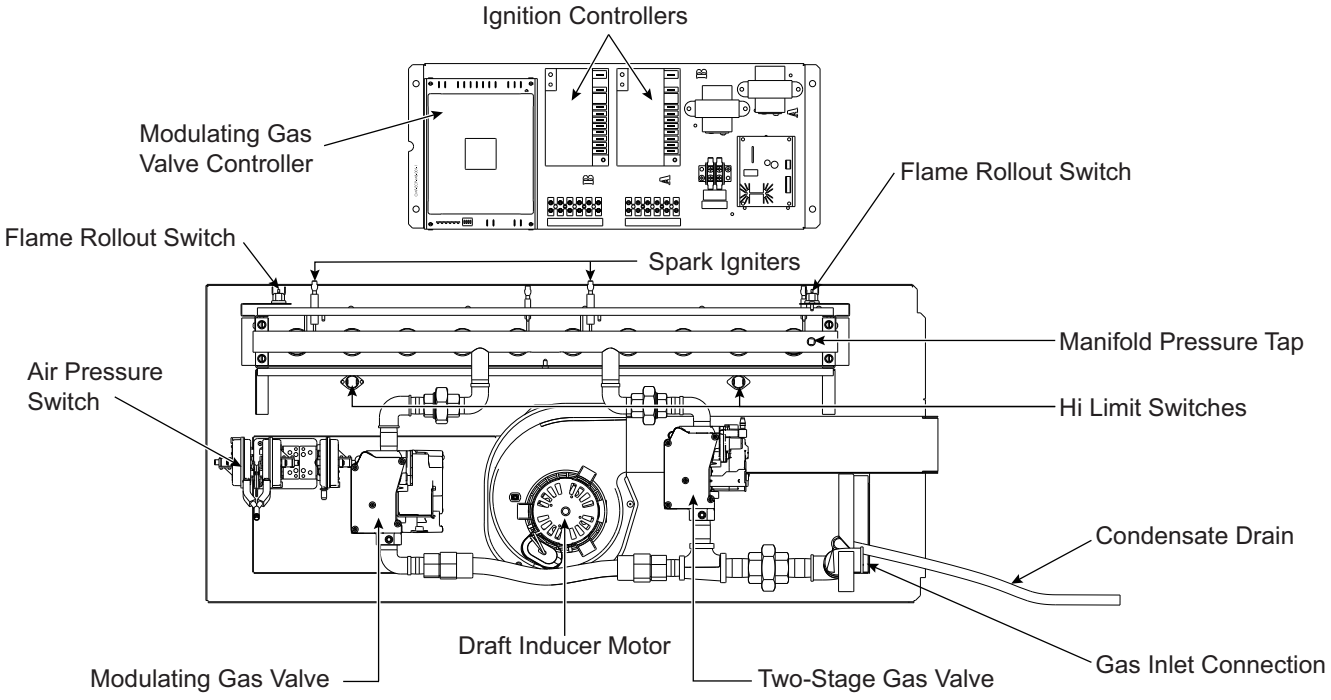


Fig. 66 — 48WE(8,9)H — Gas Heat Component Location and Identification (Size 12 Shown)

Several of the gas heat system control components can indicate start-up issues to help with troubleshooting. There are two separate gas heat control devices. One is to control the modulating gas valve (see Fig. 67 for 5:1 turndown units or Fig. 68 for 10:1 turndown units). The other is for the gas heat ignition controller (see Fig. 69).

See Fig. 65 and 66 for the locations of the Modulating Gas Valve Controller and the Gas Heat Ignition Controller.

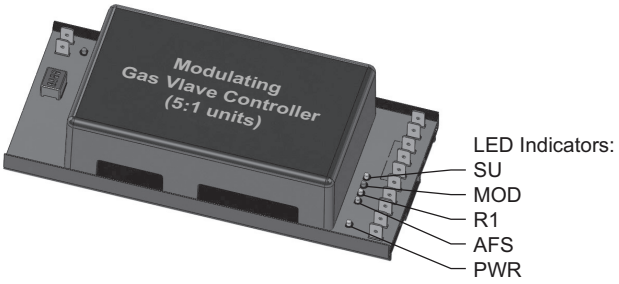


Fig. 67 — Modulating Gas Valve Control (5:1)

Fig. 68 — Modulating Gas Valve Control (10:1)

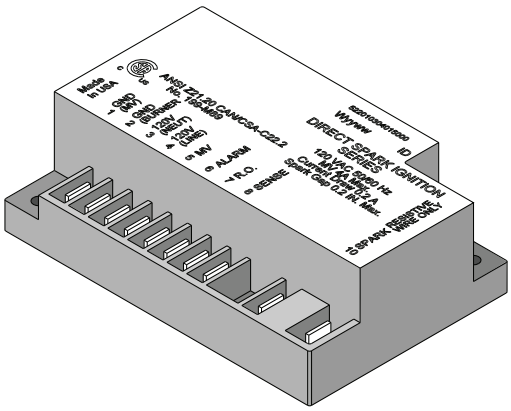
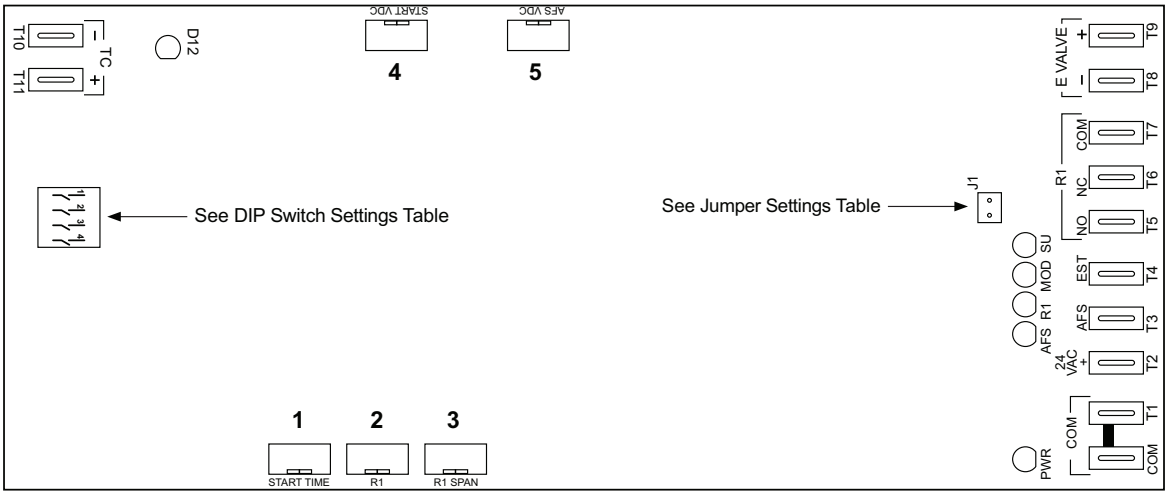


Fig. 69 — Gas Heat Ignition Controller

Prior to unit start-up, verify the DIP switch settings are correct on the Modulating Gas Valve Controller for your specific unit.

See Fig. 70 for the locations of the DIP switches and Jumper on the Modulating Gas Valve Controller for 5:1 turndown units. See Table 10 for the correct DIP switch setting on the Modulating Gas Valve Controller for 5:1 turndown units.

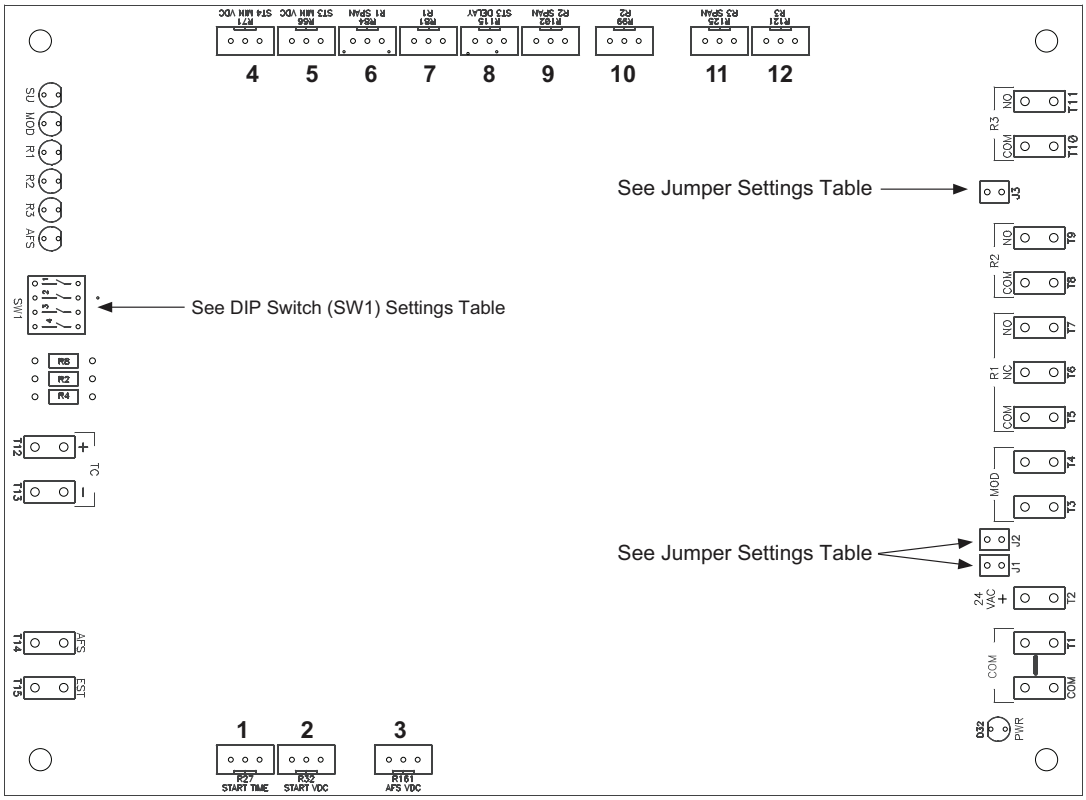
See Fig. 71 for the locations of the DIP switches and Jumper on the Modulating Gas Valve Controller for 10:1 turndown units. See Table 11 for the correct DIP switch setting on the Modulating Gas Valve Controller for 10:1 turndown units.



Setting	
1	Start Time
2	Relay 1 Trigger
3	Relay 1 Deadband
4	Start Voltage
5	AFS Limit (certain units)

NOTE(S):
Turn trimpot clockwise to increase, counterclockwise to decrease.
Some versions have fixed settings. Trimpots are not installed.

Fig. 70 — Modulating Gas Valve Controller (5:1 units) — Trimpot, LED, DIP Switch and Jumper Locations



Setting			
1	Start time	**7**	Relay 1 trigger
2	Start voltage	**8**	ST3 start time
3	AFS limit (certain units)	**9**	Relay 2 deadband
4	ST4 MIN voltage	**10**	Relay 2 trigger
5	ST3 MIN voltage	**11**	Relay 3 deadband
6	Relay 1 deadband	**12**	Relay 3 trigger

Fig. 71 — Modulating Gas Valve Controller (10:1 units) — DIP Switch and Jumper Locations

Table 10 — Modulating Gas Valve Controller (5:1 units) DIP Switch Settings

TC INPUT	DIP SWITCH (SW1) SETTINGS			
	1	2	3	4
0-10 vdc	OFF	ON	OFF	Set to ON to disable AFS Function (certain units)
2-10 vdc	OFF	OFF	ON	
0-20 mA	ON	ON	OFF	
4-20 mA	ON	OFF	ON	

Table 11 — Modulating Gas Valve Controller (10:1 units) DIP Switch Settings

TC INPUT	DIP SWITCH (SW1) SETTINGS			
	1	2	3	4
0-10 vdc	OFF	ON	OFF	Set to ON to disable AFS Function (certain units)
2-10 vdc	OFF	OFF	ON	
0-20 mA	ON	ON	OFF	
4-20 mA	ON	OFF	ON	

Verify that the jumper is assembled correctly (see Fig. 72) and that the jumper is configured correctly for your unit (see Table 12 for 5:1 turndown units and Table 13 for 10:1 turndown units).

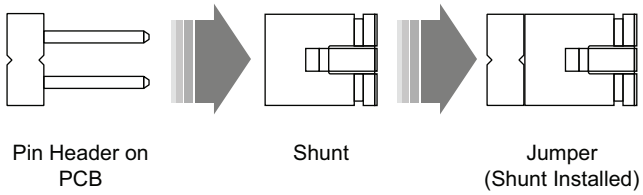


Fig. 72 — Shunt Jumper Configuration

Table 12 — Modulating Gas Valve Controller (5:1 units) Jumper Settings

J1	Connects T2 to T7	**J1**	Dry contact: no shunt 24vac: shunt installed

Table 13 — Modulating Gas Valve Controller (10:1 units) Jumper Settings

J1	Connects T2 to T5	Dry contact: no shunt 24vac: shunt installed
J2	Connects T2 to T8	
J3	Connects T9 to T10	R2 output to R3 input

Unit specific wiring diagrams (Fig. 73-76) and PCB Connections (Tables 14 and 15) are provided for additional reference.

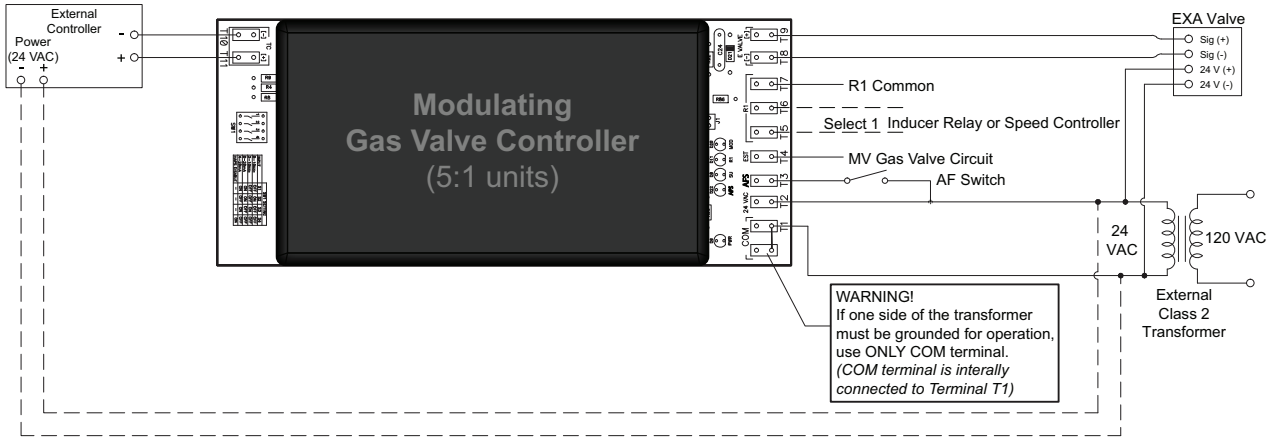


Fig. 73 — Modulating Gas Valve Controller (5:1 units) — Wiring Diagram

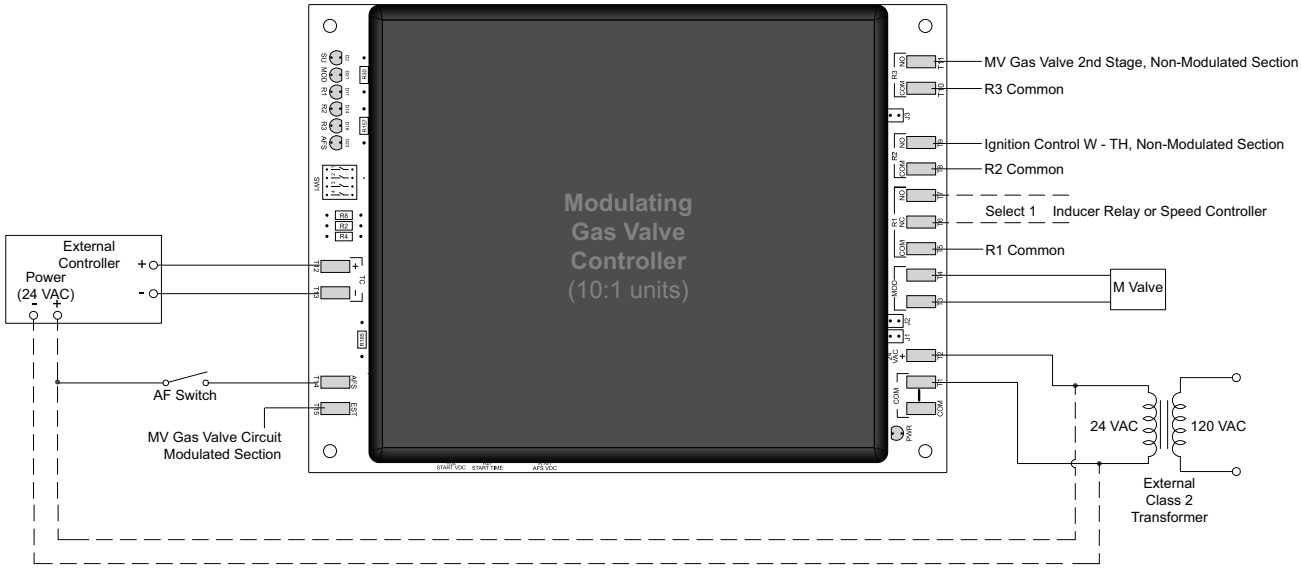


Fig. 74 — Modulating Gas Valve Controller (10:1 units) — Wiring Diagram

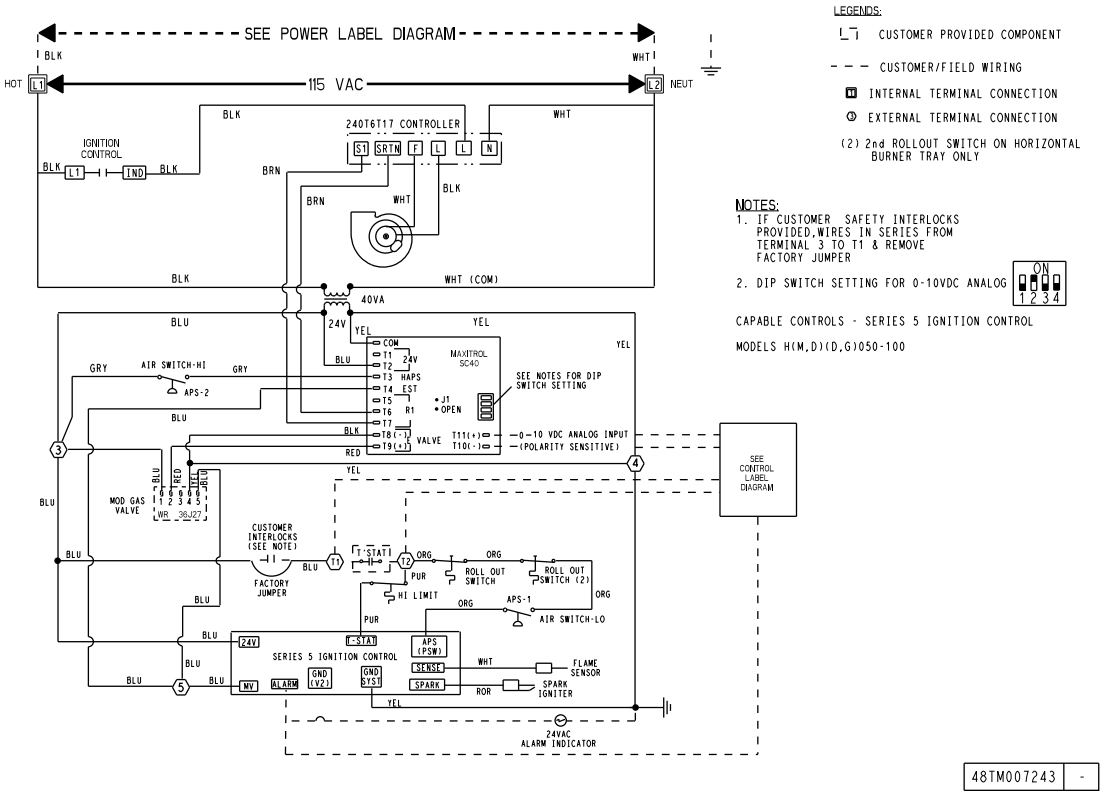


Fig. 75 — Heat Controller Wiring Diagram — 48WE(4,5,6)H07-12 — 5:1 Turndown

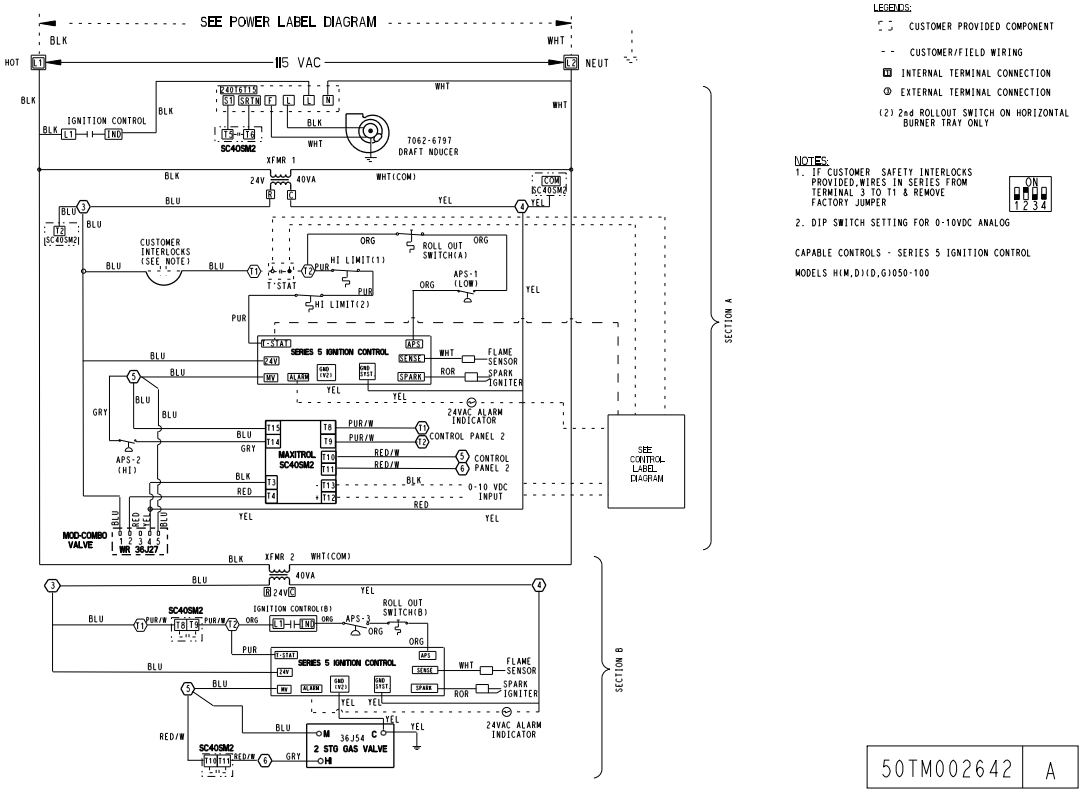


Fig. 76 — Heat Controller Wiring Diagram — 48WE(8,9)08-12 — 10:1 Turndown

Table 14 — Modulating Gas Valve Controller (5:1 units) — PCB Connections

No	PCB LABEL		DESCRIPTION	NOTES	
COM	COM		Power Common	Internally connected to T1	
T1			Power Common	E valve T4	Polarity sensitive
T2	24vac	+	Power	E valve T3	
T3	AFS		Airflow Switch	AFS Circuit, 24vac input (certain units)	
T4	EST		Electronic Start Trigger	MV Circuit, 24vac input	
T5	R1	NO	Normally Open Contact	Inducer Speed Stage	
T6		NC	Normally Closed Contact		
T7		COM	Relay 1 Common	24vac - internally (J1)	
T8	EXA	-	0-10vdc	E valve T2	Polarity sensitive
T9		+		E valve T1	
T10	TC	-	Temperature Controller Input	Control signal, polarity sensitive	
T11		+			

Table 15 — Modulating Gas Valve Controller (10:1 units) — PCB Connections

No	PCB LABEL		DESCRIPTION	NOTES	
COM	COM		Power Common	Internally connected to T1	
T1			Power Common	Polarity sensitive	
T2	24vac	+	Power Input		
T3	MOD		2 -15vdc, 18vdc Max	REF: Natural Gas	Not polarity sensitive
T4			2 - 20vdc, 24vdc Max	REF: LP	
T5	R1	COM	Relay 1 common	24vac - internally (J1)	
T6		NC	Normally Closed Contact	Inducer Speed Stage	
T7		NO	Normally open contact		
T8	R2	COM	Relay 2 common	24vac - internally (J2)	
T9		NO	Normally open contact	Ignition control W - TH, non-modulated selection	
T10	R3	COM	Relay 3 common	24vac - internally (J3)	
T11		NO	Normally open contact	Gas valve (MV) second stage, non-modulated selection	
T12	TC	-	TC Input	Control signal, polarity sensitive	
T13		+			
T14	AFS		Airflow Switch	AFS Circuit, 24vac input (certain units)	
T15	EST		Electronic Start Trigger	MV Circuit, 24vac input, modulated selection	

If there is an issue during system start-up, check the Modulating Gas Heat Controller or the Gas Heat Inputs Controller to see if there are any LED indicators. Use the provided Error Code tables (Tables 16-19) to help diagnose or troubleshoot any issues with the Gas Heat control modules.

Table 16 — Modulating Gas Valve Controller (5:1 units) — LED Status Indicators

STATUS	PCB LABEL	COLOR
Main Power	PWR	Blue
Start-up	SU	Yellow
Relay 1 energized	R1	Red
AFS	AFS	Green
Modulation	MOD	Green
TC Polarity	D12	Red

Table 17 — Modulating Gas Valve Controller (10:1 units) — LED Status Indicators

STATUS	PCB LABEL	COLOR
Main Power	PWR	Blue
Start-up	SU	Yellow
Relay 1 energized	R1	Red
Relay 2energized	R2	Red
Relay 3 energized	R3	Red
AFS	AFS	Green
Modulation	MOD	Green

Table 18 — Gas Heat Inputs Controller LED Indicators — Normal Operation

LED Condition	DESCRIPTION
Green: 1/2 sec on, 1/2 sec off	Pre-purge, Inter-purge, Post-purge
Green: Blinking rapidly	Trial for ignition
Green: On solid	Flame detected. Pilot/main burners on

Table 19 — Gas Heat Inputs Controller — LED Error Codes

LED Condition	DESCRIPTION
Red: 1 flash, then pause	No flame in trial time. Lockout
Red: 2 flashes, then pause	Flame sense stuck on. Lockout
Red: 3 flashes, then pause	Pilot/main relay failure. Lockout
Red: 4 flashes, then pause	Repetitive flame loss error. Lockout
Red: 5 flashes, then pause	Rollout error. Lockout
Red: 6 flashes, then pause	APS airflow error. Lockout
Red: 7 flashes, then pause	Internal control error. Lockout
Red: On solid	Line voltage/frequency error. Standby

LEAK DISSIPATION SYSTEM

48WE*H units use R-454B refrigerant. These units are equipped with a factory installed R-454B leak dissipation system to ensure safe operation in the event of a refrigerant leak. This systems consists of an A2L sensor (Fig. 77) and the dissipation control board (see Fig. 78) which are located in the Indoor Coil section of the unit (see the view labeled “BACK” in Fig. 2 on page 8). The A2L sensor is located between the indoor coil and the air filters.

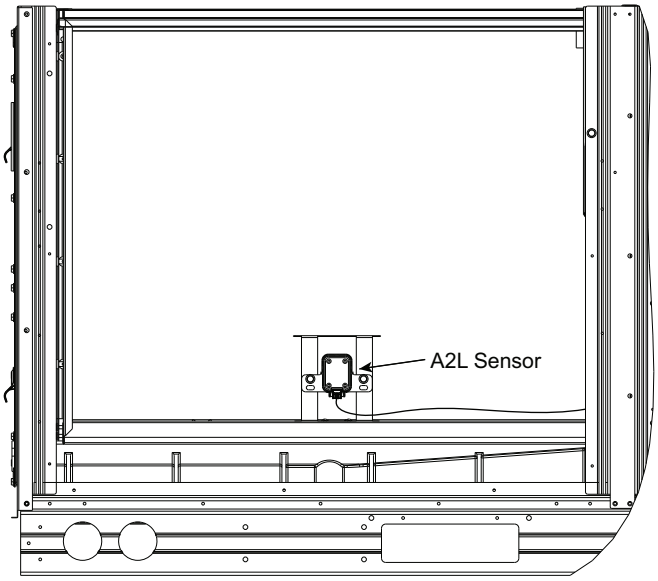


Fig. 77 — Location of A2L Sensor

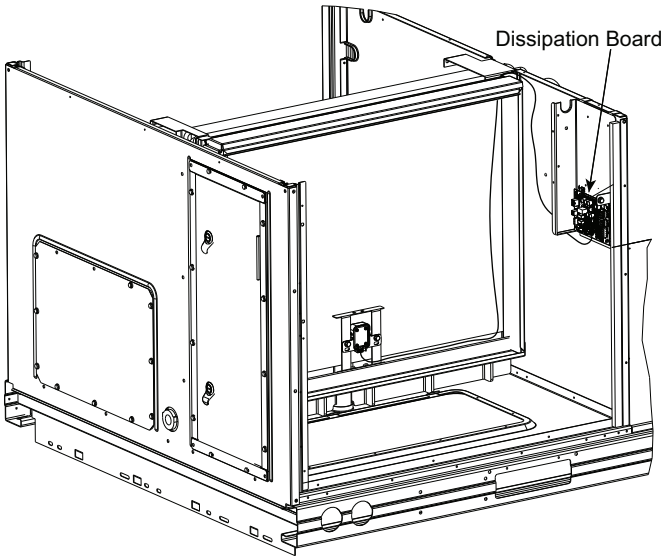


Fig. 78 — Location of Dissipation Control Board (Shown with Dust Cover Removed)

The A2L detection sensor communicates via a wiring harness to the dissipation board. The sensor harness is routed on the bottom of the filter rack towards the unit bulkhead and secured with wire ties. The sensor harness then runs up the side of the filter rack and exits over the top of the rack towards the dissipation board.

NOTE: The drain wire must be properly connected to the ground lug on the dissipation board via the quick connect and ground harness. Failure of proper sensor harness grounding can lead to false dissipation events.

Sequence of Operation

The control functions as an R-454B refrigerant dissipation system. If the refrigerant detection sensor sends a signal indicating a refrigerant leak, the control board will prevent heating and cooling operation and begin dissipating the sensed refrigerant with a blower request. The refrigerant dissipation board will display a flash code from the yellow status LED (see Fig. 79) indicating the sensor that detected the refrigerant. See Fig. 81 — on page 55 for the full text on the Dissipation Control dust cover label.

When the sensor signal indicates the refrigerant has dissipated, the dissipation board yellow status LED will display a flash code 3 and return to its normal state and allow unit operations after a 5 minute delay.

When a leak is detected and dissipation is required the ZDOR output is triggered. ZDOR output opens all zoning dampers to meet the requirements of UL60335-2-40 standard.

LEAK DISSIPATION SYSTEM SELF-TEST

Power on the unit and verify proper functioning of equipment. The yellow Status LED on the dissipation board should be steady (see Fig. 79). If flash codes are present, see Troubleshooting on page 55.

NOTE: Operation of the Test Mode is only possible if no faults exist on the dissipation board.

Remove the dust cover from the Dissipation control board to access the Test button (see Fig. 80). The Test button is located above the COMM LED.

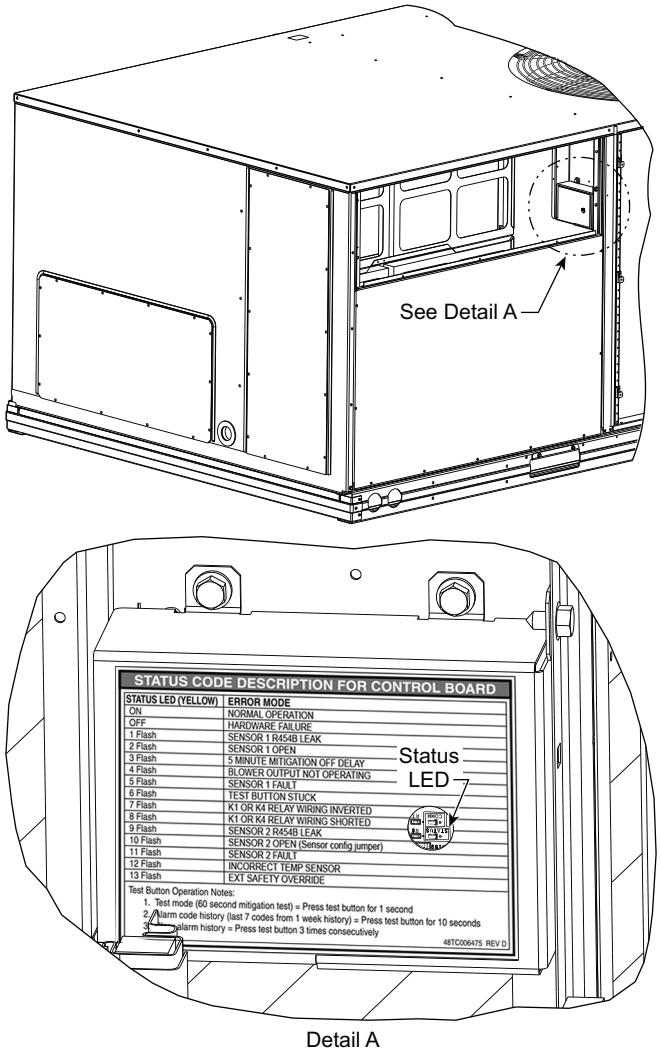
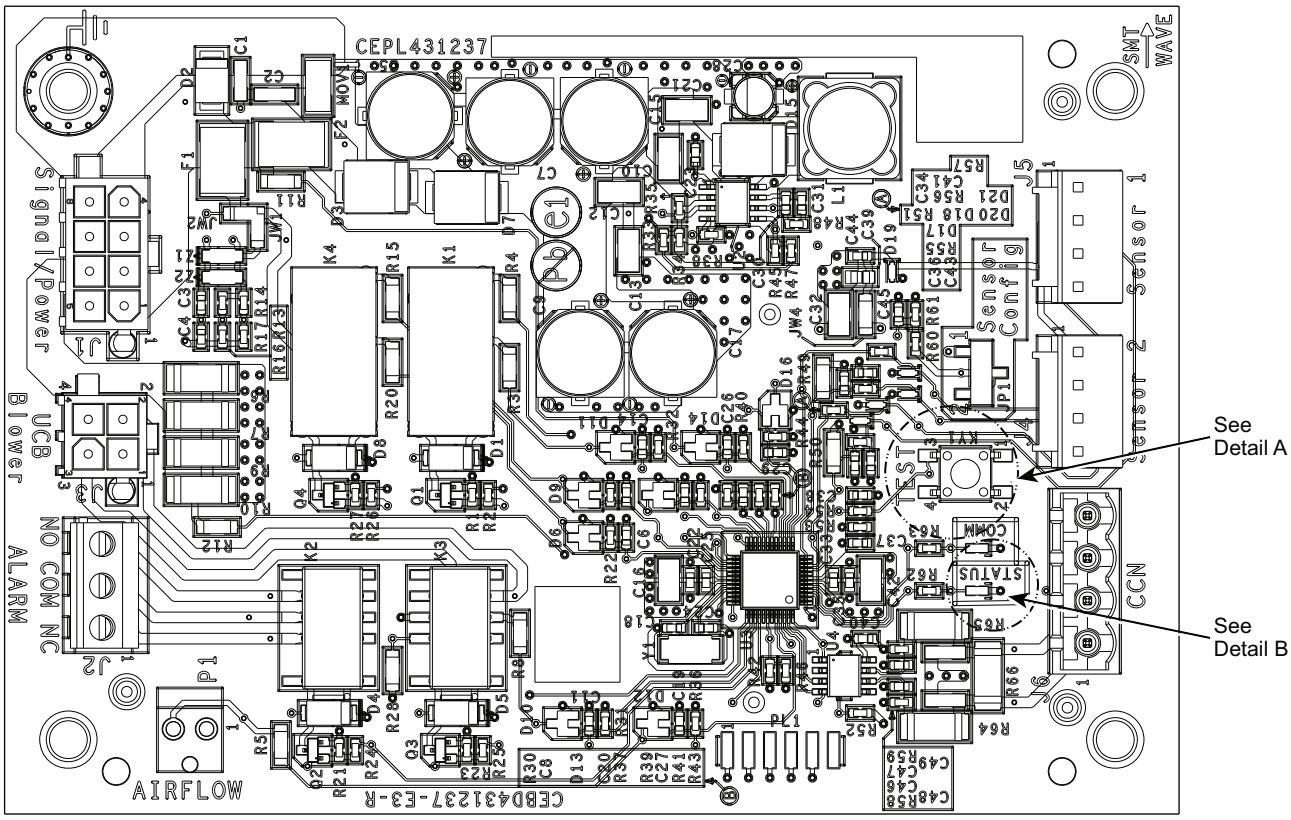
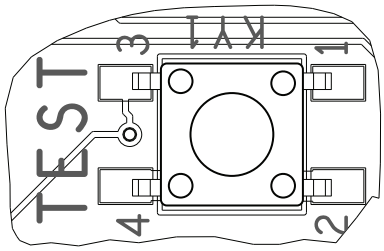
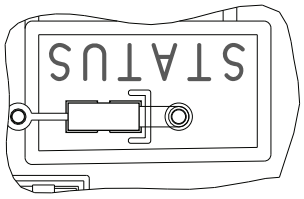


Fig. 79 — Yellow STATUS LED





Detail A — Test Button



Detail B — Status LED

Fig. 80 — Dissipation Control Board — Shown without Dust Cover

Press the Test button on the dissipation system control board to ensure proper dissipation system operation under each test condition listed below. After pressing the Test button, system will enter Dissipation Mode for 60 seconds to help verify correct operation.

IMPORTANT: Press the Test button for roughly ONE SECOND to enter Test Mode. Pressing the Test button for a longer periods enables different functions (see Table 20).

Table 20 — Dissipation Board Test Button Functions

HOLD BUTTON TIME (SEC)	FUNCTION
1-4	Dissipation Mode for 60 seconds
5-29	Display flash code history
30+	Flash code 6
3 Rapid Presses	Clear flash code history

Ensure that the unit is able to meet the minimum required dissipation mode airflows. These required minimum airflow rates during Dissipation Mode are listed in Table 21. They are based on the total system refrigerant charge quantity.

Table 21 — Minimum Dissipation Air Flows

MINIMUM DISSIPATION AIR FLOW (cfm)	
UNIT	cfm
48WE*H07	600
48WE*H08	680
48WE*H12	780

Table 22 details the required operational checks to ensure proper dissipation system function.

Table 22 — Dissipation System Required Operational Checks

NORMAL OPERATION				
TEST NO.	UNIT DEMAND	COMPRESSOR	INDOOR FAN	ELECTRIC/ GAS HEAT
1	None	Off	Off	Off
2	Cool	On	On	Off
3	Heat	On	On	On
DISSIPATION ACTIVATED				
4	None	Off	On	Off
5	Cool	Off	On	Off
6	Heat	Off	On	Off

Figure 50 shows the flash codes displayed on the Dissipation control board.

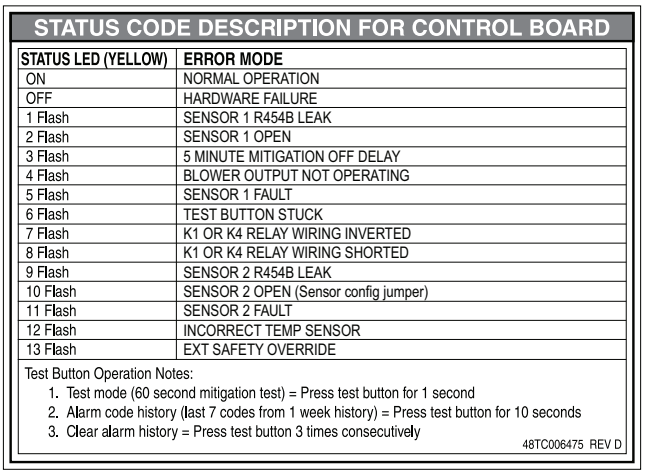
Troubleshooting

For all flash codes, first try power cycling the system to remove the code.

No Power

Verify the wiring to/from pins 1 and 8 on the power harness plug. Check the 24V system wiring from the transformer.

See Table 23 for details on the operating status and troubleshooting of the Dissipation system for the various flash codes.



STATUS CODE DESCRIPTION FOR CONTROL BOARD

STATUS LED (YELLOW)	ERROR MODE
ON	NORMAL OPERATION
OFF	HARDWARE FAILURE
1 Flash	SENSOR 1 R454B LEAK
2 Flash	SENSOR 1 OPEN
3 Flash	5 MINUTE MITIGATION OFF DELAY
4 Flash	BLOWER OUTPUT NOT OPERATING
5 Flash	SENSOR 1 FAULT
6 Flash	TEST BUTTON STUCK
7 Flash	K1 OR K4 RELAY WIRING INVERTED
8 Flash	K1 OR K4 RELAY WIRING SHORTED
9 Flash	SENSOR 2 R454B LEAK
10 Flash	SENSOR 2 OPEN (Sensor config jumper)
11 Flash	SENSOR 2 FAULT
12 Flash	INCORRECT TEMP SENSOR
13 Flash	EXT SAFETY OVERRIDE

Test Button Operation Notes:

1. Test mode (60 second mitigation test) = Press test button for 1 second
2. Alarm code history (last 7 codes from 1 week history) = Press test button for 10 seconds
3. Clear alarm history = Press test button 3 times consecutively

48TC006475 REV D

Fig. 81 — Dissipation Control Cover Label

Table 23 — Status LED Troubleshooting Table

STATUS LED	REASON	CONTROL VERBIAGE	MODE
1 Flash	Sensor 1 ≥ 20% LFL	REFRIG DISSIPATION ACTIVE	Dissipation in Process
2 Flash	Sensor 1 Open	REFRIG SENSOR OPEN	Dissipation in Process
3 Flash	5 Minute Blower Operating, Sensor < 20% LFL and sensors are not opened (done after fault 1, 2, 9 and 10)	DISSIPATION OFF DELAY ACTIVE	Dissipation in Process
4 Flash	0 VAC sensed on G output.	BLOWER OUTPUT NOT OPERATING	Dissipation in Process
5 Flash	Fault with the A2L digital sensor	REFRIG SENSOR FAULT	Dissipation in Process
6 Flash	If KY1 is stuck pressed for more than 30 seconds.	TEST BUTTON STUCK	To prevent a shorted KY1 to keep the dissipation running continuously.
7 Flash	Y out switched with Y in or W out switched with W in	Y (K4) OR W (K1) WIRING INVERTED	Normal mode
8 Flash	Y or W shorted (relay detects both sides are high)	Y (K4) OR W (K1) OUTPUT SHORTED TO Y (K4) OR W (K1) INPUT	Normal mode
9 Flash[a]	Sensor 2 ≥ 20% LFL	SENSOR 2 DISSIPATION ACTIVE	Dissipation in Process
10 Flash[a]	Sensor 2 Open	SENSOR 2 OPEN	Dissipation in Process
11 Flash[a]	Fault with the second A2L digital sensor	SENSOR 2 FAULT	Dissipation in Process
12 Flash	High temperature sensor attached on commercial	OVERCURRENT INCORRECT SENSOR	Normal mode
13 Flash	G input signal is lost. Indicates another unit safety will override dissipation.	EXT SAFETY OVERRIDE	Normal mode

NOTE(S):

a. There is only one sensor mounted in these units. This table represents the standard label being put on all commercial equipment. The hardware changes only allow one sensor to be connected to the board; the software remains the same for a one or two sensor board. Although unlikely these flash codes may appear if the board malfunctions.

LEGEND

LFL — Lower Flammable Limit

CONTROLS OPERATION AND QUICK SETUP

Introduction

The WeatherExpert® 48WE*H features the Carrier SmartVu™ Controls with PIC 6.1 Interface, which controls and monitors the unit operation. This manual provides step by step guidance on control set-up and unit operation for typical applications. For additional information on controls service access, refer to Appendix A — “START-UP CONTROL OPERATION” on page 99.

Overview

The SmartVu control system includes multiple control boards and a touchscreen interface, which can be found in the control box. See Fig. 82 and 83 for control box location and Fig. 84-85 for typical control box layout. The SmartVu controls include multiple standard and optional factory-installed sensors. See Fig. 86-88 for sensor locations. See Fig. 90 for SmartVu display connections. See Table 25 for air sensor listing.

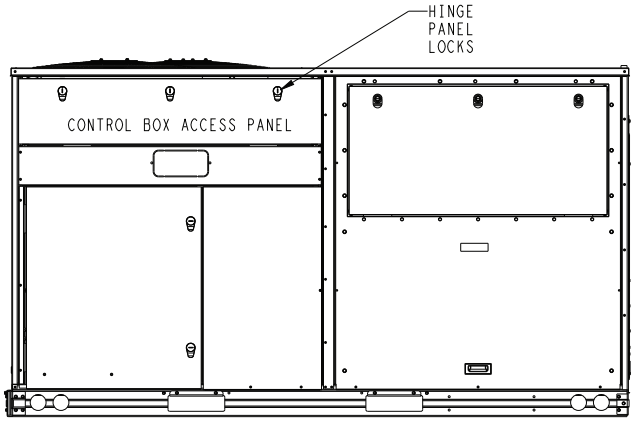


Fig. 82 — 48WE*H07 Control Box Location

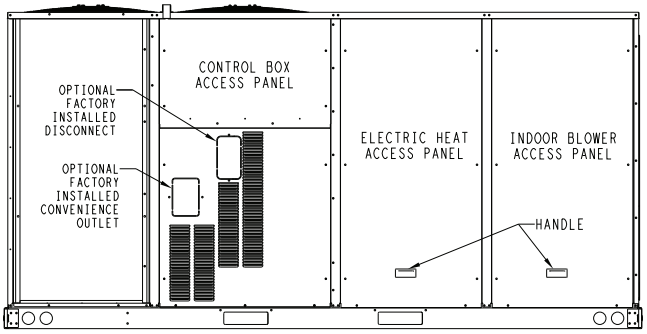


Fig. 83 — 48WE*H08/12 Control Box Location

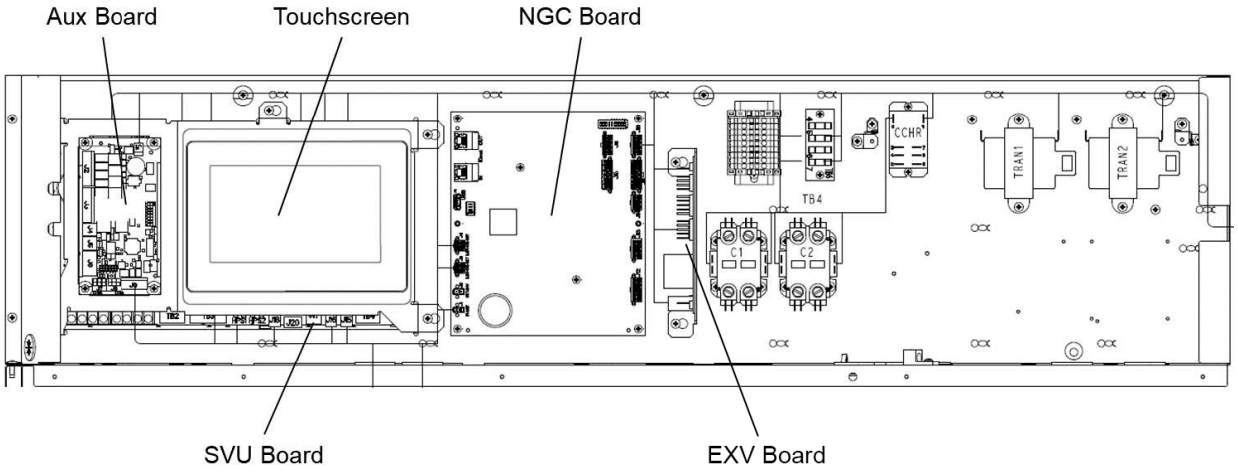


Fig. 84 — Typical Control Box Layout (Size 07)

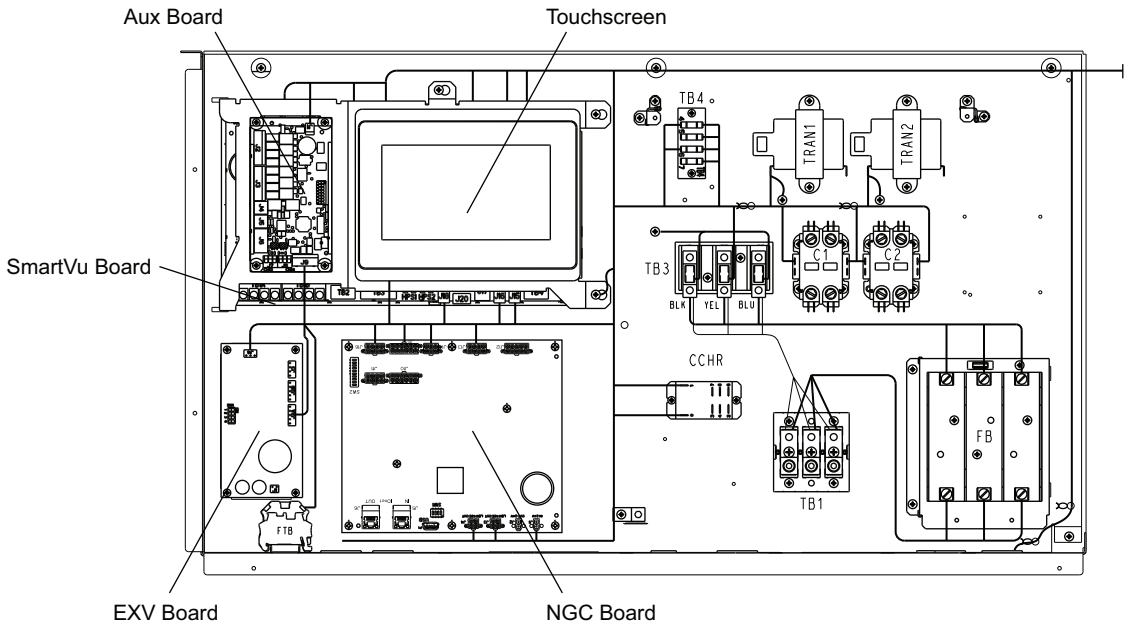


Fig. 85 — Typical Control Box Layout (Sizes 08-12)

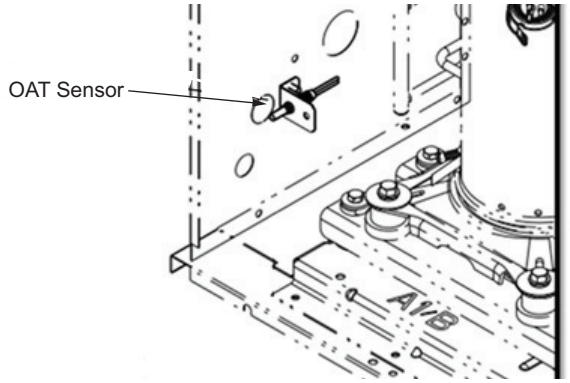


Fig. 86 — OAT Sensor Location

Fig. 87 — SARH Sensor Location

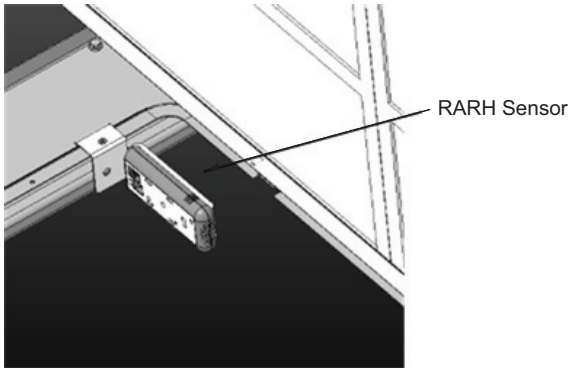


Fig. 88 — RARH Sensor Location

Control Interface

NAVIGATION

The interface operation method is the same for both touchscreen and web browser use and is typical of a touchscreen interface, like a smartphone or tablet. Clicking on specific icons or buttons will perform an action. See Table 26 for a list of the interface buttons related to navigation.

Screens can contain multiple pages of information. When additional pages are present, the page up/down button will be displayed at the bottom of the screen and the number after will show as 2 or more. Pressing the page up/down button will scroll through the available pages. See Fig. 89 for an example of a screen with multiple pages.

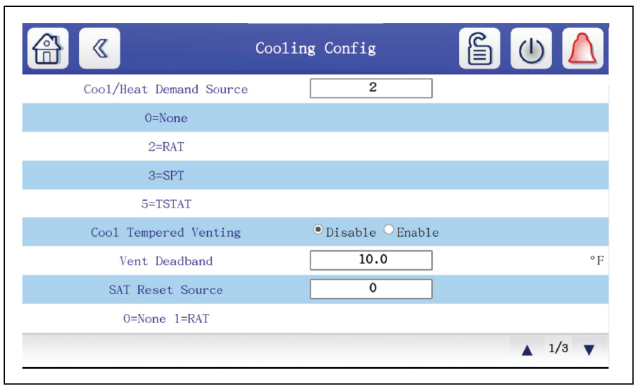


Fig. 89 — Page Up/Down Buttons

TOUCHSCREEN DISPLAY

The SmartVu touchscreen display is the primary method of interfacing with the controls for set up and equipment start-up. The touchscreen is a capacitive 7 in. LCD that can be activated with a finger, touch compatible gloves, or capacitive compatible stylus. Refer to Fig. 90 for display layout and port locations.

VNC VIEWER

The SmartVu controls can be accessed using a hardwired ethernet connection at ethernet port 0 (on the bottom right side of the touchscreen display) and a VNC Viewer, such as RealVNC. Refer to Fig. 90 (SmartVu touchscreen display) for ethernet port 0 port locations. See Table 24 for default IP addresses ethernet port 0.

Once the hardwired connection is established between the computer and the control, open a VNC Viewer, and add a new connection using the IP address for enternet port 0 control. The user interface should appear on the web browser.

LEGACY CONTROL INTERFACES

The SmartVu controls are not compatible with legacy Carrier control interfaces, such as the Navigator™, TouchPilot™, Equipment Touch™, or System Touch™ interfaces.

Table 24 — Ethernet Addresses

PORT NAME	LOCATION	DEFAULT ADDRESSES
ETH0	Bottom right side of display	169.254.1.1
ETH1	Bottom Center of Display	192.168.100.100

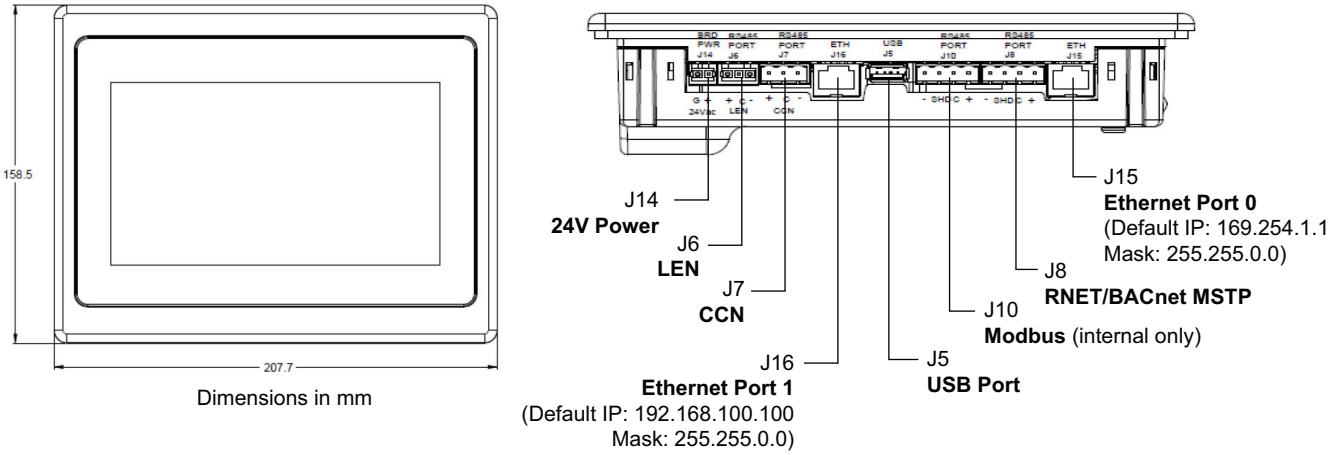


Fig. 90 — Carrier SmartVu™ Touchscreen Display Interface and Connections

Table 25 — Factory-Installed Sensors and Switches

NAME	DESCRIPTION	LOCATION	INCLUDED
OAT	Outdoor Air Temperature	Condenser Section	Standard
OARH	Outdoor Air Relative Humidity	Condenser Section	Standard
RAT	Return Air Temperature	Return Section	Standard
RARH	Return Air Relative Humidity	Return Section	Standard
SAT	Supply Air Temperature	Field-installed in Supply Duct	Standard
SARH	Supply Air Relative Humidity	Supply Fan Section	Standard
HPS	Refrigerant High-pressure Switch	Discharge Line	Standard
SSP.A	Saturated Suction Pressure	Suction Line	Standard
SDP.A	Saturated Discharge Pressure	Discharge Line	Standard
CCT	Cooling Coil Temperature	Supply Fan Section	Standard
COFS	Condensate Overflow Switch	Condensate Pan	Standard
SP	Supply Duct Pressure	Control Box	Optional
BP	Building Pressure	Control Box	Optional
IAQ	Return Air Carbon Dioxide (CO_2)	Return Section	Optional

Table 26 — Navigation Buttons

BUTTON	NAME	ACTION
	Home Button	Goes to the home screen.
	Back Button	Goes back to the previous screen.
	Main Menu Button	Goes to the main menu screen.
	Login Button	Goes to the login screen.
	Start/Stop Button	Goes to the start/stop screen.
	Screen Icon	Goes to the screen indicated by the icon name.
	Alarm Button	Goes to the alarm screen. The bell turns red when an alarm or alert is active.
	Page Up/down	Scrolls through screens with multiple pages.
	Status Button[a]	Goes to the status screen for the associated component.
	Technical Documents	Only shown on web user interface. Opens technical documents in a new browser tab.
	Help	Only shown on web user interface. Opens help document in a new browser tab.

NOTE(S):

a. Only appears on the Web User interface.

NAVIGATION CONVENTION

This manual provides guidance to access specific screens to perform specific functions. The convention used is this manual to get to a specific screen is (***Main Menu → System Config → Cooling Config***).

Based on the above guidance, the user must go to the main menu screen (by pressing the Main Menu button from the home screen or other screens), then go to the System Configuration screen (by pressing the system configuration icon on the main menu screen), then go to the Cooling Configuration screen (by pressing the cooling configuration icon on the system configuration screen). See Fig. 91 for the screen views and click points for this example.

NOTE: Sufficient access level (user or higher) is required to access certain screens.

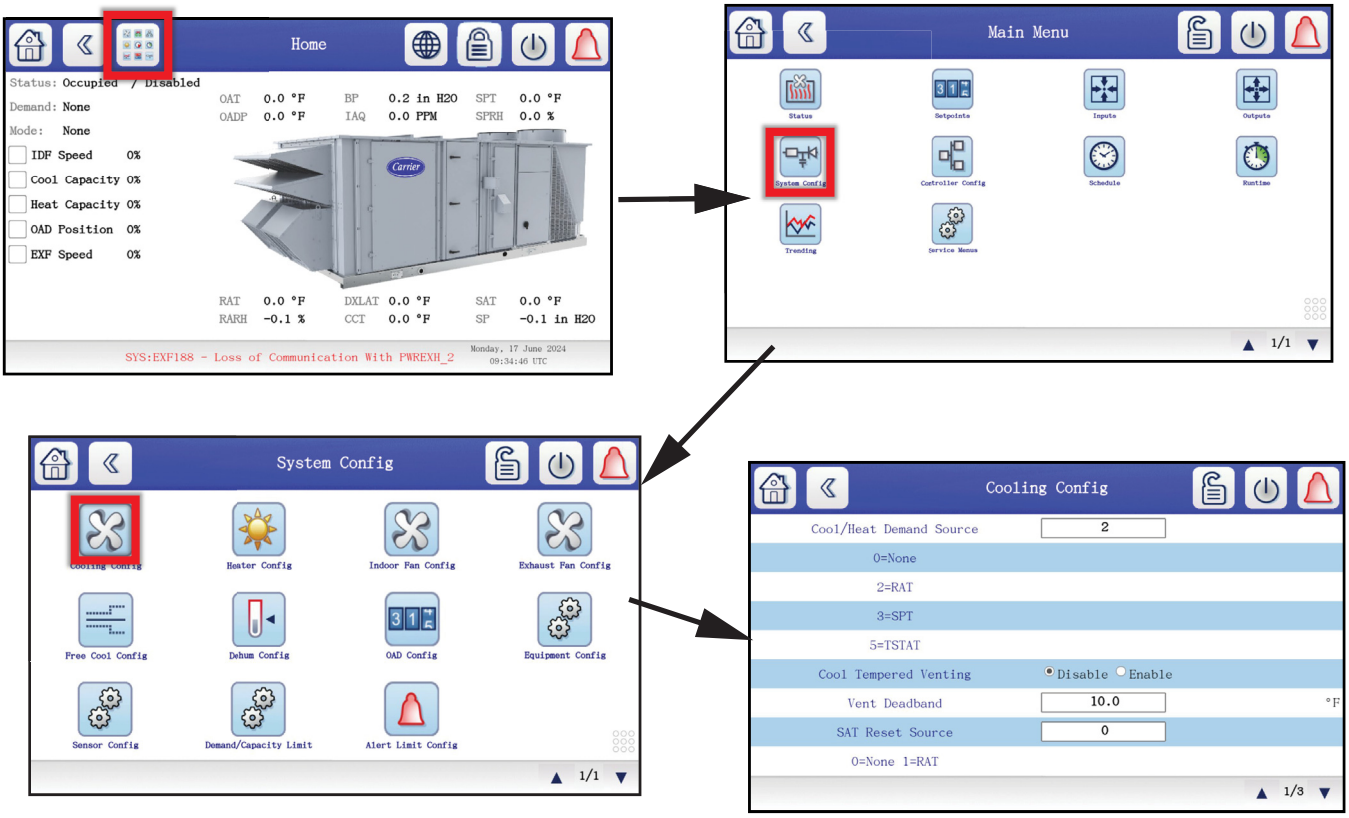


Fig. 91 — Equipment Configuration Screen Navigation Example

DATA ENTRY

Most screens contain data that is editable or selectable between multiple options, such as setpoints and configurations. See Table 27 for interface buttons related to data entry.

NOTE: Sufficient access level may be required to modify setpoints and settings.

Editable data is indicated by a number with a box around it 100.00 or letters/characters with a box or oval ***. When editable data is numerical, such as a temperature setpoint, clicking on editable data, on the touchscreen UI will bring up the keypad to allow the user to change the data. See Fig. 92 for keypad layout.

When editable data is alpha-numerical, such as a password entry, clicking on the editable data will bring up the keyboard to allow the user to change the data. See Fig. 93 for keyboard touchscreen layout.

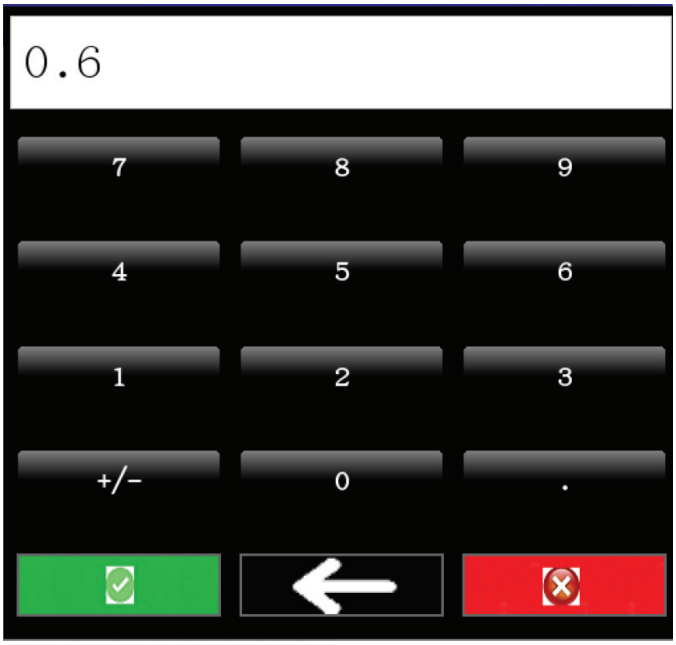


Fig. 92 — Keypad Layout

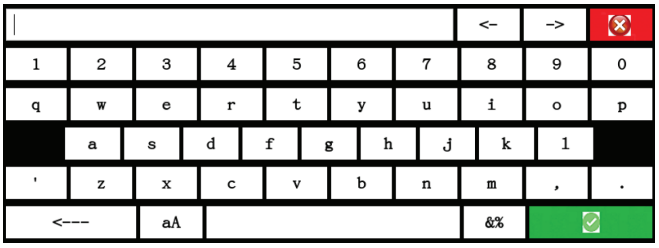


Fig. 93 — Keyboard Layout Touchscreen

For settings that have 2 configurations options, bubbles are used to indicate the configuration. See Fig. 94 for a configuration example. In this example, the smoke detector is enabled, and the thermostat is disabled.

For settings that have multiple configuration options, a numerical value is used to indicate the configuration. The possible configurations are listed below the device name and are assigned a numerical value. See Fig. 95 for an example of a configured device. In this example, the Cool/Heat Demand Source is set to 5, which is TSTAT heat based on the configuration descriptions (5=TSTAT).

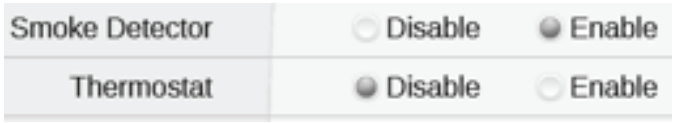


Fig. 94 — Enable/Disable Configuration Example

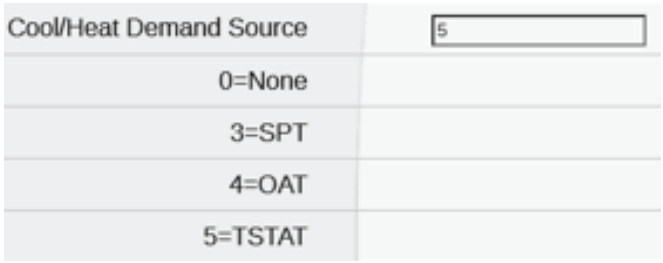
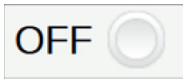


Fig. 95 — Configured Device Example

Table 27 — Data Buttons

VIEW	NAME	ACTION
	View Only Data	None. The data is not editable.
	Editable Data	Brings up the keypad or keyboard for data entry.
	Password Entry	Brings up the keyboard to allow password entry.
	Inactive Bubble	The indicated option is not active.
	Active Bubble	The indicated option is active.
	Save Button	Saves changes made on a screen.
	Discard Button	Discards changes made on a screen.
	Locked Button	Indicated that the value is locked for editing based on access level. Goes to the login screen.
	Login Button	Accepts the current access level and returns to the Home screen.
	Logout Button	Reverts to the basic access level and returns to the Home screen.

Main Screens

WELCOME SCREEN

The welcome screen is the first screen shown after Carrier Controller is powered on and will be shown for 2-3 minutes. See Fig. 96. The welcome screen will automatically change to the Home screen when the controller has completed initialization.

LOGIN SCREEN

The login screen can be accessed by pressing the login button from the top of the home screen. The login screen is used to elevate the user access level above basic and displays the current access level at the bottom of the screen. See Fig. 97 for login screen layout.

PASSWORDS

There are multiple user access levels. See Table 28 for a listing of the access levels, default password, and the explanation of access. All instructions in this manual, including equipment start-up, can be performed with user access.

USER LOGINS SCREEN

To enter the user access password, click on the user login from the login screen to go to the user login screen. See Fig. 98 for user login screen layout. Click on **** to bring up the keyboard and enter the password, then click done. Click on to complete the login.

NOTE: The bottom login screen should update to reflect the user access level.

MAIN MENU

The main menu screen can be accessed by pressing the main menu button from the home screen or other screens. The main menu screen provides a view of screens that are available to the user based on access level. See Fig. 99 for main menu layout for the user access level.

HOME SCREEN

The home screen is the first screen that is displayed after the welcome screen provides an overview of the unit operation and key setpoints, and has shortcuts for the main menu screen, login screen, start/stop screen, and alarm screen. The home screen can be accessed by pressing the home shortcut .

The home screen graphic, component status, and setpoints will vary based on the system configuration and the control configuration. The setpoints on the home screen are only editable with the user access level or higher. See Fig. 100 for typical home screen layout.

Fig. 96 — Welcome Screen Example

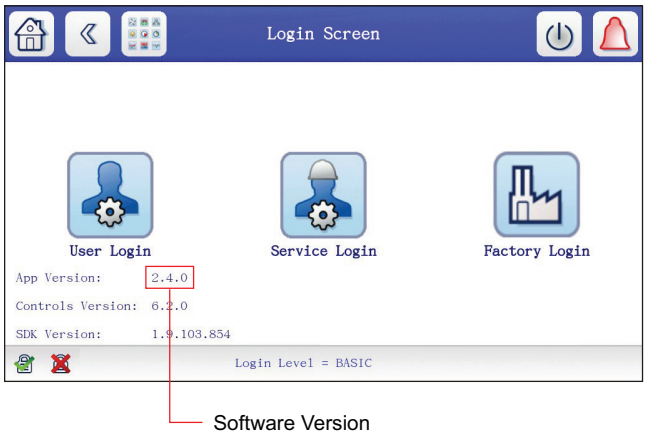


Fig. 97 — Login Screen

Fig. 98 — User Login Screen

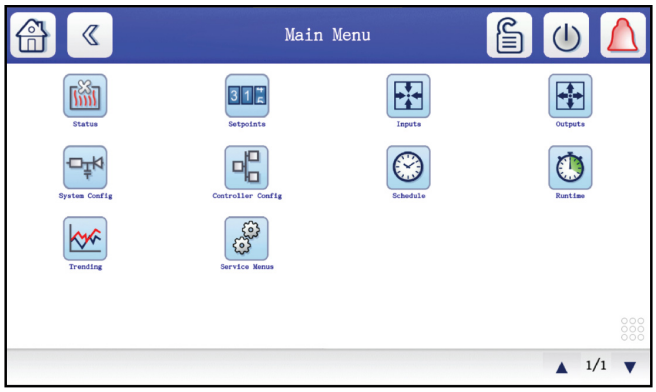


Fig. 99 — Main Menu Screen

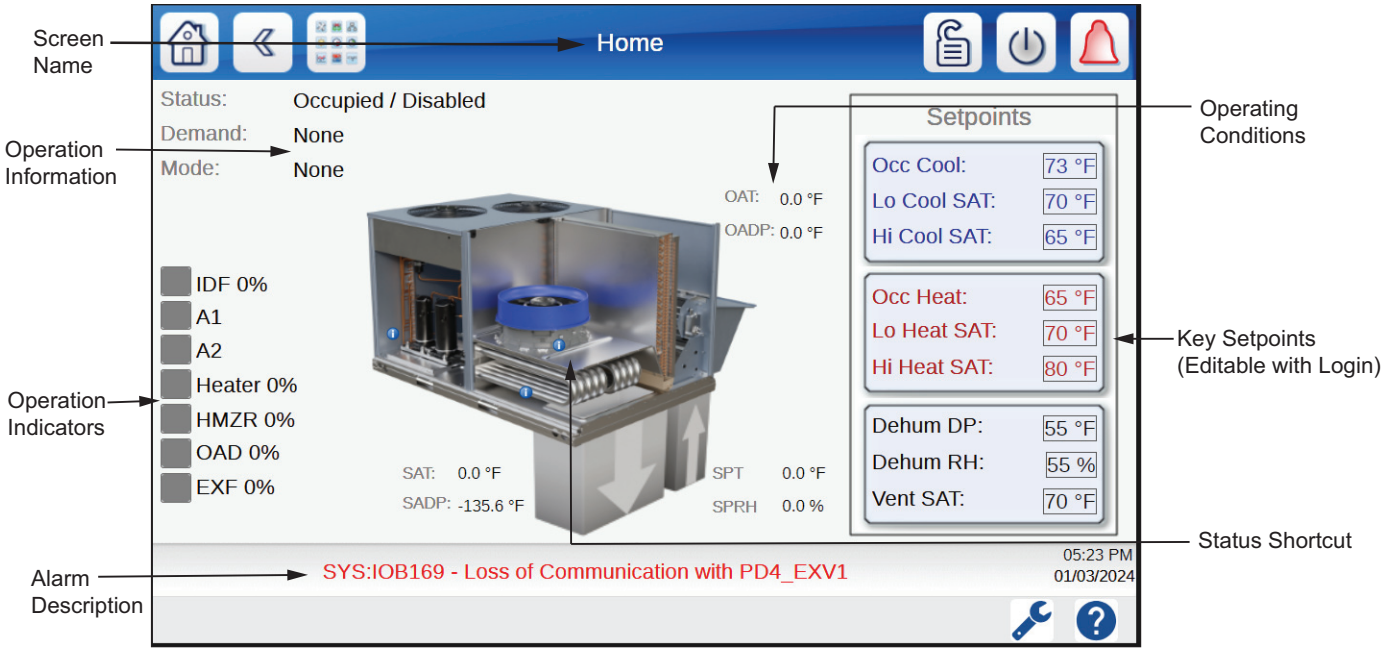


Fig. 100 — Home Screen Example

Table 28 — Control Access Levels

ACCESS LEVEL	PASSWORD	DESCRIPTION
BASIC	None	Access level at initial start-up or after a timeout has expired. Provides view only access to select setpoints and settings. Not all screens will be viewable. Basic access can disable the unit.
USER	1111	Intermediate access to adjust setpoints and settings and access most screens. User can enable/disable the unit, enable component and system tests, and acknowledge alarms.
SERVICE	Contact factory support.	Includes all User access, plus access to advanced setpoints and settings. Password is only available to factory trained personnel. See Advanced Controls, Operation, and Troubleshooting Guide for information on obtaining the service password or contact your local Carrier sales office for emergency service password access.
FACTORY	Rolling	Factory use only.

STATUS SCREEN

The status screens can be accessed by pressing the status icon from the main menu screen. The status screens are accessible for all access levels. The types of status screens shown will depend on the unit configuration. The status screens are not editable and will display information about a specific component or system. See Fig. 101 for status screen example.

SETPOINT SCREENS

The setpoint screens can be accessed by pressing the setpoints icon from the main menu screen. The setpoint screen is only accessible with the user access level or higher and the available setpoint screens will vary based on the unit configuration. See Fig. 102 for setpoint screen layout.

SYSTEM CONFIGURATION SCREENS

The system configuration screen can be accessed by pressing the system configuration icon from the main menu screen. The system configuration screen is only accessible with the user access level or higher and contains all user accessible configurations. See Fig. 103 for the system configuration screen layout.

CONTROLLER CONFIGURATION SCREENS

The controller configuration screen is accessed by pressing the Controller Configuration icon from the Main Menu screen. The controller configuration screen is only accessible with the user access level or higher and contains user accessible configurations related to control functions, such as time/date, communication, and user password. See Fig. 104 for the controller configuration screen layout.

CONTROLLER ID SCREEN

The controller ID screen is accessed by pressing the Controller ID icon from the Controller Configuration screen. The controller ID screen is only accessible with the user access level or higher and contains the unit model and serial number, software version, and other control information. See Fig. 105 for the controller ID screen layout.

START/STOP SCREEN

The start/stop screen can be accessed by pressing the start/stop button from the Home or Main Menu screen. With basic access level, the user can only disable unit operation or press emergency stop (if the unit was running). User or higher access level is required to enable unit operation, adjust the auto-restart configuration, and access the schedule menu. User or higher access level can also enable service run mode, enable component test mode, and access the service tests screen when in service run or component test mode. See Fig. 106 for the start/stop screen layout (shown with user access level in Service Run mode). See Table 29 for the start/stop screen functions.

Fig. 101 — Status Screen

Fig. 102 — Setpoint Screen

Fig. 103 — System Configuration Screen

Fig. 104 — Controller Configuration Screen

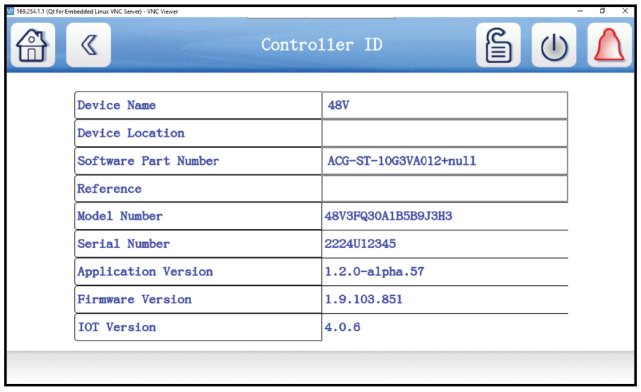


Fig. 105 — Controller ID Screen

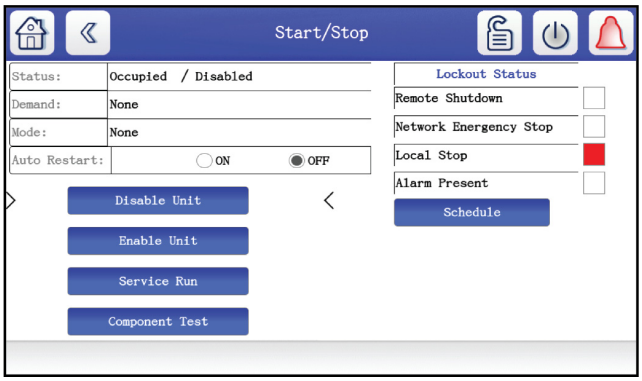


Fig. 106 — Start/Stop Screen

Table 29 — Start/Stop Functions

FUNCTION	DESCRIPTION
AUTO RESET	Off — unit operation is disabled when power is cycled.
	On — unit operation is enabled when power is cycled.
DISABLE UNIT	Unit operation is prevented.
ENABLE UNIT	Normal unit operation is enabled.
SERVICE RUN	Service Run mode is enabled.
COMPONENT TEST	Component Test mode is enabled.
SERVICE TEST MENU	Goes to the Service Test Menu screen.
SCHEDULE	Goes to the Schedules screen.
EMERGENCY STOP	Immediately shuts down the unit and disables unit operation.

Control Set Up

The 48WE can be used in a wide variety of applications. The remainder of the control section provides step by step directions and actions for control set up for typical applications, including single zone air conditioning (single-zone) and multi-zone air conditioning (multi-zone) with air terminal units. See Table 30 for an overview of the typical control set-up steps. See the Advanced Controls, Service, and Troubleshooting Guide for service control configuration. See the SmartVu integration guide for set up direction for network communication or communicating sensors.

Table 30 — Control Set-up Steps

	CONTROL SET-UP STEPS
A	Power on the control.
B	Login with the user access level.
C	Optional: Set daylight savings time.
D	Set date and time.
E	Configure the equipment for field-installed devices (sensors or accessories).
F	Configure the equipment for field-installed sensors.
G	Configure indoor fan.
H	Optional: Configure the outdoor air damper (only units with economizer).
I	Configure the cooling system.
J	Configure the dehumidification system.
K	Configure the heating system.
L	Optional: Configure the exhaust fan (only units with exhaust fan).
M	Optional: Configure free cooling.
N	Optional: Configure demand/capacity limiting
O	Optional: Configure alerts
P	Optional: Set indoor fan setpoints (only SP indoor fan control).
Q	Set cooling setpoints.
R	Set dehumidify setpoints.
S	Set heating setpoints.
T	Optional: Set exhaust fan setpoint (BP exhaust fan control only).
U	Set up occupancy control method or schedule.

IMPORTANT: Changing the unit model number will reset all control configurations and settings back to their defaults. If a model number change is required, such as configuring a special order unit, change the model number first. See the advanced controls, operation, and troubleshooting guide for changing the unit model number.

STEP A — POWER ON THE CONTROL

Turn power on at the unit disconnect. Verify the control board lights illuminate and the touchscreen display turns on. The unit will show the Home screen when the control is booted up. The unit operation is disabled by default, so the unit should not begin to operate. Once the control is fully booted, proceed to Step B.

If the unit does start up (indoor fan, compressors, or heat turn on), navigate to the Start/Stop screen by pressing the start/stop icon on the top bar and press the disable button to disable unit operation. The control will still be able to function if unit operation is disabled.

If the touchscreen or control boards do not power on, refer to the Controls, Operation, and Troubleshooting manual for troubleshooting steps or contact your Carrier sales office.

STEP B — LOGIN WITH USER ACCESS LEVEL

Click on the login icon on the top right panel of the Home screen to go to the Login screen. Then, click on the user login icon. On the User Login screen, click on password entry button (***_) to bring up the keyboard. Enter the user password (1111) and click done. Then, click on the login icon at the bottom left of the screen to complete the login and go back to the home screen.

NOTE: User access level (or higher) is required to complete the listed control set-up steps and start-up.

NOTE: The user access level is automatically logged out after a period of inactivity.

STEP C — SET DAYLIGHT SAVINGS TIME (DST) (OPTIONAL)

Navigate to the Daylight Savings Time screen (***Main Menu*** → ***Controller Config*** → ***Time Sync*** → ***Manual Time Sync*** → ***Daylight Savings Time)***. See Fig. 107 for daylight savings time screen layout. Set the start and stop days for daylight savings installation location. When finished, click the save changes button at the bottom of the page.

The system automatically updates the current time based on when DST is enabled, and the current time and date is in between the start and stop conditions. DST start or stop status is indicated in the upper right-hand corner of the screen. See Table 31 for DST configurations.

NOTE: If the time is manually set before DST is set, the time will be automatically changed based on the DST time settings. Manually change the time again to the current time to correct this issue.

STEP D — SET DATE AND TIME

Navigate to the Manual Time Sync screen (***Main Menu*** → ***Controller Config*** → ***Time Sync*** → ***Manual Time Sync***). See Fig. 108 for manual time sync screen layout. Set date and time for the installation location. When finished, click the save changes button at the bottom of the page.

Time and date are used as part of the unit occupancy schedule and must be set based on application requirements. To change the date, click on the box containing the date to bring up the calendar. Use the arrow buttons on the left and right of the month/year to increase or decrease the month or click on the month or year to bring up a drop-down list. Once the calendar is at the correct month and year, click on the current date to finalize the date selection.

NOTE: The date will show on this screen in month/day/year format.

To change the time, click on the box containing the time to bring up the time adjuster. Use the up and down arrows to change the hours, minutes, and seconds.
NOTE: Time is in 24-hour (military) format. Click OK to complete the time setting.

STEP E — CONFIGURE EQUIPMENT FOR FIELD-INSTALLED DEVICES

NOTE: Some equipment configuration changes require a reboot. A reboot button will appear on the bottom of the screen when required. Perform the reboot after all configuration changes are made. You do not need to reboot after each configuration.

Navigate to the Equipment Configuration screen (***Main Menu*** → ***System Config*** → ***Equipment Config***). Review the device listing and enable or configure any field-installed or field-use devices. See Fig. 109 for equipment configuration screen layout. When finished, click the save changes button at the bottom of the page.

NOTE: Configuration changes may require a reboot for the change to take effect. Press the reboot button to reboot the controller.

Field-installed accessories (smoke detector, economizer, phase monitor, filter switch) and field-use control inputs and outputs must be configured to match the application requirements and for associated screens, configurations, and setpoints to be displayed on the user interface. For example, if the economizer (OAD) is disabled, the ventilation configuration screen and free cooling configuration screen will not display.

If using a network point, the local (hardwired at unit control) input/output point does not have to be enabled in the equipment configuration. For example, if the system will be configured for IDF modulation based on a third-party signal and a network third-party IDF modulation signal is provided, the local third-party IDF input does not need to be enabled.

See Table 32 for equipment configurations by application. All devices in this screen are disabled by default, except when the device is included as a factory-installed option (based on unit model number).

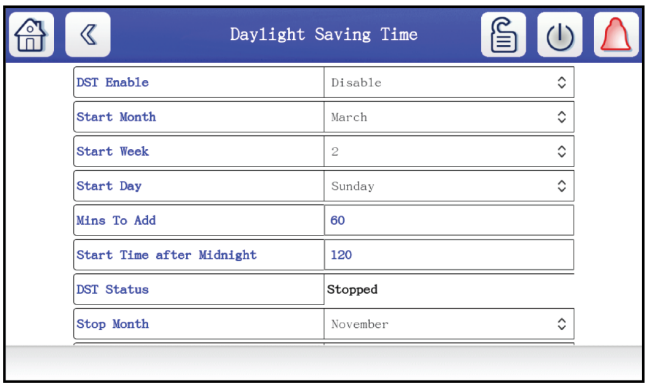


Fig. 107 — Daylight Savings Time Screen

Table 31 — Daylight Savings Time Configurations

CONFIGURATION	VALUE	DESCRIPTION
DST Enable	Enable	Daylight savings time is enabled, the system time will automatically be adjusted based on the DST configuration.
	Disable	Daylight savings time is not used.
Start Month	Jan. to Dec.	The month that DST will start.
Start Week	1 to 5	The week of the month that DST will start.
Start Day	Mon. to Sun.	The day of the week that DST will start.
Minutes To Add	60 min.	The amount of daylight savings time change (addition).
Start Time After Midnight	0 to 720	Time after 0:00 to apply the daylight savings time change.
Start Month	Jan. to Dec.	The month that DST will stop.
Start Week	1 to 5	The week of the month that DST will stop.
Start Day	Mon. to Sun.	The day of the week that DST will stop.
Minutes To Add	60 min.	The amount of daylight savings time change (subtraction).
Start Time At Midnight	0 to 720	Time after 0:00 to apply the daylight savings time change.

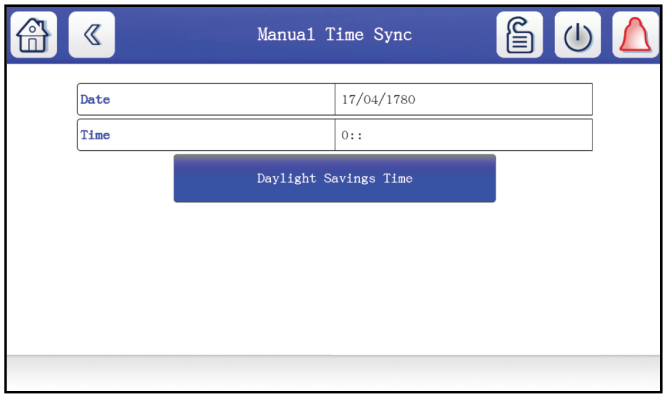


Fig. 108 — Manual Time Sync Screen

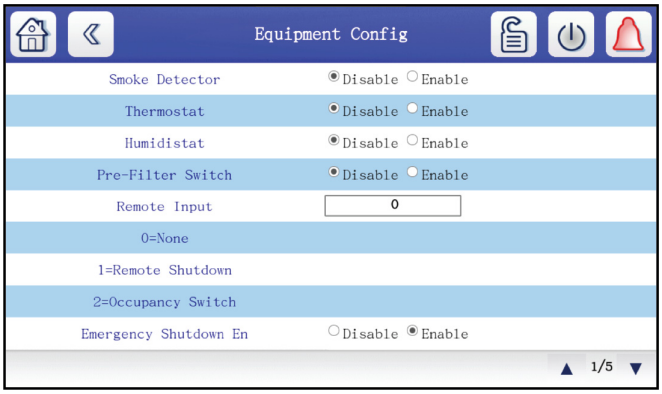


Fig. 109 — Equipment Configuration Screen

Table 32 — Equipment Configuration by Application

ITEM	VALUE	DESCRIPTION	APPLICATION
Smoke Detector	Enable	The system monitors local smoke detector input for smoke shutdown. NOTE: The smoke detector will default to enabled for units with a factory-installed smoke detector.	Any
	Disable	The system does not monitor the local smoke detector input.	Any
Thermostat	Enable	The system enables the local thermostat inputs (Y1, Y2, G, W1, W2). Used when the cool/heat demand source configuration is set to TSTAT or indoor fan control configuration is set to third-party.	Single Zone
	Disable (Default)	The system does disables the local thermostat inputs.	Any
Humidistat	Enable	The system enables local humidistat (dehumidify switch) input. Used when dehumidify demand source configuration is set to HSTAT.	Single Zone
	Disable (Default)	The system disables the local humidistat input.	Any
Pre-filter Switch	Enable	The system enables local pre-filter input. Used when the pre-filter change reminder alert configuration is set to switch. NOTE: The pre-filter switch will default to enabled for units with factory installed pre-filter status switch.	Any
	Disable	The system disables the local pre-filter input.	Any
Remote Switch	0=None (Default)	Remote switch not used.	Any
	1=Remote Shutdown	The system monitors the local remote switch input for a non-emergency shutdown command.	Any
	2= Remote Occupancy	The system monitors the local remote switch input to determine occupancy status.	Any
Emergency Shutdown	Enable	The system monitors the input for emergency shutdown. NOTE: Emergency shutdown is enabled by default for units with factory installed phase monitor.	Any
	Disable	The system does not monitor the local emergency shutdown input.	Any
Fire Shutdown	Enable	The system monitors the local fire shutdown input for emergency shutdown.	Any
	Disable (Default)	The system does not monitor the local fire shutdown input.	Any
ZDOR	Enable	The system provides a zone damper override relay to notify zone dampers to override their position when the system is in dissipation mode, heating mode, dehumidification mode, test mode, or the IDF is operating during the unoccupied period.	Any
	Disable (Default)	The system does not provide a zone damper override relay.	Any
IDF Third-party Mod.	Enable	The system enables the local third-party indoor fan speed analog input. Used with third-party IDF control type.	Any
	Disable (Default)	The system disables the third-party indoor fan speed analog input.	Any
EXF Third-party Mod.	Enable	The system enables the local third-party exhaust fan speed analog input. Used when the exhaust fan control configuration is set to third-party.	Any
	Disable (Default)	The system disables the third-party exhaust fan speed analog input.	Any
OAD Third-party Mod.	Enable	The system enables the local third-party outdoor air damper position analog input. Used when the ventilation control configuration is set to third-party vent or full.	Any
	Disable (Default)	The system disables the third-party outdoor air damper position analog input.	Any
Economizer (OAD)	Enable	The system provides a local analog output for outdoor air damper modulation and monitors a local analog input for damper position feedback. Required for 100% OA or SZ A/C with ventilation or free cooling. NOTE: The system defaults to enabled for units with factory-installed economizer.	Any
	Disable	The system does not provide an economizer (OAD) output.	Any
COFS	Enable	The system monitors a local condensate overflow switch input for overflow status. NOTE: System with factory-installed COFS will default to enabled.	Any
	Disable	The system does not monitor the COFS input.	Any

Table 32 — Equipment Configuration by Application (cont)

ITEM	VALUE	DESCRIPTION	APPLICATION
Auxiliary Relay	0=Not Used (Default)	Auxiliary relay is not used.	Any
	1=Alarm Status	The auxiliary relay indicates alarm status.	Any
	2= Occ Status	The auxiliary relay indicates occupancy status.	Any
IAQ/OAD Input Config.	0=Not Used (Default)	The system disables the IAQ/OAD input.	Any
	1= IAQ Sensor	Enables the input and assigns it to IAQ sensor, such as CO_2. Used when ventilation control configuration is set to IAQ mapping or IAQ reset source configuration is set to IAQ sensor NOTE: The IAQ/OAQ input defaults to IAQ for units with factory RA CO_2 sensor.	Any
	2=Third-Party OAD Mod	Enables the input and assigns it to the third-party signal to modulate the outdoor air damper position. Used when the ventilation control configuration is set to third-party vent or full.	Any
	3=Third-Party IAQ Reset	Enables the input and assigns it for third-party signal to reset the outdoor air damper ventilation position. Used when the IAQ reset configuration is set to third-party.	Any
	4=Third-Party OA CFM Reset	Enables the input and assigns it for 3rd party signal to reset the outdoor air flow setpoint. Used if the IAQ reset source configuration is set to third party and the unit is equipped with an OA CFM sensor.	Any
IAQ/OAQ Switch Config.	0=Not Used (Default)	The system disables the IAQ/OAQ switch input.	Any
	1= IAQ Switch	Enables the input and assigns it to IAQ switch. Used when the IAQ reset source configuration is set to IAQ switch.	Any
	2=OAQ Switch	The system monitors the input for OAQ switch to disable free cooling and ventilation when OAQ is poor.	Any
Occupied Standby Time	5 to 30 min. 5 min. Default	The amount of time the space is continuously unoccupied for before occupied setback starts.	Any
Occupied Override Time	0t o 4 Hours 2 Hours Default	The amount of time the system is in occupied override when occupied override mode is active.	Any

STEP F — CONFIGURE EQUIPMENT FOR FIELD-INSTALLED SENSORS

Navigate to the Sensor Configuration screen (***Main Menu*** → ***System Config*** → ***Sensor Config)***. Review the sensor listing and enable or configure any field-installed sensors. See Fig. 110 for sensor configuration screen layout. When finished, click the save changes button at the bottom of the page.

NOTE: Configuration changes may require a reboot for the change to take effect. Press the reboot button to reboot the controller.

Field-installed sensors must be configured to match applications requirements. For example, if the cool/heat demand source is configured for SPT and a network SPT input is not used, then the sensor configuration for SPT must be enabled for the system to read a local sensor.

If using a network sensor, the local sensor point does not have to be enabled in the sensor configuration. For example, if the cool/heat demand source is configured for SPT and a network SPT input is used, the local SPT does not need to be disabled. However, best practice is to have a local sensor as backup, in the event of network communication issues. In that case, the local sensor must be enabled. If both a local input and network input are valid, the system will prioritize the network input.

See Table 33 for a listing of commonly used sensors by application. All devices in this screen are disabled by default, except when the device is included as a factory-installed option (from model number).

NOTE: Sensors that are standard on all units (RAT/OAT), will not be listed in the sensor configuration.

STEP G — CONFIGURE INDOOR FAN

Navigate to the Indoor Fan configuration screen (***Main Menu*** → ***System Config*** → ***Indoor Fan Config***). Configure the indoor fan operation and operating speeds based on application requirements. See Fig. 111 for indoor fan configuration screen layout. When finished, click the save changes button at the bottom of the screen.

The indoor fan operation, including the control type, occupied operation, and unoccupied operation, and indoor fan speeds must be configured to match application requirements. See Table 34 for indoor fan control configurations by application.

NOTE: Fan speed configurations are in percent of maximum operating speed (rpm). Review the unit submittal or the fan tables in the Product Data documents to identify the required operating rpm to achieve the applications airflow.

For example, if a unit has a motor capable of 2000 rpm maximum and the fan needs to operate at 1500 rpm to achieve the design cooling and heating airflows, then the associated maximum/high fan speed configurations should be set to 75% (1500/2000 rpm).

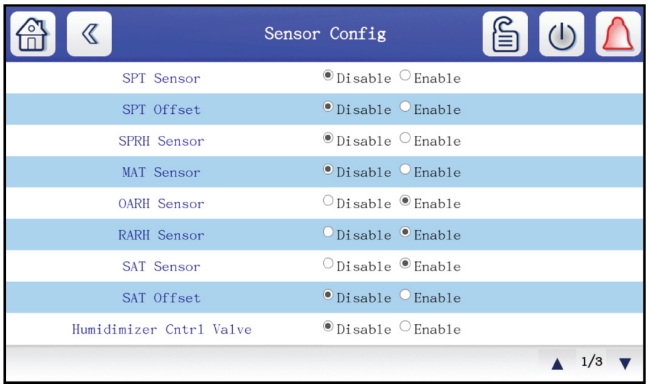


Fig. 110 — Sensor Configuration Screen Layout

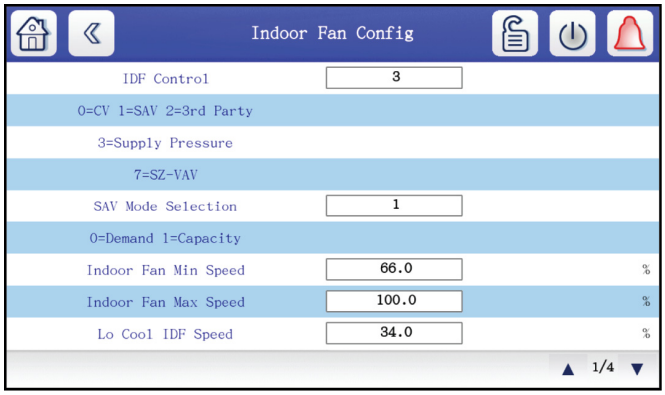


Fig. 111 — Indoor Fan Configuration Screen

Table 33 — Sensor Configurations by Application

CONFIGURATION	VALUE	DESCRIPTION	APPLICATION
SPT Sensor	Enable	The system enables a local space temperature (SPT) sensor input. Used when the cool/heat demand source is configured for SPT or for SAT or SP reset based on SPT.	Single Zone
	Disable (Default)	The system disables the local space temperature sensor input.	Any
SPT Offset	Enable	The system monitors a local space temperature sensor offset.	Single Zone
	Disable (Default)	The system does not monitor the local space temperature offset input.	Any
SPT OCC Override	Enable	The system monitors the local space temperature sensor for occupied override during the unoccupied period.	Single Zone
	Disable (Default)	The system does not monitor for local occupancy override.	Any
OCC Override Time	0 to 4 Hours, 0 Default	When SPT occupied override is activated, this is the occupied override time applied when the button is first pressed.	Single Zone
OCC Override 2nd Press	0 = Reset (Default)	When occupied override is in effect and the override button is pressed a second time during the override period, the override period is restarted at the occupied override time.	Single Zone
	1 = Clear	When occupied override is in effect and the override button is pressed a second time during the override period, the override time is cleared, and the unit is returned to unoccupied.	Single Zone
MAT Sensor	Enable	The system monitors a local mixed air temperature (MAT) sensor. MAT is used for cooling and heating mode determination.	Single Zone
	Disable (Default)	The system does not monitor the local MAT sensor. NOTE: If an MAT sensor is not available, then the system calculates MAT based on OAT, RAT, and the OAD position.	Any
OARH Sensor	Enable	The system enables the local outdoor air relative humidity (OARH) sensor. OARH is used with OAT to calculated OAE and OADP, which are used for free cooling control for OADP limit check, enthalpy changeover, and differential enthalpy changeover. NOTE: OARH is enabled by default for units with the humidity and enthalpy sensing option.	Any
	Disable	The system disables the local OARH sensor. Disabled by default for units without the humidity and enthalpy sensing option.	Any
RARH Sensor	Enable	The system enables the local return air relative humidity (RARH) sensor. RARH is used when the dehumidify demand source is configured for RARH or for differential enthalpy free cooling changeover. NOTE: RARH is enabled by default on units with the humidity and enthalpy sensing option.	Any
	Disable	The system disables the local RARH sensor. Disabled by default for units without the humidity and enthalpy sensing option.	Any
SAT Sensor	Enable	The system monitors a local supply air temperature (SAT) sensor. SAT is used for cooling, venting, and modulating/multi-stage heat operation. NOTE: SAT is enabled by default for units with modulating or multi-stage heat.	Any
	Disable	The unit will not monitor the local SAT sensor input. NOTE: The system uses the DX LAT sensor reading as SAT for cooling and venting operation if a SAT sensor is not available.	Any
SP Sensor	Enable	The system enables the local duct supply pressure sensor. Supply pressure is used when the indoor fan control configuration is set to SP. SP is used for multi-zone VAV applications. SP control can also be used for true constant volume applications to account for pressure drop from filter loading. NOTE: SP is enabled by default for VAV units.	Multi-zone
	Disable	The system disables the local duct supply pressure sensor. NOTE: SP is disabled by default for SAV units.	Single Zone
BP Sensor	Enable	The system enables the local building pressure sensor. Used when the exhaust fan control configuration is set to BP. NOTE: Enabled by default for units with power exhaust with building pressure control.	Any
	Disable	The system disables the local building pressure sensor. Disabled by default for units without power exhaust with building pressure control.	Any
SP High Range	0 to 5 in. H_2O 5 in. H_2O Default	The high pressure range of the supply pressure transducer. Must be 5 in. H_2O for the factory installed SP sensor	Any
SP Low Range	0 to 5 in. H_2O 0 in. H_2O Default	The high pressure range of the supply pressure transducer. Must be 0 in. H_2O for the factory installed SP sensor	Any
BP High Range	–1 to1 in. H_2O 0.25 in. H_2O Default	The high pressure range of the building pressure transducer. Must be 0.25 in. H_2O for the factory installed BP sensor	Any
BP Low Range	–1 to 1 in. H_2O –0.25 in. H_2O Default	The low pressure range of the supply pressure transducer. Must be –0.25 in. H_2O for the factory installed BP sensor	Any
IAQ High Range	0 to 5000 PPM 5000 PPM Default	The high PPM range of the IAQ sensor. Must be 5000 PPM for the factory installed RA CO_2 sensor	Any
IAQ Low Range	0 to 5000 PPM 0 PPM Default	The low PPM range of the IAQ sensor. Must be 0 PPM for the factory installed RA CO_2 sensor	Any

Table 34 — Indoor Fan Configurations by Application

<table>
<tr><th>CONFIGURATION</th><th>VALUE</th><th>DESCRIPTION</th><th>APPLICATION</th></tr>
<tr><td rowspan="5">Indoor Fan Control</td><td>0 = Constant Volume</td><td>The indoor fan operates at the IDF high cool speed with a cool, vent, or dehum demand, and the IDF high heat speed with a heat demand. CV IDF control is common for process applications, can be used in select single zone applications (where code allows).</td><td>Single Zone</td></tr>
<tr><td>1 = Staged Air Volume (SAV™)</td><td>The indoor fan speed stages based on demand level or cooling and heating capacity level. SAV is common for single-zone air conditioning applications. See the SAV mode selection for more details on specific operation for SAV demand and SAV capacity. SAV can only be used with SPT or TSTAT cool/heat demand source. NOTE: SP is default for SAV units.</td><td>Single Zone</td></tr>
<tr><td>2 = Third-Party IDF Modulation[a]</td><td>The indoor fan speed modulates between minimum and maximum speed based on a third-party input. Requires a local third-party IDF modulation input or network third-party IDF modulation signal.</td><td>Any</td></tr>
<tr><td>3 = Supply Pressure (SP)[a]</td><td>The indoor fan speed modulates between minimum and maximum speed to maintain the supply pressure at the supply pressure setpoint. Most common for multi-zone VAV applications with air terminal units or true constant volume operation (compensates for filter loading). Requires the local or supply pressure sensor or network supply pressure reading. NOTE: SP is default for VAV units.</td><td>Multi-zone</td></tr>
<tr><td>7 = Single Zone VAV (SZVAV)[a]</td><td>The indoor fan speed modulates between minimum and maximum IDF speeds based on space temperature and the Occupied Cooling and Occupied Heating setpoints. Requires SPT cool/heat demand source.</td><td>Single Zone</td></tr>
<tr><td rowspan="2">SAV Mode Selection</td><td>0 = Demand</td><td>The indoor fan speed is based on the demand level. See below for SAV demand IDF speed details.<table><tr><th>DEMAND</th><th>INDOOR FAN SPEED</th></tr><tr><td>Vent</td><td>IDF Min. Speed</td></tr><tr><td>Low Cool</td><td>IDF Low Cool Speed</td></tr><tr><td>High Cool And Dehumidify</td><td>IDF High Cool Speed</td></tr><tr><td>Low Heat</td><td>IDF Low Heat Speed</td></tr><tr><td>High Heat</td><td>IDF High Heat Speed</td></tr></table>The IDF control must be set to SAV for SAV demand operation. SAV demand is recommended in single zone air conditioning applications for tighter space temperature control.</td><td>Single Zone</td></tr>
<tr><td>1 = Capacity (Default)</td><td>The indoor fan speed is based on the demand level or the cool or heat capacity level. See below for SAV demand IDF speed details.<table><tr><th>DEMAND/CAPACITY</th><th>INDOOR FAN SPEED</th></tr><tr><td>Vent Demand</td><td>IDF Min Speed</td></tr><tr><td>Dehum Demand</td><td>IDF High Cool Speed</td></tr><tr><td>Cool Capacity < SAV Low Cool Threshold</td><td>IDF Min. Speed</td></tr><tr><td>SAV Low Cool Threshold ≤ Cool Capacity < SAV Med. Cool Threshold</td><td>IDF Low Cool Speed</td></tr><tr><td>SAV Med. Cool Threshold ≤ Cool Capacity < SAV Hi Cool Threshold</td><td>IDF Med Cool Speed</td></tr><tr><td>Cool Capacity ≥ SAV High Cool Threshold</td><td>IDF High Cool Speed</td></tr><tr><td>1% < Heat Capacity ≤ 75%</td><td>IDF Low Heat Speed</td></tr><tr><td>Heat Capacity > 75%</td><td>IDF High Heat Speed</td></tr></table>During free cooling mode, integrated free cooling mode, or heat tempered venting mode, the IDF speed will follow the demand level (IDF Low Cool Speed with Low Cool Demand or IDF High Cool Speed with High Cool Demand). The IDF control must be set to SAV for SAV capacity operation. SAV capacity is recommended in single-zone air conditioning applications for most efficient operation.</td><td>Single Zone</td></tr>
<tr><td>IDF Min. Speed</td><td>0 to 100%
34% Default</td><td>IDF min. speed is used directly for SAV, SP, and ZP indoor fan control types. The system will prevent any other IDF speed configuration from being below the IDF min. speed configuration.</td><td>Any</td></tr>
<tr><td>IDF Max. Speed</td><td>0 to 100%,
100% Default</td><td>IDF max. speed is used directly for SP and ZP indoor fan control types. The system will prevent any other IDF speed configuration from being above the IDF max. speed configuration.</td><td>Any</td></tr>
<tr><td>IDF Low Cool Speed</td><td>0 to 100%,
54% Default</td><td>IDF low cool speed is only used as part of SAV demand or SAV capacity IDF control.</td><td>Single Zone</td></tr>
<tr><td>IDF Med. Cool Speed</td><td>0 to 100%,
55% Default</td><td>IDF med. cool speed is only used as part of SAV capacity IDF control.</td><td>Single Zone</td></tr>
<tr><td>IDF High Cool Speed</td><td>0 to 100%,
81% Default</td><td>IDF high cool speed is used as part of CV, SAV demand, or SAV capacity IDF control.</td><td>Any</td></tr>
</table>

Table 34 — Indoor Fan Configurations by Application (cont)

CONFIGURATION	VALUE	DESCRIPTION	APPLICATION
SAV Low Cool Cap. Threshold	0 to 100%, 0% Default	SAV low cool capacity threshold is only used with SAV capacity IDF control.	Single Zone
SAV Med. Cool Cap. Threshold	0 to 100%, 50% Default	SAV med. cool capacity threshold is only used with SAV capacity IDF control.	Single Zone
SAV High. Cool Cap. Threshold	0 to 100%, 75% Default	SAV high cool capacity threshold is only used with SAV capacity IDF control.	Single Zone
IDF Low Heat Speed	0 to 100%, 67% Default	IDF lo heat speed is only used as part of SAV demand or SAV capacity IDF control for units with a heat source.	Single Zone
IDF High Heat Speed	0 to 100%, 100% Default	IDF high heat speed is used as part of CV, SAV demand, or SAV capacity IDF control for units with a heat source.	Any
Occupied Fan	0 = Demand Based	The IDF will only operate when there is a demand for cool, heat, vent, or dehumidify during the occupied period. Demand based IDF should only be used for single zone A/C applications where the RTU does not provide zone ventilation.	Single Zone
	1 = Continuous (Default)	The IDF will operate continuously during the occupied period. Recommended for 100% OA applications or single zone A/C applications where the RTU provides zone ventilation.	Any
Unoccupied Fan	0 = Disabled	The IDF is off during the unoccupied period. Required for 100% OA applications.	Any
	1 = Demand Based (Default)	The IDF will only operate when there is a demand for cool, heat, vent, or dehumidify during the unoccupied period. This configuration must be set for the RTU to provide unoccupied cooling, heating, dehumidification, or venting.	Single Zone
IDF Smoke Purge Speed	0 to 100% 34% Default	The speed that the indoor fan operates at when smoke purge mode is activated	Any
IDF Smoke Press Speed	0 to 100% 34% Default	The speed that the indoor fan operates at when smoke pressurization mode is activated	Any
IDF Smoke Evac Speed	0 to100% 34% Default	The speed that the indoor fan operates at when smoke evacuation mode is activated	Any
SP Reset Source	0=None (Default)	SP reset is not performed	Any
	1=RAT	The system monitors RAT for SP reset. When there is a cool or vent demand and the RAT is < the Occupied Cooling setpoint, the SP reset is calculated by (Occupied Cooling setpoint - RAT)*(IDF Reset Ratio config). The SP reset value is limited by the SP Reset Limit config. SP reset requires SP indoor fan control.	Multi-Zone VAV
	2=SPT	The system monitors SPT for SP reset. When there is a cool or vent demand and the SPT is < the Occupied Cooling setpoint, the SP reset is calculated based on the (Occupied Cooling setpoint - SPT)*(IDF Reset Ratio config). The SP reset value is limited by the SP Reset Limit config. Requires SP indoor fan control and local or network SPT sensor.	Multi-Zone VAV
	3= Third-Party	The system monitors the hardwired 3rd party IDF input or network SP reset input for SP reset. When there is a cool or vent demand and the SPT is < the Occupied Cooling setpoint, the SP is reset is set based on the network SP reset value (in. H_2O) or the analog input value (2V=0 in. H_2O, 10V=3 in. H_2O), down to the SP Reset Limit config.	Multi-Zone VAV
SP Reset Ratio	0 to 3 in. H_2O/°F 0.2 in. H_2O/°F Default	The value used for calculating SP reset for RAT and SPT for SP reset source.	Multi-Zone VAV
SP Reset Limit	0 to 3 in. H_2O '0.75 in. H_2O Default	The maximum allowable value for SP Reset when using RAT or SPT for SP reset source.	Multi-Zone VAV
SP Reset Limit	0 to 100% 34% Default	The speed that the indoor fan operates at when smoke evacuation mode is activated.	Multi-Zone VAV

NOTE(S):

a. For units with 2-stage heat, the IDF speed is set to the low heat IDF speed with a low heat demand or the IDF high heat speed with a high heat demand.

STEP H — CONFIGURE OUTDOOR AIR DAMPER (OPTIONAL)

For units with economizer, navigate to the Outdoor Air Damper Configuration screen (***Main Menu → System Config → OAD Config***). Review the OAD position configurations and adjust as need. See Fig. 112 for outdoor air damper configuration screen layout. When finished, click the save changes button at the bottom of the screen.

⚠ CAUTION

For all applications, verify that proper building pressure relief (barometric or power exhaust) is operational before operating the unit with the outdoor air damper open. Operating a unit with outdoor air without proper building pressure relief can cause doors to push open, damage to building and roofing materials, and damage to HVAC equipment.

NOTE: The OAD configuration screen will only display when the economizer (OAD) is enabled on the configure equipment screen.

The OAD configuration screen is used to set the OAD operation, ventilation control, and position restrictions. Free cooling is configured on a separate screen. All OAD positions are based on 0 to 100% range. See Table 35 for outdoor air damper configurations by application.

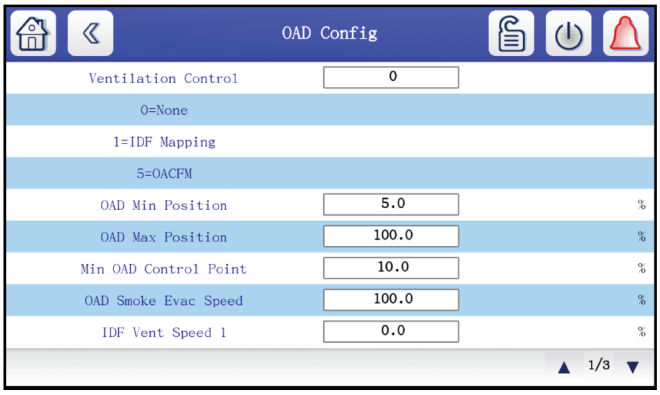


Fig. 112 — Outdoor Air Damper Configuration Screen

Table 35 — Outdoor Air Damper Configurations by Application

CONFIGURATION	VALUE	DESCRIPTION	APPLICATION
Vent Control	0 = None (Default)	Ventilation is not performed. This configuration should only be used on equipment without an economizer (OAD).	Any
	1 = IDF Mapping	The OAD ventilation position is modulated linearly based on the indoor fan speed and IDF/OAD vent positions 1-4 configurations. See below for IDF mapping OAD position details.To achieve a constant ventilation rate, the OAD position has to increase as the IDF speed decreases. **IDF SPEED** / **OAD POSITION** **IDF VENT SPEED 1** — OAD vent pos 1 **IDF VENT SPEED 2** — OAD vent pos 2 **IDF VENT SPEED 3** — OAD vent pos 3 **IDF VENT SPEED 4** — OAD vent pos 4 When the IDF speed is in between 2 IDF vent speed configurations, the OAD vent position is linearly calculated based on the IDF speed and the closest OAD vent position configurations. For example, if IDF Vent Speed 1 = 30%, IDF Vent Speed 2 = 50%, OAD Vent Pos 1 = 40%, OAD Vent Pos 2 = 30%, and the IDF speed was 40%, the OAD position would be 35%.	Any
	2 = Third-Party Full	The OAD position modulates between the minimum and maximum OAD positions based on a third-party input. Free cooling or IAQ reset will not override the third-party commanded OAD position. Requires the local third-party IDF input or a network third-party IDF modulation signal.	Any
	3 = Third-Party Vent Only	The OAD ventilation position modulates between the minimum and maximum OAD positions based on a third-party input. Free cooling or IAQ reset will override the third-party commanded OAD position. Requires the local third-party IDF input or a network third-party IDF modulation signal.	Any
OAD Min. Position	0 to 100% Default 5%	This is the minimum OAD position that the system is allowed to operate at while ventilation or free cooling is being performed. No other OAD position configuration can be lower the OAD minimum position.	Any
OAD Max. Position	0 to 100% Default, 98%	This is the maximum OAD position that the system is allowed to open to. No other OAD position configuration can be higher than the OAD maximum position.	Any
IDF Vent Speed 1	0 to 100%, Default 34%	IDF vent speed 1 is only used when the OAD control type is set to IDF mapping. The IDF vent speed 1 should match the lowest configured IDF speed, typically the IDF min speed. IDF vent speed 1 cannot be below IDF min speed or more than IDF vent speed 2.	Any
IDF Vent Speed 2	0 to 100%, Default 44%	IDF vent speed 2 is only used when the OAD control type is set to IDF mapping. For SAV IDF control, the IDF vent speed 2 should match the low cool IDF speed. IDF vent speed 2 cannot be below IDF vent speed 1 or more than IDF vent speed 3.	Any
IDF Vent Speed 3	0 to 100%, Default 66%	IDF vent speed 3 is only used when the OAD control type is set to IDF mapping. For SAV IDF control, the IDF vent speed 3 should match the med. cool IDF speed (if used) or be between the low cool and high cool IDF speeds. IDF vent speed 3 cannot be below IDF vent speed 2 or more than IDF vent speed 4.	Any
IDF Vent Speed 4	0 to 100%, Default 100%	IDF vent speed 4 is only used when the OAD control type is set to IDF mapping. The IDF vent speed 4 should match the highest configured IDF speed, typically the IDF max. speed or the IDF high cool speed. IDF vent speed 4 cannot be below IDF vent speed 3 or more than IDF max. speed.	Any

Table 35 — Outdoor Air Damper Configurations by Application (cont)

CONFIGURATION	VALUE	DESCRIPTION	APPLICATION
OAD Vent Pos 1	0 to 100%, Default 50%	OAD vent pos 1 is only used when the OAD control type is set to IDF mapping and is the highest of the vent positions. OAD vent position 1 cannot be below OAD vent position 2 or above max. OAD position.	Any
OAD Vent Pos 2	0 to 100%, Default 40%	OAD vent pos 2 is only used when the OAD control type is set to IDF mapping. OAD vent position 2 cannot be below OAD vent position 3 or above OAD vent position 1.	Any
OAD Vent Pos 3	0 to 100%, Default 30%	OAD vent pos 3 is only used when the OAD control type is set to IDF mapping. OAD vent position 3 cannot be below OAD vent position 4 or above OAD vent position 2.	Any
OAD Vent Pos 4	0 to 100%, Default 20%	OAD vent pos 4 is only used when the OAD control type is set to IDF mapping and is the lowest of the vent positions. OAD vent position 4 cannot be below the minimum OAD position or above the vent OAD position 3.	Any
IAQ Override Config.	0=None (Default)	IAQ reset is not performed	Any
	1=Over Thresh Override	IAQ reset is performed (damper position increased) when the IAQ PPM reading is above the IAQ Override Threshold setpoint by the IAQ Override Deadband. IAQ reset is stopped when the IAQ is below the IAQ Override Threshold by the IAQ Override Deadband.	Any
	1=Under Thresh Override	IAQ reset is performed (damper position decreased) when the IAQ PPM reading is below the IAQ Override Threshold setpoint by the IAQ Override Deadband. IAQ reset is stopped when the IAQ is above the IAQ Override Threshold by the IAQ Override Deadband.	Any
OAD Smoke Evac. Position	0 to 100% 100% Default	The position that the OAD goes to when smoke evacuation mode is activated.	Any
IAQ Vent Standby Demand	Disable (Default)	Prevents high IAQ PPM from triggering a vent demand.	Any
	Enable	High IAQ PPM from an IAQ switch, IAQ sensor, or Linkage IAQ will trigger a vent demand during the occupied period.	Any
IAQ Reset Source	0=None (Default)	IAQ reset is not performed.	Any
	1=IAQ Switch	IAQ reset is performed based on an IAQ switch.	
	2=IAQ PPM Sensor	IAQ reset is performed based on an IAQ sensor.	
	3= Third-Party Reset	IAQ reset is performed based on an third-party hardwired input or network point.	Any
IAQ Override Threshold	0 to 5000 PPM 1200 PPM Default	The IAQ (CO2 PPM) target. Used when ventilation configurator is set to IAQ Mapping or IAQ reset is set to IAQ Sensor.	Any
IAQ Override Deadband	0 to 5000 PPM 200 PPM Default	The amount that the IAQ PPM reading needs to be above or below the IAQ Override Threshold to trigger IAQ reset to start or stop (based on the IAQ Override Config) or the amount that the IAQ PPM reading needs to be above the IAQ Override Threshold to trigger a Vent demand when IAQ Standby Vent Demand is enabled.	Any
IAQ Override Position	–100 to 100% –10% Default	The amount that the OAD position is reset when IAQ reset is active. The value must be negative to decrease the OAD position during IAQ reset (common wen IAQ Override Config is set for Under Threshold) or positive to increase the OAD position during IAQ reset (common when IAQ Override Config is set for Over Threshold).	Any
IAQ Pre-Occ Purge	Disable (Default)	Disables pre-occupancy purge.	Any
	Enable	Pre-occupancy purge is allowed to operate if the unit is unoccupied, the next occupied time is within 1-2 hours, the OAQ is above the IAQ Purge Low Lockout and below the IAQ Purge OAT High Lockout and temperature compensated start is not active.	Any
IAQ Purge OAT Low Lockout	0 to 50°F 45°F Default	Pre-occupancy purge is disabled when the OAT is at or below this temperature.	Any
IAQ Purge OAT High Lockout	85 to 115°F 95°F Default	Pre-occupancy purge is disabled when the OAT is at or above this temperature.	Any
IAQ Purge Low Temp Position	0 to 100% 25% Default	The OAD position used during pre-occupancy purge when the OAT is below the Occupied Heating setpoint - Low Heat On deadband and above the Occupied Cooling setpoint + Low Cool On deadband.	Any
IAQ Purge High Temp Position	0 to 100% 75% Default	The OAD position used during pre-occupancy purge when the OAT is above the Occupied Heating setpoint - Low Heat On deadband and below the Occupied Cooling setpoint + Low Cool On deadband.	Any
IAQ OA CFM Reset	0 to 40000 CFM 500 CFM Default	The amount the OA CFM control point is reduced when IAQ reset is active when the ventilation configuration is set to OA CFM.	Any
Purge Short Duration	0 to 60 min. 20 min. Default	The pre-occupancy purge duration used with the IAQ Purge Hi Temp Pos when the OAT is above the Occupied Heating setpoint - Low Heat On deadband and below the Occupied Cooling setpoint + Low Cool On deadband.	Any
Purge Long Duration	0-60 min. 60 min. Default	The pre-occupancy purge duration used with the IAQ Purge Lo Temp Pos when the OAT is below the Occupied Heating setpoint - Low Heat On deadband and above the Occupied Cooling setpoint + Low Cool On deadband.	Any
OA CFM Setpoint	0-40000 CFM 2000 CFM Default	The OA CFM setpoint used when the ventilation control configuration is set to OA CFM.	Any

STEP I — CONFIGURE THE COOLING SYSTEM

Navigate to the Cooling Configuration screen (***Main Menu*** → ***System Config*** → ***Cooling Config***). Configure the cool/heat demand source based on application requirements. See Fig. 113 for cooling configuration screen layout. When finished, click the save changes button at the bottom of the screen.

The cooling system must be configured based on application requirements using the cooling configuration screen. The cool/heat demand source indicates which inputs the control will monitor to determine if there is a demand for cooling. For units with a heat source, the same demand source is used to determine a heating demand.

The control can be configured to monitor a local or network temperature sensor input, such as space temperature (SPT) or return air temperature (RAT) and will compare the sensor readings to the occupied or unoccupied cooling (and heating) setpoints to establish a cooling (or heating) demand. The control can also be configured to monitor inputs from a thermostat (TSTAT) to interpret a cooling (or heating) demand.

SAV units default to SPT cool/heat demand source and can be field-configured to TSTAT. VAV units default to RAT cool/heat demand.

See Table 36 for cooling configurations by application.

STEP J — CONFIGURE THE DEHUMIDIFICATION SYSTEM (OPTIONAL)

For units with Humidi-MiZer dehumidification, navigate to the Dehumidify Configuration screen ***(Main Menu → System Config → Dehum Config***). Configure the dehumidify demand source based on application requirements. See Fig. 114 for dehumidify configuration screen layout. When finished, click the save changes button at the bottom of the screen.

The dehumidification system must be configured based on application requirements using the dehumidification configuration screen. The dehum demand source indicates which inputs the control will monitor to determine if there is a demand for dehumidification.

For single and multi-zone applications, the control can be configured to monitor the RARH or SPRH sensor and will compare the RH sensor reading to the dehum RH setpoint to determine if there is a dehumidify demand. The control can also be configured to monitor a dehumidify input (HSTAT), from a humidistat or thermostat with dehumidify output, to establish a dehumidify demand.

See Table 37 for dehumidification configurations by application.

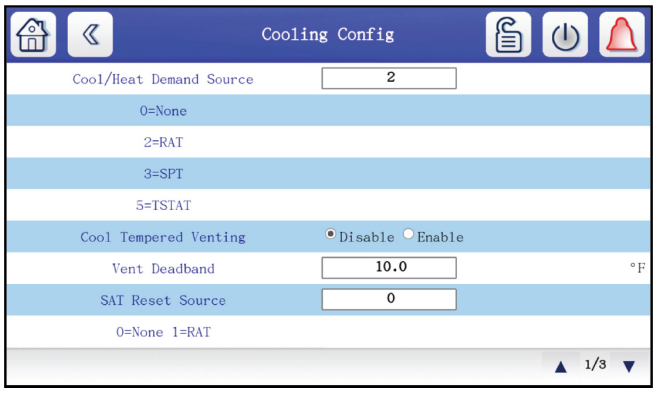


Fig. 113 — Cooling Configuration Screen

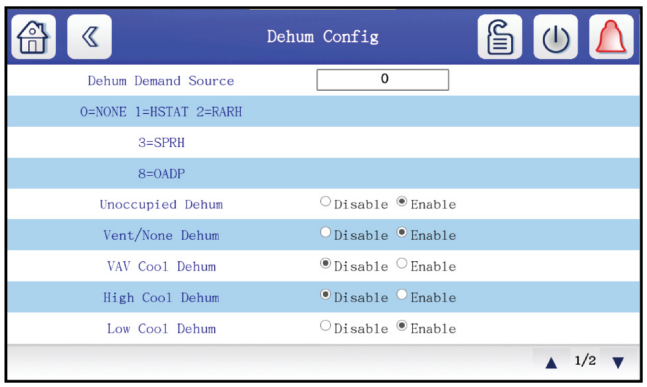


Fig. 114 — Dehumidification Configuration Screen

Table 36 — Cooling Configurations by Application

<table>
<tr><th>CONFIGURATION</th><th>VALUE</th><th>DESCRIPTION</th><th>APPLICATION</th></tr>
<tr><td rowspan="4">Cool/Heat Demand Source</td><td>0 = None (Default)</td><td>Cooling and heating is disabled.</td><td>None</td></tr>
<tr><td>1 = SPT</td><td>The control compares the space temperature sensor (SPT) reading to the occupied/unoccupied cooling (and heating) setpoints to determine if there is a cooling (or heating) demand. Used for single-zone applications. Requires a local SPT sensor or network SPT value.</td><td>Single Zone</td></tr>
<tr><td>2 = RAT</td><td>During the occupied period, the control compares the return air temperature (RAT) reading to the occupied heating setpoint to determine if there is a cool or heat demand. During the unoccupied period, the control compares the RAT to the unoccupied cooling and heating setpoints to determine if there is a cool or heat demand. Commonly used for multi-zone applications.
Requires a local RAT sensor or network RAT value.</td><td>Multi-zone</td></tr>
<tr><td>4 = TSTAT</td><td>The control monitors the thermostatic inputs (Y1, Y2, W1, W2) to determine a cooling (or heating) demand. Used for single-zone space air conditioning applications with 2-stage heat/cool thermostat. Requires a local thermostat or network thermostat values. See below for demand mapping based on input:
<table><tr><th>ACTIVE INPUT</th><th>DEMAND LEVEL</th></tr><tr><td>Y1</td><td>Low Cool</td></tr><tr><td>Y2</td><td>High Cool</td></tr><tr><td>W1</td><td>Low Heat</td></tr><tr><td>W2</td><td>High Heat</td></tr><tr><td>G</td><td>Vent</td></tr></table>NOTE: If Y2 or W2 are active without Y1 or W1 also active, the demand level will be set to high heat or cool, but the control will trigger an alert. If any Y1/2 and W1/2 inputs are active at the same time, the control will trigger and alarm and will disable cooling and heating.</td><td>Single Zone</td></tr>
<tr><td rowspan="2">Cool Tempered Venting</td><td>Enable</td><td>When there is a Vent demand and the MAT is above the vent SAT setpoint by the vent deadband for more than 2 minutes, the system will enable mechanical cooling to temper the MAT to the vent SAT setpoint.</td><td>Any</td></tr>
<tr><td>Disable (Default)</td><td>Cool tempered venting is disabled.</td><td>Any</td></tr>
<tr><td>Vent Deadband</td><td>10 to 20°F,
Default 10°F</td><td>The system compares the MAT to the vent SAT setpoint minus the vent deadband for heat tempered venting or the vent SAT setpoint plus the vent deadband for cool tempered venting.</td><td>Any</td></tr>
<tr><td rowspan="6">SAT Reset Source</td><td>0=None (Default)</td><td>SAT reset is not performed.</td><td>Any</td></tr>
<tr><td>1=RAT</td><td>SAT reset is performed based on RAT. When there is a cooling demand and the RAT is below the Occupied Cooling setpoint, the SAT reset is calculated based on SAT Reset Ratio * (Occupied Cooling setpoint - RAT). NOTE: RAT reset is not available when the demand source is RAT.</td><td>Any</td></tr>
<tr><td>2=SPT</td><td>SAT reset is performed based on SPT. When there is a cooling demand and the SPT is below the Occupied Cooling setpoint, the SAT reset is calculated based on SAT Reset Ratio * (Occupied Colling setpoint - SPT). Requires hardwired SPT sensor or network SPT input. NOTE: SPT reset is not available when the demand source is SPT.</td><td>Any</td></tr>
<tr><td>3=OAT</td><td>SAT reset is performed based on OAT. When there is a cooling demand and the OAT is below the Occupied Cooling setpoint, the SAT reset is calculated based on SAT Reset Ratio * (Occupied Cooling setpoint - OAT).</td><td>Any</td></tr>
<tr><td>4=Analog Input</td><td>SAT reset is calculated linearly based on an analog input. When the input is 4mA, the SAT reset is set to 0°F. When the input is 20mA, the SAT reset is set to the SAT Reset Limit config. Requires the Demand Limiting/SAT reset input to be configured for third-party SAT reset.</td><td>Any</td></tr>
<tr><td>5=Setpoint</td><td>SAT reset is performed based on a The SAT Reset Limit as fixed setpoint. SAT Reset Limit is available as a writable network point.</td><td>Any</td></tr>
<tr><td>SAT Reset Ratio</td><td>1 to 10°F
3°F Default</td><td>The ratio that the SAT is reset for ever 1°F that the SAT reset source is below the Occupied Cooling Setpoint.</td><td>Any</td></tr>
<tr><td>SAT Reset Limit</td><td>1 to 20°F
10°F Default</td><td>The maximum value of SAT Reset that is allowed.</td><td>Any</td></tr>
<tr><td rowspan="2">Cool Comfort Trending</td><td>Enable</td><td>Prevents the system from going directly from a None or Vent demand to a High Cool Demand. The system sets the demand to Low Cool until the Cool Trend Time as expired. Requires the cool/heat demand source to be configured for SPT.</td><td>Single Zone</td></tr>
<tr><td>Disable (Default)</td><td>Cool comfort trending is disabled.</td><td>Any</td></tr>
<tr><td>Cool Trend Time</td><td>1 to 5 min.
5 min. Default</td><td>The amount of time that comfort trending allows to pass before allowing a high cool demand.</td><td>Single Zone</td></tr>
<tr><td>Cool Heat Gap Config.</td><td>2 to 10°F
5°F Default</td><td>The minimum temperature difference between the Occupied Cooling and Occupied Heating setpoints.</td><td>Any</td></tr>
<tr><td>TC Start Cool Factor</td><td>0 to 60 min.
0 min. Default</td><td>When TC Start Cool Factor is set above 0 min., the system calculates an optimal start time prior to occupancy based on the TC Start Cool Factor * (Cool/Heat Demand Source Temp [SPT or RAT] - Occupied Cooling Setpoint). Once the time before occupancy = the calculated optimal start time, temperature compensated start mode is activated and the unit cools the space, while remaining unoccupied.
Requires the Unoccupied IDF configuration to be set for Demand Based.
NOTE: Setting the TC Start Cool Factor to 0 disables the function.</td><td>Any</td></tr>
</table>

Table 37 — Dehumidify Configurations by Application[a]

CONFIGURATION	VALUE	DESCRIPTION	APPLICATION
Dehumidify Demand Source	0 = None (Default)	Dehumidification is not performed.	None
	1 = HSTAT	The unit monitors the dehumidify switch input to determine a dehumidify demand. Used for single-zone A/C applications humidistat or 2-stage cooling/heating thermostat with dehumidification output. Requires the equipment configuration for humidistat to be enabled. See below for demand mapping based on input: **DEHUM SWITCH INPUT STATUS** / **DEHUM DEMAND** Inactive / No Active / Yes	Single Zone
	2 = RARH	The unit compares the return air relative humidity (RARH) sensor reading to the dehumidify relative humidity (dehum RH) setpoint to determine if there is a dehumidify demand. Requires local RARH sensor or network RARH value.	Any
	3 = SPRH	The unit compares the space relative humidity (SPRH) sensor reading to the dehumidify relative humidity (dehum RH) setpoint to determine if there is a dehumidify demand. Requires local SPRH sensor or network SPRH value.	Any
Unoccupied Dehum.	Enable	Dehumidification can occur during the unoccupied period.	Any
	Disable	Dehumidification is prevented the unoccupied period.	Any
Vent/None Dehum.	Enable	A dehumidify demand can exist with a vent or none demand. This configuration is recommended for most applications.	Any
	Disable	A dehumidify demand is prevented with a vent or none demand.	Any
High Cool Dehum.	Enable	A dehumidify demand can exist with a high cool demand.	Any
	Disable	A dehumidify demand is prevented with a high cool demand. This configuration is recommended for applications that prioritize space temperature over dehumidification.	Any
Low Cool Dehum.	Enable	A dehumidify demand can exist with a low cool demand.	Any
	Disable	A dehumidify demand is prevented with a low cool demand.	Any
Low Heat Dehum.	Enable	A dehumidify demand can exist with a low heat demand. This configuration is only recommended for applications that prioritize dehumidification over space temperature.	Any
	Disable	A dehumidify demand is prevented with a low heat demand.	Any
VAV Cool Dehum.	Enable	A dehumidify demand can exist with a VAV cool demand. This configuration is only recommended for applications that prioritize dehumidification over space temperature.	Multi-Zone
	Disable	A dehumidify demand is prevented with a VAV cool demand.	
Occupied Free Dehum	Enable	Allows free cooling to satisfy a Dehumidify demand during the occupied period, when the OAT is below the Dehum CCT setpoint. Requires an economizer with free cooling to be enabled.	Any
	Disable (Default)	Occupied free dehumidification is disabled	Any
Unoccupied Free Dehum	Enable	Allows free cooling to satisfy a Dehumidify demand during the unoccupied period, when the OAT is below the Dehum CCT setpoint. Requires an economizer with free cooling to be enabled.	Any
	Disable (Default)	Unoccupied free dehumidification is disabled	Any

NOTE(S):

a. Dehumidify demand is not allowed with a high heat demand.

STEP K — CONFIGURE THE HEATING SYSTEM

For units with a heat source, navigate to the Heating Configuration screen (***Main Menu → System Config → Heating Config***). The heater configuration screen will only show if the unit is equipped with a heat source. Set the heater configurations based on the application requirements. See Fig. 115 for heater configuration screen layout. When finished, click the save changes button at the bottom of the screen. Heating on/off deadband.

The heater must be configured based on application requirements. Select configurations that govern the heater operation are included in the cooling configuration screen, including the cool/heat demand source and venting deadband. See Table 38 for heater configurations and applications.

STEP L — CONFIGURE EXHAUST FAN (OPTIONAL)

For units with an exhaust fan, navigate to the Exhaust Fan Configuration screen (***Main Menu → System Config → Exhaust Fan Config***). The exhaust fan screen will only show if the exhaust is enabled in the equipment configuration. Configure the exhaust fan control based on application requirements. See Fig. 116 for exhaust fan configuration screen layout. When finished, click the save changes button at the bottom of the screen.

The exhaust configuration governs how the fan operates when it is on and what speeds it operates at. See Table 39 for exhaust fan control configurations and descriptions by application.

STEP M — CONFIGURE FREE COOLING (OPTIONAL)

For units with economizer that require free cooling, navigate to the Free Cooling Configuration screen (***Main Menu → System Config → Free Cooling Config***). Configure the free cooling configuration based on application requirements. See Fig. 117 for free cooling configuration screen layout. When finished, click the save changes button at the bottom of the screen.

Single-zone and multi-zone A/C units with an outdoor air damper can be configured to provide free cooling. When free cooling is enabled, the system will check to see if free cooling or integrated cooling (free cooling + mechanical cooling), prior to starting mechanical cooling mode. Multiple free cooling checks can be enabled and used simultaneously. All enabled free cooling checks must pass to allow free cooling or integrated cooling. See Table 40 for free cooling configurations.

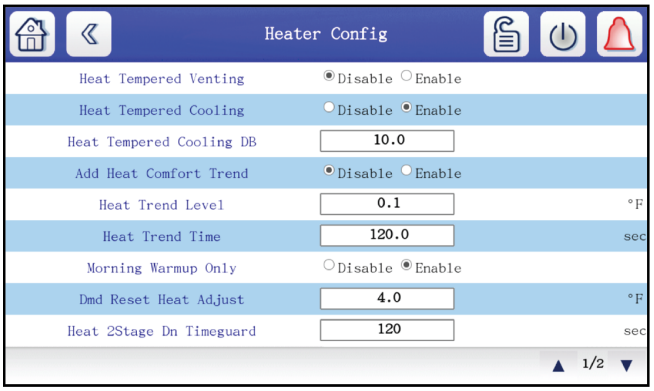


Fig. 115 — Heater Configuration Screen

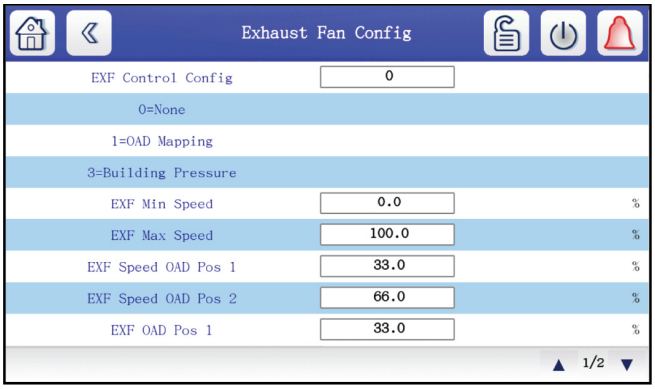


Fig. 116 — Exhaust Fan Configuration Screen

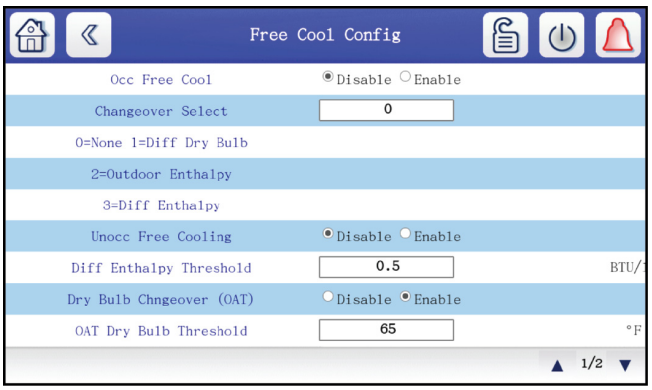


Fig. 117 — Free Cooling Configuration Screen

Table 38 — Heater Configurations by Application

CONFIGURATION	VALUE	DESCRIPTION	APPLICATION
Heat Tempered Venting	Enable	When there is a Vent Demand and the MAT is below the Vent SAT setpoint by the Vent Deadband for more than 2 minutes, the system will enable the modulating or multi-stage heat source to temper the MAT to the Vent SAT setpoint. NOTE: A modulating or multi-stage heat source is required for heat tempered venting.	Any
	Disable	Heat tempered vending is not performed.	Any
Heat Tempered Cooling	Enable	When there is a cooling demand and the MAT is below the SAT control point by the Heat Tempered Cooling DB, heat tempered cooling mode is enabled. The heat source turns on and modulates to maintain the SAT at the SAT control point for a minimum of 5 minutes and until the Cool demand stops or the MAT rises above the SAT control point - 1/2 Heat Tempering DB. NOTE: A modulating or multi-stage heat source is required for heat tempered cooling.	Any
	Disable	Heat tempered cooling is not performed.	Any
Heat Tempering Deadband	5 to 15°F, 10°F Default	Used as part of heat tempered cooling.	Any
Heat Comfort Trending	Enable	Prevents the system from going directly from a None or Vent demand to a High Heat Demand. The system sets the demand to Low Heat until the Heat Trend Time as expired. Requires the cool/heat demand source to be configured for SPT.	Single Zone
	Disable (Default)	Heat comfort trending is disabled	Any
Heat Trend Time	1 to 5 min. 5 min. Default	The amount of time that comfort trending allows to pass before allowing a high cool demand.	Single Zone
Morning Warmup Only	Enable (Default)	Prevents a heating mode from occurring after a cooling mode has occurred, during the occupied period. A heating mode is still allowed after an ventilate or standby mode. NOTE: Requires the cool/heat demand source to be configured for RAT.	Multi-Zone
	Disable	A heating mode is allowed to occur after a cooling mode has occurred during the occupied period.	Any
TC Start Heat Factor	0 to 60 min. 0 min. Default	When TC Start Heat Factor is set above 0 min., the system calculates an optimal start time prior to occupancy based on the TC Start Heat Factor * (Occupied Heating setpoint - Cool/Heat Demand Source Temp [SPT or RAT]). Once the time before occupancy = the calculated optimal start time, temperature compensated start mode is activated and the unit heats the space, while remaining unoccupied. Requires the Unoccupied IDF configuration to be set for Demand Based. NOTE: Setting the TC Start Heat Factor to 0 disables the function.	Any

Table 39 — Exhaust Fan Configurations by Application

<table>
<tr><th>CONFIGURATION</th><th>VALUE</th><th>DESCRIPTION</th><th>APPLICATION</th></tr>
<tr><td rowspan="4">EXF Control Configuration</td><td>0=None</td><td>Default configuration for units without power exhaust. The exhaust fan is disabled.</td><td>All</td></tr>
<tr><td>1=OAD Mapping</td><td>Modulating Centrifugal Power Exhaust (MCPE)
When the OAD is below EXF OAD Pos 1, the EXF is off. When the OAD is at or above EXF OAD Pos 1, the EXF is at EXF SPEED OAD Pos 1. When the OAD is at or above EXF OAD Pos 2, the EXF is at EXF Speed OAD Pos 2. When the OAD is closed, the EXF is off.

<table><tr><th>OAD POSITION</th><th>EXHAUST FAN STAGE</th></tr><tr><td>< EXF OAD Pos 1</td><td>Off</td></tr><tr><td>≥ EXF OAD Pos 1,
< EXF OAD Pos 2</td><td>EXF Speed OAD Pos 1</td></tr><tr><td>≥ EXF OAD Pos 2</td><td>EXF Speed OAD Pos 2</td></tr></table></td><td>Single Zone</td></tr>
<tr><td>3=Building Pressure</td><td>Modulating Centrifugal Power Exhaust (MCPE)
NOTE: Default configuration for units MCPE with building pressure (BP) control. If the building pressure is above the BP setpoint, the EXF turns on and modulates between the minimum and maximum EXF speeds to maintain the building pressure at the BP setpoint. If the building pressure drops below the BP setpoint, the EXF runs at minimum speed (default 0%). When the OAD is closed, the EXF is off. Requires hardwired BP sensor or network BP value.</td><td>All</td></tr>
<tr><td>4=Third-party Input</td><td>Modulating Centrifugal Power Exhaust (MCPE)
The EXF modulates between off or between the minimum and maximum EXF speed based on a third-party signal. When the OAD is closed, the EXF is off. Requires a hardwired third-party input or network third-party EXF speed value.</td><td>All</td></tr>
<tr><td>EXF Min Speed</td><td>0 to 100%
0% Default</td><td>The minimum speed the exhaust fan operates at when enabled.</td><td>Any</td></tr>
<tr><td>EXF Max Speed</td><td>0 to 100%
100% Default</td><td>The maximum speed the exhaust fan operates at when enabled.</td><td>Any</td></tr>
<tr><td>EXF Speed OAD Pos 1</td><td>0 to 100%
33% Default</td><td>The speed that the exhaust fan operates at when the OAD is at or above the EXF OAD Pos 1 configuration. Requires EXF Control to be configured for OAD Mapping and the exhaust fan type to be high capacity PE.</td><td>Single Zone</td></tr>
<tr><td>EXF Speed OAD Pos 2</td><td>0 to 100%
66% Default</td><td>The speed that the exhaust fan operates at when the OAD is at or above the EXF OAD Pos 2 configuration. Requires EXF Control to be configured for OAD Mapping and the exhaust fan type to be high capacity PE.</td><td>Single Zone</td></tr>
<tr><td>EXF OAD Pos 1</td><td>0 to 100%
33% Default</td><td>The position that the OAD must be at or above to trigger EXF Speed OAD Pos 1. Requires EXF Control to be configured for OAD Mapping and the exhaust fan type to be high capacity PE.</td><td>Single Zone</td></tr>
<tr><td>EXF OAD Pos 2</td><td>0 to 100%
66% Default</td><td>The position that the OAD must be at or above to trigger EXF Speed OAD Pos 2. Requires EXF Control to be configured for OAD Mapping and the exhaust fan type to be high capacity PE.</td><td>Single Zone</td></tr>
<tr><td>EXF Smoke Purge Speed</td><td>0 to 100%
0% Default</td><td>The speed that the exhaust fan operates at when smoke purge mode is activated.</td><td>Any</td></tr>
<tr><td>EXF Smoke Evac. Speed</td><td>0 to 100%
0% Default</td><td>The speed that the exhaust fan operates at when smoke evacuation mode is activated.</td><td>Any</td></tr>
</table>

Table 40 — Free Cooling Configurations

CONFIGURATION	VALUE	DESCRIPTION	APPLICATION
Occ. Free Cooling	Enable (Default)	The system is allowed to perform free cooling during the occupied period.	Any
	Disabled	Free cooling is not performed at any time.	Any
Unoccupied Free Cooling	Enable	Free cooling is allowed during the unoccupied period.	Any
	Disable (Default)	Free cooling is not performed during the unoccupied period.	Any
Changeover Select	0 = None (Default)	Changeover check is not used.	Any
	1 = Diff Dry Bulb	The system will check the differential between the OAT and RAT to the differential dry bulb threshold to see if free cooling is allowed.	Dry Climate
	2 = Enthalpy	The system will check the OAE (Outdoor Air Enthalpy) versus the 28 btu/lb limit to see if free cooling is allowed.	Humid Climate
	3 = Diff Enthalpy	The system will check the differential between the OAE and RAE versus the differential enthalpy threshold to see if free cooling is allowed.	Humid Climate
Diff Dry Bulb Threshold	0 to 10°F, Default 5°F	If the changeover select is set to differential dry bulb threshold, free cooling is prevented when the OAT > RAT minus differential dry bulb threshold for 1 minute.	Dry Climate
Diff Enthalpy Threshold	0 to 2 btu/hr., Default 0.2 btu/hr.	If the changeover select is set to differential enthalpy threshold, free cooling is prevented when the OAE > RAE minus differential enthalpy threshold for 1 minute.	Humid Climate
OADP Limit Check	Enable	The system will check the differential between the OAT and RAT to see if free cooling is allowed.	Humid Climates
	Disable (Default)	The control does not check OADP to determine if free cooling is available.	Dry Climates
OADP Threshold	50 to 62°F, Default 55°F	If the OADP limit check is enabled, free cooling is prevented when the OADP is above the OADP threshold for 1 minute.	Humid Climate
OAT Dry Bulb Limit Check	Enable (Default)	The system will check the OAT versus the OAT dry bulb limit to see if free cooling is allowed.	Any
	Disable	The control does not check OAT to determine if free cooling is available.	Any
OAT Dry Bulb Threshold	–40 to 120°F, Default 70°F	If the OAT dry bulb limit check is enabled, free cooling is prevented when the OAT is above the OAT dry bulb threshold for 1 minute.	Any

STEP N — CONFIGURE DEMAND/CAPACITY LIMITING (OPTIONAL)

For applications that require demand or capacity limiting, navigate to the Demand/Capacity Limit screen ***(Main Menu → System Config → Demand/Capacity Limit Config)***. Configure the demand and capacity limiting configurations based on application requirements. When finished, click the save changes button at the bottom of the screen.

Demand and capacity limiting can be used to increase the effective cooling and heating temperatures or restrict the DX circuit and heat source capacity to save energy, limit energy usage, or prevent system operation. See Table 41 for demand and capacity limiting configurations.

STEP O — CONFIGURE ALERTS (OPTIONAL)

To adjust limited for unit alerts and filter change reminders, navigate to the Alert Configuration screen ***(Main Menu → System Config → Alert Config)***. Configure the alerts based on application requirements. When finished, click the save changes button at the bottom of the screen.

Alerts can be used to notify users of abnormalities in the system, such as unexpected temperatures or pressures. An alert can also be configured for filter change reminder. See Table 42 for alert configurations.

Table 41 — Demand/Capacity Limiting Configuration

CONFIGURATION	VALUE	DESCRIPTION	APPLICATION
Demand Switch Enable	Enable	Enables the demand/capacity limit switch inputs.	Any
	Disable (Default)	Disables the demand/capacity limit switch inputs.	Any
Demand Analog Enable	Enable	Enables the demand/capacity limit analog input.	Any
	Disable (Default)	Disables the demand/capacity limit analog input.	Any
Demand Limit Source	0=None (Default)	Demand limiting is not performed.	Any
	1-Setpoint	Demand limiting is performed using the Demand Reset Cool Adjust configuration or network point for cooling and the Demand Reset Cool Adjust configuration or network point for heating.	Any
	2=Analog	Demand limiting is performed based on a hardwired analog input where 4mA/2V = 0°F demand limit and 20mA/10V = 10°F demand limit. Requires the Demand Limit/SAT reset input to be configured for Demand Limit. NOTE: The limiting analog input can only be used for one of demand limiting or capacity limiting.	Any
	3=Switches	Demand limiting is performed based on a hardwired discrete input switches 1 and 2. The effective occupied cooling temperature is reset by the Cool Demand Limit S1 configuration when limit switch 1 is active and by the Cool Demand Limit S2 configuration when limit switch 2 is active. The effective occupied heating temperature is reset by the Heat Demand Limit S1 configuration when limit switch 1 is active and by the Heat Demand Limit S2 configuration when limit switch 2 is active. NOTE: the limit switches can only be used for one of demand limiting or capacity limiting.	Any
Demand Analog Mode	0=Heat and Cool	Demand/capacity analog input applies to heating/heat source and cooling/DX circuit.	Any
	1=Heat Only	Demand/capacity analog input applies to heating/heat source only.	Any
	2-Cool Only	Demand/capacity analog input applies to cooling/DX circuit only.	Any
Capacity Limit Source	0=None (Default)	Capacity limiting is not performed.	Any
	1=Setpoint	Capacity limiting is performed using the Max. Cool and Max. Heat Capacity configuration or network Cool and Heat Capacity points.	Any
	2=Analog	Capacity limiting is performed based on a hardwired analog input where 4mA/2V = 100% capacity allowed, and 20mA/10V = 0% capacity allowed. Requires the Demand Limit/SAT reset input to be configured for Capacity Limit. NOTE: The limiting analog input can only be used for one of demand limiting or capacity limiting.	Any
	3=Switches	Capacity limiting is performed based on a hardwired discrete input switches 1 and 2. The available DX circuit capacity is set to the Cool Capacity Limit S1 configuration when limit switch 1 is active and by the Cool Capacity Limit S2 configuration when limit switch 2 is active. The available heat source capacity is set to the Heat Capacity Limit S1 configuration when limit switch 1 is active and by the Heat Capacity Limit S2 configuration when limit switch 2 is active. NOTE: the limit switches can only be used for one of demand limiting or capacity limiting.	Any
Max. Cool Capacity	0 to100% 100% Default	The maximum allowable capacity of the DX circuit when the Capacity Limit Source configuration is set to Setpoint.	Any
Cool Capacity Limit S1	0 to100% 100% Default	The maximum allowable capacity of the DX circuit when the Capacity Limit Source configuration is set to Switches and switch 1 is active.	Any
Cool Capacity Limit S2	0 to100% 100% Default	The maximum allowable capacity of the DX circuit when the Capacity Limit Source configuration is set to Switches and switch 2 is active	Any
Cool Capacity Limit S1	0 to 10% 4°F Default	The amount that the effective cooling temperature is increased Demand Limit Source configuration is set to Switches and switch 1 is active.	Any
Cool Capacity Limit S2	0 to 10% 6°F Default	The amount that the effective cooling temperature is increased Demand Limit Source configuration is set to Switches and switch 2 is active.	Any
Max. Heat Capacity	0 to100% 100% Default	The maximum allowable capacity of the DX circuit when the Capacity Limit Source configuration is set to Setpoint.	Any
Heat Capacity Limit S1	0 to100% 100% Default	The maximum allowable capacity of the heat source when the Capacity Limit Source configuration is set to Switches and switch 1 is active.	Any
Heat Capacity Limit S2	0 to100% 100% Default	The maximum allowable capacity of the heat source when the Capacity Limit Source configuration is set to Switches and switch 2 is active.	Any
Heat Capacity Limit S1	0 to10% 4°F Default	The amount that the effective heating temperature is increased Demand Limit Source configuration is set to Switches and switch 1 is active.	Any
Heat Capacity Limit S2	0 to10% 6°F Default	The amount that the effective heating temperature is increased Demand Limit Source configuration is set to Switches and switch 2 is active.	Any
Demand Reset Cool Adjust	0 to10% 4°F Default	The amount that the effective cooling temperature is increased Demand Limit Source configuration is set to Setpoint.	Any
Demand Reset Heat Adjust	0 to10% 4°F Default	The amount that the effective heating temperature is increased Demand Limit Source configuration is set to Setpoint.	Any

Table 42 — Alerts Configurations

CONFIGURATION	VALUE	DESCRIPTION	APPLICATION
SAT Low Occ Limit	–40 to 245°F 40°F Default	When the SAT is at or below this temperature during the occupied period, a low SAT alert is triggered.	Any
SAT High Occ Limit	–40 to 245°F 40°F Default	When the SAT is at or above this temperature during the occupied period, a high SAT alert is triggered.	Any
SAT Low Unocc Limit	–40 to 245°F 40°F Default	When the SAT is at or below this temperature during the unoccupied period, a low SAT alert is triggered.	Any
SAT High Unocc Limit	–40 to 245°F 40°F Default	When the SAT is at or above this temperature during the unoccupied period, a high SAT alert is triggered.	Any
RAT Low Occ Limit	–40 to 245°F 40°F Default	When the RAT is at or below this temperature during the occupied period, a low RAT alert is triggered.	Any
RAT High Occ Limit	–40 to 245°F 40°F Default	When the RAT is at or above this temperature during the occupied period, a high RAT alert is triggered.	Any
RAT Low Unocc Limit	–40 to 245°F 40°F Default	When the RAT is at or below this temperature during the unoccupied period, a low RAT alert is triggered.	Any
RAT High Unocc Limit	–40 to 245°F 40°F Default	When the RAT is at or above this temperature during the unoccupied period, a high RAT alert is triggered.	Any
SP Low Limit	0 to 0.5 in. H_2O 0.1 in. H_2O Default	When the SP is at or below this pressure, a low SP alert is triggered.	Any
SP High Limit	1.5 to 2.2 in. H_2O 2.0 in. H_2O Default	When the SP is at or above this pressure, a high SP alert is triggered.	Any
BP Low Limit	–0.5 to 0 in. H_2O –0.1 in. H_2O Default	When the BP is at or below this pressure, a low BP alert is triggered.	Any
BP High Limit	0 to 0.15 in. H_2O 0.1 in. H_2O Default	When the BP is at or above this pressure, a high BP alert is triggered.	Any
SAT Low Limit	–40 to 245°F 45°F Default	When the SAT is at or below this temperature, a SAT low alert is triggered.	Any
SAT High Limit	–40 to 245°F 130°F Default	When the SAT is at or above this temperature, a high SAT alert is triggered.	Any
OAT Low Limit	–40 to 245°F 40°F Default	When the OAT is at or below this temperature, a SAT low alert is triggered.	Any
OAT High Limit	–40 to 245°F 150°F Default	When the OAT is at or above this temperature, a high SAT alert is triggered.	Any
IAQ High Limit	0 to 5000 PPM 1200 PPM Default	When the IAQ PPM is at or above this reading, a high IAQ alert is triggered.	Any
Pre-filter Source	0=None	The system does not alert for dirty filters.	Any
	1=Timer	The system alerts for dirty filters based on change time.	Any
	2=Switch	The system alerts for dirty filters based on a pre-filter status switch. NOTE: Default for units with factory installed pre-filter status switch.	Any
	3=Measuring	The system alerts for dirty filters based on a measured pre-filter pressure drop. NOTE: Default for units with factory installed pre-filter measuring.	Any
Pre-filter Change Time	0 to 8800 Hours 2000 Hours Default	When the pre-filter source is configured for timer, and the filter run time exceeds the pre-filter change time, a dirty filter alert is triggered. NOTE: Setting 0 hours disables the alert.	Any
Pre-filter Press Limit	0.5 to 5 in. H_2O 1.5 in. H_2O Default	When the pre-filter source is configured for measuring, and the filter pressure drop exceeds the pre-filter press limit, a dirty filter alert is triggered. NOTE: Setting 0 hours disables the alert.	Any

STEP P — SET INDOOR FAN SETPOINTS (OPTIONAL)

If the unit is configured for SP IDF control, navigate to the Indoor Fan Setpoint screen (***Main Menu*** → ***Setpoints*** → ***Indoor Fan Setpoints***). Adjust the fan setpoints as needed based on application requirements. See Fig. 118 for indoor fan setpoint screen layout. When finished, click the save changes button at the bottom of the screen.

For units configured for supply pressure (SP) control (IDF Control = 3), the supply pressure or zone pressure setpoints can be adjusted on the Indoor Fan Setpoint screen. For all other indoor fan control configurations, the indoor fan setpoints do not need to be adjusted. See Table 43 for indoor fan setpoints.

STEP Q — SET COOLING SETPOINTS

Navigate to the Cooling Setpoints screen (***Main Menu*** → ***Setpoints*** → ***Cooling Setpoints***). Adjust the cooling setpoints as needed based on application requirements. See Fig. 119 for cooling setpoint screen layout. When finished, click the save changes button at the bottom of the screen.

The occupied and unoccupied cooling setpoints, setpoint deadbands, and the cooling supply air temperature (SAT) setpoints can be adjusted on the cooling setpoint screen. See Table 44 for setpoint information and descriptions by application type.

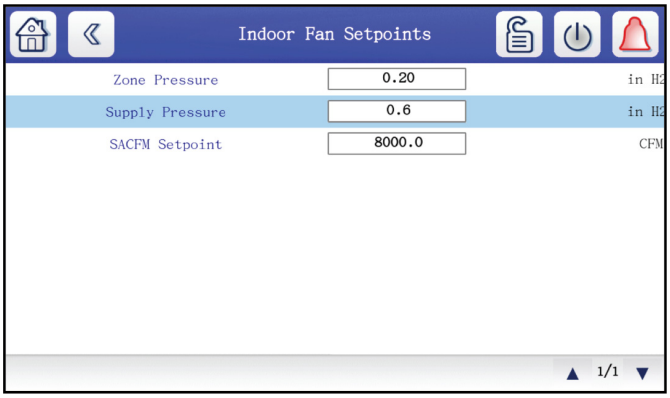


Fig. 118 — Indoor Fan Setpoints Screen

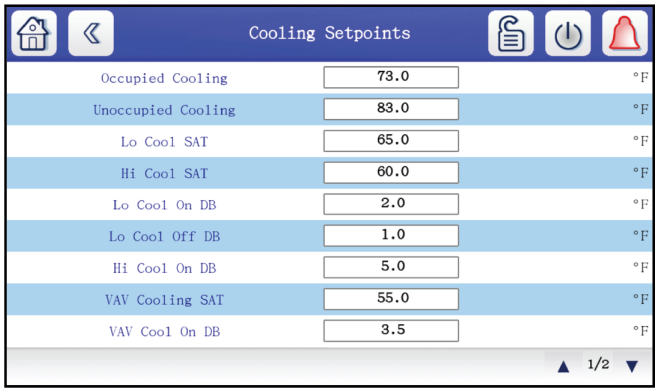


Fig. 119 — Cooling Setpoints Screen

Table 43 — Indoor Fan Setpoints

SETPOINT	RANGE	IDF CONTROL CONFIG.	DESCRIPTION
Supply Pressure	0 to 3 in., Default 1 in.	Supply Pressure Control (SP)	The indoor fan will modulate to maintain the supply pressure at the supply pressure setpoint. Requires local SP sensor or network SP value.

Table 44 — Cooling Setpoints

SETPOINT	RANGE	COOL/HEAT DEMAND SOURCE CONFIG.	DESCRIPTION
Occupied Cooling	55 to 80°F, Default 72°F	SPT	In the occupied period, the system compares the demand source temperature to the occupied cooling setpoint and setpoint deadbands to determine cooling demands. For RAT demand source, the system uses the occupied heating setpoint during the occupied period to determine a cooling demand.
Unoccupied Cooling	55 to 110°F, Default 85°F	SPT or RAT	In the unoccupied period, the system compares the demand source temperature to the unoccupied cooling setpoint and setpoint deadbands to determine cooling demands.
Low Cool SAT	55 to 75°F, Default 65°F	SPT, TSTAT, and unoccupied RAT	The effective SAT setpoint with a low cool demand.
High Cool SAT	45 to 75°F, Default 55°F	SPT, TSTAT, or RAT (unoccupied only)	The effective SAT setpoint with a high cool demand.
VAV Cool SAT	45 to 75°F, Default 55°F	RAT	The effective SAT setpoint with a VAV cool demand.
Vent SAT	55 to 85°F, Default 70°F	All	The effective SAT setpoint with a vent demand.
Low Cool On DB	0 to 2°F, Default 1°F	SPT or unoccupied RAT	The amount that the demand source temperature needs to be above the effective cooling setpoint to initiate a low cool demand.
Low Cool Off DB	0.5 to 2°F, Default 1°F	SPT or unoccupied RAT	The amount that the demand source temperature needs to be below the effective cooling setpoint to stop a low cool demand.
High Cool On DB	0.5 to 20°F, Default 2°F	SPT or unoccupied RAT	The amount that the demand source temperature needs to be above a low cool demand to initiate a high cool demand.
VAV Cool On DB	0 to 25ºF, Default 3ºF	RAT (occupied only)	The amount that the demand source temperature needs to be above the effective heating setpoint minus the low heat on deadband plus the high heat on deadband to initiate a VAV cool demand.
VAV Cool Off DB	1 to 25ºF, Default 2ºF	RAT (occupied only)	The amount that the demand source temperature needs to be below the effective heating setpoint minus the low heat on deadband, plus the high heat on deadband, plus the VAV cool on deadband initiate a VAV cool demand.

STEP R — SET DEHUMIDIFY SETPOINTS (OPTIONAL)

For units with Humidi-MiZer dehumidification, navigate to the Dehumidify Setpoints screen (***Main Menu*** → ***Setpoints*** → ***Dehum Setpoints***). Adjust the dehumidify setpoints based on application requirements. See Fig. 120 for dehumidify setpoint screen layout. When finished, click the save changes button at the bottom of the screen.

The dehumidify RH and DP setpoints can be adjusted on the Dehumidify Setpoint screen. See Table 45 for setpoint information and descriptions.

STEP S — SET HEATING SETPOINTS

For units with heat, navigate to the Heating Setpoint screen (***Main Menu*** → ***Setpoints*** → ***Heating Setpoints***). The heating setpoints screen will only show if the unit is equipped with a heat source. Adjust the heating setpoints based on application requirements. See Fig. 121 for heating setpoint screen layout When finished, click the save changes button at the bottom of the screen.

The occupied or unoccupied heating setpoints and the heating supply air temperature (SAT) setpoints can be adjusted from the heating setpoint screen. See Table 46 for setpoint information and descriptions.

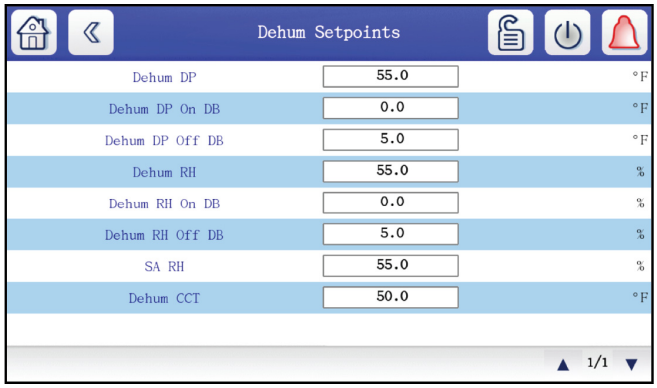


Fig. 120 — Dehumidify Setpoints Screen

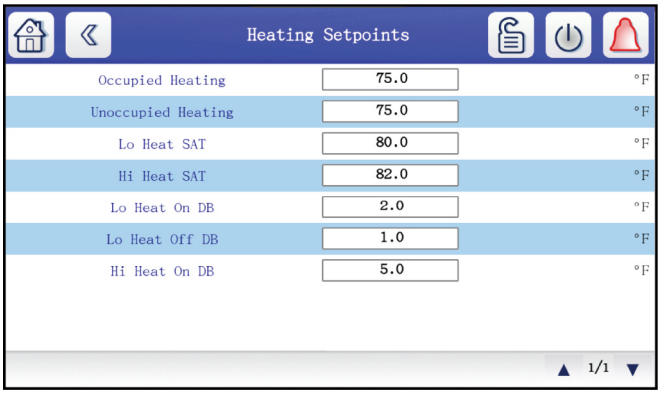


Fig. 121 — Heating Setpoints Screen

Table 45 — Dehumidify Setpoints

SETPOINT	RANGE	DEHUM DEMAND SOURCE CONFIG.	DESCRIPTION
Dehum. RH	40 to 100%, Default 60%	SPRH or RARH	The system compares the RH to the dehum. RH setpoint and the dehum. RH on deadband to establish a dehum. demand.
Dehum. RH On DB	0 to 20%, Default 5%	SPRH or RARH	The system compares the RH to the dehum. RH setpoint and the dehum. RH on deadband to establish a dehum. demand.
Dehum. RH Off DB	1 to 20%, Default 5%	SPRH or RARH	The system compares the RH to the dehum. RH setpoint and the dehum. RH off deadband to stop a dehum. demand.
Dehum. CCT	40 to 60°F, Default 55°F	All	The cooling coil temperature that the system will try to maintain during dehumidification mode.

Table 46 — Heating Setpoints

SETPOINT	RANGE	COOL/HEAT DEMAND SOURCE CONFIG.	DESCRIPTION
Occupied Heating	55 to 80°F, Default 68°F	SPT or RAT	The system compares the demand source temperature to the occupied heating setpoint to determine an occupied heating demand. If the demand source is set to RAT, the unit also uses the occupied heating setpoint to determine if there is a VAV cooling demand during the occupied period. See Fig. 120 for occupied RAT demand processing.
Unoccupied Heating	40 to 80°F, Default 60°F	SPT or RAT	The system compares the SPT to the occupied heating setpoint to determine an unoccupied heating demand. Only used if unoccupied indoor fan is configured for demand.
Low Heat SAT	60 to 115°F, Default 75°F	All	The effective SAT setpoint with a low heat demand.
High Heat SAT	60 to 125°F, Default 85°F	All	The effective SAT setpoint with a high heat demand.
Low Heat On DB	0 to 2°F, Default 1°F	SPT or RAT	The amount that the demand source temperature needs to be below the effective heating setpoint to initiate a low heat demand. Also used as part of VAV cooling determination during the occupied period with RAT demand source.
Low Heat Off DB	0.5 to 2°F, Default 1°F	SPT or RAT	The amount that the demand source temperature needs to be above the effective heating setpoint to stop a low heat demand. Also used as part of VAV cooling determination during the occupied period with RAT demand source.
High Heat On DB	0.5 to 20°F, Default 2°F	SPT or RAT	The amount that the demand source temperature needs to be below a low heat demand to initiate a high heat demand.

STEP T — SET EXHAUST FAN SETPOINTS (OPTIONAL)

For units with exhaust fans configured for building pressure control, navigate to the exhaust fan setpoint screen (***Main Menu*** → ***Setpoints*** → ***Indoor Fan Setpoints***). The Exhaust Fan Setpoints screen will only show when the exhaust fan is enabled. See Fig. 122 for exhaust fan setpoint screen layout. Adjust the building pressure setpoint as needed based on application requirements. When finished, click the save changes button at the bottom of the screen.

For units with exhaust fan configured for building pressure (BP) control, the building setpoint is adjusted on the Exhaust Fan Setpoint screen. See Table 47 for setpoint information and descriptions.

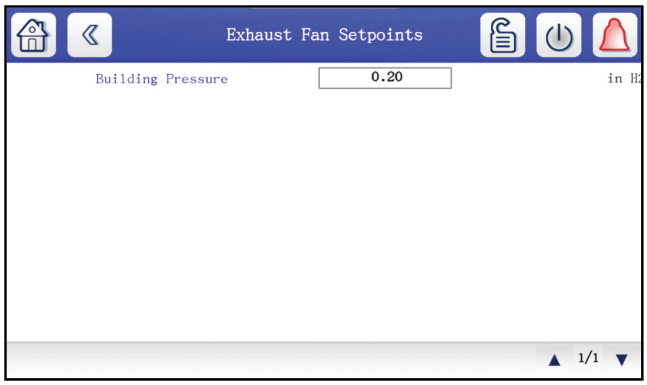


Fig. 122 — Exhaust Fan Setpoints Screen

STEP U — SET UP OCCUPANCY CONTROL

Set up the occupancy switch, unit schedule, or BAS occupancy point to determine when the unit is in the occupied or unoccupied period. See below for guidance on setting up the local schedule or occupancy switch. See the Advanced Controls, Operation, and Troubleshooting guide for direction on setting up BAS occupancy and communication.

Local Schedule

Navigate to the Local Schedule screen ***(Main Menu*** → ***Schedules*** → ***Local Schedules).*** Local schedules are often used for standalone applications. The default schedule 1 is set for 24/7 occupied. Adjust the local schedule as needed based on application requirements. When finished, click the home button to exit to the home screen. When finished, click the save changes button at the bottom of the screen.

Up to 8 different local schedules can be configured. To configure a schedule, use the page/up down arrows to change schedule number. Select which days the schedule is active by activating the check box below the day of the week. Enter the occupancy start time next to "occupied from". Enter the occupied stop time next to "to". NOTE: Time is in 24-hour (military) time.

In the example in Fig. 123, the schedule is active for Monday through Friday. The unit will be in the occupied period from 4AM (4:00) to 6 PM (18:00).

Fig. 123 — Local Schedule Screen

Occupancy Switch

Navigate to the Equipment Configuration screen. (***Main Menu*** → ***System Config*** → ***Equipment Config***). Configure the remote switch for remote occupancy. When finished, click the save changes button at the bottom of the screen.

When the remote switch is configured for occupancy, the system will monitor inputs 3 and 4 on TB3. Refer to Fig. 41-42 for TB3 wiring details. When the inputs show open, the unit is unoccupied. When the input show closed (short), the unit is occupied. See Table 48 for remote switch configuration details.

Table 47 — Exhaust Fan Setpoints

SETPOINT	RANGE	DEFAULT	DEMAND SOURCE	DESCRIPTION	APPLICATION
Building Pressure	–0.25 in. to 0.25 in.	0.03 in.	Building Pressure Control (BP)	The unit compares the building pressure reading to the building pressure setpoint for exhaust fan speed modulation.	All

Table 48 — Remote Switch Configuration

CONFIGURATION	RANGE	DESCRIPTION	APPLICATION
Remote Switch	2 = Remote Occupancy	The system will monitor the local remote switch input to determine occupancy status.	All

OPERATION

Prior to enabling full unit operation, Carrier recommends performing an air balance, completing the pre-start-up checklist, startup-checklist, and the start-up log. See CL-1 for detailed information.

Temporary Operation for an Under-Construction Building

This product is not designed to operate in a construction environment. Extensive equipment damage can be caused by operating this equipment while construction, renovation, or remodeling is occurring in the space or near the equipment. Carrier recommends using equipment designed for specific construction duty or specialized application duty based on the construction or application need.

Temporary Operation During Building Finishing

The unit heat source may be used for temporary operation during the finishing stages of construction. See Temporary Furnace Operation During Constructionon page CL-9 for checklist.

Temporary Operation with a Generator

Due to the sensitive nature of the electronic devices uses on packaged HVAC systems, Carrier does not recommend powering the unit with a generator for extended periods. Generator power should only be used for temporary, emergency operation.

Temporary Operation for a Completed Building

Carrier does not recommend operating the supply fan, cooling, dehumidification, or heating systems of this equipment prior to equipment start-up and air balancing being performed. Operating the equipment prior to start-up can cause damage to the equipment. Damages caused by improper operation is not covered under Carrier's standard or extended warranties.

If temporary operation of equipment is required, Carrier recommends performing a start-up on the equipment system that requires temporary operation, such as heating or cooling. Performing a start-up on the system will help ensure proper operation. Consider the following if operating the unit before the system is full commissioned:

1. Ensure all duct systems are connected and complete.
2. Ensure all air terminal units (VAV or VVT boxes) and fire dampers are fully open.
3. Verify sufficient power and gas service.
4. Verify the minimum cooling and heating airflows are achieved during operation. Refer to the unit product data and fan tables for fan speeds by unit size and type.
5. Verify the fan max. static pressure is not exceeding during operation. Refer to the unit product data and fan tables.
6. If the appropriate sensors have not been installed for normal operation, consider unit control using a field provided and installed thermostat or using the factory installed RAT sensor.
   a. Setup the cool/heat demand source for TSTAT or RAT. See "STEP I — CONFIGURE THE COOLING SYSTEM" on page 76 of the Control Quick Setup Section on page 66.
   b. For intermittent supply fan and no ventilation (outdoor air), leave the unit in the unoccupied period and configure the unoccupied IDF to demand. See "STEP G — CONFIGURE INDOOR FAN" on page 70 of the Control Quick Setup Section on page 66.
   c. For constant supply fan and ventilation (outdoor air), configure a unit schedule and configure the occupied IDF for continuous. See "STEP G — CONFIGURE INDOOR FAN" on page 70 of the Control Quick Setup Section on page 66.
   d. If cooling or heating are not required during temporary operation, lockout the operation using capacity limiting.
   a. Login with the user access level (1111).
   b. Navigate to the Demand/Capacity Limit screen ***(Main Menu → System Config → Demand/Capacity Limit)***
   c. Set the Capacity Limit Source to 1 (Setpoint).
   d. Set the Max. Cool Capacity to 0 to lock out cooling or set the Max. Heat Capacity to 0 to lock out heating.
7. If the unit will be operating for extended periods, maintenance must be performed on the equipment to ensure proper operation. Damage or failures that can be attributed to improper maintenance or lack of maintenance is not covered under warranty.
8. The equipment warranty starts at the first period of unit operation, which includes temporary operation.

Normal Operation

To enable full unit operation:

1. Login using the user access password (1111).
2. Navigate to Start/Stop screen (⏻).
3. Press Enable Unit to enable unit operation.
4. Set the Auto Restart configuration to On to automatically enable unit upon the next power on, or to Off to automatically disable unit upon next power on.

SEQUENCE OF OPERATION

48WE Series units can provide cooling, heating, optional dehumidification, optional ventilation, and optional building pressure control for single-zone and multi-zone applications. The sequence of operation will depend on the operating period (occupied or unoccupied), the unit configuration, and the control configurations.

The system provides supply air temperature (SAT) based cooling and heating operation. For systems without a SAT sensor, the direct expansion leaving air temperature (DX-LAT) sensor is used instead. The unit monitors the control inputs and compares space conditions to user adjustable setpoints to determine if there is a demand for cooling or heating. Once a demand for cooling or heating is established, the control sets an effective supply air temperature control point based on the active demand level and user adjustable setpoints. Based on the current operating conditions, the control will enable a cooling or heating mode to achieve the supply air temperature control point.

For units with two-stage heating, operation is based directly on the demand level. The unit monitors the control inputs and compares space conditions to user adjustable setpoints to determine if there is a demand for heating. Once a demand for heating is established, the control select the heating stage based on the demand level.

For units with Humidi-MiZer dehumidification, operation is based on cooling coil leaving air temperature (CCT). The unit monitors the control inputs and compares space conditions to user adjustable setpoints to determine if there is a demand for dehumidification. Once a demand for dehumidification is established, the control sets an effective cooling coil temperature control point based on a user adjustable setpoint. Based on the current operating conditions, the control will enable cooling to achieve the cooling coil temperature control point. The Humidi-MiZer bypass valve is then modulated based on the active cooling or heating demand to maintain the supply air temperature at the supply air temperature control point.

Refer to the following for unit sequence of operation by period and configuration.

Cool/Heat Demand Sources

RETURN AIR TEMPERATURE (RAT)

The control monitors the RAT and compares the reading to the occupied heating and unoccupied cooling and heating setpoints to determine if there is a VAV Cool (occupied only), Low Cool (unoccupied only), High Cool (unoccupied only), Low Heat, or High Head demand. Deadbands are used to adjust when the demand starts and stops versus the cooling and heating setpoints. During the occupied period, if there is not a cool or heat demand and the IDF is on, the demand is set to Vent. If the IDF is off during the unoccupied period, the demand is set to None. RAT is recommended for multi-zone VAV applications. Can also be used for single zone applications (except single-zone VAV indoor fan control, which requires SPT)).

See Table 49 for available demands for the RAT cool/heat demand source, the start and stop conditions for each demand, and the applicable supply air temperature setpoint. See Fig. 124 and 125 for RAT demand processing.

SPACE TEMPERATURE (SPT)

The control monitors the SPT and compares the reading to the occupied and unoccupied cooling and heating setpoints to determine if there is a Low Cool, High Cool, Low Heat, or High Heat demand. Deadbands are used to adjust when the demand starts and stops versus the cooling and heating setpoints. During the occupied or unoccupied period, if there is not a cool or heat demand and the IDF is on, the demand is set to Vent. If the IDF is off during the occupied or unoccupied period, the demand is set to None. SPT is recommended for single-zone applications with a space temperature sensor. SPT is required for single-zone VAV.

See Table 50 for available demands for the SPT cool/heat demand source. See Fig. 126 for SPT demand processing.

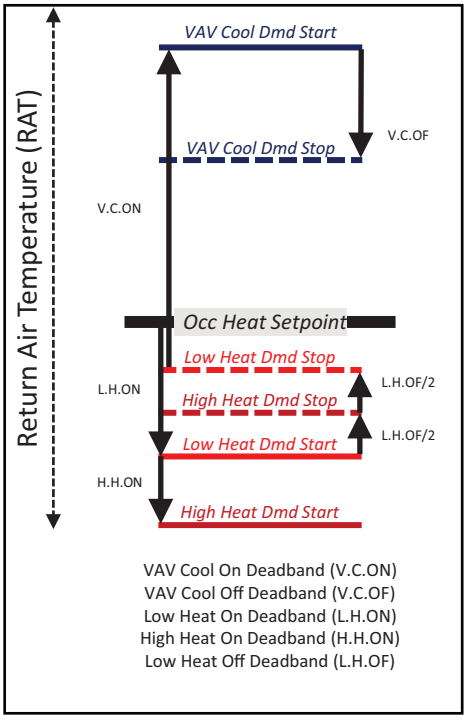


Fig. 124 — Occupied RAT Demand Processing

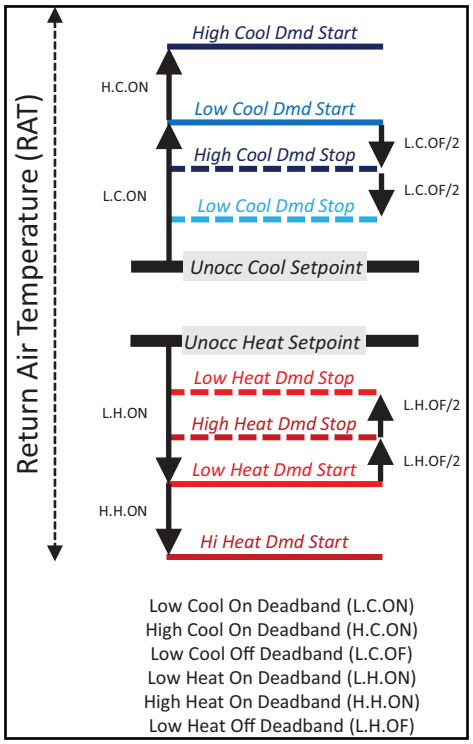


Fig. 125 — Unoccupied RAT Demand Processing

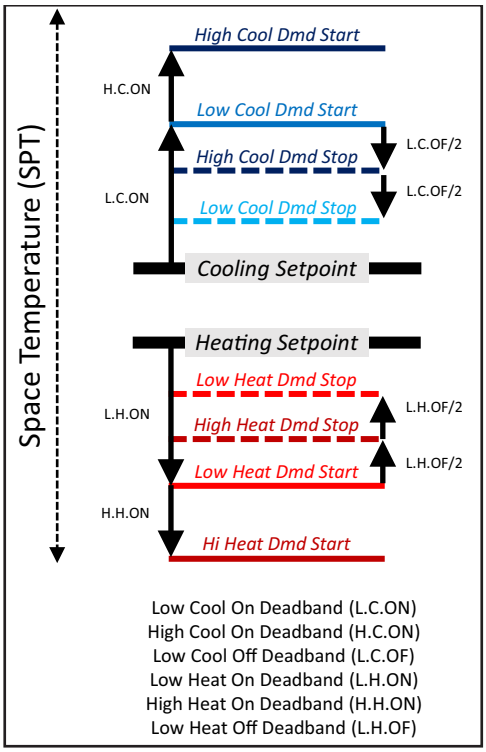


Fig. 126 — SPT Demand Processing

THERMOSTAT (TSAT)

The control monitors the local or network thermostat inputs (Y1, Y2, W1, W2) to determine if there is a Low Cool, High Cool, Low Heat, or High Heat demand. During the occupied period, if there is not a cool or heat demand and the IDF is on, the demand is set to Vent. If the IDF is off during the occupied or unoccupied period, the demand is set to None. TSTAT is recommended for single-zone applications with a thermostat or for third-party control of unit cooling and heating.

See Table 51 for available demands for the RAT cool/heat demand source.

Table 49 — RAT Demand Levels

DEMAND	START CONDITION	STOP CONDITION
None	Unoccupied only. There is no cool or heat demand.	Vent, VAV Cool, Low Cool, or Low Heat demand starts.
Vent	Occupied only. RAT is below the Occupied Heating setpoint, minus the Low Heat On deadband, plus the Low Heat Off deadband, plus the VAV Cool On deadband and above the Occupied Heating setpoint minus the Low Heat On deadband.	VAV Cool or Low Heat demand starts.
VAV Cool	Occupied only. RAT rises above the Occupied Heating setpoint, minus the Low Heat On deadband, plus the Low Heat Off deadband, plus the VAV Cool On deadband.	RAT drops below the Occupied or Unoccupied Heating setpoint, minus the Low Heat On deadband, plus the Low Heat Off deadband, plus the VAV Cool On deadband, minus the VAV Cool Off deadband.
Low Cool	Unoccupied only. RAT rises above the Unoccupied Cooling setpoint plus the Low Cool On deadband.	RAT drops below the Unoccupied Cooling setpoint plus the Low Cool On deadband minus the Low Cool Off deadband or a High Cool demand starts.
High Cool	Unoccupied only. RAT rises above the Unoccupied Cooling setpoint plus the Low Cool On deadband plus the High Cool On deadband.	RAT drops below the Unoccupied Cooling setpoint plus the Low Cool On deadband plus the High Cool On deadband minus the 1/2 Low Cool Off deadband.
Low Heat	RAT drops below the Occupied or Unoccupied Heating setpoint minus the Low Heat On deadband.	RAT rises above the Occupied or Unoccupied Heating setpoint minus the Low Heat On deadband plus the Low Heat Off deadband or High Heat demand starts.
High Heat	RAT drops below the Unoccupied Heating setpoint minus the Low Heat On deadband minus the High Heat On deadband.	RAT rises above the Occupied Heating setpoint minus the Low Heat On deadband minus the High Heat On deadband plus the 1/2 Low Heat Off deadband.

Table 50 — SPT Demand Levels

DEMAND	START CONDITION	STOP CONDITION
	OCCUPIED PERIOD	
None	There is no cool or heat demand.	A Vent, Low Cool, or Low Heat demand starts.
Vent	SPT is below the Occupied or Unoccupied Cooling setpoint plus the Low Cool On deadband, and above the Occupied or Unoccupied Heating setpoint minus the Low Heat On deadband.	Low Cool or Low Heat demand starts.
Low Cool	SPT rises above the Occupied or Unoccupied Cooling setpoint plus the Low Cool On deadband.	SPT drops below the Occupied or Unoccupied Cooling setpoint plus the Low Cool On deadband minus the Low Cool Off deadband or a High Cool demand starts.
High Cool	SPT rises above the Occupied or Unoccupied Cooling setpoint plus the Low Cool On deadband plus the High Cool On deadband.	SPT drops below the Occupied or Unoccupied Cooling setpoint plus the Low Cool On deadband plus the High Cool On deadband minus the 1/2 Low Cool Off deadband.
Low Heat	SPT drops below the Occupied or Unoccupied Heating setpoint minus the Low Heat On deadband.	SPT rises above the Occupied or Unoccupied Heating setpoint minus the Low Heat On deadband plus the Low Heat Off deadband or High Heat demand starts.
High Heat	SPT drops below the Unoccupied Heating setpoint minus the Low Heat On deadband minus the High Heat On deadband.	SPT rises above the Occupied Heating setpoint minus the Low Heat On deadband minus the High Heat On deadband plus the 1/2 Low Heat Off deadband.

Table 51 — TSAT Demand Levels

DEMAND	START CONDITION	STOP CONDITION
None	No thermostat inputs are active and the indoor fan is configured for demand during the occupied or unoccupied period or the indoor fan is configured for disabled during the occupied period.	Y1, Y2, W1, or W2 input becomes active.
Vent	The G input is active or the system is occupied and the unit is configured for continuous indoor fan during the occupied period.	Y1, Y2, W1, or W2 input become active.
Low Cool	Y1 input is active.	Y1 input deactivates.
High Cool	Y1 and Y2 inputs are active.	Y2 input deactivates.
Low Heat	W1 input is active.	W1 input deactivates.
High Heat	W1 and W2 inputs are active.	W2 input deactivates.

Dehumidify Demand Sources

RETURN AIR RELATIVE HUMIDITY (RARH)

The control monitors RARH and compares it to the dehumidify relative humidity setpoint to determine if there is a dehumidify demand. Deadbands are used to adjust when the demand starts and stops compared to the dehumidify setpoint. RARH is recommended for single or multi-zone applications. See Table 52 for RARH demand levels and Fig. 127 for RARH demand determination

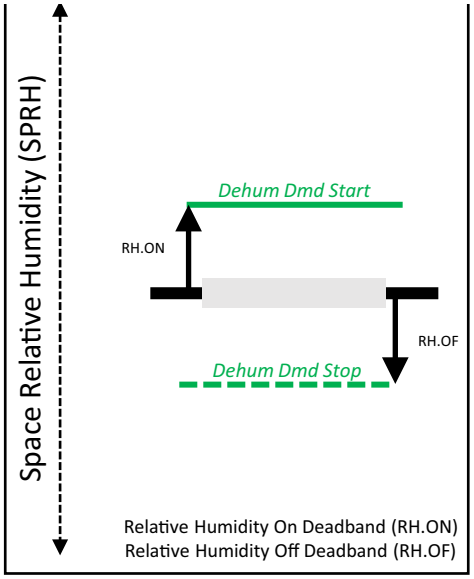


Fig. 127 — RARH Demand Processing

SPACE RELATIVE HUMIDITY (SPRH)

The control monitors SPRH and compares it to the dehumidify relative humidity setpoint to determine if there is a dehumidify demand. Deadbands are used to adjust when the demand starts and stops compared to the dehumidify setpoint. SPRH is recommended for single-zone applications. See Table 52 for SPRH demand levels and Fig. 128 for SPRH demand determination.

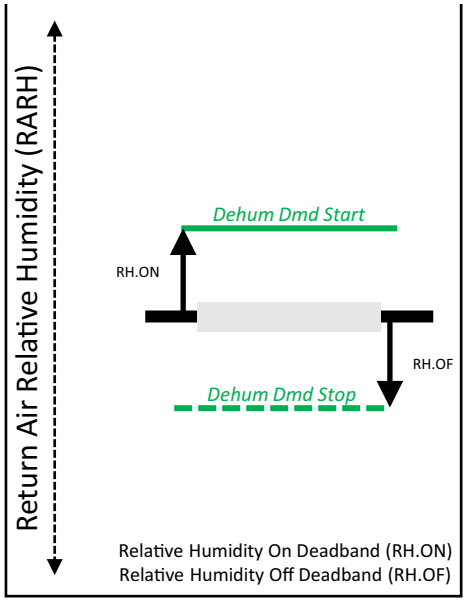


Fig. 128 — SPRH Demand Processing

HUMIDISTAT (HSTAT)

The control monitors the dehumidify input to determine if there is a dehumidify demand. A dehumidify demand can co-exist with a cool demand or a vent demand. A Dehumidify demand can co-exist with a VAV Cool, Low Cool, High Cool, Vent, or Low Heat demand. Recommended for single-zone applications or third-party control of unit dehumidification. See Table 53 for available demands for HSTAT demand source.

Indoor Fan

CONSTANT VOLUME (CV)

Constant volume indoor fan is recommended for sound sensitive or process applications, where allowed by code. See Table 54 for sequence of operation.

Table 52 — RARH and SPRH Demand Levels[a]

DEMAND	START CONDITION	STOP CONDITION
Vent/Dehum.	There is a Vent or None demand, and the RH rises above the Dehumidify RH setpoint by the Dehumidify RH deadband.	The RH drops below the Dehumidify RH setpoint minus the Dehumidify Off deadband or a VAV Cool, Low Cool, or Low Heat demand starts.
Low Cool/Dehum.	There is a Low Cool demand, and the RH rises above the Dehumidify RH setpoint by the Dehumidify RH deadband.	The RH drops below the Dehumidify RH setpoint minus the Dehumidify Off deadband or High Cool demand starts, or Low Cool demand stops.
High Cool/Dehum.	There is a High Cool demand, and the RH rises above the Dehumidify RH setpoint by the Dehumidify RH deadband.	The RH drops below the Dehumidify RH setpoint minus the Dehumidify Off deadband or High Cool demand stops.
VAV Cool/Dehum.	There is a VAV Cool demand, and the RH rises above the Dehumidify RH setpoint by the Dehumidify RH deadband.	The RH drops below the Dehumidify RH setpoint minus the Dehumidify Off deadband or VAV Cool demand stops.
Low Heat/Dehum.	There is a Low Heat demand, and the RH rises above the Dehumidify RH setpoint by the Dehumidify RH deadband.	The RH drops below the Dehumidify RH setpoint minus the Dehumidify Off deadband or Low Heat demand stops, or High Heat demand starts.

NOTE(S):

a. A dehumidification demand is prevented with a high heat demand.

Table 53 — HSTAT Demand Levels[a]

DEMAND	START CONDITION	STOP CONDITION
Vent/Dehum.	H input is active.	Y1 or W1 input activates **OR** H input deactivates.
Low Cool/Dehum.	Y1 and H inputs active.	Y2 input activates, **OR** Y1 or H input deactivates.
High Cool/Dehum.	Y1, Y2, and H inputs are active.	Y2 or H inputs deactivate.
Low Heat/Dehum.	W1 and H inputs active.	W1 input activates or H input deactivates **OR** W2 input activates.

NOTE(S):

a. A dehumidification demand is prevented with a high heat demand.

Table 54 — CV Indoor Fan Sequence of Operation

CCUPANCY	IDF CONFIG.	DEMAND	OPERATION
Occupied	Continuous Occupied IDF	Vent, Cool, or Dehum.	The IDF operates at the High Cool IDF speed.
		Heat	The IDF operates at the High Heat IDF speed.
	Occ IDF Intermittent	None	The IDF is off.
		Vent, Cool, or Dehum.	The IDF operates at the High Cool IDF speed.
		Heat	The IDF operates at the High Heat IDF speed.
Unoccupied	Disabled Unoccupied IDF	All	The IDF is off.
	Intermittent Unoccupied IDF[a]	None	
		Vent, Cool, or Dehum.	The IDF operates at the High Cool IDF speed.
		Heat	The IDF operates at the High Heat IDF speed.

NOTE(S):

a. For units configured for unoccupied RAT cool/heat demand, the indoor fan is turned on for 10 minutes to recirculate air though the space, once an unoccupied demand is initiated. If the demand persists after 10 minutes, a mode is selected to satisfy the demand. If the demand does not persist after 10 minutes, the indoor fan shuts off.

STAGED AIR VOLUME (SAV) CAPACITY

Staged air volume capacity indoor fan is recommended for single-zone applications with low sensible heat ratio. This is the default setting for units ordered as SAV. See Table 55 for sequence of operation.

SUPPLY PRESSURE CONTROL (SP)

Supply pressure indoor fan control is recommended for multi-zone applications with air terminal units. SP control can also be used for true constant volume operation to account for filter loading. This is the default setting for units ordered as VAV. See Table 56 for sequence of operation.

MULTIZONE VAV (MS-VAV)

For multizone variable air volume applications with air terminal units, the rooftop unit will operate in "standalone mode" and determine load and fan requirements via installed sensors. Direct communication with air terminal boxes through Linkage or BACnet is not available at this time.

THIRD-PARTY INPUT CONTROL (THIRD-PARTY)

Third-party input control allows a third-party system to enable and disable the indoor fan and modulate the fan speed under most conditions. The G fan input is used to command the IDF on and off. The third-party IDF input is used for the fan speed control. See Table 57 for sequence of operation.

SINGLE ZONE VAV (SZ-VAV)

Single-zone variable air volume is recommended for single-zone applications with high sensible loads or that are sound sensitive to fan staging. See Table 58 for sequence of operation.

Table 55 — SAV Demand Indoor Fan Sequence of Operation

OCCUPANCY	IDF CONFIG.	DEMAND	CONDITION	OPERATION
Occupied	Continuous Occupied IDF	Vent	All	The IDF operates at the Min IDF Speed.
		Low Cool, High Cool, VAV Cool	Min. Cool Capacity	The IDF operates at the Min IDF Speed.
			Low Cool Capacity	The IDF operates at the Low Cool IDF Speed.
			Med. Cool Capacity	The IDF operates at the Med Cool IDF Speed.
			High Cool Capacity	The IDF operates at the High Cool IDF Speed.
		Low Cool	Free Cooling	The IDF operates at the Low Cool IDF Speed.
		High Cool, VAV Cool	Free Cooling	The IDF operates at the High Cool IDF Speed.
		Dehumidify	All	The IDF operates at the High Cool IDF Speed.
		Low Heat	All	The IDF operates at the Low Heat IDF Speed.
		High Heat	All	The IDF operates at the High Heat IDF Speed.
	Intermittent Occupied IDF	None	All	The IDF is off.
		Vent	All	The IDF operates at the Min IDF Speed.
		Low Cool, High Cool, VAV Cool	Min. Cool Capacity	The IDF operates at the Min IDF Speed.
			Low Cool Capacity	The IDF operates at the Low Cool IDF Speed.
			Med. Cool Capacity	The IDF operates at the Med Cool IDF Speed.
			High Cool Capacity	The IDF operates at the High Cool IDF Speed.
		Low Cool	Free Cooling	The IDF operates at the Low Cool IDF Speed.
		High Cool, VAV Cool	Free Cooling	The IDF operates at the High Cool IDF Speed.
		Dehumidify	All	The IDF operates at the High Cool IDF Speed.
		Low Heat	All	The IDF operates at the Low Heat IDF Speed.
		High Heat	All	The IDF operates at the High Heat IDF Speed.
Unoccupied	Disabled Unoccupied IDF	All	All	The IDF is off.
	Intermittent Unoccupied IDF[a]	None	All	The IDF is off.
		Vent	All	The IDF operates at the Min IDF Speed.
		Low Cool, High Cool, VAV Cool	Min Cool Capacity	The IDF operates at the Min IDF Speed.
			Low Cool Capacity	The IDF operates at the Low Cool IDF Speed.
			Med Cool Capacity	The IDF operates at the Med Cool IDF Speed.
			High Cool Capacity	The IDF operates at the High Cool IDF Speed.
		Low Cool	Free Cooling	The IDF operates at the Low Cool IDF Speed.
		High Cool, VAV Cool	Free Cooling	The IDF operates at the High Cool IDF Speed.
		Dehumidify	All	The IDF operates at the High Cool IDF Speed.
		Low Heat	All	The IDF operates at the Low Heat IDF Speed.
		High Heat	All	The IDF operates at the High Heat IDF Speed.

NOTE(S):

a. For units configured for RAT cool/heat demand, the indoor fan is turned on for 10 minutes to recirculate air though the space, once an unoccupied demand is initiated. If the demand persists after 10 minutes, a mode is selected to satisfy the demand. If the demand does not persist after 10 minutes, the indoor fan shuts off.

Table 56 — Supply Pressure Indoor Fan Sequence of Operation

OCCUPANCY	IDF CONFIG.	DEMAND	CONFIGURATION	OPERATION
Occupied	Continuous Occupied IDF	Vent Low Cool, High Cool, VAV Cool, Dehumidify	All	The IDF ramps between min. and max. IDF speed to maintain the supply pressure at the supply pressure control point.
		Low Heat, High Heat	Modulating/Multi-Stage Heat	The IDF ramps between min. and max. IDF speed to maintain the supply pressure at the supply pressure control point.
		Low Heat	2-Stage Heat	The IDF operates at the Low Heat IDF Speed.
		High Heat	2-Stage Heat	The IDF operates at the High Heat IDF Speed.
Unoccupied	Disabled Unoccupied IDF	All	All	The IDF is off.
	Intermittent Unoccupied IDF[a]	Vent Low Cool, High Cool, VAV Cool, Dehumidify	All	The IDF ramps between min. and max. IDF speed to maintain the supply pressure at the supply pressure control point.
		Low Heat, High Heat	Modulating/Multi-Stage Heat	The IDF ramps between min. and max. IDF speed to maintain the supply pressure at the supply pressure control point.
		Low Heat	2-Stage Heat	The IDF operates at the Low Heat IDF Speed.
		High Heat	2-Stage Heat	The IDF operates at the High Heat IDF Speed.

NOTE(S):

a. For units configured for RAT cool/heat demand, the indoor fan is turned on for 10 minutes to recirculate air though the space, once an unoccupied demand is initiated. If the demand persists after 10 minutes, a mode is selected to satisfy the demand. If the demand does not persist after 10 minutes, the indoor fan shuts off.

Table 57 — Third-Party Input Indoor Fan Sequence of Operation

OCCUPANCY	IDF CONFIG.	DEMAND	CONFIGURATION	OPERATION
Occupied	Continuous or intermittent Occupied IDF	All	All	The IDF is off.
		Vent Low Cool, High Cool, VAV Cool, Dehumidify	All	The IDF ramps between min and max IDF speed based on a third-party input signal. The G input must be active to enable the IDF.
		Low Heat	2-Stage Heat	The IDF operates at the Low Heat IDF Speed. The G input must be active to enable the IDF.
		High Heat	2-Stage Heat	The IDF operates at the High Heat IDF Speed. The G input must be active to enable the IDF.
Unoccupied	Disabled Unoccupied IDF	All	All	The IDF is off.
	Intermittent Unoccupied IDF[a]	Vent Low Cool, High Cool, VAV Cool, Dehumidify	All	The IDF ramps between min and max IDF speed based on a third-party input signal. The G input must be active to enable the IDF.
		Low Heat, High Heat	Modulating/Multi-Stage Heat	The IDF ramps between min and max IDF speed based on a third-party input signal. The G input must be active to enable the IDF.
		Low Heat	2-Stage Heat	The IDF operates at the Low Heat IDF Speed. The G input must be active to enable the IDF.
		High Heat	2-Stage Heat	The IDF operates at the High Heat IDF Speed. The G input must be active to enable the IDF.

NOTE(S):

a. For units configured for RAT cool/heat demand, the indoor fan is turned on for 10 minutes to recirculate air though the space, once an unoccupied demand is initiated. If the demand persists after 10 minutes, a mode is selected to satisfy the demand. If the demand does not persist after 10 minutes, the indoor fan shuts off.

Table 58 — Single-Zone VAV Indoor Fan Sequence of Operation

OCCUPANCY	IDF CONFIG.	DEMAND	CONFIGURATION	OPERATION
Occupied	Continuous Occupied IDF	Vent	All	The IDF operates at the Min IDF Speed.
		Low Cool	All	The IDF modulates between the Low Cool IDF speed and the High Cool IDF speed based on the space temperature vs the effective cooling setpoint.
		High Cool, Dehumidify	All	The IDF operates at the High Cool IDF Speed.
		Low Heat	Modulating/Multi-Stage Heat	The IDF modulates between the Low Heat IDF speed and the High Heat IDF speed based on the space temperature vs the effective cooling setpoint.
		High Heat	Modulating/Multi-Stage Heat	The IDF operates at the High Heat IDF Speed.
		Low Heat	2-Stage Heat	The IDF operates at the Low Heat IDF Speed.
		High Heat	2-Stage Heat	The IDF operates at the High Heat IDF Speed.
	Intermittent Occupied IDF	None		The IDF is off.
		Vent		The IDF operates at the Min IDF Speed.
		Low Cool	All	The IDF modulates between the Low Cool IDF speed and the High Cool IDF speed based on the space temperature vs the effective cooling setpoint.
		High Cool, Dehumidify	All	The IDF operates at the High Cool IDF Speed.
		Low Heat	Modulating/Multi-Stage Heat	The IDF modulates between the Low Heat IDF speed and the High Heat IDF speed based on the space temperature vs the effective cooling setpoint.
		High Heat	Modulating/Multi-Stage Heat	The IDF operates at the High Heat IDF Speed.
		Low Heat	2-Stage Heat	The IDF operates at the Low Heat IDF Speed.
		High Heat	2-Stage Heat	The IDF operates at the High Heat IDF Speed.
Unoccupied	Disabled Unoccupied IDF	All	All	The IDF is off.
	Intermittent Unoccupied IDF[a]	None	All	The IDF is off.
		Vent	All	The IDF operates at the Min IDF Speed.
		Low Cool	All	The IDF modulates between the Low Cool IDF speed and the High Cool IDF speed based on the space temperature vs the effective cooling setpoint.
		High Cool, Dehumidify	All	The IDF operates at the High Cool IDF Speed.
		Low Heat	Modulating/Multi-Stage Heat	The IDF modulates between the Low Heat IDF speed and the High Heat IDF speed based on the space temperature vs the effective heating setpoint.
		High Heat	Modulating/Multi-Stage Heat	The IDF operates at the High Heat IDF Speed.
		Low Heat	2-Stage Heat	The IDF operates at the Low Heat IDF Speed.
		High Heat	2-Stage Heat	The IDF operates at the High Heat IDF Speed.

NOTE(S):

a. For units configured for RAT cool/heat demand, the indoor fan is turned on for 10 minutes to recirculate air though the space, once an unoccupied demand is initiated. If the demand persists after 10 minutes, a mode is selected to satisfy the demand. If the demand does not persist after 10 minutes, the indoor fan shuts off.

Cooling and Heating Modes

All cooling, modulating heating, and venting modes operate to maintain the unit supply air temperature (SAT) at the SAT control point, which is selected based on the effective demand level SAT setpoint plus any applicable SAT resets. For example, if the current demand was VAV Cool, the VAV cool SAT setpoint was 55°F, and there was a 2°F active SAT reset, the SAT control point would be 57°F and the system would select a cooling mode based on the current operating conditions to bring the SAT to the SAT control point. For units without an SAT sensor (2-stage heat), the DX LAT sensor is used as the SAT.

NOTE: Two-stage heat modes operate based directly on the demand level.

NOTE: Cooling and heating will only occur during the unoccupied period if the indoor fan is configured for intermittent unoccupied operation.

MECHANICAL COOLING

Mechanical cooling mode uses the unit cooling circuit (compressors, evaporator, condenser fans, condenser, EXVs) to provide cooling. See Table 59 for mechanical cooling mode operation.

HEAT TEMPERED COOLING MODE

For units in cold climates in applications with constant cooling loads, the modulating/multi-stage heat source can be used to prevent delivery of very cold air to the space with a cooling demand. See Table 60 for heat tempered cooling mode operation.

VENTING MODES

Venting mode is intended to provide neutral ventilation air to the space when ventilation is required but there is no active cooling or heating demand. See Table 61 for venting mode operation.

MODULATING HEATING MODE

The modulating/multi-stage heat source is used to provide heating based on the effective SAT control point. See Table 62 for modulating heating mode operation.

TWO-STAGE HEATING MODE

The two-stage heat source is used to provide demand-based heating operation when there is a heat demand. See Table 63 for two-stage heating mode operation.

Table 59 — Mechanical Cooling Mode Sequence of Operation

DEMAND	CONDITION	MODE	OPERATION
Low Cool, High Cool, VAV Cool	Free cooling is unavailable, the cooling system is available, and the MAT is above the SAT control point.	Mechanical Cooling	The mechanical cooling system is enabled, and the compressors are modulated/staged to maintain the unit SAT at the SAT control point.

Table 60 — Heat Tempered Cooling Mode Sequence of Operation

DEMAND	CONDITION	MODE	OPERATION
Low Cool, High Cool, VAV Cool	The unit has modulating heat, heat is available, and the MAT is below the SAT control point minus the Heat Tempering deadband.	Heat Tempered Cooling	The heating system is enabled and modulates to maintain the unit SAT at the SAT control point.

Table 61 — Venting Mode Sequence of Operation

DEMAND	CONDITION	MODE	OPERATION
None	All	None	None
Vent	The MAT is within the Vent SAT setpoint ± the Vent deadband **OR** if the unit has two-stage heat and the MAT is below the MAT control point minus the Vent deadband.	Fan Only Venting	Cooling and heating are disabled.
	Cooling is available and the MAT is above the Vent SAT setpoint plus the Vent deadband.	Cool Tempered Venting	The mechanical cooling system is enabled, and the compressors are modulated/staged to maintain the unit SAT at the Vent SAT setpoint.
	The unit has modulating heat, heating is available, and the MAT is below the Vent SAT setpoint minus the Vent deadband.	Heat Tempered Venting	The mechanical cooling system is enabled, and the compressors are modulated/staged to maintain the unit SAT at the Vent SAT setpoint.

Table 62 — Modulating Heating Mode Sequence of Operation

DEMAND	CONDITION	MODE	OPERATION
Low Heat, High Heat	The unit has modulating/multi-stage heat, heating is available, and the MAT is below the SAT control point.	Modulating Heating	The heating system is enabled and modulates to maintain the unit SAT at the SAT control point.

Table 63 — Two-Stage Heating Mode Sequence of Operation

DEMAND	CONDITION	MODE	OPERATION
Low Heat	The unit has two-stage heat and heating is available.	Two-Stage Heating	Heat stage 1 is enabled.
High Heat	The unit has two-stage heat and heating is available.	Two-Stage Heating	Heat stage 2 is enabled.

Dehumidification Modes

For units with Humidi-Mizer system, the cooling system operates to maintain the air leaving the evaporator coil at the dehumidify cool coil temperature (CCT) control point and the supply air temperature (SAT) at the SAT control point based on the active cooling or heating demand. Configurations are provided to allow the user to select when dehumidification can be performed based on the active cool/heat demand and occupancy. Dehumidification is never performed with a high heat demand.

NOTE: Dehumidification will only occur during the unoccupied period if the indoor fan is configured for intermittent unoccupied operation. See Table 64 for dehumidification checks and Table 65 for sequence of operation.

Outdoor Air Damper

Units with an economizer include an actuated outdoor air damper (OAD) and return air damper (RAT). The economizer can be configured for ventilation control and free cooling operation.

VENTILATION

When the economizer is configured to provide ventilation, the outdoor air damper opens during the occupied period. The outdoor air damper is controlled to a ventilation position based on the selected configuration. The OAD typically does not provide ventilation during the unoccupied period and is closed. See Table 66 for a list of outdoor air damper ventilation control configurations and the associated sequence of operation.

FREE COOLING

The economizer can be configured to provide free cooling during the occupied or unoccupied periods. A series of user adjustable checks are available to determine if free cooling is available. If any of the enabled checks prevent free cooling, then free cooling is made unavailable. See Table 67 for a list of available free cooling checks. See Table 68 for free cooling sequence of operation.

Exhaust Fan

For units with an exhaust fan (EXF), the EXF can be configured to provide building pressure control based on OAD position, a third-party input signal, or a building pressure sensor. The EXF is on whenever the OAD is open. The EXF is off whenever the OAD is closed. See Table 69 for exhaust fan sequence of operation.

OTHER OPERATION FUNCTION

See the Controls, Operation, and Troubleshooting guide for guidance on additional operating functions and configurations.

Table 64 — Dehumidification Checks

NAME	ALLOW DEHUMIDIFICATION	PREVENT DEHUMIDIFICATION
Vent Dehum.	With Vent demand, if enabled.	With Vent demand, if disabled.
VAV Cool Dehum.	With VAV Cool demand, if enabled.	With VAV Cool demand, if disabled.
Low Cool Dehum.	With Low Cool demand, if enabled.	With Low Cool demand, if disabled.
High Cool Dehum.	With High Cool demand, if enabled.	With High Cool demand, if disabled.
Low Heat Dehum.	With Low Heat demand, if enabled.	With Low Heat demand, if disabled.
Unoccupied Dehum.	During unoccupied, if enabled.	During unoccupied, if disabled.

Table 65 — Humidi-MiZer Dehumidification Sequence of Operation

DEMAND	CONDITION	MODE	COOLING OPERATION	HUMIDI-MIZER OPERATION
Vent/ Dehumidify	If cooling and dehumidification are available.	Mechanical Dehumidification	Compressors are enabled and modulate/stage to maintain the CCT at the Dehum. CCT setpoint.	The HZMR reheat valve is enabled, the HZMR bypass valve modulates to maintain the SAT at the Vent SAT setpoint.
Low Cool/Dehumidify				The HZMR reheat valve is enabled, the HZMR bypass valve modulates to maintain the SAT at the Low Cool setpoint.
High Cool/Dehumidify				The HZMR reheat valve is enabled, the HZMR bypass valve modulates to maintain the SAT at the High Cool setpoint.
VAV Cool/Dehumidify				The HZMR reheat valve is enabled, the HZMR bypass valve modulates to maintain the SAT at the VAV Cool SAT setpoint.
Low Heat/Dehumidify				The HZMR reheat valve is enabled, the HZMR bypass valve modulates to maintain the SAT at the Low Heat SAT setpoint.

Table 66 — Ventilation Control Sequence of Operation

VENTILATION	DEMAND	OPERATION
None	All	The OAD is closed.
IDF Mapping	None	The OAD is closed.
	All Other	The OAD ventilation position is modulated based on IDF speed and a linear curve for the OAD position, calculated from four user-adjustable configurations for IDF vent speeds and OAD vent positions. For example, when the indoor fan speed is at the IDF Vent Speed 2 configured speed, the OAD is set to the OAD Vent Position 2 configured position.
2=Third-Party Full	None	The OAD is closed.
	All Other	The OAD position is modulated between minimum and maximum OAD positions based on a third-party analog input. Free cooling and IAQ overrides are disabled and will not override the commanded OAD position.
3=Third-Party Vent Only	None	The OAD is closed.
	All Other	The OAD ventilation position is modulated between minimum and maximum OAD positions based on a third-party analog input. Free cooling and IAQ overrides can increase the OAD position above the ventilation position.

Table 67 — Free Cooling Checks

NAME	CHECK	ALLOW FREE COOL	PREVENT FREE COOL
Dry Bulb Limit	OAT vs Setpoint	OAT is at or below the OAT Dry Bulb Limit setpoint for 1 minute.	OAT is above the OAT Dry Bulb Limit setpoint.
Changeover (Select 1)	OAE	If OAE is at or below 28 btu/lb for 1 minute.	If OAE is above 28 btu/lb.
	Differential Enthalpy[a] (OAE vs RAE)	OAE is at or below the RAE minus the Diff. Enth. deadband for 1 minute.	OAE is above the RAE minus the Diff Enth deadband.
	Differential Dry Bulb (OAT vs RAT)	OAT is at or below the RAT minus the Diff DB deadband for 1 minute.	OAT is above the RAT minus the Diff DB deadband.
Dew Point Limit	OADP vs Setpoint[a]	OADP is at or below the Dew Point Limit configuration for 1 minute.	OADP is above the Dew Point Limit configuration.
Occupied Free Cooling	Occupancy period	If occupied free cooling is enabled and the current period is occupied.	If occupied free cooling is disabled and the current period is occupied.
Unoccupied Free Cooling	Occupancy period	If unoccupied free cooling is enabled and the current period is unoccupied.	If unoccupied free cooling is disabled and the current period is unoccupied.

NOTE(S):

a. Requires humidity and enthalpy sensing option for OARH and RARH sensors

Table 68 — Free Cooling Sequence of Operation

DEMAND	CONDITION	MODE	OPERATION
All	Free cooling not available.	All	Free cooling is disabled, the OAD operates at the ventilation position.
Vent, Low Heat, High Heat, Dehumidify	Free cooling available.	All	Free cooling is disabled, the OAD operates at the ventilation position.
Low Cool, High Cool, VAV Cool	Free cooling is available, the OAT is below the SAT control point.	Free Cooling	The OAD modulates between the ventilation position and max position to maintain the SAT at the SAT control point.
Low Cool, High Cool, VAV Cool	Free cooling is available, the OAT is above the SAT control point.	Integrated Free Cooling	The lowest stage of compression is turned on and the OAD is modulated between the ventilation position and the max. position to maintain the SAT at the SAT control point. Once the OAD reaches the maximum position, the compressors are allowed to ramp up.

Table 69 — Exhaust Fan Sequence of Operation

EXV CONTROL	CONDITION	OPERATION
None	All	The EXF is off.
OAD Mapping	Modulating Centrifugal Exhaust	When the OAD is below EXF OAD position1, the EXF if off. When the OAD is at or above EXF OAD position 1, the EXF is at EXF speed at OAD 1. When the OAD is at or above EXF OAD position 2, the EXF is at EXF speed at OAD 2. When the OAD is closed, the EXF is off.

OAD POSITION	EXHAUST FAN STAGE
< EXF OAD Pos 1	Off
≥ EXF OAD Pos 1, < EXF OAD Pos 2	EXF Speed OAD Pos 1
≥ EXF OAD Pos 2	EXF Speed OAD Pos 2

Building Pressure	Modulating Centrifugal Exhaust	If the building pressure is above the BP setpoint, the EXF turns on and modulates between the minimum and maximum EXF speeds to maintain the building pressure at the BP setpoint. If the building pressure drops below the BP setpoint, the EXF runs at minimum speed (default 0%). When the OAD is closed, the EXF is off.
Third-Party Input	Modulating Centrifugal Exhaust	The EXF modulates between off and the max EXF speed based on a third-party signal. When the OAD is closed, the EXF is off.

APPENDIX A — START-UP CONTROL OPERATION

Overview

The SmartVu™ controls include test modes that can be used as part of the start-up process. See below for guidance on initiating Component and System Test modes.

Step 1 — Login with the User Access Level

The User access level is required to enable component tests and set configurations and setpoints. To login, navigate to the User Login screen (*press on the top bar* → ***User Login***), Click on ✱✱✱ to bring up the keyboard and enter the user password (1111 default).

Step 2 — Enable Component Test Mode

The component tests can be used to enable and test individual components, including indoor fan (IDF), outdoor air damper (OAD), exhaust fan (EXF), condenser fans (CFs), and hot gas reheat valve (HGRH).

To enable Component Test mode, navigate to the Start/Stop screen (*press on the top bar*). Click on the component test button to enable Component Test mode. The Service Test Menu link will appear on the Start/Stop screen when Component Test mode is enabled. See Fig. A for Start/Stop screen layouts in test mode (Service Run or Component Test).

Fig. A — Start/Stop Screen in Test Mode

Step 3 — Service Test Menu

Click on the Service Test Menu button on the Start/Stop screen to navigate to the Service Test Menu. Click on the Test Air System icon to go to the Air System Test screen (IDF, EXF, OAD test) or the Test DX Circuit to go to the Test DX Circuit screen (condenser fans, crankcase heater, or HGRH valve). See Fig. B for Test DX Circuit and Test Air System screen layout when Component Test is enabled.

The Test Air System or Test DX Circuit screen listing reflects the only unit equipment configuration as set by the model number or in the Equipment Configuration screen (for field installed accessories). If a field installed component, such as the economizer (OAD) or exhaust fan, are missing from this screen, refer to the Configure Equipment section of the controls quick start guide. If a factory-installed component is missing from this screen, such as the indoor fan, or HGRH valve, contact your local Carrier sales representative.

TEST ON/OFF DEVICE

Click on the bubble next to ON to turn on the component. Click on the bubble next to OFF to turn the component off. See Fig. C for an example of the crankcase heater turned on in test mode.

TEST MODULATING DEVICE

Click on the bubble next to MANUAL to enable the test. When the test is enabled, the request field will be displayed on the screen. Click on the request field to bring up the keypad. Enter the requested operating capacity and click OK. The device will begin to operate. Click on the bubble next to OFF to turn the component off. See Fig. D for an example of the indoor fan turned on and requested at 20% speed in test mode.

STOP COMPONENT TEST

To stop Component Test mode, navigate back to the Start/Stop screen. Disabling or enabling the unit or starting Service Run mode will stop Component Test mode. Component Test mode will also automatically timeout after 60 minutes and unit operation will be disabled if auto restart is set to off, or unit operation will be enabled if auto restart is set to on.

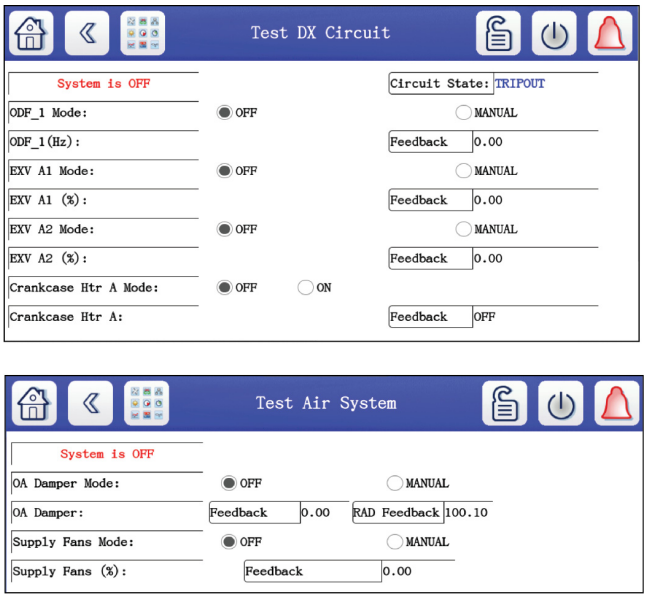


Fig. B — Test DX Circuit and Test Air System Screens (Component Test)

Fig. C — Crankcase Heater Test Example

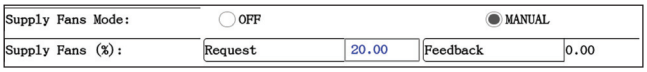


Fig. D — Indoor Fan Test Example

Step 4 — Enable Service Run Mode

Service can be used to enable and test systems, such as cooling, dehumidification, and heating. The unit must be in Service Run mode to perform system tests.

Prior to enabling Service Run, it is recommended to disable unit operation. To disable unit operation, navigate to the Start/Stop screen (*press on the top bar)* and press disable unit. This will disable all unit components prior to starting Service Run. To enable Service Run mode, navigate to the Start/Stop screen (*press on the top bar*). Click on the Service Run button to enable Service Run mode. The Service Test Menu link will appear on the Start/Stop screen when Service Run mode is enabled.

Step 5 — Test Devices Using Service Run

Click on the Service Test Menu button on the Start/Stop screen to navigate to the Service Test Menu and click on the Test Air System icon to get to the Air System Test screen or the Test DX Circuit button to get to the Test DX Circuit screen. See Fig. E for Test DX Circuit and Test Air System screen layout when Service Run is enabled.

When Service Run mode is enabled, all components will be set to OFF in the service test if unit operation was disabled prior to starting Service Run mode. If unit operation was enabled prior to starting Service Run mode, all components will be set to auto.

NOTE: The system will prevent conflicting systems from being tested at the same time. For example, the compressors cannot be set to ON when the heater is set to ON or MANUAL.

ON/OFF MANUAL CONTROL

For on/off systems (compressors), click on the bubble next to ON to turn on the system. To test modulating systems (modulating heat), click on the bubble next to MANUAL to enable the test. When the test is enabled, the request field will be displayed on the screen. Click on the request field to bring up the keypad. Enter the requested operating capacity and click OK. To turn a component or system off, press the bubble next to OFF.

AUTO CONTROL

In addition to manual tests, systems can be set to auto control mode for testing. In auto control mode, the system/component behaves like it would if under normal operating conditions based on the unit configuration, occupancy, operating conditions, and demand level. Additionally, when a system that requires additional components to operate (operating compressors requires indoor fan and condenser fans, operating heat requires indoor fan), is set to auto, on, or manual control, the required components will be set to auto control mode and will operate normally based on the control configuration. Select modulating components (indoor fan, outdoor air damper) can be put into manual control mode for manual component modulation.

See Fig. F for an example of an air system test in Service Run Mode. In this example, the heater is in manual control and set to 50% capacity. The outdoor air damper is in manual control and set to 25%. The indoor fan and exhaust fan are in auto control and will behave as they would under normal operating conditions and their associated control configurations.

STOP SERVICE RUN

To stop Service Run mode, navigate back to the Start/Stop screen. Disabling or enabling the unit or starting Component Test mode will stop Service Run mode. Service Run mode will also automatically timeout after 60 minutes and unit operation will be disabled if auto restart is set to off, or unit operation will be enabled if auto restart is set to on.

Step 6 — Restore Unit Operation

Navigate back to the Start/Stop screen. Press disable unit to prevent unit operation. Press enable unit to restore normal unit operation.

NOTE: If the unit needs to remain disabled in the event of a power cycle, ensure the auto restart configuration is set to off. If auto restart is set to on, the unit will automatically be enabled after a power cycle.

Fig. E — Test DX Circuit and Test Air System Screens (Service Run)

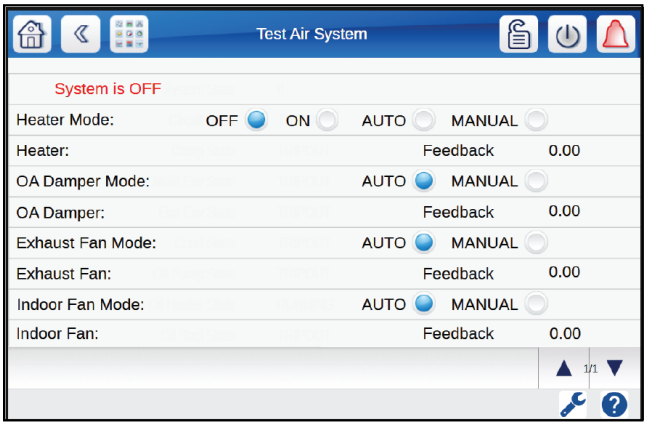


Fig. F — Test Air System Example (Service Run)

APPENDIX B — AIR BALANCE INSTRUCTIONS

Overview

This section provides basic guidance on using component test to test the air system and details on key air system configurations and setpoints. An air balance is recommended for all applications to ensure proper system operation. The air balance should be performed prior to equipment start-up. See Tables A-E for component configurations.

Step 1 — Login with the User Access Level

The User access level is required to enable component tests and set configurations and setpoints. To login, navigate to the User Login screen (*press* *on the top bar* → ***User Login***), Click on (* * * _) to bring up the keyboard and enter the user password (1111 default).

Step 2 — Enable Component Test Mode

The component tests can be used to enable and test individual components, including indoor fan (IDF), outdoor air damper (OAD), and exhaust fan (EXF).

To enable Component Test mode, navigate to the Start/Stop screen (*press* *on the top bar*). Click on the component test button to enable Component Test mode. The Service Test Menu link will appear on the start/stop screen after Component Test is enabled. See Fig. G for start/stop screen layout in component test mode.

NOTE: Component test is recommended for performing an air balance. If the space is occupied or the ambient conditions require the unit to operate cooling or heating during the air balance, refer to Appendix A "Step 4 — Enable Service Run Mode" on page 99 for controls start-up guidance. Leave the compressors and heat in auto control mode, and modulate the air balance components according to the guidance below.

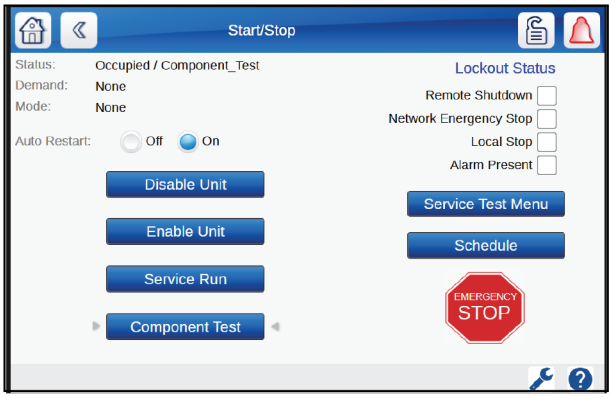


Fig. G — Start/Stop Screen in Test Mode

Step 3 — Go to the Service Test Menu

Click on the Service Test Menu button on the Start/Stop screen to navigate to the Service Test Menu. Click on the Test Air System icon to go to the Air System Test screen (IDF, EXF, OAD test). See Fig. H for test air system screen layout when component test is enabled.

The test air system screen listing reflects the only unit equipment configuration as set by the model number or in the Equipment Configuration screen (for field installed accessories).

TEST MODULATING DEVICE

Click on the bubble next to MANUAL to enable the test. When the test is enabled, the request field will be displayed on the screen. Click on the request field to bring up the keypad. Enter the requested operating capacity and click OK. The device will begin to operate. Multiple components can be tested together simultaneously, such as testing the outdoor air damper and the indoor fan at the same time. Click on the bubble next to OFF to turn the component off. See Fig. I for an example of the indoor fan turned on and requested at 20% speed in test mode.

Step 4 — Record Required Test Values, Set Configurations and Setpoints

Use the Component Test mode to identify the required values for the following configurations and setpoints, where applicable. Fan speeds are in % based on % of maximum rpm. Damper positions are based on 0-100% open. The configurations and setpoints can be set during the component test, exiting out of the component test screen won't exit the test mode.

Step 5 — Restore Unit Operation

To exit Component Test mode, navigate back to the start/stop screen. Disabling or enabling the unit will stop component test mode. Press enable unit to restore normal unit operation or disable unit to shut off the unit.

NOTE: If the unit needs to remain disabled in the event of a power cycle, ensure the auto restart configuration is set to off. If auto restart is set to on, the unit will automatically be enabled after a power cycle.

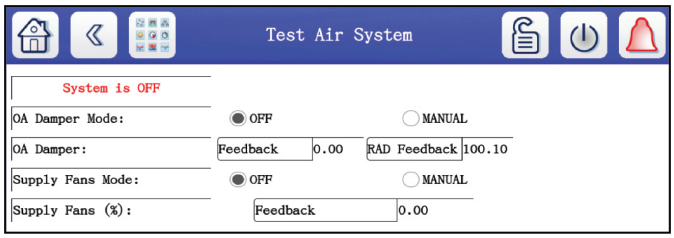


Fig. H — Test Air System Screens (Component Test)

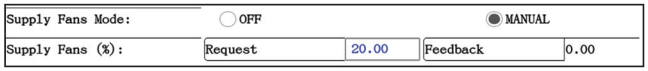


Fig. I — Indoor Fan Test Example

Table A — Indoor Fan Configurations

CONFIGURATION	VALUE	DESCRIPTION
(Main Menu → System Config → IDF Config)		
IDF Min. Speed	%	Minimum speed the IDF can operate at, typically during vent mode. Used for SAV Demand, SAV Capacity, SP, ZP, or third-party IDF control configurations.
IDF Max. Speed	%	Maximum speed the IDF can operate at, typically the higher of the cooling or heating design airflows. Used for SP, ZP, or third-party IDF control configurations.
IDF Low Cool Speed	%	IDF speed with a low cool demand or low cool capacity. If unknown, target 50%-66% of design cooling airflow. Used with SAV demand or SAV capacity IDF control configurations.
IDF Med Cool Speed	%	IDF speed with med cool capacity. If unknown, target 66% of design cooling airflow. Used with SAV capacity IDF control configuration.
IDF High Cool Speed	%	IDF speed with a high cool demand or high cool capacity, typically the design cooling airflow. Used with SAV demand, SAV capacity, or CV IDF control configurations.
IDF Low Heat Speed	%	IDF speed with a low heat demand or low heat capacity. If unknown, target 66%-75% of design heating airflow. Used with SAV demand, SAV capacity, or CV IDF control configurations.
IDF High Heat Speed	%	IDF speed with a high heat demand or high heat capacity, typically the design heating airflow. Used with SAV demand, SAV capacity, or CV IDF control configurations.

Table B — Indoor Fan Setpoints

SETPOINT	VALUE	DESCRIPTION
(Main Menu → Setpoints → IDF Setpoints)		
Supply Pressure (SP)	in. wg	The required supply pressure to achieve the peak design airflow. Used with SP IDF control configuration.
Zone Pressure (ZP)	in. wg	The required zone pressure that the indoor fan is trying to maintain. Used with ZP IDF control configuration for 100% OA applications.

Table C — Outdoor Air Damper Configurations

CONFIG/SETPOINT	VALUE	DESCRIPTION
(Main Menu → System Config → IDF Config)		
OAD Min. Position	%	Minimum position that the OAD is allowed to operate at when providing ventilation. Typically based on the required ventilation position at the highest airflow. Used for IDF mapping, third-party vent only, and third-party full ventilation control.
OAD Max. Position	%	Minimum position that the OAD is allowed to operate at when providing ventilation or free cooling. Typically limited to 98%. Used for all control types and for free cooling.
IDF Vent Speed 1	%	Lowest fan speed for calculating OAD position as part of IDF mapping ventilation control. Typically fan speed 1 should match the minimum IDF speed.
IDF Vent Speed 2	%	Second lowest fan speed for calculating OAD position as part of IDF mapping ventilation control. Typically fan speed 2 should match the low cool IDF speed or 1/3 of the way between min. and max. IDF speed.
IDF Vent Speed 3	%	Second highest fan speed for calculating OAD position as part of IDF mapping ventilation control. Typically fan speed 3 should match the medium cool IDF speed or be 2/3 of the way between min. and max. IDF speed.
IDF Vent Speed 4	%	Highest fan speed for calculating OAD position as part of IDF mapping ventilation control. Typically fan speed 4 should match the max. IDF speed or the higher of the high cool/high heat IDF speed.
OAD Vent Pos 1	%	OAD position required to achieve the design ventilation airflow when the IDF is at vent speed 1 as part of IDF mapping ventilation control. Should be the most open damper position.
OAD Vent Pos 2	%	OAD position required to achieve the design ventilation airflow when the IDF is at vent speed 2 as part of IDF mapping ventilation control. Should be the second most open damper position.
OAD Vent Pos 3	%	OAD position required to achieve the design ventilation airflow when the IDF is at vent speed 3 as part of IDF mapping ventilation control. Should be the second most closed damper position.
OAD Vent Pos 4	%	OAD position required to achieve the design ventilation airflow when the IDF is at vent speed 4 as part of IDF mapping ventilation control. Should be the most closed damper position.

Table D — Exhaust Fan Configurations

CONFIG/SETPOINT	VALUE	DESCRIPTION
		(Main Menu → System Config → IDF Config)
EXF Max. Speed	%	The maximum speed the EXF can operate at, based on the max design exhaust airflow (usually during free cooling). Used with 2-stage, third-party, or building pressure exhaust fan control.
EXF OAD Pos 1	%	The OAD position where the exhaust fan turns on and operates at speed 1 when using 2-stage exhaust fan control. EXF OAD position 1 is typically set to the OAD min. position for ventilation.
EXF OAD Pos 2	%	The OAD position where the exhaust fan turns operates at speed 2 when using 2-stage exhaust fan control. EXF OAD position 2 is typically set above OAD vent position 1 so that the exhaust fan only operates at speed 2 during free cooling (when the OAD is open more than the normal ventilation position).
EXF Speed OAD Pos 1	%	The speed that the exhaust fan operates at when the OAD is at or above OAD position1, but below OAD position 2. EXF speed OAD position 1 is typically set to maintain neutral or slightly positive building pressure during normal ventilation operation.
EXF Speed OAD Pos 2	%	The speed that the exhaust fan operates at when the OAD is at or above OAD position1, but below OAD position 2. EXF speed OAD position 2 is typically set to maintain neutral or slightly positive building pressure during free cooling operation.

Table E — Exhaust Fan Setpoints

CONFIG/SETPOINT	VALUE	DESCRIPTION
		(Main Menu → Setpoints → EXF Setpoints)
BP Setpoint	in. wg	The required building pressure that the exhaust fan is trying to maintain. Used with BP EXF control configuration.

APPENDIX C — WARNINGS, ALERTS AND ALARMS

Warnings, Alerts and Alarms — PIC 6.1 (48/50WE*H Units)

ALARM NAME	CODE	DESCRIPTION
ALARM_046	A046	A:CIR046 - Circuit Unexpected Off Alarm
ALARM_047	A047	A:CIR047 - Circuit Failure to Pressurize Alarm
ALARM_051	A051	A1:CMP051 - Compressor Stuck on Alarm
ALARM_052	A052	A2:CMP052 - Compressor Stuck on Alarm
ALARM_057	A057	A:PRS057 - Cir A High Pressure Switch Trip Alarm
ALARM_069	A069	A1:CMP069 - Compressor Drive Fault Alert
ALARM_071	A071	A1:CMP071 - Compressor Trip Lock
ALARM_073	A073	SYS:THR073 - Outside Air Temperature Thermistor Failure Alarm
ALARM_075	A075	COOL:THR075 - Return Air Thermistor Failure Alarm
ALARM_090	A090	A:TRD090 - Discharge Pressure Transducer Failure Alarm
ALARM_092	A092	A:TRD092 - Suction Pressure Transducer Failure Alarm
ALARM_110	A110	A:PRS110 - Loss of Charge Alarm
ALARM_120	A120	A:TMP120 - Low Saturated Suction Temperature Alarm
ALARM_126	A126	A:PRS126 - High Head Pressure Alarm
ALARM_140	A140	A1:CMP140 - Reverse Rotation Alarm
ALARM_141	A141	A2:CMP141 - Reverse Rotation Alarm
ALARM_1445	A1445	SYS:COMP445 - Condensate Overflow Switch Circuit Alarm
ALARM_150	A150	SYS:RUN150 - Emergency Stop Command Alarm
ALARM_151	A151	SYS:RUN151 - Emergency Stop Input Alarm
ALARM_152N	A152	SYS:RUN152 - Unit Down Due to Failure
ALARM_154N	A154	SYS:HW154 - Serial EEPROM Hardware Failure Alarm
ALARM_156N	A156	SYS:HW156 - Critical Serial EEPROM Storage Failure Alarm
ALARM_157N	A157	SYS:HW157 - A/D Hardware Failure Alarm
ALARM_166	A166	SYS:IOB166 - IOB1 Communications Alarm
ALARM_167	A167	SYS:IOB167 - IOB2 Communications Alarm
ALARM_168	A168	SYS:IOB168 - IOB3 Communications Alarm
ALARM_169	A169	SYS:IOB169 - IOB4 Communications Alarm
ALARM_191N	A191	SYS:LEN191 - LEN Scan Error
ALARM_193N	A193	SYS:IDF193 - IDF ECM Fan 1 Alarm
ALARM_194N	A194	SYS:IDF194 - IDF ECM Fan 2 Alarm
ALARM_195N	A195	A:ECM195 - ECM Alarm
ALARM_200	A200	SYS:TMP200 - Linkage Timeout Error - Comms Failure Alarm
ALARM_210	A210	SYS:TRD210 - Building Pressure Transducer Failure System Alarm
ALARM_2101	A2101	SYS:TRD210 - Building Pressure Transducer Failure Alarm
ALARM_211	A211	SYS:PRS211 - Static Pressure Transducer Failure Alarm
ALARM_220	A220	COOL:SNSR220 - Indoor Air Quality Sensor Failure Alarm
ALARM_222	A222	SYS:SNSR222 - 3rd Party OA Damper Input Failure Alarm
ALARM_223	A223	SYS:SNSR223 - 3rd Party SF Speed Input Failure Alarm
ALARM_224	A224	SYS:SNSR224 - 3rd Party EF Speed Input Failure Alarm
ALARM_228	A228	COOL:RN228 - Outdoor Air Damper Pos Feedback Input Fail Alarm
ALARM_2445	A2445	SYS:COMP445 - Condensate Overflow Switch Circuit Lockout Alarm
ALARM_269	A269	SYS: 269 - NGC IOB Low Voltage Alarm
ALARM_329	A329	A:CIR329 - Low Pressure Ratio Alarm
ALARM_331	A331	A:CIR331 - Flooding Detected Alarm
ALARM_3445	A3445	SYS:COMP445 - Condensate Overflow Switch Unit Lockout Alarm
ALARM_404	A404	U:FIRE404 - Fire Shutdown Alarm
ALARM_420	A420	SYS:IDF420 - Supply Fan Limit Switch Trip Alarm
ALARM_433	A433	U:PWR433 - 3-Phase Power Failure Alarm
ALARM_435	A435	HEAT:TMP435 - SAT Above Maximum Threshold Alarm
ALARM_436	A436	SYS:TMP436 - SAT Below Minimum Threshold Alarm
ALARM_437	A437	SYS:PRS437 - Static Duct Pressure Above Maximum Threshold Alarm
ALARM_438N	A438	U:SHTDWN438 - Shutdown Switch Input Alarm
ALARM_445	A445	SYS:COMP445 - Condensate Overflow Switch Unit Alarm
ALARM_700	A700	COOL:SNR700 - Supply Air Temperature Sensor Failure Alarm
ALARM_706	A706	Heat:THR706-Leaving Evap Thermistor Failure Alarm
ALARM_710N	A710	SYS:SNR710 - Control Fluid Sensor Alarm
ALARM_NULL	0	ALM MESSAGE END
ALERT_045	T045	A:CIR045 - Circuit Stuck On Alert
ALERT_047	T047	A:CIR047 - Circuit Failure to Pressurize Alert
ALERT_051	T051	A1:CMP051 - Compressor Failure Alarm

Warnings, Alerts and Alarms — PIC 6.1 (48/50WE*H Units) (cont)

ALARM NAME	CODE	DESCRIPTION
ALERT_052	T052	A2:CMP052 - Compressor Failure Alarm
ALERT_057	T057	A:PRS057 - Cir A High Pressure Switch Trip Alert
ALERT_062	T062	A:CMP062 - Suction Pressure Alert
ALERT_072	T072	COOL:RUN072 - Supply Air Reset Sensor Failure Alert
ALERT_073	T073	SYS:THR073 - Outside Air Temperature Thermistor Failure Alert
ALERT_074	T074	COOL:THR074 - Space Temperature Thermistor Failure Alert
ALERT_075	T075	COOL:THR075 - Return Air Thermistor Failure Alert
ALERT_076	T076	COOL:SNSR076 - Outside Air Relative Humidity Snsr Failure Alert
ALERT_077	T077	COOL:SNSR077 - Space Relative Humidity Sensor Failure Alert
ALERT_078	T078	COOL:SNSR078 - Return Air Relative Humidity Snsr Failure Alert
ALERT_079	T079	COOL:SNS079 - Mixed Air Temperature Thermistor Failure Alert
ALERT_080	T080	COOL:SNS080 - Exhaust Air Temperature Thermistor Failure Alert
ALERT_081	T081	COOL:SNS081 - Mixed Air Relative Humidity Sensor Failure Alert
ALERT_082	T082	COOL:SNSR082 - Space Temperature Offset Sensor Failure Alert
ALERT_083	T083	COOL:SNS083 - Supply Air Relative Humidity Sensor Failure Alert
ALERT_084	T084	COOL:SNS084 - Cooling Coil Temperature Thermistor Failure Alert
ALERT_085	T085	COOL:SNSR085 - SPRH Sensor Below Limit
ALERT_086	T086	COOL:SNSR086 - SPRH Sensor Above Limit
ALERT_087	T087	SYS: 087 - Heat Capacity Limit
ALERT_088	T088	SYS: 088 - Cool Capacity Limit
ALERT_090	T090	A:TRD090 - Discharge Pressure Transducer Failure Alert
ALERT_092	T092	A:TRD092 - Suction Pressure Transducer Failure Alert
ALERT_112N	T112	A:RUN112 - Low Circuit Charge Alert (Auto-Test)
ALERT_114N	T114	A:RUN114 -High Circuit Charge Alert (Auto-Test)
ALERT_120	T120	A:TMP120 - Low Saturated Suction Temperature Alert
ALERT_122	T122	A:TMP122 - High Saturated Suction Temperature Alert
ALERT_126	T126	A:PRS126 - High Head Pressure Alert
ALERT_129	T129	CMP129 - Low Compressor Ratio Ckt A
ALERT_147	T147	CMP147 - SDT High Temp
ALERT_153	T153	SYS:HW153 - Real Time Clock Hardware Failure Alert
ALERT_155N	T155	SYS:HW155 - Serial EEPROM Storage Failure Alert
ALERT_177	T177	U:TRD177 - 4-20 mA Demand Limit Failure Alert
ALERT_178	T178	SYS:TRD178 - 4-20 mA Static Pressure Reset Alert
ALERT_190N	T190	SYS:LEN190 - LEN Scan Warning
ALERT_210	T210	SYS:TRD210 - Building Pressure Transducer Failure Alert
ALERT_211	T211	SYS:PRS211 - Static Pressure Transducer Failure Alert
ALERT_220	T220	COOL:SNSR220 - Indoor Air Quality Sensor Failure Alert
ALERT_221	T221	COOL:SNSR221 - Outdoor Air Quality Sensor Failure Alert
ALERT_222	T222	SYS:SNSR222 - 3rd Party OA Damper Input Failure Alert
ALERT_223	T223	SYS:SNSR223 - 3rd Party SF Speed Input Failure Alert
ALERT_224	T224	SYS:SNSR224 - 3rd Party EF Speed Input Failure Alert
ALERT_245	T245	COOL:SNSR245 - Outside Air CFM Sensor Failure Alert
ALERT_300	T300	SYS:TMP300 - Space Temperature Below Limit Alert
ALERT_301	T301	SYS:TMP301 - Space Temperature Above Limit Alert
ALERT_302	T302	SYS:TMP302 - Supply Air Temperature Below Limit Alert
ALERT_303	T303	SYS:TMP303 - Supply Air Temperature Above Limit Alert
ALERT_304	T304	SYS:TMP304 - Return Air Temperature Below Limit Alert
ALERT_305	T305	SYS:TMP305 - Return Air Temperature Above Limit Alert
ALERT_308	T308	Heat:SEN308 - Return Air Relative Humidity Below Limit Alert
ALERT_309	T309	Heat:SEN309 - Return Air Relative Humidity Above Limit Alert
ALERT_310	T310	SYS:RUN310 - Supply Duct Static Pressure Below Limit
ALERT_311	T311	SYS:RUN311 - Supply Duct Static Pressure Above Limit
ALERT_312	T312	COOL:PRS312 - Building Pressure Below Limit Alert
ALERT_313	T313	COOL:PRS313 - Building Pressure Above Limit Alert
ALERT_314	T314	COOL:SEN314 - IAQ Above Limit Alert
ALERT_316	T316	COOL:SEN316 - OAT Below Limit Alert
ALERT_317	T317	COOL:SEN317 - OAT Above Limit Alert
ALERT_318	T318	SYS:PRS318 - Static Pressure (SP) Not Holding Setpoint Alert
ALERT_319	T319	SYS:PRS319 - Building Pressure (BP) Not Holding Setpoint Alert
ALERT_320	T320	SYS:COMP320 - Compressor Cycling Alert
ALERT_321	T321	SYS:COMP321 - OAT Compressor Lockout Alert

APPENDIX C — WARNINGS, ALERTS AND ALARMS (cont)

Warnings, Alerts and Alarms — PIC 6.1 (48/50WE*H Units) (cont)

ALARM NAME	CODE	DESCRIPTION
ALERT_322	T322	SYS:HEAT:322 - OAT Heater Lockout Alert
ALERT_323	T323	SYS:COMP323 - MAT Compressor Lockout Alert
ALERT_329	T329	A:CIR329 - Low Pressure Ratio Alert
ALERT_330	T330	B:CIR330 - Low Pressure Ratio Alert
ALERT_335	T335	Heat:SEN335 - Excess Outdoor Air Alert
ALERT_350	T350	ERV:FDBK350 - ERV Wheel Stuck Alert
ALERT_351	T351	ERV:FDBK351 - ERV Wheel Free Spinning Alert
ALERT_352	T352	ERV:FRST352 - ERV Frost Indication Alert
ALERT_405	T405	U:SMOKE405 - Smoke Evacuation Alert
ALERT_406	T406	U:SMOKE406 - Pressurization Alert
ALERT_407	T407	U:SMOKE407 - Smoke Purge Alert
ALERT_408	T408	U:FIL408 - Dirty Main Air Filter Alert
ALERT_411N	T411	SYS:EXF411 - Exhaust Fan 1 VFD Fault Alarm
ALERT_414	T414	U:TMP414 - Damper Not Modulating Alert
ALERT_415N	T415	U:FIL415 - Main Air Filter Notification - Change Soon Warning
ALERT_421	T421	U:TSTAT421-Thermostat Y2 Input ON without Y1 ON Alert
ALERT_422	T422	U:TSTAT422 - Thermostat W2 Input ON without W1 ON Alert
ALERT_423	T423	U:TSTAT423 - Thermostat Y and W Inputs ON Alert
ALERT_424	T424	U:TSTAT424 - Thermostat G Input OFF on a Call for Cooling Alert
ALERT_434	T434	HEAT:TMP434 - Heating Temperature Limit Switch Trip Alert
ALERT_435	T435	HEAT:TMP435 - SAT Above Maximum Threshold Alert
ALERT_615	T615	U:ACTR615 - Econ 1 Not Economizing When it Should Alert
ALERT_616	T616	U:ACTR616 - Econ 1 Economizing When it Should Not Alert
ALERT_617	T617	U:ACTR617 - Econ 1 Damper Stuck or Jammed Alert
ALERT_629	T629	RFG:629 - Refrigerant Dissipation
ALERT_706	T706	Heat:THR706-Leaving Evap Thermistor Failure Alert
ALERT_707	T707	COOL:THR707 - Digital Scroll Discharge Thermistor Failure Alert
TEST_AMB_HF	Y002	none
TEST_AMB_SF	Y010	none
TEST_AMBA_HF	Y006	none
TEST_AMBA_SF	Y014	none
TEST_AMBB_HF	Y007	none
TEST_AMBB_SF	Y015	none
TEST_CIRA_HF	Y004	none
TEST_CIRA_SF	Y012	none
TEST_CIRB_HF	Y005	none
TEST_CIRB_SF	Y013	none
TEST_CMPA1	Y016	none
TEST_CMPA2	Y017	none
TEST_CMPB1	Y018	none
TEST_CMPB2	Y019	none
TEST_RFG_HF	Y001	none
TEST_RFG_SF	Y009	none
TEST_UNIT_HF	Y000	none
TEST_UNIT_SF	Y008	none
TEST_ZNE_HF	Y003	none
TEST_ZNE_SF	Y011	none
WARN_051	P051	A1:CMP051 - Compressor Failure Warning
WARN_052	P052	A2:CMP052 - Compressor Failure Warning
WARN_415N	P415	U:FIL415 - Main Air Filter Notification - Change Soon Warning
WARN_416N	P416	U:FIL416 - Post Air Filter Notification - Change Soon Warning

APPENDIX D — THERMISTOR VALUES

Temperature (°F) vs Resistance/Voltage Drop Values for OAT, RAT, SAT, and SPT Thermistors (10K at 25°C Type II Resistors)

TEMP (°F)	RESISTANCE (Ohms)	VOLTAGE DROP (V)	TEMP (°F)	RESISTANCE (Ohms)	VOLTAGE DROP (V)	TEMP (°F)	RESISTANCE (Ohms)	VOLTAGE DROP (V)
–25	196,453	4.758	**37**	28,373	3.697	**99**	5,961	1.867
–24	189,692	4.750	**38**	27,597	3.670	**100**	5,827	1.841
–23	183,300	4.741	**39**	26,838	3.654	**101**	5,698	1.815
–22	177,000	4.733	**40**	26,113	3.615	**102**	5,571	1.789
–21	171,079	4.724	**41**	25,396	3.587	**107**	4,984	1.663
–20	165,238	4.715	**42**	24,715	3.559	**108**	4,876	1.639
–19	159,717	4.705	**43**	24,042	3.531	**109**	4,769	1.615
–18	154,344	4.696	**44**	23,399	3.503	**110**	4,666	1.591
–17	149,194	4.686	**45**	22,770	3.474	**111**	4,564	1.567
–16	144,250	4.676	**46**	22,161	3.445	**112**	4,467	1.544
–15	139,443	4.665	**47**	21,573	3.416	**113**	4,370	1.521
–14	134,891	4.655	**48**	20,998	3.387	**114**	4,277	1.498
–13	130,402	4.644	**49**	20,447	3.357	**115**	4.185	1.475
–12	126,183	4.633	**50**	19,903	3.328	**116**	4,096	1.453
–11	122,018	4.621	**51**	19,386	3.298	**117**	4,008	1.431
–10	118,076	4.609	**52**	18,874	3.268	**118**	3,923	1.409
–9	114,236	4.597	**53**	18,384	3.238	**119**	3,840	1.387
–8	110,549	4.585	**54**	17,904	3.208	**120**	3,759	1.366
–7	107,006	4.572	**55**	17,441	3.178	**121**	3,681	1.345
–6	103,558	4.560	**56**	16,991	3.147	**122**	3,603	1.324
–5	100,287	4.546	**57**	16,552	3.117	**123**	3,529	1.304
–4	97,060	4.533	**58**	16,131	3.086	**124**	3,455	1.284
–3	94,020	4.519	**59**	15,714	3.056	**125**	3,383	1.264
–2	91,019	4.505	**60**	15,317	3.025	**126**	3,313	1.244
–1	88,171	4.490	**61**	14,925	2.994	**127**	3,244	1.225
0	85,396	4.476	**62**	14,549	2.963	**128**	3,178	1.206
1	82,729	4.461	**63**	14,180	2.932	**129**	3,112	1.187
2	80,162	4.445	**64**	13,824	2.901	**130**	3,049	1.168
3	77,662	4.429	**65**	13,478	2.870	**131**	2,986	1.150
4	75,286	4.413	**66**	13,139	2.839	**132**	2,926	1.132
5	72,940	4.397	**67**	12,814	2.808	**133**	2,866	1.114
6	70,727	4.380	**68**	12,493	2.777	**134**	2,809	1.096
7	68,542	4.363	**69**	12,187	2.746	**135**	2,752	1.079
8	66,465	4.346	**70**	11,884	2.715	**136**	2,697	1.062
9	64,439	4.328	**71**	11,593	2.684	**137**	2,643	1.045
10	62,491	4.310	**72**	11,308	2.653	**138**	2,590	1.028
11	60,612	4.292	**73**	11,031	2.622	**139**	2,539	1.012
12	58,781	4.273	**74**	10,764	2.592	**140**	2,488	0.996
13	57,039	4.254	**75**	10,501	2.561	**141**	2,439	0.980
14	55,319	4.235	**76**	10,249	2.530	**142**	2,391	0.965
15	53,693	4.215	**77**	10,000	2.500	**143**	2,343	0.949
16	52,086	4.195	**78**	9,762	2.470	**144**	2,297	0.934
17	50,557	4.174	**79**	9,526	2.439	**145**	2,253	0.919
18	49,065	4.153	**80**	9,300	2.409	**146**	2,209	0.905
19	47,627	4.132	**81**	9,078	2.379	**147**	2,166	0.890
20	46,240	4.111	**82**	8,862	2.349	**148**	2,124	0.876
21	44,888	4.089	**83**	8,653	2.319	**149**	2,083	0.862
22	43,598	4.067	**84**	8,448	2.290	**150**	2,043	0.848
23	42,324	4.044	**85**	8,251	2.260	**151**	2,003	0.835
24	41,118	4.021	**86**	8,056	2.231	**152**	1,966	0.821
25	39,926	3.998	**87**	7,869	2.202	**153**	1,928	0.808
26	38,790	3.975	**88**	7,685	2.173	**154**	1,891	0.795
27	37,681	3.951	**89**	7,507	2.144	**155**	1,855	0.782
28	36,610	3.927	**90**	7,333	2.115	**156**	1,820	0.770
29	35,577	3.903	**91**	7,165	2.087	**157**	1,786	0.758
30	34,569	3.878	**92**	6,999	2.059	**158**	1,752	0.745
31	33,606	3.853	**93**	6,838	2.030	**159**	1,719	0.733
32	32,654	3.828	**94**	6,683	2.003	**160**	1,687	0.722
33	31,752	3.802	**95**	6,530	1.975	**161**	1,656	0.710
34	30,860	3.776	**96**	6,383	1.948	**162**	1,625	0.699
35	30,009	3.750	**97**	6,238	1.921	**163**	1,594	0.687
36	29,177	3.723	**98**	6,098	1.894	**164**	1,565	0.676

APPENDIX D — THERMISTOR VALUES (cont)

Temperature (°F) vs Resistance/Voltage Drop Values for OAT, RAT, SAT, and SPT Thermistors (10K at 25°C Type II Resistors) (cont)

TEMP (°F)	RESISTANCE (Ohms)	VOLTAGE DROP (V)	TEMP (°F)	RESISTANCE (Ohms)	VOLTAGE DROP (V)	TEMP (°F)	RESISTANCE (Ohms)	VOLTAGE DROP (V)
165	1,536	0.666	**188**	1,016	0.461	**207**	737	0.343
166	1,508	0.655	**189**	998	0.454	**208**	725	0.338
167	1,480	0.645	**190**	981	0.447	**209**	714	0.333
168	1,453	0.634	**191**	964	0.440	**210**	702	0.328
173	1,326	0.585	**192**	947	0.433	**211**	691	0.323
174	1,302	0.576	**193**	931	0.426	**212**	680	0.318
175	1,278	0.567	**194**	915	0.419	**213**	670	0.314
176	1,255	0.558	**195**	900	0.413	**214**	659	0.309
177	1,233	0.549	**196**	885	0.407	**215**	649	0.305
178	1,211	0.540	**197**	870	0.400	**216**	639	0.300
179	1,190	0.532	**198**	855	0.394	**217**	629	0.296
180	1,169	0.523	**199**	841	0.388	**218**	620	0.292
181	1,148	0.515	**200**	827	0.382	**219**	610	0.288
182	1,128	0.507	**201**	814	0.376	**220**	601	0.284
183	1,108	0.499	**202**	800	0.370	**221**	592	0.279
184	1,089	0.491	**203**	787	0.365	**222**	583	0.275
185	1,070	0.483	**204**	774	0.359	**223**	574	0.272
186	1,052	0.476	**205**	762	0.354	**224**	566	0.268
187	1,033	0.468	**206**	749	0.349	**225**	557	0.264

APPENDIX E — TRANSDUCER VALUES

Pressure (psig) vs. Voltage Drop Values for Suction Pressure Transducers

PRESSURE (psig)	VOLTAGE DROP (V)	PRESSURE (psig)	VOLTAGE DROP (V)	PRESSURE (psig)	VOLTAGE DROP (V)	PRESSURE (psig)	VOLTAGE DROP (V)
0	0.466	**61**	1.066	**122**	1.667	**183**	2.267
1	0.476	**62**	1.076	**123**	1.677	**184**	2.277
2	0.486	**63**	1.086	**124**	1.686	**185**	2.287
3	0.495	**64**	1.096	**125**	1.696	**186**	2.297
4	0.505	**65**	1.106	**126**	1.706	**187**	2.307
5	0.515	**66**	1.116	**127**	1.716	**188**	2.316
6	0.525	**67**	1.125	**128**	1.726	**189**	2.326
7	0.535	**68**	1.135	**129**	1.736	**190**	2.336
8	0.545	**69**	1.145	**130**	1.745	**191**	2.346
9	0.554	**70**	1.155	**131**	1.755	**192**	2.356
10	0.564	**71**	1.165	**132**	1.765	**193**	2.366
11	0.574	**72**	1.175	**133**	1.775	**194**	2.375
12	0.584	**73**	1.184	**134**	1.785	**195**	2.385
13	0.594	**74**	1.194	**135**	1.795	**196**	2.395
14	0.604	**75**	1.204	**136**	1.805	**197**	2.405
15	0.614	**76**	1.214	**137**	1.814	**198**	2.415
16	0.623	**77**	1.224	**138**	1.824	**199**	2.425
17	0.633	**78**	1.234	**139**	1.834	**200**	2.434
18	0.643	**79**	1.243	**140**	1.844	**201**	2.444
19	0.653	**80**	1.253	**141**	1.854	**202**	2.454
20	0.663	**81**	1.263	**142**	1.864	**203**	2.464
21	0.673	**82**	1.273	**143**	1.873	**204**	2.474
22	0.682	**83**	1.283	**144**	1.883	**205**	2.484
23	0.692	**84**	1.293	**145**	1.893	**206**	2.494
24	0.702	**85**	1.303	**146**	1.903	**207**	2.503
25	0.712	**86**	1.312	**147**	1.913	**208**	2.513
26	0.722	**87**	1.322	**148**	1.923	**209**	2.523
27	0.732	**88**	1.332	**149**	1.932	**210**	2.533
28	0.741	**89**	1.342	**150**	1.942	**211**	2.543
29	0.751	**90**	1.352	**151**	1.952	**212**	2.553
30	0.761	**91**	1.362	**152**	1.962	**213**	2.562
31	0.771	**92**	1.371	**153**	1.972	**214**	2.572
32	0.781	**93**	1.381	**154**	1.982	**215**	2.582
33	0.791	**94**	1.391	**155**	1.992	**216**	2.592
34	0.801	**95**	1.401	**156**	2.001	**217**	2.602
35	0.810	**96**	1.411	**157**	2.011	**218**	2.612
36	0.820	**97**	1.421	**158**	2.021	**219**	2.622
37	0.830	**98**	1.430	**159**	2.031	**220**	2.631
38	0.840	**99**	1.440	**160**	2.041	**221**	2.641
39	0.850	**100**	1.450	**161**	2.051	**222**	2.651
40	0.860	**101**	1.460	**162**	2.060	**223**	2.661
41	0.869	**102**	1.470	**163**	2.070	**224**	2.671
42	0.879	**103**	1.480	**164**	2.080	**225**	2.681
43	0.889	**104**	1.490	**165**	2.090	**226**	2.690
44	0.899	**105**	1.499	**166**	2.100	**227**	2.700
45	0.909	**106**	1.509	**167**	2.110	**228**	2.710
46	0.919	**107**	1.519	**168**	2.120	**229**	2.720
47	0.928	**108**	1.529	**169**	2.129	**230**	2.730
48	0.938	**109**	1.539	**170**	2.139	**231**	2.740
49	0.948	**110**	1.549	**171**	2.149	**232**	2.749
50	0.958	**111**	1.558	**172**	2.159	**233**	2.759
51	0.968	**112**	1.568	**173**	2.169	**234**	2.769
52	0.978	**113**	1.578	**174**	2.179	**235**	2.779
53	0.988	**114**	1.588	**175**	2.188	**236**	2.789
54	0.997	**115**	1.598	**176**	2.198	**237**	2.799
55	1.007	**116**	1.608	**177**	2.208	**238**	2.809
56	1.017	**117**	1.618	**178**	2.218	**239**	2.818
57	1.027	**118**	1.627	**179**	2.228	**240**	2.828
58	1.037	**119**	1.637	**180**	2.238	**241**	2.838
59	1.047	**120**	1.647	**181**	2.247	**242**	2.848
60	1.056	**121**	1.657	**182**	2.257	**243**	2.858

APPENDIX E — TRANSDUCER VALUES (cont)

Pressure (psig) vs. Voltage Drop Values for Suction Pressure Transducers (cont)

PRESSURE (psig)	VOLTAGE DROP (V)
244	2.868
245	2.877
246	2.887
247	2.897
248	2.907
249	2.917
250	2.927
251	2.936
252	2.946
253	2.956
254	2.966
255	2.976
256	2.986
257	2.996
258	3.005
259	3.015
260	3.025
261	3.035
262	3.045
263	3.055
264	3.064
265	3.074
266	3.084
267	3.094
268	3.104
269	3.114
270	3.124
271	3.133
272	3.143
273	3.153
274	3.163
275	3.173
276	3.183
277	3.192
278	3.202
279	3.212
280	3.222
281	3.232
282	3.242
283	3.251
284	3.261
285	3.271
286	3.281
287	3.291
288	3.301
289	3.311
290	3.320
291	3.330
292	3.340
293	3.350
294	3.360
295	3.370
296	3.379
297	3.389
298	3.399
299	3.409
300	3.419
301	3.429
302	3.438
303	3.448
304	3.458
305	3.468
306	3.478
307	3.488
308	3.498
309	3.507
310	3.517
311	3.527
312	3.537
313	3.547
314	3.557
315	3.566
316	3.576
317	3.586
318	3.596
319	3.606
320	3.616
321	3.626
322	3.635
323	3.645
324	3.655
325	3.665
326	3.675
327	3.685
328	3.694
329	3.704
330	3.714
331	3.724
332	3.734
333	3.744
334	3.753
335	3.763
336	3.773
337	3.783
338	3.793
339	3.803
340	3.813
341	3.822
342	3.832
343	3.842
344	3.852
345	3.862
346	3.872
347	3.881
348	3.891
349	3.901
350	3.911
351	3.921
352	3.931
353	3.940
354	3.950
355	3.960
356	3.970
357	3.980
358	3.990
359	4.000
360	4.009
361	4.019
362	4.029
363	4.039
364	4.049
365	4.059
366	4.068
367	4.078
368	4.088
369	4.098
370	4.108
371	4.118
372	4.128
373	4.137
374	4.147
375	4.157
376	4.167
377	4.177
378	4.187
379	4.196
380	4.206
381	4.216
382	4.226
383	4.236
384	4.246
385	4.255
386	4.265
387	4.275
388	4.285
389	4.295
390	4.305
391	4.315
392	4.324
393	4.334
394	4.344
395	4.354
396	4.364
397	4.374
398	4.383
399	4.393
400	4.403
401	4.413
402	4.423
403	4.433
404	4.442
405	4.452
406	4.462
407	4.472
408	4.482
409	4.492
410	4.502
411	4.511
412	4.521
413	4.531
414	4.541
415	4.551
416	4.561
417	4.570
418	4.580
419	4.590
420	4.600

PRE-START-UP INFORMATION FOR CHECKLIST

(The pre-start-up checklist must be completed by installing contractor. For Carrier factory start-up, the pre-start-up checklist must be submitted to the Carrier start-up team prior to arranging start-up. Please review to the unit submittal or air balance report for airflow information.)

NOTE: To avoid injury to personnel and damage to equipment or property when completing the procedures listed in this start-up checklist, use good judgment, follow safe practices, and adhere to the safety considerations/information as outlined in preceding sections of this Installation, Controls, and Start-up Instruction document.

I. PROJECT INFORMATION

PROJECT NAME_____
ADDRESS _____
CITY _____
STATE/PROVIDENCE/ZIPCODE _____
INSTALLER_____
CONTACT NAME_____
CONTACT PHONE _____
CONTACT EMAIL _____

Unit Information

MODEL NUMBER _____
UNIT TAG/NAME_____
SERIAL NUMBER _____
UNIT LOCATION _____
LADDER NEEDED (YES/NO)_____
APPROX. HEIGHT (FT) _____

Application Information

APPLICATION TYPE: 100% OUTDOOR AIR _____ COMFORT COOLING _____ OTHER _____
SUPPLY AIRFLOW_____CFM SUPPLY EXTERNAL STATIC_____in. wg
EXHAUST AIRFLOW_____CFM EXHAUST ETERNAL STATIC_____in. wg
OUTDOOR AIRFLOW_____CFM
OCCUPANCY AIRFLOW:_____ LOCAL SCHEDULE_____ OCCUPANCY SWITCH _____ BAS _____
COMMUNICATION TYPE:_____ NONE _____ CCN _____ BACNet MS/TP _____ BACnet IP _____
COMMUNICATION DETAILS: _____

START-UP NOTES:

Record any notes that the start-up technician must be aware of, such as special access requirements (fall protection, etc.), any training or escort requirements, third-party control information, the presence of air terminal units or fire dampers, or any time of access restrictions (days/time where site is not available).

_____
_____
_____
_____
_____
_____
_____

II. PRE-START-UP CHECKLIST

Check to verify the activity has been completed, write Y. If the activity does not apply, write N/A.

Verify packing materials have been removed from the unit. (Y/NA) _____
Verify the unit is free of damage. If damage exists, contact your local Carrier sales representative. (Y/NA) _____
Verify the unit has been installed in accordance with the service clearances in the installation instructions. (Y/NA) _____
Verify the supply and return ductwork have been installed per the unit installation instructions. (Y/NA) _____
Verify the unit is within level tolerances to promote proper condensate drainage. (Y/NA) _____
Verify all required field installed components or accessories (hoods, sensors, etc.) have been installed. (Y/NA) _____
Verify the unit power feed is installed, and the phasing is correct (L1, L2, L3). (Y/NA) _____
Verify the unit voltage and frequency have been verified to match the incoming power feed. (Y/NA) _____
Verify the incoming power voltage is steady and within 10% tolerance from nameplate. (Y/NA) _____
Verify the power feed wire size meets the MCA requirements on the unit nameplate. (Y/NA) _____
Verify an overcurrent production device (fuse or breaker) has been installed upstream of the unit (units without HACR breaker) is compliant with the MOCP requirements indicated on the unit nameplate. (Y/NA) _____
Verify a means of disconnecting and locking out electrical service at the unit has been provided (units without non-fused disconnect or HACR breaker). (Y/NA) _____
Verify all electrical connections and terminals are tight; all terminals are free from corrosion. (Y/NA) _____
Verify the air-cooled condenser coil(s) is clean and free from obstructions and defects. (Y/NA) _____
Verify The crank case heaters verified to be operational and will operate 24 hours prior to performing cooling start-up. (Y/NA) _____
Verify the evaporator filters and outdoor air hood screens installed and are clean. (Y/NA) _____
Verify a properly sized condensate drain trap has been installed and is free from obstructions. (Y/NA) _____
Verify the refrigerant circuit is free from leaks. (Y/NA) _____
Verify the supply and return ductwork are installed and free from obstructions (smoke dampers, etc.). (Y/NA) _____
Verify the equipment has been applied and installed in accordance with product documentation. (Y/NA) _____
Verify the gas piping is installed, is free from leaks, and is at the correct pressure (Y/NA) _____
Verify The heat condensate drain has been installed (Y/NA) _____

Factory-Installed Options (If Equipped)

1. For units with economizer, the outdoor air hood and screens have been installed and are clear, and the outdoor air damper and return air dampers move freely without binding. (Y/N) _____
2. For units with barometric relief, the relief hoods have been installed and the dampers are free to open. (Y/N) _____
3. For units with supply pressure control, pneumatic tubing with a duct pressure pickup has been installed on the high side port of the transducer and the tubing is free from kinks or bends. (Y/N) _____
4. For units with zone/building pressure control, pneumatic tubing with a building pressure pickup has been installed on the high side port of the transducer and the tubing is free from kinks or bends. (Y/N) _____
5. For units with field wired convenience outlet, field provided power wiring with disconnecting means has been provided to the outlet. The outlet has been noted to be powered even when the unit power is disconnected. (Y/N) _____
6. The SAT sensor has been installed in the supply ductwork and wired back to the controller. (Y/N) _____
7. For units requiring for space temperature (SPT) or relative humidity control (SPRH), a space temperature sensor and space relative humidity sensor has been installed or network points will be available. (Y/N) _____
8. The units requiring thermostat (TSTAT) or humidistat (HSTAT) control, a two-stage heat/cool thermostat and humidistat (or thermostat with dehumidification output) has been installed or network points will be available. (Y/N) _____
9. The control configuration is complete, and the controls are setup according to project requirements. (Y/N) _____

Air Balance

See Appendix B on page 101 for air balance instructions.

1. An air balance has been performed and the supply fan, outdoor air dampers, and exhaust fan (if equipped) have been configured for operation in accordance with the system design. (Y/N) _____
2. For units where air balance has been completed, include a copy of the air balance with the pre-start-up checklist. (Y/N) _____

III. CONTROL CONFIGURATION

Fill in the tables to indicate the unit control configurations that are set as part of the pre-start-up setup. Control and configuration setup are not included in factory start-up.

Schedule

CONFIGURATION	VALUE	APPLICATION
(Main Menu → Schedules → Local Schedule)		
Schedule 1	Mon Tue Wed Thu Fri Sat Sun	
	Start	Stop
Schedule 2	Mon Tue Wed Thu Fri Sat Sun	
	Start	Stop
Schedule 3	Mon Tue Wed Thu Fri Sat Sun	
	Start	Stop
Schedule 4	Mon Tue Wed Thu Fri Sat Sun	
	Start	Stop
Other Schedules	—	

Equipment Configurations

CONFIGURATION	VALUE
(Main Menu → System Config → Equipment Config)	
Smoke Detector	Enable/Disable
Thermostat	Enable/Disable
Humidistat	Enable/Disable
Pre-Filter Switch	Enable/Disable
Remote Switch	0 = None
	1 = Remote Shutdown
	2 = Remote Occupancy
Phase Monitor	Enable/Disable
Fire Shutdown	Enable/Disable
ZDOR	Enable/Disable
IDF Third-Party Mod	Enable/Disable
EXF Third-Party Mod	Enable/Disable
OAD Third-Party Mod	Enable/Disable
Exhaust Fan	Enable/Disable
Economizer (OAD)	Enable/Disable
COFS	Enable/Disable
Auxiliary Relay	0=Not Used
	1=Alarm Status
	2=OCC Status

Sensor Configurations

CONFIGURATION	VALUE
(Main Menu → System Config → Sensor Config)	
SPT Sensor	Enable/Disable
SPT Offset	Enable/Disable
SPT OCC Override	Enable/Disable
OCC Override Time	Hours
OCC Override 2nd Press	0 = Reset
	1 = Clear
MAT Sensor	Enable/Disable
OARH Sensor	Enable/Disable
RARH Sensor	Enable/Disable
SAT Sensor	Enable/Disable
SP Sensor	Enable/Disable
BP Sensor	Enable/Disable

Outdoor Air Damper Configurations

CONFIGURATION	VALUE
(Main Menu → System Config → OAD Config)	
Vent Control	0 = None
	1= IDF Mapping
	2 = Third-Party Full
	3 = Third-Party Vent Only
	4 = 100% OA
OAD Min. Position	%
OAD Max. Position	%
IDF Vent Speed 1	%(IDF Map Only)
IDF Vent Speed 2	%(IDF Map Only)
IDF Vent Speed 3	%(IDF Map Only)
IDF Vent Speed 4	%(IDF Map Only)
OAD Vent Pos 1	%(IDF Map Only)
OAD Vent Pos 2	%(IDF Map Only)
OAD Vent Pos 3	%(IDF Map Only)
OAD Vent Pos 4	%(IDF Map Only)

Indoor Fan Configurations

CONFIGURATION	VALUE
(Main Menu → System Config → Indoor Fan Config)	
Indoor Fan Control	0 = Constant Volume
	1 = Staged Air Volume
	2 = Third-Party IDF Mod
	3 = Supply Pressure (SP)
	4 = Zone Pressure (ZP)
SAV Mode Selection	0 = Demand
	1 = Capacity
IDF Min. Speed	%
IDF Max. Speed	%
IDF Low Cool Speed	% (SAV only)
IDF Med. Cool Speed	% (SAV only)
IDF High Cool Speed	% (SAV only)
SAV Low Cool Cap	% (SAV only)
SAV Med. Cool Cap	% (SAV only)
SAV Med. Cool Cap	% (SAV only)
IDF Low Heat Speed	% (SAV only)
IDF High Heat Speed	% (SAV only)
Occupied Fan	0=Demand 1=Continuous
Unoccupied Fan	0=Disabled 1=Demand

Cooling Configurations

CONFIGURATION	VALUE
(Main Menu → System Config → Cooling Config)	
Cool/Heat Demand Source	0=None (Default)
	1 = SPT
	3 = OAT
	4 = TSTAT
Cool Tempered Venting	Enable/Disable
Vent Deadband	°F

Dehumidify Configurations

CONFIGURATION	VALUE
(Main Menu → System Config → Dehum Config)	
Demand Source	0=None
	1 = HSTAT
	2 = RARH
	3 = SPRH
	4 = OADP
Unoccupied Dehumidification	Enable/Disable
Vend/None Dehumidification	Enable/Disable
High Cool Dehumidification	Enable/Disable
Low Cool Dehumidification	Enable/Disable
Low Heat Dehumidification	Enable/Disable

Heater Configurations

CONFIGURATION	VALUE
(Main Menu → System Config → Heater Config)	
Heat Tempered Venting	Enable/Disable
Heat Tempered Cooling	Enable/Disable
Heat Tempering Deadband	°F

Exhaust Fan Configurations

CONFIGURATION	VALUE
(Main Menu → System Config → Exhaust Fan Config)	
Exhaust Fan Control	0 = None
	1 = 2-Stage
	2 = Third-Party
	3 = Building Pressure
EXF Max. Speed	%
EXF Speed OAD Pos 1	% (2-Stage Only)
EXF Speed OAD Pos 2	% (2-Stage Only)
EXF OAD Pos 1	% (2-Stage Only)
EXF OAD Pos 2	% (2-Stage Only)

Free Cooling Configurations

ITEM	VALUE
(Main Menu → System Config → Free Cool Config)	
Free Cooling	Enable/Disable
Unoccupied Free Cooling	Enable/Disable
Changeover Select	0 = None
	1 = Diff Dry Bulb
	2 = Enthalpy
	3 = Diff Enthalpy
OADP Limit Check	Enable/Disable
OAT Dry Bulb Limit Check	Enable/Disable

CONFIGURATION NOTES:_____

_____

_____

_____

_____

IV. CONTROL SETPOINTS

Fill in the table to indicate the unit control setpoints that are set as part of the pre-start-up setup. Control and setpoint setup not included in factory start-up.

Free Cooling Setpoints

(Main Menu → System Config → Free Cool Config)		
SETPOINT	**VALUE**	**FREE COOL CONFIG.**
OAT Dry Bulb Threshold	°F	OAT Dry Bulb Limit
OADP Threshold	°F	OADP Limit
Diff. Dry Bulb Threshold	°F	Diff. Dry Bulb Changeover
Diff. Enthalpy Threshold	Btu/hr.	Diff. Enthalpy Changeover

Indoor Fan Setpoints

(Main Menu → Setpoints → Indoor Fan Setpoints)		
SETPOINT	**VALUE**	**IDF CONTROL CONFIG.**
Supply Pressure	in.wg	SP
Zone Pressure	in.wg	ZP

Cooling Setpoints

(Main Menu → Setpoints → Cooling Setpoints)		
SETPOINT	**VALUE**	**COOL DEMAND SOURCE**
Occupied Cooling	°F	SPT or OAT
Unoccupied Cooling	°F	SPT
Low Cool SAT	°F	SPT or TSTAT
High Cool SAT	°F	SPT or TSTAT
100% OA Low Cool SAT	°F	OAT
100% OA High Cool SAT	°F	OAT
Vent SAT	°F	All
Low Cool On DB	°F	SPT or OAT
Low Cool Off DB	°F	SPT or OAT
High Cool On DB	°F	SPT or OAT

Dehumidify Setpoints

(Main Menu → Setpoints → Dehum Setpoints)		
SETPOINT	**VALUE**	**DEHUM. DEMAND SOURCE**
Dehum. DP	°F	OADP
Dehum. DP On DB	°F	OADP
Dehum. DP Off DB	°F	OADP
Dehum. RH	°F	SPRH or RARH
Dehum. RH On DB	°F	SPRH or RARH
Dehum. RH Off DB	°F	SPRH or RARH
Dehum. CCT	°F	All

Heating Setpoints

(Main Menu → Setpoints → Heating Setpoints)		
SETPOINT	**VALUE**	**HEAT DEMAND SOURCE**
Occupied Heating	°F	SPT or OAT
Unoccupied Heating	°F	SPT
Low Heat SAT	°F	SPT or TSTAT
High Heat SAT	°F	SPT or TSTAT
100% Low OA Heat SAT	°F	OAT
100% OA High Heat SAT	°F	OAT
Low Heat On DB	°F	SPT or OAT
Low Heat Off DB	°F	SPT or OAT
High Heat On Db	°F	SPT or OAT

Exhaust Fan Setpoints

(Main Menu → Setpoints → Exhaust Fan Setpoints)		
SETPOINT	**VALUE**	**EXF CONTROL**
Building Pressure	in.wg.	BP

SETPOINT NOTES:_____

_____

_____

_____

_____

START-UP CHECKLIST

To be completed by installing contractor or Carrier Factory Service. A copy of the checklist, start-up checklist, and log must be provided to the Carrier start-up team after start-up has been completed.

WARNING: To avoid injury to personnel and damage to equipment or property when completing the procedures listed in this start-up checklist, use good judgment, follow safe practices, wear personal protective equipment (PPE), and adhere to the safety considerations/information as outlined in preceding sections of this installation, controls, and start-up instruction.

Prior to performing start-up, the crank case heaters **MUST** operate for 24 hours. Cooling start-up can only be completed when the outdoor air temperature is above 60°F.

START-UP PERFORMED BY:

COMPANY _____
ADDRESS _____
CITY _____
STATE/PROVIDENCE _____
ZIP CODE _____
CONTACT PHONE _____
CONTACT EMAIL _____
START-UP DATE _____
TECHNICIAN _____

UNIT INFORMATION:

MODEL NUMBER: _____
UNIT TAG/NAME: _____
SERIAL NUMBER: _____
SOFTWARE VERSION: _____
(***Main Menu → Controller Config → Controller ID***)

INSTRUCTIONS:

Check to verify the activity has been completed, write Y. If the activity does not apply, write N/A.

PRE-START CHECK

1.	The pre-start-up checklist has been reviewed and is complete and accurate.	(Y/NA) ____
2.	Unit is free from damage or defects; all parts and accessories appear to be properly installed.	(Y/NA) ____
3.	Unit has been installed with proper service clearances and air flow clearances.	(Y/NA) ____
4.	Verify that the supply and return ductwork has been installed and is complete.	(Y/NA) ____
5.	Power feed, voltage, overcurrent protection, and phasing are correct.	(Y/NA) ____
6.	Electrical connections and terminals are tight and free from corrosion.	(Y/NA) ____
7.	The supply air temperature sensor has been relocated to the supply ductwork.	(Y/NA) ____
8.	The evaporator filters and outdoor air hood screens installed and are clean.	(Y/NA) ____
9.	Outdoor air screens, filters, condenser coil, and evaporator coil are all clean.	(Y/NA) ____
10.	The supply fan and exhaust fans (if equipped) rotate freely.	(Y/NA) ____
11.	All required accessories, factory options, and sensors have been setup/installed properly.	(Y/NA) ____
12.	A properly sized condensate drain trap has been installed and is free from obstructions.	(Y/NA) ____
13.	The controls setup is complete and has been documented in the pre-start-up list.	(Y/NA) ____
14.	All air terminal units (VAV or VVT boxes), fire dampers, and volume dampers are confirmed to be fully open or at their maximum balanced condition.	(Y/NA) ____
15.	No construction, remodeling, or major renovation is occurring in the space or around the unit that could negatively impact unit operation.	(Y/NA) ____
16.	No safety conditions exist that would prevent start-up or operation of the equipment.	(Y/NA) ____
17.	No application or installation concerns exist that would prevent start-up or operation of the equipment.	(Y/NA) ____

START-UP LOG

ELECTRICAL

Incoming Voltage L1-L2_____L1-L3_____L2-L3_____
Average Voltage L1 _____ (L1-L2+L1-L3+L2-L3)/3
Voltage Tolerance L1 _____(Average Voltage-Nameplate Voltage)/Nameplate Voltage
Voltage Imbalance L1 _____(Maximum Deviation Voltage/Average Voltage) x 100

The Maximum Deviation Voltage is the voltage that is furthest away from the Average Voltage.

IMPORTANT: Do not proceed with start-up if voltage tolerance or imbalance exceeds 10%.

SUPPLY FAN AND EXHAUST FAN CHECKS

The supply fan rotates freely and in the correct direction. _____
The exhaust fan rotates freely and in the correct direction _____
An air balance has been completed or the unit is configured for proper airflow operation. _____

SUPPLY FAN AND EXHAUST FAN LOG

Use Component Test Mode to test component operation (see Appendix A on (Y/N) for start-up control operation).
NOTE: Motor amp readings should be taken at full load airflow (per air balance).

Supply Fan _____ RPM_____Amps
Exhaust Fan _____ RPM _____Amps

COOLING CHECKS

The air-cooled condenser coil(s) is clean and free from obstructions and defects. _____
The condenser fan motors rotate freely are positioned correctly in the condenser housing. _____
The evaporator coil and reheat coils are clean and free from obstructions and defects. _____
The compressor rotation has been verified to be in the correct direction. _____
The refrigerant circuit is free from leaks.

IMPORTANT: Do not proceed with cooling start-up unless the following are verified:

- Crankcase heaters have been confirmed to be operating for 24 hours prior to cooling start-up. (Y/N)_____
- Ambient condition is above 60°F and will allow for cooling start-up. (Y/N)_____

COOLING LOG

Use Service Run Mode to test cooling operation (see Appendix A on page 99).
NOTE: Cooling start-up should only occur when the outdoor air temperature is above 60°F and at full load airflow (per air balance). Force economizer closed (for recirculating applications) or open (100% outdoor air applications) and disable HGRH (hot gas reheat) when measuring cooling performance.

Outdoor Air Temperature (OAT) _____° F DB
Return Air Temperature (RAT) if circulating _____° F DB_____° F WB
Cooling Supply Air Temperature (SAT) _____° F DB _____° F WB

Circuit A
Compressor 1 Voltage L1-L2_____L1-L3_____L2-L3_____Amps_____A
Compressor 2 Voltage L1-L2_____L1-L3_____L2-L3_____Amps_____A

Suction Line Temp_____°F Press_____PSIGSuperheat_____°F
Liquid Line Temp_____°F Press_____PSIGSubcooling_____°F
Discharge Line Temp_____°F Press_____PSIG

Verify factory refrigerant charge using the charging charts in the service and maintenance instructions. _____
Disable HGRH and verify condenser fans are at 100% speed when verifying refrigerant charge. _____

Charge Adjustment ±_____lb.

GAS HEATING CHECKS

The gas piping has been installed per manufacturer recommendations, is free from leaks. (Y/N) _____
The gas feed is at the correct inlet pressure. (Y/N) _____
The gas flue hood has been installed. (Y/N) _____
The gas heat condensate drain has been installed per recommendations and connected to a drain. (Y/N) _____

GAS HEATING LOG

Heating start-up should only occur at full load airflow (per air balance). Force economizer closed (for recirculating applications) or open (100% outdoor air applications).

Outdoor Air Temperature (OAT) _____° F DB
Return Air Temperature (RAT) _____° F DB (if recirculating)
Unit Supply Air A Temperature (SAT) _____°F DB at 100% capacity
Gas Inlet Pressure _____in. wg
Gas Manifold Pressure _____in. wg at 100% capacity

START-UP NOTES:_____
_____
_____
_____
_____
_____
_____

TEMPORARY FURNACE OPERATION DURING CONSTRUCTION

The furnace may be operated during the finishing stage of construction. To ensure proper operation, follow the checklist below:

1. Prior to the finishing stage of construction, ensure that return air and vent openings are covered to minimize penetration of dust and construction debris into the unit. (Y/N)_____
2. Interior drywall installation shall be completed and covered with paint or primer prior to unit operation. (Y/N)_____
3. Premises shall be substantially free of debris and dust. (Y/N)_____
4. Ensure all return and vent coverings have been removed. (Y/N)_____
5. Verify the return ducts (except 100% OA) and supply ducts are connected, are free from obstructions, are clean, and are properly sealed. (Y/N)_____
6. Ensure proper vent installation per installation instructions. (Y/N)_____
7. Ensure gas piping has been connection per installation instructions. (Y/N)_____
8. Verify that the gas piping is free of leaks. (Y/N)_____
9. Furnace to be set to operate under appropriate control to ensure proper operation. (Y/N)_____
10. Minimum MERV 11 air filters to be installed during the finishing stages of construction. (Y/N)_____
11. Set furnace input rate and temperature rise per rating plate marking. (Y/N)_____
12. Ensure means for providing combustion air in accordance with the manufacturer's shipped installation instructions. (Y/N)_____
13. Return air temperature to be maintained between 55°F (13°C) and 80°F (27°C). (Y/N)_____
14. Furnace shall be set up to operate in accordance with installation instructions and shall be verified for operating conditions including ignition, input rate, pressure, temperature rise, and venting. (Y/N)_____
15. Install new filters as per installation instructions prior to final occupancy. (Y/N)_____

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

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