



# WeatherMaster® Hybrid Heat 48QE\*\*07-09 Single Package Rooftop Heat Pump with Gas Heat 2 and 3 Stage Models with Puron Advance™ (R-454B) Refrigerant and EcoBlue™ Fan Technology

## Installation Instructions

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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.

**⚠ WARNING**

**FIRE, EXPLOSION HAZARD**

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

Disconnect gas piping from unit when leak testing at pressure greater than 0.5 psig (3450 Pa). Pressures greater than 0.5 psig (3450 Pa) will cause gas valve damage resulting in hazardous condition. If gas valve is subjected to pressure greater than 0.5 psig (3450 Pa), it must be replaced before use. When pressure testing field-supplied gas piping at pressures of 0.5 psig (3450 Pa) or less, a unit connected to such piping must be isolated by closing the manual gas valve(s).

**⚠ ADVERTISSEMENT**

**RISQUE D'INCENDIE OU D'EXPLOSION**

Le non-respect de cet avertissement peut entraîner la mort, des blessures graves et/ou des dommages matériels.

Débranchez la tuyauterie de gaz de l'appareil lors d'un essai de pression à une pression supérieure à 0,5 psig (3450 Pa). Une pression supérieure à 0,5 psig endommagera la valve de gaz et créera une situation dangereuse. Si la valve de gaz est soumise à une pression supérieure à 0,5 psig, elle doit être remplacée avant utilisation. Lors d'un essai de pression sur une tuyauterie de gaz fournie sur site à une pression inférieure ou égale à 0,5 psig, l'appareil raccordé à cette tuyauterie doit être isolé en fermant la ou les valves de gaz manuelles.

**⚠ 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.

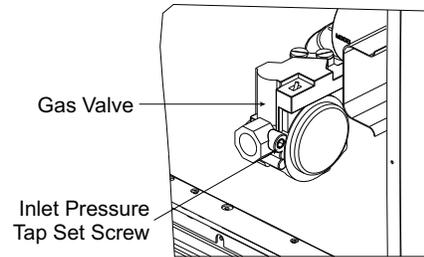
Veiller à ce que la ou les sorties de l'évent de l'appareil de chauffage (et la prise d'air) ne soient, en aucune façon, obstruées, quelle que soit la saison.

**⚠ WARNING**

**FIRE HAZARD**

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

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

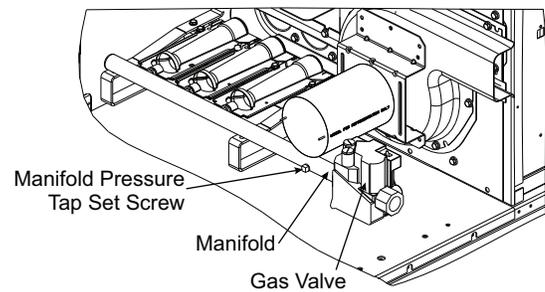


**⚠ WARNING**

**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.

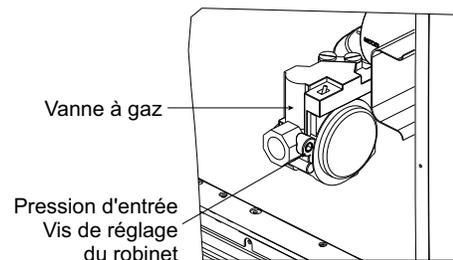


**⚠ ADVERTISSEMENT**

**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 d'entrée doit être serrée et un bouchon de tuyau NPT de 1/8 po doit être installé pour éviter les fuites de gaz.

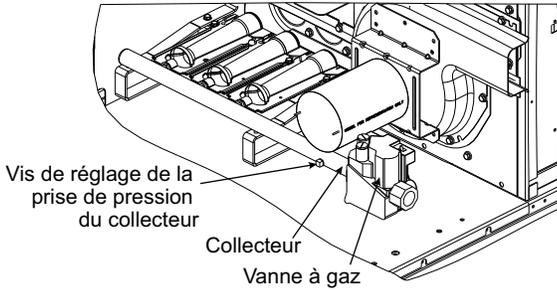


**⚠ ADVERTISSEMENT**

**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.



**⚠ 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.

**⚠ WARNING**

**ELECTRICAL SHOCK HAZARD**

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.

**⚠ WARNING**

**UNIT OPERATION AND SAFETY HAZARD**

Failure to follow this warning could cause personal injury, death and/or equipment damage.

R-454B is an A2L refrigerant. All service equipment or components must be A2L refrigerant rated. Do not use non-A2L rated equipment or components on R-454B refrigerant equipment.

**⚠ 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 équipements peuvent avoir plusieurs alimentations de courant.

**⚠ WARNING**

Use caution when servicing compressor terminal pins. System or compressor abnormalities can dislodge pins allowing oil and refrigerant to vent under pressure.

**⚠ 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.

**⚠ AVERTISSEMENT**

Soyez prudent lors de l'entretien des bornes du compresseur. Les anomalies du système ou du compresseur peuvent déloger les bornes, permettant à l'huile et au réfrigérant de s'évacuer sous pression.

**⚠ 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.

**⚠ WARNING**

**FIRE OR EXPLOSION HAZARD**

Failure to follow the safety warnings exactly could result in serious injury, death or property damage.

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. A fire or explosion may result causing property damage, personal injury or loss of life.

**⚠ 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 jamais vérifier la présence de fuites de gaz au moyen d'une flamme nue. Vérifier tous les raccords en utilisant une solution savonneuse commerciale conçue spécialement pour la détection de fuites. Un incendie ou une explosion risque de se produire, ce qui peut entraîner la mort, des blessures ou des dommages matériels.

**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.

**⚠ AVERTISSEMENT**

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.

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

UNIT	$(TA_{min})^a$	
	Sq Ft	Sq Meter
48QE*M/T07	441	41
48QE*M/T08	491	46
48QE*M09	558	52
48QE*T09	617	58
48QE*N/U07	466	44
48QE*N/U08	699	65
48QE*N/U09	822	77

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<sup>®</sup> 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.

**⚠ AVERTISSEMENT**

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**

See Fig. 1 for 48QE\*\*07-09 model number nomenclature. See Fig. 2 and 3 (pages 7 - 12) for unit dimensional drawings.

**Rated Indoor Airflow**

Table 2 lists the rated indoor airflow used for the AHRI efficiency rating for the units covered in this document.

**Table 2 — Rated Indoor Airflow**

MODEL NUMBER	RATED INDOOR AIRFLOW (cfm)
48QE**07	2600
48QE**08	3000
48QE**09	3200

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

Position:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Example:	4	8	Q	E	S	M	0	8	A	2	A	6	-	3	A	0	A	0

**Unit Heat Type**  
48 = Gas Heat Packaged Rooftop

**Model Series - WeatherMaster®**  
QE = Mid Tier Hybrid Heat with Puron Advance™

**Heat Type**  
S = Low Gas Heat, Stainless Steel (SS) Heat Exchanger  
R = Medium Gas Heat, SS Heat Exchanger  
T = High Gas Heat, SS Heat Exchanger

**Refrigerant Options**  
M = Two Stage Cooling, Single Circuit  
N = Two Stage Cooling, Single Circuit with Humidi-MiZer® System  
T = Three Stage Cooling, Single Circuit  
U = Three Stage Cooling, Single Circuit with Humidi-MiZer System

**Cooling Tons**  
07 = 6.0 tons  
08 = 7.5 tons  
09 = 8.5 tons

**Sensor Options**  
A = None  
B = Return Air Smoke Detector (RA)  
C = Supply Air Smoke Detector (SA)  
D = RA + SA Smoke Detector  
J = Condensate Overflow Switch (COFS)  
K = Condensate Overflow Switch + RA Smoke Detector  
L = Condensate Overflow Switch + RA and SA Smoke Detectors  
M = Condensate Overflow Switch + SA Smoke Detector

**Indoor Fan Options - Vane Axial EcoBlue Fan System**  
2 = Standard/Medium Static Motor  
3 = High Static Motor  
5 = Standard/Medium Static Motor, Filter Status Switch  
6 = High Static Motor - Vertical Supply and Filter Status Switch

**Coil Options – RTPF (Outdoor – Indoor – Hail Guard)**  
A = Al/Cu – Al/Cu  
B = Precoat Al/Cu – Al/Cu  
C = E-coat Al/Cu – Al/Cu  
D = E-coat Al/Cu – E-coat Al/Cu  
M = Al/Cu – Al/Cu – Louvered Hail Guard  
N = Precoat Al/Cu – Al/Cu – Louvered Hail Guard  
P = E-coat Al/Cu – Al/Cu – Louvered Hail Guard  
Q = E-coat Al/Cu – E-coat Al/Cu – Louvered Hail Guards  
R = Cu/Cu – Al/Cu – Louvered Hail Guard  
S = Cu/Cu – Cu/Cu – Louvered Hail Guard

**Voltage**  
1 = 575-3-60  
5 = 208/230-3-60  
6 = 460-3-60

**Design Revision**  
- = Factory Design Revision

**Packaging Compliance**  
0 = Standard

**Electrical Options**  
A = None  
B = HACR Breaker  
C = Non-Fused Disconnect (NFDC)  
D = Thru-The-Base Connections (TTB)  
E = HACR +TTB  
F = NFDC + TTB  
N = Phase Monitor Protection (PMR)  
P = PMR + HACR  
Q = PMR + NFDC  
R = PMR + TTB  
S = PMR + HACR + TTB  
T = PMR + NFDC + TTB  
1 = HSCCR<sup>a</sup> (High Short Circuit Current Rating)  
2 = HSCCR<sup>a</sup> + TTB

**Service Options**  
0 = None  
1 = Unpowered Convenience Outlet (NPCO)  
2 = Powered Convenience Outlet (PCO)  
3 = Hinged Panels (HP)  
4 = Hinged Panels + NPCO  
5 = Hinged Access Panels + PCO  
6 = MERV-13 Filters (M13)  
7 = NPCO + MERV-13 Filters  
8 = PCO + MERV-13 Filters  
9 = Hinged Panels + MERV-13 Filters  
A = HP + NPCO + MERV-13 Filters  
B = HP + PCO + MERV-13 Filters  
C = Foil Faced Insulation (FF)  
D = FF + NPCO  
E = FF + PCO  
F = FF + HP  
G = FF + HP + NPCO  
H = FF + HP + PCO  
J = FF + MERV-13 Filters  
K = FF + NPCO + MERV-13 Filters  
L = FF + PCO + MERV-13 Filters  
M = FF + HP + MERV-13 Filters  
N = FF + HP + NPCO + MERV-13 Filters  
P = FF + HP + PCO + MERV-13 Filters

**Intake / Exhaust Options**  
A = None  
B = Temperature Economizer with Barometric Relief  
F = Enthalpy Economizer with Barometric Relief  
L = ULL (Ultra Low Leak) Temperature Economizer with Barometric Relief and CO<sub>2</sub> Sensor  
M = ULL Enthalpy Economizer with Barometric Relief and CO<sub>2</sub> Sensor  
U = ULL Temperature Economizer with Barometric Relief  
W = ULL Enthalpy Economizer with Barometric Relief

**Base Unit Controls**  
3 = SystemVu™ Controller

NOTE(S):  
<sup>a</sup> Not available on the following models/options: Size 09 (8.5 ton) units, 575V, Head Pressure Control, Phase Loss Monitor, Non-Fused Disconnect, HACR Breaker, Powered Convenience Outlet, or Two Stage units with Humidi-MiZer system.

**Fig. 1 — 48QE 07-09 Model Number Nomenclature (Example)**

NOTES:

1. DIMENSIONS ARE IN INCHES. DIMENSIONS IN [ ] ARE IN MILLIMETERS.

2. CENTER OF GRAVITY

3. DIRECTION OF AIR FLOW

4. ALL VIEW DRAWN USING 3RD ANGLE

UNIT	OUTDOOR COIL TYPE	J	K	H
48QE 07	RTPF	49 3/8 [1253]	36 3/8 [925]	15 7/8 [403]
48QE 08	RTPF	49 3/8 [1253]	36 3/8 [925]	15 7/8 [403]

RTPF - ROUND TUBE, PLATE FIN (COPPER/ALUM)



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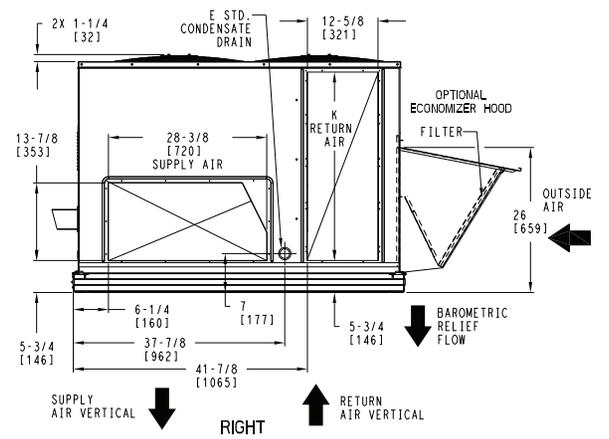
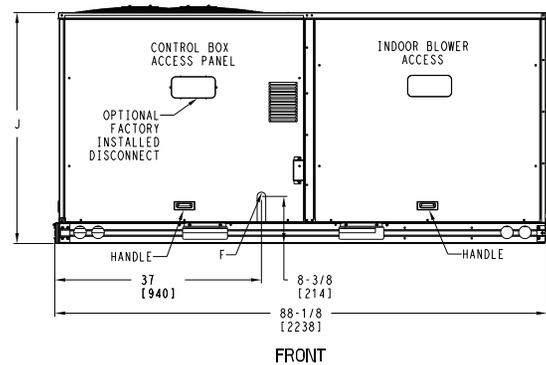
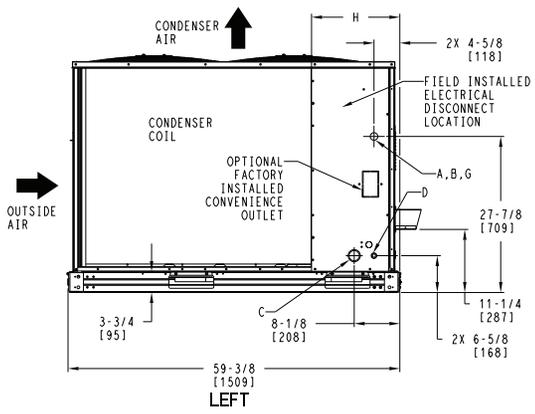
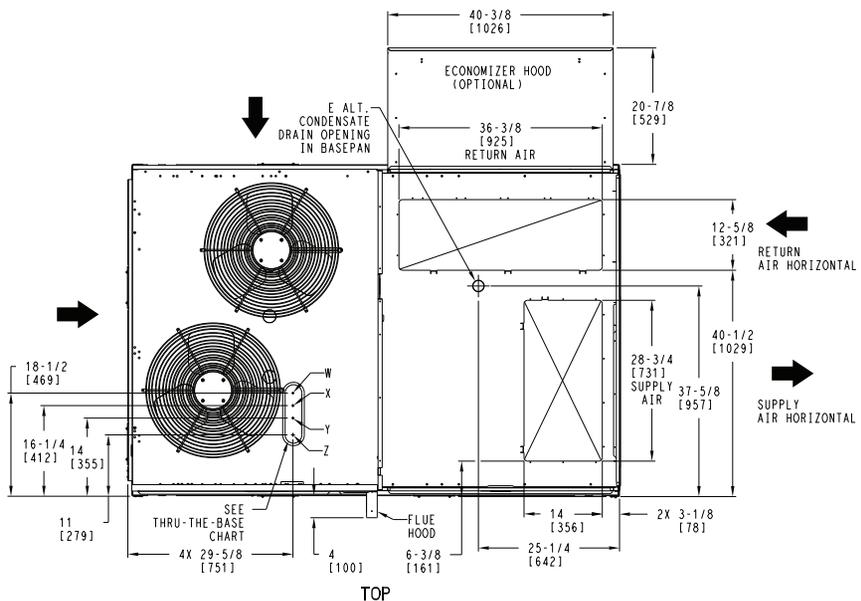
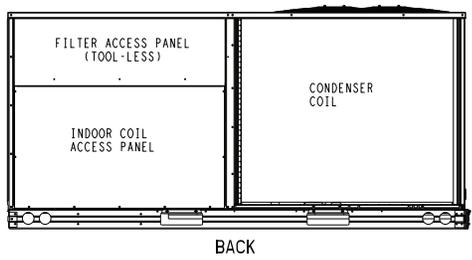
CONNECTION SIZES		
A	1 3/8" [35]	DIA FIELD POWER SUPPLY HOLE
B	2 1/2" [64]	DIA POWER SUPPLY KNOCKOUT
C	1 3/4" [51]	DIA GAUGE ACCESS PLUG
D	7/8" [22]	DIA FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT	CONDENSATE DRAIN
F	1/2"-14 NPT GAS CONNECTION	
G	3/4"-14 NPT GAS CONNECTION	
G	2" [51]	DIA POWER SUPPLY KNOCK-OUT

**THRU-THE-BASE CHART (FIELD INST)**  
 THESE HOLES REQUIRED FOR USE WITH ACCY KITS:  
 CRBTMPWR002A01: GAS THRU CURB  
 CRBTMPWR004A01: GAS THRU BASEPAN

	THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
W	1/2"	ACC.	7/8" [22.2]
X	1/2"	24V	7/8" [22.2]
Y	1 1/4" (002,004)	POWER	1 3/4" [44.4]
Z *	(004) 3/4" FPT	GAS	1 3/4" [44.4]

\* (002) PROVIDES 3/4" FPT THRU CURB FLANGE & FITTING. HOLE SIZE: 2" [50.8]

**THRU-THE-BASE CHART (FIOP)**  
 FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR ONLY X, Y, & Z ARE PROVIDED. \*\*  
 \*\* FOR BELOW LISTED MODELS, A FIELD SUPPLIED 1/2" ADAPTER IS REQUIRED BETWEEN BASE PAN FITTING AND GAS VALVE: 48QES\*08



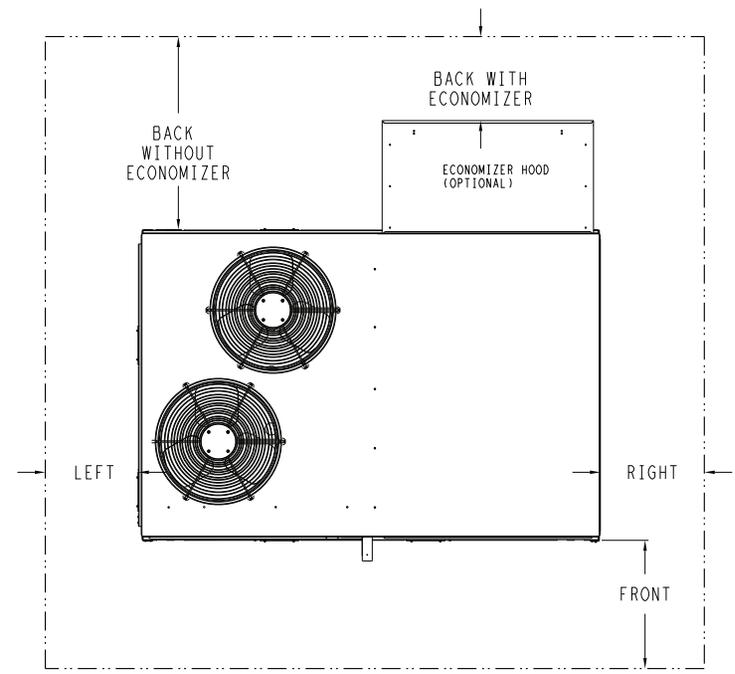
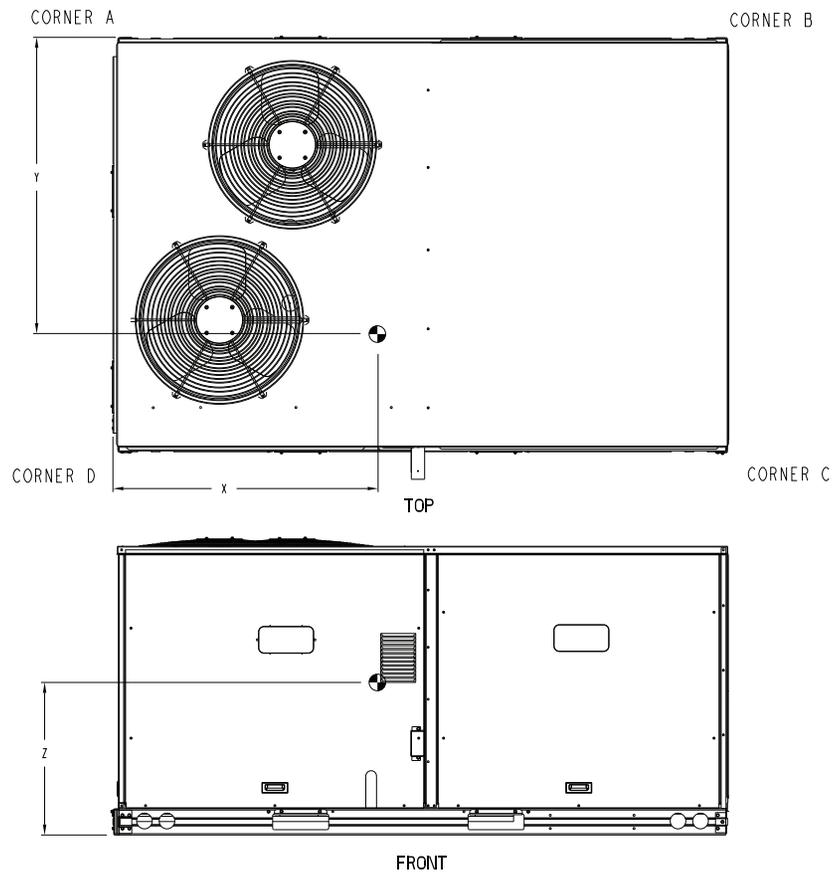
ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	48QE 07,08 SINGLE ZONE ELECTRICAL HEAT PUMP WITH GAS HEAT	48TM010127	REV
U.S. ECCN:NSR	1 OF 3	7/11/25	11/19/24			A

Fig. 2 — 48QE 07-08 Unit Dimensional Drawing

UNIT	OUTDOOR COIL TYPE	STD. UNIT WEIGHT ***		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C. G.		
		LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
48QE 07	RTPF	839	381	253	115	198	90	170	77	218	99	38 5/8 [981]	32 [813]	19 1/8 [486]
48QE 08	RTPF	875	397	264	120	206	93	177	80	227	103	38 5/8 [981]	32 [813]	19 1/8 [486]

RTPF - ROUND TUBE, PLATE FIN (COPPER/ALUM)

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

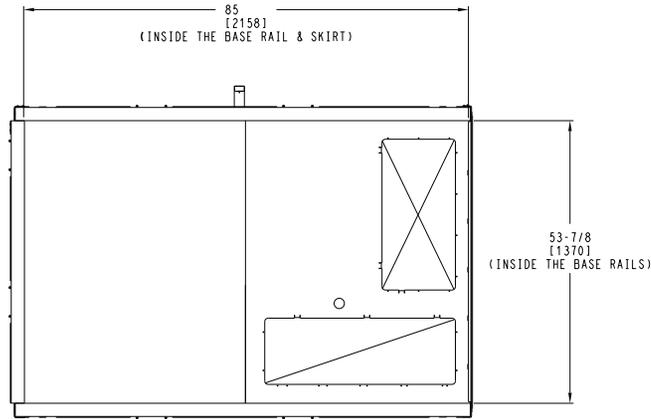
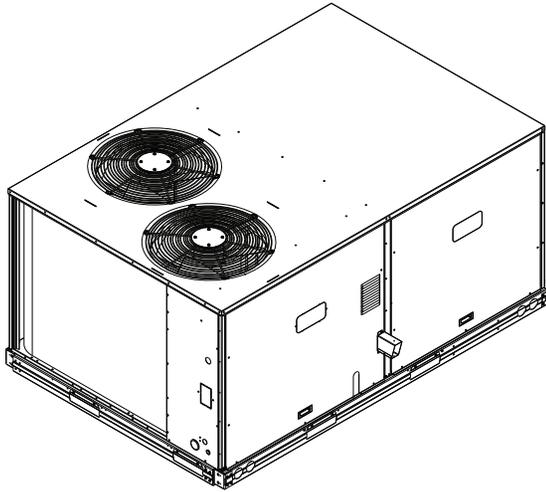


NOTE:  
1. FOR ALL MINIMUM CLEARANCES LOCAL CODES OR JURISDICTIONS MAY PREVAIL.

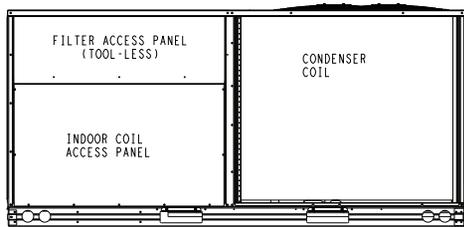
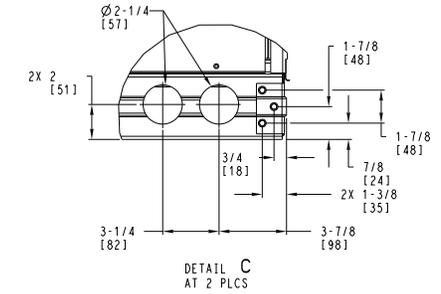
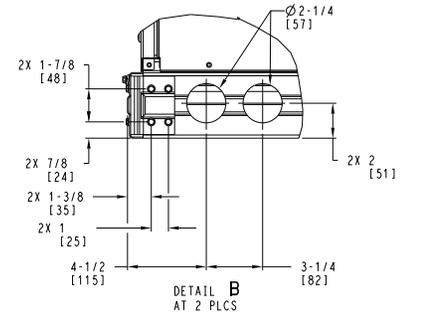
SURFACE	CLEARANCE		OPERATING CLEARANCE
	SERVICE WITH CONDUCTIVE BARRIER	SERVICE WITH NONCONDUCTIVE BARRIER	
FRONT	48 [1219mm]	36 [914mm]	18 [457mm]
LEFT	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK W/O ECON	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK W/ECON	36 [914mm]	36 [914mm]	18 [457mm]
RIGHT	36 [914mm]	36 [914mm]	18 [457mm]
TOP	72 [1829mm]	72 [1829mm]	72 [1829mm]

ITC CLASSIFICATION U.S. ECCN:NSR	SHEET 2 OF 3	DATE 07/11/25	SUPERCEDES 11/19/24	48QE 07,08 SINGLE ZONE ELECTRICAL HEAT PUMP WITH GAS HEAT	48TM010127	REV A
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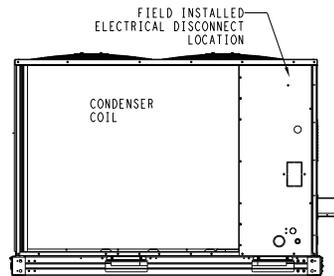
Fig. 2 — 48QE 07-08 Unit Dimensional Drawing (cont)



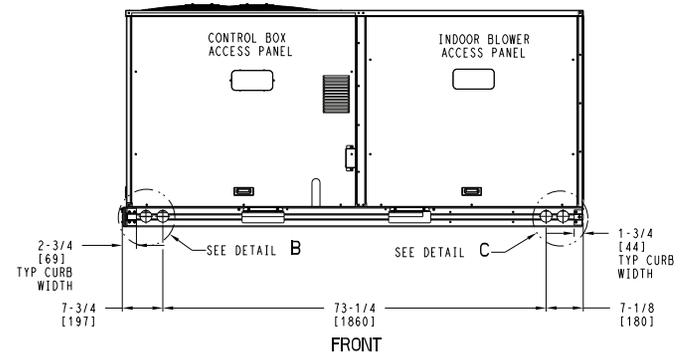
INSIDE BASERAIL DIMENSIONS  
BOTTOM



BACK



LEFT



FRONT

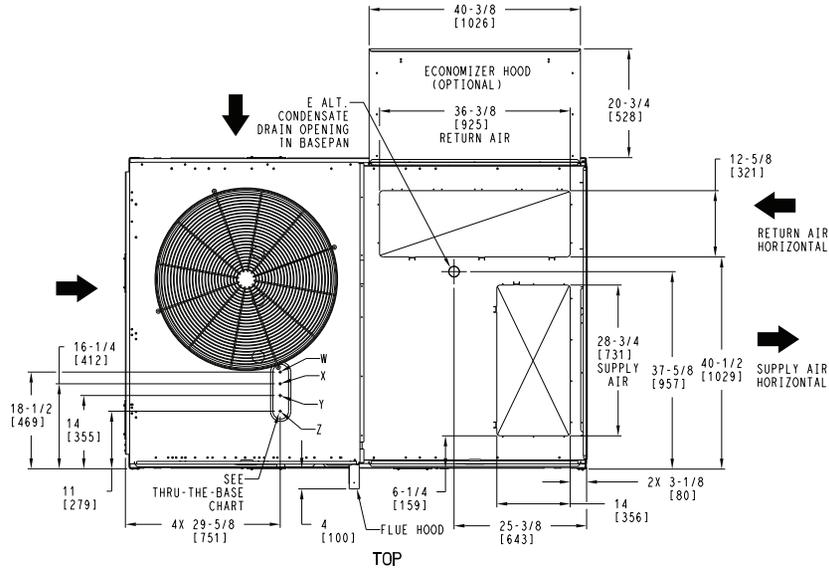
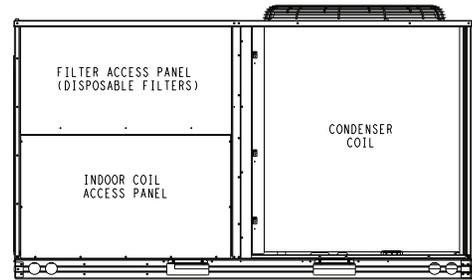
ITC CLASSIFICATION U.S. ECCN: NSR	SHEET 3 OF 3	DATE 7/11/25	SUPERCEDES 11/19/24	48QE 07,08 SINGLE ZONE ELECTRICAL HEAT PUMP WITH GAS HEAT	48TM010127	REV A
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Fig. 2 — 48QE 07-08 Unit Dimensional Drawing (cont)

NOTES:

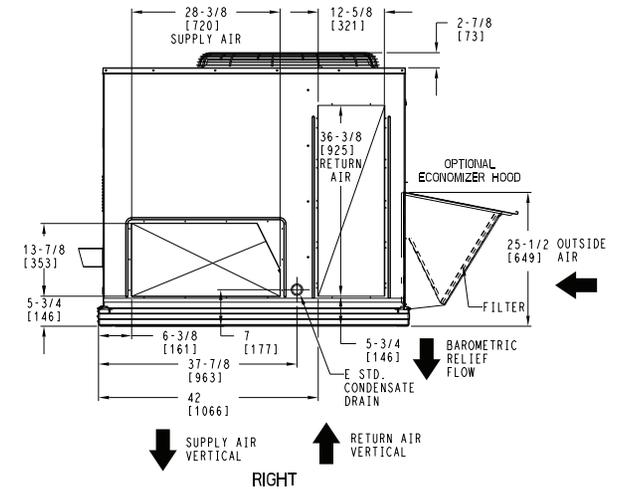
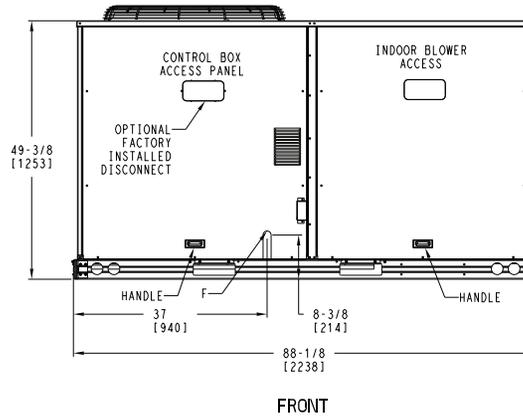
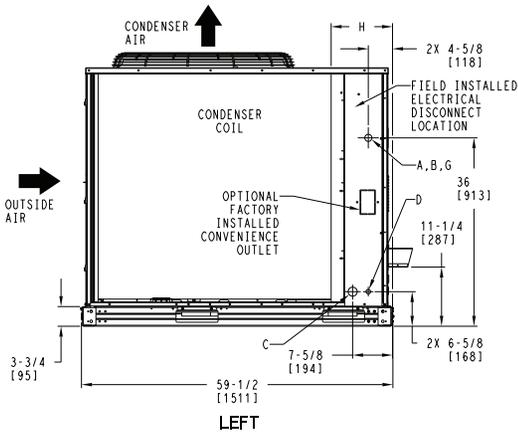
1. DIMENSIONS ARE IN INCHES. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. CENTER OF GRAVITY
3. DIRECTION OF AIR FLOW
4. ALL VIEW DRAWN USING 3RD ANGLE

UNIT	OUTDOOR COIL TYPE	H
48QE-09	RTPF	15 7/8 [403]
RTPF - ROUND TUBE, PLATE FIN (COPPER/ALUM)		



CONNECTION SIZES	
A	1 3/8" [35] DIA FIELD POWER SUPPLY HOLE
B	2 1/2" [64] DIA POWER SUPPLY KNOCKOUT
C	1 3/4" [51] DIA GAUGE ACCESS PLUG
D	7/8" [22] DIA FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
F	3/4"-14 NPT GAS CONNECTION
G	2" [51] DIA POWER SUPPLY KNOCK-OUT

THRU-THE-BASE CHART THESE HOLES REQUIRED FOR USE CRBTMPWR002A01.004A01			
	THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
W	1/2"	ACC.	7/8" [22.2]
X	1/2"	24V	7/8" [22.2]
Y	1 1/4" (002,004)	POWER	1 3/4" [44.4]
Z*	(004) 3/4" FPT	GAS	1 5/8" [41.3]
FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR ONLY X, Y, & Z ARE PROVIDED			
* (002) PROVIDES 3/4" FPT THRU CURB FLANGE & FITTING.			



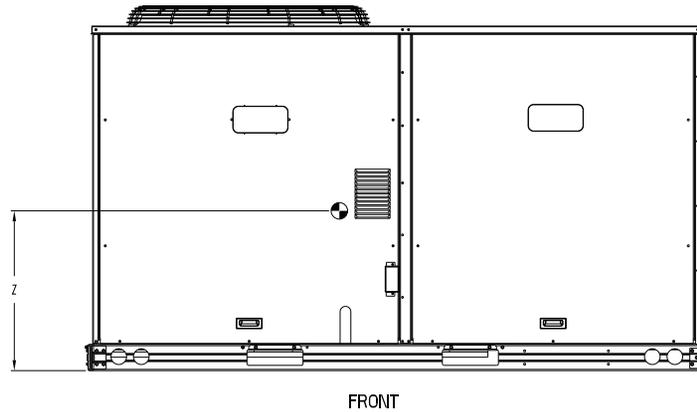
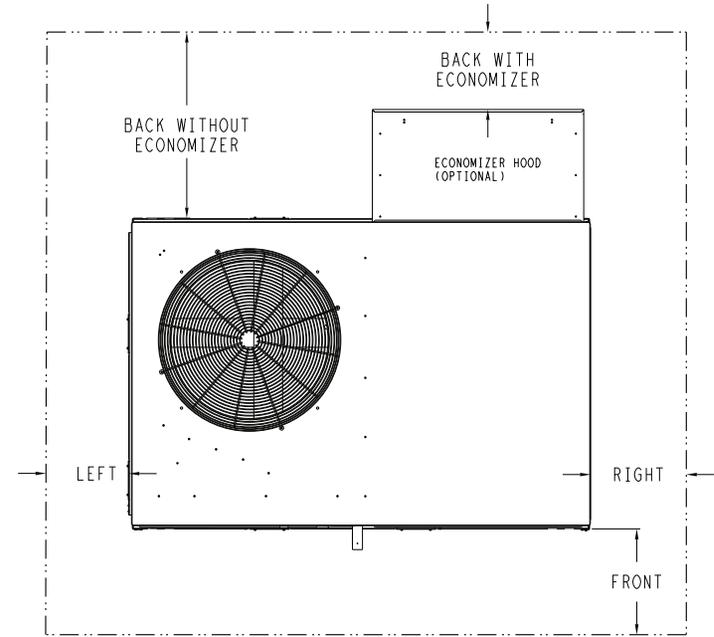
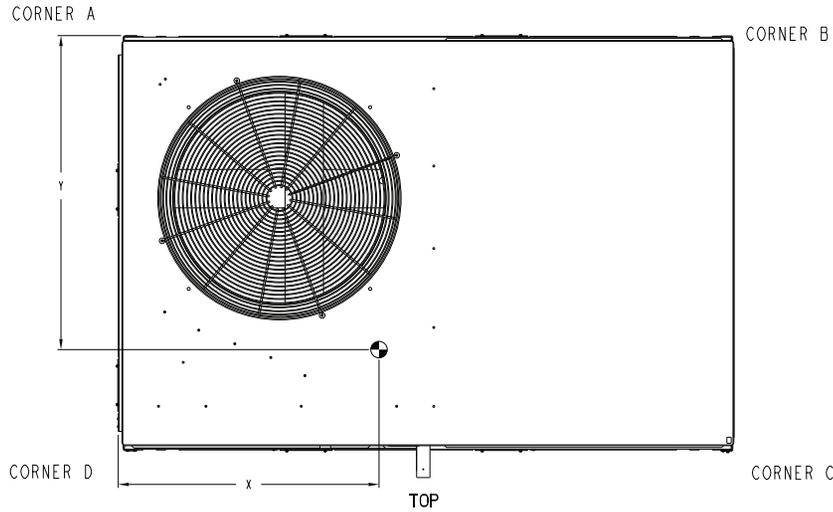
ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	48QE-09 SINGLE ZONE ELECTRICAL HEAT PUMP WITH GAS HEAT	48TM010128	REV
U.S. ECCN:NSR	1 OF 3	7/11/25	11/20/24			A

Fig. 3 — 48QE 09 Unit Dimensional Drawing

UNIT	OUTDOOR COIL TYPE	STD. UNIT WEIGHT***		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.					
		LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z			
48QE 09	RTPF	1010	458	310	141	242	110	201	91	257	117	38 5/8	1981	32 1/2	1826	19 1/8	1486

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

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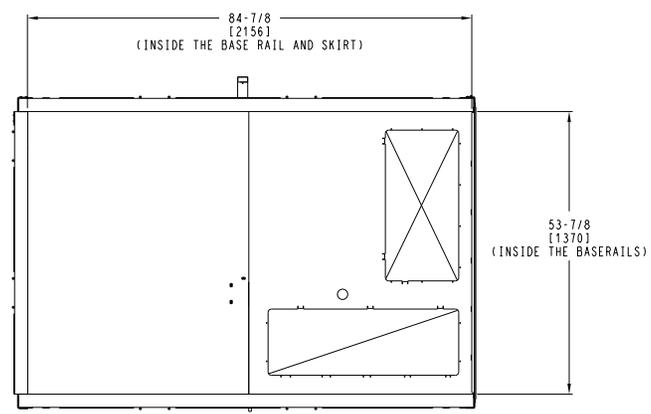
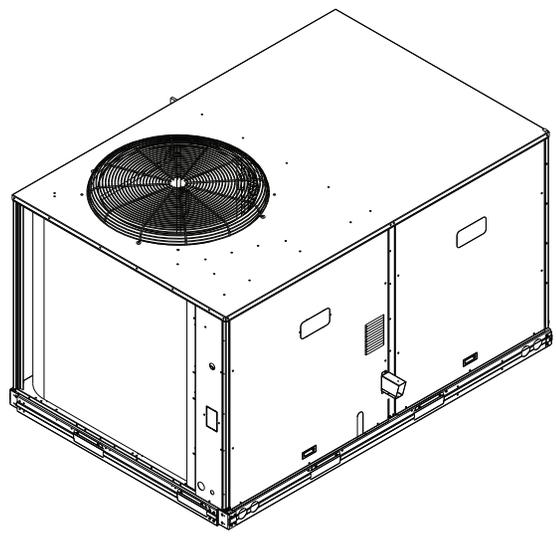
NOTE:  
1. FOR ALL MINIMUM CLEARANCES LOCAL CODES OR JURISDICTIONS MAY PREVAIL.

SURFACE	CLEARANCE		OPERATING CLEARANCE
	SERVICE WITH CONDUCTIVE BARRIER	SERVICE WITH NONCONDUCTIVE BARRIER	
FRONT	48 [1219mm]	36 [914mm]	18 [457mm]
LEFT	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK W/O ECON	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK W/ECON	36 [914mm]	36 [914mm]	18 [457mm]
RIGHT	36 [914mm]	36 [914mm]	18 [457mm]
TOP	72 [1829mm]	72 [1829mm]	72 [1829mm]

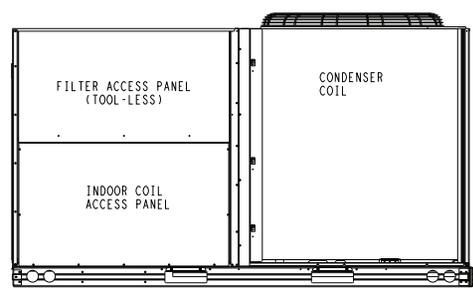
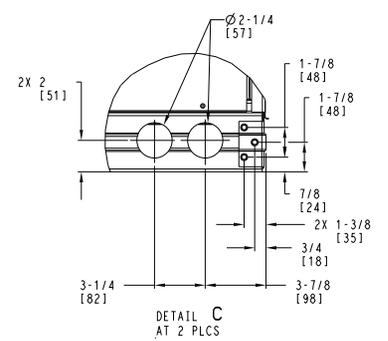
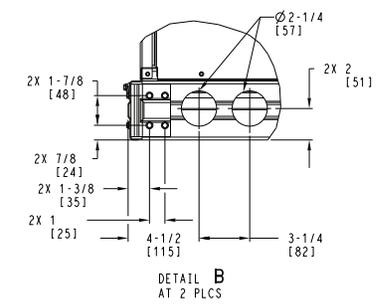
ITC CLASSIFICATION U.S. ECCN:NSR	SHEET 2 OF 3	DATE 7/11/25	SUPERCEDES 5/21/24	48QE-09 SINGLE ZONE ELECTRICAL HEAT PUMP WITH GAS HEAT	48TM010128	REV A
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Fig. 3 — 48QE 09 Unit Dimensional Drawing (cont)

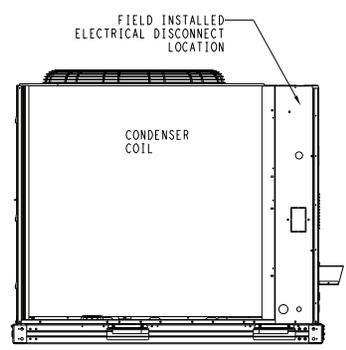
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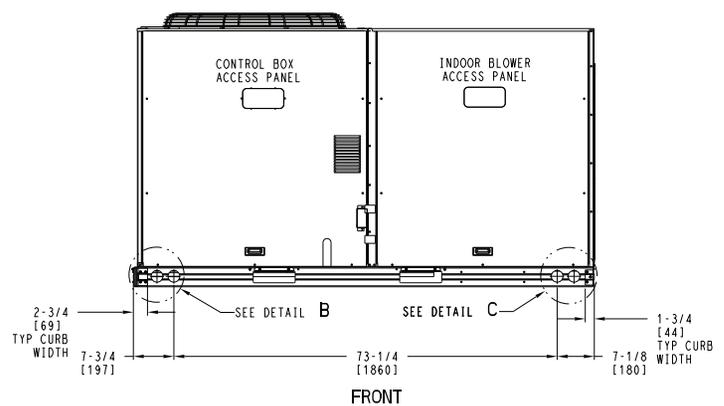
INSIDE BASERAIL DIMENSIONS  
BOTTOM



BACK



LEFT



FRONT

ITC CLASSIFICATION U.S. ECCN: NSR	SHEET 3 OF 3	DATE 7/11/25	SUPERCEDES 5/21/24	48QE-09 SINGLE ZONE ELECTRICAL HEAT PUMP WITH GAS HEAT	48TM010128	REV A
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Fig. 3 — 48QE 09 Unit Dimensional Drawing (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.

### Step 1 — Plan for Unit Location

Select a location for the unit and its support system (curb or other) that provides for minimum clearances required for safety (including clearance to combustible surfaces), unit performance and service access below, around and above unit as specified in unit drawings. See Fig. 2 on page 8 or Fig. 3 on page 11.

NOTE: Consider also 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 or other sources of contaminated air. For proper unit operation, adequate combustion and ventilation air must be provided in accordance with Section 5.3 (Air for Combustion and Ventilation) of the National Fuel Gas Code, ANSI Z223.1 (American National Standards Institute) and NFPA (National Fire Protection Association) 54 TIA-54-84-1. In Canada, installation must be in accordance with the CAN1-B149 installation codes for gas burning appliances.

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

Locate mechanical draft system flue assembly at least 4 ft (1.2 m) from any opening through which combustion products could enter the building, and at least 4 ft (1.2 m) from any adjacent building (or per local code). Locate the flue assembly at least 10 ft (3.05 m) from an adjacent unit's fresh air intake hood if within 3 ft (0.91 m) of same elevation (or per local code). When unit is located adjacent to public walkways, flue assembly must be at least 7 ft (2.1 m) above grade.

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 21 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**

48QE**	UNIT LB (KG)		
	07	08	09
<b>Base Unit</b>	839 (381)	875 (397)	1010 (458)
<b>Economizer</b>			
<b>Vertical</b>	75 (34)	75 (34)	75 (34)
<b>Horizontal</b>	127 (58)	127 (58)	127 (58)
<b>Humidi-MiZer® Coil</b>	25 (12)	34 (16)	34 (16)
<b>Powered Outlet</b>	35 (16)	35 (16)	35 (16)
<b>Curb</b>			
<b>14 in. (356 mm)</b>	143 (65)	143 (65)	143 (65)
<b>24 in. (610 mm)</b>	245 (111)	245 (111)	245 (111)

### 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.

### CURB-MOUNTED INSTALLATION

1. Install curb
2. Install field-fabricated ductwork inside curb
3. Install accessory thru-base service connection package (affects curb and unit) (refer to accessory installation instructions for details)
4. Prepare bottom condensate drain connection to suit planned condensate line routing (refer to Install External Condensate Trap and Line on page 21 for details)
5. Rig and place unit
6. Install outdoor air hood
7. Install flue hood
8. Install gas piping
9. Install condensate line trap and piping
10. Make electrical connections
11. Install other accessories

### PAD-MOUNTED INSTALLATION

1. Prepare pad and unit supports
2. Check and tighten the bottom condensate drain connection plug
3. Rig and place unit
4. Convert unit to side duct connection arrangement
5. Install field-fabricated ductwork at unit duct openings
6. Install outdoor air hood
7. Install flue hood
8. Install gas piping
9. Install condensate line trap and piping
10. Make electrical connections
11. Install other accessories

### 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. Do not remove carton until unit has been rigged and located in final position.

### Step 4 — Provide Unit Support

#### ROOF CURB MOUNT

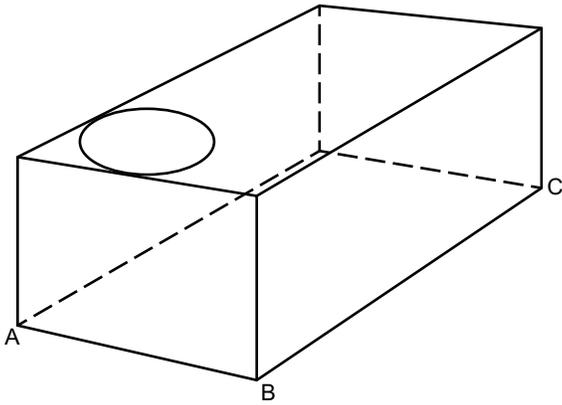
Accessory roof curb details and dimensions are shown in Fig. 5 (on page 15). Assemble and install accessory roof curb in accordance with instructions shipped with the curb.

Curb should be level. This is necessary for unit drain to function properly. Unit leveling tolerances are shown in Fig. 4. Refer to Accessory Roof Curb Installation Instructions for additional information as required.

Install insulation, cant strips, roofing felt, and counter flashing as shown. *Ductwork must be attached to curb and not to the unit. The accessory thru-the-base power and gas connection package must be installed before the unit is set on the roof curb.*

If electric and control wiring is to be routed through the basepan, attach the accessory thru-the-base service connections to the basepan in accordance with the accessory installation instructions.

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. 5. Improperly applied gasket can also result in air leaks and poor unit performance.



**MAXIMUM ALLOWABLE DIFFERENCE in. (mm)**

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

**Fig. 4 – Unit Leveling Tolerances**

**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.

**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. *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.

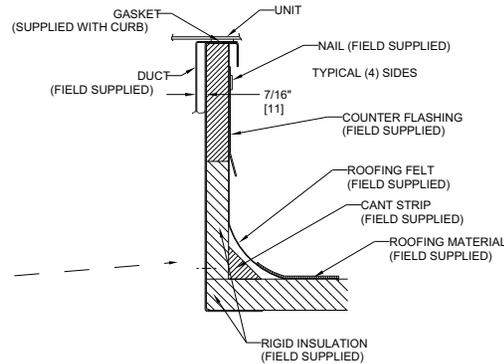
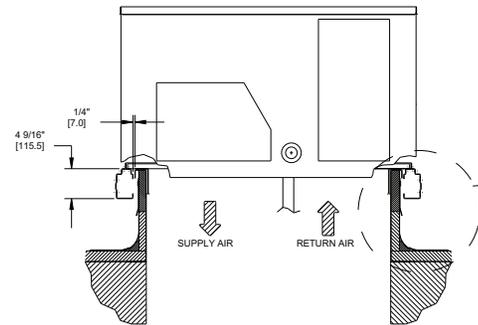
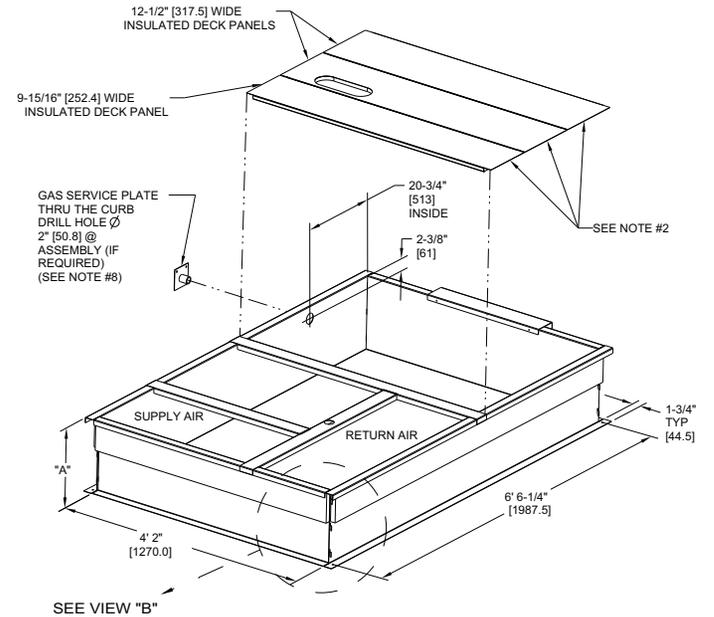
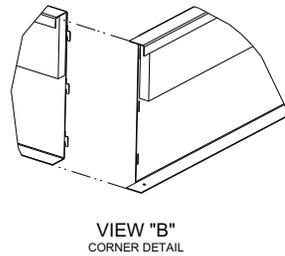
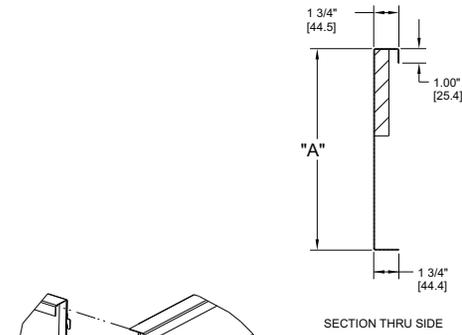
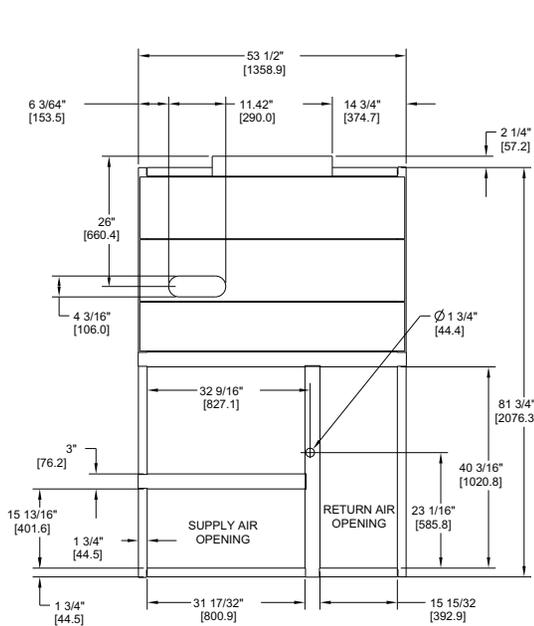
<b>⚠ CAUTION</b>
<b>PROPERTY DAMAGE HAZARD</b>
Failure to follow this caution may result in damage to roofing materials.
Membrane roofs can be cut by sharp sheet metal edges. Be careful when placing any sheet metal parts on such roof.

<b>⚠ WARNING</b>
<b>PERSONAL INJURY HAZARD</b>
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.

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				



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TITLE	
CURB ASY, ROOF	
DRAWING NUMBER	REV
50HJ405012	C

Fig. 5 — Roof Curb Details

## Step 6 — Rig and Place Unit

Keep unit upright and do not drop. Spreader bars are required. Rollers may be used to move unit across a roof. Level by using unit frame as a reference. See Table 3 and Fig. 6 on page 16 for additional information.

Lifting holes are provided in base rails as shown in Fig. 6. Refer to rigging instructions on unit.

Rigging materials under unit (cardboard or wood to prevent base pan damage) 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 drain pan can be tightened with a 1/2 in. square socket drive extension. For further details see Install External Condensate Trap and Line on page 21.

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.

### POSITIONING ON CURB

Position unit on roof curb so that the following clearances are maintained: 1/4-in. (6.4 mm) clearance between the roof curb and

the base rail inside the front and back, 0.0-in. clearance between the roof curb and the base rail inside on the duct end of the unit. This will result in the distance between the roof curb and the base rail inside on the condenser end of the unit being approximately 1/4-in. (6.4 mm).

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

Flue vent discharge must have a minimum horizontal clearance of 4 ft (1220 mm) from electric and gas meters, gas regulators, and gas relief equipment. Minimum distance between unit and other electrically live parts is 48 inches (1220 mm).

Flue gas can deteriorate building materials. Orient unit such that flue gas will not affect building materials. Locate mechanical draft system flue assembly at least 48-in. (1220 mm) from an adjacent building or combustible material.

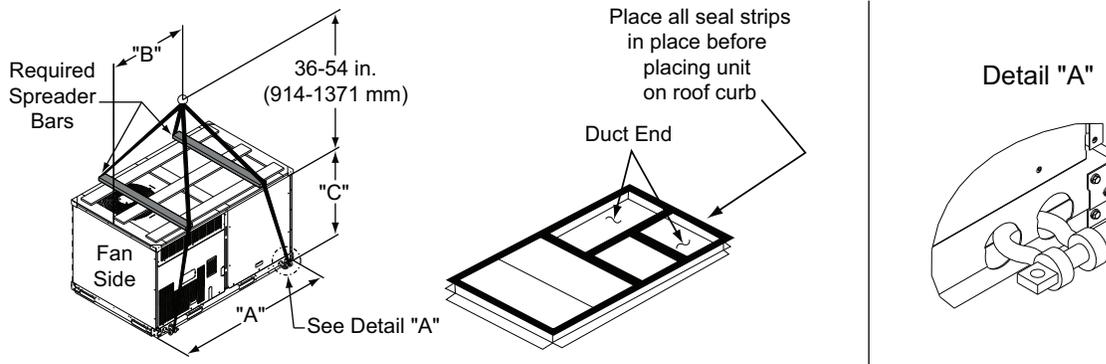
NOTE: Installation of accessory flue discharge deflector kit will reduce the minimum clearance to combustible material to 18-in. (460 mm).

After unit is in position, remove rigging skids and shipping materials.

**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 sections:

**Factory-Option Thru-Base Gas Connections**  
see page 20

**Factory-Option Thru-Base Electrical Connections**  
see page 26



#### NOTE(S):

1. SPREADER BARS ARE REQUIRED. Top damage will occur if spreader bars are not used.
2. 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. Use wooden top to prevent rigging straps from damaging unit.

UNIT	MAX WEIGHT		DIMENSIONS					
			A		B		C	
	lb	kg	in.	mm	in.	mm	in.	mm
48QE**07	1411	640	88.0	2235	38.5	980	49.5	1255
48QE**08	1476	670	88.0	2235	38.5	980	49.5	1255
48QE**09	1661	753	88.0	2235	38.5	980	49.5	1255

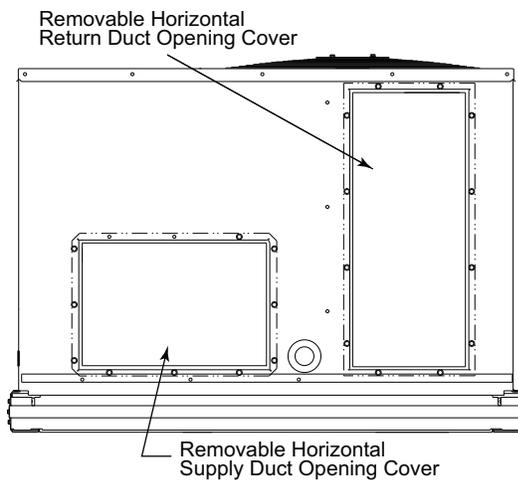
Fig. 6 — Rigging Details

## Step 7 — Convert to Horizontal and Connect Ductwork (when required)

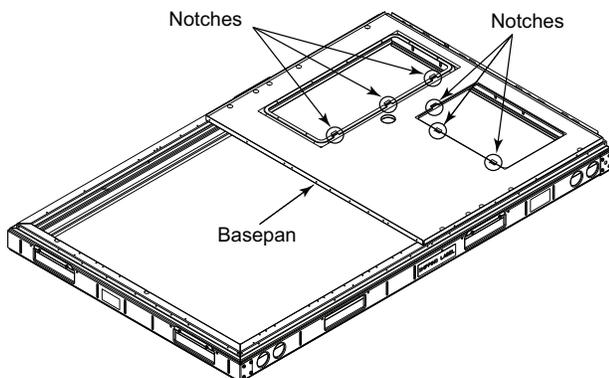
Unit is shipped in the vertical duct configuration. Unit without factory-installed economizer or return-air smoke detector option may be field-converted to horizontal ducted configuration. To convert to horizontal configuration, remove screws from side duct opening covers (see Fig. 7) and remove covers. Use the screws to install the covers on vertical duct openings with the insulation-side down. The panels must be inserted into the notches on the basepan to properly seal. The notches are covered by the tape used to secure the insulation to the basepan and are not easily seen. See Fig. 8 for position of the notches in the basepan. Seals around duct openings must be tight. Secure with screws as shown in Fig. 9. Cover seams with foil duct 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.

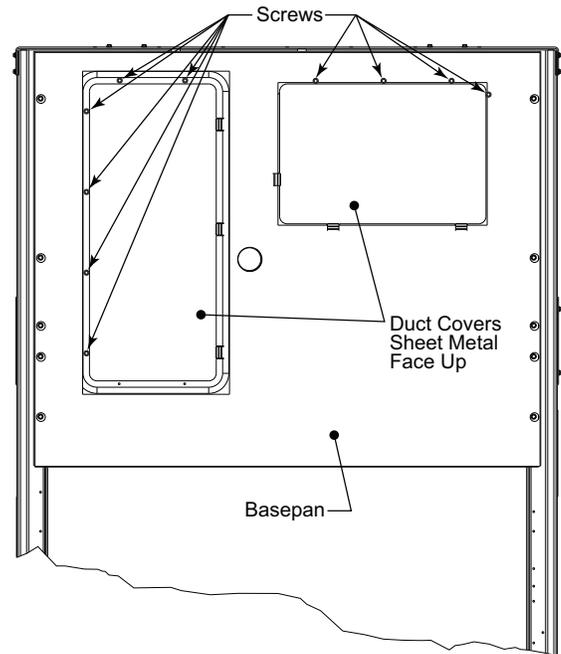
Do not cover or obscure visibility to the unit's informative data plate when insulating horizontal ductwork.



**Fig. 7 — Horizontal Conversion Panels**



**Fig. 8 — Location of Notches**

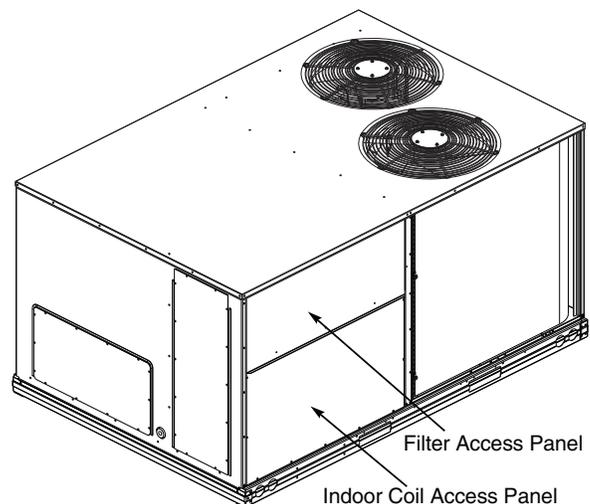


**Fig. 9 — Horizontal Duct Panels In Place**

## Step 8 — Install Outside Air Hood

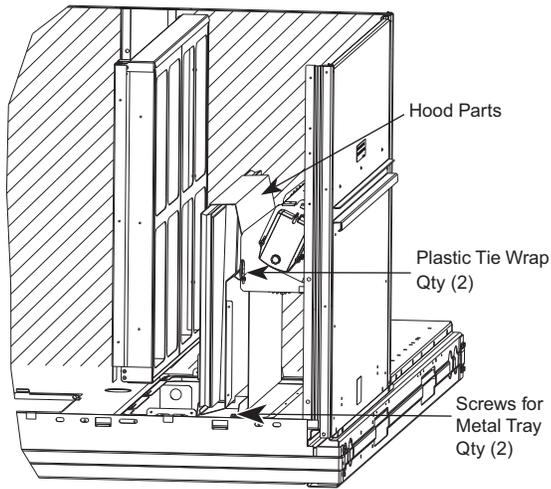
### ECONOMIZER HOOD PACKAGE REMOVAL (FACTORY OPTION)

1. 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.
2. To gain access to the hood, remove the filter access panel. (See Fig. 10.)



**Fig. 10 — Typical Access Panel Locations**

3. 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. 11.) Be careful to not damage any wiring or cut tie-wraps securing any wiring.



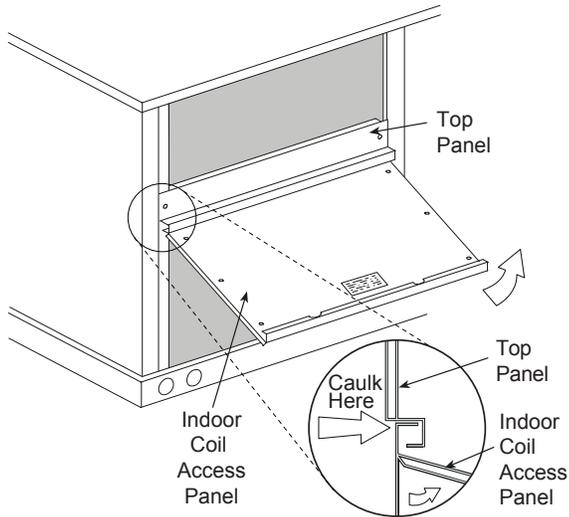
**Fig. 11 – Economizer Hood Parts Location**

- 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**

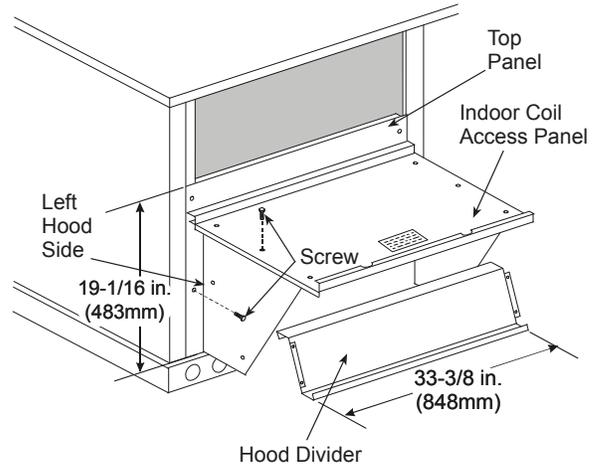
NOTE: If the power exhaust accessory is to be installed on the unit, the hood shipped with the unit will not be used and must be discarded. Save the aluminum filter for use in the power exhaust hood assembly.

- 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. 12.



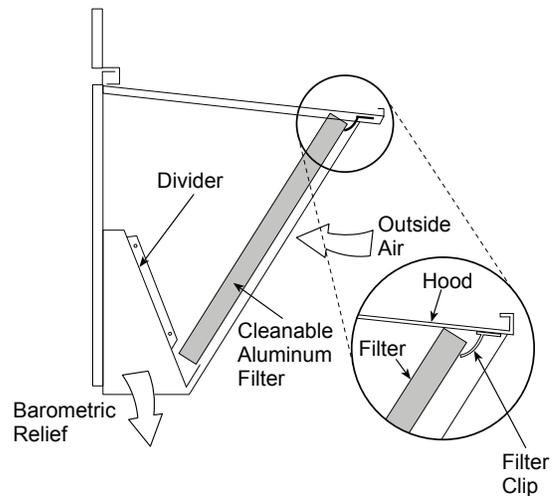
**Fig. 12 – Indoor Coil Access Panel Relocation**

- 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. 13.



**Fig. 13 – Economizer Hood Construction**

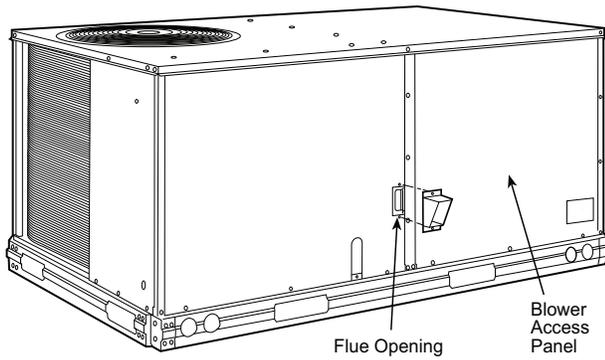
- Remove the shipping tape holding the economizer barometric relief damper in place (economizer only).
- Insert the hood divider between the hood sides. See Fig. 13 and 14. Secure hood divider with 2 screws on each hood side. The hood divider is also used as the bottom filter rack for the aluminum filter.
- 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. 14.
- Caulk the ends of the joint between the unit top panel and the hood top.
- Replace the filter access panel.



**Fig. 14 – Economizer Filter Installation**

**Step 9 – Install Flue Hood**

Flue hood is shipped screwed to the basepan beside the burner compartment access panel. Remove from shipping location and using screws provided, install flue hood and screen in location shown in Fig. 15.



**Fig. 15 – Flue Hood Details**

### Step 10 – 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 in 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 (NG) 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 (LP) fuel. See accessory kit installation instructions regarding these accessories.

NOTE: Furnace gas input rate on rating plate is for installation up to 2000 ft (610 m) above sea level. The input rating for altitudes above 2000 ft (610 m) must be derated by 4% for each 1000 ft (305 m) above sea level.

NOTE: Installation of this furnace at altitudes above 2000 ft (610 m) shall be made in accordance with the Listed High Altitude Conversion Kit available with this furnace.

NOTE: L'installation de ce générateur de chaleur à des altitudes supérieures à 2000 pi (610 mm) doit être effectuée conformément aux instructions accompagnant la trousse de conversion pour haute altitude fournie avec cet appareil.

For natural gas applications, gas pressure at unit gas connection must not be less than 4 in. wg (996 Pa) or greater than 13 in. wg (3240 Pa) while the unit is operating (see Table 4). For liquefied petroleum applications, the gas pressure must not be less than 11 in. wg (2740 Pa) or greater than 13.0 in. wg (3240 Pa) at the unit connection (see Table 5).

**Table 4 – Natural Gas Supply Line Pressure Ranges**

UNIT MODEL	UNIT SIZE	MIN.	MAX.
48QE/S/R/T	07, 08, 09	4.0 in. wg (996 Pa)	13.0 in. wg (3240 Pa)

**Table 5 – Liquid Propane Supply Line Pressure Ranges**

UNIT MODEL	UNIT SIZE	MIN.	MAX.
48QE/S/R/T	07, 08, 09	11.0 in. wg (2740 Pa)	13.0 in. wg (3240 Pa)

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 1/2-in. FPT gas inlet port on the unit gas valve (see Table 6).

Manifold pressure is factory-adjusted for NG fuel use. Adjust as required to obtain best flame characteristics.

**Table 6 – Natural Gas Manifold Pressure Ranges**

UNIT MODEL	UNIT SIZE	HIGH FIRE	LOW FIRE <sup>a</sup>
48QES/R/T	07, 08, 09	3.5 in. wg (872 Pa)	2.0 in. wg (498 Pa)

NOTE(S):

a. LOW FIRE, 1.7 in. wg (423 Pa), applies to the following units only: 48QES\*07, 48QES\*08, and 48QES\*09.

Manifold pressure for LP fuel use must be adjusted to specified range (see Table 7). Follow instructions in the accessory kit to make initial readjustment.

**Table 7 – Liquid Propane Manifold Pressure Ranges**

UNIT MODEL	UNIT SIZE	HIGH FIRE	LOW FIRE <sup>a</sup>
48QES/R/T	07, 08, 09	10.0 in. wg (2490 Pa)	5.7 in. wg (1420 Pa)

NOTE(S):

a. LOW FIRE, 5.0 in. wg (1420 Pa), applies to the following units only: 48QES\*07, 48QES\*08, and 48QES\*09.

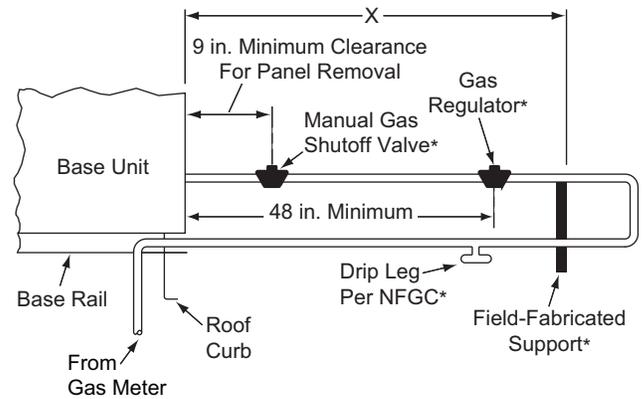
**⚠ CAUTION**

**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.

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. Do not use a pipe size smaller than 1/2-inch. Size the gas supply line to allow for a maximum pressure drop of 0.5 in. wg (124 Pa) between gas regulator source and unit gas valve connection when unit is operating at high-fire flow rate.

The gas supply line can approach the unit in three ways: horizontally from outside the unit (across the roof), thru-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. 16.



LEGEND  
NFGC — National Fuel Gas Code

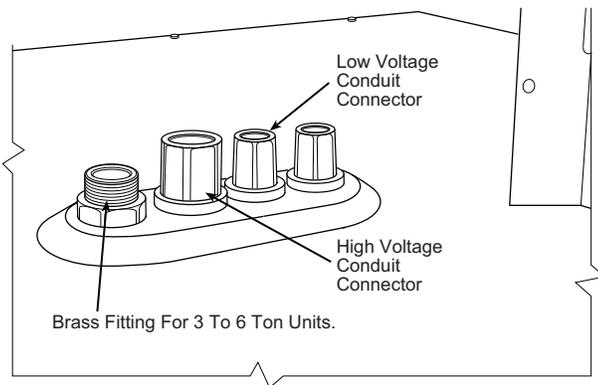
NOTE: Follow all local codes.  
\*Field-installed.

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. 16 – Gas Piping Guide (with Accessory Thru-the-Curb Service Connections)**

## FACTORY OPTION THRU-BASE GAS CONNECTIONS

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. 17.

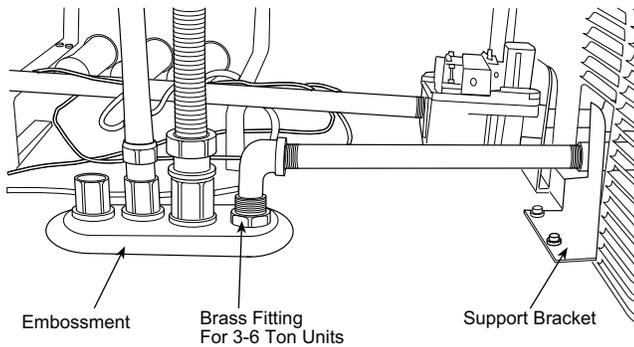


**Fig. 17 — Thru-Base Connection Fittings**

The thru-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.

Check tightness of connector lock nuts before connecting gas piping.

Install a 1/2-in. NPT street elbow on the thru-base gas fitting. Attach a 1/2-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. 18.

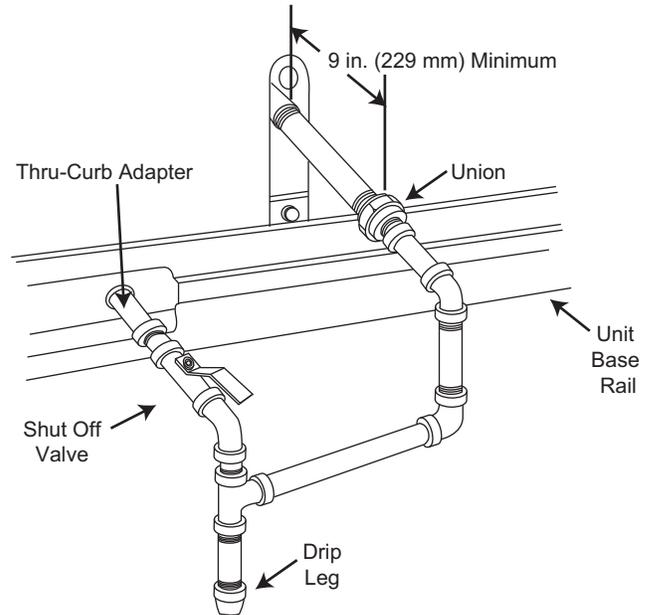


**Fig. 18 — Gas Line Piping**

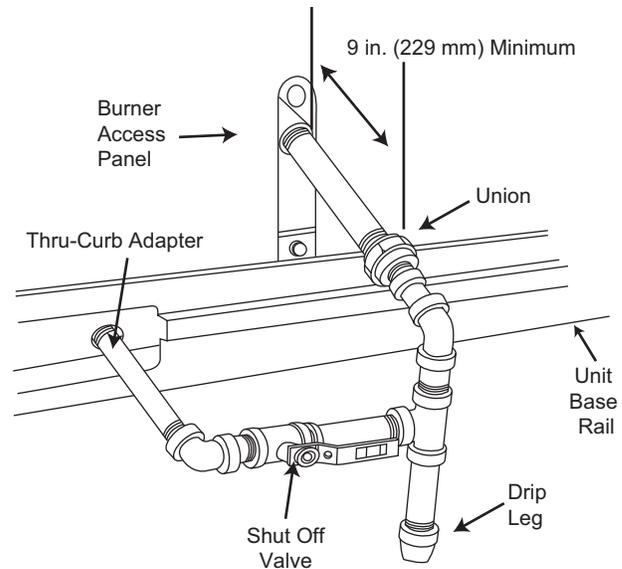
Other hardware required to complete the installation of the gas supply line will include a manual shutoff valve, a sediment trap (drip leg), and a ground-joint union. A pressure regulator valve may also be required (to convert gas pressure from pounds to inches of pressure). The manual shutoff valve 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. 19 and 20 for typical piping arrangements for gas piping that has been routed through the sidewall of the curb. See Fig. 21 for typical piping arrangement when thru-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.

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:

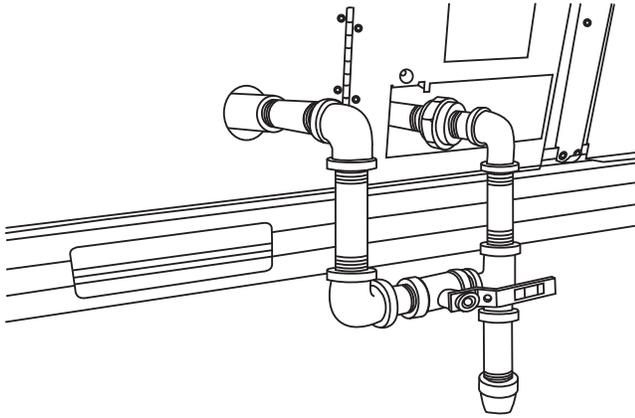
1. Avoid low spots in long runs of pipe. Grade all pipe 1/4-in. in every 15 ft (7 mm in every 5 m) to prevent traps. Grade all horizontal runs downward to risers. Use risers to connect to heating section and to meter.
2. Protect all segments of piping system against physical and thermal damage. Support 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.



**Fig. 19 — Gas Piping, Typical Curb Sidewall Piping (Example 1)**



**Fig. 20 — Gas Piping, Typical Curb Sidewall Piping (Example 2)**

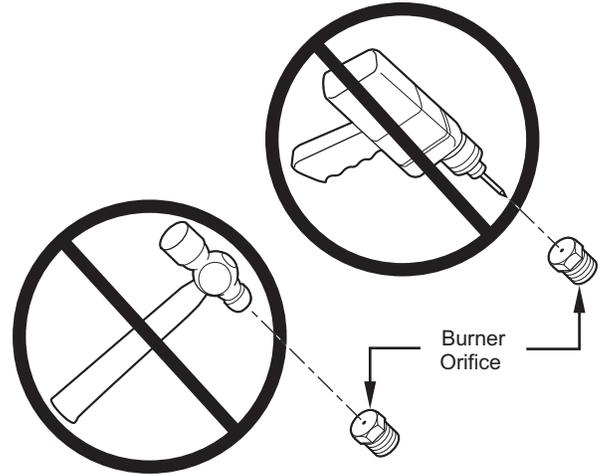


**Fig. 21 — Gas Piping Thru-Base Connections**

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<sup>®1</sup>) 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.

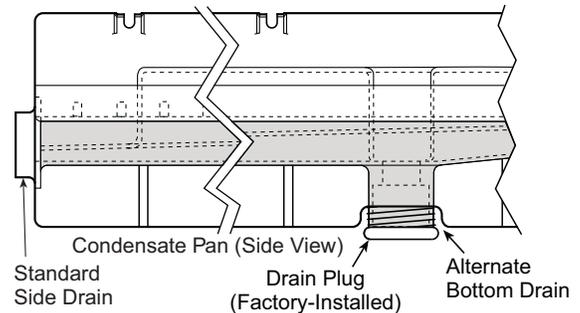
Check for gas leaks at the field-installed and factory-installed gas lines after all piping connections have been completed. Use soap-and-water solution (or method specified by local codes and/or regulations).



**Fig. 22 — Orifice Hole**

**Step 11 — 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.

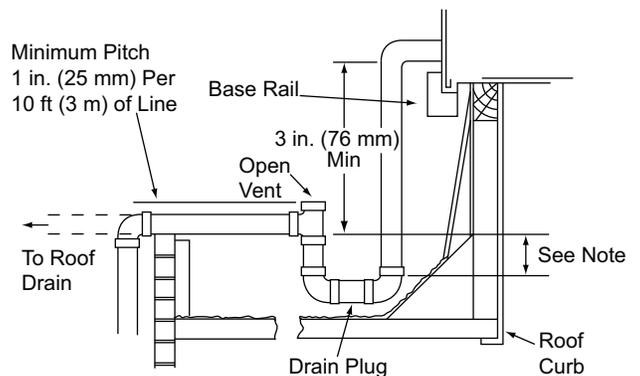


**Fig. 23 — Condensate Drain Pan (Side View)**

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.

**NOTE:** If the alternate bottom drain is not used check the drain plug for tightness prior to setting the unit on the roof curb.



**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**

**⚠ 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 (see Fig. 22). A burr-free and squarely aligned orifice hole is essential for proper flame characteristics.

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

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.).

## Step 12 — Make Electrical Connections

### ⚠ WARNING

#### ELECTRIC SHOCK HAZARD

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

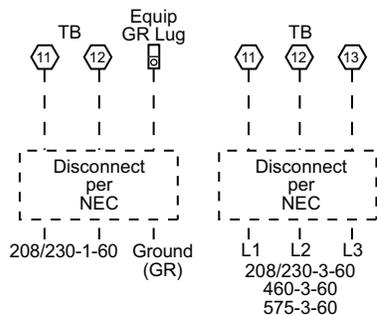
Unit cabinet must have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur. This ground may consist of electrical wire connected to unit ground lug in control compartment, or conduit approved for electrical ground when installed 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

If equipped with optional powered convenience outlet: The power source leads to the convenience outlet's transformer primary are not factory connected. Installer must connect these leads according to required operation of the convenience outlet. If an always-energized convenience outlet operation is desired, connect the source leads to the line side of the unit-mounted disconnect. (Check with local codes to ensure this method is acceptable in your area.) If a de-energize via unit disconnect switch operation of the convenience outlet is desired, connect the source leads to the load side of the unit disconnect. On a unit without a unit-mounted disconnect, connect the source leads to compressor contactor C and indoor fan contactor IFC pressure lugs with unit field power leads (see Fig. 25).

#### Units Without Non-Fused Disconnect or HACR Option



#### Units With Non-Fused Disconnect or HACR Option

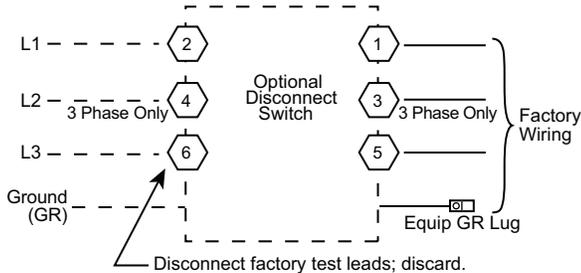


Fig. 25 — Power Wiring Connections

Field power wires will be connected at the line-side pressure lugs on the power terminal block or at factory-installed option non-fused disconnect or HACR.

#### FIELD POWER WIRING CONNECTIONS

Field power wires are connected to the unit at line-side pressure lugs on compressor contactor C and indoor fan contactor IFC (see wiring diagram label for control box component arrangement), or at factory-installed option non-fused disconnect switch or HACR. Max wire size is no. 4ga AWG (copper only) per pole on contactors, no. 4ga AWG (copper only) or 1/0 AWG (copper only) per pole on optional disconnect (max wire size depends on the disconnect size supplied with unit), 1/0 AWG (copper only) on optional HACR and 4/0 AWG (copper only) per pole on terminal or fuse block on units with single point box. See Fig. 25 and unit label diagram for field power wiring connections.

Refer to Table 8 for maximum wire sizes at connection lugs Use copper wire only. See Fig. 25 and 26.

NOTE: TEST LEADS - Unit may be equipped with short leads (pigtailed) on the field line connection points on contactor C or optional disconnect switch. 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.

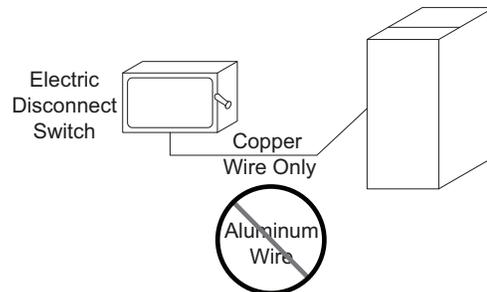


Fig. 26 — Disconnect Switch and Unit

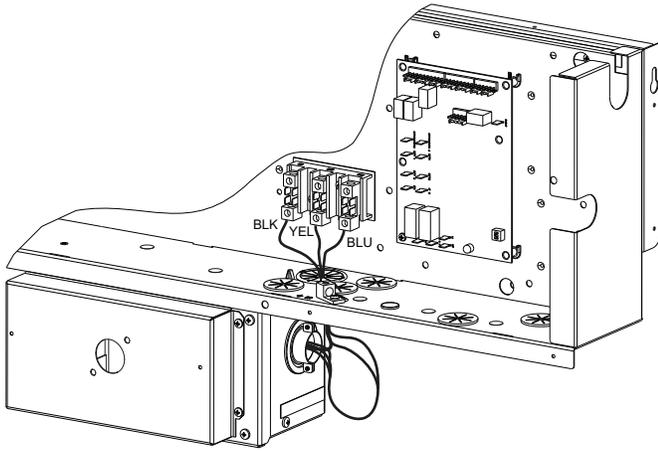
Table 8 — Connection Lug Min/Max Wire Sizes

	Minimum	Maximum
<b>TB1 In Unit Control Box</b>	#14	#1
<b>80A Disconnect Option</b>	#14	#4
<b>100A Disconnect Option</b>	#8	1/0

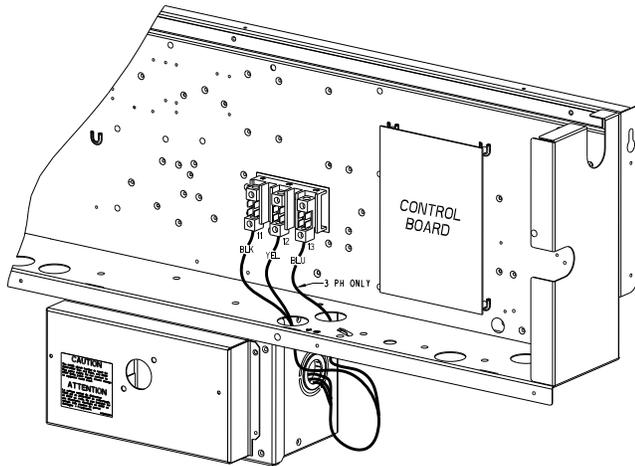
#### UNITS WITH FACTORY-INSTALLED NON-FUSED DISCONNECT OR HACR

The factory-installed option non-fused disconnect (NFD) (see Fig. 27) or HACR (see Fig. 28) switch is located in a weatherproof enclosure located under the main control box. The manual switch handle and shaft are shipped in the disconnect or HACR enclosure. Assemble the shaft and handle to the switch at this point. Discard the factory test leads (see Fig. 25). Connect field power supply conductors to LINE side terminals when the switch enclosure cover is removed to attach the handle.

Connect field power supply conductors to LINE side terminals when the switch enclosure cover is removed to attach the handle.



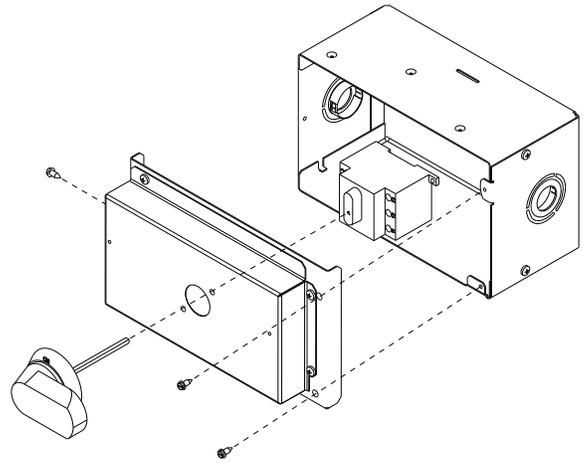
**Fig. 27 — Location of Non-Fused Disconnect Enclosure**



**Fig. 28 — Location of HACR Circuit Breaker Enclosure**

*To field install the NFD shaft and handle (see Fig. 29):*

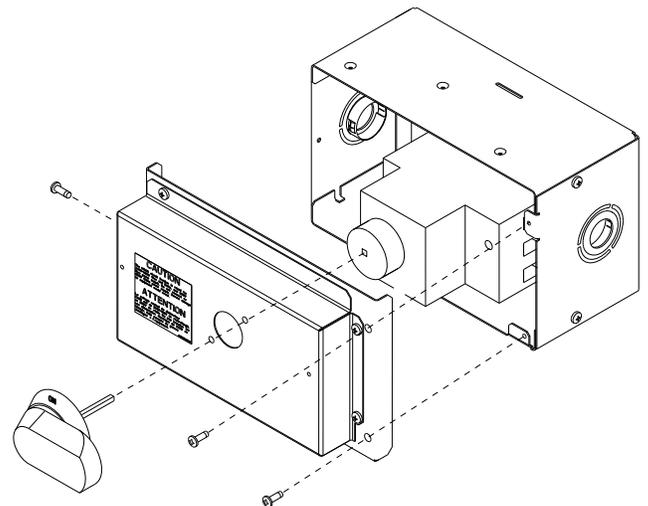
1. Remove the unit front panel (see Fig. 2 and 3).
2. Remove (3) hex screws on the NFD enclosure - (2) on the face of the cover and (1) on the left side cover.
3. Remove the front cover of the NFD enclosure.
4. Make sure the NFD shipped from the factory is at OFF position (the arrow on the black handle knob is at OFF).
5. Insert the shaft with the cross pin on the top of the shaft in the horizontal position.
6. Measure from the tip of the shaft to the top surface of the black pointer; the measurement should be 3.75 in. to 3.88 in. (95 mm to 99 mm).
7. Tighten the locking screw to secure the shaft to the NFD.
8. Turn the handle to the OFF position with red arrow pointing to 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. 29 — Handle and Shaft Assembly for NFD**

*To field install the HACR circuit breaker shaft and handle (see Fig. 30):*

1. Remove the unit front panel (see Fig. 2 or Fig. 3).
2. Remove (3) hex screws on the HACR enclosure - (2) on the face of the cover and (1) on the left side cover.
3. Remove the front cover of the HACR enclosure.
4. Make sure the HACR circuit breaker shipped from the factory is at OFF position (the white arrow pointing at OFF).
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 circuit breaker.
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 circuit breaker enclosure.
11. Re-install the unit front panel.



**Fig. 30 — Handle and Shaft Assembly for HACR Circuit Breaker**

**UNITS WITHOUT FACTORY-INSTALLED NON-FUSED DISCONNECT OR HACR CIRCUIT BREAKER**

When installing units, provide a disconnect switch per NEC (National Electrical Code) of adequate size. 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.

**FIELD WIRING COMPLIANCE**

All field wiring must comply with NEC and all local code requirements. Size wire based on MCA (Minimum Circuit Amps) on the unit informative plate. See Fig. 25 and unit label diagram for power wiring connections to the unit and equipment ground. Maximum wire size is no. 4 ga AWG (copper only) per pole on contactors and no. 2 ga AWG (copper only) per pole on optional non-fused disconnect or HACR.

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 Over-current Protection) device size.

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

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.

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 following formula to determine the percent of voltage imbalance. 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.

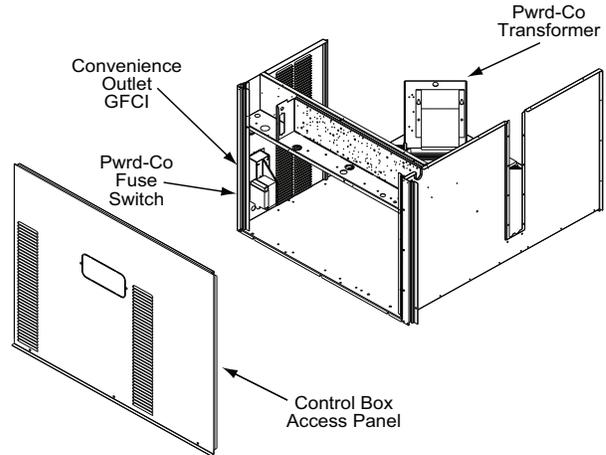
**CONVENIENCE OUTLETS**

<b>⚠ WARNING</b>
<b>ELECTRICAL OPERATION HAZARD</b>
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 48QE models: 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 end panel of the unit. See Fig. 31.

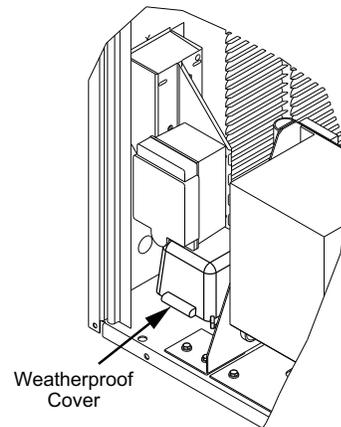
**Installing Weatherproof Cover**

A weatherproof cover is now required by UL standards for the factory-installed convenience outlets. 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.



**Fig. 31 — Convenience Outlet Location**

The weatherproof cover kit is secured to the basepan underneath the control box. See Fig. 32.



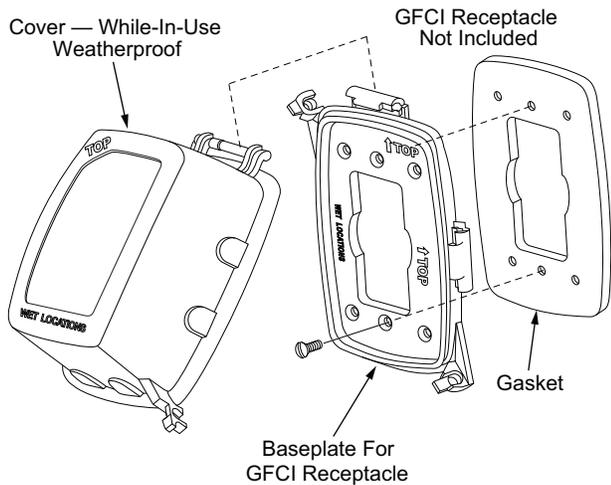
**Fig. 32 — Weatherproof Cover - Shipping Location on Units with Factory-Installed DDC**

**Disconnect All Power To Unit and Convenience Outlet. Lock-Out and Tag-Out All Power.**

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

Loosen the two screws at the GFCI duplex outlet, until approximately 1/2 in. (13 mm) under screw heads is 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 two screws until snug (do not over-tighten).

Mount the weatherproof cover to the backing plate as shown in Fig. 33. Remove two slot fillers in the bottom of the cover to permit service tool cords to exit the cover. Check for full closing and latching.



**Fig. 33 — Weatherproof Cover Installation**

**Non-powered 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, 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 step-down 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 unit’s control box access panel. See Fig. 31.

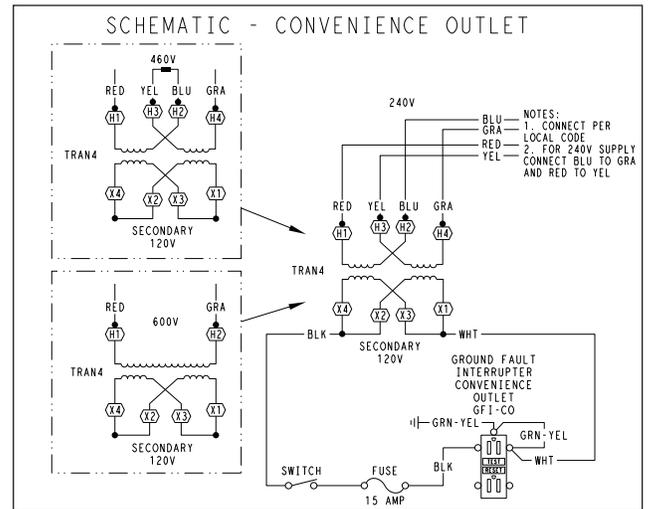
The primary leads to the convenience outlet transformer are not factory-connected. Selection of primary power source is a customer option. If local codes permit, the transformer primary leads can be connected at the line-side terminals on the unit-mounted non-fused disconnect; this will provide service 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 34. On a unit without a unit-mounted disconnect, connect the source leads to the main terminal block (TB1).

**ALL UNITS**

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.

**Unit-mounted convenience outlets**

Outlets 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.



UNIT VOLTAGE	CONNECT AS	PRIMARY CONNECTIONS	TRANSFORMER TERMINALS
208, 230	240	L1: RED+YEL L2: BLU+YEL	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. 34 — Powered Convenience Outlet Wiring**

**Fuse on power type**

The factory fuse is a Bussmann™ “Fusetron” T-15, non-renewable screw-in (Edison base) type plug fuse. See Fig. 35 for maximum continuous use amp limitations.

**HACR AMP RATING**

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 (for example, power exhaust, ERV), 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 (Fig. 36). See unit nameplates for the proper fuse, HACR or maximum over-current protection device required on the unit with field installed accessories.

NOTICE

Convenience Outlet Utilization

Maximum Continuous use: 15 Amps for receptacle outlets, and 8 Amps for factory supplied transformers

50HJ542739 C

**Fig. 35 — Convenience Outlet Utilization Notice Label**

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

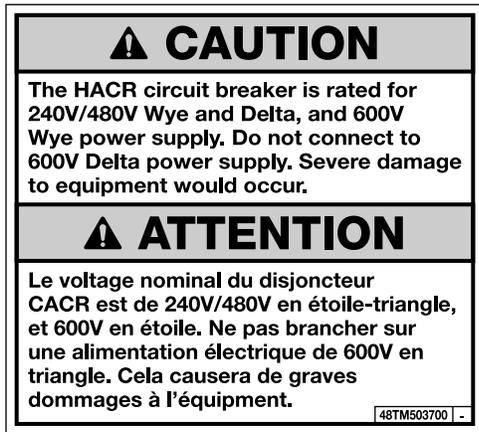


Fig. 36 — HACR Caution Label

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

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. The 3/4 in. bulkhead connector enables the low-voltage control wires to pass through the basepan. The 1/2 in. electrical bulkhead connector allows the high-voltage power wires to pass through the basepan. See Fig. 37.

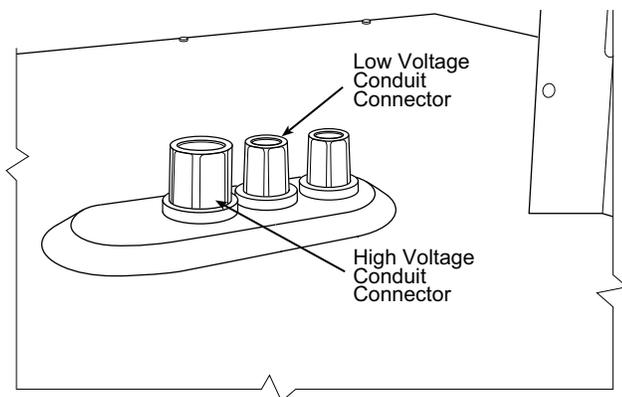


Fig. 37 — Thru-Base Connection Fittings

Check tightness of connector lock nuts before connecting electrical conduits.

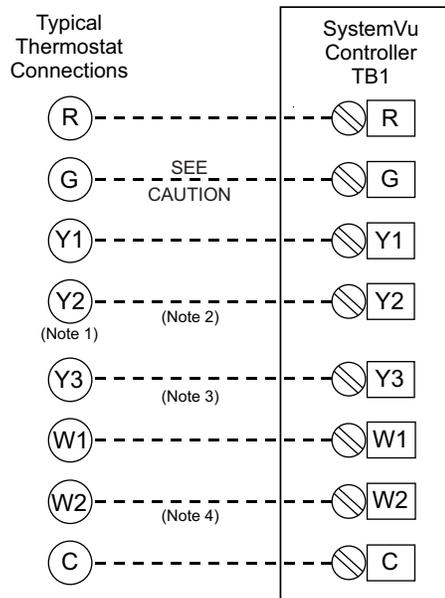
Field-supplied and field-installed liquid tight conduit connectors and conduit may be attached to the connectors on the basepan. Pull correctly rated high voltage through appropriate conduits. Connect the power conduit to the internal disconnect (if unit is so equipped) or to the external disconnect (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.

#### Units Without Thru- 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 38.

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 on page 24 to determine the percent of voltage imbalance. Operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage

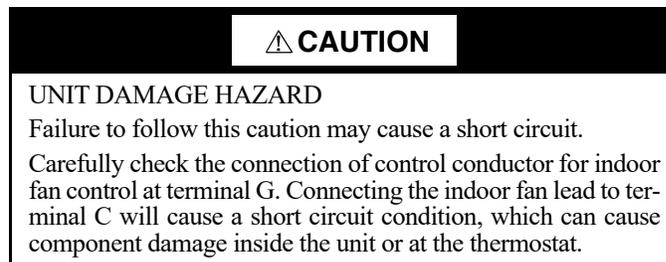
to electrical components. Such operation would invalidate any applicable Carrier warranty.



#### NOTES:

1. Typical multi-function marking. Follow manufacturer's configuration instructions to select Y2.
  2. Y2 to Y2 connection required on single-stage cooling units when integrated economizer function is desired.
  3. Y3 terminal is configurable in the software.
  4. W2 connection not required on units with single-stage heating.
- Field Wiring

Fig. 38 — Low-Voltage Connections



#### Field Control Wiring

48QE units are equipped with the SystemVu™ controller which can be use on a Carrier Comfort Network® or as a stand-alone control. All field added wire must comply with UL and local NEC standards. Use raceway shown in Fig. 39 to help with compliance as needed.

All low voltage wiring should be routed through the provided raceway (see Fig. 39) built into the corner post of the unit or secured to the unit control box with electrical conduit in order to provide UL-required clearance between high-voltage and low-voltage wiring.

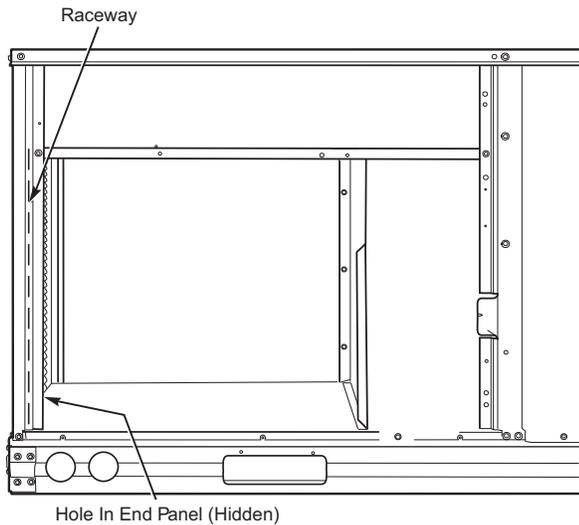
#### Thermostat

Install a Carrier-approved accessory 2-stage or 3-stage thermostat according to installation instructions included with the accessory. For complete economizer function and 2-stage or 3-stage compressor operation, select a two-stage or three-stage cooling thermostat. If a 2-stage or 3-stage cooling thermostat is not available, use a single stage cooling thermostat instead, but note that this will limit cooling to just 1 stage. Locate the thermostat accessory on a solid wall in the conditioned space to sense average temperature in accordance with the thermostat installation instructions. If the thermostat contains a logic circuit requiring 24-v power, use a thermostat cable or equivalent single leads of different colors with minimum of seven leads for 2 stage units and eight leads for

3 stage units (see Fig. 38). If the thermostat does not require a 24-v source (no “C” connection required), use a thermostat cable or equivalent with minimum of six leads for 2 stage units and seven leads for 3 stage unit. Check the thermostat installation instructions for additional features which might require additional conductors in the cable. For wire runs up to 50 ft (15 m), use no. 18 AWG (American Wire Gauge) insulated wire [35°C (95°F) minimum]. For 50 to 75 ft (15 to 23 m), use no. 16 AWG insulated wire [35°C (95°F) minimum]. For over 75 ft (23 m), use no. 14 AWG insulated wire [35°C (95°F) minimum]. All wire sizes larger than no. 18 AWG cannot be directly connected to the thermostat and will require a junction box and splice at the thermostat.

**Unit Without Thru-Base Connection Kit**

Pass the thermostat control wires through the hole provided in the corner post; then feed the wires through the raceway built into the corner post to the control box. Pull the wires over to the terminal strip on the lower-left corner of the SystemVu controller main base board (MBB). See Fig. 39.



**Fig. 39 – Field Control Wiring Raceway**

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

**ZS SPACE SENSOR**

The ZS Standard, Plus, or Pro can be wired into J20 or J24 of the SystemVu controller (see Fig. 44 and 45), J20 provides an easy field connection plug. A maximum of 5 ZS sensors can be connected but a separate power supply may be needed. Use the ZS SENSOR CFG menu (**SETTINGS**→**NETWORK SETTINGS**) when setting up the ZS sensors in SystemVu. The Sensor addresses have to be unique and set in the actual sensors via DIP also. The Typical default for the ZS Sensor is address 1. Follow the ZS installation instruction for further details on the sensors. ZS sensor data can be monitored on SystemVu in the ZS Sensor Info menu (**INPUTS**→**NETWORK**→**ZS SENSOR INFO**).

- J20-1            Sensor Common
- J20-2            Sensor Communication Positive (+)
- J20-3            Sensor Communication Negative(-)
- J20-4            Sensor +12 vdc Power

**HUMIDI-MIZER® SYSTEM CONTROL CONNECTIONS**

**Humidi-MiZer Space RH Controller**

NOTE: The Humidi-MiZer system is a factory-installed option. Humidi-MiZer system is not available for single phase (-3 voltage code) models.

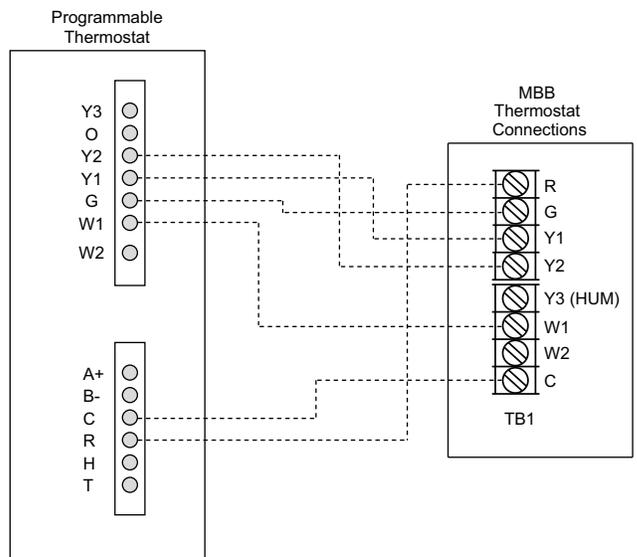
The Humidi-MiZer dehumidification system requires a field-supplied and field-installed space relative humidity control device such as Carrier’s Connect Plus thermostat with isolated contact set for dehumidification control. See Fig. 40.



**Fig. 40 – Field-Installed Connect Plus Thermostat**

**Connecting the Carrier Connect Plus (33TCSPL-4)**

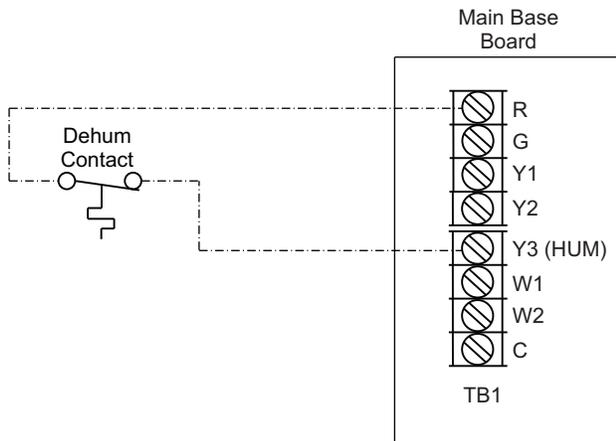
1. Route the multi-conductor thermostat cable (field-supplied) through the bushing the unit’s louvered end panel.
2. Route the cable through the snap-in wire tie and up to the web bushing near the control box. This provides the UL-required clearance between high-voltage and low-voltage wiring.
3. Feed the cable 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. Use a connector to protect the cable as it enters the control box.
4. Use the connector and the wire tie to reduce any slack in the thermostat cable to ensure that it will not be damaged by contact with the condenser coil.
5. For connections to the SystemVu controller MBB (Main Base Board) see Fig. 41. Refer to the installation instructions included with the Carrier Connect Plus thermostat for more information.



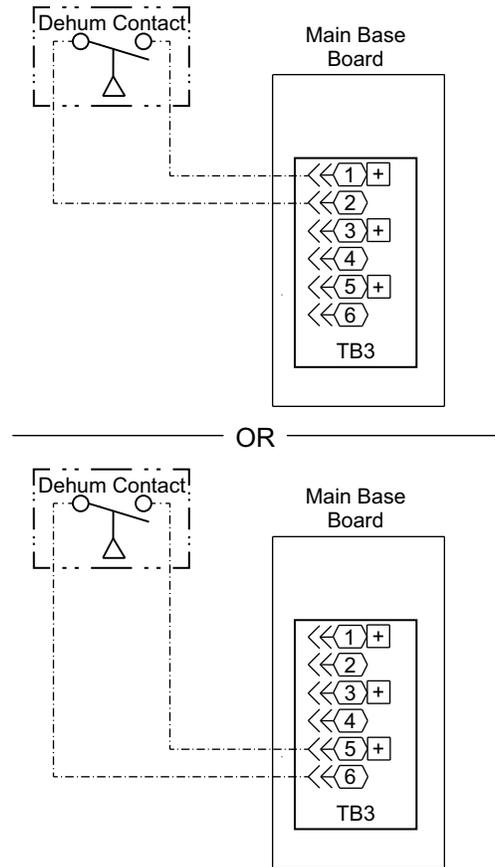
**Fig. 41 – Typical Thermostat Connections – SystemVu Controller MBB**

**Humidi-MiZer Connections to Connect Plus Thermostat**

1. Route the humidistat 2-conductor cable (field-supplied) through the bushing on the unit's louvered end panel.
2. Route the cable through the snap-in wire tie and up to the web bushing near the control box. This provides the UL-required clearance between high-voltage and low-voltage wiring.
3. Feed the cable 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. Use a connector to protect the cable as it enters the control box.
4. Use the connector and the wire tie to reduce any slack in the humidistat cable to ensure that it will not be damaged by contact with the condenser coil.
5. For 2-Stage SystemVu controller units connect one of the leads from the 2-conductor cable to the Y3 (HUM) terminal on the MBB (Main Base Board). Connect the other lead to the R terminal on the MBB. See Fig. 42.
6. For 3-Stage SystemVu controller units, if TB3 terminals 1 and 2 or 5 and 6 are open, connect one of the leads from the 2-conductor cable to TB3 terminal 1 (or 5) on the MBB (Main Base Board), and connect the other lead to TB3 terminal 2 (or 6) on the MBB (see Fig. 43.). If these terminals are not open, use a space or relative humidity sensor or communicating space sensor. More instructions can be found in the *FEQ/GEQ/QE Series Single Package Rooftop Units with SystemVu Controller Controls, Start-up, Operation and Troubleshooting* manual.



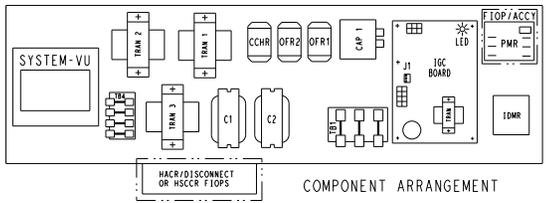
**Fig. 42 — Humidistat Connections to MBB (2-Stage SystemVu Units)**



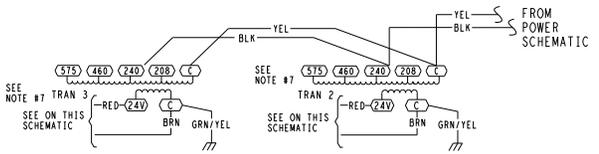
**Fig. 43 — Humidistat Connections to MBB (3-Stage SystemVu Units)**

**CONTROL AND POWER WIRING DIAGRAMS**

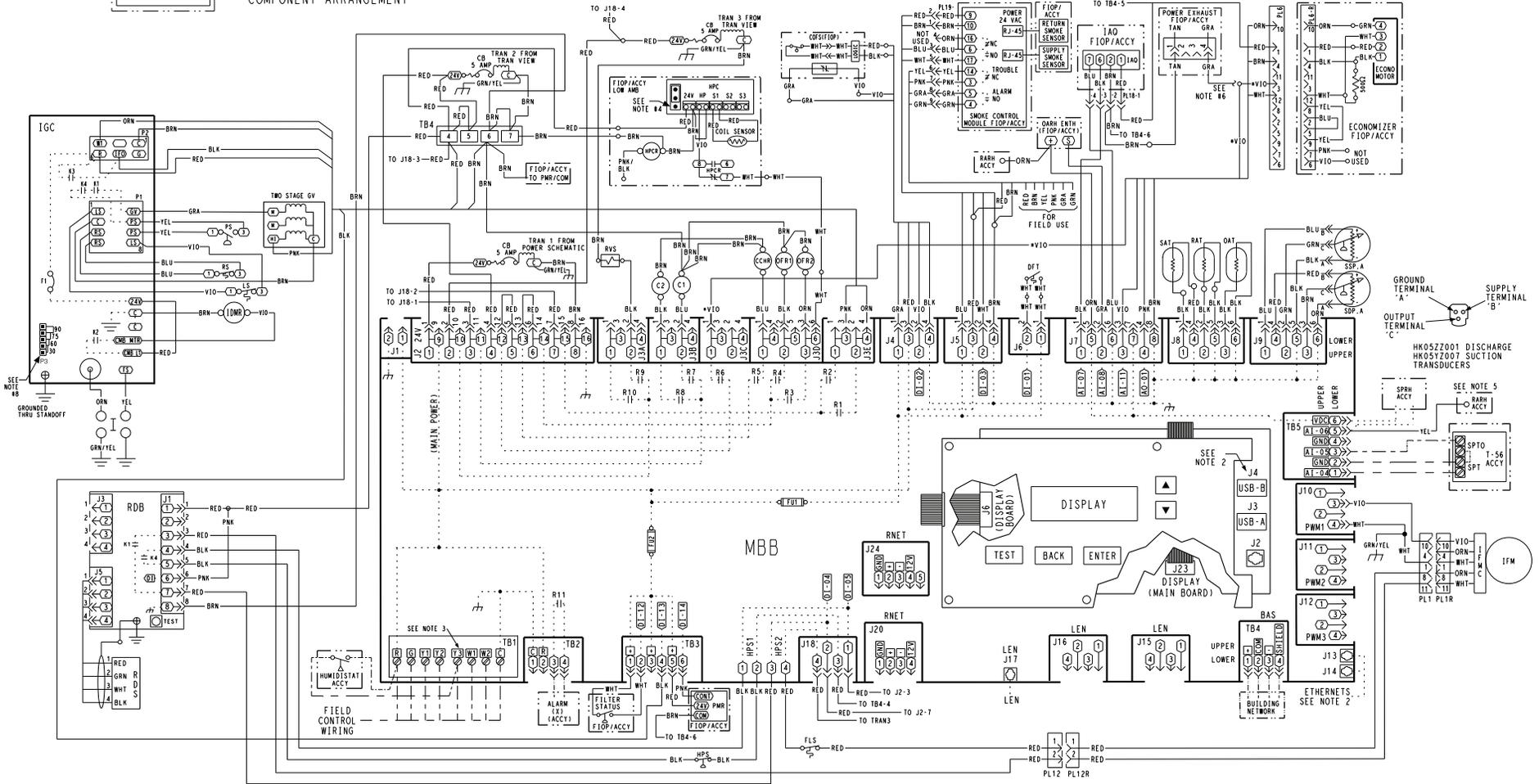
Figures 44-52 are typical control and power wiring diagrams. These wiring diagrams are mounted on the inside of the unit control box. Refer to the wiring diagrams in the unit control box when making field power wiring connections.



- NOTES:
1. LOW VOLTAGE CONNECTIONS MUST BE CLASS 2.
  2. USB-B AT J4 AND ETHERNETS AT J13, J14 ARE SHOWN FOR FUTURE USE.
  3. THE "13" TERMINAL IS CONFIGURABLE IN THE SOFTWARE.
  4. HARDCUT AND CUTOFF SET TO "MIN". JUMPER PIN ON TOP 2-PINS AS SHOWN.
  5. WHEN USING A RARH SENSOR, MAKE CONNECTION IN THE RETURN AIR SECTION. WHEN USING SPRN SENSOR, MAKE CONNECTION HERE BY DISCONNECTING YELLOW WIRE.
  6. DISCONNECT V10 TO ALLOW POWER EXHAUST CONNECTION.
  7. TRANSFORMER IS DEDICATED BASED ON UNIT VOLTAGE. TAPS ONLY SHOWN TO SIMPLIFY SCHEMATIC. 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 208V TAP.
  8. IGC P3 SETTING:30 SEC.

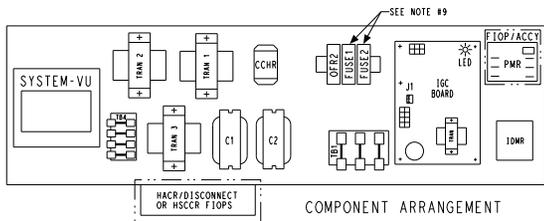


COMPONENT ARRANGEMENT

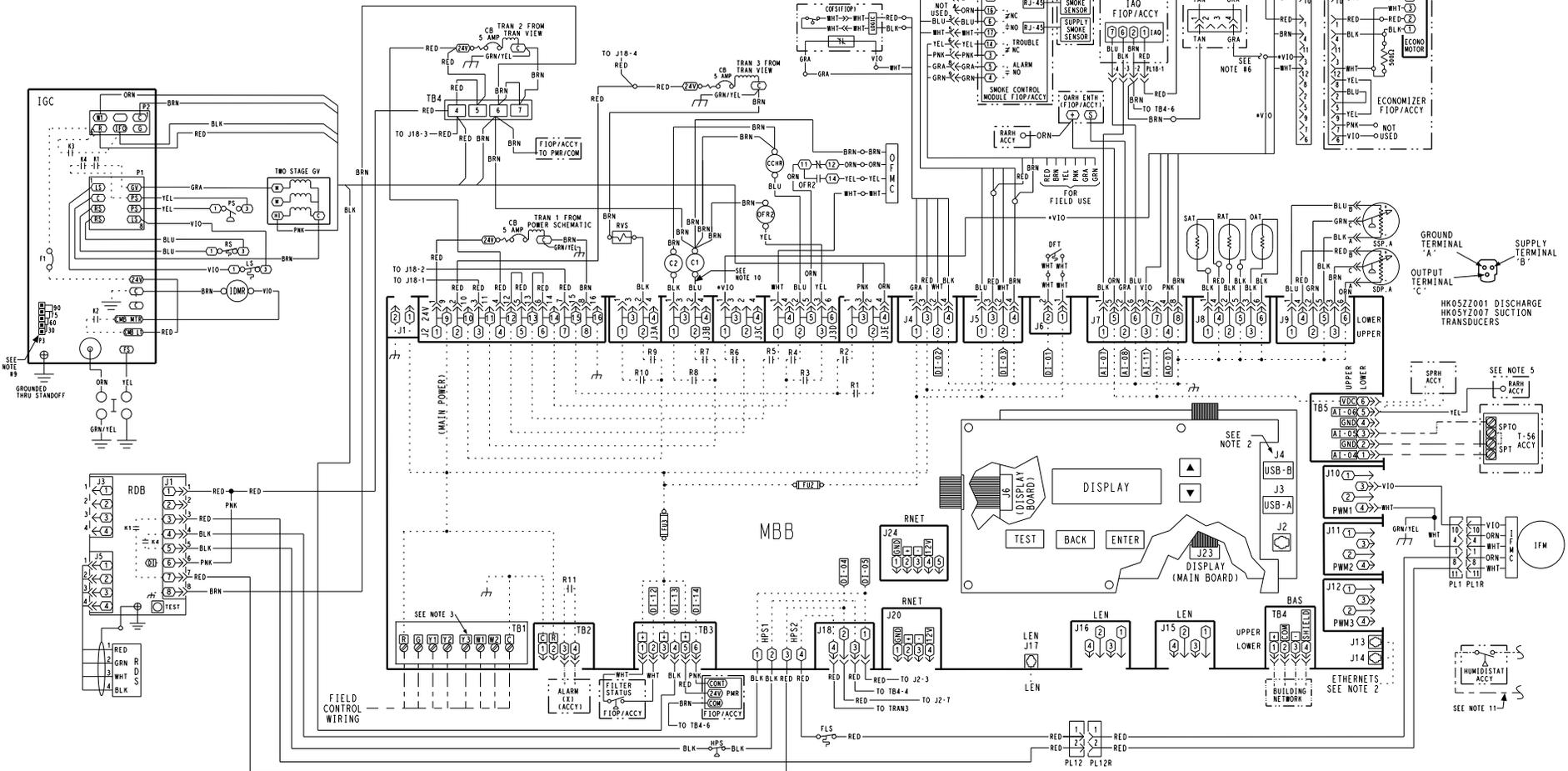
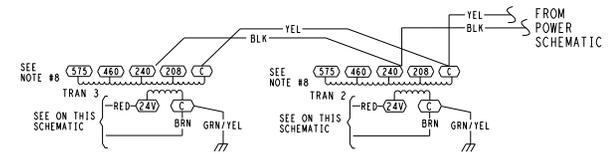


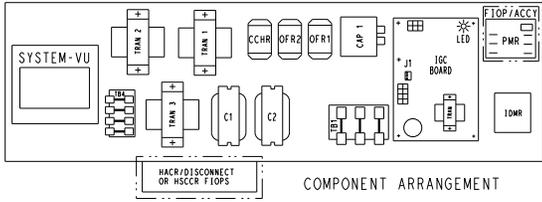
DUAL FUEL CONTROL 230/460/575V SVU T2 6-7.5 TON 48TM010131 A

Fig. 44 — Typical 2-Stage Control Wiring Diagram, SystemVu™ Controller (48QE\*\*07-08 230/460/575-3-60 Shown)

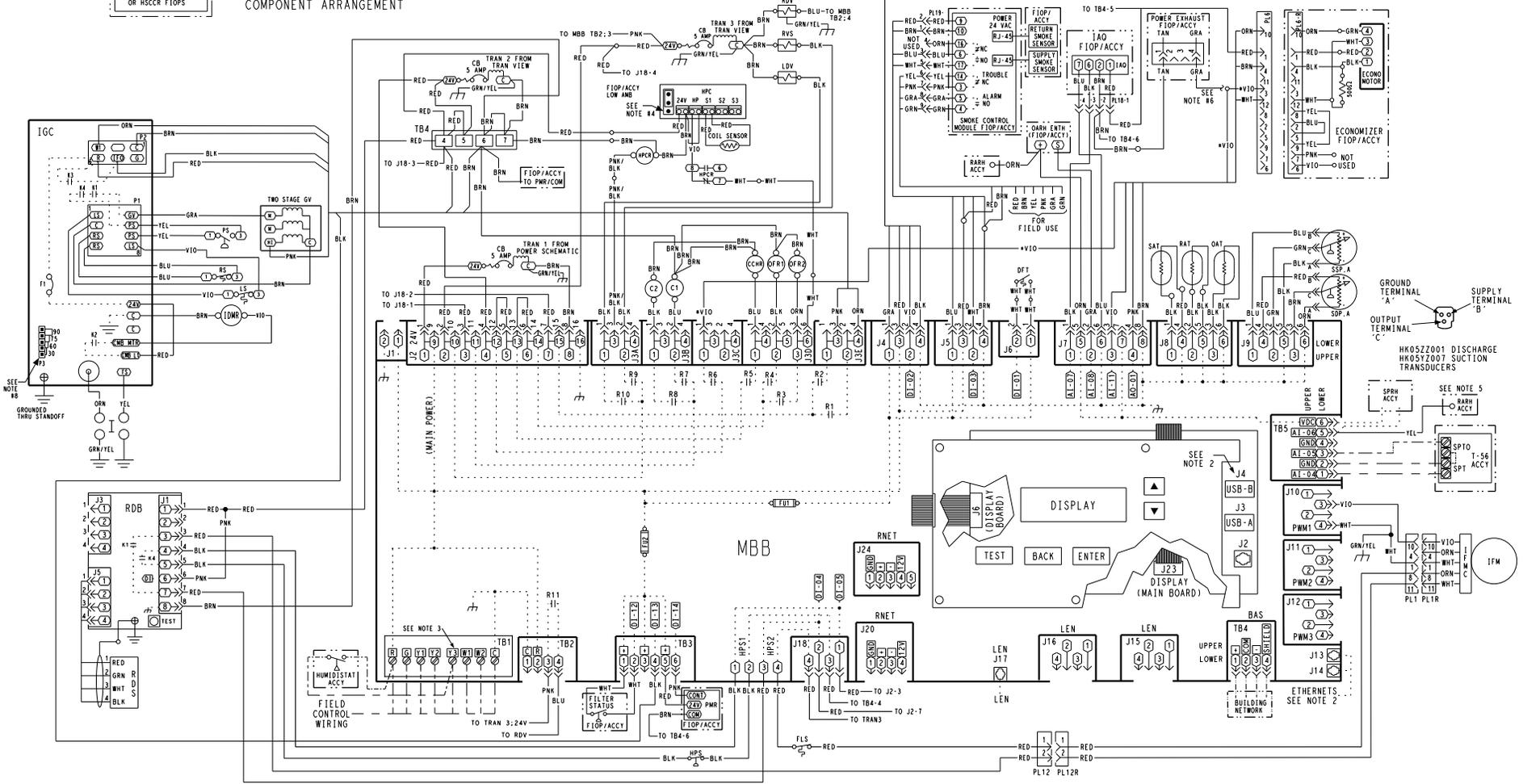


- NOTES:
1. LOW VOLTAGE CONNECTIONS MUST BE CLASS 2.
  2. USB-B AT J4 AND ETHERNETS AT J13, J14 ARE SHOWN FOR FUTURE USE.
  3. THE "+V3" TERMINAL IS CONFIGURABLE IN THE SOFTWARE.
  4. HARDSTART AND CUTOFF SET TO "MIN". JUMPER PIN ON TOP 2-PINS AS SHOWN.
  5. WHEN USING A RARH SENSOR, MAKE CONNECTION IN THE RETURN AIR SECTION. WHEN USING SPRH SENSOR, MAKE CONNECTION HERE BY DISCONNECTING YELLOW WIRE.
  6. DISCONNECT VIO TO ALLOW POWER EXHAUST CONNECTION.
  7. FUSES FOR 230V ARE LOCATED IN CONTROL BOX. FUSES FOR 460/575V ARE LOCATED BELOW THE CONTROL BOX.
  8. TRANSFORMER IS DEDICATED BASED ON UNIT VOLTAGE. TAPS ONLY SHOWN TO SIMPLIFY SCHEMATIC. 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 208V TAP.
  9. IGC P3 SETTING: 30 SEC.
  10. JUMPER AT SYSTEM-VU BOARD NECESSARY FOR 3-STAGE FUNCTIONALITY.
  11. IF THE UNIT REQUIRES A HUMIDITY INPUT, WIRE A HUMIDISTAT TO TB3 AND CONFIGURE ON BOARD. IF NO SPACE ON TB3, WIRE A RELATIVE HUMIDITY SENSOR TO TB5.



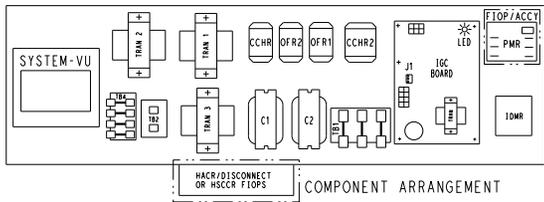


- NOTES:
1. LOW VOLTAGE CONNECTIONS MUST BE CLASS 2.
  2. USB-B AT J4 AND ETHERNETS AT J13, J14 ARE SHOWN FOR FUTURE USE.
  3. THE "Y3" TERMINAL IS CONFIGURABLE IN THE SOFTWARE.
  4. HARDCUT AND CUTOFF SET TO "MIN". JUMPER PIN ON TOP 2-PINS AS SHOWN.
  5. WHEN USING A BRN SENSOR, MAKE CONNECTION IN THE RETURN AIR SECTION. WHEN USING SPRH SENSOR, MAKE CONNECTION HERE BY DISCONNECTING YELLOW WIRE.
  6. DISCONNECT V10 TO ALLOW POWER EXHAUST CONNECTION.
  7. TRANSFORMER IS DEDICATED BASED ON UNIT VOLTAGE. TAPS ONLY SHOWN TO SIMPLIFY SCHEMATIC. 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 208V TAP.
  8. IGC P-3 SETTING: 30 SEC.



DUAL FUEL REHEAT CONTROL 230/460/575V SVU T2 6-7.5 TON 48TM010350 A

Fig. 46 — Typical 2-Stage 48QE\*07-08 SystemVu Controller with Humidi-MiZer System (230/460/575-3-60 Unit Shown)



- NOTES:
1. LOW VOLTAGE CONNECTIONS MUST BE CLASS 2.
  2. USB-B AT J4 AND ETHERNETS AT J13, J14 ARE SHOWN FOR FUTURE USE.
  3. THE \*Y3\* TERMINAL IS CONFIGURABLE IN THE SOFTWARE.
  4. WHEN USING A BARN SENSOR, MAKE CONNECTION IN THE RETURN AIR SECTION. WHEN USING SPRH SENSOR, MAKE CONNECTION HERE BY DISCONNECTING YELLOW WIRE.
  5. DISCONNECT V10 TO ALLOW POWER EXHAUST CONNECTION.
  6. TRANSFORMER IS DEDICATED BASED ON UNIT VOLTAGE. TAPS ONLY SHOWN TO SIMPLIFY SCHEMATIC. 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 208V TAP.

7. IGC P3 SETTING: 30 SEC.
8. JUMPER AT SYSTEM-VU BOARD NECESSARY FOR 3-STAGE FUNCTIONALITY.
9. IF THE UNIT REQUIRES A HUMIDITY INPUT, WIRE A HUMIDISTAT TO TB3 AND CONFIGURE ON BOARD. IF NO SPACE ON TB3, WIRE A RELATIVE HUMIDITY SENSOR TO TB5.

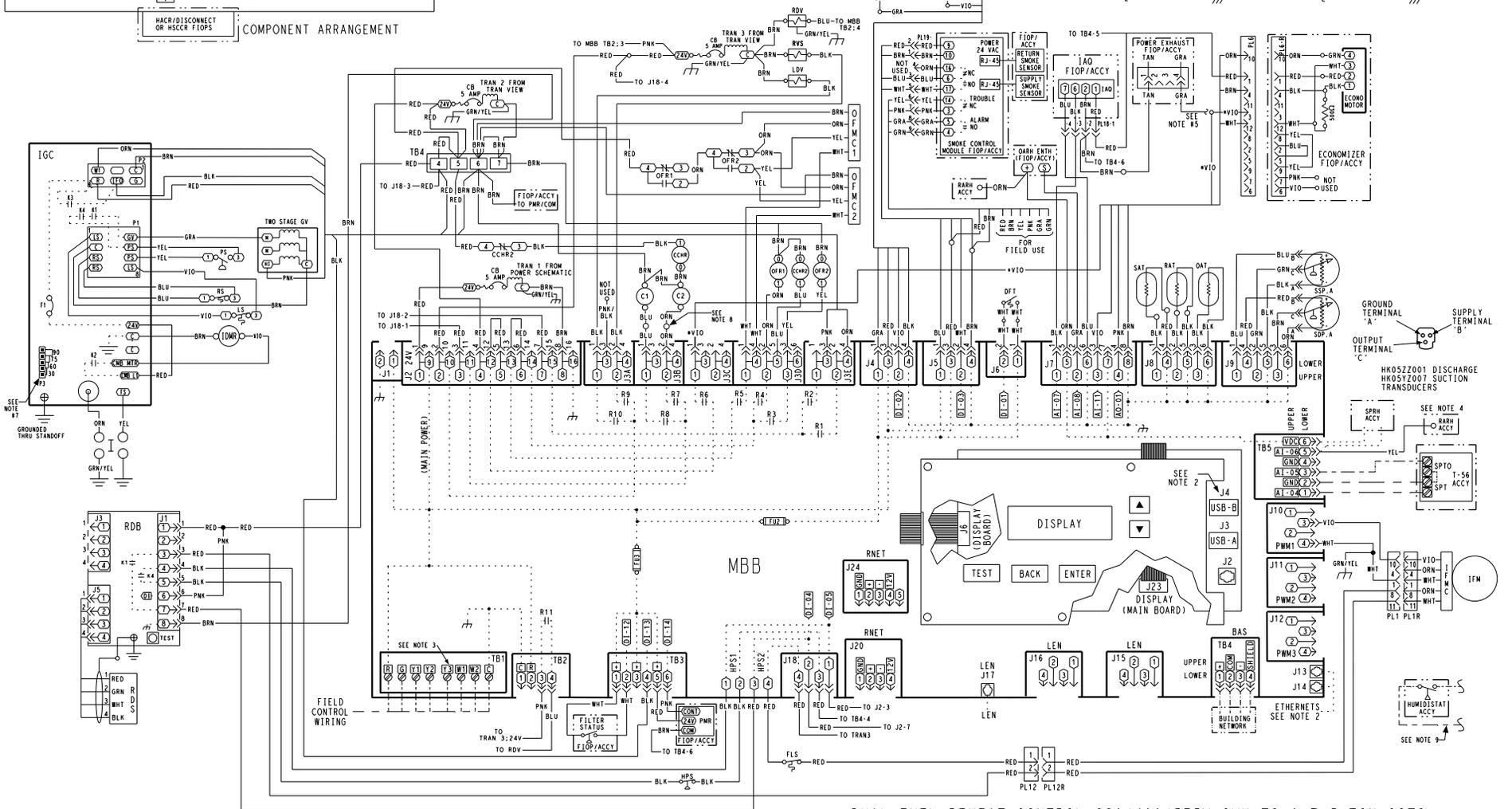
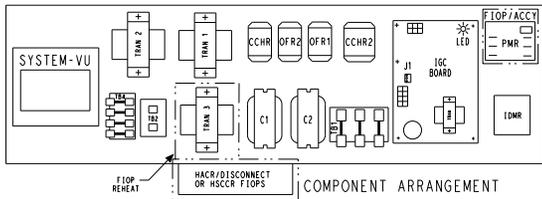
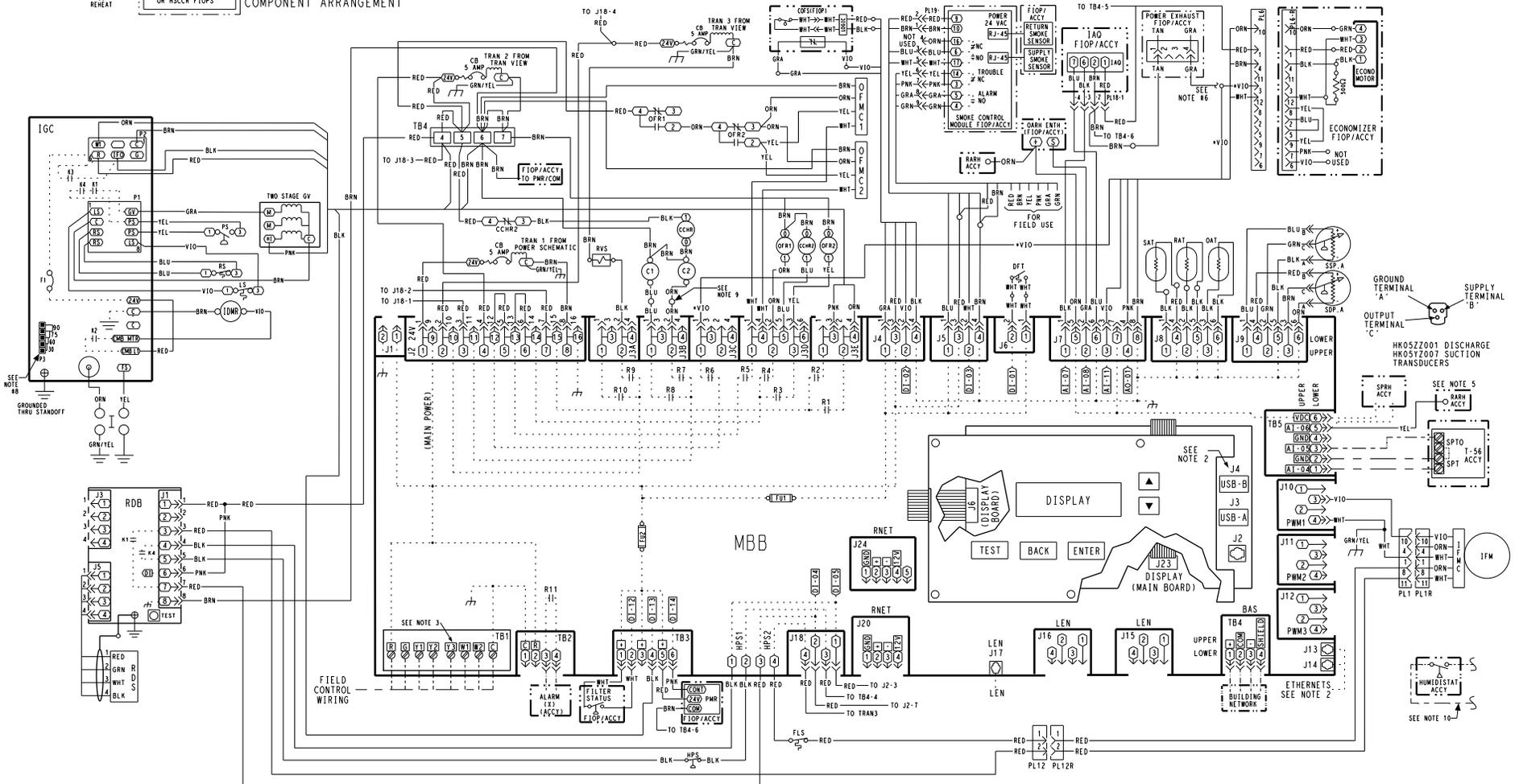
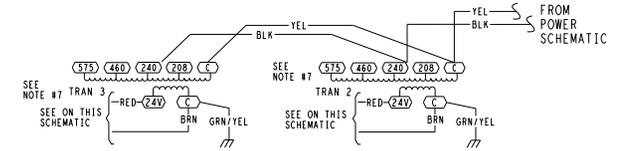


Fig. 47 — Typical 3-Stage 48QE\*07-08 SystemVu Controller with Humidi-MiZer System (230/460/575-3-60 Unit Shown)

48T010427

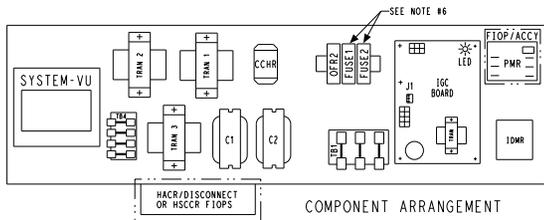


- NOTES:**
1. LOW VOLTAGE CONNECTIONS MUST BE CLASS 2.
  2. USB-B AT J4 AND ETHERNETS AT J13, J14 ARE SHOWN FOR FUTURE USE.
  3. THE "73" TERMINAL IS CONFIGURABLE IN THE SOFTWARE.
  4. HARDSTART AND CUTOFF SET TO "M" JUMPER PIN ON TOP 2 PINS AS SHOWN.
  5. WHEN USING A RARH SENSOR, MAKE CONNECTION IN THE RETURN AIR SECTION.
  6. WHEN USING SPRH SENSOR, MAKE CONNECTION HERE BY DISCONNECTING YELLOW WIRE.
  7. TRANSFORMER IS DEDICATED BASED ON UNIT VOLTAGE. TAPS ONLY SHOWN TO SIMPLIFY SCHEMATIC. 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 208V TAP.
  8. IGC P3 SETTING: 30 SEC.
  9. JUMPER AT SYSTEM-VU BOARD NECESSARY FOR 3-STAGE FUNCTIONALITY.
  10. IF THE UNIT REQUIRES A HUMIDITY INPUT, WIRE A HUMIDISTAT TO TB3 AND CONFIGURE ON BOARD. IF NO SPACE ON TB3, WIRE A RELATIVE HUMIDITY SENSOR TO TB5.



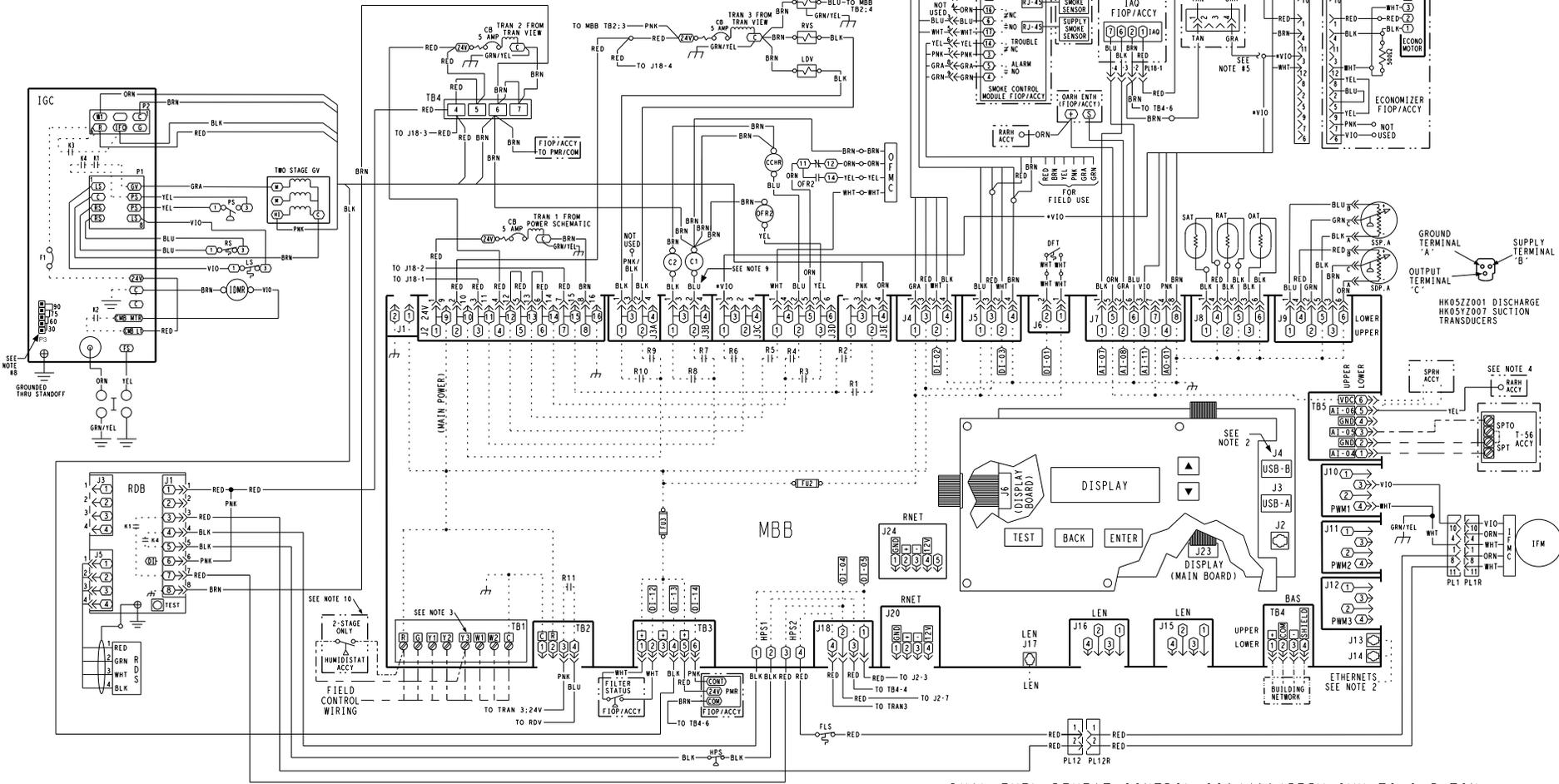
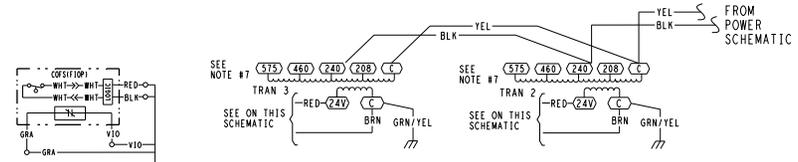
DUAL FUEL CONTROL 230/460/575V SVU T2 6-7.5 TON 3STG 48TM010320 8

Fig. 48 — Typical 3-Stage Control Wiring Diagram, SystemVu™ Controller (48QE\*\*07-08 230/460/575-3-60 Shown)



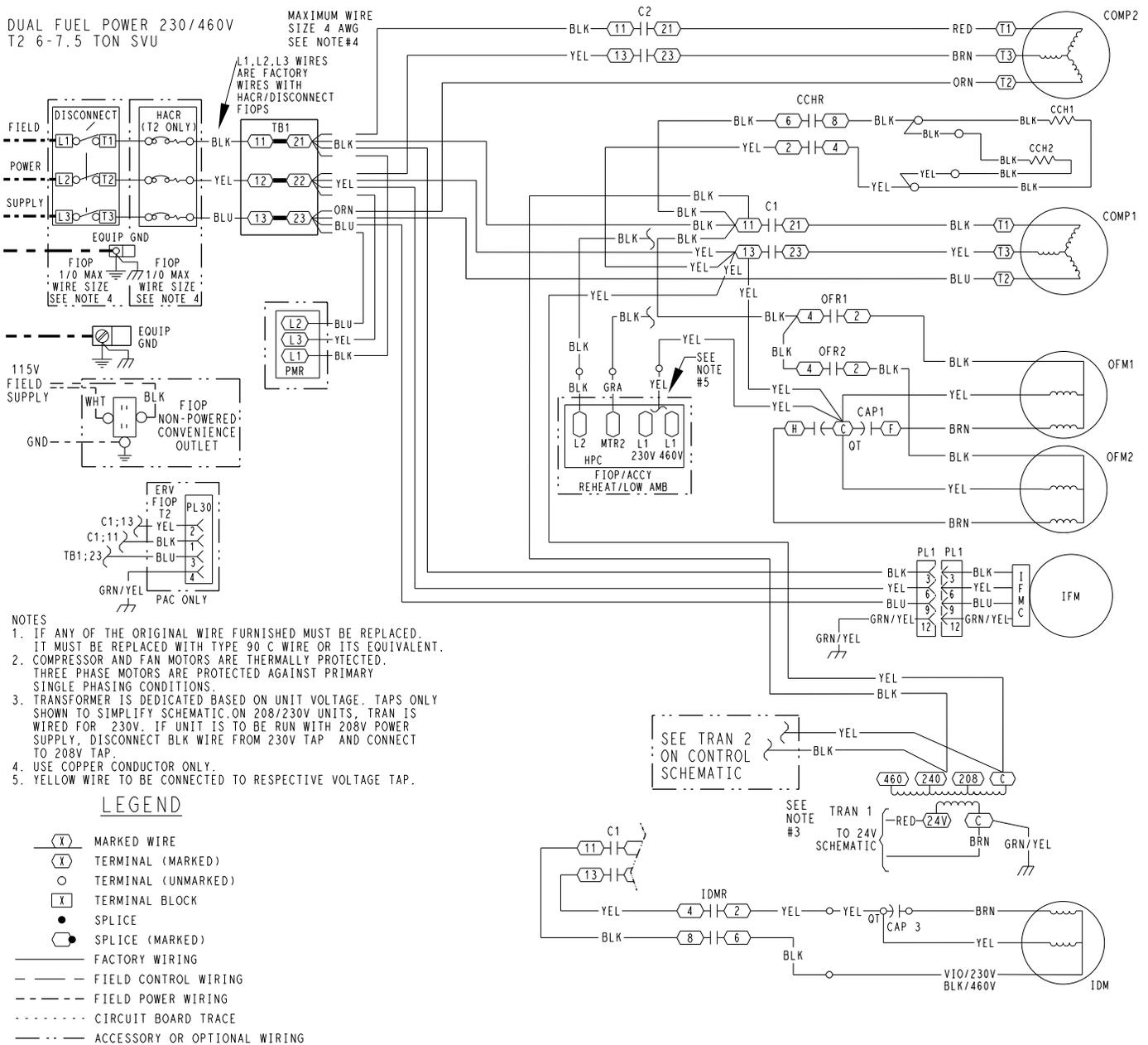
COMPONENT ARRANGEMENT

- NOTES:
1. LOW VOLTAGE CONNECTIONS MUST BE CLASS 2.
  2. USB-B AT J4 AND ETHERNETS AT J13, J14 ARE SHOWN FOR FUTURE USE.
  3. THE "Y3" TERMINAL IS CONFIGURABLE IN THE SOFTWARE.
  4. WHEN USING A BARN SENSOR, MAKE CONNECTION IN THE RETURN AIR SECTION. WHEN USING SPRH SENSOR, MAKE CONNECTION HERE BY DISCONNECTING YELLOW WIRE.
  5. DISCONNECT V10 TO ALLOW POWER EXHAUST CONNECTION.
  6. FUSES FOR 230V ARE LOCATED IN CONTROL BOX. FUSES FOR 460/575V ARE LOCATED BELOW THE CONTROL BOX.
  7. TRANSFORMER IS DEDICATED BASED ON UNIT VOLTAGE. TAPS ONLY SHOWN TO SIMPLIFY SCHEMATIC. 208/230V UNIT IS WIRED FOR 230V UNIT. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 208V TAP.
  8. IGC P3 SETTING: 30 SEC.
  9. JUMPER AT SYSTEM-VU BOARD NECESSARY FOR 3-STAGE FUNCTIONALITY.
  10. IF UNIT IS 3-STAGE, WIRE TO MBB TB3 AND CONFIGURE ON BOARD. IF NO SPACE IS AVAILABLE ON MBB TB3, WIRE A RELATIVE HUMIDITY SENSOR TO MBB TB5.



DUAL FUEL REHEAT CONTROL 230/460/575V SVU T2 8.5 TON 481M10351 A

Fig. 49 — Typical 2-Stage and 3-Stage 48QE\*09 SystemVu Controller with Humidi-MiZer System (230/460/575-3-60 Unit Shown)

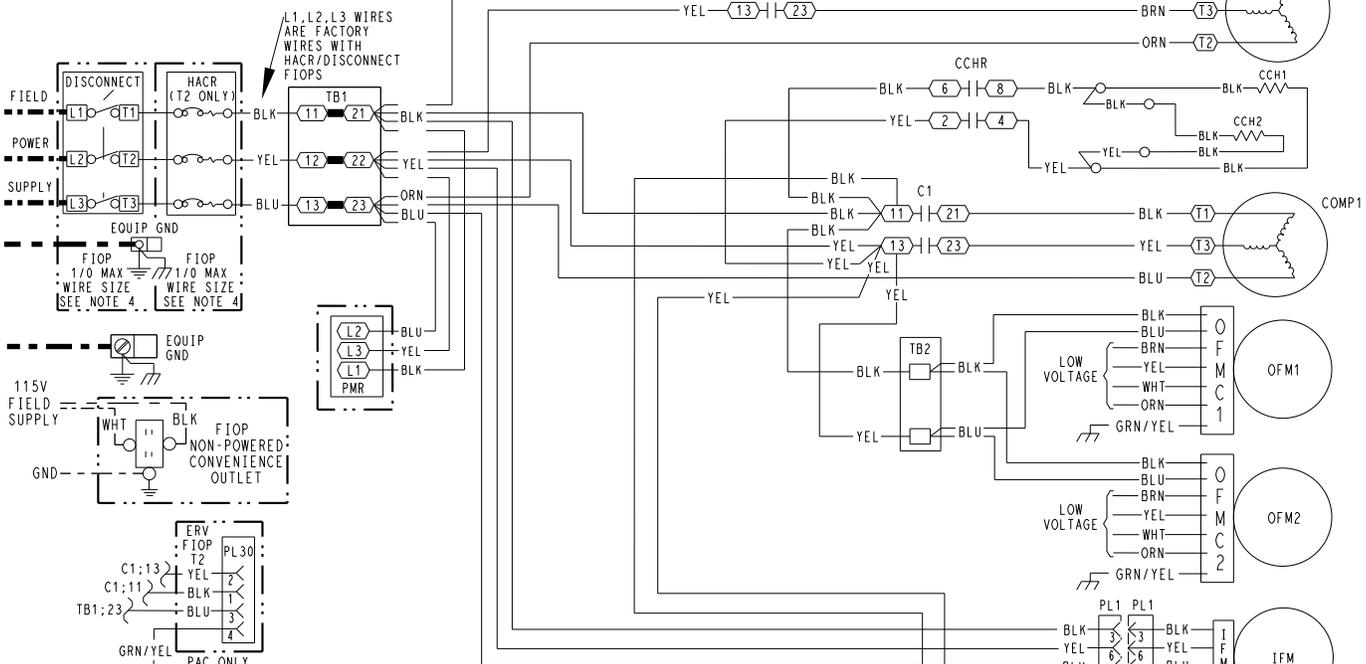


**Fig. 50 — Typical 2-Stage 48QE\*\*07-08 Power Wiring Diagram, 230/460V-3-60 Shown (SystemVu™ Control Units)**

48TM010135 | A

DUAL FUEL POWER 230/460V  
T2 6-7.5 TON SVU 3STG

MAXIMUM WIRE  
SIZE 4 AWG  
SEE NOTE#4



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. TRANSFORMER IS DEDICATED BASED ON UNIT VOLTAGE. TAPS SHOWN TO SIMPLIFY SCHEMATIC. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 208V TAP.
4. USE COPPER CONDUCTOR ONLY.
5. YELLOW WIRE TO BE CONNECTED TO RESPECTIVE VOLTAGE TAP.

LEGEND

- (X) MARKED WIRE
- (X) TERMINAL (MARKED)
- (O) TERMINAL (UNMARKED)
- (X) TERMINAL BLOCK
- SPLICE
- (S) SPLICE (MARKED)
- FACTORY WIRING
- - - FIELD CONTROL WIRING
- - - FIELD POWER WIRING
- · - · - CIRCUIT BOARD TRACE
- · - · - ACCESSORY OR OPTIONAL WIRING

ACCY	ACCESSORY	IAQ	INDOOR AIR QUALITY SENSORS	PL	PLUG ASSEMBLY
AMB	AMBIENT	IDM	INDUCED DRAFT MOTOR	POT	POTENTIOMETER
C	CONTACTOR, COMPRESSOR	IFCB	INDOOR FAN CIRCUIT BREAKER	PMR	PHASE MONITOR RELAY
CAP	CAPACITOR	IFM	INDOOR FAN MOTOR	QT	QUADRUPLE TERMINAL
CB	CIRCUIT BREAKER	IFMC	INDOOR FAN MOTOR CONTROLLER	RARH	RETURN AIR RELATIVE HUMIDITY
CCH	CRANKCASE HEATER	IGC	INTEGRATED GAS CONTROL	RAT	RETURN AIR TEMP. SENSOR
CCHR	CRANKCASE HETAER RELAY	LA	LOW AMBIENT LOCKOUT	RDB	REFRIGERANT DISSIPATION BOARD
COFS	CONDENSATE OVERFLOW SWT	LDR	COMPRESSOR LOADER (INTERNAL)	RDS	REFRIGERANT DISSIPATION SENSOR
COMP	COMPRESSOR MOTOR	LDV	LIQUID DIVERTER VALVE	RDV	REHEAT DISCHARGE VALVE
CS2V	COOLING STAGE-2 VALVE	LPS	LOW PRESSURE SWITCH	SAT	SUPPLY AIR TEMP. SENSOR
DDC	DIRECT DIGITAL CONTROL	LSM	LIMIT SWITCH (MANUAL RESET)	SEN	SENSOR
ERV	ENERGY RECOVERY VENTILATOR	LTLO	LOW TEMPERATURE LOCKOUT	SPRH	SPACE RELATIVE HUMIDITY
FIOP	FACTORY INSTALLED OPTION	MOV	VOLTAGE RESTRICTOR	SPT	SPACE TEMPERATURE SENSOR
FLS	FAN LIMIT SWITCH	MTR	MOTOR	SPTO	SPACE TEMPERATURE OFFSET
FPT	FREEZE PROTECTION THERMOSTAT	MTS	MIXED AIR TEMPERATURE SWITCH	STD	STANDARD
FSD	FIRE SHUT DOWN	OAO	OUTDOOR AIR QUALITY	TB	TERMINAL BLOCK
FU	FUSE	OARH	OUTSIDE AIR RELATIVE HUMIDITY	TRAN	TRANSFORMER
GND	GROUND	OAT	OUTDOOR AIR TEMP. SEN	UCB	UNIT CONTROL BOARD
HPC	HEAD PRESSURE CONTROL	OFM	OUTDOOR FAN MOTOR		
HPS	HIGH PRESSURE SWITCH	OFR	OUTDOOR FAN RELAY		
		OL	OVERLOAD		

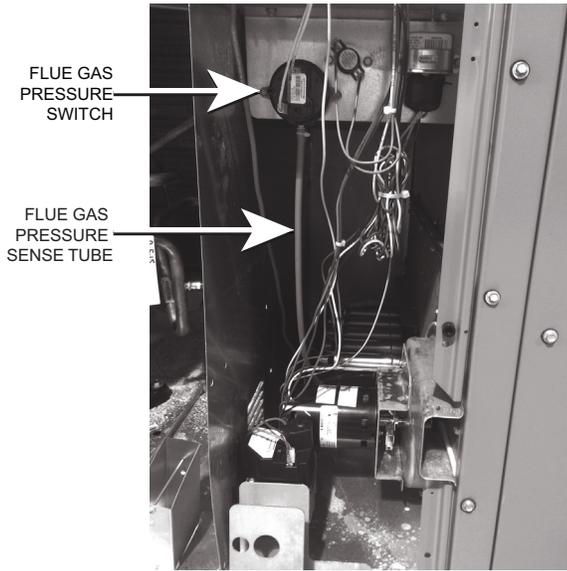
48TM010326 -

Fig. 51 — Typical 3-Stage 48QE\*\*07-08 Power Wiring Diagram, 230/460V-3-60 Show (SystemVu™ Controller Units)



## Integrated Gas Controller

This unit contains an Integrated Gas Controller (IGC) board. The IGC control board uses a flue gas pressure switch that senses pressure drop in the heat exchanger due to the combustion inducer. See Fig. 53.



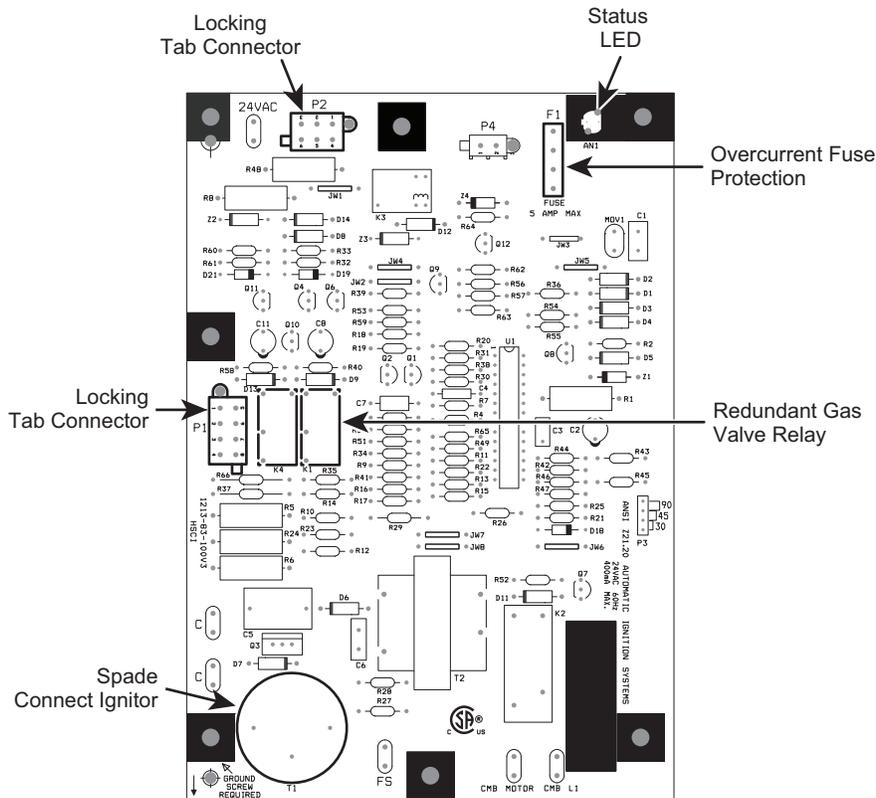
**Fig. 53 — Flue Gas Pressure Switch and Pressure Sense Tube (Typical Location)**

When the thermostat calls for heating, power is sent to W on the Integrated Gas Controller (IGC) board. An LED (light emitting

diode) on the IGC board turns on and remains on during normal operation. A check is made to ensure that the rollout switch and limit switch are closed, and that the pressure switch is open. If the check was successful, the induced draft motor is energized. When the pressure in the heat exchanger is low enough to close the pressure switch, the ignition activation period begins. Once ignition occurs, the IGC board will continue to monitor the condition of the rollout switch, the limit switches, the pressure switch, and the flame sensor. 45 seconds after ignition occurs, the indoor fan motor will energize, and the outdoor air dampers will open to their minimum position. If the “over temperature limit” opens prior to the start of the indoor fan blower, the IGC will shut down the burners, and the control will shorten the 45 second delay to 5 seconds less than the time to trip the limit. For example, if the limit trips at 37 seconds, the control will change the “fan on delay” from 45 seconds to 32 seconds. Once the “fan on delay” has been modified, it will not change back to 45 seconds unless power is reset to the control. On units with 2 stages of heat, W2 closes and initiates power to the second stage of the main gas valve when additional heat is required.

When the thermostat is satisfied, W1 and W2 open and the gas valve closes, interrupting the flow of gas to the main burners. If the call for W1 lasted less than 1 minute, the heating cycle will not terminate until 1 minute after W1 became active. If the unit is controlled through a room thermostat set for fan auto, the indoor fan motor will continue to operate for an additional 90 seconds, then stop. An LED indicator is provided on the IGC to monitor operation.

See Fig. 54 for IGC board component layout. See Fig. 44 and 45 for typical IGC control wiring connections to the SystemVu controller. Table 9 lists the IGC Board LED Alarm Codes.



**Fig. 54 — IGC Board Component Layout**

**Table 9 – IGC Board LED Alarm Codes<sup>a,b,c,d</sup>**

LED FLASH CODE	DESCRIPTION	ACTION TAKEN BY CONTROL	RESET METHOD	PROBABLE CAUSE
<b>On</b>	Normal Operation	—	—	—
<b>Off</b>	Hardware Failure	No gas heating.	—	Loss of power to the IGC. Check 5 amp fuse on IGC, power to unit, 24-v circuit breaker, transformer, and wiring to the IGC.
<b>1 Flash</b>	Indoor Fan On/Off Delay Modified	5 seconds subtracted from On delay. 5 seconds added to Off delay (3 minute maximum).	Power reset.	High temperature limit switch opens during heat exchanger warm-up period before fan-on delay expires. High temperature limit switch opens within 10 minutes of heat call (W) Off. See Limit Switch Fault.
<b>2 Flashes</b>	Limit Switch Fault	Gas valve and igniter Off. Indoor fan and inducer On.	Limit switch closed or heat call (W) Off.	High temperature limit switch is open. Check the operation of the indoor (evaporator) fan motor. Ensure that the supply-air temperature rise is within the range on the unit nameplate. Check wiring and limit switch operation.
<b>3 Flashes</b>	Flame Sense Fault	Indoor fan and inducer On.	Flame sense normal. Power reset for LED reset.	The IGC sensed a flame when the gas valve should be closed. Check wiring, flame sensor, and gas valve operation.
<b>4 Flashes</b>	Four Consecutive Limit Switch Fault	No gas heating.	Heat call (W) Off. Power reset for LED reset.	Four consecutive limit switch faults within a single call for heat. See Limit Switch Fault.
<b>5 Flashes</b>	Ignition Fault	No gas heating.	Heat call (W) Off. Power reset for LED reset.	Unit unsuccessfully attempted ignition for 15 minutes. Check igniter and flame sensor electrode spacing, gaps, etc. Check flame sense and igniter wiring. Check gas valve operation and gas supply.
<b>6 Flashes</b>	Induced Draft Motor/Pressure Switch Fault	If heat off: no gas heating. If heat on: gas valve Off and inducer On.	Inducer sense normal or heat call (W) Off.	Inducer sense On when heat call Off, or inducer sense Off when heat call On. Check wiring, voltage, and operation of IGC motor. Check inducer motor and flue gas pressure switch.
<b>7 Flashes</b>	Rollout Switch Lockout	Gas valve and igniter Off. Indoor fan and inducer On.	Power reset.	Rollout switch has opened. Check gas valve operation. Check induced-draft blower wheel is properly secured to motor shaft.
<b>8 Flashes</b>	Internal Control Lockout	No gas heating.	Power reset.	IGC has sensed internal hardware or software error. If fault is not cleared by resetting 24-v power, check for bad gas valve, replace the IGC.
<b>9 Flashes</b>	Temporary Software Lockout	No gas heating.	One hour auto reset or power reset.	Electrical interference is disrupting the IGC software.

NOTE(S):

- a. There is a 3-second pause between alarm code displays.
- b. If more than one alarm code exists, then all applicable alarm codes will be displayed in numerical sequence.
- c. Alarm codes on the IGC will be lost if power to the unit is interrupted.
- d. If the flue gas inducer pressure switch is stuck closed on a W1 call, then the unit will sit idle, and the IGC will produce no fault codes.

LEGEND

- IGC** — Integrated Gas Unit Control  
**LED** — Light-Emitting Diode

## Leak Dissipation System

48QE 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 system consists of an A2L sensor (Fig. 55) and the dissipation control board (see Fig. 56) which are located in the Indoor Coil section of the unit (see the view labeled “BACK” in Fig. 2 on page 7 for size 07-08 units or Fig. 3 on page 10 for size 09 units). The A2L sensor is located between the indoor coil and the air filters.

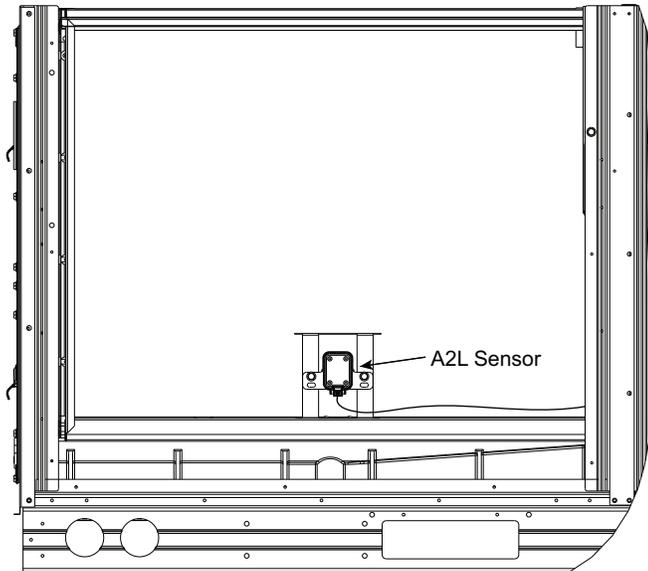


Fig. 55 – Location of A2L Sensor

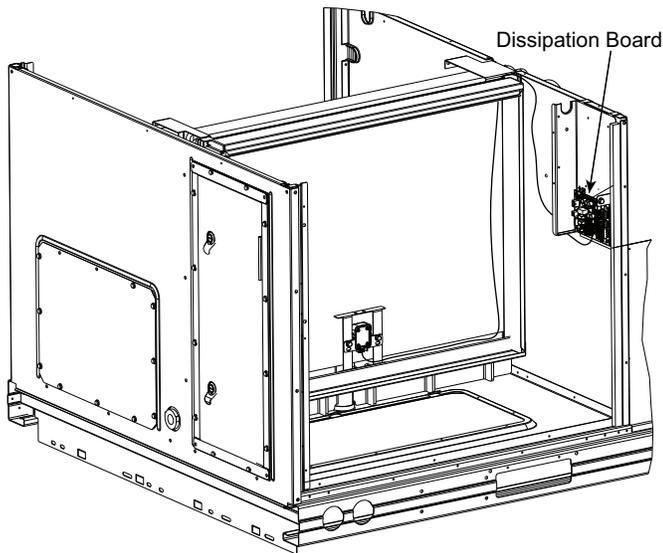


Fig. 56 – Location of Dissipation Control Board (Shown with Dust Cover Removed)

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. 57) indicating the sensor that detected the refrigerant. See Fig. 59 on page 42 for the full text on the Dissipation Control dust cover label.

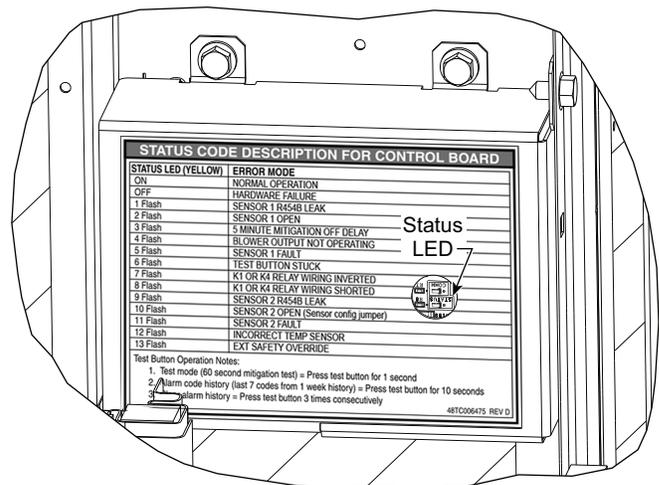
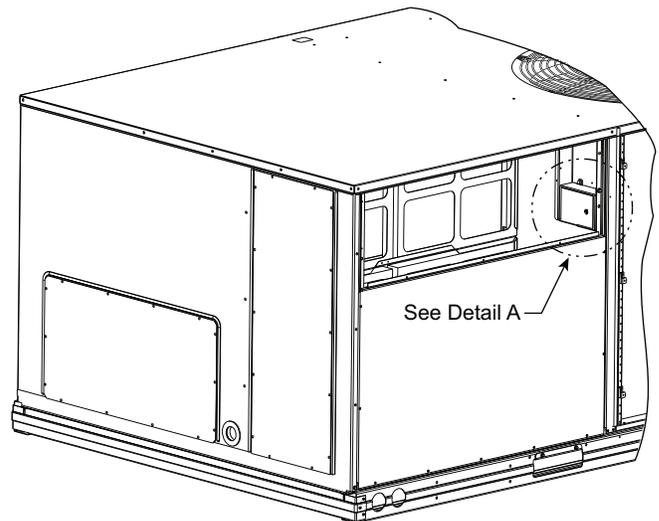
When the sensor signal indicates the refrigerant has dissipated, the dissipation board yellow status LED will display a flash code 3 and return to its normal state and allow unit operations after a 5 minute delay.

## 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. 57). If flash codes are present, see Troubleshooting on page 42.

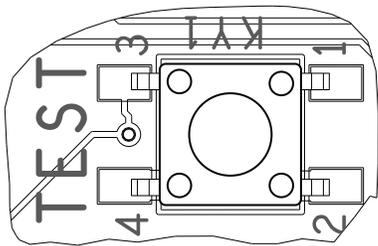
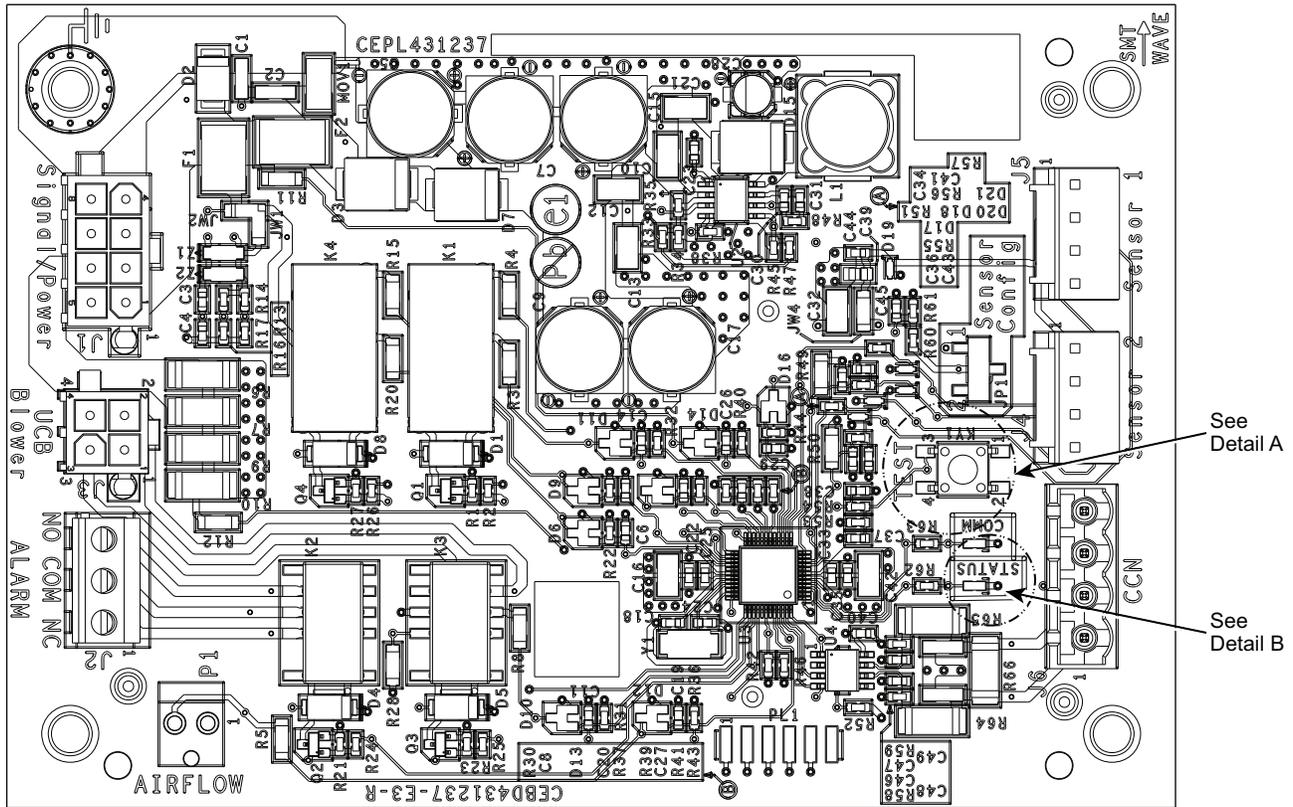
NOTE: Operation of the Test Mode is only possible if no faults exist on the dissipation board.

Remove the dust cover from the Dissipation control board to access the Test button (see Fig. 58). The Test button is located above the COMM LED.

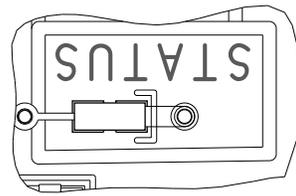


Detail A

Fig. 57 – Yellow STATUS LED



Detail A — Test Button



Detail B — Status LED

**Fig. 58 — 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 10).

**Table 10 — 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 11. They are based on the total system refrigerant charge quantity.

**Table 11 — Minimum Dissipation Air Flows**

MINIMUM DISSIPATION AIR FLOW (cfm)	
UNIT	cfm
48QE*M/T07	410
48QE*M/T08	450
48QE*M09	510
48QE*T09	570
48QE*N/U07	430
48QE*N/U08	640
48QE*N/U09	760

Table 12 details the required operational checks to ensure proper dissipation system function.

**Table 12 – 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 59 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 13 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. 59 – Dissipation Control Cover Label**

**Table 13 – Status LED Troubleshooting Table**

STATUS LED	REASON	CONTROL VERBIAGE	MODE
1 Flash	Sensor 1 $\geq$ 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 <sup>a</sup>	Sensor 2 $\geq$ 20% LFL	SENSOR 2 DISSIPATION ACTIVE	Dissipation in Process
10 Flash <sup>a</sup>	Sensor 2 Open	SENSOR 2 OPEN	Dissipation in Process
11 Flash <sup>a</sup>	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

## Humidi-MiZer® Dehumidification System (Optional)

Units with the factory-installed Humidi-MiZer system option are capable of providing multiple modes of improved dehumidification as a variation of the normal cooling cycle. The Humidi-MiZer system option includes additional valves in the liquid line and discharge line of the refrigerant circuit and a reheat coil downstream of the evaporator.

NOTE: The reheat coil is downstream of the evaporator coil on the air side (not the refrigerant side). Figures 60-62 show both refrigerant and air flow.

Humidi-MiZer system operation requires the installation and configuration of a relative humidity switch input or a space relative humidity sensor. These provide the dehumidification demand to the control.

With Humidi-MiZer system units there are two additional HVAC modes available for the user: Dehumidification and Dehum/Mech Cooling. Selection of the Dehum/Mech Cooling mode is determined by the dehumidification demand and the cooling demand. Table 14 shows the corresponding circuit mode and output status for the different demand combinations.

### NORMAL COOLING

This mode is the standard rated cooling system performance, and occurs when there is cooling demand without dehumidification demand.

For 48QE 07-09 units, refrigerant flows from the outdoor condenser through the de-energized 3-Way Liquid Diverter Valve

(LDV) to the expansion device bypassing the reheat condenser coil. The Reheat Discharge Valve (RDV) is closed. (See Fig. 60.)

### DEHUM/MECH COOLING (SUBCOOLING) MODE

This mode increases the latent heat removal and decreases sensible cooling compared to normal cooling. This occurs when there is a cooling and dehumidification demands.

For 48QE 07-09 units, refrigerant flows from the outdoor condenser, through the energized 3-Way LDV and through the reheat condenser coil to the expansion device. The RDV is closed. (See Fig. 61.)

### DEHUMIDIFICATION (HOT GAS REHEAT) MODE

This mode provides maximum latent cooling with little to no sensible capacity. This occurs when there is a dehumidification demand and no cooling demand.

For 48QE 07-09 units, this is the same as the Subcooling mode but the RDV is open, which provides some compressor discharge gas to the reheat condenser to further increase the reheat of the evaporator air stream. (See Fig. 62.)

### REHEAT CONTROL

When there is only a cooling demand, the unit will operate in normal cooling mode. When there is only dehumidification demand, the unit will operate in Dehumidification mode (Hot Gas Reheat). When there is both cooling demand and dehumidification demand, the unit will operate in Dehum/Mech Cooling mode (Subcooling). During Dehumidification and Dehum/Mech cooling mode, the unit will run all cooling stages.

Table 14 — Humidi-MiZer System Control Modes (48QE 07-09)

DEMAND AND MODE			OUTPUTS		LDV Valve 3-WAY	RDV Valve 2-WAY
Space Humidity	Circuit Cooling Demand	Circuit Mode	Circuit Compressor			
—	—	No power	Off	Off	Off	Off (closed)
Low	No	Off	Off	Off	Off	Off (closed)
	Yes	Cool	On	Off	Off	Off (closed)
High	Yes	Dehum/Mech Cooling	On	On	On	Off (closed)
	No	Dehum	On	On	On	On (open)

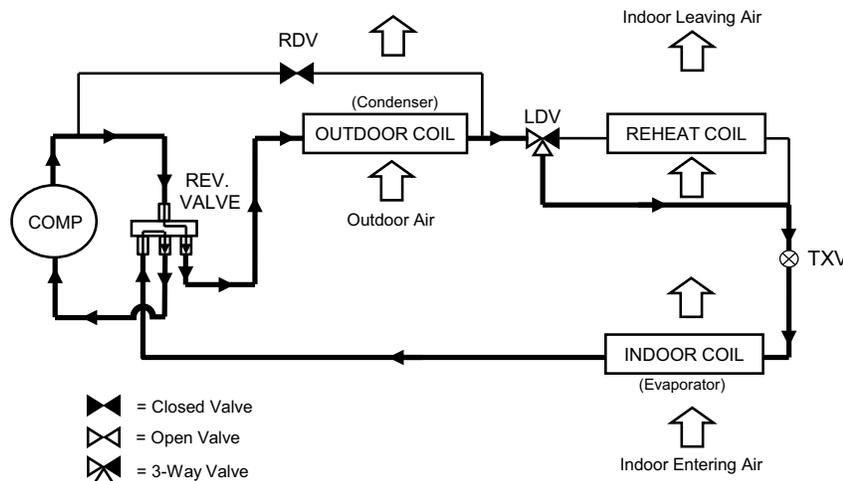
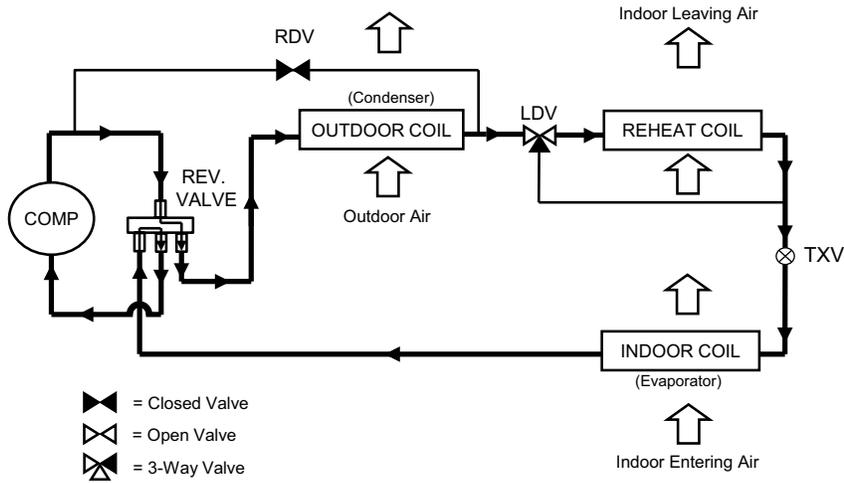
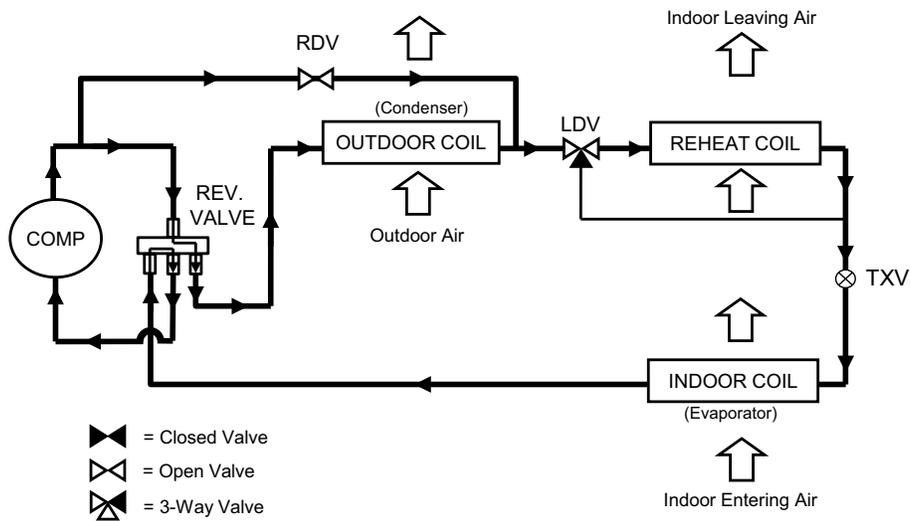


Fig. 60 — Normal Cooling Mode — Humidi-MiZer System for 48QE 07-09



**Fig. 61 – Subcooling Mode – Humidi-MiZer System for 48QE 07-09**



**Fig. 62 – Hot Gas Reheat Mode – Humidi-MiZer System for 48QE 07-09**

### SystemVu™ Controller

48QE units are equipped with the SystemVu controller (standard), refer to the *FEQ/GEQ/QE Series Single Package Rooftop Units with SystemVu Controller Controls, Start-up, Operation and Troubleshooting* manual.

## Controller Options

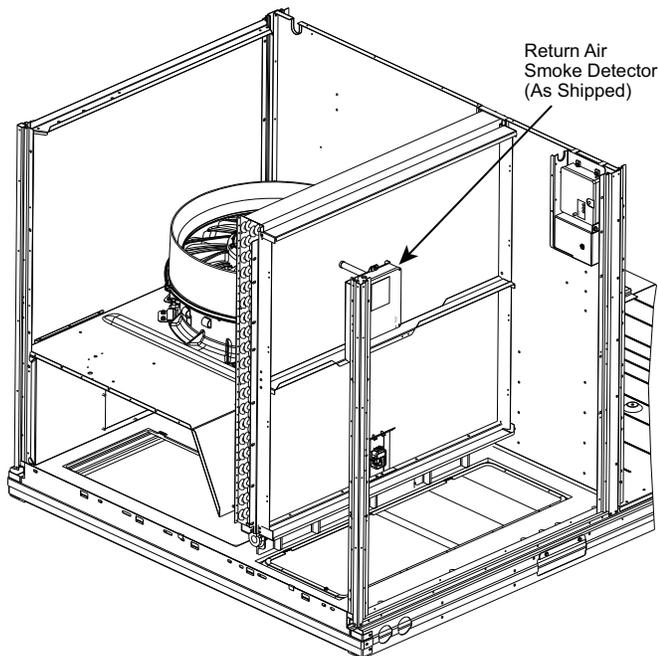
### LOW AMBIENT

48QE units come equipped with the SystemVu controller, refer to its installation control manual for details on adjusting “Cooling Lock-Out” setting and configure for the specific job requirements.

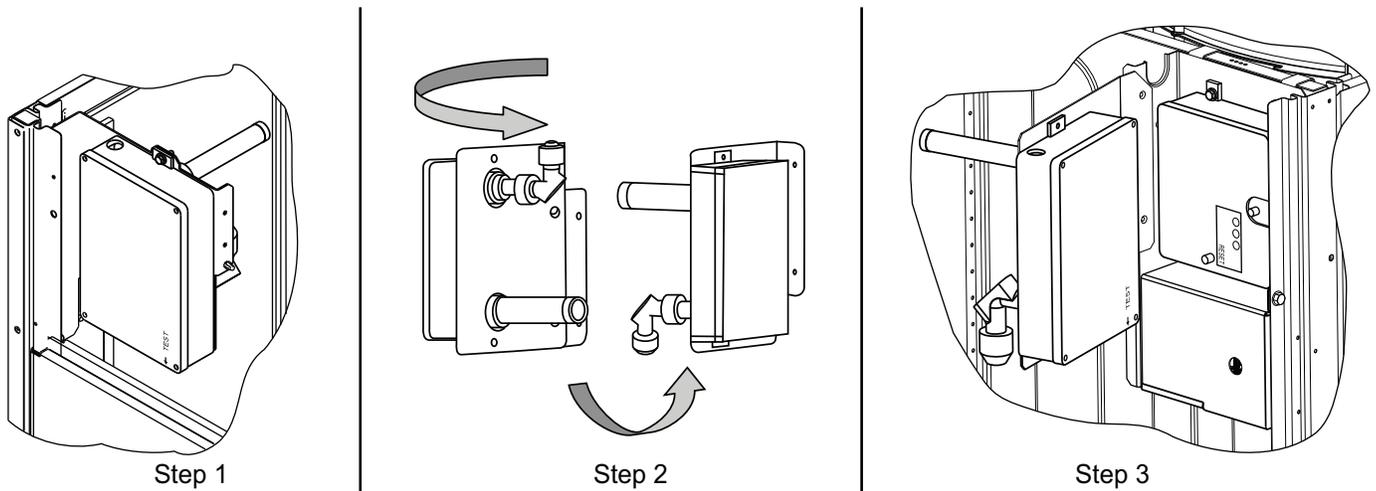
## Smoke Detectors

Smoke detectors are available as factory-installed options on 48QE models. Smoke detectors may be specified for supply air only, for return air without or with economizer, or in combination of supply air and return air. All components necessary for operation are factory-provided and mounted. The unit is factory-configured for immediate smoke detector shutdown operation; additional wiring or modifications to unit terminal board 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. 63 for the as-shipped location.



**Fig. 63 — Return Air Smoke Detector; Shipping Position**



**Fig. 64 — Completing Installation of Return Air Smoke Sensor**

## COMPLETING RETURN AIR SMOKE SENSOR INSTALLATION

1. Unscrew the two screws holding the Return Air Smoke Detector assembly. See Fig. 64, 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. 64, Step 2.
3. Screw the sensor and detector plate into its operating position using screws from Step 1. See Fig. 64, Step 3.
4. Connect the flexible tube on the sampling inlet to the sampling tube on the basepan.

## ADDITIONAL APPLICATION DATA

Refer to the application data sheet titled “*Factory-Installed Smoke Detector; for Small and Medium Rooftop Units 2 to 25 Tons*” for discussions on additional control features of these smoke detectors including multiple unit coordination.

## Step 13 — Install Accessories

Available accessories include:

- Roof curb
- Thru-base connection kit (must be installed before unit is set on curb)
- LP conversion kit
- Economizer
- Manual outside air damper
- Two-Position motorized outside air damper
- Power exhaust
- Differential dry-bulb sensor
- Outdoor enthalpy sensor
- Differential enthalpy sensor
- Low ambient controls
- Thermostat / Sensors
- CO<sub>2</sub> sensor
- Louvered hail guard
- Flue discharge deflector
- Phase monitor control

Refer to separate installation instructions for information on installing these accessories.

## Step 14 – Fan Speed Set Up

Fan Speed settings are accessed through the SystemVu interface.

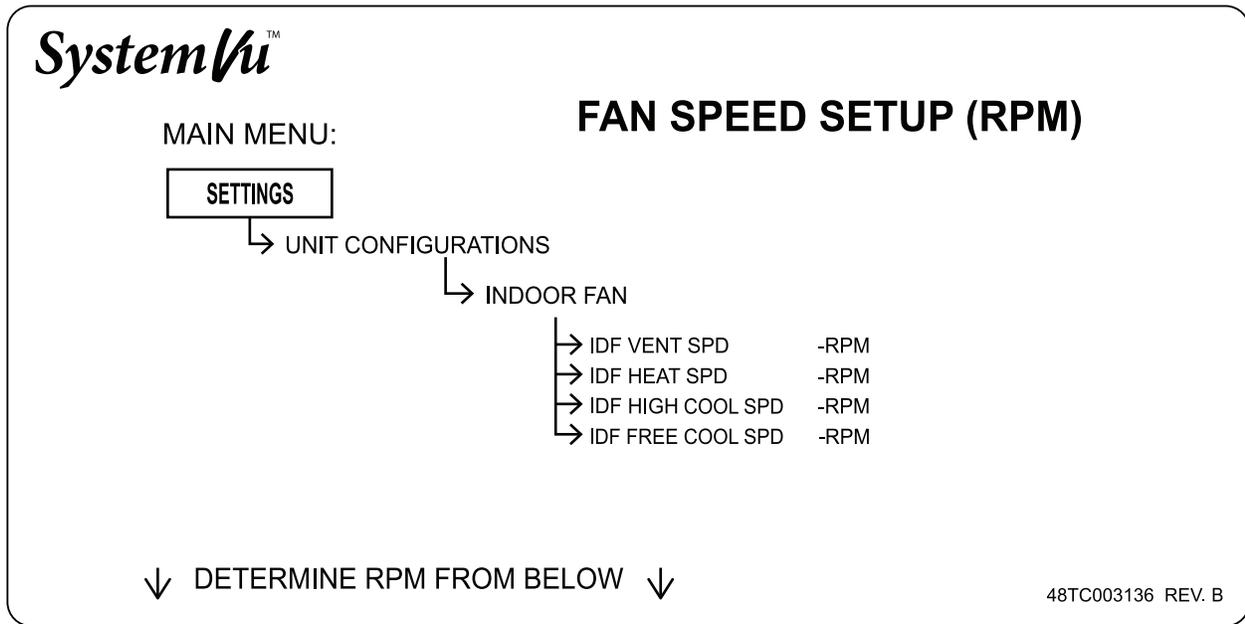
1. Check the job specifications for the CFM (cubic feet per minute) and ESP (external static pressure) required.
2. Using the chart on the Fan Speed Set Up labels (see Fig. 65), calculate the RPM from the CFM and ESP for the base unit plus any field accessories (as listed on the label).

NOTE: The Fan Speed Set Up labels are located on the High Voltage cover in the Control Box.

3. Press any key on the SystemVu interface to activate the display backlight and then press the MENU key.
4. Using the UP and DOWN arrow keys highlight SETTINGS and then press ENTER.
5. Use the DOWN arrow key highlight the UNIT CONFIGURATIONS menu then press ENTER.

6. Highlight UNIT CONFIGURATIONS then press ENTER.
7. Highlight INDOOR FAN and then press ENTER.
8. Refer to the job specifications to set the following, determining the values per the RPM Calculator label (see Fig. 65). Use the UP and DOWN arrow keys and the BACK key to set the values. Press ENTER after setting each value to continue to the next selection.
  - IDF VENT SPD
  - IDF HEAT SPD
  - IDF HIGH SPD
  - IDF FREE COOL SPD

For further details see the *FEQ/GEQ/QE Series Single Package Rooftop Units with SystemVu Controller Controls, Start-up, Operation and Troubleshooting* manual.



RPM Calculator		ESP in. wg										
		0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	
UNIT MODEL NUMBER	CFM	3000	1250	1348	1441	1528	1610	1688	1762	1832	1899	1963
		3250	1336	1428	1515	1598	1677	1753	1824	1893	1959	2021
		3500	1423	1509	1591	1670	1746	1819	1888	1955	2020	2081
		3750	1510	1591	1669	1744	1817	1887	1954	2019	2082	2143
		4000	1598	1675	1749	1820	1890	1957	2022	2085	2146	
		4250	1687	1759	1829	1898	1964	2029	2092	2153		
		4500	1776	1845	1912	1977	2041	2103	2163			
		4750	1866	1931	1995	2057	2118	2178				
		5000	1955	2018	2079	2138	2197					
Field Accessories:												
	Economizer	89	89	89	89	89	89	89	89	89	89	89

NOTE: Values in the Field Accessories section are VDC adders.

Fig. 65 – Example of Fan Speed Set Up Labels for SystemVu™ Controls

## TEMPORARY FURNACE OPERATION DURING CONSTRUCTION

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

## COMPRESSOR ROTATION

### CAUTION

#### EQUIPMENT DAMAGE HAZARD

Failure to follow this caution can result in premature wear and damage to equipment.

Scroll compressors can only compress refrigerant if rotating in the right direction. Reverse rotation for extended times can result in internal damage to the compressor. Scroll compressors are sealed units and cannot be repaired on site location.

NOTE: When the compressor is rotating in the wrong direction, the unit makes an elevated level of noise and does not provide cooling.

On 3-phase units with scroll compressors, it is important to be certain compressor is rotating in the proper direction. To determine whether or not compressor is rotating in the proper direction:

1. Connect service gauges to suction and discharge pressure fittings.
2. Energize the compressor.
3. The suction pressure should drop and the discharge pressure should rise, as is normal on any start-up.
4. Turn off power to the unit.
5. Reverse any two of the three unit power leads.
6. Reapply electrical power to the compressor. The suction pressure should drop and the discharge pressure should rise which is normal for scroll compressors on start-up.
7. Replace compressor if suction/discharge pressures are not within specifications for the specific compressor.

The suction and discharge pressure levels should now move to their normal start-up levels.

## FASTENER TORQUE VALUES

Table 15 details the torque values for fasteners referenced in this installation instruction.

**Table 15 – Fastener Torque Values**

FASTENER	TORQUE VALUE
Heat shield screws	30 in.-lb (3.4 Nm) ±2 in.-lb (0.2 Nm)
Stator motor mounting screws	23 in.-lb (2.6 Nm) ±2 in.-lb (0.2 Nm)
Fan rotor mounting screws	23 in.-lb (2.6 Nm) ±2 in.-lb (0.2 Nm)
Limit switch screws	50 in.-lb (5.7 Nm) ±5 in.-lb (0.6 Nm)
Fan deck bracket screws	50 in.-lb (5.7 Nm) ±5 in.-lb (0.6 Nm)
Condenser fan motor mounting screws	30 in.-lb (3.4 Nm) ±3 in.-lb (0.3 Nm)
Condenser fan hub set screw	60 in.-lb (6.8 Nm) ±5 in.-lb (0.6 Nm)
Compressor mounting bolts	65 in.-lb (7.3 Nm) ±10 in.-lb (1.2 Nm)
Control box grounding lug	20 in.-lb (2.25 Nm) ±2 in.-lb (0.2 Nm)

## TYPICAL UNIT PIPING

Each heat pump system includes two compressors, a reversing valve, dual-function outdoor and indoor coils, a common liquid line with bi-flow TXV, and dedicated cooling and heating TXVs. 48QE\*\*07-08 unit outdoor coils contain a vapor header check valve. 48QE\*\*09 unit indoor coils contain a vapor header check valve. See Fig. 66-71 and Tables 16-21 for typical unit piping schematic parallel coil circuits during evaporator-function operation and converging coil circuits during the condenser-function operation.

**Table 16 – 48QE\*\*07-08 – Cooling Mode**

COMPONENT	STATUS/POSITION
Reversing Valve	Energized
Check Valve A	Closed
Check Valve B	Open
Check Valve C	Open
Check Valve D	Open
Check Valve E	Closed
Check Valve F	Closed

**Table 17 – 48QE\*\*07-08 – Heating Mode**

COMPONENT	STATUS/POSITION
Reversing Valve	De-energized
Check Valve A	Open
Check Valve B	Closed
Check Valve C	Closed
Check Valve D	Closed
Check Valve E	Open
Check Valve F	Open

**Table 18 – 48QE\*\*07-08 – Defrost Mode**

COMPONENT	STATUS/POSITION
Defrost Thermostat	Closed
Outdoor Fan(s)	Off
Reversing Valve	Energized
Check Valve A	Closed
Check Valve B	Open
Check Valve C	Open
Check Valve D	Open
Check Valve E	Closed
Check Valve F	Closed

**Table 19 – 48QE\*\*09 – Cooling Mode**

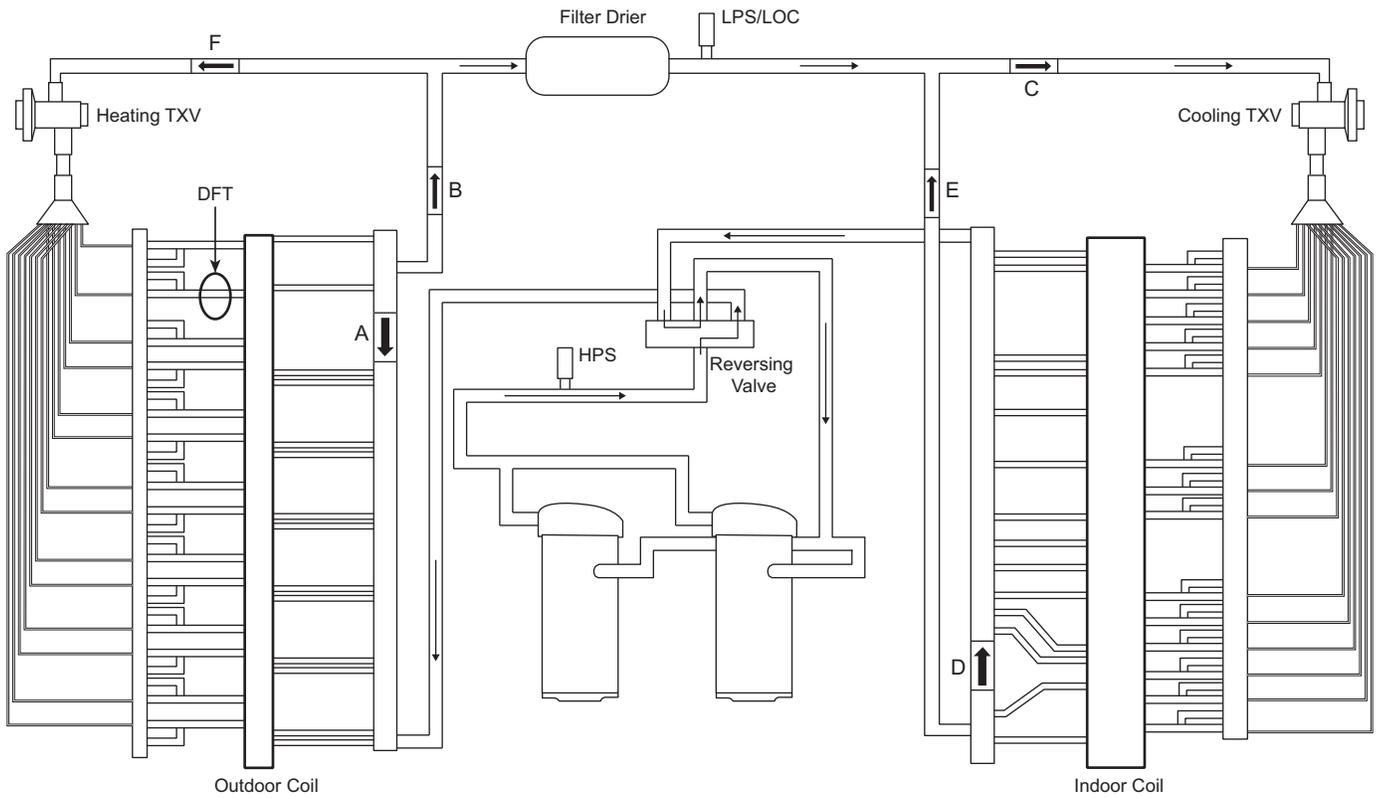
COMPONENT	STATUS/POSITION
Reversing Valve	Energized
Check Valve A	N/A
Check Valve B	Open
Check Valve C	Open
Check Valve D	Open
Check Valve E	Closed
Check Valve F	Closed

**Table 20 – 58QE\*\*09 – Heating Mode**

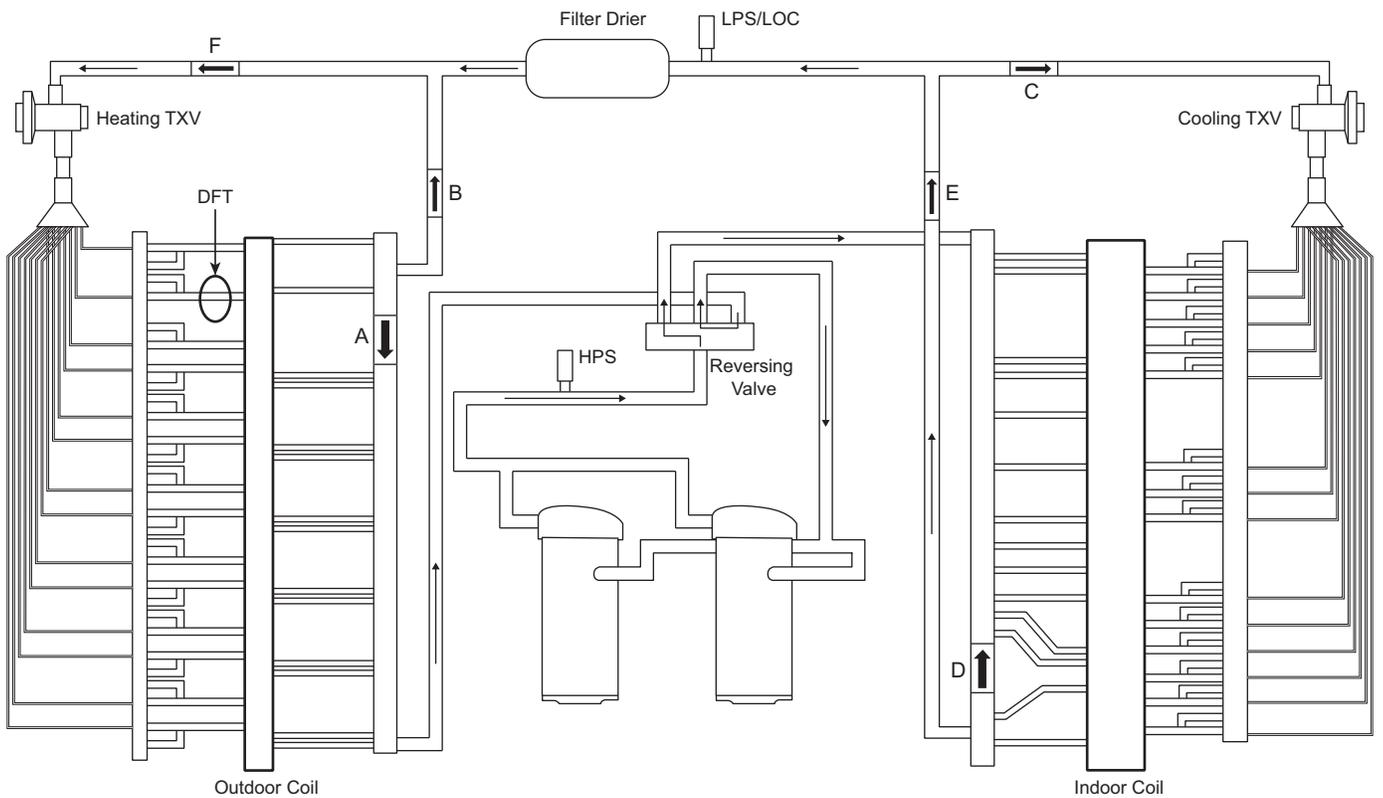
COMPONENT	STATUS/POSITION
Reversing Valve	De-energized
Check Valve A	N/A
Check Valve B	Closed
Check Valve C	Closed
Check Valve D	Closed
Check Valve E	Open
Check Valve F	Open

**Table 21 – 48QE\*\*09 – Defrost Mode**

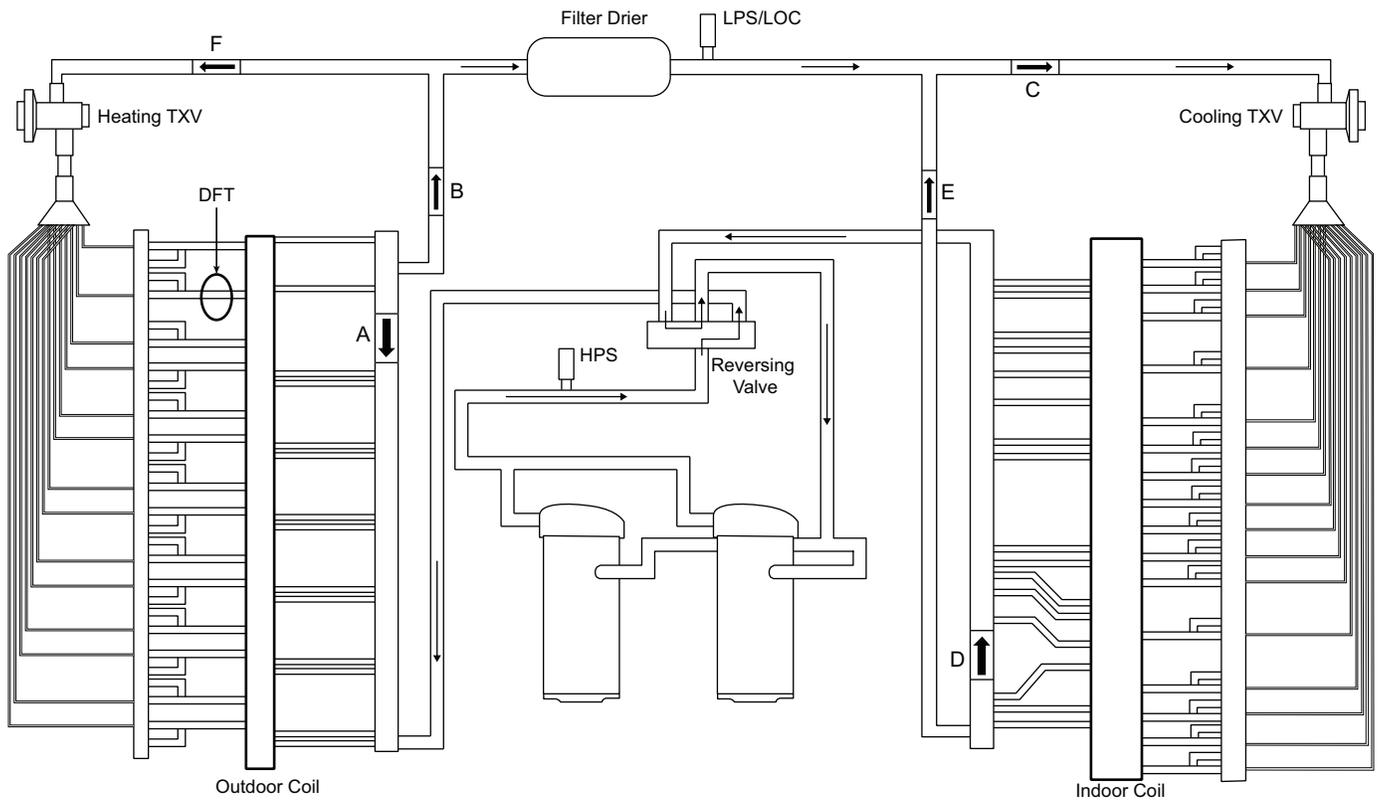
COMPONENT	STATUS/POSITION
Defrost Thermostat	Closed
Outdoor Fan(s)	Off
Reversing Valve	Energized
Check Valve A	N/A
Check Valve B	Open
Check Valve C	Open
Check Valve D	Open
Check Valve E	Closed
Check Valve F	Closed



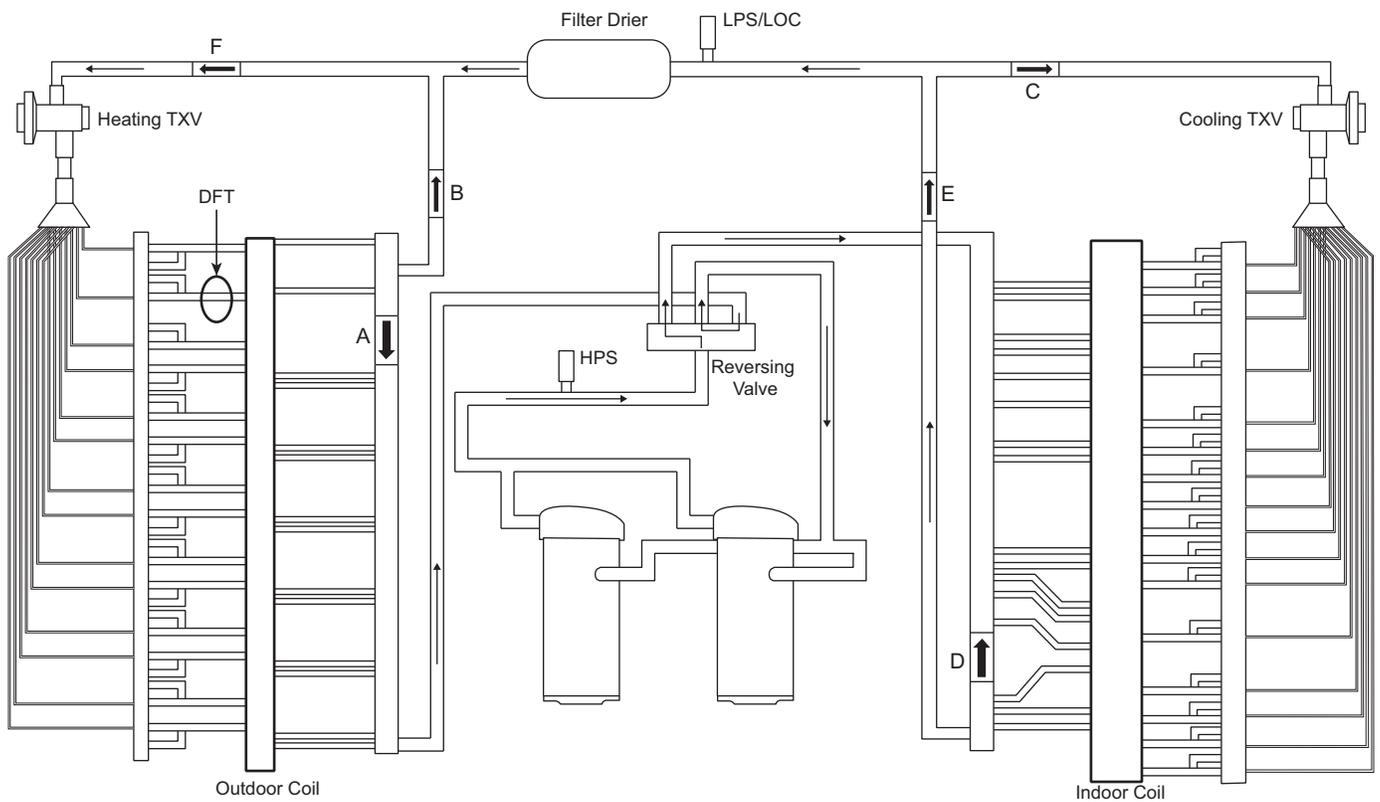
**Fig. 66 — Piping Schematic — 48QE\*\*07 Cooling Mode**



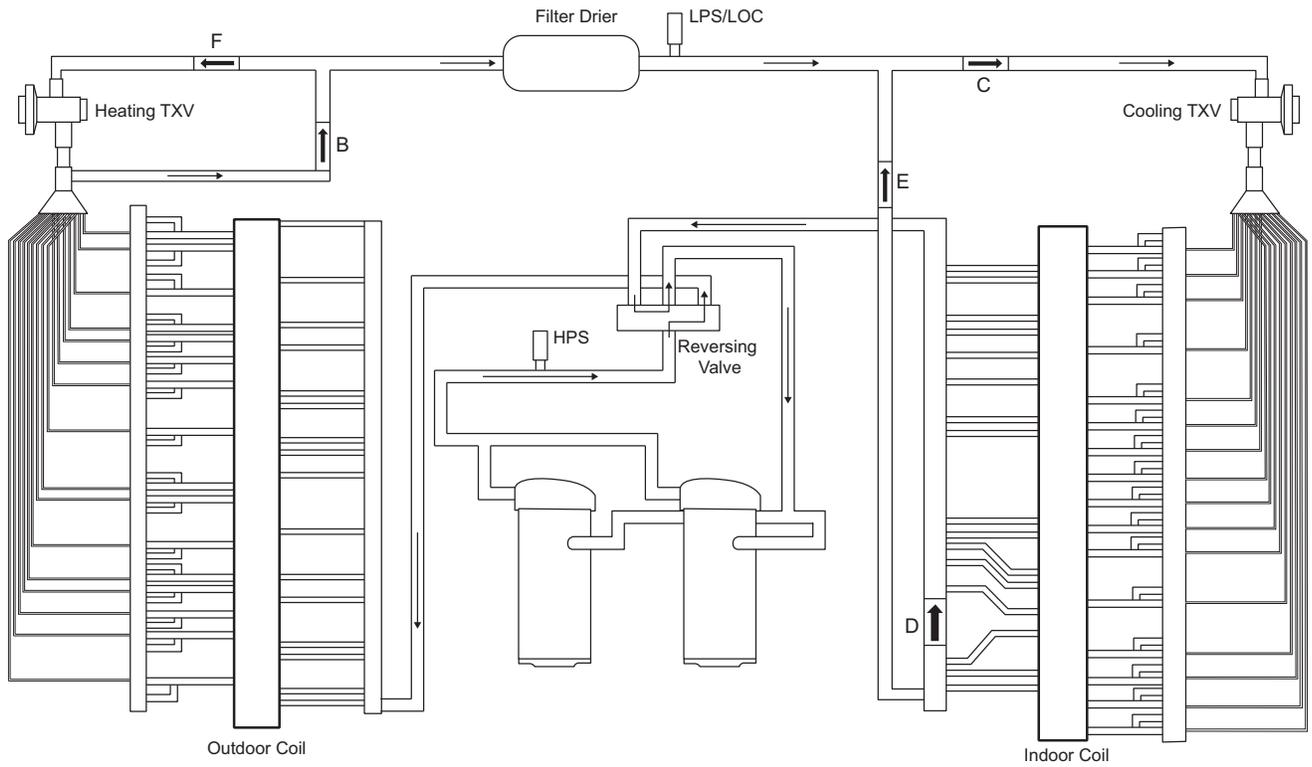
**Fig. 67 — Piping Schematic — 48QE\*\*07 Heating Mode**



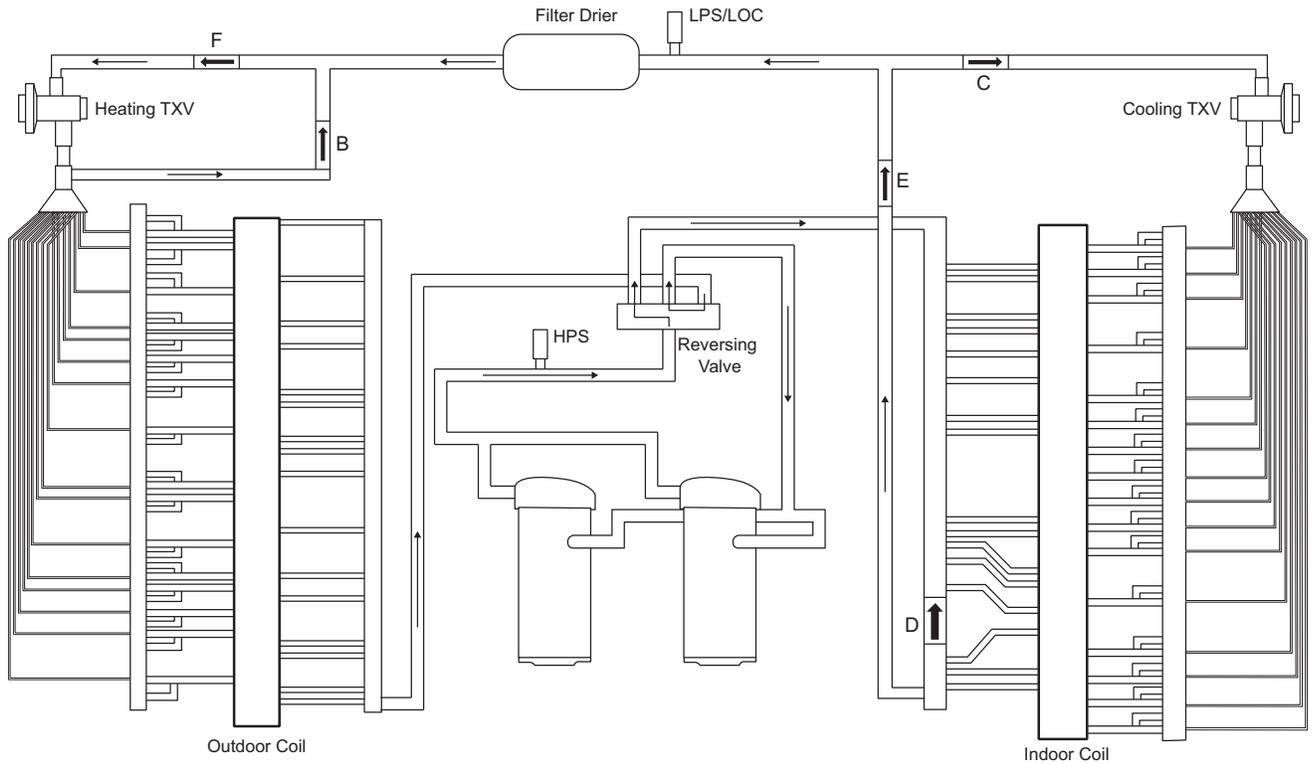
**Fig. 68 – Piping Schematic – 48QE\*\*08 Cooling Mode**



**Fig. 69 – Piping Schematic – 48QE\*\*08 Heating Mode**



**Fig. 70 — Piping Schematic — 48QE\*\*09 Cooling Mode**



**Fig. 71 — Piping Schematic — 48QE\*\*09 Heating Mode**



# START-UP CHECKLIST

48QE\*\*07-09 Single Package Rooftop Hybrid Heat Unit

(Remove and use for job file)

**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 Instruction document.**

## I. PRELIMINARY INFORMATION

MODEL NO. \_\_\_\_\_  
JOB NAME \_\_\_\_\_  
SERIAL NO. \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
START-UP DATE \_\_\_\_\_  
TECHNICIAN NAME \_\_\_\_\_  
ADDITIONAL ACCESSORIES \_\_\_\_\_  
\_\_\_\_\_

## II. PRE-START-UP

Verify that all packaging materials have been removed from unit (Y/N) \_\_\_\_\_  
Verify installation of outdoor air hood (Y/N) \_\_\_\_\_  
Verify installation of flue exhaust and inlet hood (Y/N) \_\_\_\_\_  
Verify that condensate connection is installed per instructions (Y/N) \_\_\_\_\_  
Verify that all electrical connections and terminals are tight (Y/N) \_\_\_\_\_  
Verify gas pressure to unit gas valve is within specified range (Y/N) \_\_\_\_\_  
Check gas piping for leaks (Y/N) \_\_\_\_\_  
Check that indoor-air filters are clean and in place (Y/N) \_\_\_\_\_  
Check that outdoor air inlet screens are in place (Y/N) \_\_\_\_\_  
Verify that unit is level (Y/N) \_\_\_\_\_  
Check fan propellers for location in housing/orifice and verify setscrew is tight (Y/N) \_\_\_\_\_  
Verify that scroll compressors are rotating in the correct direction (Y/N) \_\_\_\_\_  
Verify yellow LED light on dissipation board is steady (Y/N) \_\_\_\_\_  
Verify the dissipation board test button will operate the indoor fan for 1 minute (Y/N) \_\_\_\_\_  
Verify installation of thermostat (Y/N) \_\_\_\_\_  
Verify that crankcase heaters have been energized for at least 24 hours (Y/N) \_\_\_\_\_

## III. START-UP

### ELECTRICAL

Supply Voltage	L1-L2 _____	L2-L3 _____	L3-L1 _____
Supply Voltage to Ground	L1 to Ground _____	L2 to Ground _____	L3 to Ground _____
Compressor Amps 1	L1 _____	L2 _____	L3 _____
Compressor Amps 2	L1 _____	L2 _____	L3 _____
Supply Fan Amps	L1 _____	L2 _____	L3 _____

### TEMPERATURES

Outdoor-air Temperature \_\_\_\_\_ °F DB (Dry Bulb)  
Return-air Temperature \_\_\_\_\_ °F DB \_\_\_\_\_ °F WB (Wet Bulb)  
Cooling Supply Air Temperature \_\_\_\_\_ °F  
Gas Heat Supply Air \_\_\_\_\_ °F

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

## PRESSURES

Gas Inlet Pressure \_\_\_\_\_ in. wg  
Gas Manifold Pressure STAGE 1 \_\_\_\_\_ in. wg  
STAGE 2 \_\_\_\_\_ in. wg  
Refrigerant Suction STAGE 1 \_\_\_\_\_ PSIG  
STAGE 2 \_\_\_\_\_ PSIG  
STAGE 3 \_\_\_\_\_ PSIG  
Refrigerant Discharge STAGE 1 \_\_\_\_\_ PSIG  
STAGE 2 \_\_\_\_\_ PSIG  
STAGE 3 \_\_\_\_\_ PSIG  
Verify Refrigerant Charge using Charging Charts (Y/N) \_\_\_\_\_

## GENERAL

Economizer minimum vent and changeover settings to job requirements (if equipped). (Y/N) \_\_\_\_\_  
Verify smoke detector unit shutdown by utilizing magnet test. (Y/N) \_\_\_\_\_

## IV. HUMIDI-MIZER® SYSTEM START-UP

### STEPS

1. Use Service Test mode to turn on maximum cooling.
  - a. Turn on Cool A1 test under Cool Test menu (Y/N) \_\_\_\_\_
  - b. Turn on Cool A2 Test under Cool Test Menu (Y/N) \_\_\_\_\_

### OBSERVE AND RECORD

- a. Suction pressure \_\_\_\_\_ PSIG \_\_\_\_\_ PSIG
  - b. Discharge pressure \_\_\_\_\_ PSIG \_\_\_\_\_ PSIG
  - c. Entering air temperature \_\_\_\_\_ °F \_\_\_\_\_ °F
  - d. Liquid temperature at outlet or reheat coil \_\_\_\_\_ °F \_\_\_\_\_ °F
  - e. Confirm correct rotation for compressor (Y/N) \_\_\_\_\_
  - f. Check for correct ramp-up of outdoor fan motor as condenser coil warms (Y/N) \_\_\_\_\_
2. Check unit charge per charging chart. (Y/N) \_\_\_\_\_
  3. Switch unit to HIGH-LATENT mode (SUBCOOL) by turning Humidimizer test to SUBCOOL under the COOL TEST menu. (Y/N) \_\_\_\_\_

### OBSERVE

- a. Reduction in suction pressure (5 to 7 psi expected) (Y/N) \_\_\_\_\_
  - b. Discharge pressure unchanged (Y/N) \_\_\_\_\_
  - c. Liquid temperature drops to 50 to 55°F range (Y/N) \_\_\_\_\_
  - d. LDV solenoid energized (valve switches to reheat coil flow) (Y/N) \_\_\_\_\_
4. Switch unit to DEHUMID (REHEAT) by turning Humidimizer test to REHEAT under the COOL TEST menu. (Y/N) \_\_\_\_\_

### OBSERVE

- a. Suction pressure increases to normal cooling level (Y/N) \_\_\_\_\_
  - b. Discharge pressure decreases 30 to 50 PSI (Y/N) \_\_\_\_\_
  - c. Liquid temperature returns to normal cooling level (Y/N) \_\_\_\_\_
  - d. LDV solenoid energized (valve switches to reheat coil flow) (Y/N) \_\_\_\_\_
  - e. RDV solenoid energized, valve opens for flow (Y/N) \_\_\_\_\_
5. Switch unit to OFF by turning Humidimizer test to OFF under the COOL TEST menu. Compressor and outdoor fan stop, RDV or LDV solenoids de-energized. (Y/N) \_\_\_\_\_

## V. TEMPORARY FURNACE OPERATION DURING CONSTRUCTION

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