# Installation and Maintenance Manual IM 986-17

Group: **WSHP**
Part Number: **910388284**
Date: **April 2022**

# Vertical Stack Water Source Heat Pumps

## Model VHF Cabinet
## Model VHC Chassis (Standard Range)
## Model VHW Chassis (Geothermal Range)

## Unit Sizes 009 – 036 / R-410A Refrigerant

**Model VHF** **Model VHC/VHW**

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## Hazard Identification Information

**⚠ WARNING**

This Installation and Maintenance bulletin is intended to provide the proper procedures for installing a Daikin Console Water Source Heat Pump. Failure to follow these procedures can cause property damage, severe personal injury or death. Additional, failure to follow these procedures can cause premature failure of this equipment or cause erratic unit operation, resulting in diminished unit performance. Disregarding these directions may further lead to suspension or revocation of the manufacturer's warranty.

**⚠ DANGER**

Dangers indicates a hazardous situation, which will result in death or serious injury if not avoided.

**⚠ WARNING**

Warnings indicate potentially hazardous situations, which can result in property damage, severe personal injury, or death if not avoided.

**⚠ CAUTION**

Cautions indicate potentially hazardous situations, which can result in personal injury or equipment damage if not avoided.

**Note:** *Indicates important details or clarifying statements for information presented.*

***Note:*** *Text displayed in* ***Bold-Italics*** *designate standard offering.*

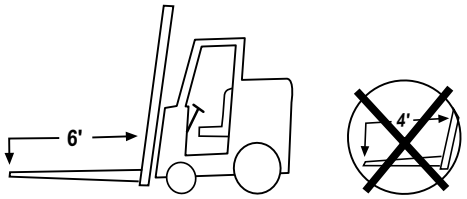
| Category | Code Item | Code Option | Code Designation & Description *(Bold-Italic = Standard)* |
|---|---|---|---|
| **Product Category** | **1** | **1** | ***W = Water Source Heat Pump*** |
| **Model Type** | **2** | **2, 3, 4** | ***VHC = Vertical Stacked Heat Pump Chassis*** |
| | | | ***VHF = Vertical Stacked Heat Pump Cabinet*** |
| | | | VHW = Vertical Stacked Geothermal Chassis only |
| **Design Series** | **3** | **5** | 3 = 3rd Design |
| | | | 4 = 4th Design (Sizes 015 only) |
| **Unit Size** | **4** | **6, 7, 8** | 009 = 9,000 Btuh Nominal Cooling |
| | | | 012 = 12,000 Btuh Nominal Cooling |
| | | | 015 = 15,000 Btuh Nominal Cooling |
| | | | 018 = 18,000 Btuh Nominal Cooling |
| | | | 021 = 21,000 Btuh Nominal Cooling |
| | | | 024 = 24,000 Btuh Nominal Cooling |
| | | | 030 = 30,000 Btuh Nominal Cooling |
| | | | 036 = 36,000 Btuh Nominal Cooling |
| **Controls** | **5** | **9** | ***B = MicroTech III Unitary Controller - Standalone*** |
| | | | C = Microtech III Unitary Controller w/LonWorks Comm Module |
| | | | D = Microtech III Unitary Controller w/BACnet Comm Module |
| | | | F = Microtech III Unitary Controller w/BACnet Comm Module - WSHP System |
| **Voltage** | **6** | **10** | A = 115/60/1 |
| | | | E = ***208-230/60/1*** |
| | | | J = 265-277/60/1 |
| **Secondary Drain Pan** | **7** | **11, 12** | ***GL = Standard Galvanized*** |
| | | | SS = Stainless Steel - IAQ Option |
| | | | YY = None |
| **Refrigerant** | **8** | **13** | ***A = R410A*** |
| **Motorized 2-way Isolation Valve** | **9** | **14** | C = 2-Way Motorized 1/2" Iso-Valve, General Close-Off Pressure N.C. (Normally Closed) |
| | | | V = 2-Way Motorized 1/2" Iso-Valve, General Close-Off Pressure N.O. (Normally Open) |
| | | | H = 2-Way Motorized 1/2" Iso-Valve, High Close-Off Pressure N.C. (Normally Closed) |
| | | | D = 2-Way Motorized 3/4" Iso-Valve, General Close-Off Pressure N.C. (Normally Closed) |
| | | | K = 2-Way Motorized 3/4" Iso-Valve, General Close-Off Pressure N.O. (Normally Open) |
| | | | J = 2-Way Motorized 3/4" Iso-Valve, High Close-Off Pressure N.C. (Normally Closed) |
| | | | E = 3-Way Motorized 1/2" Iso-Valve, General Close-Off Pressure N.C. (Normally Closed) |
| | | | G = 3-Way Motorized 1/2" Iso-Valve, High Close-Off Pressure N.C. (Normally Closed) |
| | | | M = 3-Way Motorized 3/4" Iso-Valve, General Close-Off Pressure N.C. (Normally Closed) |
| | | | P = 3-Way Motorized 3/4" Iso-Valve, High Close-Off Pressure N.C. (Normally Closed) |
| | | | B = Auto-Reg-PT |
| | | | Y = None |
| **Chassis Construction Type** | **10** | **15** | A = 1/2" Fiberglass Skin Faced |
| | | | E = 3/8" Closed Cell Foam |
| **Note:** | | | Y = None |
| A compressor sound blanket is not available for units with a rotary compressor (Unit sizes 009-021) | | **16** | M = Mass Plate & Compressor Blanket (Unit Sizes 024-036 Only) |
| | | | Y = None |
| | | | S = Mass Plate Only |
| | | **17** | D = Corrosion Protection |
| | | | Y = None |
| **Coaxial Heat Exchanger Construction** | **11** | **18** | C = Copper Inner Tube - Steel Outer Shell |
| | | | S = Cupronickel Inner Tube - Steel Outer Shell |
| **Discharge Air** | **13** | **20** | B = Primary Supply - Back |
| | | | F = Primary Supply - Front |
| | | | L = Primary Supply - Left |
| | | | R = Primary Supply - Right |
| | | | T = Primary Supply - Top |
| | | | Y = None |
| | | **21** | B = Secondary Supply - Back |
| | | | F = Secondary Supply - Front |
| | | | L = Secondary Supply - Left |
| | | | R = Secondary Supply - Right |
| | | | T = Secondary Supply - Top |
| | | | Y = None |
| | | **22** | T = Tertiary - Top |
| **Power Connection** | **14** | **23** | F = Fused Disconnect with Wire Harness |
| | | | N = Non-Fused Disconnect with Wire Harness |
| | | | H = HACR Breaker |

***Note:*** *Text displayed in* ***Bold-Italics*** *designate standard offering.*

| Category | Code Item | Code Option | Code Designation & Description *(Bold-Italic = Standard)* |
|---|---|---|---|
| **Blower Motor** | **15** | **24, 25** | 12 = PSC Motor, 2-Speed Fan, T'stat Controlled |
| | | | 13 = PSC Motor, 2-Speed Fan Switch (Unit Mounted) |
| | | | 22 = High Static PSC Motor, 2-Speed Fan, T'stat Controlled (Sizes 015-018) |
| | | | 23 = High Static PSC Motor, 2-Speed Fan Switch (Unit Mounted - Sizes 015-018) |
| | | | 34 = EC Motor, 4-Position Fan Speed Selection Switch |
| **Power & Control Access** | **16** | **26** | ***S = Side*** |
| | | | T = Top |
| **Flow Control** | **17** | **27** | B = Auto Flow Regulator 1.5 GPM |
| | | | C = Auto Flow Regulator 2.0 GPM |
| | | | D = Auto Flow Regulator 2.5 GPM |
| | | | E = Auto Flow Regulator 3.0 GPM |
| | | | F = Auto Flow Regulator 3.5 GPM |
| | | | G = Auto Flow Regulator 4.0 GPM |
| | | | H = Auto Flow Regulator 4.5 GPM |
| | | | I = Auto Flow Regulator 5.0 GPM |
| | | | J = Auto Flow Regulator 5.5 GPM |
| | | | K = Auto Flow Regulator 6.0 GPM |
| | | | L = Auto Flow Regulator 7.0 GPM |
| | | | M = Auto Flow Regulator 8.0 GPM |
| | | | N = Auto Flow Regulator 9.0 GPM |
| | | | O = Auto Flow Regulator 10.5 GPM |
| | | | YY = None |
| | | **28** | S = Strainer |
| **Filter Type** | **18** | **29** | ***S = Standard 1" Fiberglass*** |
| | | | Y = None |
| | | | M = 1" Merv 8 |
| | | | H = 2" Merv 13 |
| **Cabinet Height** | **19** | **30, 31, 32** | 080 = 80" Cabinet Height |
| | | | 088 = 88" Cabinet Height |
| | | | 092 = 92" Cabinet Height |
| | | | 096 = 96" Cabinet Height |
| | | | KDN = 63.5" Cabinet (for ducted discharge applications only) |
| **Cabinet Insulation** | **20** | **33, 34** | AY = Standard 1/2" Fiberglass |
| | | | EY = 3/8" Closed Cell Foam (IAQ) |
| | | | FY = 1/2" Foil Faced |
| | | | YY = None |
| **Riser Mounting** | **21** | **35** | F = Factory Supplied Shipped with Cabinet - for Field Installation |
| | | | J = Factory Supplied Shipped Separate from Cabinet - for Field Installation |
| **Riser Location** | **22** | **36** | L = Left Cabinet Piping |
| | | | R = Right Cabinet Piping |
| | | | B = Back Cabinet Piping |
| **Heating Options** | **23** | **37** | H = Hot Water Coil |
| | | | Y = None |
| **Heating Control Option** | | **38** | Y = None |
| | | **39** | A = 3-Way 1/2" Motorized Valve |
| | | | B = 3-Way 3/4" Motorized Valve |
| | | | Y = None |
| **Wireless T'Stat Option** | **24** | **40** | N = Factory Installed Wireless RF Receiver with Non-Programmable Thermostat |
| | | | P = Factory Installed Wireless RF Receiver with 7-Day Programmable Thermostat |
| | | | Y = None |
| **Factory Installed Subbase** | **28** | **47** | 2 = 2 Inch Subbase |
| | | | 3 = 3 Inch Subbase |
| | | | 4 = 4 Inch Subbase |
| | | | 5 = 5 Inch Subbase |
| **Packaging** | **30** | **50** | 1 = Multipack Chassis or Single Crated Cabinet |
| | | | 2 = Multipack Cabinets - Multiple Cabinets on one pallet group |

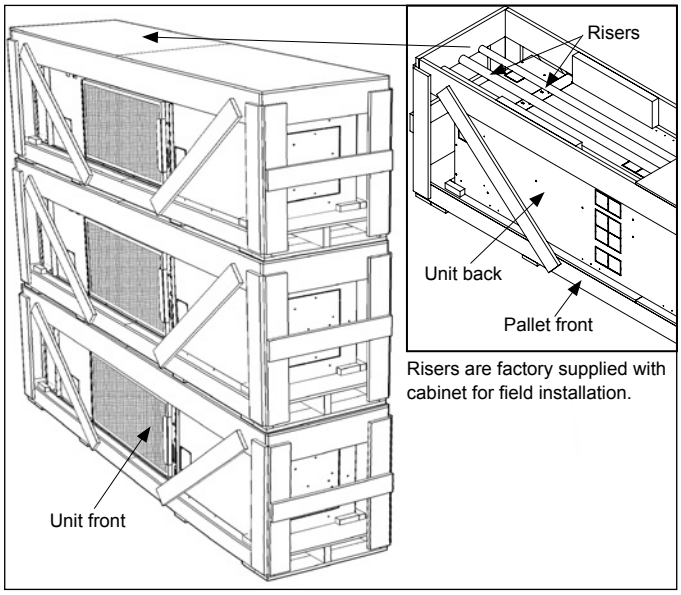
## Receiving and Storage

Upon receipt of the equipment, check the carton and pallets for visible damage. Make a notation on the shipper's delivery ticket before signing. If there is any evidence of rough handling, immediately open the cartons to check for concealed damage. If any damage is found, notify the carrier within 48 hours to establish your claim and request their inspection and a report. The Warranty Claims Department should then be contacted.




### Cabinet Stacking (1 unit per crate)

Do not stack over three crates high at any time during transportation or storage.




Risers are factory supplied with cabinet for field installation.

### Chassis (4 per skid)

Do not stack over two skid high at any time during transportation or storage. For storing, each carton is marked with "up" arrows.

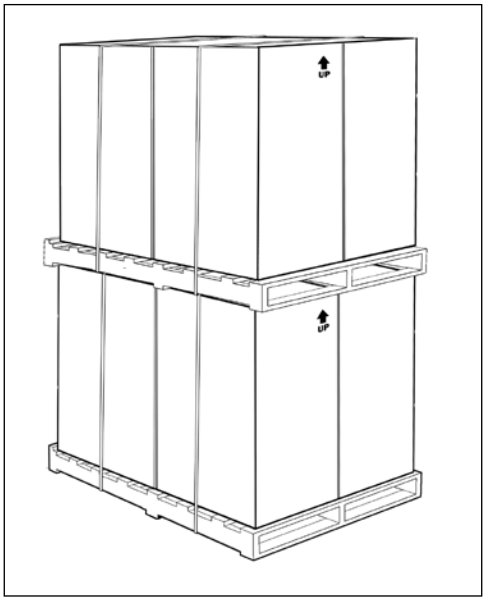



***Table 1: Short stack 63.5" cabinet without factory attached risers - overall shipping dimensions (4-pack dimensions shown)***

| Unit Size | Overall Dimensions |
|---|---|
| **009-012** | 42-5/8" x 45-1/2" x 67-5/8" |
| **015-018** | 46-5/8" x 46-3/8" x 67-5/8" |
| **021-036** | 54-5/8" x 57-1/2" x 67-5/8" |

*Note: 63.5" high cabinets ship from 1 to 4 per skid, vertically, similar to the chassis's as shown above.*

### Storage and Operating Environment

Temporary storage at the job site must be indoor, completely sheltered from rain, snow, etc. Units should not be installed in environments that fall below freezing or exceed 140°F ambient.

***Table 2: Cabinet packaging overall dimensions***

| Unit Size | | Cabinet Size | | |
|---|---|---|---|---|
| | | **18 x 18** | **18 x 20** | **24 x 24** |
| **009-012** | **With Risers**[1] | 21"W x 29"H x 91.50" to 124.50"L | – | – |
| | **Without Risers** | 21"W x 27"H x 91.50" to 107.50"L | – | – |
| **015-018** | **With Risers**[1] | _ | 21"W x 31"H x 91.50" to 124.50"L | – |
| | **Without Risers** | _ | 21"W x 29"H x 91.50" to 107.50"L | – |
| **021-036** | **With Risers**[1] | _ | – | 27"W x 35"H x 91.50" to 124.50"L |
| | **Without Risers** | _ | – | 27"W x 23"H x 91.50" to 107.50"L |

*Note: [1] Risers are factory supplied with cabinet for field installation.*

## Handling

Carefully check items against the bills of lading to verify all crates and cartons have been received. Cabinets and Chassis normally ship four to a pallet.

Carefully inspect all units for shipping damage. Report damage immediately to the carrier and file a claim.

Check the unit data plate to be sure the unit electrical agrees with the power supply available (Figure 1).

DO NOT handle units by the riser piping. Riser clamps hold the riser in position; they are not designed to support the cabinet weight. The clamps are removed after the unit is installed.

***Figure 1: Unit components & descriptions - received as assembled cabinet with chassis shipped separate***

### Component Descriptions (Assembled Cabinet)

1. Cabinet assembly complete (without chassis)
   - **1a.** Pipe riser sets (return, supply and condensate)
   - **1b.** Inner front panel and filter bracket
2. Cooling and heating chassis (shipped separate)
3. Return air grille/panel (accessory)
4. Double-deflection diffuser (accessory)

Unit cabinets are factory assembled and wired and have individual thermostat control capability. They are installed by stacking one unit on top of the other. While installing, prevent dirt and other foreign matter from entering the risers and plugging lines or valves.

## General Information

Daikin Vertical Stack units are designed for use in multiple floor apartments, office buildings, hotels, nursing homes and other similar applications. They require a minimum amount of floor space and are designed for multiple discharge arrangement.

Installation and maintenance must follow accepted industry practices as described in the ASHRAE Handbook, the National Electric Code, and other applicable standards. Install this equipment in accordance with regulations of authorities having jurisdiction and with all applicable codes.

**⚠ CAUTION**

Installation and maintenance are to be performed by qualified personnel who are familiar with local codes and regulations, and experienced with this type of equipment.

**⚠ WARNING**

The installer must determine and follow all applicable codes and regulations. This equipment presents hazards of electricity, rotating parts, sharp edges, heat and weight. Failure to read and follow these instructions can result in property damage, severe personal injury or death. This equipment must be installed by experienced, trained personnel only.

**⚠ CAUTION**

Sharp metal edges are a hazard, use care when servicing to avoid contact with them.

## Disassembling Upper and Lower Cabinet Sections

The Vertical Stack unit cabinet ships completely assembled. If required, it may be disassembled into two (2) sections (upper-fan/discharge cabinet) and (lower chassis/return air cabinet) to make it easier to handle. To disassemble, do the following.

1. Remove risers (if received attached).
2. Remove the three (bottom row) screws on the back of the unit as shown in Figure 2.

***Note:*** *Retain all screws for later use to reassemble unit in reverse order as described in steps 1-6. Number of screws will vary depending on unit size.*

3. Carefully lay the unit down on its back and remove the remaining eight (8) screws on the left and right side of the cabinet (Figure 3).
4. Remove the ten (10) screws and lift off the front panel/filter rack to gain access to the cabinet interior (Figure 4).
5. Locate and remove the six (6) screws located inside the cabinet joining the upper and lower cabinet sections (Figure 5).

***Note:*** *Pull the insulation away from the walls of the cabinet interior to get access to the screws.*

6. Separate the lower return air cabinet section from the upper blower/discharge cabinet section (Figure 6).

***Figure 2: Remove three (3) screws (bottom row) on the back of the unit.***

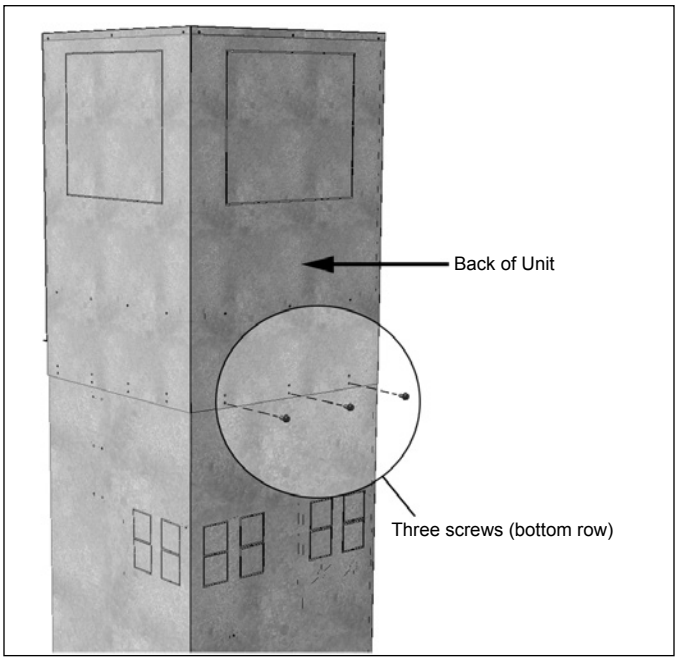



***Figure 3: Remove remaining eight (8) screws on the left and right sides of the cabinet***

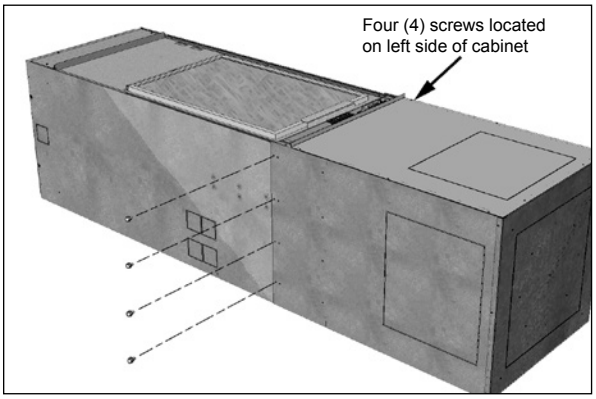



***Figure 4: Remove the ten (10) screws from the front panel/ filter rack.***

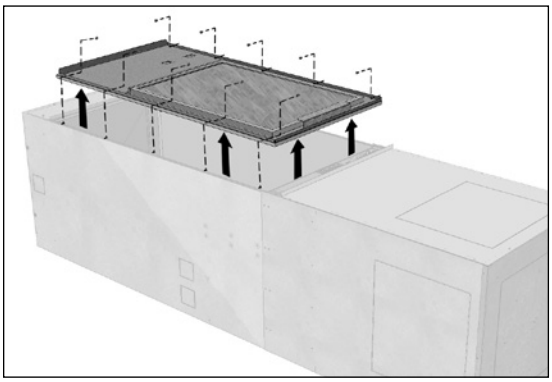


***Figure 5: Remove the six (6) screws located on the interior of the unit.***

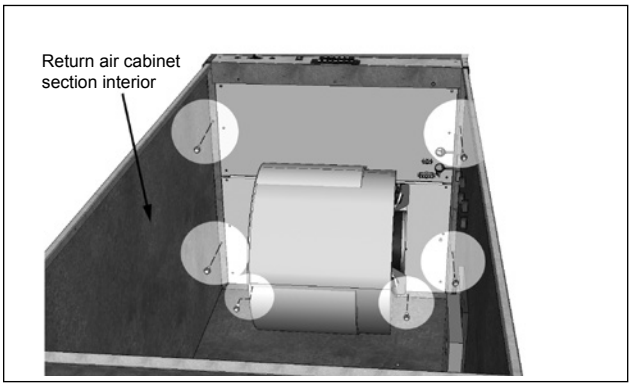
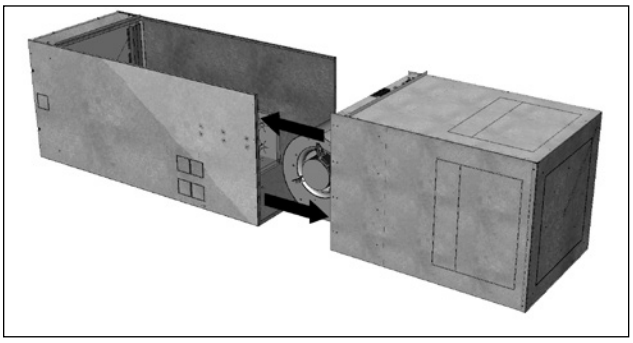
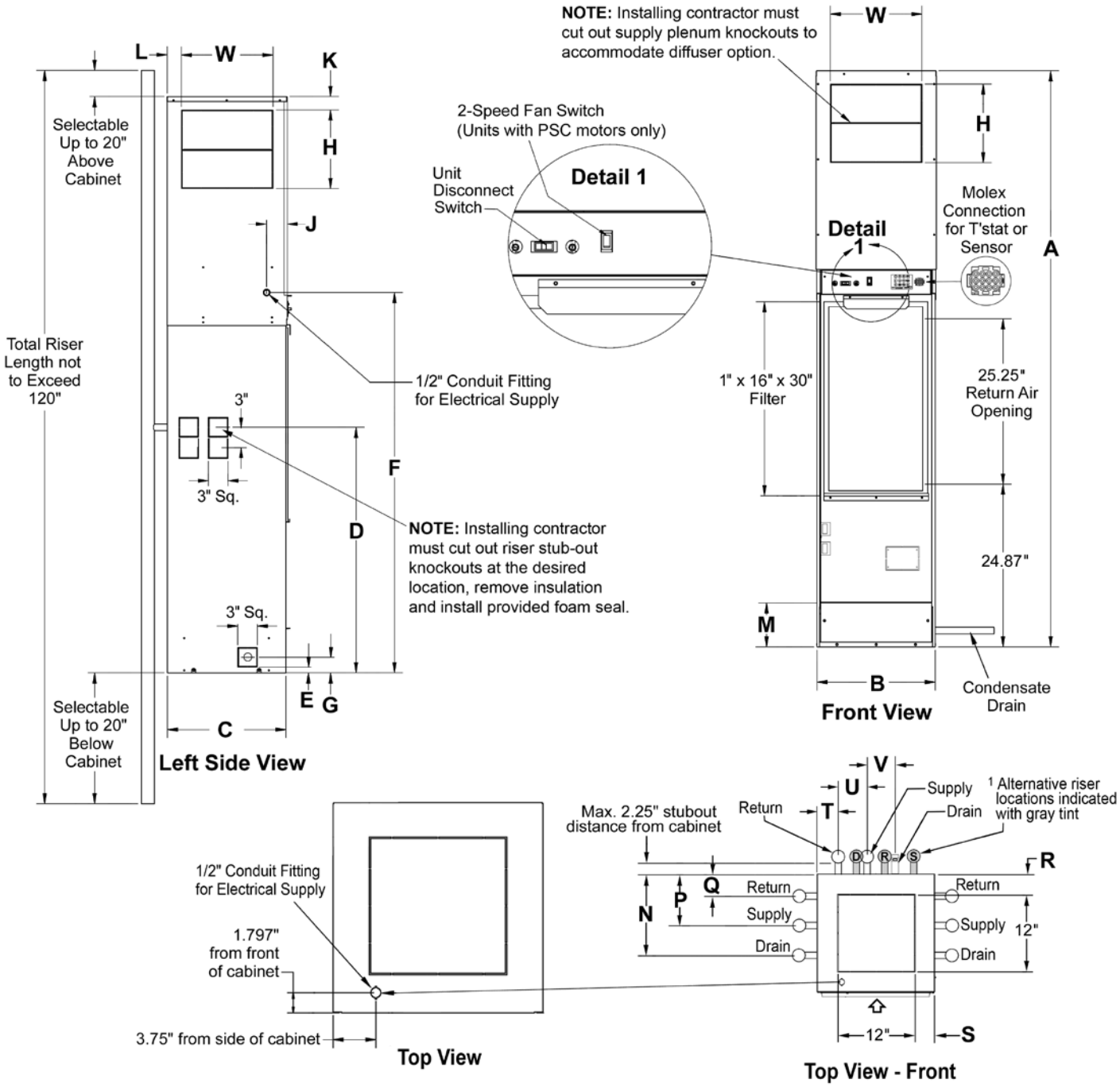



***Figure 6: Separate the lower cabinet section from the upper cabinet.***



## Model VHF & VHW – 18" × 18" Cabinet – Size 009-012



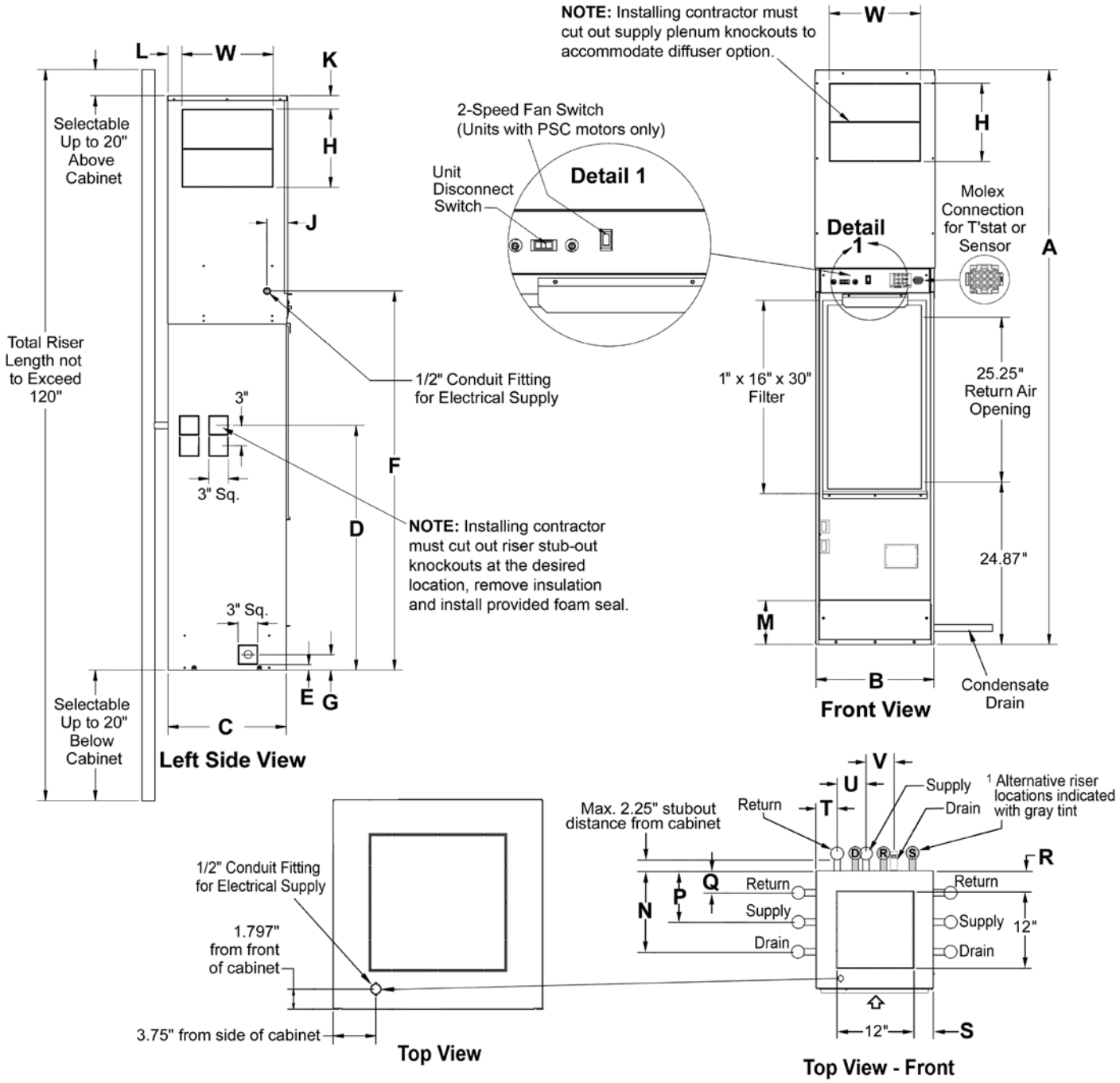

### Dimensions

| Unit Size 009–018 (18" × 18") Cabinet (Dimensions in inches) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unit Height "A"** | **B** | **C** | **D** | **E** | **F** | **G** | **J** | **K** | **L** | **M** | **N** | **P** | **Q** | **R** | **S** | **T** | **U** | **V** |
| **80, 88, 92, 96** | 18.07 | 18.11 | 37.50 | 0.88 | 58.09 | 2.38 | 3.125 | 2.0 | 2.0 | 6.72 | 12.4 | 7.9 | 3.3 | 3.0 | 3.0 | 3.3 | 4.5 | 4.5 |

| Discharge Openings (Dimensions in inches) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Unit Size** | **Single** | | **Double** | | **Triple** | | **Single- Top Opening** | |
| **009–012** | **W** | **H** | **W** | **H** | **W** | **H** | **W** | **H** |
| | 14 | 16 | 14 | 8 | NR | NR | 12 | 12 |

***Notes:*** *[1] Alternative riser locations dimensions mirror those shown as "T", "U", and "V"*
*NR = Not Recommended*
*80" high cabinet not available with side discharge, top discharge only.*

## Model VHF & VHW – 18" × 20" Cabinet – Size 015-018



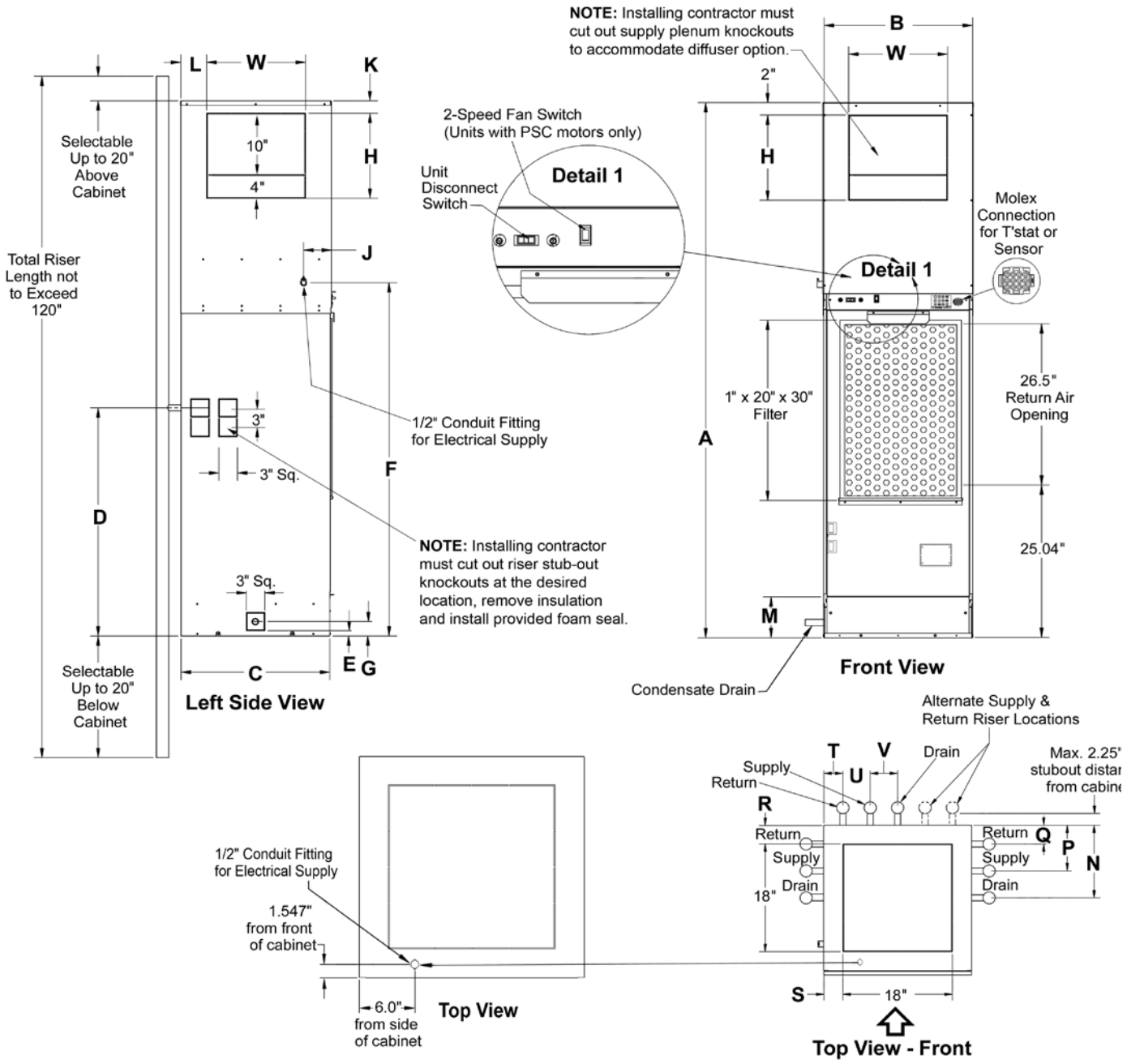

### Dimensions

| Unit Size 015–018 (18" × 20") Cabinet (Dimensions in inches) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Height "A" | B | C | D | E | F | G | J | K | L | M | N | P | Q | R | S | T | U | V |
| 80, 88, 92, 96 | 18.07 | 20.00 | 37.50 | 0.88 | 58.09 | 2.38 | 3.125 | 2.0 | 3.0 | 6.72 | 12.4 | 7.9 | 3.3 | 4.0 | 3.0 | 3.12 | 4.5 | 4.5 |

| Discharge Openings (Dimensions in inches) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Unit Size | Single | | Double | | Triple | | Single- Top Opening | |
| 015–018 | W | H | W | H | W | H | W | H |
| | 14 | 16 | 14 | 8 | 14 | 8 | 12 | 12 |

***Notes:*** *[1] Alternative riser locations dimensions mirror those shown as "T", "U", and "V"*
*80" high cabinet not available with side discharge, top discharge only.*

## Model VHF & VHW – 24" × 24" Cabinet – Size 021-036



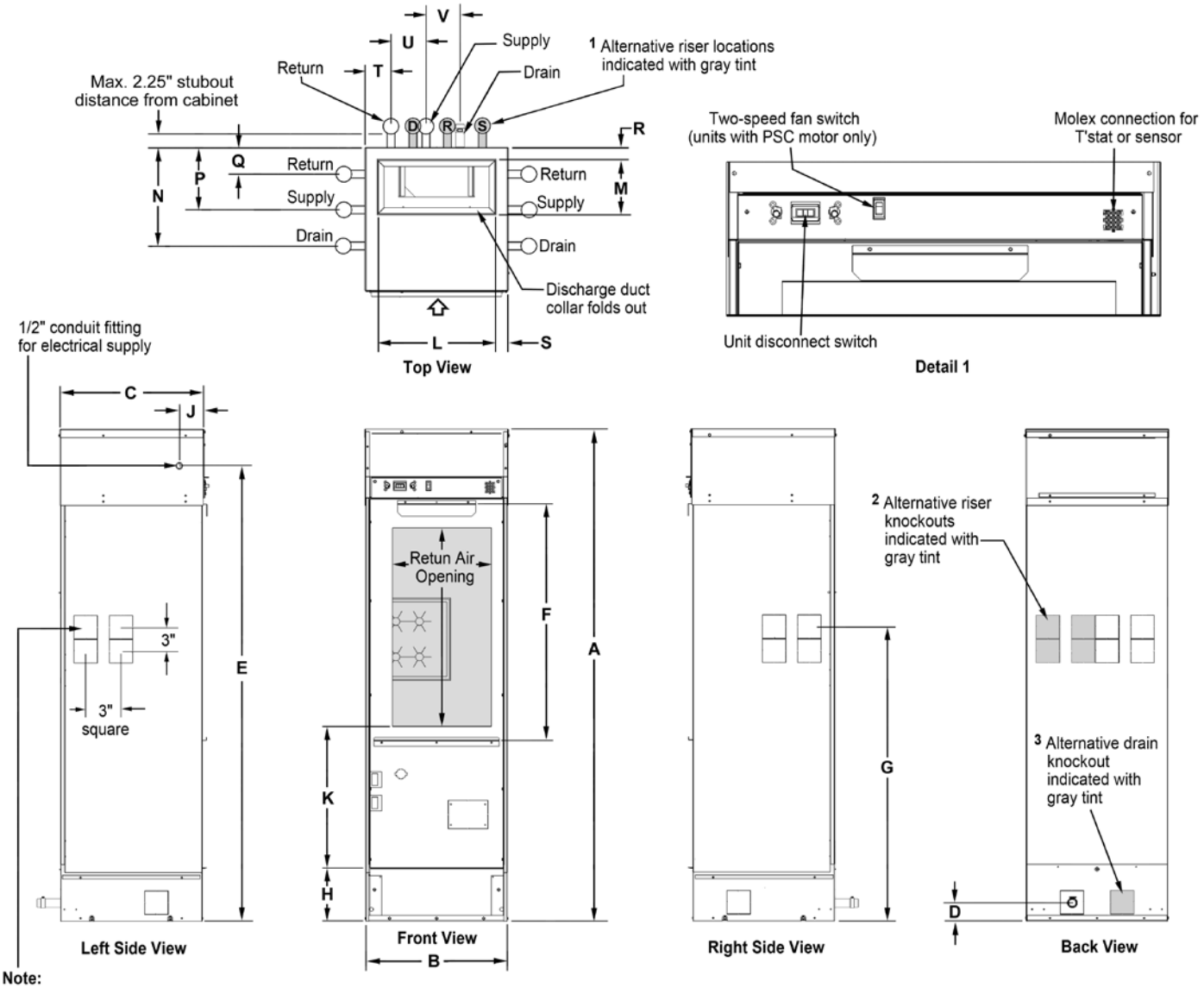

### Dimensions

| Unit Size 021–036 (24" × 24") Cabinet (Dimensions in inches) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unit Height "A"** | **B** | **C** | **D** | **E** | **F** | **G** | **J** | **K** | **L** | **M** | **N** | **P** | **Q** | **R** | **S** | **T** | **U** | **V** |
| **80, 88, 92, 96** | 24.00 | 24.04 | 37.50 | 0.88 | 58.08 | 2.38 | 4.54 | 2.0 | 3.0 | 6.72 | 12.4 | 7.9 | 3.3 | 3.09 | 3.10 | 3.12 | 4.5 | 4.5 |

| Discharge Openings (Dimensions in inches) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Unit Size** | **Single** | | **Double** | | **Triple** | | **Single- Top Opening** | |
| **021–024** | W | H | W | H | W | H | W | H |
| | NR | NR | 18 | 10 | 18 | 10 | 18 | 18 |
| **030–036** | NR | NR | 18 | 14 | 18 | 10 | 18 | 18 |

***Notes:*** *NR = Not Recommended*
*80" high cabinet not available with side discharge, top discharge only.*

## Model VHF 63.5" High Cabinet - Sizes 009-018




**Note:**
Installing contractor must cut-out knockouts at the desired locations, remove insulation and install foam seal

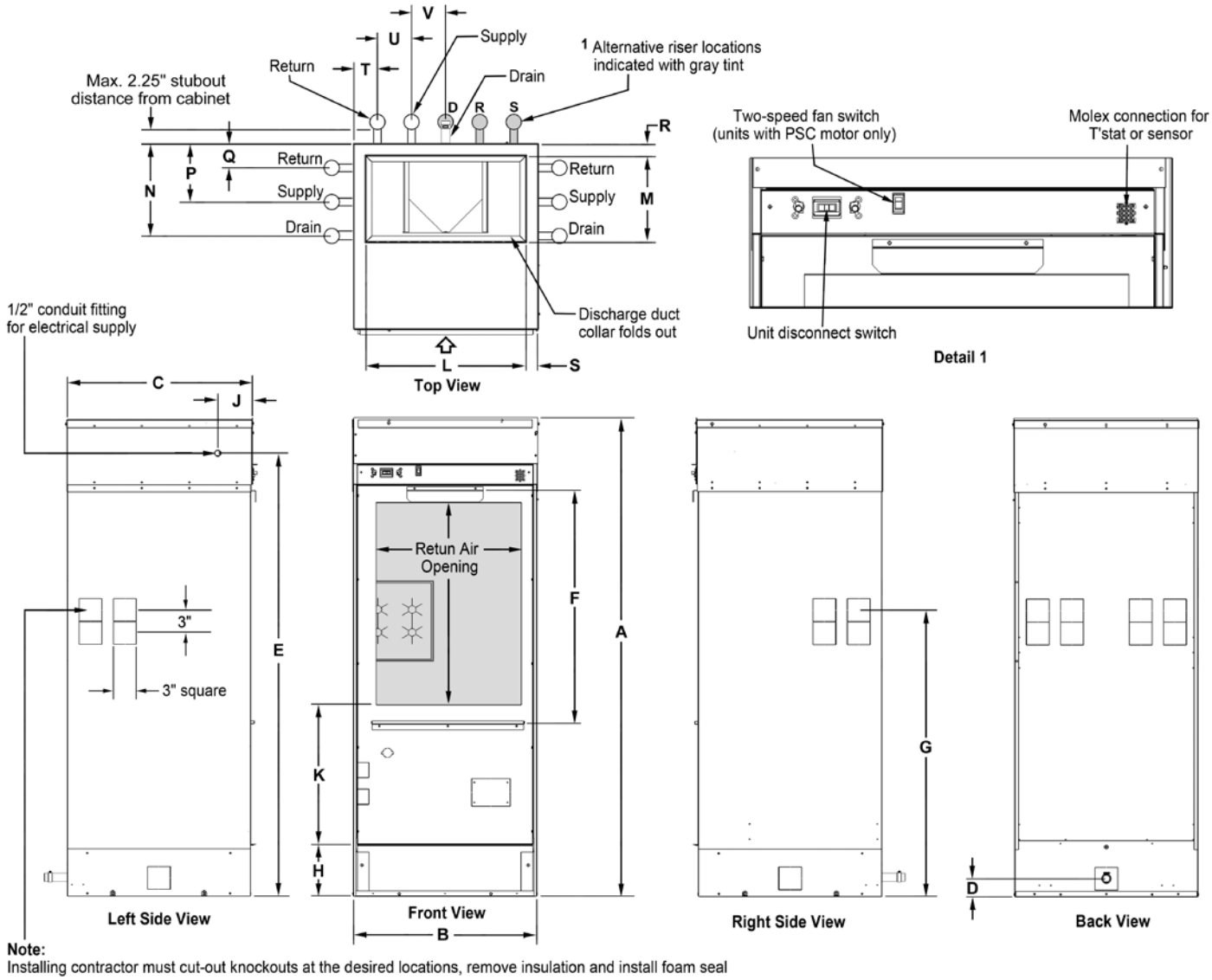
### Dimensions

| Cabinet | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cabinet | A[4] | B | C | D | E | Filter Size F | Return Air Opening | G | H | J | K |
| 18 x 18 (Size 009-012) | 62.75 | 18.00 | 18.00 | 2.38 | 58.08 | 16"w x 30"h x 1"d | 12.62w x 25.25h | 37.50 | 6.72 | 3.125 | 24.87 |
| 18 x 20 (Size 015-018) | | | 20.00 | | | | | | | | |

| Top View | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cabinet | Discharge Air Opening[5] | | N | P | Q | R | S | T | U | V |
| | L | M | | | | | | | | |
| 18 x 18 (Size 009-012) | 15.00 | 6.80 | 12.4 | 7.9 | 3.3 | 1.64 | 1.64 | 3.12 | 4.50 | 4.50 |
| 18 x 20 (Size 015-018) | | 8.80 | | | | | | | | |

***Notes:*** *1 Alternative riser locations dimensions mirror those shown as "**T**", "**U**", and "**V**"*
*2 Alternative riser locations for unit sizes 009-018 are field-specified (code 22 = A)*
*3 Alternative drain location for unit sizes 009-018 is field-specified (code 22 = A)*
*4 Dimension "**A**" overall cabinet height is 63.5" with discharge duct collar folded out.*
*5 Dimensions "**L**" and "**M**" are the discharge air opening with the duct collar folded out.*

## Model VHF 63.5" High Cabinet - Sizes 021-036



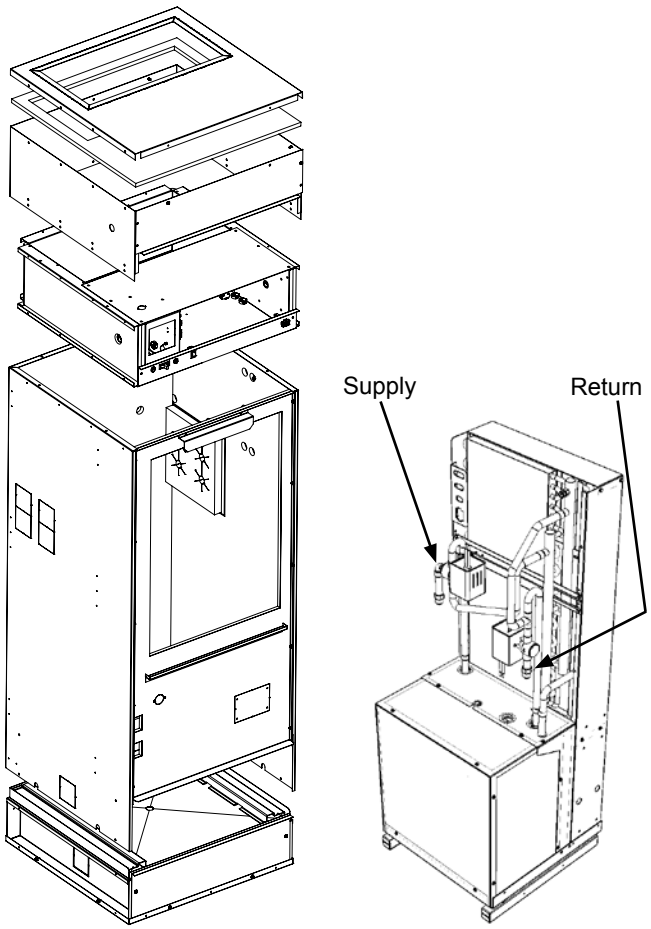

### Dimensions

| Cabinet | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cabinet | A[4] | B | C | D | E | Filter Size F | Return Air Opening | G | H | J | K |
| 24 x 24 (Size 021-036) | 62.75 | 24.00 | 24.00 | 2.38 | 58.08 | 20"w x 30"h x 1"d | 19.00w x 26.50h | 37.50 | 6.72 | 4.54 | 25.04 |

| Top View | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cabinet | Discharge Air Opening[5] | | N | P | Q | R | S | T | U | V |
| | L | M | | | | | | | | |
| 24 x 24 (Size 021-036) | 21.00 | 11.25 | 12.4 | 7.9 | 3.3 | 1.64 | 1.64 | 3.12 | 4.50 | 4.50 |

***Notes:*** 1 *Alternative riser locations dimensions mirror those shown as "***T***", "***U***", and "***V***". Knockouts are factory provided on unit sizes 021-036.*
2 *Alternative riser locations for unit sizes 009-018 are field-specified (code 22 = A).*
3 *Alternative drain location for unit sizes 009-018 is field-specified (code 22 = A).*
4 *Dimension "***A***" overall cabinet height is 63.5" with discharge duct collar folded out.*
5 *Dimensions "***L***" and "***M***" are the discharge air opening with the duct collar folded out.*

## 63.5" High Unit – Cabinet (VHF) and Chassis (VHC)



1. To prevent damage to equipment, do not operate supplementary heating and cooling during the construction period.
2. Inspect the carton for any specific tagging numbers indicated by the factory per a request from the installing contractor. At this time the voltage, phase and capacity should be checked against the plans.
3. Check the unit size against the plans to verify that the unit is being installed in the correct location.
4. Before installation, check the available dimensions of the area where the unit is to be installed versus the dimensions of the unit.
5. Note the location and routing of water piping, condensate drain piping, and electrical wiring. The locations of these items are clearly marked on submittal drawings.
6. The installing contractor will find it beneficial to confer with piping, sheet metal, and electrical foremen before installing any unit.

***Note:*** *Check the unit data plate for correct voltage with the plans before installing the equipment.*

**⚠ WARNING**

Make sure all electrical ground connections are made in accordance with local code.

**⚠ WARNING**

The contractor shall cover the units to protect the machines during finishing of the building. This is critical while spraying fireproofing material on bar joists, sandblasting, spray painting and plastering.

### For Optimum Unit Performance and to Help Minimize Noise and Vibration

- Adhere to the "Critical Dimensions" for locations of framing and distances to the cabinet.
- Be sure there are no kinks and that the stainless steel braided hoses do not come in contact with and vibrate on chassis and cause noise.
- Be sure there are no kinks in the condensate drain hose that can restrict flow of condensate to the drain riser.
- Ensure there is no metal-to-metal contact between return air grille and cabinet and the discharge diffuser and the cabinet, use provided gaskets.
- Air balancing in ducted applications is critical for proper airflow at each diffuser.
- It is recommended that all unused openings in the cabinet be sealed to eliminate any air leakage from the cabinet.

***Figure 7: Typical side by side unit installation***

**NOTICE**

Top air discharge units will require turning vanes and/or a volume damper for proper air flow and balancing, to minimize turbulence. These components must be field-installed and furnished in accordance with SMACNA guidelines.

*Figure 8: Single side discharge*

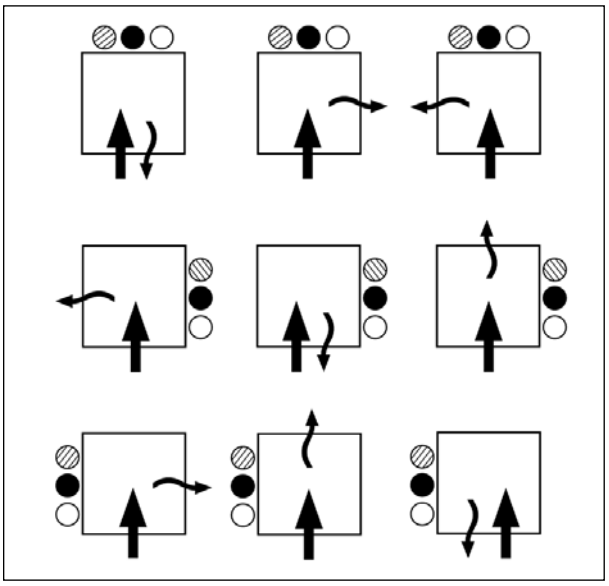


*Figure 9: Double side discharge*

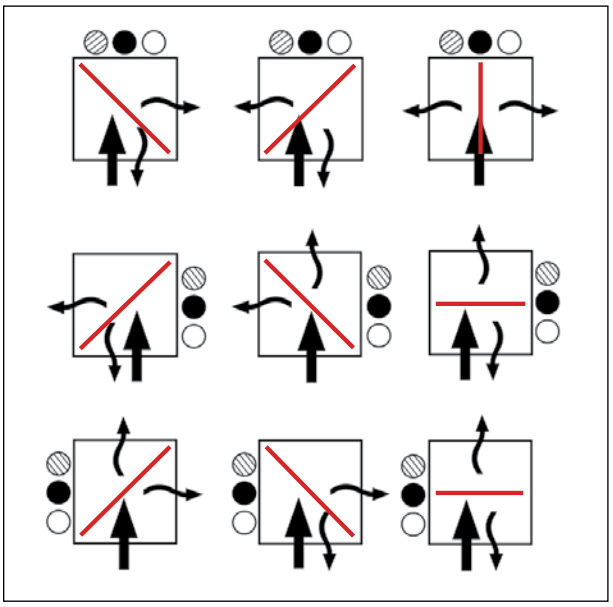
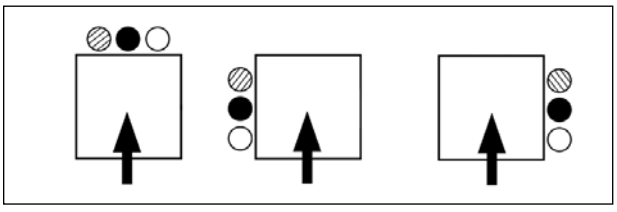


*Figure 10: Closed plenum – field modification required*



**Privacy Baffles: (refer to Figure 9 and Figure 12)**

**Note:** *If cabinet has multiple discharge air openings- check to make sure privacy baffle is present and oriented properly to block sight lines. It is important that this step is taken before wall is completed around the cabinet.*

*Figure 11: Side & top discharge (see Notice on page 16)*

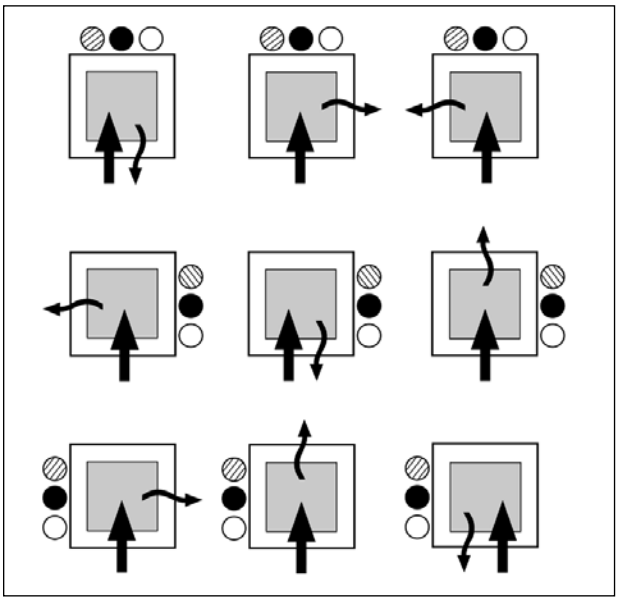


*Figure 12: Double side & top discharge (see Notice on page 16)*

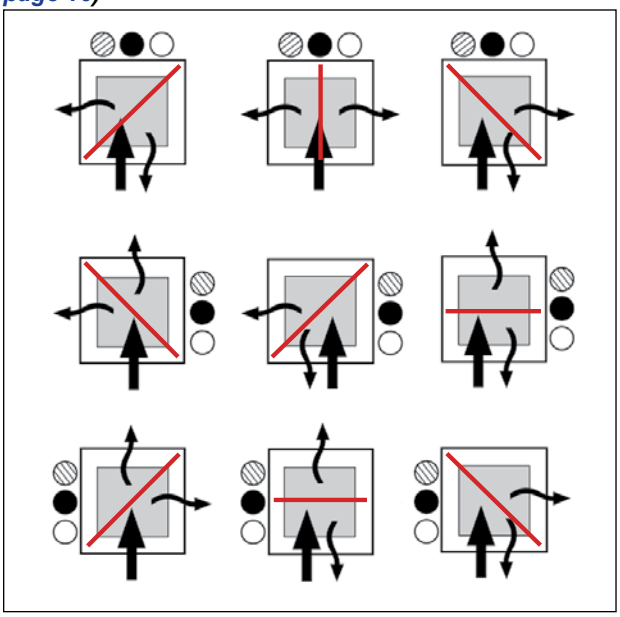
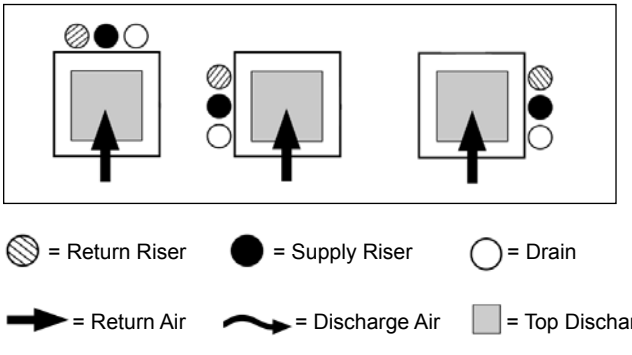
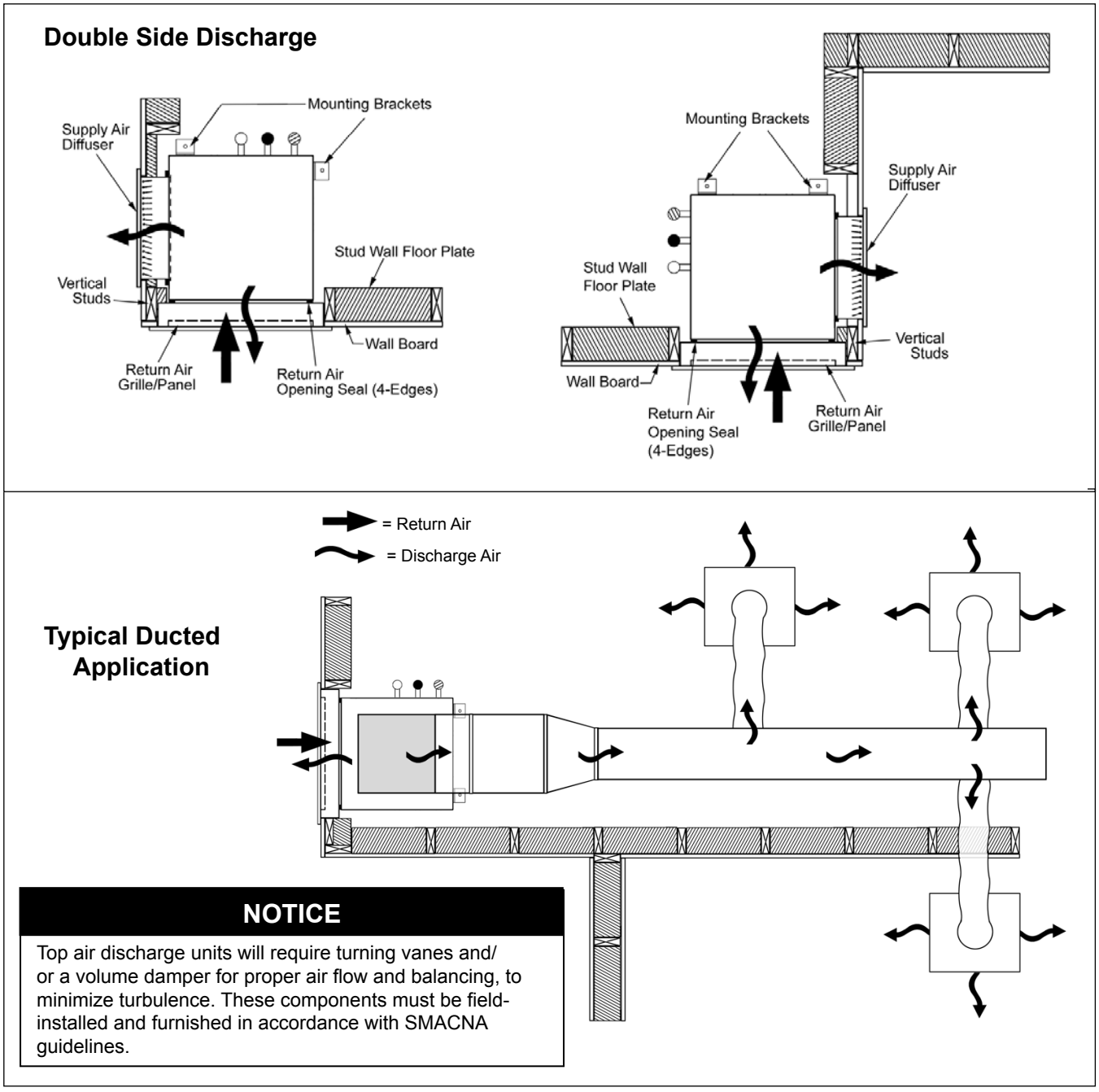


*Figure 13: Top discharge (see Notice on page 18)*




***Note:*** *80" high cabinet not available with side discharge, top discharge only.*

*Figure 14: Typical framing & discharge arrangements*

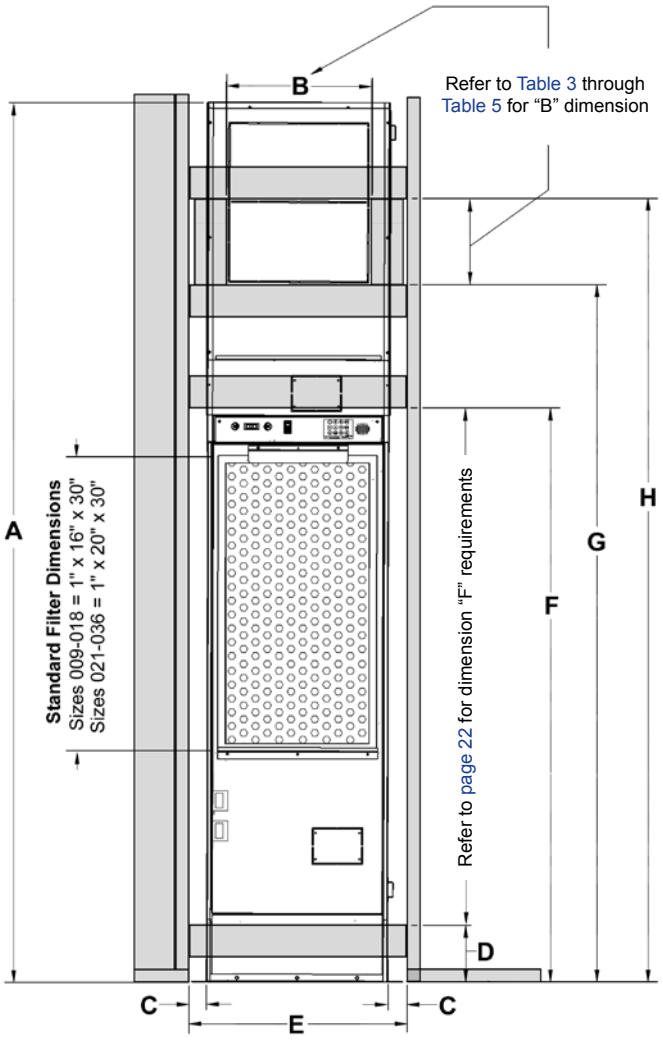


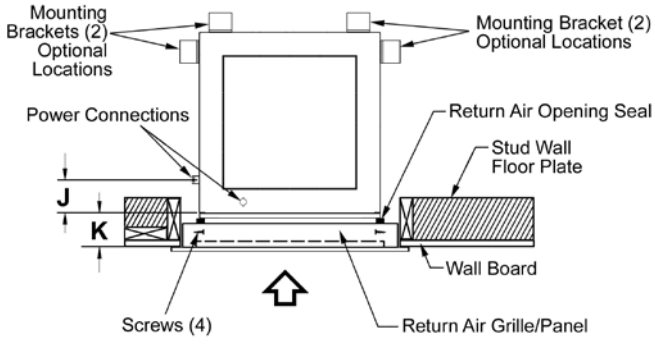

***Note:*** *All ducted applications require a unit that utilizes an EC motor*

## Framing Locations and Dimensions

Location of framing around unit is critical for proper fit-up and will help reduce sound levels due to the transfer of vibration when properly installed.

***Figure 15: Framing locations and dimensions***




**IMPORTANT**

If an optional subbase is used, add its height of either 2", 3", 4" or 5" to the vertical dimensions shown in Figure 15.

***Table 3: Letter dimensions for Figure 15 (18" x 18" unit)***

| Dimension | Framing Locations | | | |
|---|---|---|---|---|
| | 18" x 18" Unit - Sizes 009-012 | | | |
| | Unit Height "A" | | | |
| | 80" | 88" | 92" | 96" |
| B | 14" | | | |
| C | 2.07" | | | |
| D | 5.75" | | | |
| E[1] | 22.25" | | | |
| F | 58.75" | | | |
| G[2] | 60.75" | 68.75" | 72.75" | 76.75" |
| H[2] | 78.75" | 86.75" | 90.75" | 94.75" |
| J | 3.125" | | | |
| K[3, 4] | 3.125" Min./Max. (See Note 4 exception) | | | |

***Table 4: Letter dimensions for Figure 15 (18" x 20" unit)***

| Dimension | Framing Locations | | | |
|---|---|---|---|---|
| | 18" x 20" Unit - Sizes 015 & 018 | | | |
| | Unit Height "A" | | | |
| | 80" | 88" | 92" | 96" |
| B | 14" | | | |
| C | 2.07" | | | |
| D | 5.75" | | | |
| E[1] | 22.25" | | | |
| F | 58.75" | | | |
| G[2] | 60.75" | 68.75" | 72.75" | 76.75" |
| H[2] | 78.75" | 86.75" | 90.75" | 94.75" |
| J | 3.125" | | | |
| K[3, 4] | 3.125" Min./Max. (See Note 4 exception) | | | |

***Table 5: Letter dimensions for Figure 15 (24" x 24" unit)***

| Dimension | Framing Locations | | | |
|---|---|---|---|---|
| | 24" x 24" Unit - Sizes 021-036 | | | |
| | Unit Height "A" | | | |
| | 80" | 88" | 92" | 96" |
| B | 18" | | | |
| C | 2.125" | | | |
| D | 5.75" | | | |
| E[1] | 28.25" | | | |
| F | 58.75" | | | |
| G[2] | 62.75" | 70.75" | 74.75" | 78.75" |
| H[2] | 78.75" | 86.75" | 90.75" | 94.75" |
| J | 4.54" | | | |
| K[3, 4] | 3.125" Min./Max. (See Note 4 exception) | | | |

***Notes:*** [1] *Dimension "E" ± 0.125*

[2] *Dimension "G" and "H" will vary based on cabinet height selected and choice of upper or lower discharge knockout. Refer to "Dimensional Data" on page 10 through page 12.*

[3] ***Dimension "K" is critical**, and that it be no more or no less than 3.125" from the finished wall surface to the front of the unit when using the hinged perimeter return air panel door or the louvered return air panel door. See Note 4 for the exception. Also refer to page 22.*

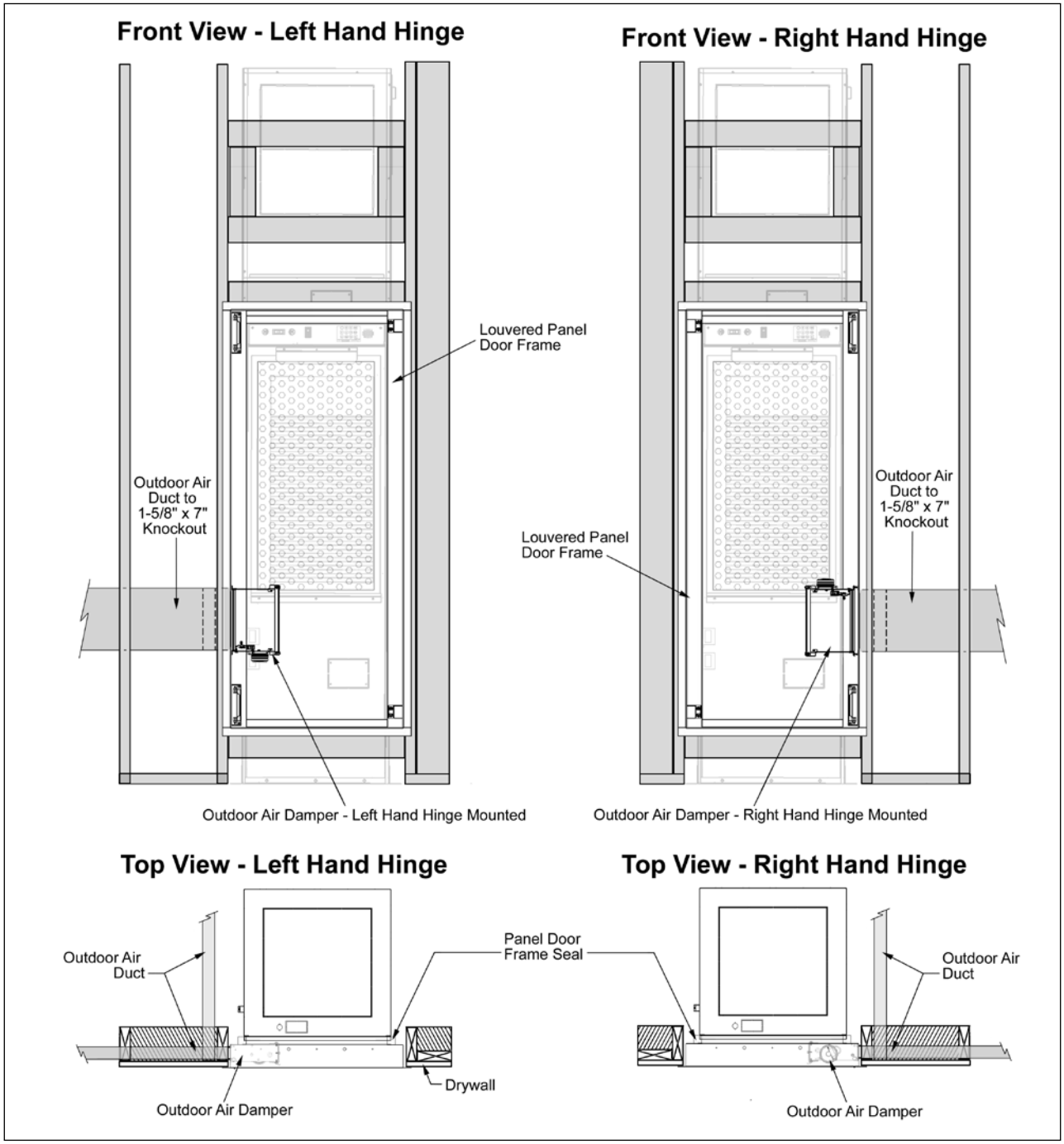
[4] *Add 1" to dimension "K" when a 2", Merv 13 filter is used.*

## Louvered Return Air Panel Door with Optional Motorized Outdoor Air Damper

1. Based on the location of the hinges on the ordered louvered panel door, construct the framing to accommodate the ducting for connecting the motorized outdoor air damper, see Figure 16. Also refer to "Return Air Panel Door(s) Dimensions" on page 22 and "Installing The Optional Motorized Outdoor Air Damper with Louver Panel Door Only" on page 37 for details.

***Note:*** *It is the responsibility of the installing contractor to install the ductwork that connects the outdoor air opening in the panel door frame to the source of the outdoor intake opening in the building. All ductwork should conform to industry standards of good practice as described in the ASHRAE Systems Guide. Also refer to good installation practices as outlined in ED 18529.*

***Figure 16: Louvered panel door with motorized outdoor air damper***




***Note:*** *The outdoor air duct can be located on either side of the cabinet and routed around the side- to the back of the cabinet, or run straight- parallel to the front of the cabinet.*

## Vertical Riser Stub-Outs Locations to Unit Knockouts

***Figure 17: Riser stub-outs knockouts locations***

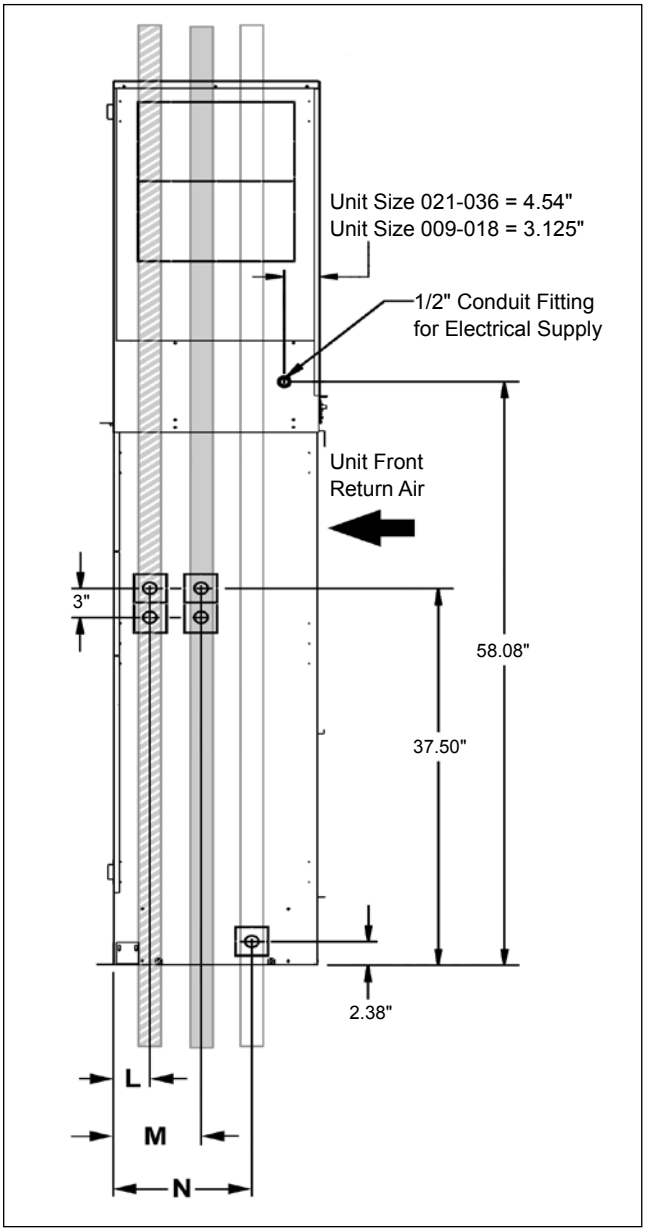



***Table 6: Letter dimensions for Figure 17 (18" x 18" unit)***

| Dimension | Riser Stub-Outs Locations | | | | |
|---|---|---|---|---|---|
| | 18" x 18" Unit - Sizes 009-012 | | | | |
| | Unit Height | | | | |
| | 63.5" | 80" | 88" | 92" | 96" |
| L | 3.3" | | | | |
| M | 7.9" | | | | |
| N | 12.4" | | | | |

***Table 7: Letter dimensions for Figure 17 (18" x 20" unit)***

| Dimension | Riser Stub-Outs Locations | | | | |
|---|---|---|---|---|---|
| | 18" x 20" Unit - Sizes 015 & 018 | | | | |
| | Unit Height | | | | |
| | 63.5" | 80" | 88" | 92" | 96" |
| L | 3.3" | | | | |
| M | 7.9" | | | | |
| N | 12.4" | | | | |

***Table 8: Letter dimensions for Figure 17 (24" x 24" unit)***

| Dimension | Riser Stub-Outs Locations | | | | |
|---|---|---|---|---|---|
| | 24" x 24" Unit - Sizes 021-036 | | | | |
| | Unit Height | | | | |
| | 63.5" | 80" | 88" | 92" | 96" |
| L | 3.13" | | | | |
| M | 7.63" | | | | |
| N | 12.13" | | | | |

## Return Air Panel Door(s) Dimensions

Location of studs in relation to the unit and the return air panel door are critical for proper installation and fit up. When installed, the return air grille gasket must compress and seal completely against the outer edge of the cabinet and around the inner front panel and filter bracket. Refer to "Installing The Return Air Panel Door" on page 36 and Figure 15 on page 19.

***Figure 18: Hinged panel door***

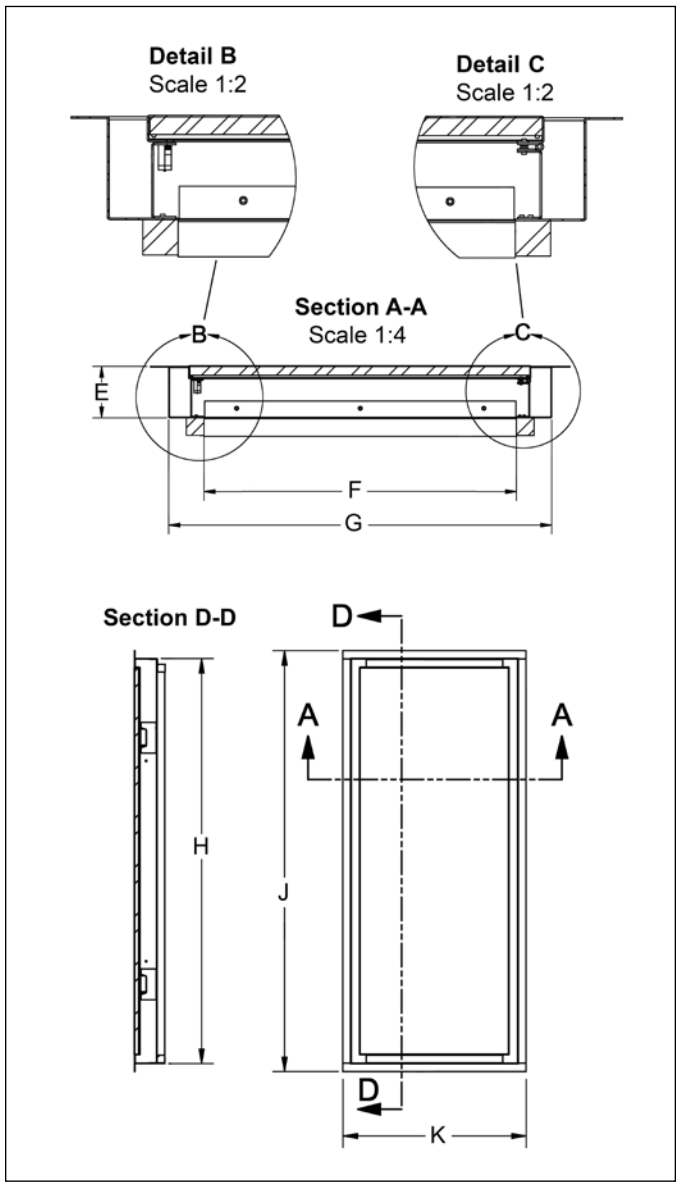
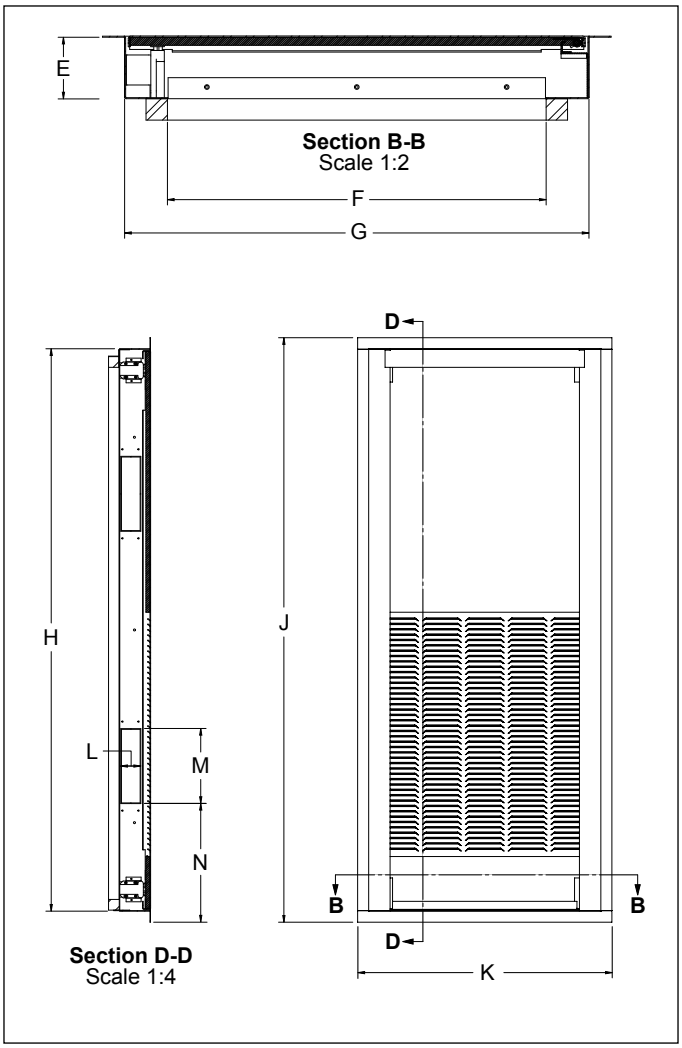



***Figure 19: Louvered panel door***




### Dimensions

| Unit Size | E | | F | G | H | J | K | Outdoor Air Opening | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1" Filter Compatible Door | 2" Filter Compatible Door | | | | | | L | M | N |
| 009-018 | 2.92" | 3.92" | 17.69" | 21.69" | 52.53" | 54.60" | 23.75" | 1.88" | 7.00" | 11.08" |
| 021-036 | | | 23.69" | 27.69" | | | 29.75" | | | |

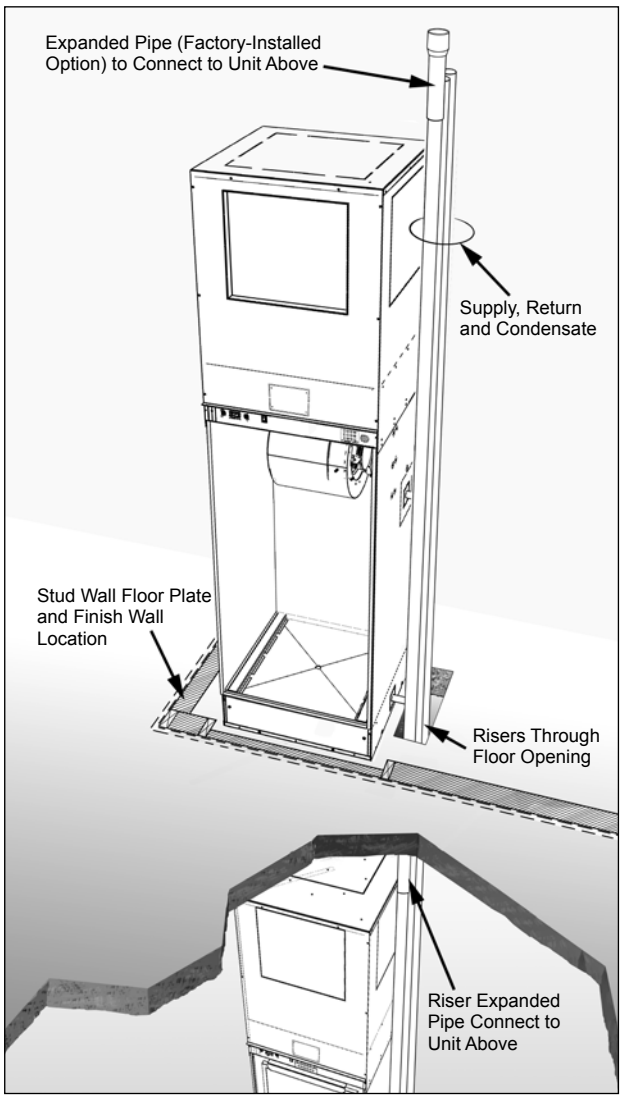
**⚠ CAUTION**

Installation and maintenance is to be performed only by qualified personnel who are familiar with, and in compliance with state, local and national codes and regulations, and experienced with this type of equipment. Sharp edges and coil surfaces are potential injury hazards. Avoid contact with them.

## Risers and Cabinet

1. Position the cabinet and risers within the building pipe chase and align with the unit on the floor above and/or below (Figure 20).

***Figure 20: Position the cabinet and risers***



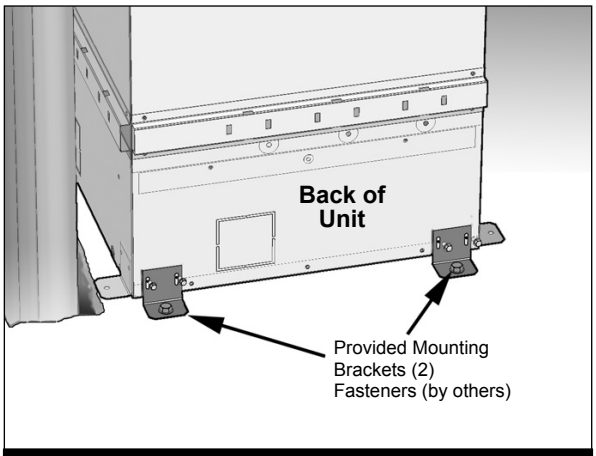

**IMPORTANT**

The cabinet must be centered between the wall studs and plumb vertically for the grille/panel frame and diffuser to properly align and seal to the cabinet. Use of a 4' level is recommended.

***Note:*** *Refer to Figure 21 Critical Dimension Notice to determine the correct recess depth from the front of the unit to the drywall face. When the installation is complete, the return air grille/panel frame must meet to seal with the cabinet discharge opening and the discharge air diffuser duct must meet and seal with the discharge opening.*

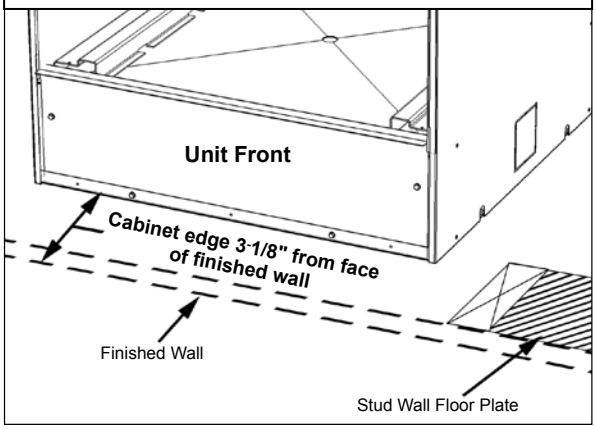
2. Using the riser extensions, make preliminary riser connections between the units above and or below to assure proper riser alignment (supply, return and condensate). Figure 20.
3. After all components are aligned properly, anchor the unit cabinet to the floor using the Daikin provided mounting brackets (Figure 21).
4. Locate the two (2) mounting brackets in the parts bag and position them near the back corners of the unit, or one on a side and one on the back, whichever location or combination is most suitable, as illustrated in Figure 21. Contractor is responsible for the appropriate fasteners to secure the brackets to the floor, as local codes dictate.

***Figure 21: Position the cabinet for securing to the floor with mounting brackets (2)***




**NOTICE**

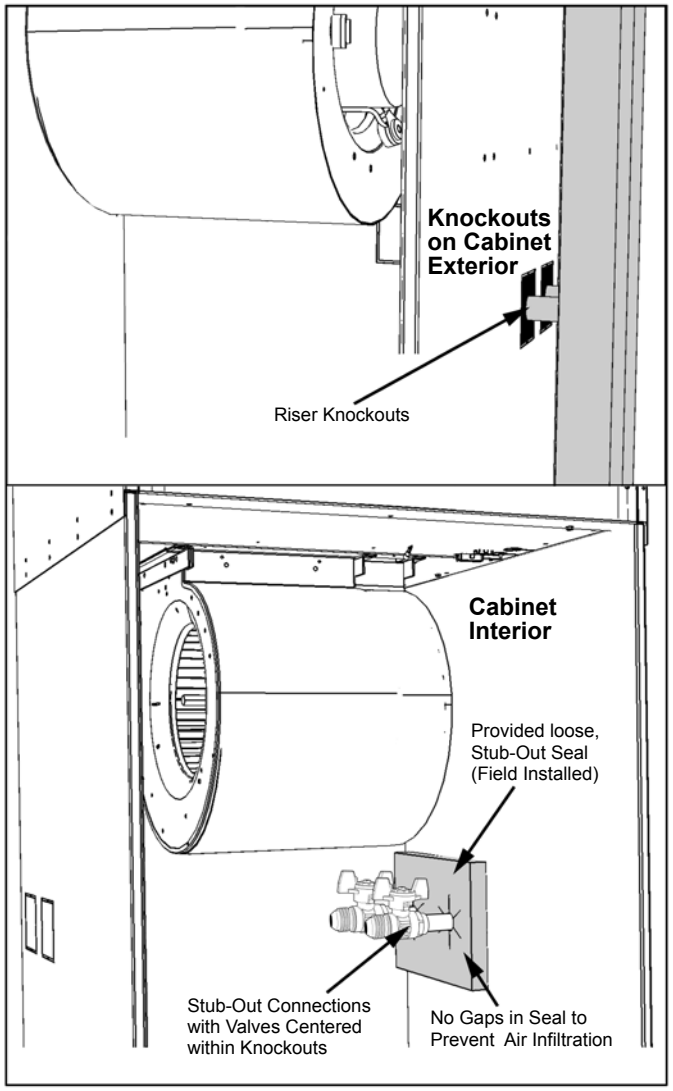
Critical Dimension!




***Note:*** *Add 1" to dimension when a 2", Merv 13 filter is used.*

***Note:*** *Apply the provided seal to the interior of the cabinet around the stub-outs. Be sure there are no voids between the stub-outs and the stub-out seal which helps prevent air infiltration into the cabinet*

***Figure 22: Center the riser stub-outs within the knockouts and apply provided seal to the cabinet interior***




**⚠ CAUTION**

The unit is not designed to support the weight of the risers. Anchor them securely to the building structure.

5. Anchor risers to the building structure to prevent vertical riser movement greater than, plus or minus one inch to allow for riser expansion or contraction.
6. Solder all supply and return riser connections to units above and/or below.
7. Remove riser ties used to secure the risers to the cabinet during shipping.

**⚠ WARNING**

Before furring-in units, hydrostatically test the risers and unit connection joints in accordance with local building codes, to make sure they are leak-proof.

***Note:*** *Perform "Cleaning and Flushing Water System" on page 26*

**⚠ CAUTION**

When furring-in units make sure that no screws or nails penetrate the unit cabinet.

8. Layout the stud wall floor plates and frame-in unit referencing "Typical framing & discharge arrangements" on page 18 and Figure 15 on page 19.

***Note:*** *Before cutting and hanging drywall, remove the appropriate discharge air opening knockout. See Table 9). Protect unit from construction debris with a protective cover.*

***Table 9: Discharge knockout openings***

| Unit Size | Discharge Openings | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Single | | Double | | Triple | | Single-Top Opening | |
| | W | H | W | H | W | H | W | H |
| **009–012** | 14" | 16" | 14" | 8" | NR | NR | 12" | 12" |
| **015–018** | 14" | 16" | 14" | 8" | 14" | 8" | 12" | 12" |
| **021–024** | NR | NR | 18" | 14" | 18" | 10" | 18" | 18" |
| **030–036** | NR | NR | 18" | 14" | 18" | 10" | 18" | 18" |

***NR*** *= Not Recommended*

## Water System Quality

The cleaning, flushing and chemical treatment of a water source heat pump system is fundamental to efficient operation and the life expectancy of the system.

Potential system problems produced by the use of water fall into three general categories:

- **Scale formation –** Mineral deposits which result from the crystallization and precipitation of dissolved salts in the water. The deposits form an insulating barrier, reducing the heat transfer rate and impeding the circulation of fluids due to increased pressure drop.
- **Corrosion –** Decomposition of the metal caused by absorption of gases from the air. Corrosion may occur in any metal component of the system.
- **Organic growths –** Slime and algae which form under certain environmental conditions, and can reduce the heat transfer rate by forming an insulating coating or can promote corrosion by pitting.

The system water should be evaluated for degrees of impurity, with testing available from independent testing labs, health departments or state agencies.

Table 10 is a list of water characteristics, the potential impurities and their results and the recommended treatment.

### Avoiding Potential Problems

As shown in Table 10, all water contains some degree of impurities which may affect the performance of a heat pump system. The use of a cupro-nickel coil can help avoid potential problems. Water flow rates should:

- Be high enough that the temperature rise through the heat exchanger does not exceed 10° F when operating in the cooling mode.
- Not exceed 4 GPM per nominal ton. Flow rates that have velocities of 10 feet per second or more may cause pipe erosion and heat exchanger failure.

***Table 10: Water quality conditions & applications***

| Potential Problem | Chemical(s) or Condition | Range for Copper Heat Exchangers | Range of Cupronickel Heat Exchanger |
|---|---|---|---|
| **Scaling** | Calcium & Magnesium Carbonate | Less than 350 ppm | Less than 350 ppm |
| **Corrosion** | pH Range | 7 – 9 | 5 – 9 |
| | Total Dissolved Solids | Less than 1000 ppm | Less than 1500 ppm |
| | Ammonia, Ammonium Hydroxide | Less than 0.5 ppm | Less than 0.5 ppm |
| | Ammonium Chloride, Ammonium Nitrate | Less than 0.5 ppm | Less than 0.5 ppm |
| | Calcium Chloride/ Sodium Chloride | Less than 125 ppm | Less than 125 ppm - Note 4 |
| | Chlorine | Less than 0.5 ppm | Less than 0.5 ppm |
| | Hydrogen Sulfide | None Allowed | None Allowed |
| **Biological Growth** | Iron Bacteria | None Allowed | None Allowed |
| | Iron Oxide | Less than 1 ppm | Less than 1 ppm |
| **Erosion** | Suspended Solids | Less than 10 ppm | Less than 10 ppm |
| | Water Velocity | Less than 8 ft./s | Less than 12 ft./s |

**Notes:** *1. Water hardness in ppm is equivalent to hardness in mg/L.*

*2. Grains/gallon = ppm divided by 17.1.*

*3. Copper and cupronickel heat exchangers are not recommended for pool applications for water outside the range of the table. Secondary heat exchangers are required for applications not meeting the requirements shown above.*

*4. Salt water applications (approximately 25,000 ppm) require secondary heat exchangers due to copper piping between the heat exchanger and the unit fittings.*

## Supply & Return Piping

All units should be connected to supply and return piping in a two-pipe reverse return configuration. A reverse return system is inherently self-balancing and requires only trim balancing where multiple quantities of units with different flow and pressure drop characteristics exist in the same loop.

- To insure proper water flow, measure the temperature differential between the supply and return connections. The temperature differential should be 10°F to 14°F (5°C to 8°C) for units in cooling mode.

A direct return system may also work acceptably, but proper water flow balancing is more difficult to achieve and maintain.

- The piping can be steel or copper.

**⚠ WARNING**

Polyolester Oil, commonly known as POE oil is a synthetic oil used in many refrigeration systems, and may be present in this Daikin product. POE oil, if ever in contact with PVC/CPVC will coat the inside wall of PVC/CPVC pipe causing environmental stress fractures. Although there is no PVC/CPVC piping in this product, please keep this in mind when selecting piping materials for your application, as system failure and property damage could result.

The supply and return stub outs and the factory-provided shutoff valves have male JIC connections and usually join the unit via short lengths of high pressure flexible hose which are sound attenuators for both unit operating noise and hydraulic pumping noise.

- Some flexible hose threaded fittings are supplied with sealant compound. If not, apply Teflon tape to assure a tight seal.

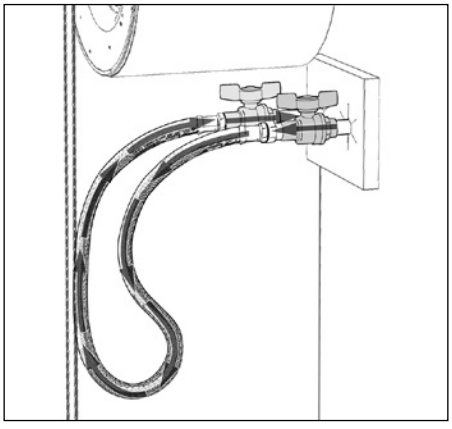
## Cleaning and Flushing Water System

**⚠ CAUTION**

Prior to first operation of any unit, the water circulating system must be cleaned and flushed of all construction dirt and debris or damage will occur.

1. Prior to first operation of any unit, the water circulating system must be cleaned and flushed of all construction dirt and debris.
2. If the units are equipped with water shutoff valves, either electric or pressure operated, the supply and return runouts must be connected together at each unit location. This will prevent the introduction of dirt into the unit, (Figure 23).

***Figure 23: Connections for flushing system piping***



2. Fill the system at the city water makeup connection with all air vents open. After filling, close all air vents.
   The contractor should start main circulator with the pressure reducing valve open. Check vents in sequence to bleed off any trapped air, ensuring circulation through all components of the system.
   Power to the heat rejector unit should be off, and the supplementary heat control set at 80°F (27°C).
   While circulating water, the contractor should check and repair any leaks in the unit and surrounding piping. Drains at the lowest point(s) in the system should be opened for initial flush and blow-down, making sure city water fill valves are set to make up water at the same rate. Check the pressure gauge at pump suction and manually adjust the makeup to hold the same positive steady pressure both before and after opening the drain valves. Flush should continue for at least two hours or longer until the drain water is clean and clear.
3. Shut off supplemental heater and circulator pump and open all drains and vents to completely drain down the system. Short circuited supply and return runouts should now be connected to the unit supply and return connections. Do not use sealers at the swivel flare connections of hoses.
4. Flush system with water for 2 hours or longer until water is clean.
5. Refill the system with clean water. Test the water using litmus paper for acidity, and treat as required to leave the water slightly alkaline (pH 7.5 to 8.5). The specified percentage of antifreeze may also be added at this time. Use commercial grade antifreeze designed for HVAC systems only. Do not use automotive grade antifreeze (See "Antifreeze Correction Factors" on page 27).
   Once the system has been filled with clean water and antifreeze (if used), precautions should be taken to protect the system from dirty water conditions.

**NOTICE**

It is not Daikin Applied policy to make recommendations on water treatment. However, the general contractor or owner should contact a local water treatment company regarding water treatment. A fouled closed loop water system will lead to premature component failure.

***Note:*** *Contact a local water treatment company to confirm water clarity prior to unit operation.*
*Dirty water will result in system wide degradation of performance and solids may clog system-wide valves, strainers, flow regulators, etc. Additionally, the heat exchanger may become clogged which reduces compressor service life or causes premature failure.*

6. Set the loop water controller heat add setpoint to 70°F (21°C) and the heat rejection setpoint to 85°F (29°C). Supply power to all motors and start the circulating pumps. After full flow has been established through all components including the heat rejector (regardless of season) and the vented air and loop temperatures have been stabilized, each of the units will be ready for check, test and start-up, air balancing, and water balancing.

### Environment

This equipment is designed for indoor installation only. Sheltered locations such as attics, garages, etc., generally will not provide sufficient protection against extremes in temperature and/or humidity, and equipment performance, reliability, and service life may be adversely affected.

**⚠ CAUTION**

Units must be checked for water leaks upon initial water system start-up. Water leaks may be a result of mishandling or damage during shipping. Failure by the installing contractor to check for leaks upon start-up of the water system could result in property damage.

## Operating Limits

***Table 11: Air limits in °F (°C)***

| Air Limits | Standard Range Units | | Geothermal Range Units | |
|---|---|---|---|---|
| | Cooling (DB/WB) | Heating | Cooling (DB/WB) | Heating |
| **Minimum Ambient Air[1]** | 50°F/40°F (10°C/4°C) | 50°F (10°C) | 40°F/30°F (4°C/-1°C) | 40°F (4°C) |
| **Maximum Ambient Air[2]** | 100°F/85°F (38°C/29°C) | 85°F (29°C) | 100°F/85°F (38°C/29°C) | 85°F (29°C) |
| **Minimum Entering Air[1]** | 65°F/55°F (18°C/13°C) | 50°F (10°C) | 65°F/55°F (18°C/13°C) | 50°F (10°C) |
| **Common Design Entering Air** | 75°F/63°F (24°C/17°C) | 70°F (21°C) | 75°F/63°F (24°C/17°C) | 70°F (21°C) |
| **Maximum Entering Air[2]** | 85°F/71°F (29°C/22°C) | 80°F (27°C) | 85°F/71°F (29°C/22°C) | 80°F (27°C) |
| **Minimum CFM/Ton** | 300 | | | |
| **Maximum CFM/Ton** | 450 | | | |

***Table 12: Fluid limits***

| Fluid Limits | Standard Range Units | | Geothermal Range Units | |
|---|---|---|---|---|
| | Cooling | Heating | Cooling | Heating |
| **Minimum Entering Fluid** | 55°F (13°C) | 55°F (13°C) | 30°F (-1°C) | 20°F (-6°C) |
| **Common Design Entering Fluid** | 85-90°F (29-32°C) | 70°F (21°C) | 90°F (32°C) | 35-60°F (1.5-16°C) |
| **Maximum Entering Fluid** | 120°F (49°C) | 90°F (32°C) | 120°F (49°C) | 90°F (32°C) |
| **Minimum GPM/Ton** | 1.5 | | | |
| **Nominal GPM/Ton** | 3.0 | | | |
| **Maximum GPM/Ton** | 4.0 | | | |

**Notes:** *1. Maximum and minimum values may not be combined. If one value is at maximum or minimum, the other two conditions may not exceed the normal condition for standard units. Geothermal range units may combine any two maximum conditions, but not more than two, with all other conditions being normal conditions.*

*2. This is not a normal or continuous operating condition. It is assumed that such a start-up is for the purpose of bringing the building space up to occupancy temperature.*

## Antifreeze Correction Factors

| | Antifreeze % by weight | | | |
|---|---|---|---|---|
| | 15% | 25% | 35% | 45% |
| **Ethanol** | | | | |
| Cooling Capacity | 0.985 | – | – | – |
| Heating Capacity | 0.9825 | – | – | – |
| Pressure Drop | 1.04 | | | |
| **Ethylene Glycol** | | | | |
| Cooling Capacity | 0.9935 | 0.9895 | 0.985 | 0.981 |
| Heating Capacity | 0.9865 | 0.9795 | 0.973 | 0.965 |
| Pressure Drop | 1.10 | 1.16 | 1.22 | 1.27 |
| **Methanol** | | | | |
| Cooling Capacity | 0.985 | – | – | – |
| Heating Capacity | 0.9825 | – | – | – |
| Pressure Drop | 1.04 | – | – | – |
| **Propylene Glycol** | | | | |
| Cooling Capacity | 0.985 | 0.975 | 0.965 | 0.955 |
| Heating Capacity | 0.981 | 0.9685 | 0.952 | 0.936 |
| Pressure Drop | 1.11 | 1.20 | 1.31 | 1.40 |

## Power Wiring From Building to Unit

**⚠ DANGER**

To avoid electrical shock, personal injury or death:
1. Installer must be qualified, experienced technician.
2. Disconnect power supply before installation to prevent electrical shock and damage to equipment.

1. Locate the electrical power supply wiring from the building and feed wiring through a 1/2" conduit fitting (strain relief), (field provided) on the unit as shown in Figure 24 & Figure 25, following local electrical codes and regulations.

***Figure 24: Supply electric wiring from building to unit***

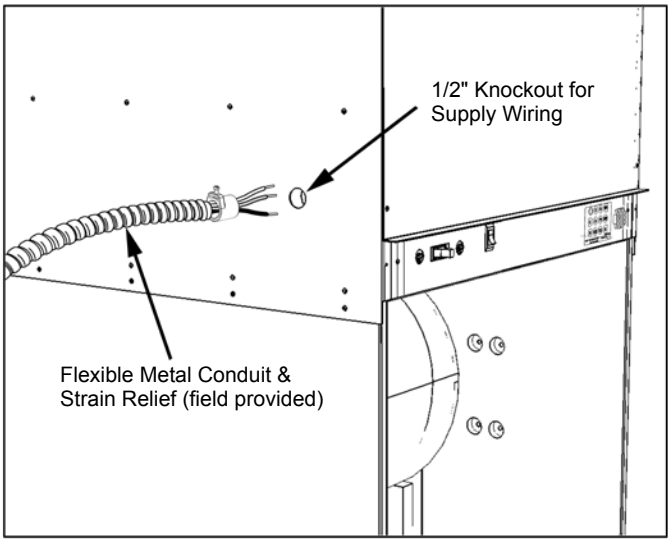
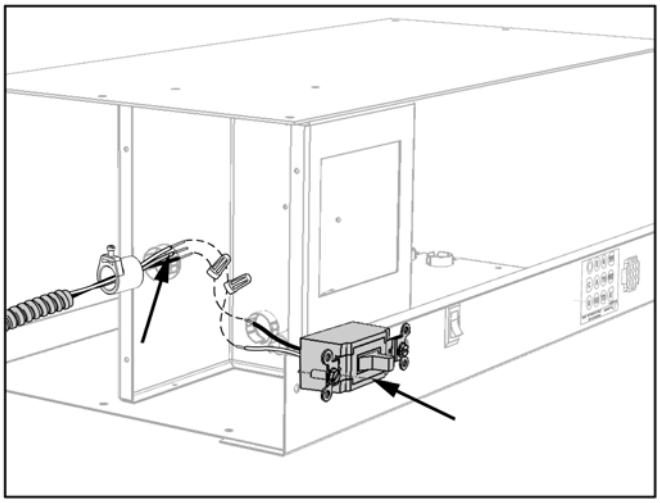
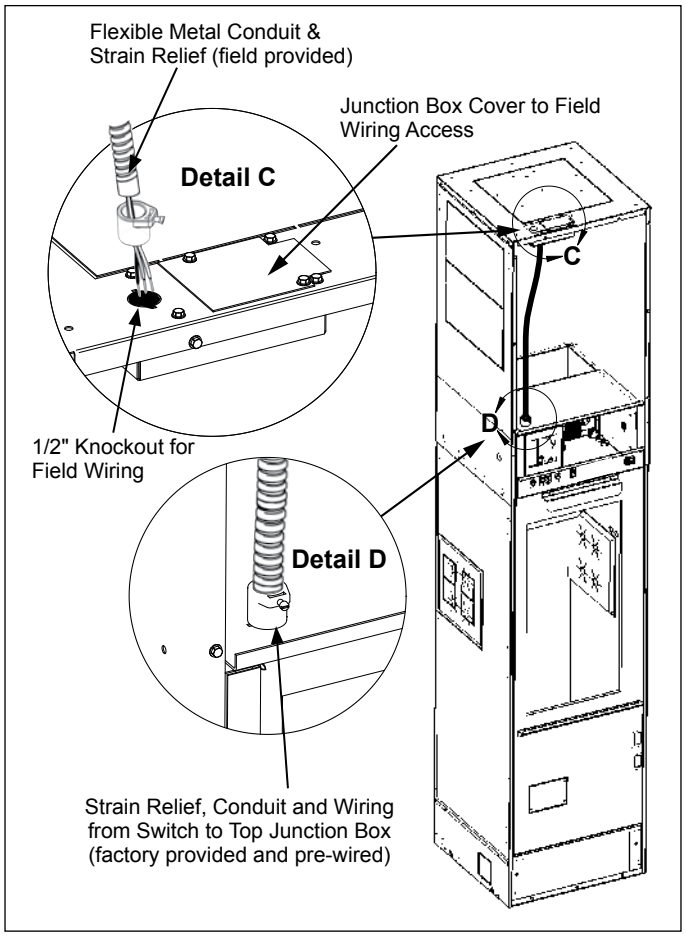



***Figure 25: Wire to unit switch***



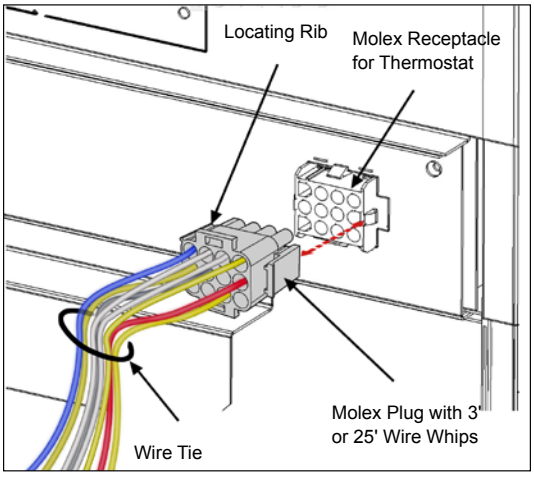
### Electrical Entry Through Top

***Figure 26: Power wiring through top entry***




2. If a remote wall-mounted thermostat is being used, install it referring to the the installation manual that came with the thermostat. Route the wires and male molex plug to the unit mounted molex receptacle located on the face plate of the unit. Secure the wires in compliance with local codes. Plug in the 12-pin molex plug noting the position of the locating rib as a reference, Figure 27. See Table 13 on page 29.

***Figure 27: Plug 12-pin molex with wire whips into the molex receptacle***



**NOTICE**

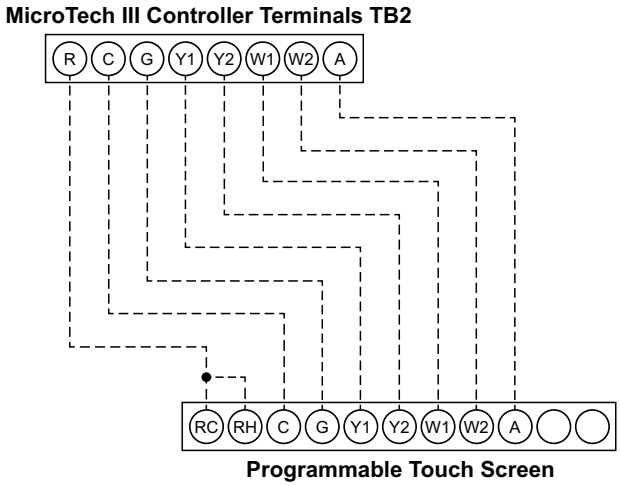
Before enclosing the unit with drywall, install the 3.25" deep diffuser extension frame to the unit discharge air opening. See "Installing The 3.25" Deep (2-Piece) Discharge Air Diffuser" on page 40. Note that the louvered discharge air diffuser will slide into and connect to the extension frame and secured *after* the unit has been framed-in and the discharge opening is cut out of drywall.

***Table 13: Thermostat Molex Plug***

| Molex Plug | | Thermostat |
|---|---|---|
| **Wire Color** | **Wire No.** | **Termination Point** |
| BLU | 1 | R |
| WHT | 2 | W2 |
| WHT | 3 | W1 |
| YEL | 4 | Y2 |
| YEL | 5 | Y1 |
| GRY | 6 | G |
| YEL | 7 | G2 |
| RED | 8 | A |
| PNK | 9 | E |
| BRN | 10 | U |
| YEL | 11 | C |

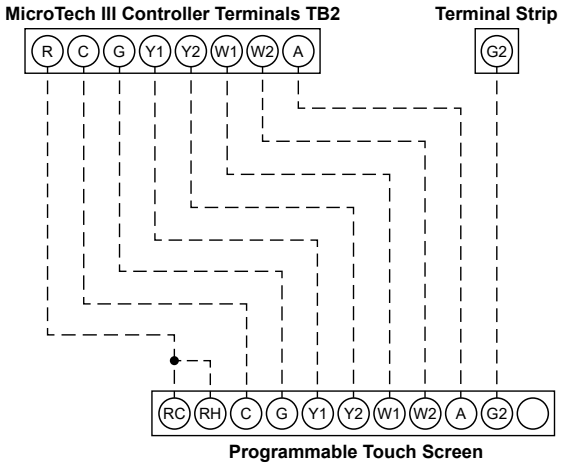
## Typical Connections For Thermostats & Temperature Sensors Applications

### *Programmable Electronic Thermostat 2 Heat/2 Cool, 7-Day Programmable, Auto Changeover, Hardwired – P/N 910193126 & Wi-Fi P/N 910193131*



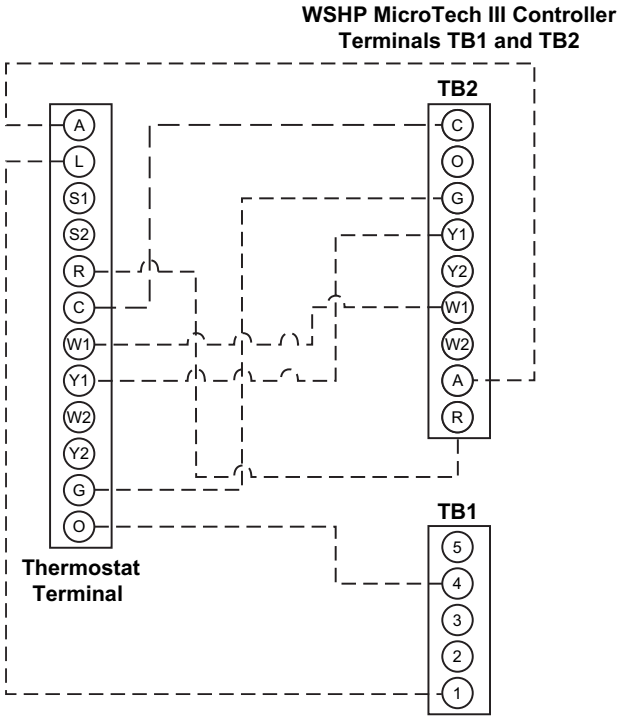

**Notes:** *Includes thermostat and wall plate Refer to IO manual 910193126.*

### *Programmable Electronic Thermostat 2 Heat/2 Cool, 7-Day Programmable, Auto Changeover, Hardwired – P/N 910193093 & Wi-Fi P/N 910193130*



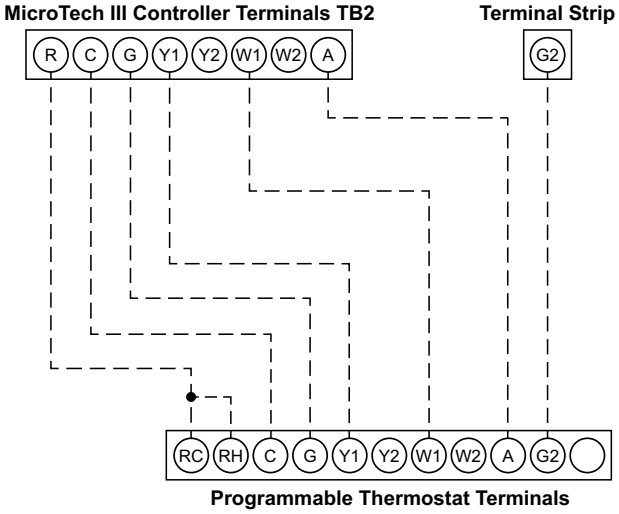

**Notes:** *Includes thermostat and wall plate Refer to IO manual 910193093.*

### *Non-Programmable Electronic Thermostat Hardwired – 1 Heat/1 Cool, Auto Changeover Fan Speed Control – P/N 668811201*



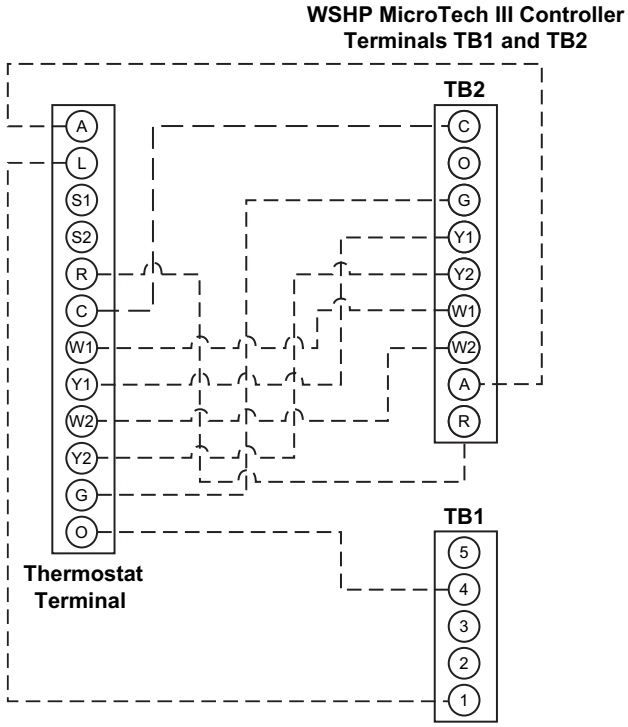

**Notes:** *Includes thermostat and wall plate. Refer to IO manual 668811201.*
**When remote reset of a lockout condition is required at the wall thermostat, it will be necessary to utilize a conductor between terminal "O" on the wall thermostat to "TB1 terminal 4" on the MicroTech III unit controller (non-programmable stat only).*

### *Programmable Electronic Thermostat Hardwired – 1 Heat/1 Cool, Auto Changeover Fan Speed Control – P/N 668811301*




**Notes:** *Includes thermostat and wall plate. Refer to IO manual 668811301.*

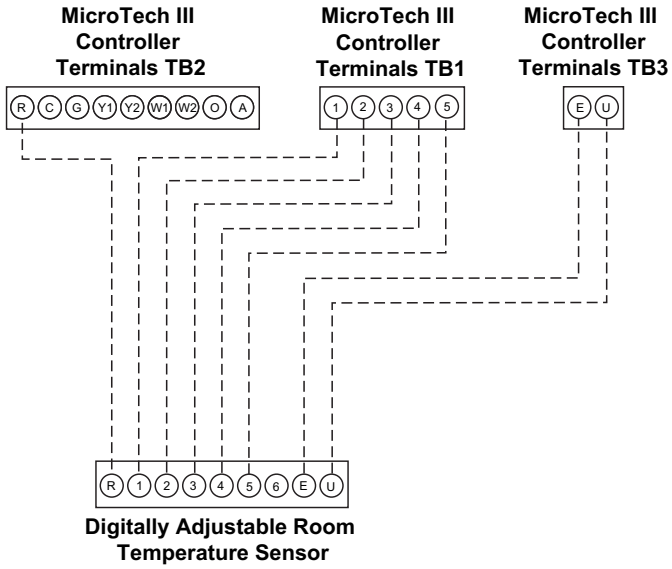
### *Non-Programmable Electronic Thermostat 2 Heat/2 Cool, Auto Changeover, Hardwired – P/N 910121746 & P/N 910121748*



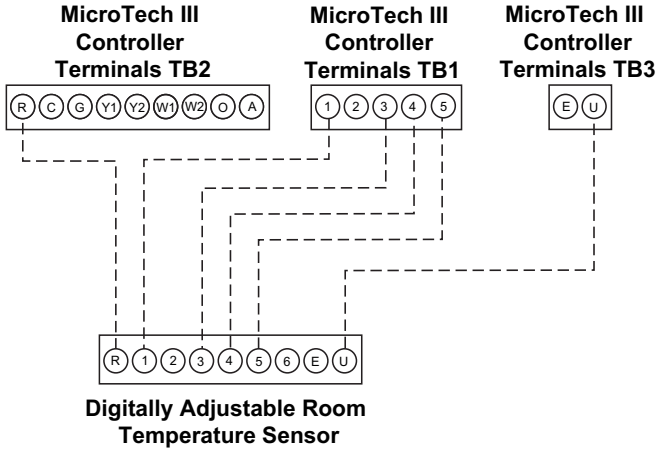

**Notes:** *Includes thermostat and wall plate. Refer to IO manuals 910121746 or 910121748.*
**When remote reset of a lockout condition is required at the wall thermostat, it will be necessary to utilize a conductor between terminal "O" on the wall thermostat to "TB1 terminal 4" on the MicroTech III unit controller (non-programmable stat only).*

## Sensors Used With Vertical Stack Units – Building Automated System (BAS) Operation – Wiring

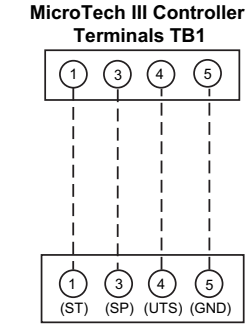
### *6-Button Digitally Adjustable Display Sensor – P/N 910121754*




### *4-Button Digitally Adjustable Display Sensor – P/N 910152147*

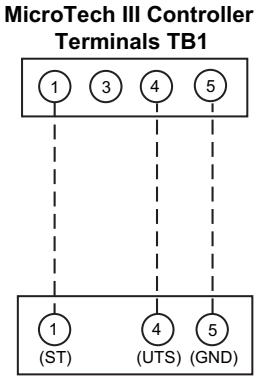


### *Cool/Warm Adjustable Sensor Wiring – P/N 910171464*



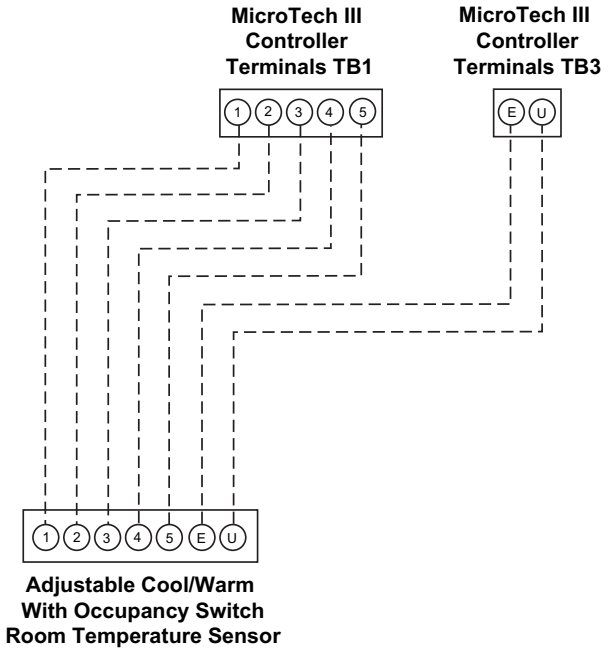

**Cool/Warm Adjustable Sensor (Part No. 910171464)**

### *Basic Sensor Wiring – P/N 910152149*



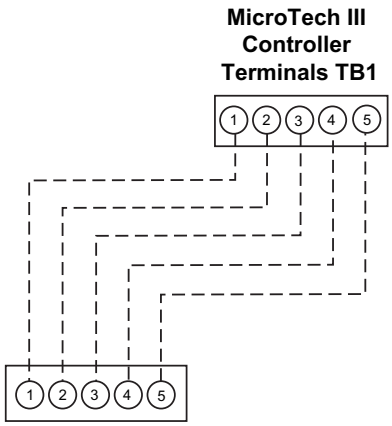

**Basic Sensor (Part No. 910152149)**

### *Room Temperature Sensor – Adjustable Cool/ Warm With Occupancy Switch – P/N 910121753*



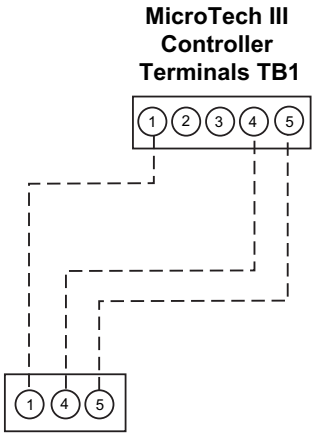

**Adjustable Cool/Warm With Occupancy Switch Room Temperature Sensor**

### *Room Temperature Sensors Adjustable 55° to 95°F or +/- 3°F – P/N 669529101 Sensor +/- 3°F – P/N 669529201*




**Adjustable 55º to 95º or +/- 3ºF Room Temperature Sensor**

### *Basic Sensor – P/N 669529001*




**Basic Sensor**

### Connect Condensate Drain Hose to Field-Supplied or Factory-Provided (Shipped Loose) Drain Stub-Out

**NOTICE**

For shipped loose or field supplied risers by others, the condensate hose connection is dependent on riser location and must be field adjusted. For a drain riser located at the back of the unit the factory provided drain hose can be connected (as is) to the drain stub out. Right or left hand drain hose connections will require the drain tube be cut at the indicated cut line on the drain tube, (units sizes 009 - 018 only)

1. Remove the two (2) screws located along the back edge of the drain pan, holding it in place (Figure 28).

***Figure 28: Remove two (2) screws along back edge of drain pan***

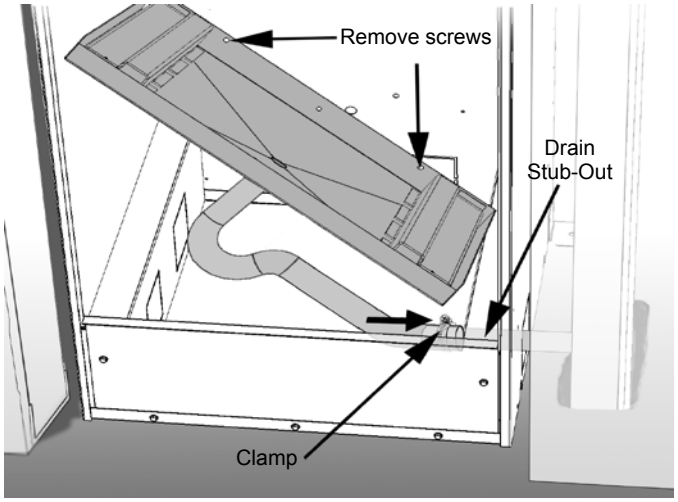
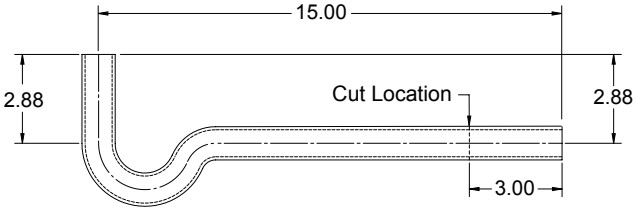



***Figure 29: Drain tube cut location (see Notice above)***




2. Cut the drain tube to the appropriate length for a right or left hand drain connection, (units sizes 009 - 018 only). If connecting the drain tube to the drain stub-out at the back of the unit, Cutting the drain tube may not be necessary.
3. Connect the condensate drain hose to the drain stub-out. Using the provided clamp, secure the hose by tightening the clamp.

**⚠ CAUTION**

Be sure that there are no kinks, bends or restrictions in the drain tube, but that it is straight with a slight down-pitch between the J-trap and clamp.

4. Reinstall the secondary drain pan with the two (2) screws removed in step 1.

## Water Connections

All piping connections should be made using good plumbing practices and in accordance with any and all local codes that may apply.

## Unit Piping Connection

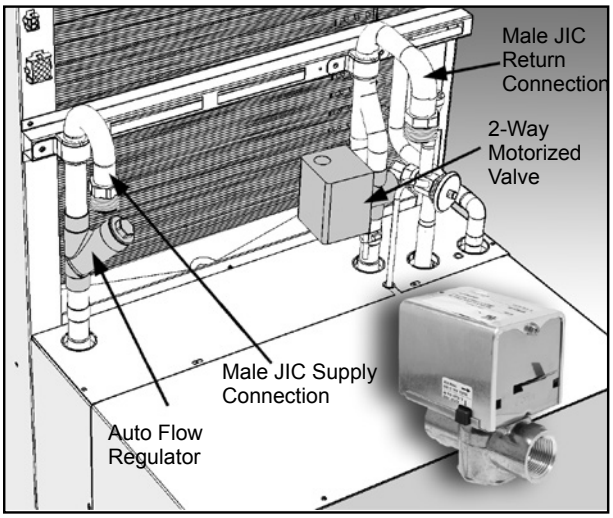
Unit sizes 009 through 018 coil connections are gooseneck style, made of copper tubing with 1/2" male JIC. Unit sizes 021 through 036 have 3/4" male JIC connections (Figure 30).

## Shutoff/Balancing Valve

Each heat pump requires a flexible hose with a shutoff valve on both the supply and return stubouts for easy serviceability and removal of the chassis when necessary.

Daikin recommends a factory installed 2-way motorized isolation valve on the return line of the chassis and an Auto Flow Regulator (AFR) installed on the supply line which allows proper water flow in a given size unit. Each valve package has 1/2" JIC or 3/4" JIC threaded connections (Figure 30).

***Figure 30: Typical motorized valve piping***



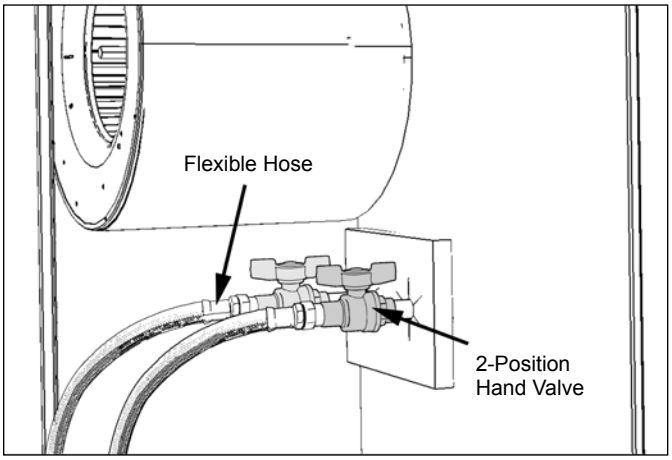

## Motorized Valve & Auto Flow Regulator

The Vertical stack water source heat pump chassis can be configured with a 2-way motorized valve. The 2-way motorized valve is mounted on the return line of each unit and the Auto Flow Regulator (AFR) is mounted to the supply line.

## Make Flexible Hose Connections to the Supply and Return Valves From Riser Stub-Outs

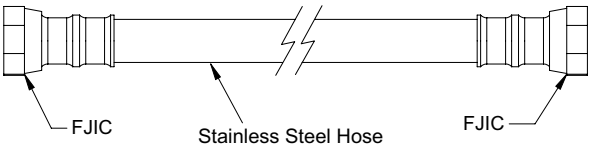
1. Using the specified supply and return hoses make supply and return hose connections to the riser stub-outs valve connections (Figure 31).
2. Attach one end of the JIC swivel hose end to the male JIC connection on the supply and return stub out valves. Using two crescent wrenches, one to hold the valve and the second on the hose end, tighten the connections.

***Figure 31: Make supply and return hose connections to the valves from the riser stub-outs***




***Note:*** *To complete the flexible hose connections to the chassis, only partially install the chassis into the cabinet as shown in Figure 34.*

***Figure 32: Hose kits, sizes 007-019 (1/2" x 30"), sizes 021-036 (3/4" x 36")***



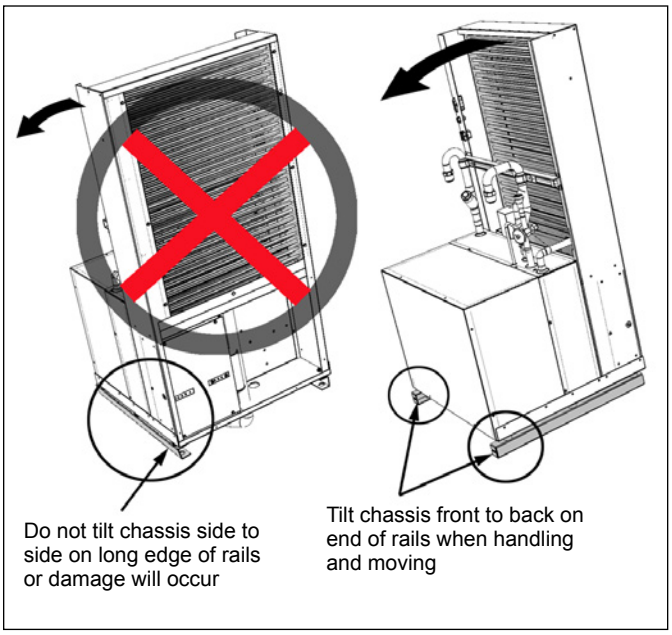

## Important When Handling Chassis

***Note:*** *If using a hand truck to move chassis, tip the chassis forward or back only, pivoting on the ends of the chassis rails. Tipping and pivoting the chassis side-to side on the long edge of the rails will damage the rails and the rubber vibration isolators.*

**⚠ CAUTION**

To avoid personal injury, protective gloves should be used while moving and lifting the unit chassis.

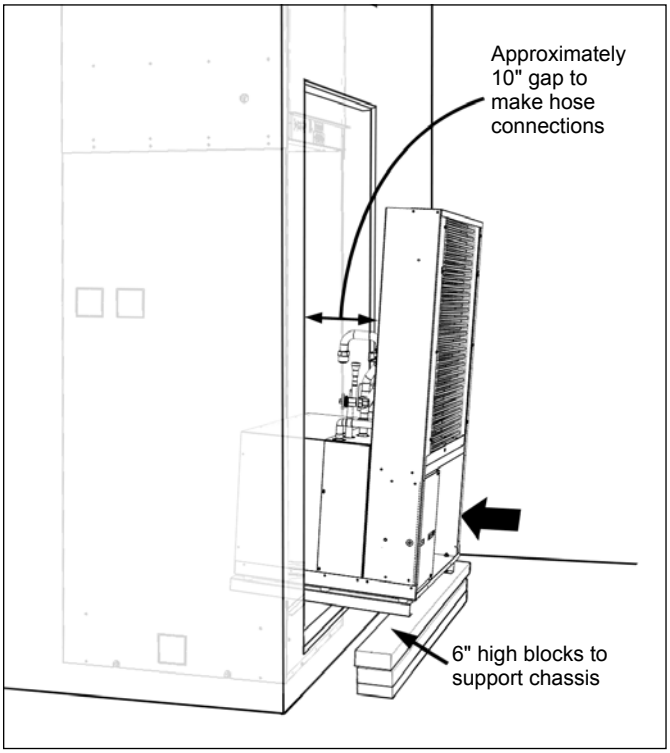
***Figure 33: Tip chassis front to back only, Pivoting on the ends of the rails***




## Installing Unit Chassis

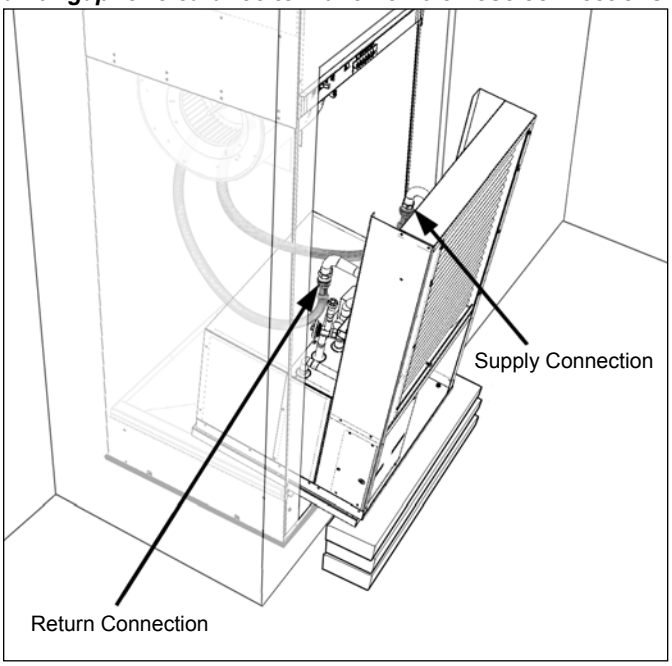
1. Install the chassis by sliding it into the cabinet opening until the chassis support rails sit on the cabinet rails. Slide the chassis into the cabinet until there is approximately a 10" space between the chassis coil and the cabinet. This will allow adequate clearance to connect the flexible hoses to the chassis coil. For safety, place a 6" high block under the chassis rails to support the chassis as shown in Figure 34.

***Figure 34: Slide chassis partially into the unit cabinet***



2. Thread the female swivel ends of the hoses on to the water supply and return connections. Using two crescent wrenches, one to hold the chassis pipe fitting connection and the second on the flexible hose swivel, tighten the connections. (Figure 35).

***Figure 35: Slide chassis into cabinet leaving approximately a 10" gap for clearance to make flexible hose connections***



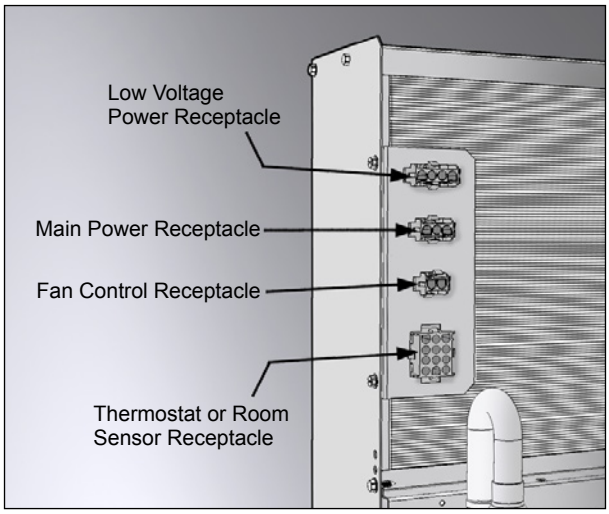

## Making Cabinet to Chassis Wiring Connections

**⚠ DANGER**

To avoid electrical shock, personal injury or death:
1. Installer must be qualified, experienced technician.
2. Disconnect power supply before installation to prevent electrical shock and damage to equipment.

1. Locate the wires and plugs in the upper fan section of the unit that connect to the unit chassis.
2. Plug in the wires from the top cabinet section into the proper molex receptacle on the chassis (Figure 36).

***Figure 36: Plug unit component wiring from the top cabinet section into the proper receptacle on the chassis (Unit Size 015 Chassis Shown)***




2. Push the chassis into the cabinet until it makes contact with the stops on the rails at the rear of the cabinet.

***Note:*** *Be sure there are no kinks and that the stainless steel braided hoses do not come in contact with and vibrate on chassis and cause noise. Also be sure not to pinch wires between cabinet and chassis when inserting chassis.*

## Installing the (Optional) Remote Control Node (RCN) For Use With The Optional Wireless Thermostat

**Heat Pump Kit Part No. 910139783 – Parts Included**

1. RCN
2. Bezel with Overlay
3. Wire harness to MTIII Board
4. Wire harness to RCN Board

### *Introduction*

Although the wireless temperature control kit is factory supplied it may also be field installed, which requires units set up for unit-mounted 24V thermostat control. The kit consists of a battery powered wireless remote thermostat and a unit-mounted Remote Control Node (RCN) and wireless remote control decal.

***Note:*** *The Remote Control Node is configured at the factory. See factory default configurations for Part Number 910139783.*

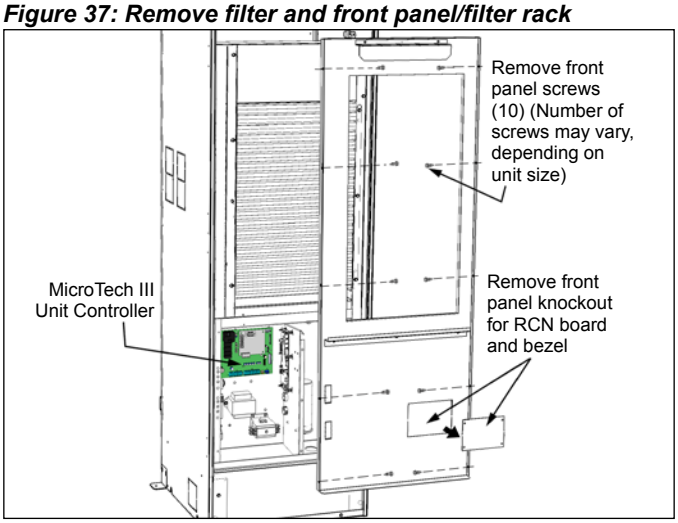
### *Tools Required*

- Phillips head screw driver
- Small Phillips head screw driver
- Small (flat head) screw driver

### *Procedure*

1. Be sure that all power to the unit is disconnected and that the disconnect switch is in the OFF position.
2. Remove the filter and then the front panel/filter rack (Figure 37).

***Figure 37: Remove filter and front panel/filter rack***



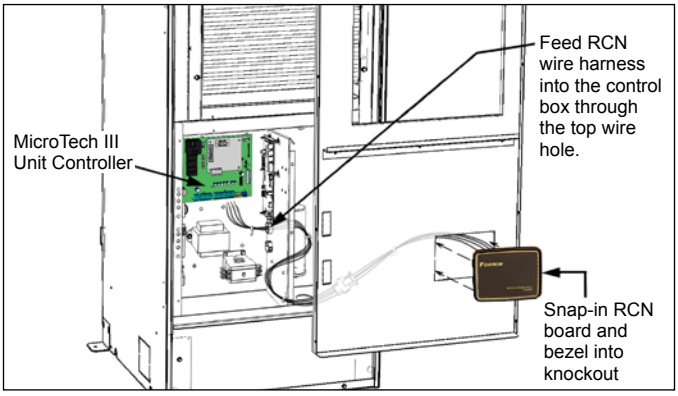

3. Remove the knockout plate in the front panel/filter rack and cut away the insulation within the knockout opening (Figure 37).

***Note:*** *For clarity, not all unit components are shown in illustrations.*

4. Feed the provided RCN wire harness through the knockout opening and snap the RCN bezel and board assembly into the knockout (Figure 38).

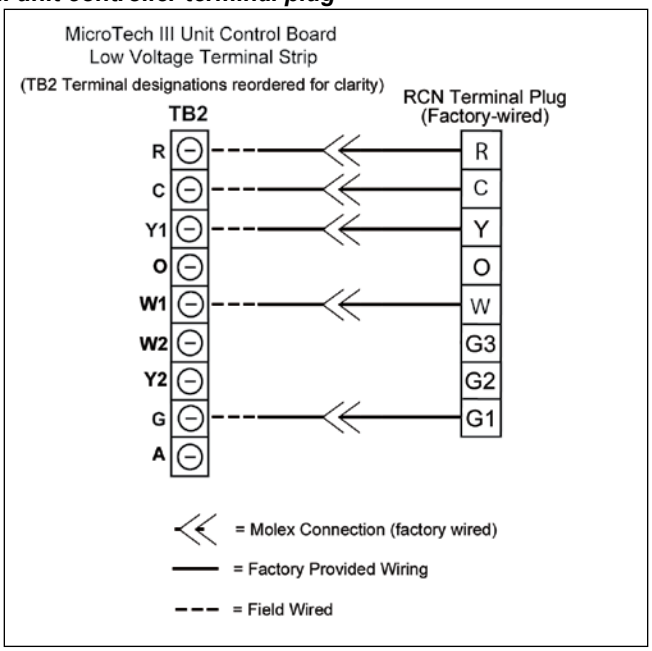
***Note:*** *Feed RCN wire harness into the control box through the top wire hole.*

***Figure 38: Feed RCN wire harness through front panel knockout***




6. Remove existing wires (if any) from the unit control board terminal plug (TB2), R, C, W, Y, G2.
7. Connect the provided (pre-stripped) RCN wire harness wires to the unit control board plug on terminals R, C, W, Y & G2 as shown in Figure 39.

***Figure 39: RCN wire harness connections to the MicroTech III unit controller terminal plug***




8. Reinstall the front panel/filter rack and filter.

## Installing The Return Air Panel Door

1. Install the return air panel door assembly (Figure 40). Center, level and plumb the frame inside the framed opening. Push the assembly into the opening until the gaskets compress against the cabinet, and the frame face is tight to the finished wall.

***Notes:*** *1. Shims (field-supplied) should be used to make up the space between the studs and the panel frame at the locations of the fasteners on the panel frame (4). Adhere them to the panel frame to keep them in place (Figure 40).*

*2. Be sure the bottom flange of the door frame slides beneath the cabinet flange, as shown in Figure 40. This seal must compress between the bottom panel flange and the bottom cabinet flange when the installation of the panel door frame is complete.*

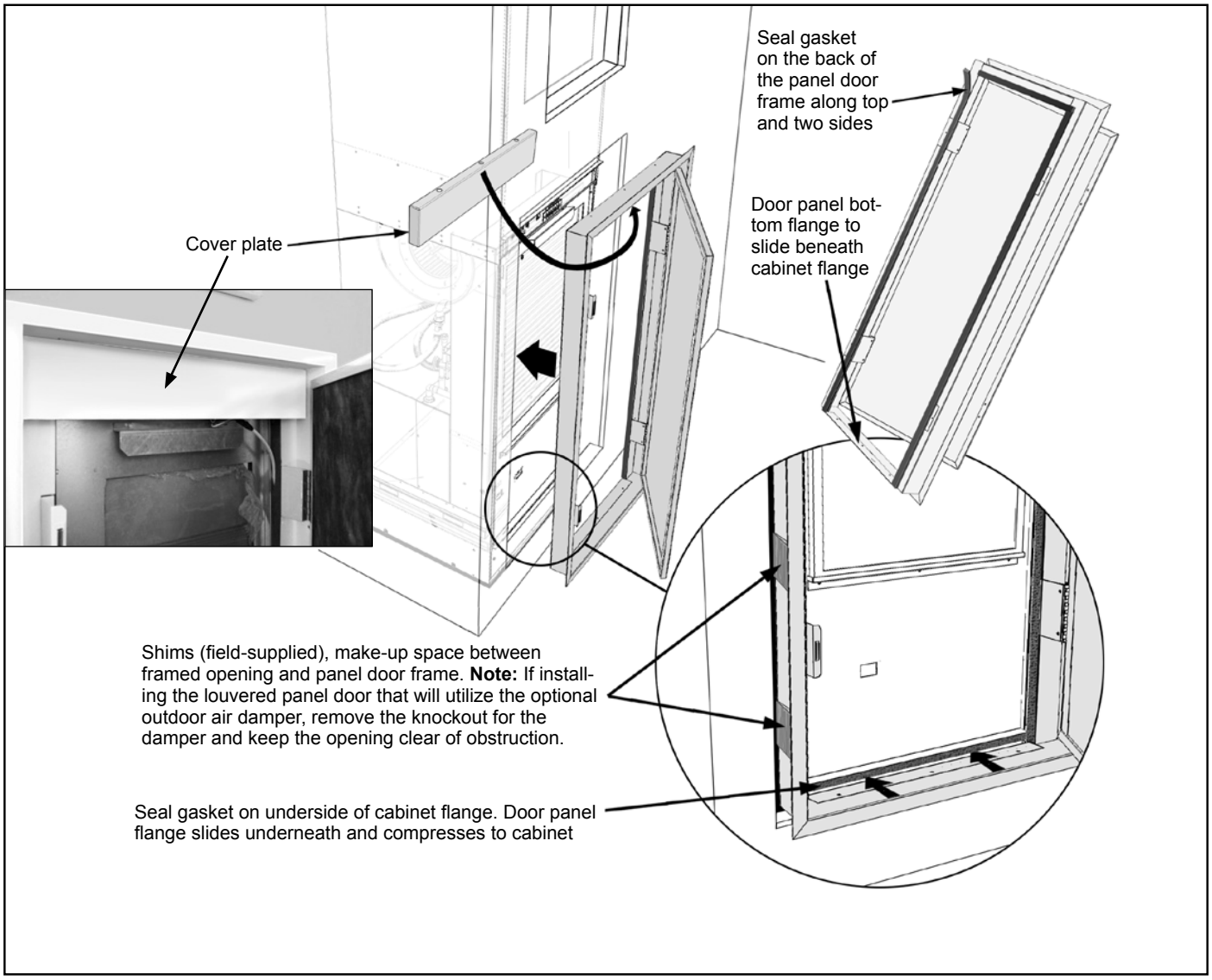
2. Check that the panel door frame is centered within the opening and seals completely to the cabinet return air opening. Also confirm that the room side flange of the frame is level, plumb and firmly against the drywall. Secure the hinged panel door frame with the appropriate fasteners/screws (field provided).

***Note:*** *Before proceeding to instruction 3, be sure to clean frame with rubbing alcohol to remove any oils or dust to ensure a strong bond between velcro and door frame.*

3. Remove the backing on the (hook) velcro strips and firmly press the cover plate to the panel door frame in the location shown in Figure 40.

***Note:*** *The clearance holes along the top edge of the cover plate should fit around the screws on the underside of the top door frame.*

***Figure 40: Installing the return air panel door (hinged perimeter panel door shown)***



## Installing The Optional Motorized Outdoor Air Damper with Louver Panel Door Only

1. Install the return air panel door assembly as described in "Installing The Return Air Panel Door" on page 36.
3. Fasten the damper assembly to the door frame with the provided screws. On left hand hinged doors the damper assembly will mount on the hinge side with the motor located at the bottom, and with right hand hinged doors the damper assembly will mount on the right side with the motor in the top position.
4. Wire the damper assembly motor using the correct schematic based on the unit motor type and voltage, (Figure 55 through Figure 60).

***Note:*** *It is the responsibility of the installing contractor to install the ductwork that connects the outdoor air opening in the panel door frame to the source of the outdoor intake opening in the building. All ductwork should conform to industry standards of good practice as described in the ASHRAE Systems Guide. Also refer to good installation practices as outlined in ED 18529.*

***Figure 41: Fasten the outside air damper assembly to the louver panel door frame***

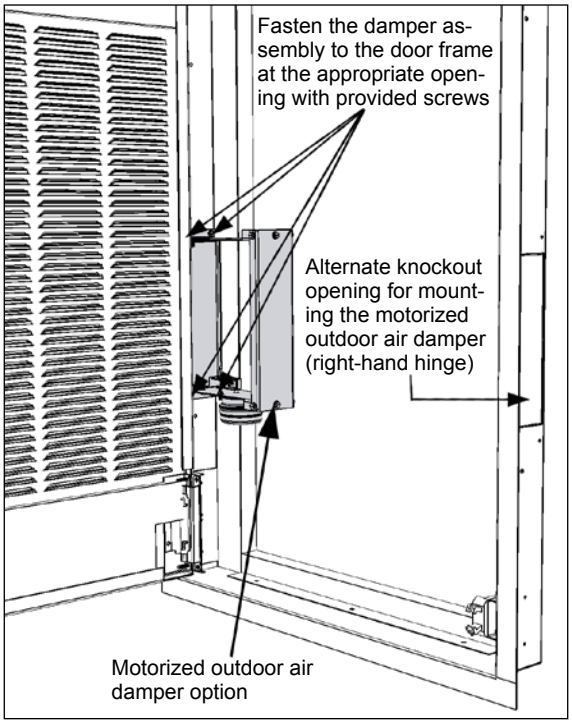


*Figure 55: Damper control wiring, sizes 009-012 with 208/230V and 277V fan motor control*

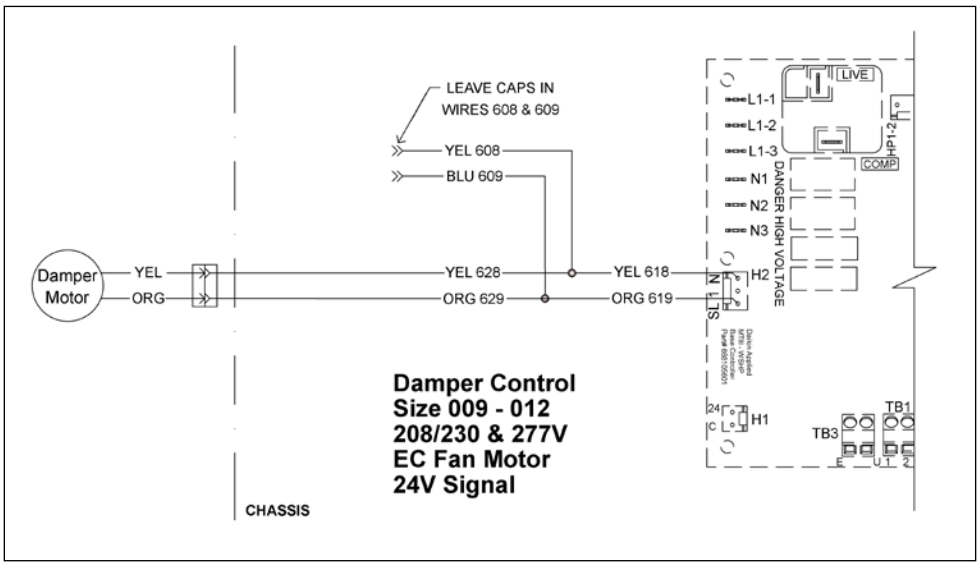



*Figure 56: Damper control wiring, sizes 015-036 with EC motor*

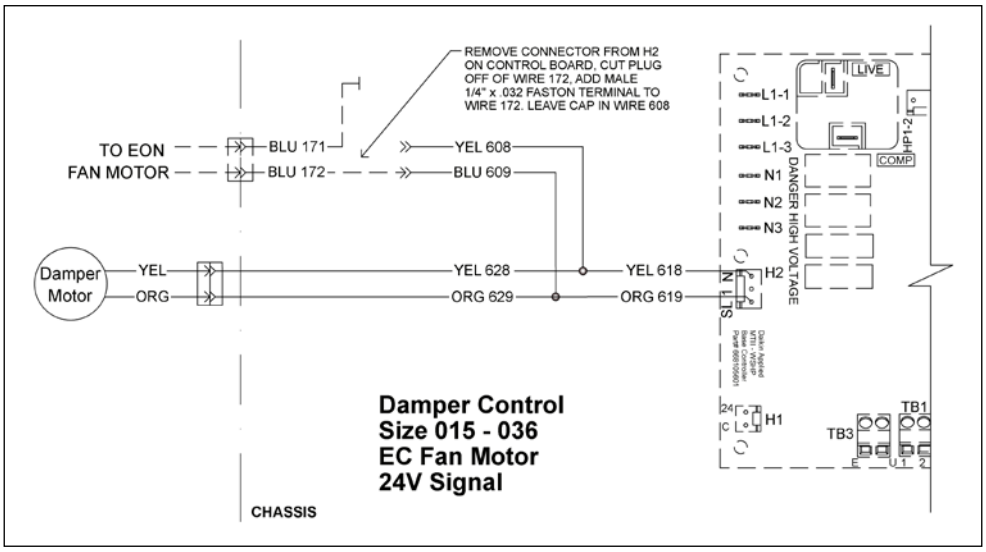



*Figure 57: Damper control wiring, sizes 009-012 with 115V PSC fan motor, line voltage control*

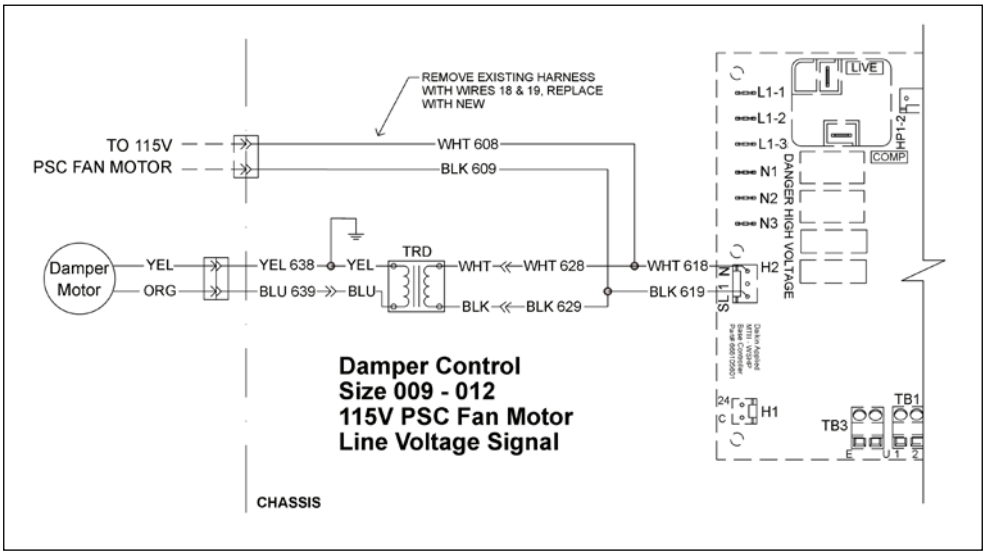


*Figure 58: Damper control wiring, sizes 009-036 with 277V PSC fan motor, 24V control*

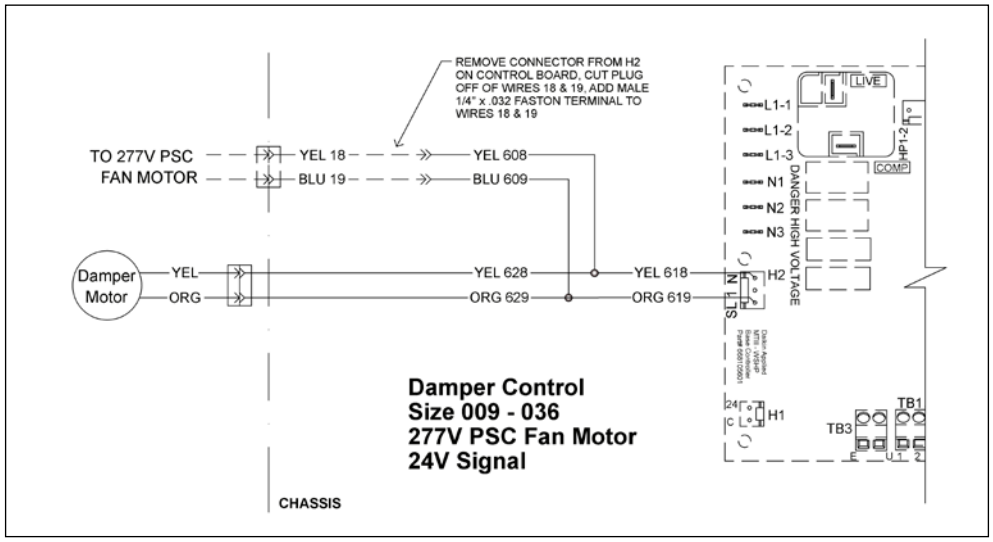



*Figure 59: Damper control wiring, sizes 009-036 with 208/230V PSC fan motor, 24V control*

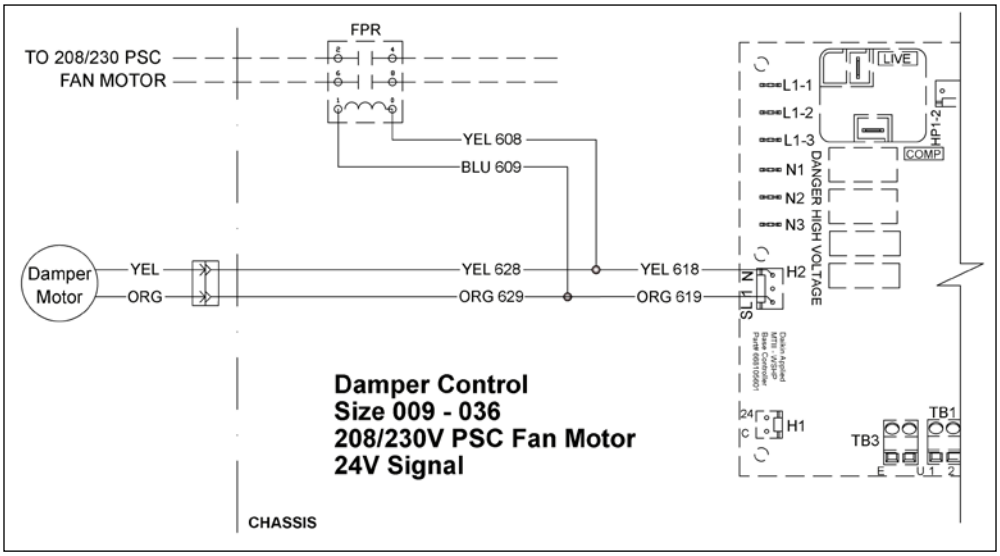
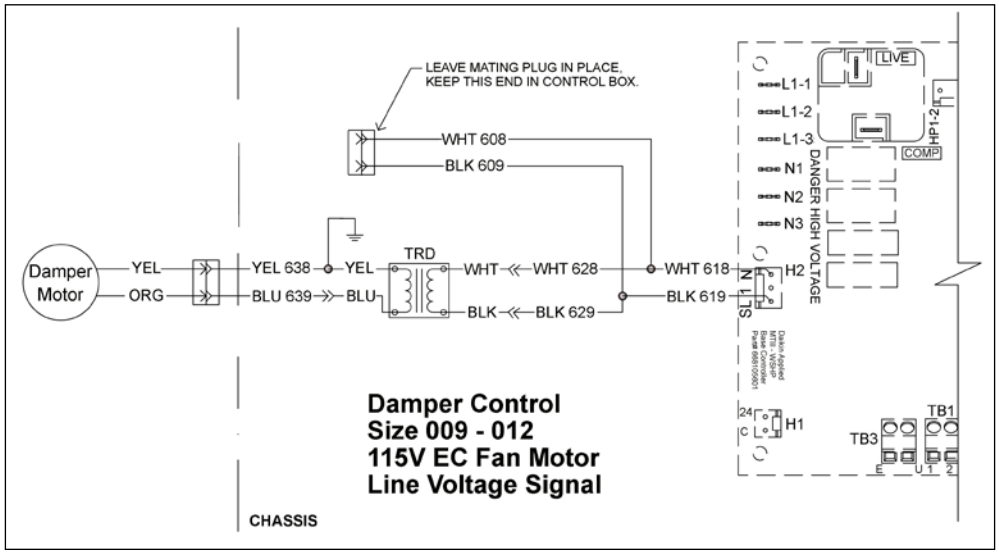



*Figure 60: Damper control wiring, sizes 009-012 with 115V EC fan motor, line voltage control*



## Installing The 3.25" Deep (2-Piece) Discharge Air Diffuser

**NOTICE**

Install the diffuser extension frame half of the two-piece 3.25" deep discharge air diffuser assembly to the unit before installing drywall. The louvered discharge air diffuser will slide in and connect to the extension frame and secured *after* the unit has been framed-in and the discharge opening is cut out of the drywall.

***Note:*** *To lessen noise transmission and air leakage, avoid metal-to-metal contact. Installation of a foam seal around the units discharge air opening is recommended.*

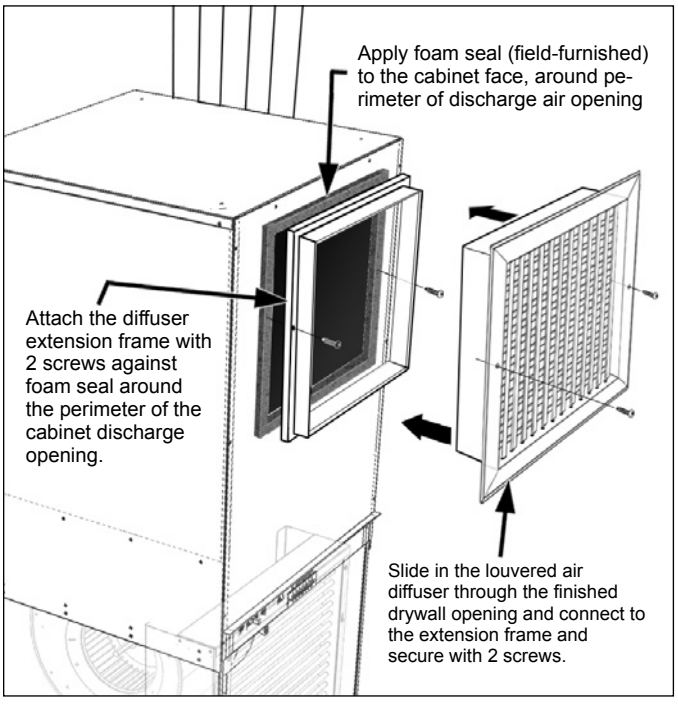
1. Adhere field-provided 1/2" foam seal to the face of the cabinet around the perimeter of the discharge air opening (Figure 42).
2. Attach the extension frame portion of the two-piece discharge air diffuser assembly to the foam seal around the perimeter of the cabinet discharge opening.

***Note:*** *Be sure the the extension frame is level and plumb.*

3. After the unit has been framed-in and the discharge opening is cut out of the drywall, slide in the louvered air diffuser through the finished drywall opening and connect to the extension frame. Secure with two (2) screws provided.

***Notes:*** *1. To avoid bending the adjustable discharge louvers do not press on them.*
*2. When installed correctly the diffuser frame should connect to the extension frame and seal to the cabinet discharge air opening so no discharge air is lost between the unit and the wall cavity.*

***Figure 42: Installing the 3.25" deep (2-piece) discharge air diffuser***




## Installing The 1.75" Deep Discharge Air Diffuser

***Note:*** *To lessen noise transmission and air leakage, avoid metal-to metal contact. Installation of a foam seal around the units discharge air opening is recommended.*

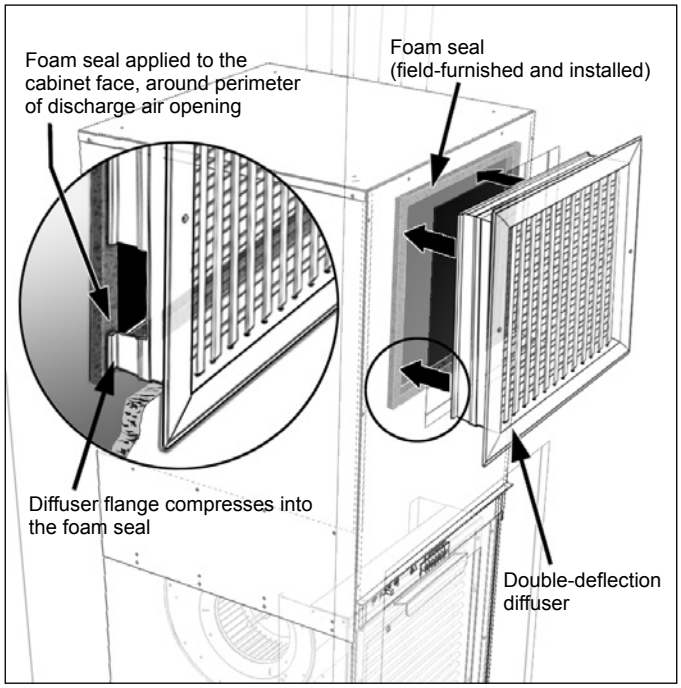
1. Adhere field-provided 1/2" foam seal to the face of the cabinet around the perimeter of the discharge air opening (Figure 43).
2. Insert the diffuser into the wall opening and align the frame with the foam seal.

***Note:*** *To avoid bending the adjustable discharge louvers do not press on them.*

3. Push the diffuser frame in until it compresses against the foam seal and the room side frame is flush against the drywall. Be sure the diffuser frame is level and plumb and secure it with the two (2) screws provided.

***Note:*** *When installed correctly the diffuser frame should seal to the cabinet discharge air opening and no discharge air will be lost between the unit and the wall cavity.*

***Figure 43: Installing the 1.75" deep discharge air diffuser***



## Twin Units Installation

Twin opposite hand units share a common riser system; i.e., supply, return, and drain riser. This is commonly called a “master/secondary” arrangement. The master unit is shipped with the risers attached. These special risers have stub-outs for both the master unit and the secondary unit which must be field connected and the following procedures must be followed for all twin unit installations.

1. Secondary units ship without risers and share common risers with the master unit. Knockout holes on the cabinet are provided for the 6" stub outs to make piping connections to the coil supply and return and the condensate drain.
2. Master units are offered in two-pipe systems with either right-hand or left-hand connections. Secondary units are offered to accommodate internal connections to any of these riser systems or locations.
3. The riser location (right or left) is determined by facing the return air grille panel. The risers are located on either the right or left of the unit. This defines the riser location. See "Cabinet Configurations" on page 17.
4. The riser block-off plates are located in the base of the secondary unit. Block-offs must be installed on the secondary unit before putting it into position.

***Figure 44: Twin unit arrangement (side by side)***

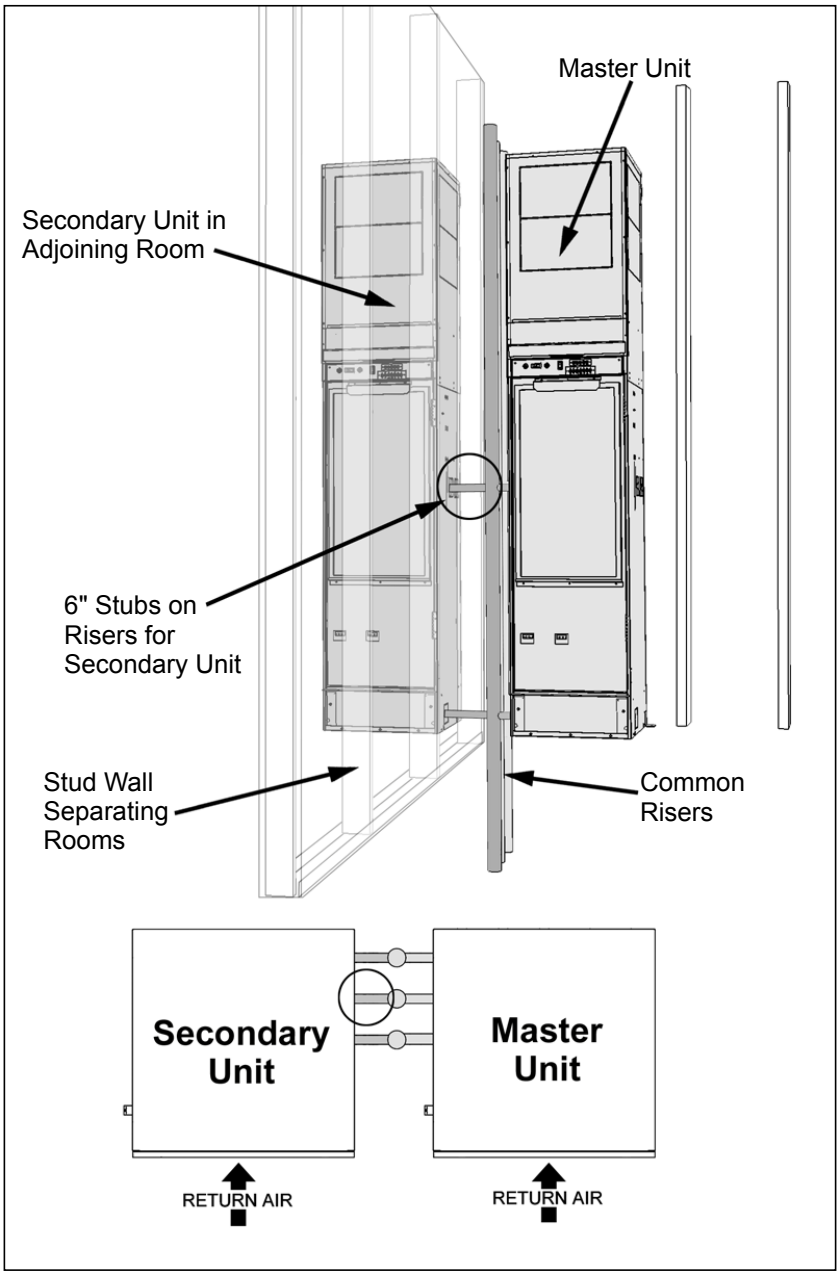


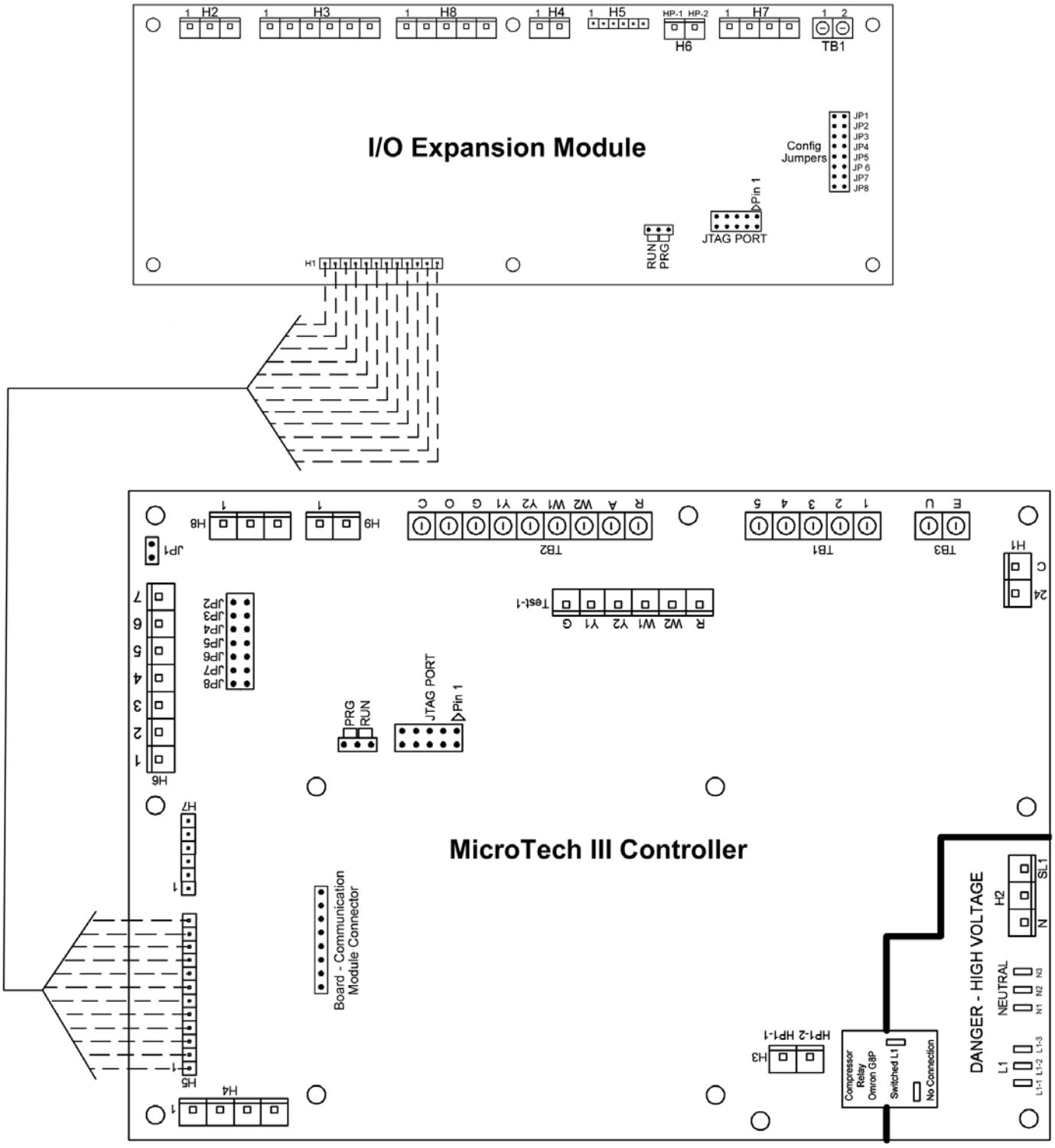
***Table 14: MicroTech III unit controller terminals & descriptions***

| | | |
|---|---|---|
| H1 – 1 | 24 | 24 VAC Power Input |
| H1 – 2 | C | 24 VAC common |
| H2 – 1 | SL1 | Fan Main Required Output – Switched L1 |
| H2 – 2 | | Blank Terminal |
| H2 – 3 | N | Fan Main Required Output – Neutral |
| H3 – 1 | HP1-1 | Comp High Pressure Switch (HP1) Input Terminal 1 |
| H3 – 2 | HP1-2 | Comp High Pressure Switch (HP1) Input Terminal 2 |
| H4 – 1 | 1 | Discharge Air Temp Sensor – Common |
| H4 – 2 | | Discharge Air Temp Sensor – Signal |
| H4 – 3 | | Leaving Water Temp Sensor – Common |
| H4 – 4 | | Leaving Water Temp Sensor – Signal |
| H5 – 1 | 1 | Connections to I/O Expansion Board |
| H5 – 2 | | |
| H5 – 3 | | |
| H5 – 4 | | |
| H5 – 5 | | |
| H5 – 6 | | |
| H5 – 7 | | |
| H5 – 8 | | |
| H5 – 9 | | |
| H5 – 10 | | |
| H5 – 11 | | |
| H5 – 12 | | |
| H6 – 1 | 1 | Condensate Overflow Signal Input |
| H6 – 2 | | Compressor Suction Temp Sensor (LT1) – Common |
| H6 – 3 | | Compressor Suction Temp Sensor (LT1) – Signal |
| H6 – 4 | | Compressor Low Pressure Switch (LP1) – Source Voltage |
| H6 – 5 | | Compressor Low Pressure Switch (LP1) – Signal |
| H6 – 6 | | Reversing Valve – Common |
| H6 – 7 | | Reversing Valve – Output |
| H7 – 1 | 1 | No Connection |
| H7 – 2 | | No Connection |
| H7 – 3 | | Red LED Output |
| H7 – 4 | | Green LED Output |
| H7 – 5 | | Yellow LED Output |
| H7 – 6 | | Red-Green-Yellow LED Common |
| H8 – 1 | 1 | Isolation Valve/Pump Request Relay N/O |
| H8 – 2 | | Isolation Valve/Pump Request Relay N/C |
| H8 – 3 | | 24 VAC Common |
| H9 – 1 | 1 | Room Temp Sensor & Tenant Override – Signal |
| H9 – 2 | | Room Temp Sensor & Tenant Override – Common |
| TB1 – 1 | 1 | Room Sensor – Status LED Output |
| TB1 – 2 | 2 | Room Sensor – Fan Mode & Unit Mode Switches |
| TB1 – 3 | 3 | Room Sensor – Setpoint Adjust Potentiometer |
| TB1 – 4 | 4 | Room Sensor – Room Temp Sensor & Tenant Override |
| TB1 – 5 | 5 | Room Sensor – DC Signal Common |
| TB2 – 1 | R | 24 VAC |
| TB2 – 2 | A | Thermostat – Alarm Output |
| TB2 – 3 | W2 | Thermostat – Heat Stage #2 (W2) Input |
| TB2 – 4 | W1 | Thermostat – Heat Stage #1 (W1) Input |
| TB2 – 5 | Y2 | Thermostat – Cool Stage #2 (Y2) Input |
| TB2 – 6 | Y1 | Thermostat – Cool Stage #1 (Y1) Input |
| TB2 – 7 | G | Thermostat – Fan Input |
| TB2 – 8 | O | Thermostat – Heat Stage #3 (W3) Input |
| TB2 – 9 | C | 24 VAC Common |
| TB3 – 1 | E | Emergency Shutdown Input |
| TB3 – 2 | U | Unoccupied Input |
| L1 – 1 | L1 - 1 | Line Voltage Terminal 1 |
| L1 – 2 | L1 - 2 | Line Voltage Terminal 2 |
| L1 – 3 | L1 - 3 | Line Voltage Terminal 3 |
| N1 | N1 | Neutral Terminal 1 |
| N2 | N2 | Neutral Terminal 2 |
| N3 | N3 | Neutral Terminal 3 |

***Table 15: I/O expansion module connectors/terminals***

| | | |
|---|---|---|
| H1 – 1 | 1 | Connections to Main Board |
| H1 – 2 | | |
| H1 – 3 | | |
| H1 – 4 | | |
| H1 – 5 | | |
| H1 – 6 | | |
| H1 – 7 | | |
| H1 – 8 | | |
| H1 – 9 | | |
| H1 – 10 | | |
| H1 – 11 | | |
| H1 – 12 | | |
| H2 – 1 | 1 | Auxiliary Heat Stage #2 Output – N/O |
| H2 – 2 | | No Connection |
| H2 – 3 | | 24 VAC Common |
| H3 – 1 | 1 | Ext. 24 VAC In |
| H3 – 2 | | Ext. 24 VAC Common In |
| H3 – 3 | | HGR / Waterside Economizer Output – N/O |
| H3 – 4 | | Ext. 24 VAC Common |
| H3 – 5 | | EC Fan Motor Variable Speed Signal Output |
| H3 – 6 | | EC Fan Motor Variable Speed Signal – Common |
| H4 – 1 | 1 | Entering Water Temp Sensor – Signal |
| H4 – 2 | | Entering Water Temp Sensor – Common |
| H5 – 1 | 1 | No Connection |
| H5 – 2 | | No Connection |
| H5 – 3 | | Red LED Output |
| H5 – 4 | | Green LED Output |
| H5 – 5 | | Yellow LED Output |
| H5 – 6 | | Red-Green-Yellow LED Common |
| H6 – 1 | HP2-1 | Comp High Capacity High Press Sw (HP2) Input Terminal 1 |
| H6 – 2 | HP2-2 | Comp High Capacity High Press Sw (HP2) Input Terminal 2 |
| H7 – 1 | | Fan Speed Table Row Select – Signal |
| H7 – 2 | | Fan Speed Table Row Select – Common |
| H7 – 3 | | Thermostat – Heat Stage #4 (W4) Input – Signal |
| H7 – 4 | | Auxiliary 24 VAC Out |
| H8 – 1 | 1 | Compressor – High Capacity Output – N/O |
| H8 – 2 | | 24 VAC Common |
| H8 – 3 | | No Connection |
| H8 – 4 | | Auxiliary Heat Stage #1 / Hydronic Heat Output N/O (24 VAC) |
| H8 – 5 | | 24 VAC Common |
| TB1 – 1 | 1 | Humidistat Signal Input |
| TB1 – 2 | 2 | Thermostat - Heat Stage #4 (W4) Input – Signal |

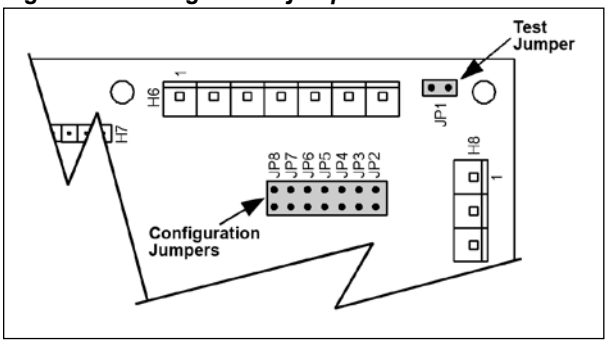
***Figure 45: MicroTech SmartSource unit controller & I/O expansion module***




**Note:** *Refer to Table 14 and Table 15 on page 42 for terminal descriptions*

## Jumper Configuration Settings

***Figure 46: Configuration jumpers location***




**⚠ WARNING**

Proper antifreeze/water solution is required to minimize the potential of fluid freeze-up. Jumper JP3 is factory set for water freeze protection with the jumper open. Operation at fluid temperatures below 32°F with anti-freeze protection requires JP3 to be field configured for the jumper closed. If unit is employing a fresh water system (no anti-freeze protection), it is extremely important that JP3 jumper setting remains in the open position (factory default setting) in order to shut down the unit at the appropriate water temperature to protect your heat pump from freezing. Failure to do so can result in unit damage and fluid leaks.

***Table 16: Jumper settings and descriptions***

| Jumper | Description | Options |
|---|---|---|
| **JP1** | Mode | Open for normal operation mode |
| | | Shorted for service/test operation mode |
| **JP2** | Fan operation | Open for continuous fan operation, when not in unoccupied mode. |
| | | Shorted for cycling fan operation |
| **JP3 (See Warning)** | Freeze Protection | Open for water freeze protection |
| | | Shorted for systems with anti-freeze protection (15°F (9°C) |
| **JP4** | Freeze Fault Protection | Open for none |
| | | Shorted to enable freeze fault protection based on Leaving Water Temperature (LWT) |
| **JP5** | Set point adjustment range only applies to network controls with a room temperature sensor | Open for adjustment range of -5.0° to +5.0° F |
| | | Shorted for 55° to 95° F adjustment range |
| **JP6** | Room control type | Open for thermostatic room control |
| | | Shorted for room temperature sensor control, MicroTech III only. |
| **JP7** | Compressor heating source | Open to enable compressor heating |
| | | Shorted to disable compressor heating |
| **JP8** | I/O expansion module | Open when I/O expansion module is not required |
| | | Shorted when I/O expansion module is required |

***Table 17: I/O expansion module jumper settings***

| I/O Expansion Description | Jumper(s) | Setting | Description |
|---|---|---|---|
| Fan Row Select for Operating Modes:<br>▪ Fan Only<br>▪ Hydronic Heating | **JP1 & JP2** | JP1 = Open<br>JP2 = Open | Fan Row #1 Selected |
| | | JP1 = Shorted<br>JP2 = Open | Fan Row #2 Selected |
| | | JP1 = Open<br>JP2 = Shorted | Fan Row #3 Selected |
| | | JP1 = Shorted<br>JP2 = Shorted | Fan Row #4 Selected |
| Heating Options | **JP3 & JP4** | JP3 = Open<br>JP4 = Open | None |
| | | JP3 = Shorted<br>JP4 = Shorted | Hydronic Heat |
| Not Used | **JP5 & JP6** | JP5 = Open<br>JP6 = Open | None |
| Not Used | **JP7** | JP7 = Open | None |
| Not Used | **JP8** | JP8 = Open | |

## MicroTech® III SmartSource Unit Controller

The MicroTech III SmartSource unit controller allows thermostat, Daikin sensor and DDC standalone operation. The R (24VAC) terminal is used to operate thermostat inputs G, Y1, Y2, W1, W2, W3, W4 and TB1-1. The C (0VAC) terminal is used to control inputs U, E and O. No external power sources may be used to operate the MicroTech III controller. All units must be properly grounded per local code requirements.

**NOTICE**

For information on sequence of operation and troubleshooting refer to OM 1149.

### Remote Reset of Automatic Lockouts

The Remote Reset feature provides the means to remotely reset automatic lockouts. There are (3) means to reset an automatic lockout condition:

- Using the thermostat create 2 demands for capacity within 30 seconds
- Press the Room Sensor or Thermostat Timed Override/ Reset Button for more than 10 seconds
- Turn the unit power off

When the cause of the fault condition has been cleared, and the unit transitions from not requiring any capacity to needing any capacity twice within 30 seconds (accomplished by user manipulation of the Heat/Cool/Auto/Off switch on the thermostat), an alarm reset equivalent to a tenant override button reset is generated. The intelligent reset counter and the 24 hour timer are cleared when this type of alarm reset is generated.

**Note:** *This feature only applies to thermostat controlled systems.*

For room sensor controlled units, pressing the “Override” or “Reset” button for more than 10 seconds will apply a ground signal to the tenant override in(screw terminal connection at TB1 pin 4) will clear the lockout alarm once the cause of the fault condition has been cleared.

A unit power cycle can also be used to clear an automatic lockout if the conditions causing the fault have been cleared.

***Table 18: MicroTech III SmartSource unit controller fault & status LED's***

| Description | Type | Yellow | Green | Red |
|---|---|---|---|---|
| **I/O Expansion Communication Fail** | Fault | ON | Flash | Flash |
| **Invalid Configuration** | Fault | Flash | Flash | OFF |
| **Low Voltage Brownout** | Fault | OFF | Flash | OFF |
| **Emergency Shutdown** | Mode | OFF | Flash | OFF |
| **Compressor High Pressure** | Fault | OFF | OFF | Flash |
| **Compressor Low Pressure** | Fault | OFF | OFF | ON |
| **Compressor Suction Temp Sensor Fail** | Fault | Flash | Flash | ON |
| **Compressor Low Suction Temp** | Fault | Flash | OFF | OFF |
| **Freeze Fault Detect** | Fault | Flash | OFF | Flash |
| **Room Temp Sensor Fail (Room Sensor Control Only)** | Fault | Flash | Flash | ON |
| **Leaving Water Temp Sensor Fail** | Fault | Flash | Flash | ON |
| **Condensate Overflow** | Fault | ON | OFF | OFF |
| **Serial EEPROM Corrupted** | Fault | ON | ON | ON |
| **Waterside Economizer Low Temp Cutout (WSE Control & Call for Cooling)** | Mode | Flash | ON | Flash |
| **Service Test Mode Enabled** | Mode | Flash | Flash | Flash |
| **Unoccupied Mode** | Mode | ON | ON | OFF |
| **Occupied, Bypass, Standby, or Tenant Override Modes** | Mode | OFF | ON | OFF |

**Note:** *Mode/faults are listed in order of priority.*

***Table 19: I/O expansion module fault & status LED's***

| Description | Type | Yellow | Green | Red |
|---|---|---|---|---|
| Baseboard Communication Fail | Fault | Flash | OFF | Flash |
| Entering Water Temp Sensor Fail (Boilerless Electric Heat or Waterside Economizer Only or Hydronic Heat) | Fault | ON | OFF | Flash |
| Low Entering Water Temperature (No Display On Boilerless Electric Heat) | Fault | OFF | ON | Flash |
| Fan is OFF | Mode | OFF | ON | OFF |
| Fan Running at Low Speed (0 to 33%) Duty Cycle | Mode | OFF | Flash | OFF |
| Fan Running at Medium Speed (34 to 66%) Duty Cycle | Mode | ON | Flash | OFF |
| Fan Running at High Speed (67 to 100%) Duty Cycle | Mode | Flash | Flash | OFF |

*Table 20: Fault recovery and reset*

| Fault Description | Auto Recovery | Tenant Override Button Reset | Network Reset |
|---|---|---|---|
| I/O Expansion Communication Fail | Yes | No | No |
| Invalid Configuration | No | No | No |
| Low Voltage Brownout | Yes | No | Yes |
| All Sensor Failures | No | No | Yes |
| Compressor High Pressure | No | Yes | Yes |
| Compressor Low Pressure | No | Yes | Yes |
| Compressor Low Suction Temp or Freeze Fault Detect (Heating and Cooling Modes) | Yes[1] | Yes | Yes |
| Compressor Low Suction Temp or Freeze Fault Detect (Dehumidification Mode) | Yes | Yes | Yes |
| Condensate Overflow | Yes | No | Yes |
| Low Entering Water Temp | Yes | No | No |
| Serial EEPROM Corrupted | No | No | No |
| Waterside Economizer Low Temp Cutout | Yes | No | No |

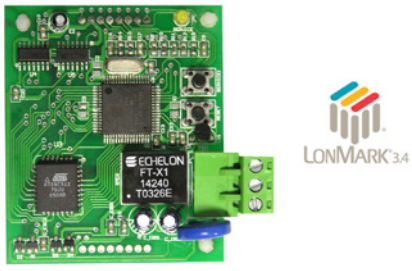
**Note:** [1] *Indicates auto recover is subject to intelligent alarm reset. Alarm auto recovers on first two occurrences, locked out on third within 24 hour period.*
*See "Intelligent Alarm Reset" on page 32 for further details.*

## MicroTech SmartSource Controller with LonWorks® Communication Module

For installation and operation information on LonWorks Communication Module and other ancillary control components, see:

- IM 927 - MicroTech III Water Source Heat Pump LonWorks Communication Module
- IM 933 - LonMaker Integration Plug-in Tool: For use with the MicroTech III SmartSource Unit Controller
- IM 955 - MicroTech III Wall Sensor for use with MicroTech III SmartSource Unit Controller

***Figure 47: LonWorks communication module***



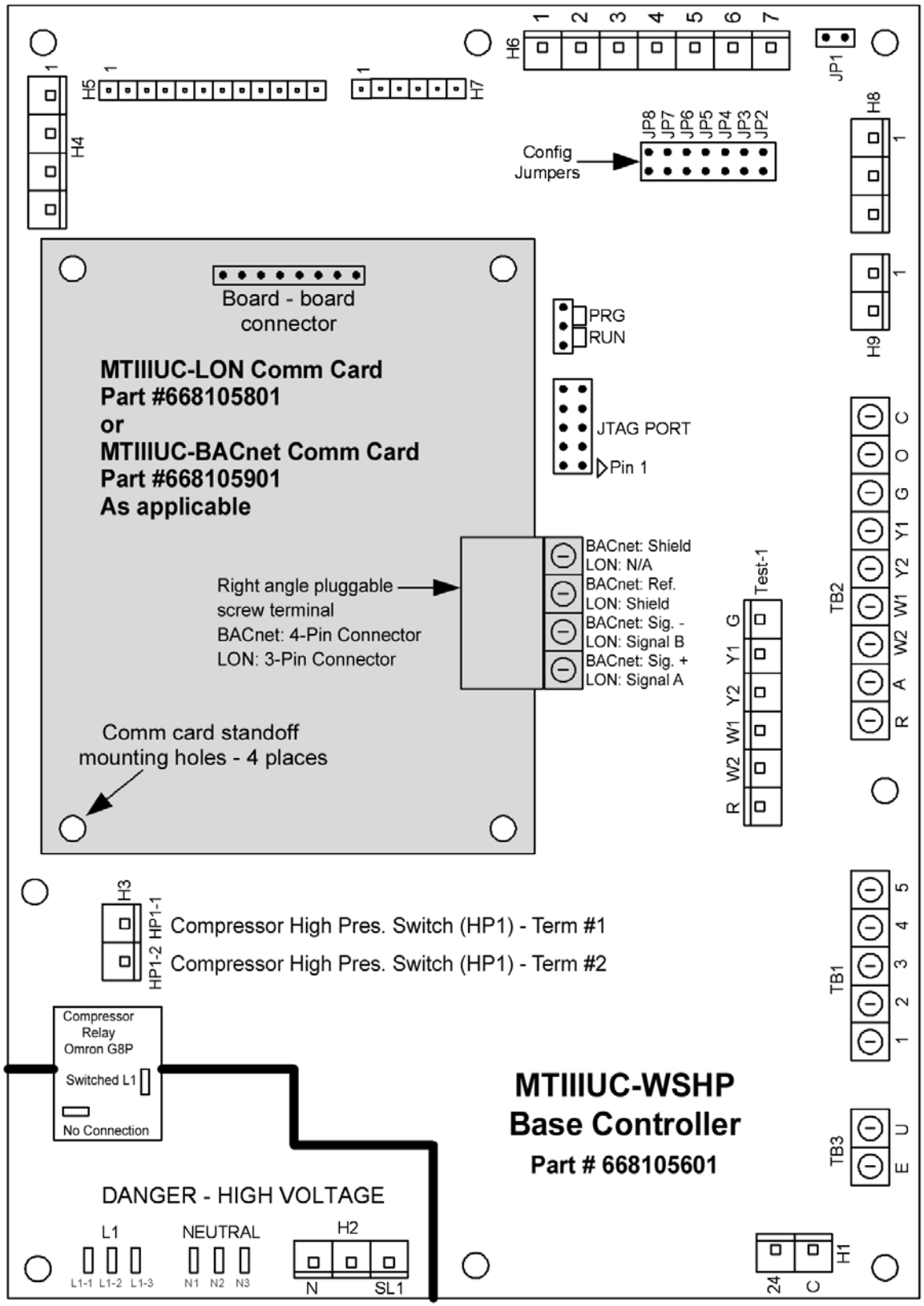

## MicroTech SmartSource Controller with BACnet® Communication Module

For installation and operation information on MicroTech III SmartSource unit controller and other ancillary components, see:

- IM 928 - MicroTech III BACnet Communication Module
- OM 931 - MicroTech III SmartSource Unit Controller for Water Source Heat Pumps Operation and Maintenance Manual
- IM 955 - MicroTech III Wall Sensor For use with MicroTech III SmartSource Unit Controller

***Figure 48: MicroTech III BACnet water source heat pump snap-in communication module***

***Figure 49: LonWorks® or BACnet® communication module placement on MicroTech™ III unit controller***



## Fan Performance for PSC Motor (Sizes 009 - 036)

***Table 21: PSC motor CFM values***

| Unit Size | Rated Airflow | Speed | External Static Pressure (in-$H_2O$) [Dry Coil and STD Filter) (inches of water column) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.00 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50 |
| 009 | 300 | High | 430 | 390 | 350 | 320 | 280 | – | – | – | – | – | – |
| | | Low | 400 | 360 | 330 | 290 | 250 | – | – | – | – | – | – |
| 012 | 400 | High | 430 | 390 | 350 | 320 | – | – | – | – | – | – | – |
| | | Low | 400 | 360 | 330 | – | – | – | – | – | – | – | – |
| 015 | 500 | High | 500 | 470 | 450 | 430 | 400 | 370 | 330 | 300 | – | – | – |
| | | Low | 430 | 400 | 380 | 360 | 340 | 310 | – | – | – | – | – |
| 018 | 600 | High | 500 | 470 | 450 | 430 | 400 | 370 | 330 | 300 | – | – | – |
| | | Low | 430 | 400 | 380 | 360 | 340 | 310 | – | – | – | – | – |
| 021 | 700 | High | 880 | 820 | 780 | 750 | 720 | 690 | 650 | 600 | 520 | – | – |
| | | Low | 740 | 710 | 690 | 680 | 650 | 610 | 580 | 540 | 490 | – | – |
| 024 | 800 | High | 880 | 820 | 780 | 750 | 720 | 690 | 650 | 600 | 520 | – | – |
| | | Low | 740 | 710 | 690 | 680 | 650 | 610 | 580 | 540 | 490 | – | – |
| 030 | 1000 | High | 1,380 | 1,360 | 1,340 | 1,310 | 1,280 | 1,250 | 1,210 | 1,170 | 1,130 | 1,080 | 1,020 |
| | | Low | 1,150 | 1,140 | 1,130 | 1,110 | 1,090 | 1,070 | 1,040 | 1,000 | 960 | 920 | 870 |
| 036 | 1200 | High | 1,380 | 1,360 | 1,340 | 1,310 | 1,280 | 1,250 | 1,210 | 1,170 | 1,130 | 1,080 | 1,020 |
| | | Low | 1,150 | 1,140 | 1,130 | 1,110 | 1,090 | 1,070 | 1,040 | 1,000 | 960 | 920 | 870 |

***Note:*** *Add 0.01" ESP for the optional discharge diffuser, and 0.02" ESP for the optional return air grille.*

## Fan Performance for High Static PSC Motor (Sizes 015 - 018)

| Unit Size | Rated Airflow | Speed | External Static Pressure (in-$H_2O$) [Dry Coil and STD Filter) (inches of water column) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.00 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50 |
| 015 | 500 | High | 700 | 700 | 690 | 670 | 660 | 640 | 620 | 590 | 570 | 540 | 500 |
| | | Low | 600 | 600 | 590 | 580 | 570 | 550 | 530 | 510 | 480 | 460 | 430 |
| 018 | 600 | High | 700 | 700 | 690 | 670 | 660 | 640 | 620 | 590 | 570 | 540 | 500 |
| | | Low | 600 | 600 | 590 | 580 | 570 | 550 | 530 | 510 | 480 | 460 | 430 |

## Fan Speed Selector Switch

A 4-position fan speed selector switch located in the control box allows CFM settings to be field adjustable. Fan speed control optimizes unit fan speed based on thermostat/room sensor inputs. The fan speed switch allows for manually setting an optimal fan speed specific to the application requirements. Refer to Table 22 and Table 23.

*Figure 50: 4-position fan speed selector switch*


## Fan Performance for Constant Torque EC Motor (Sizes 009-012)

***Table 22: Constant torque EC motor CFM values***

| Unit Size | Setting | Function | External Static Pressure (in-$H_2O$) [Dry Coil and STD Filter) (inches of water column) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.00 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 |
| 009 | 4 (High) | Stage 2 | 450 | 430 | 410 | 400 | 380 | 360 | 340 | 320 | 300 |
| | 3 (Standard) | | 420 | 400 | 380 | 360 | 340 | 320 | 300 | 270 | 250 |
| | 2 (Medium) | | 350 | 330 | 310 | 290 | 270 | 250 | 230 | 210 | 190 |
| | 1 (Low) | | 350 | 330 | 310 | 290 | 270 | 250 | 230 | 210 | 190 |
| | 4 (High) | Stage 1 | 420 | 400 | 380 | 360 | 340 | 320 | 300 | 270 | 250 |
| | 3 (Standard) | | 380 | 360 | 340 | 320 | 300 | 280 | 260 | 230 | 210 |
| | 2 (Medium) | | 350 | 330 | 310 | 290 | 270 | 250 | 230 | 210 | 190 |
| | 1 (Low) | | 350 | 330 | 310 | 290 | 270 | 250 | 230 | 210 | 190 |
| | A | *Fan Only, Hydronic Heat | 420 | 400 | 380 | 360 | 340 | 320 | 300 | 270 | 250 |
| | B | | 380 | 360 | 340 | 320 | 300 | 280 | 260 | 230 | 210 |
| | C | | 350 | 330 | 310 | 290 | 270 | 250 | 230 | 210 | 190 |
| | D | | 300 | 280 | 260 | 240 | 220 | 200 | 180 | 160 | 140 |
| 012 | 4 (High) | Stage 2 | 470 | 450 | 430 | 410 | 390 | 370 | 350 | 330 | 310 |
| | 3 (Standard) | | 450 | 430 | 410 | 390 | 370 | 340 | 320 | 300 | 280 |
| | 2 (Medium) | | 420 | 400 | 380 | 360 | 340 | 310 | 290 | 270 | 250 |
| | 1 (Low) | | 400 | 370 | 350 | 330 | 310 | 290 | 260 | 240 | 220 |
| | 4 (High) | Stage 1 | 450 | 430 | 410 | 390 | 370 | 340 | 320 | 300 | 280 |
| | 3 (Standard) | | 420 | 400 | 380 | 360 | 340 | 310 | 290 | 270 | 250 |
| | 2 (Medium) | | 400 | 370 | 350 | 330 | 310 | 290 | 260 | 240 | 220 |
| | 1 (Low) | | 400 | 370 | 350 | 330 | 310 | 290 | 260 | 240 | 220 |
| | A | *Fan Only, Hydronic Heat | 450 | 430 | 410 | 390 | 370 | 340 | 320 | 300 | 280 |
| | B | | 420 | 400 | 380 | 360 | 340 | 310 | 290 | 270 | 250 |
| | C | | 400 | 370 | 350 | 330 | 310 | 290 | 260 | 240 | 220 |
| | D | | 360 | 330 | 300 | 270 | 240 | 210 | 180 | 150 | 120 |

***Notes:*** *1. EC motor is programmed to make soft starts and stops to reduce stress transmitted to the fan housing. They adjust their speed and torque to deliver constant airflow over a wide range of external static pressure.*

*2. Units are shipped at setting 3 (standard). Speed adjustment is done by 4-position switch in the control box.*

*3. The unit is capable of high-low fan performance through the use of a 2-stage thermostat wired to specific terminals for High-Low CFM fan performance. Standard operation with a 1-stage thermostat is indicated as stage 2 fan performance.*

** See Figure 51 on page 51 for jumper configuration.*

## Fan Performance for Constant CFM EC Motor (Sizes 015 - 036)

***Table 23: Single stage units with constant CFM EC motor***

| Unit Size | MicroTech III Unit Controller | | | | | |
|---|---|---|---|---|---|---|
| | [2]Setting | Maximum ESP (in. WC.) | [1]Low CFM Heat | [1]High CFM Heat | [1]Low CFM Cool | [1]High CFM Cool |
| 015 (1-Row Hydronic Coil) | 4 (High) | 0.40 | 500 | 540 | 500 | 540 |
| | 3 (Standard) | | 440 | 500 | 440 | 500 |
| | 2 (Medium) | | 390 | 440 | 390 | 440 |
| | 1 (Low) | | 390 | 390 | 390 | 390 |
| 018 (1-Row Hydronic Coil) | 4 (High) | 0.40 | 600 | 680 | 600 | 680 |
| | 3 (Standard) | | 530 | 600 | 530 | 600 |
| | 2 (Medium) | | 470 | 530 | 470 | 530 |
| | 1 (Low) | | 470 | 470 | 470 | 470 |
| 021 (1 or 2-Row Hydronic Coil) | 4 (High) | 0.40 | 700 | 770 | 700 | 770 |
| | 3 (Standard) | | 610 | 700 | 610 | 700 |
| | 2 (Medium) | | 530 | 610 | 530 | 610 |
| | 1 (Low) | | 530 | 530 | 530 | 530 |
| 024 (1 or 2-Row Hydronic Coil) | 4 (High) | 0.40 | 800 | 900 | 800 | 900 |
| | 3 (Standard) | | 700 | 800 | 700 | 800 |
| | 2 (Medium) | | 600 | 700 | 600 | 700 |
| | 1 (Low) | | 600 | 600 | 600 | 600 |
| 030 (1 or 2-Row Hydronic Coil) | 4 (High) | 0.40 | 1000 | 1120 | 1000 | 1120 |
| | 3 (Standard) | | 880 | 1000 | 880 | 1000 |
| | 2 (Medium) | | 760 | 880 | 760 | 880 |
| | 1 (Low) | | 760 | 760 | 760 | 760 |
| 036 (1 or 2-Row Hydronic Coil) | 4 (High) | 0.40 | 1200 | 1310 | 1200 | 1310 |
| | 3 (Standard) | | 1050 | 1200 | 1050 | 1200 |
| | 2 (Medium) | | 910 | 1050 | 910 | 1050 |
| | 1 (Low) | | 910 | 910 | 910 | 910 |

***Notes:*** *[1] The unit is capable of high-low fan performance through the use of a 2-stage thermostat wired to specific terminals for High-Low CFM.*

*[2] Units are shipped at setting 3 (standard). Fan speed settings may be changed via the 4-position fan speed selector switch located inside the control box.*

*[3] Refer to Figure 51 on page 51 for location of jumpers JP1 and JP2 on the I/O expansion module. Refer to Table 25 on page 51 for jumper configurations.*

## Constant CFM EC Motor with Hydronic Heat - I/O Expansion Module Settings (Sizes 015 - 036)

***Table 24: Constant CFM EC motor with hydronic heat - I/O expansion module settings***

| Unit Size | MicroTech III Unit Controller | [3]I/O Expansion Module | | |
|---|---|---|---|---|
| | [2]Setting | Setting | Fan Only | Hydronic Heat |
| 015 (1-Row Hydronic Coil) | 4 (High) | A | 500 | 500 |
| | 3 (Standard) | B | 440 | 440 |
| | 2 (Medium) | C | 390 | 390 |
| | 1 (Low) | D | 290 | 290 |
| 018 (1-Row Hydronic Coil) | 4 (High) | A | 600 | 600 |
| | 3 (Standard) | B | 530 | 530 |
| | 2 (Medium) | C | 470 | 470 |
| | 1 (Low) | D | 360 | 360 |
| 021 (1 or 2-Row Hydronic Coil) | 4 (High) | A | 700 | 700 |
| | 3 (Standard) | B | 610 | 610 |
| | 2 (Medium) | C | 530 | 530 |
| | 1 (Low) | D | 400 | 400 |
| 024 (1 or 2-Row Hydronic Coil) | 4 (High) | A | 800 | 800 |
| | 3 (Standard) | B | 700 | 700 |
| | 2 (Medium) | C | 600 | 600 |
| | 1 (Low) | D | 450 | 450 |
| 030 (1 or 2-Row Hydronic Coil) | 4 (High) | A | 1000 | 1000 |
| | 3 (Standard) | B | 880 | 880 |
| | 2 (Medium) | C | 760 | 760 |
| | 1 (Low) | D | 580 | 580 |
| 036 (1 or 2-Row Hydronic Coil) | 4 (High) | A | 1200 | 1200 |
| | 3 (Standard) | B | 1050 | 1050 |
| | 2 (Medium) | C | 910 | 910 |
| | 1 (Low) | D | 710 | 710 |

***Notes:*** *[1] The unit is capable of high-low fan performance through the use of a 2-stage thermostat wired to specific terminals for High-Low CFM.*
*[2] Units are shipped at setting 3 (standard). Fan speed settings may be changed via the 4-position fan speed selector switch located inside the control box.*

*[3] See Table 25 and Figure 51 for jumper configuration.*

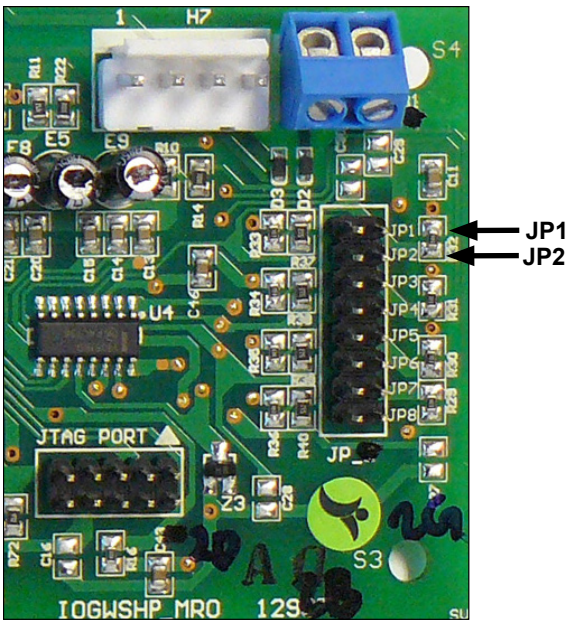
*= Hydronic heat data for sizes 015 and 018 in gray tint reflects units with 1-row hydronic coil.*

***Table 25: I/O expansion module jumper configuration***

| Setting | I/O Expansion Module Configuration | |
|---|---|---|
| | JP1 | JP2 |
| A | Open | Open |
| B | Shorted | Open |
| C | Open | Shorted |
| D | Shorted | Shorted |

***Note:*** *Refer to Figure 51 for location of jumpers JP1 and JP2 on the I/O expansion module.*

***Figure 51: JP1 & JP2 location on the I/O expansion module***

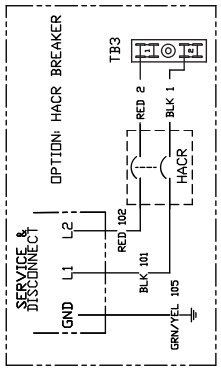


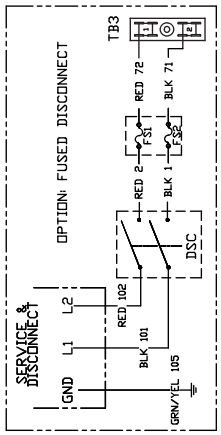
# MicroTech III Unit Controller, EC Fan, Sensor Control with Communication Module 208-230/60/1 Unit Sizes 009-012

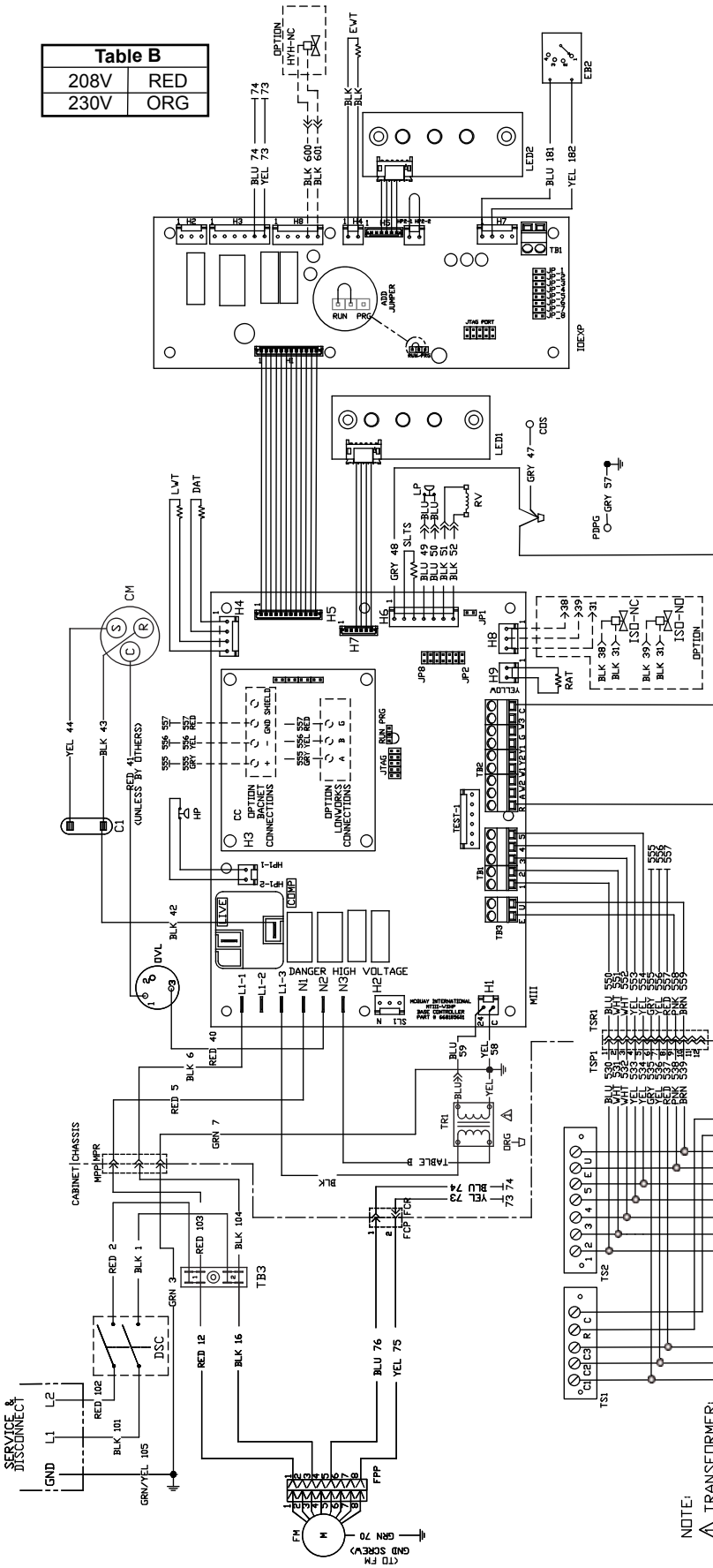
## Legend

| Item | Description |
|---|---|
| C1 | Capacitor-Compressor |
| C2 | Capacitor-Fan |
| CC | Communication Card - Optional |
| CM | Compressor - Motor |
| COS | Condensate Overflow Sensor |
| DAT | Discharge Air Temp. Sensor |
| DSC | Disconnect Switch |
| EB2 | Fan Speed Selector |
| EWT | Entering Water Temp Sensor |
| FCP | Fan Connector Plug |
| FCR | Fan Connector Receptacle |
| FM | Fan Motor |
| FS1, 2 | Fuse |
| HACR | HACR Breaker |
| HP | High Pressure Switch |
| HYH | Hydronic Heat Valve - Optional |
| IOEXP | MicroTech III I/O Expansion Board |
| ISO-** | Isolation Valve - Optional |
| LED1, 2 | LED Annunciator / Harness |
| LP | Low Pressure Switch |
| LWT | Leaving Water Temp Sensor |
| MIII | MicroTech III Main Board |
| MPP | Main Power Connector Plug |
| MPR | Main Power Connector Receptacle |
| OVL | Compressor Overload |
| P1 | Tstat Plug |
| PDPG | Primary Drain Pan Ground |
| RV | Reversing Valve Solenoid |
| SOS | Secondary Overflow Sensor |
| SLTS | Suction Line Temp Sensor |
| TS1 | Terminal Strip 1 |
| TS2 | Terminal Strip 2 |
| TSP | Terminal Strip Connector Plug |
| TSR | Terminal Strip Connector Receptacle |
| TR1 | Transformer - 24V |

| Table B | |
|---|---|
| 208V | RED |
| 230V | ORG |



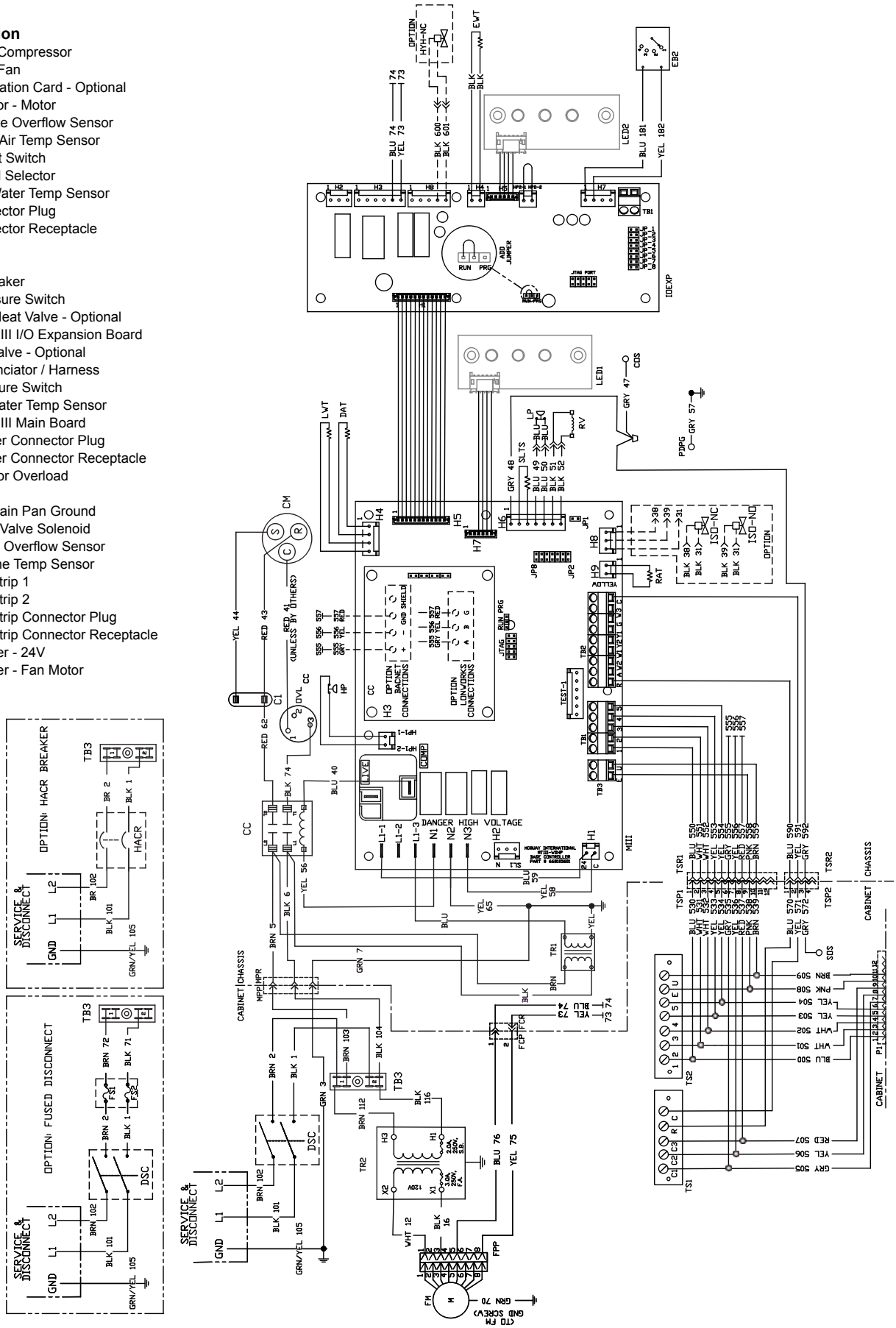



# MicroTech III Unit Controller, EC Motor, Sensor Control with Communication Module 265-277/60/1 Unit Sizes 009-012

## Legend

| Item | Description |
|---|---|
| C1 | Capacitor-Compressor |
| C2 | Capacitor-Fan |
| CC | Communication Card - Optional |
| CM | Compressor - Motor |
| COS | Condensate Overflow Sensor |
| DAT | Discharge Air Temp Sensor |
| DSC | Disconnect Switch |
| EB2 | Fan Speed Selector |
| EWT | Entering Water Temp Sensor |
| FCP | Fan Connector Plug |
| FCR | Fan Connector Receptacle |
| FM | Fan Motor |
| FS1, 2 | Fuse |
| HACR | HACR Breaker |
| HP | High Pressure Switch |
| HYH | Hydronic Heat Valve - Optional |
| IOEXP | MicroTech III I/O Expansion Board |
| ISO-** | Isolation Valve - Optional |
| LED1, 2 | LED Annunciator / Harness |
| LP | Low Pressure Switch |
| LWT | Leaving Water Temp Sensor |
| MIII | MicroTech III Main Board |
| MPP | Main Power Connector Plug |
| MPR | Main Power Connector Receptacle |
| OVL | Compressor Overload |
| P1 | Tstat Plug |
| PDPG | Primary Drain Pan Ground |
| RV | Reversing Valve Solenoid |
| SOS | Secondary Overflow Sensor |
| SLTS | Suction Line Temp Sensor |
| TS1 | Terminal Strip 1 |
| TS2 | Terminal Strip 2 |
| TSP | Terminal Strip Connector Plug |
| TSR | Terminal Strip Connector Receptacle |
| TR1 | Transformer - 24V |
| TR2 | Transformer - Fan Motor |

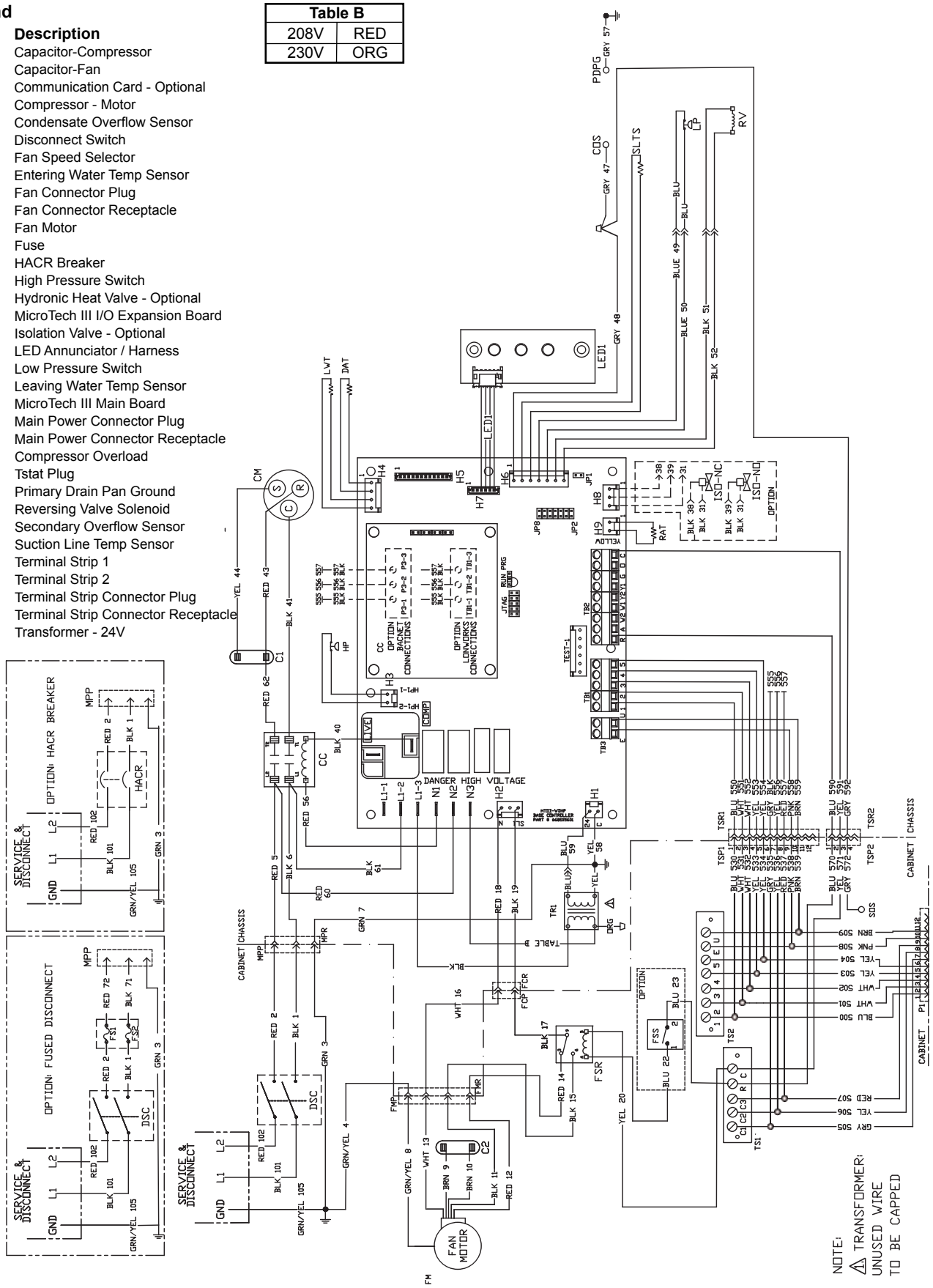


# MicroTech III Unit Controller, PSC Motor, Sensor Control with Communication Module 208-230/60/1 Unit Size 021

## Legend

| Item | Description |
|---|---|
| C1 | Capacitor-Compressor |
| C2 | Capacitor-Fan |
| CC | Communication Card - Optional |
| CM | Compressor - Motor |
| COS | Condensate Overflow Sensor |
| DSC | Disconnect Switch |
| EB2 | Fan Speed Selector |
| EWT | Entering Water Temp Sensor |
| FCP | Fan Connector Plug |
| FCR | Fan Connector Receptacle |
| FM | Fan Motor |
| FS1, 2 | Fuse |
| HACR | HACR Breaker |
| HP | High Pressure Switch |
| HYH | Hydronic Heat Valve - Optional |
| IOEXP | MicroTech III I/O Expansion Board |
| ISO-** | Isolation Valve - Optional |
| LED1, 2 | LED Annunciator / Harness |
| LP | Low Pressure Switch |
| LWT | Leaving Water Temp Sensor |
| MIII | MicroTech III Main Board |
| MPP | Main Power Connector Plug |
| MPR | Main Power Connector Receptacle |
| OVL | Compressor Overload |
| P1 | Tstat Plug |
| PDPG | Primary Drain Pan Ground |
| RV | Reversing Valve Solenoid |
| SOS | Secondary Overflow Sensor |
| SLTS | Suction Line Temp Sensor |
| TS1 | Terminal Strip 1 |
| TS2 | Terminal Strip 2 |
| TSP | Terminal Strip Connector Plug |
| TSR | Terminal Strip Connector Receptacle |
| TR1 | Transformer - 24V |

| Table B | |
|---|---|
| 208V | RED |
| 230V | ORG |

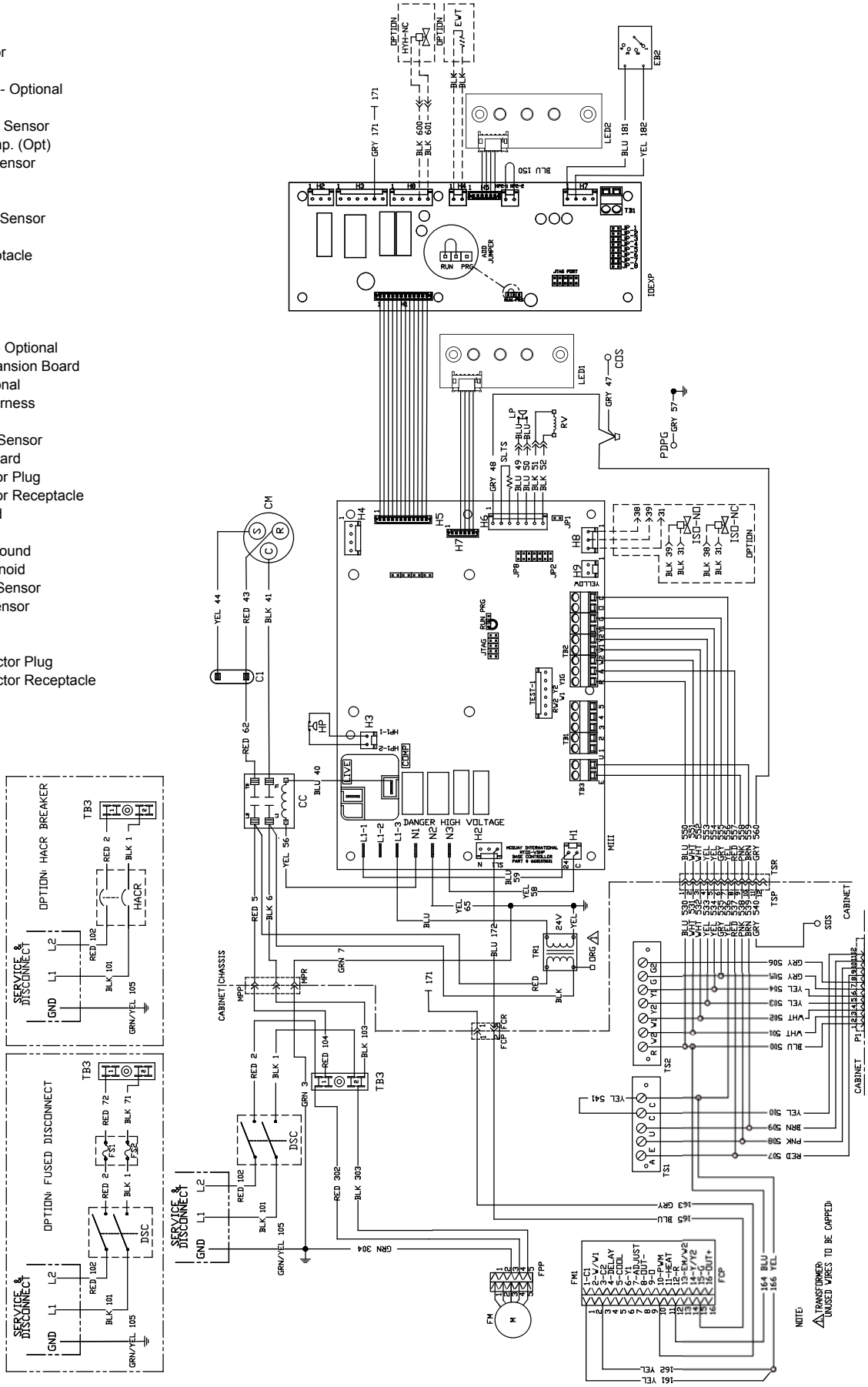


# MicroTech III Unit Controller, EC Motor, Thermostat Control

# 208-230/60/1 Unit Size 021

## Legend

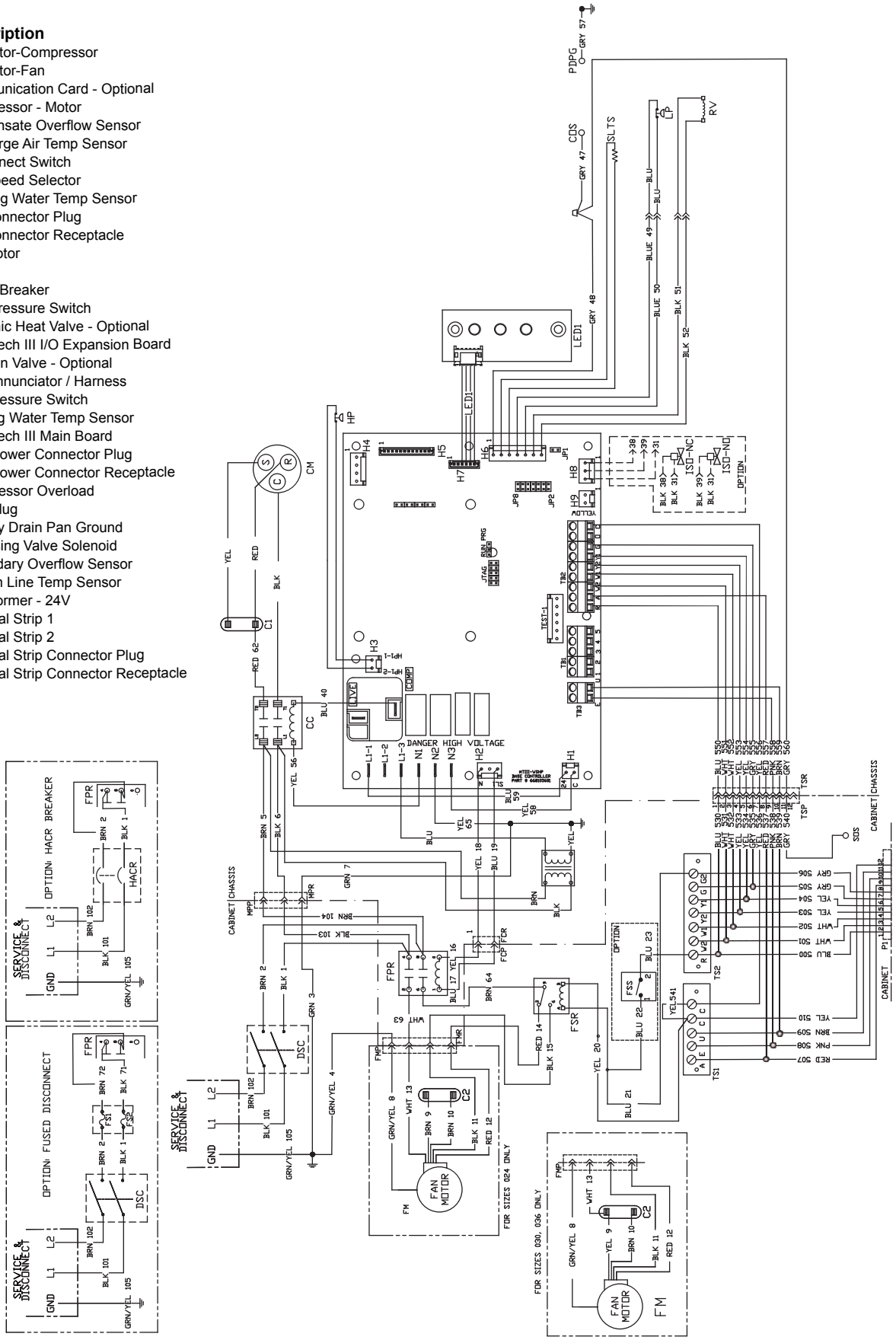
| Item | Description |
|---|---|
| C1 | Capacitor-Compressor |
| C2 | Capacitor-Fan |
| CC | Communication Card - Optional |
| CM | Compressor - Motor |
| COS | Condensate Overflow Sensor |
| CUR | Current Sensor - Comp. (Opt) |
| DAT | Discharge Air Temp Sensor |
| DSC | Disconnect Switch |
| EB2 | Fan Speed Selector |
| EWT | Entering Water Temp Sensor |
| FCP | Fan Connector Plug |
| FCR | Fan Connector Receptacle |
| FM | Fan Motor |
| FS1, 2 | Fuse |
| HACR | HACR Breaker |
| HP | High Pressure Switch |
| HYH | Hydronic Heat Valve - Optional |
| IOEXP | MicroTech III I/O Expansion Board |
| ISO-** | Isolation Valve - Optional |
| LED1, 2 | LED Annunciator / Harness |
| LP | Low Pressure Switch |
| LWT | Leaving Water Temp Sensor |
| MIII | MicroTech III Main Board |
| MPP | Main Power Connector Plug |
| MPR | Main Power Connector Receptacle |
| OVL | Compressor Overload |
| P1 | Tstat Plug |
| PDPG | Primary Drain Pan Ground |
| RV | Reversing Valve Solenoid |
| SOS | Secondary Overflow Sensor |
| SLTS | Suction Line Temp Sensor |
| TS1 | Terminal Strip 1 |
| TS2 | Terminal Strip 2 |
| TSP | Terminal Strip Connector Plug |
| TSR | Terminal Strip Connector Receptacle |
| TR1 | Transformer - 24V |



# MicroTech III Unit Controller, PSC Motor, Thermostat Control 265-277/60/1 Unit Sizes 024-036

## Legend

| Item | Description |
|---|---|
| C1 | Capacitor-Compressor |
| C2 | Capacitor-Fan |
| CC | Communication Card - Optional |
| CM | Compressor - Motor |
| COS | Condensate Overflow Sensor |
| DAT | Discharge Air Temp Sensor |
| DSC | Disconnect Switch |
| EB2 | Fan Speed Selector |
| EWT | Entering Water Temp Sensor |
| FCP | Fan Connector Plug |
| FCR | Fan Connector Receptacle |
| FM | Fan Motor |
| FS1, 2 | Fuse |
| HACR | HACR Breaker |
| HP | High Pressure Switch |
| HYH | Hydronic Heat Valve - Optional |
| IOEXP | MicroTech III I/O Expansion Board |
| ISO-** | Isolation Valve - Optional |
| LED1, 2 | LED Annunciator / Harness |
| LP | Low Pressure Switch |
| LWT | Leaving Water Temp Sensor |
| MIII | MicroTech III Main Board |
| MPP | Main Power Connector Plug |
| MPR | Main Power Connector Receptacle |
| OVL | Compressor Overload |
| P1 | Tstat Plug |
| PDPG | Primary Drain Pan Ground |
| RV | Reversing Valve Solenoid |
| SOS | Secondary Overflow Sensor |
| SLTS | Suction Line Temp Sensor |
| TR1 | Transformer - 24V |
| TS1 | Terminal Strip 1 |
| TS2 | Terminal Strip 2 |
| TSP | Terminal Strip Connector Plug |
| TSR | Terminal Strip Connector Receptacle |

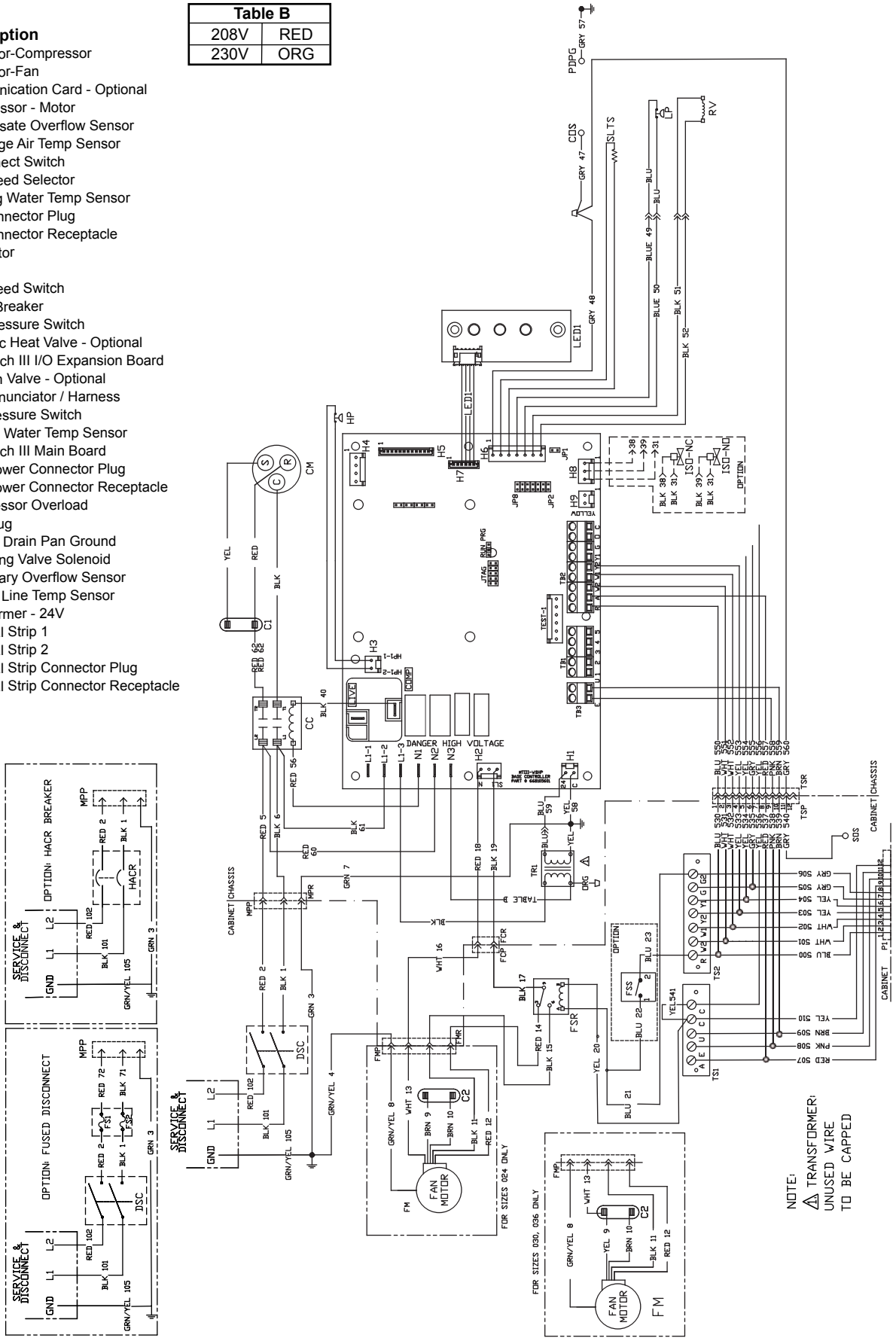


# MicroTech III Unit Controller, PSC Motor, Thermostat Control 208-230/60/1 Unit Sizes 024-036

**Legend**

| Item | Description |
|---|---|
| C1 | Capacitor-Compressor |
| C2 | Capacitor-Fan |
| CC | Communication Card - Optional |
| CM | Compressor - Motor |
| COS | Condensate Overflow Sensor |
| DAT | Discharge Air Temp Sensor |
| DSC | Disconnect Switch |
| EB2 | Fan Speed Selector |
| EWT | Entering Water Temp Sensor |
| FCP | Fan Connector Plug |
| FCR | Fan Connector Receptacle |
| FM | Fan Motor |
| FS1, 2 | Fuse |
| FSS | Fan Speed Switch |
| HACR | HACR Breaker |
| HP | High Pressure Switch |
| HYH | Hydronic Heat Valve - Optional |
| IOEXP | MicroTech III I/O Expansion Board |
| ISO-** | Isolation Valve - Optional |
| LED1, 2 | LED Annunciator / Harness |
| LP | Low Pressure Switch |
| LWT | Leaving Water Temp Sensor |
| MIII | MicroTech III Main Board |
| MPP | Main Power Connector Plug |
| MPR | Main Power Connector Receptacle |
| OVL | Compressor Overload |
| P1 | Tstat Plug |
| PDPG | Primary Drain Pan Ground |
| RV | Reversing Valve Solenoid |
| SOS | Secondary Overflow Sensor |
| SLTS | Suction Line Temp Sensor |
| TR1 | Transformer - 24V |
| TS1 | Terminal Strip 1 |
| TS2 | Terminal Strip 2 |
| TSP | Terminal Strip Connector Plug |
| TSR | Terminal Strip Connector Receptacle |

| Table B | |
|---|---|
| 208V | RED |
| 230V | ORG |



## Information for Initial Start-up

**⚠ CAUTION**

Units must be checked for water leaks upon initial water system start-up. Water leaks may be a result of mishandling or damage during shipping. Failure by the installing contractor to check for leaks upon start-up of the water system could result in property damage.

## Check, Test & Start Procedure

**NOTICE**

Complete the "Water Source Heat Pump Equipment Check, Test and Start Form" on page 62.

1. Open all valves to full open position and turn on power to the conditioner.
2. Set thermostat for “Fan Only” operation by selecting “Off” at the system switch and “On” at the fan switch. If “Auto” fan operation is selected, the fan will cycle with the compressor. Check for proper air delivery.
3. Set thermostat to “Cool.” If the thermostat is an automatic changeover type, simply set the cooling temperature to the coolest position. On manual changeover types additionally select “Cool” at the system switch.
   Again, many conditioners have time delays which protect the compressor(s) against short cycling. After a few minutes of operation, check the discharge grilles for cool air delivery. Measure the temperature difference between entering and leaving water. It should be approximately 1½ times greater than the heating mode temperature difference. For example, if the cooling temperature difference is 15°F (8°C), the heating temperature difference should have been 10°F (5°C).
   Without automatic flow control valves, target a cooling temperature difference of 10°F to 14°F (5°C to 8°C). Adjust the combination shutoff/balancing valve in the return line to a water flow rate which will result in the 10˚F to 14°F (5°C to 8°C) difference.
4. Set thermostat to “Heat.” If the thermostat is the automatic changeover type, set system switch to the “Auto” position and depress the heat setting to the warmest selection. Some conditioners have built-in time delays which prevent the compressor from immediately starting. With most control schemes, the fan will start immediately. After a few minutes of compressor operation, check for warm air delivery at discharge grille. If this is a “cold building” start-up, leave unit running until return air to the unit is at least 65°F (18°C).
   Measure the temperature difference between entering and leaving air and entering and leaving water. With entering water of 60°F to 80°F (16°C to 27°C), leaving water should be 6°F to 12°F (3.3°C to 6.6°C) cooler, and the air temperature rise through the machine should not exceed 35°F (19°C). If the air temperature exceeds 35°F (19°C), then the water flow rate is inadequate.
5. Check the elevation and cleanliness of the condensate line. If the air is too dry for sufficient dehumidification, slowly pour enough water into the condensate pan to ensure proper drainage.
6. If the conditioner does not operate, check the following points:
   a. Is supply voltage to the machine compatible?
   b. Is thermostat type appropriate?
   c. Is thermostat wiring correct?
7. If the conditioner operates but stops after a brief period:
   a. Is there proper airflow? Check for dirty filter, incorrect fan rotation (3-phase fan motors only), or incorrect ductwork.
   b. Is there proper water flow rate within temperature limits? Check water balancing; back flush unit if dirt-clogged.
8. Check for vibrating refrigerant piping, fan wheels, etc.
9. Do not lubricate the fan motor during the first year of operation as it is pre lubricated at the factory.
10. Field supplied relays installed on the input terminals W1, W2, W3, W4, Humidistat, Y1, Y2 and G may introduce electrical noise. Never install relay coils in series with the inputs.

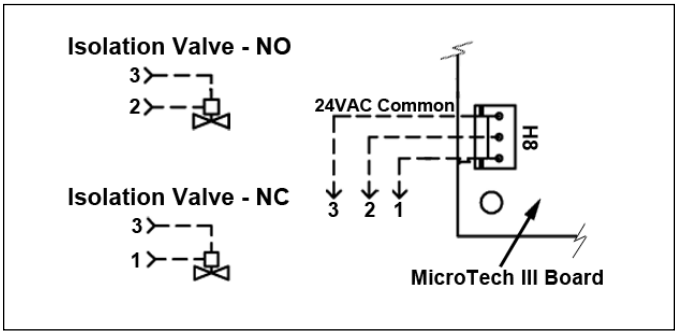
## Motorized Isolation Valve and Relay

The motorized valve kit may be ordered as a factory-installed options.

Wired as shown in Figure 52, the motorized valve will open on a call for compressor operation. Valves for unit sizes 009 to 018 are 1/2".

Using a Normally Closed (N/C), power open valve, wire as illustrated in Figure 52.

***Figure 52: Normally closed, power open motorized valve & relay wiring detail***




***Note:*** *Connectors on valve must be cut off and stripped back and the wires twisted to make connections to the IV/PR Terminals*

## The in and outs of R-410A

R-410A is a non-ozone depleting blend of two refrigerants - HFC-125 and HFC-32 in a fifty percent mixture. R-410A exhibits higher operating pressure and refrigeration capacity than R-22. R-410A is intended for use in new air conditioning applications that have traditionally been used HCFC-22 (R-22). Due to higher capacity and pressure of R-410A, it must not be used in existing R-22 systems.

Although R-410A is non-flammable at ambient temperature and atmospheric pressure, it can become combustible under pressure when mixed with air.

***Note:*** *R-410A should not be mixed with air under pressure for leak testing. Pressure mixtures of dry nitrogen and R-410A can be used for leak testing.*

## Lubrication

R-410A should be used only with polyester (POE) oil. The HFC refrigerant components in R-410A will not be compatible with mineral oil or alkylbenzene lubricants. R-410A systems will be charged with the OEM recommended lubricant, ready for use with R-410A.

## Charging

Due to the zeotropic nature of R-410A, it should be charged as a liquid. In situations where vapor is normally charged into a system, a valve should be installed in the charging line to flash the liquid to vapor while charging.

Make certain that the recycle or recovery equipment used is designed for R-410A. The pressure of R-410A refrigerant is approximately 60 percent greater than that of R-22. Pressure gauges require a range up to 800 PSIG high side and 250 PSIG low side. Recovery cylinders require a 400 PSIG rating – do not put R-410A in a 300 PSIG rated cylinder.

**⚠ WARNING**

Recycle/recovery equipment must be designated for R-410A. R-410A pressure is greater than R-22. Improper equipment can cause severe injury or death.

***Note:*** *Because a water source heat pump operates under a wide range of water and air temperatures, the values printed below are to be taken as suggested pressure and temperatures. All Daikin water source heat pumps are designed for commercial use. The units are designed for the cooling mode of operation and fail safe to cooling. The reversing valve is energized for the heating mode of operation.*

| *Superheat* | *Head Pressure* | *Water Delta T* |
|---|---|---|
| 8 to 14 degrees | 335-355 PSIG | 10° to 14° |

***Note:*** *All information above is based on ISO standard 13256-1 and tested at these conditions.*

# General Maintenance

- Normal maintenance on all units is generally limited to filter changes. Units are provided with permanently lubricated motors and require no oiling even though oil caps may be provided.
- Filter changes are required at regular intervals. The time period between changes will depend upon the project requirements. Some applications such as motels produce a lot of lint from carpeting and linen changes, and will require more frequent filter changes. Check filters at 60-day intervals for the first year until experience is acquired. If light cannot be seen through the filter when held up to sunlight or a bright light, it should be changed. A more critical standard may be desirable.
- The condensate drain pan should be checked annually and cleaned and flushed as required.
- Record performance measurements of volts, amps, and water temperature differences (both heating and cooling). A comparison of logged data with start-up and other annual data is useful as an indicator of general equipment condition.
- Periodic lockouts almost always are caused by air or water problems. The lockout (shutdown) of the unit is a normal protective result. Check for dirt in the water system, water flow rates, water temperatures, airflow rates (may be a dirty filter), and air temperatures. If the lockout occurs in the morning following a return from night setback, entering air below machine limits may be the cause.

***Note:*** *Because a water source heat pump operates under a wide range of water and air temperatures, the values printed below are to be taken as suggested pressure and temperatures.) All Daikin water source heat pumps are designed for commercial use. The units are designed for the cooling mode of operation and fail safe to cooling. The reversing valve is energized for the heating mode of operation.*

| Superheat | Head Pressure | Water Delta T |
|---|---|---|
| 8 to 14 degrees | 335-355 PSIG | 10° to 14° |

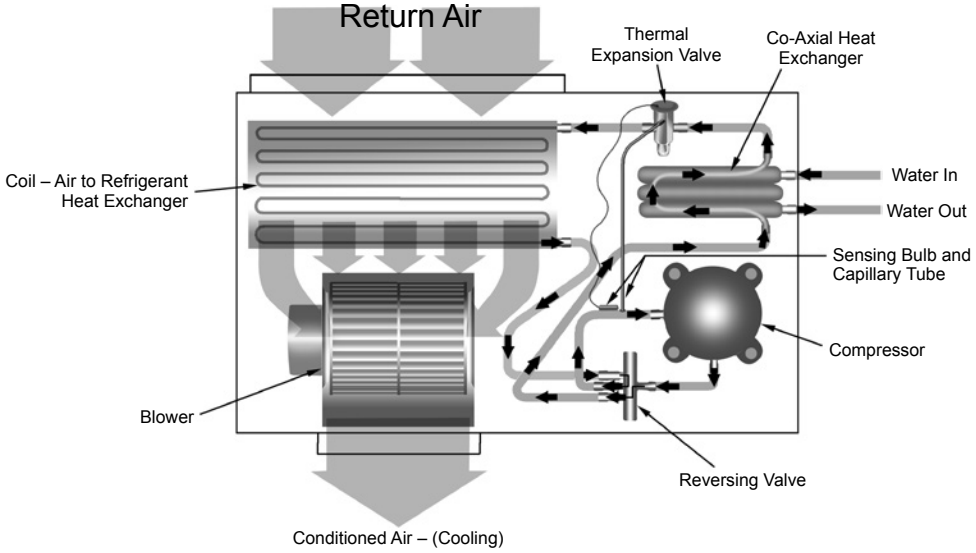
***Note:*** *All information above is based on ISO standard 13256-1 and tested at these conditions.*

*Table 26: Troubleshooting refrigeration circuit*

| Symptom | Head Pressure | Suction Pressure | Compressor Amp Draw | Super Heat | Subcooling | Air Temp Differential | Water (Loops) Temp Differential | Safety Lock Out |
|---|---|---|---|---|---|---|---|---|
| **Charge** | Low | Low | Low | High | Low | Low | Low | Low Pressure |
| **Undercharge System (Possible Leak)** | | | | | | | | |
| **Overcharge System** | High | High | High | Normal | High | Normal / Low | Normal | High Pressure |
| **Low Air Flow Heating** | High | High | High | High / Normal | Low | High | Low | High Pressure |
| **Low Air Flow Cooling** | Low | Low | Low | Low / Normal | High | High | Low | Low Temp |
| **Low Water Flow Heating** | Low / Normal | Low / Normal | Low | Low | High | Low | High | Low Temp |
| **Low Water Flow Cooling** | High | High | High | High | Low | Low | High | High Pressure |
| **High Air Flow Heating** | Low | Low | Low | Low | High | Low | Low | Low Temp |
| **High Air Flow Cooling** | Low | High | Normal | High | Low | Low | Normal | High Pressure |
| **High Water Flow Heating** | Normal | Low | Normal | High | Normal | Normal | Low | High Pressure |
| **High Water Flow Cooling** | Low | Low | Low | Low | High | Normal | Low | Low Temp |
| **TXV Restricted** | High | Low | Normal / Low | High | High | Low | Low | |

## Typical Refrigeration Cycles

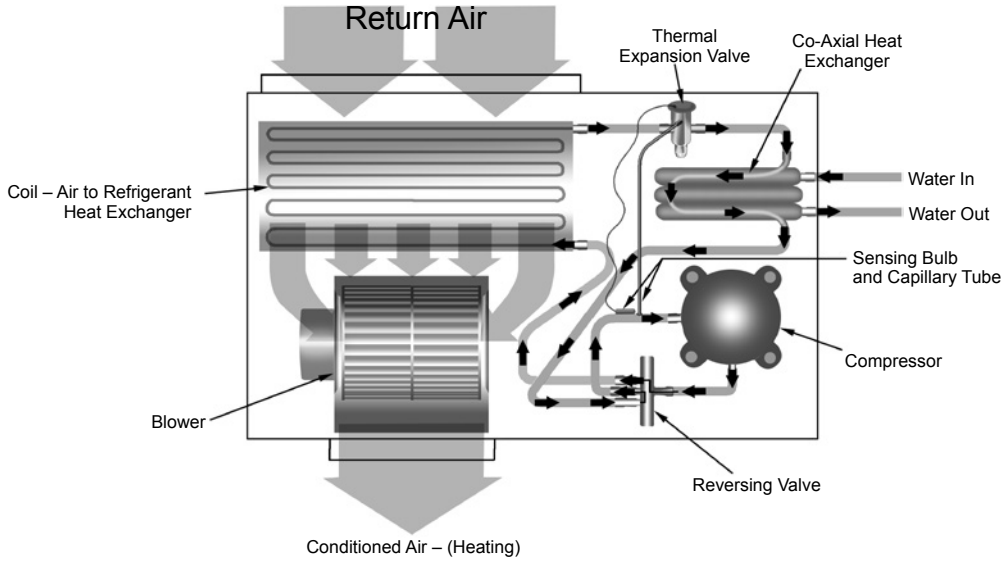
***Figure 53: Cooling mode – (single circuit only shown)***




### Cooling Refrigeration Cycle

When the wall thermostat is calling for COOLING, the reversing valve directs the flow of the refrigerant, a hot gas, leaving the compressor to the water-to-refrigerant heat exchanger. Here the heat is removed by the water and the hot gas condenses to become a liquid. The liquid then flows through a thermal expansion metering system to the air-to-refrigerant heat exchanger coil. The liquid then evaporates becoming a gas, at the same time absorbing heat and cooling the air passing over the surfaces of the coil. The refrigerant then flows as a low pressure gas through the reversing valve and back to the suction side of the compressor to complete the cycle.

***Figure 54: Heating mode – (single circuit only shown)***




### Heating Refrigeration Cycle

When the wall thermostat is calling for HEATING, the reversing valve directs the flow of the refrigerant, a hot gas, leaving the compressor to the air-to-refrigerant heat exchanger coil. Here the heat is removed by the air passing over the surfaces of the coil and the hot gas condenses to become a liquid. The liquid then flows through a capillary thermal expansion metering system to the water-to-refrigerant heat exchanger. The liquid then evaporates becoming a gas, at the same time absorbing heat and cooling the water. The refrigerant then flows as a low pressure gas through the reversing valve and back to the suction side of the compressor to complete the cycle.

# Water Source Heat Pump Equipment Check, Test and Start Form

This form must be completed and submitted within ten (10) days of start-up to comply with the terms of the Daikin warranty. Forms should be returned to Daikin Warranty Department.

**Installation Data**

Job Name _____ Check, Test & Start Date _____

City or Town _____ State _____ Zip _____

Who is Performing CTS _____

General Contractor _____

**Equipment Type (Check all that apply)**

☐ Closed Loop ☐ Open Loop

☐ Geothermal ☐ Other (specify)_____

**Essential Items Check of System – *Note:*** *"No" answers below require notice to installer by memorandum (attached copy.)*

**Essential Items Check**

A. Voltage Check_____ Volts Loop Temp._____ °F Heating Set For _____ °F Cooling System Water P.H. Levels _____

| B. Yes | No | Condition | Comments |
|---|---|---|---|
| ☐ | ☐ | Loop Water Flushed Clean | |
| ☐ | ☐ | Closed Type Cooling Tower | |
| ☐ | ☐ | Water Flow Rate to Heat Pump Balanced | |
| ☐ | ☐ | Standby Pump Installed | |
| ☐ | ☐ | System Controls Functioning | |
| ☐ | ☐ | Outdoor Portion of Water System Freeze Protected | |
| ☐ | ☐ | Loop System Free of Air | |
| ☐ | ☐ | Filters Clean | |
| ☐ | ☐ | Condensate Traps Installed | |

***Note:*** "No" answers below require notice to installer by memorandum (attached copy.)

| | | | |
|---|---|---|---|
| ☐ | ☐ | Outdoor Air to Heat Pumps: | |
| ☐ | ☐ | Other Conditions Found: | |

Please include any suggestions or comments for Daikin Applied: _____

_____

_____

_____

**Above System is in Proper Working Order**

***Note:*** *This form must be filled out and sent to the warranty administrator before any service money can be released.*

_____
Date

_____
Signature for Sales Representative

_____
Signature for Customer

**For Internal Use**

**Release:**

SM _____

CTS _____

T _____

_____
Service Manager Approval

_____
Date

Form WS-CTS-00.01 (Rev. 4/14)

## Unit Check / Equipment Data

### Installation Data

**Job Name** _____ Check Test Date: _____

City _____ State _____ Zip _____

**Daikin Model #** _____

**Daikin Serial #** _____ Job site Unit ID # (HP #) _____

General Contractor: _____ Mechanical Contractor: _____

**Technician Performing Start-Up:** Name _____ Employer: _____

**Complete equipment data from measurements taken at the locations indicated on the drawing below.**

### Equipment Data

**Flow Rate** **EWP - LWP = ΔP**

① EWP - PSI In _____ minus ② LWP - PSI Out _____ equals ΔP _____

The first step in finding GPM is to subtract leaving water pressure from entering water pressure. The difference between the two is referred to as ΔP. ΔP can be converted to GPM by looking in the equipment specification catalog.
**Caution ΔP ≠ GPM**

**Note: A conversion table must be used to find GPM from (Delta) ΔP measurements.**

**Loop Fluid Temperature** Rise / Drop through Coaxial Heat Exchanger **EWT - LWT = ΔT**

③ EWT - °F Out _____ minus ④ LWT - °F Out _____ equals Fluid ΔT _____

ΔT is the rise or drop in the fluid temperature as it passes through the Coaxial.

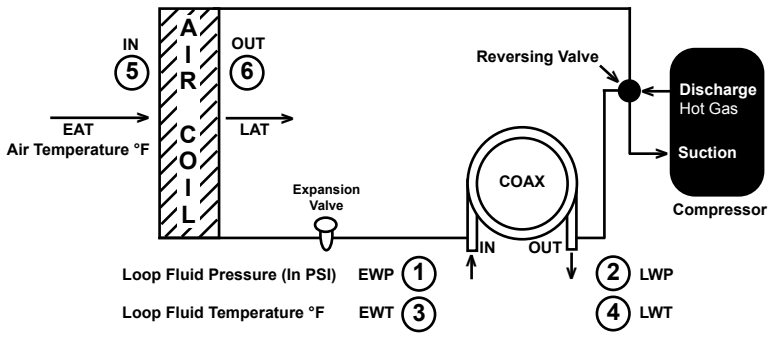
**Air Temperature** Rise / Drop through the air coil **ΔT x CFM x 1.08 = BTUH Sensible**

⑤ EAT - °F In _____ minus ⑥ LAT - °F Out _____ equals Air ΔT _____

**Note: Perform Check, Test and Start-Up in the Cooling Mode Only.**

EWT - Entering Water Temperature
LWT - Leaving Water Temperature
EWP - Entering Water Pressure
LWP - Leaving Water Pressure
EAT - Entering Air Temperature
LAT - Leaving Air Temperature
Δ- Delta (Differential)
CFM - Cubic Feet/Minute
BTUH - British Thermal Units/Hour

**Check, Test & Start**




**Form No.** _____

### Commercial Check, Test and Start Worksheet

(Complete all equipment measurements indicated for each unit per installation on previous page)

| | Model | Serial # | H.P. # | EWT ③ | LWT ④ | EWP ① | LWP ② | EAT ⑤ | LAT ⑥ | Volts | Amps Cool-ing | Check Air Filter and Coil | Comments (more comments on next sheet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | | | | | | | | | | | | | |
| 2. | | | | | | | | | | | | | |
| 3. | | | | | | | | | | | | | |
| 4. | | | | | | | | | | | | | |
| 5. | | | | | | | | | | | | | |
| 6. | | | | | | | | | | | | | |
| 7. | | | | | | | | | | | | | |
| 8. | | | | | | | | | | | | | |
| 9. | | | | | | | | | | | | | |
| 10. | | | | | | | | | | | | | |
| 11. | | | | | | | | | | | | | |
| 12. | | | | | | | | | | | | | |
| 13. | | | | | | | | | | | | | |
| 14. | | | | | | | | | | | | | |
| 15. | | | | | | | | | | | | | |
| 16. | | | | | | | | | | | | | |
| 17. | | | | | | | | | | | | | |
| 18. | | | | | | | | | | | | | |
| 19. | | | | | | | | | | | | | |
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| 24. | | | | | | | | | | | | | |
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| 34. | | | | | | | | | | | | | |
| 35. | | | | | | | | | | | | | |
| 36. | | | | | | | | | | | | | |
| 37. | | | | | | | | | | | | | |
| 38. | | | | | | | | | | | | | |
| 39. | | | | | | | | | | | | | |
| 40. | | | | | | | | | | | | | |
| 41. | | | | | | | | | | | | | |
| 42. | | | | | | | | | | | | | |

**Part No._____**

**Notes / Comments**

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### *Daikin Applied Training and Development*

Now that you have made an investment in modern, efficient Daikin equipment, its care should be a high priority. For training information on all Daikin HVAC products, please visit us at www.DaikinApplied.com and click on Training, or call 540-248-9646 and ask for the Training Department.

### *Warranty*

All Daikin equipment is sold pursuant to its standard terms and conditions of sale, including Limited Product Warranty. Consult your local Daikin Applied representative for warranty details. Refer to Form 933-430285Y. To find your local Daikin Applied representative, go to www.DaikinApplied.com.

### *Aftermarket Services*

To find your local parts office, visit www.DaikinApplied.com or call 800-37PARTS (800-377-2787).
To find your local service office, visit www.DaikinApplied.com or call 800-432-1342.

This document contains the most current product information as of this printing. For the most up-to-date product information, please go to www.DaikinApplied.com.

Products manufactured in an ISO Certified Facility.