Installer's Guide

Vertical Upflow Air Handlers with Electric Heat

2TFB3F18, 30, 36B1D05, 08, 10A **2TFB3F24B1D05, 08, 10B**
4TFB3F18, 24, 30, 36A1D05, 08, 10A **2/4TFE3F25B1D05, 08, 10A**

⚠WARNING: HAZARDOUS VOLTAGE- DISCONNECT POWER and DISCHARGE CAPACITORS BEFORE SERVICING

ALL phases of this installation must comply with NATIONAL, STATE AND LOCAL CODES

IMPORTANT—This Document is **customer property** and is to remain with this unit. Please return to service information pack upon completion of work.

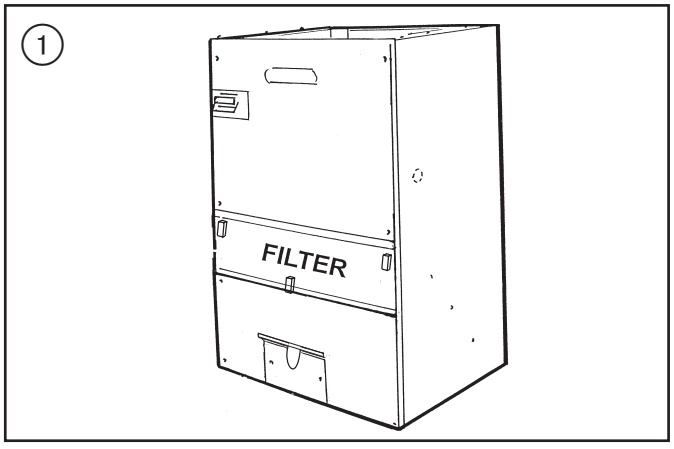
GENERAL INFORMATION

⚠ WARNING

THIS INFORMATION IS FOR USE BY INDIVIDUALS HAVING ADEQUATE BACKGROUNDS OF ELECTRICAL AND MECHANICAL EXPERIENCE. ANY ATTEMPT TO REPAIR A CENTRAL AIR CONDITIONING PRODUCT MAY RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

⚠ CAUTION

TO PREVENT SHORTENING ITS SERVICE LIFE, THE AIR HANDLER SHOULD NOT BE USED DURING THE FINISHING PHASES OF CONSTRUCTION. Condensate in the presence of chlorides and fluorides from paint, varnish stains, adhesives, cleaning compounds, and cement create a corrosive condition which may cause rapid deterioration of the evaporator coil.



These Air Handlers are shipped from the factory for vertical upflow, bottom return and convertible to vertical upflow, front return.

CONTENTS

NOTE: Version française sur la page 11.

INSPECTION

Check carefully for any shipping damage. This must be reported to and claims made against the transportation company immediately. Check to be sure all major components are in the unit. Any missing parts should be reported to your supplier at once, and replaced with authorized parts only.

INSTALLATION LIMITATIONS & RECOMMENDATIONS

Closet, Alcove, or Utility Room Installation

These air handlers are suitable for installation in a closet, alcove or utility room with free, non-ducted air return, using the area space as a return air plenum with ducted supply air, if the minimum clearances to combustible materials and service accesses are observed. (See outline drawing for specifics).

This equipment has been evaluated and meets the Code of Federal Regulations, Chapter XX, Part 3280 or the equivalent. "SUITABLE FOR MOBILE HOME USE."

This area may also be used for other purposes, including an electric hot water heater - **but in no case shall a fossil fuel device be installed and/or operated in the same closet, alcove or utility room.**

NOTE:

Condensation may occur on the surface of the air handler when installed in an unconditioned location. When units are installed in unconditioned spaces, verify that all electrical and refrigerant line penetrations on the air handler are sealed completely.

The general location of the air handler is normally selected by the architect, contractor and/or home owner for the most effective application and satisfaction. For proper installation the following items must be considered:

1. If adequate power is available and correct according to nameplate specifications.
2. Pursuant to Florida Building Code 13-610.2.A.2.1, this unit meets the criteria for a factory sealed air handler.
3. Insulate all ducts, particularly if they are located outside of the conditioned space.
4. It is recommended that the outline drawing be studied and dimensions properly noted and checked against selected installation site. By noting in advance which knockouts are to be used, proper clearance allowances can be made for installation and possible future service.
5. If the outdoor unit is to be installed later, or by others, then installation of the air handler must be made to allow access for refrigerant lines, or attach refrigerant lines to air handler when installing. Make sure there are provisions for installing condensate drain lines.
6. Minimum air flow settings, unit and duct clearances to combustibles must be maintained as stated on the air handler rating nameplate.
7. The Refrigerant lines must be sealed and Electrical inlets need to be sealed at both the low and the high voltage.
8. Route refrigerant lines away from air handler so they do not interfere with access panels and filters.
9. These units are not approved for outdoor installation.
10. These units are approved for draw-through application only.

INSTALLATION TIP!!
Removing the blower assembly before setting the air handler in place reduces lifting weight and provides increased access to refrigerant braze connections.

A. UNIT INSTALLATION

VERTICAL UPFLOW, BOTTOM RETURN

a. Unit is shipped from the factory in this position and internal changes are not required.

b. Position unit on suitable foundation. A frame strong enough to support the total weight must be provided.

IMPORTANT:

Unit must be installed on a level foundation. Failure to level unit may cause the condensate drain to malfunction.

c. Unit should be isolated from foundation using Korfund™ (or equivalent) isolating material.

d. **Openings where field wiring enters the cabinet must be completely sealed.** The Refrigerant lines must be sealed and Electrical inlets need to be sealed at both the low and the high voltage.Location of power entry is shown on the Outline Drawing.

VERTICAL UPFLOW, FRONT RETURN

Conversion to Upflow Front Return from "as shipped", requires the installer to:

a. Remove and discard the front filter access panel.

b. Detach and remove the lower front panel by removing 4 screws (See Figure 2).

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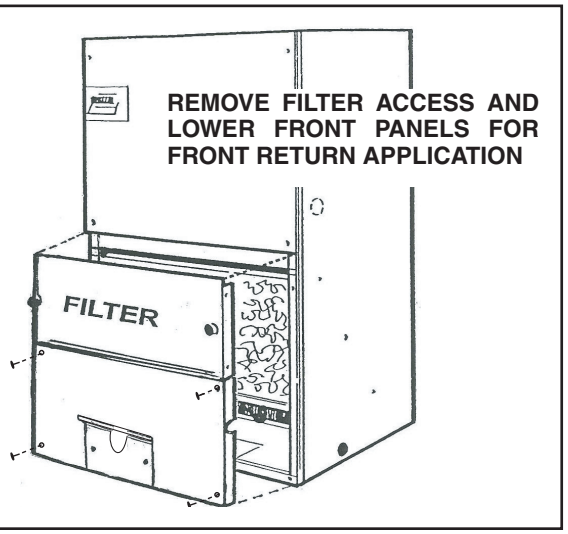
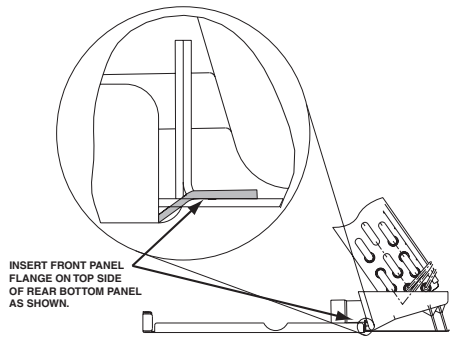
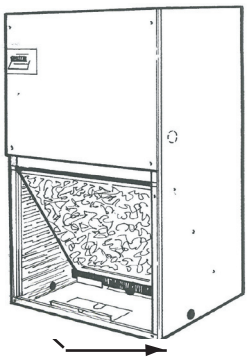


c. Reposition the lower front panel to the bottom of the air handler cabinet (See assembly detail A , Figure 3) and re-install 2 of the screws removed earlier in step (b.). See Figure 4.

d. **Openings where field wiring enters the cabinet must be completely sealed.** The Referigerant lines must be sealed and Electrical inlets need to be sealed at both the low and the high voltage. Location of power entry is shown on the Outline Drawing.



Bottom Panel assembly
Detail A



REPLACE (2) SCREWS FOR CONVERSION TO FRONT RETURN

B. DUCT CONNECTIONS

The supply air duct should be connected to the unit with flame retardant duct connectors. After duct is secured, seal around discharge to prevent air leakage.

If a return duct is connected to the Air Handler, it must be the same dimensions as the return opening shown in the outline drawings.

C. REFRIGERANT PIPING

IMPORTANT:
Refrigerant piping must be routed to maintain service access to blower compartment and provide easy removal of filter access panel and filter.

1. Refrigerant connections are made inside the cabinet.

NOTE:
TXV bulb <u>MUST</u> be protected (wrap a wet rag around the suction line between the TXV bulb and the braze joint) or removed, while brazing the tubing. Overheating of the sensing bulb will affect the functional characteristics and performance of the air handler.

2. Installation of refrigerant lines is covered in the installation instructions packaged with the outdoor unit. Evacuation, leak testing and brazing procedures are included in those instructions. Read those instructions before starting installation of refrigerant lines.

D. BRAZING TO EVAPORATOR SECTION

IMPORTANT:
Do NOT unseal refrigerant tubing until ready to cut and fit refrigerant lines.

1. Remove the sealing caps from indoor coil field connections.
2. Field supplied tubing should be cut squared-off, ensuring the tube is still round and free of burrs at the connecting end. Clean the tubing to prevent contaminants from entering the system.
3. Run refrigerant tubing into the stub sockets of indoor unit coil. **Refrigerant line openings must be completely sealed.**
4. Braze and evacuate according to indoor and outdoor installation instructions.

NOTE:
TXV equipped is Non-Bleed, and may require a start kit on the outdoor unit.

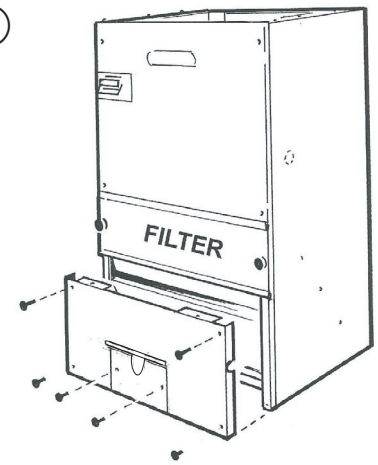
NOTE:
Torque specification for TXV equals 1/6 turn past finger tight.

PAINTED AREAS OF UNIT MUST BE SHIELDED DURING BRAZING.

E. CONDENSATE DRAIN PIPING

NOTE:
Make certain that the unit has been installed in a level position to insure proper draining.

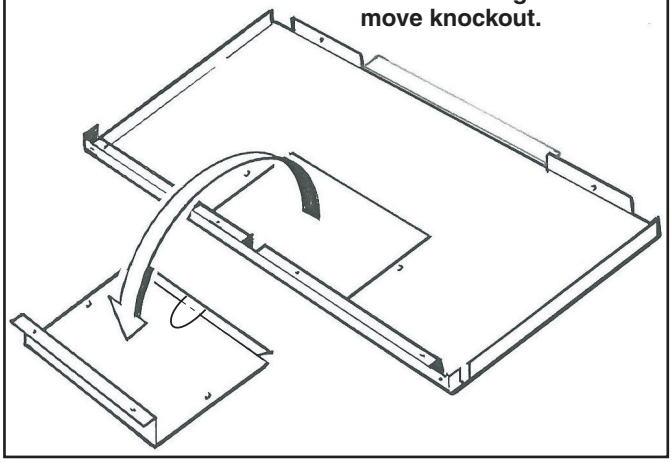
The air handler cabinet has provisions to allow the primary drain to exit the cabinet through the bottom, front, left or right side (See Outline drawing). If the primary drain is to exit the front of the cabinet (bottom return applications only), the primary drain access cover must be reversed so the drain line knockout is facing towards the bottom of the cabinet (See Figure 5, 6, 7 & 8).



Step 1.
Remove the lower front panel.

6

Step 2.
Remove the Primary drain access cover and rotate 180 degrees. Remove knockout.



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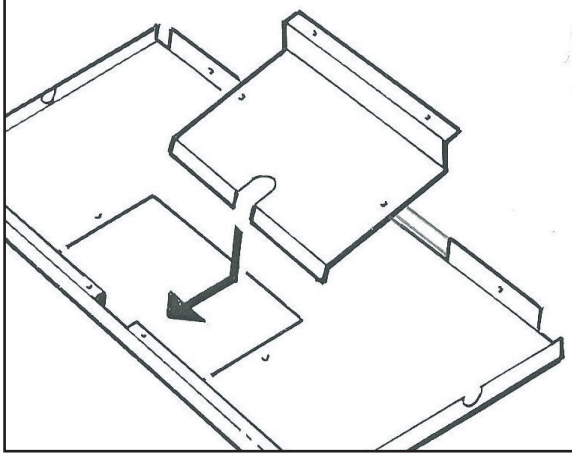
Step 3.
Re-install the Primary drain access cover as shown.



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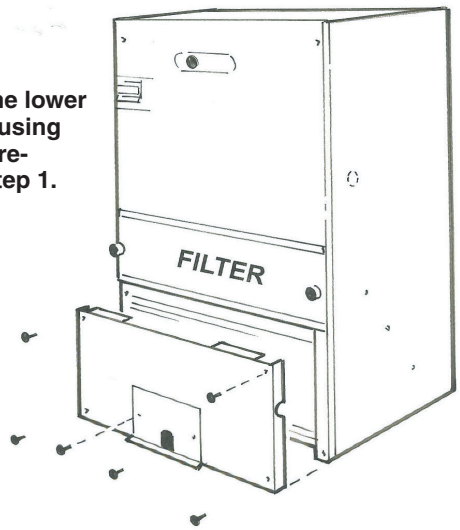
Step 4.
Re-install the lower front panel using the screws removed in Step 1.



The condensate drain line connections are 3/4" female PVC slip fittings. The primary drain (lower) line must be trapped with provision for drainage to prevent winter freeze-up. (See Figure 9 & 10).

The use of field fabricated or manufactured traps as shown in Figures 9 & 10 is acceptable. The manufactured traps shown in Figure 9 allow for a float switch option to be added.

Refer to the manufacturers data and instructions for details.

1. The trap must be located within 4 feet of the air handler drain outlet connection.
2. It is recommended that a clean-out tee or cross be installed in the primary drain line for future maintenance (See Figure 9 & 10).
3. Do not use reducing fittings in the condensate drain lines.
4. Slope the drain lines downward a minimum of 1/4" per foot.
5. Insulate the primary drain to prevent sweating.
6. **Provide means for drainage to prevent winter freeze-up of condensate line**.
7. Do not connect the drain line to a closed drain system.

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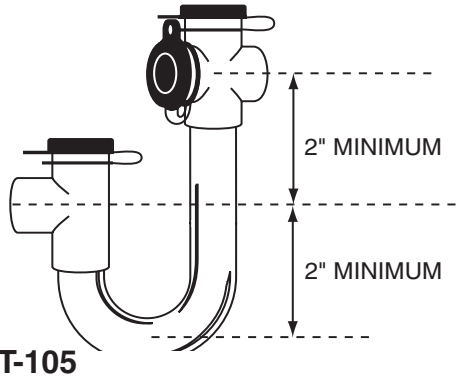
Manufactured traps



EZT-105

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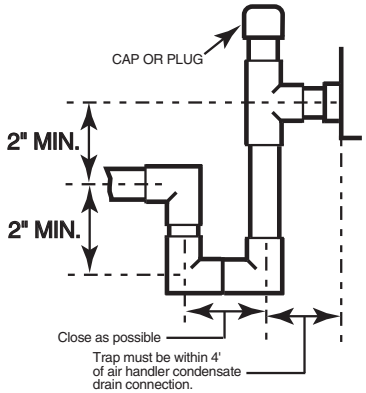
Field fabricated trap



NOTE:
Support the condensate piping and traps outside the unit to prevent strain on the drain coupling.

NOTE:
DO NOT use a torch or flame near the plastic drain pan coupling.

F. ELECTRICAL — POWER WIRING

⚠ WARNING

HAZARDOUS VOLTAGE!
DISCONNECT ALL ELECTRIC PPOWER INCLUDING REMOTE DISCONNECTS AND FOLLOW LOCK OUT AND TAG PROCEDURES BEFORE SERVICING. INSURE THAT ALL MOTOR CAPACITORS HAVE DISCHARGED STORED VOLTAGE. Failure to do the above could result in death or serious injury.

IMPORTANT:
Conduit must attach directly to service disconnect box.

1. These Air Handlers are shipped from the factory wired for 230 volts. The units may be wired for 208 volts. Follow instructions on unit wiring diagram located on blower housing and in the Service Facts document included with the unit.
2. The selection of wire and fuse sizes should be made according to the Minimum Branch Circuit Ampacity and the Maximum Overcurrent Device listed on the unit nameplate.
3. Wiring must conform to National and Local codes.
4. Ground unit per Local codes with good safety procedure. Electrical connections are made in the disconnect box located above the blower housing.

NOTE:
Seal the electrical entry hole air tight after making connections.

G. CONTROL WIRING

1. The low voltage control wiring opening is located on the top of the cabinet on the right side for routing and connecting control wiring between indoor unit, outdoor unit and thermostat.

   The use of color-coded low-voltage 18 gauge wire is recommended.

2. A low voltage terminal board is located on the right side of the blower on ECM models.

NOTE:
The low voltage control wire entry hole must be sealed air tight after making connections.

3. Field wiring diagrams are provided which show the low voltage wiring hookup for a single speed cooling only system with single stage heat and a single speed heat pump system with single stage heat.

VARIABLE SPEED BLOWER SETUP FOR 4TFE3F25 MODEL ONLY

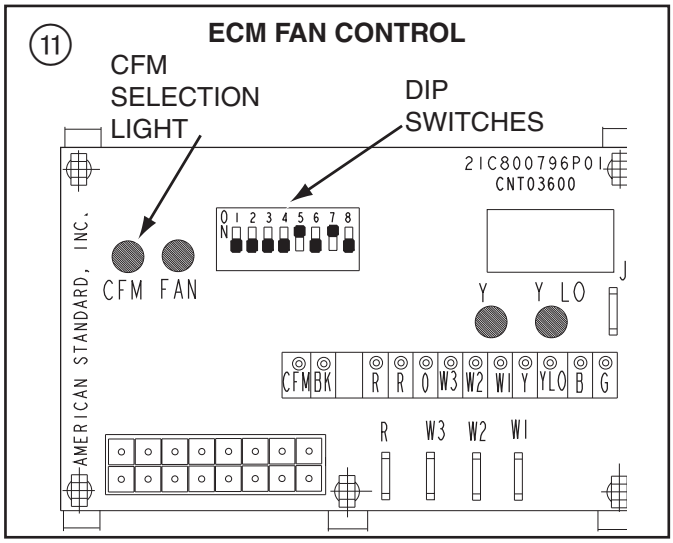
H. AIRFLOW ADJUSTMENT

Blower speed changes are made on the ECM Fan Control mounted on the control box.

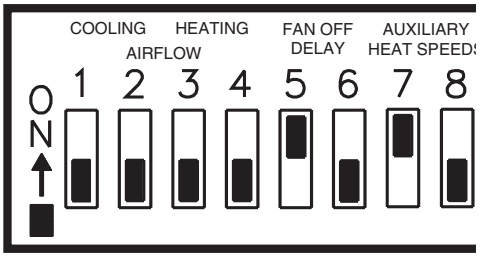
The ECM Fan Control controls the variable speed motor.

There is a bank of 8 dip switches (See Figure 11), located on the upper part of the board. The dip switches work in pairs to match the airflow for the outdoor unit size (tons), cooling airflow adjustment, Fan off-delay options, and heating airflow adjustment. The switches appear as shown in Figure 12.

(11) ECM FAN CONTROL



(12)



DIP SWITCHES (AS SHIPPED)

If the airflow needs to be increased or decreased for cooling or heating speeds, see the Airflow Label on the air handler or the Blower Performance Table in the Service Facts.

Information on changing the speed of the blower motor for your specific outdoor model size is in the Blower Performance Table.

If the optional humidistat is used, remove R-BK jumper from the terminal board and install the humidistat between R and BK. (Jumper R to O for cooling-only/ non-heat pump systems with a humidistat.)

INDOOR BLOWER TIMING

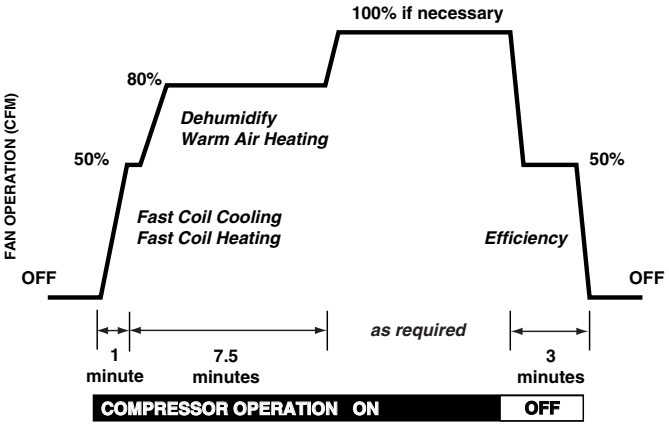
The ECM Fan Control controls the variable speed indoor blower. The FAN-OFF period is set on the ECM Fan Control board by dip switches #5 and #6. The blower off-delay settings are as follows in Figure 13.

(13) **COOLING OFF - DELAY OPTIONS**

SWITCH SETTINGS		SELECTION	NOMINAL AIRFLOW
5 - OFF	6 - OFF	NONE	SAME
5 - ON	6 - OFF	1.5 MINUTES	100% *
5 - OFF	6 - ON	3 MINUTES	50%
5 - ON	6 - ON	ENHANCED**	50 - 100%

* - This setting is equivalent to the BAY24X045 relay benefit

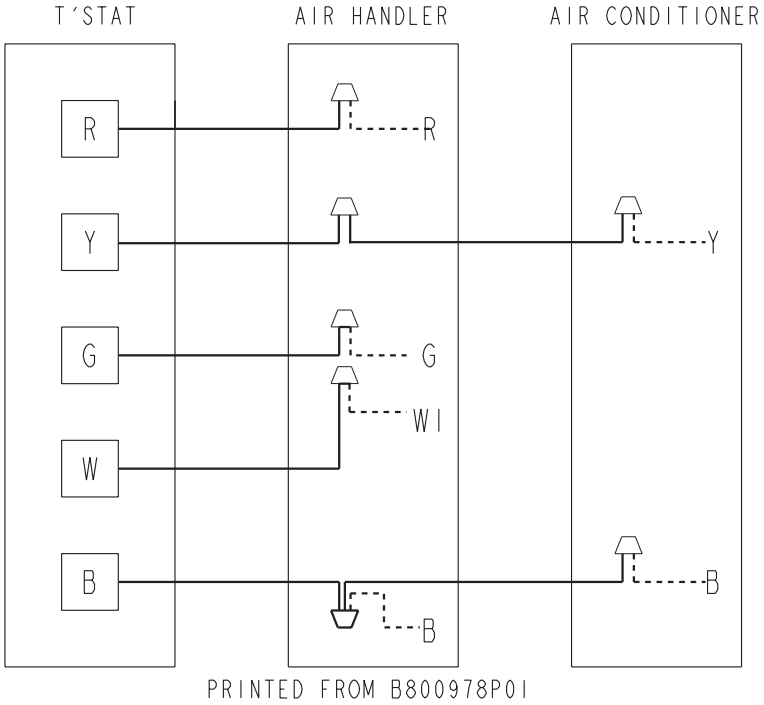
** - This ENHANCED MODE selection provides a ramping up and ramping down of the blower speed to provide improved comfort, quietness, and potential energy savings. The graph shows the ramping process.



I. CHECKOUT PROCEDURE

1. Check the Air Handler operation and installation in accordance with the "Checkout Procedure" in this instruction on page 10.
2. "Operational Procedure" for the system installation, found with the outdoor unit, will be compatible with this Air Handler.

2/4TFB AIR HANDLER WITH SINGLE STAGE COOLING, 1 STAGE HEAT

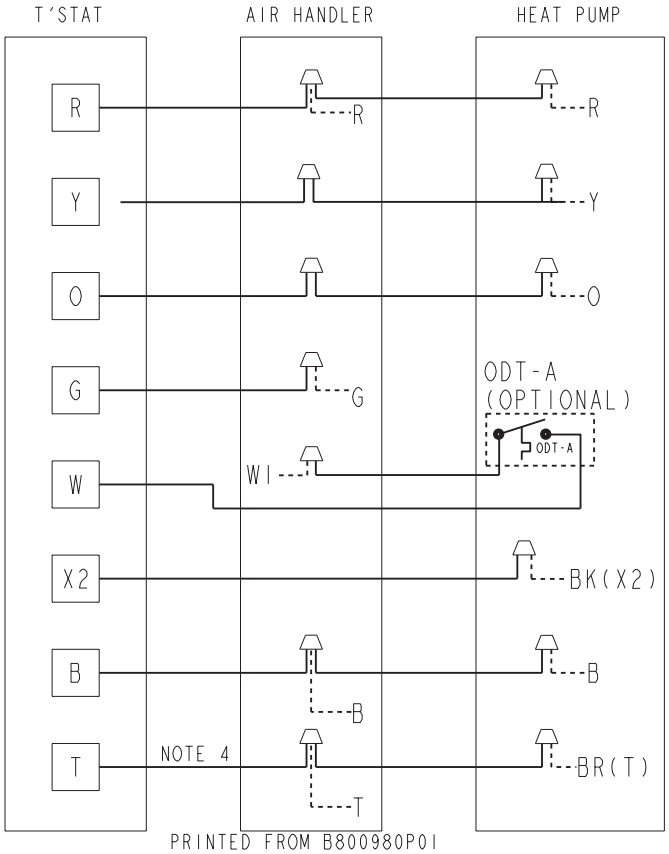


1. BE SURE POWER SUPPLY AGREES WITH EQUIPMENT NAMEPLATE.
2. POWER WIRING AND GROUNDING OF EQUIPMENT MUST COMPLY WITH LOCAL CODES.
3. LOW VOLTAGE WIRING TO BE NO. 18 AWG MINIMUM CONDUCTOR.

24V INTER-COMPONENT WIRING

(FACTORY) (WIRING) ---------- (FIELD) (WIRING) _____

2/4TFB AIR HANDLER WITH SINGLE SPEED HEAT PUMP



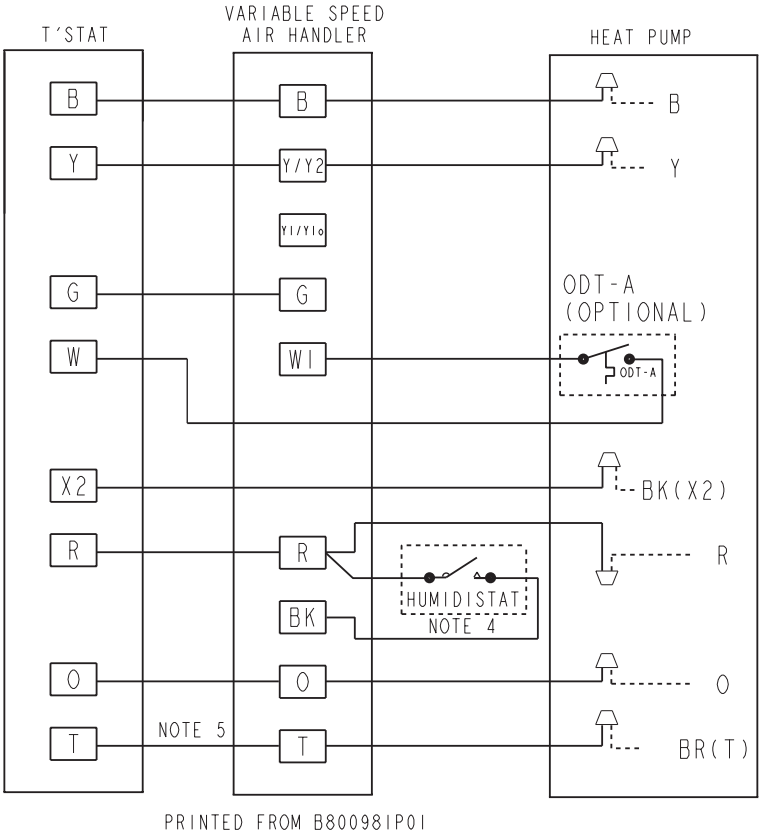
NOTES:

1. BE SURE POWER SUPPLY AGREES WITH EQUIPMENT NAMEPLATE.
2. POWER WIRING AND GROUNDING OF EQUIPMENT MUST COMPLY WITH LOCAL CODES.
3. LOW VOLTAGE WIRING TO BE NO. 18 AWG MINIMUM CONDUCTOR.
4. N/A TO PROGRAMMABLE THERMOSTAT.

24V INTER-COMPONENT WIRING

(FACTORY) (WIRING) ---------- (FIELD) (WIRING) _____

4TFE VARIABLE SPEED AIR HANDLER WITH SINGLE SPEED HEAT PUMP



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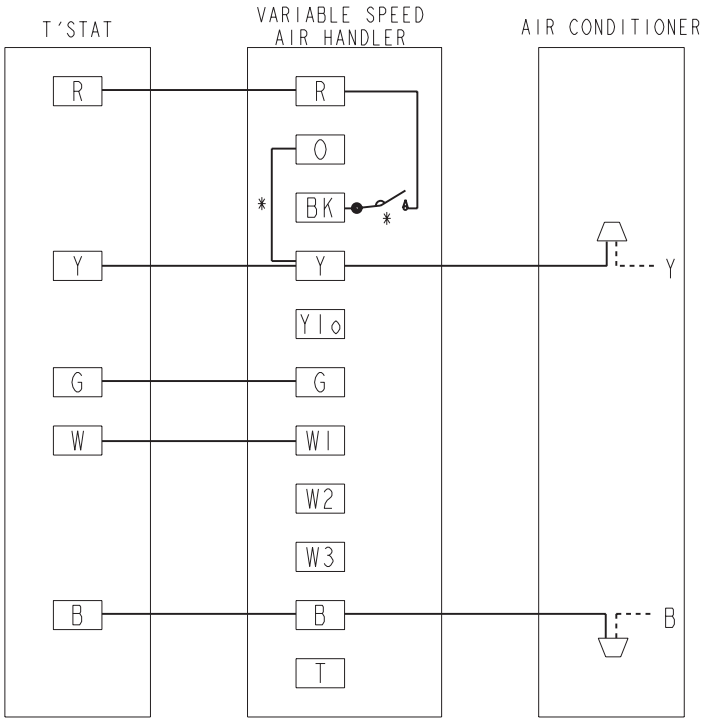
NOTES:

1. BE SURE POWER SUPPLY AGREES WITH EQUIPMENT NAMEPLATE.
2. POWER WIRING AND GROUNDING OF EQUIPMENT MUST COMPLY WITH LOCAL CODES.
3. LOW VOLTAGE WIRING TO BE NO. 18 AWG MINIMUM CONDUCTOR.
4. IF HUMIDISTAT IS NOT USED, CONNECT JUMPER FROM "R" TO "BK" FOR FULL TONNAGE AIRFLOW IN COOLING.
5. N/A TO PROGRAMMABLE THERMOSTST.

24V INTER-COMPONENT WIRING

(FACTORY) (WIRING) ---------- (FIELD) (WIRING) ————

4TFE VARIABLE SPEED AIR HANDLER WITH SINGLE STAGE COOLING, 1 STAGE HEAT



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* CONNECTIONS TO BE MADE FOR OPERATION OF BLOWER WITH HUMIDISTAT IN COOLING

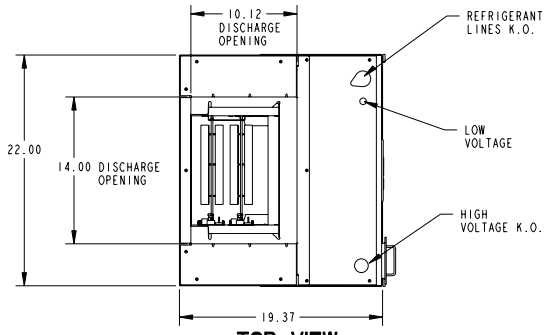
NOTES:

1. BE SURE POWER SUPPLY AGREES WITH EQUIPMENT NAMEPLATE.
2. POWER WIRING AND GROUNDING OF EQUIPMENT MUST COMPLY WITH LOCAL CODES.
3. LOW VOLTAGE WIRING TO BE NO. 18 AWG MINIMUM CONDUCTOR.

24V INTER-COMPONENT WIRING

(FACTORY) (WIRING) ---------- (FIELD) (WIRING) ————

OUTLINE DRAWING FOR 2TFB3F18,24,30,36B1D05, 08, 10; 4TFB3F18,24,30,36A1D05, 08, 10; 4TFE3F25B1D05, 08, 10



TOP VIEW

MINIMUM UNIT CLEARANCE TABLE		
	TO COMBUSTIBLE MATERIAL (REQUIRED	SERVICE CLEARANCE (RECOMMENDED)
SIDES	0"	2"
FRONT	0"	21"
BACK	0"	0"
INLET DUCT	0"	1"
OUTLET DUCT	1"*	

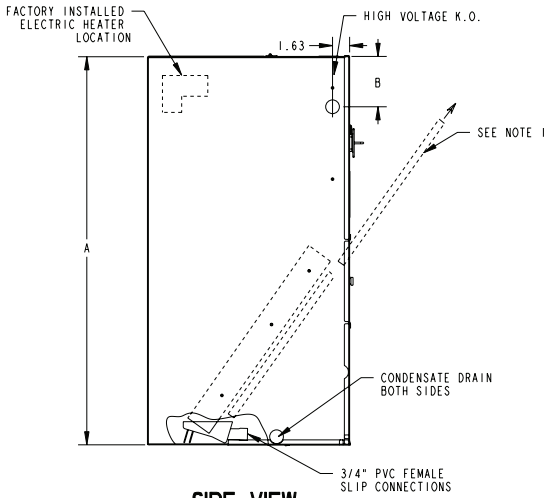
* 1" FOR THE FIRST 3 FT. OF PLENUM AND OUTLET DUCT FOR MODELS WITH 8KW OR 10KW ELECTRIC HEAT. MODELS WITH 5KW ELECTRIC HEAT ARE APPROVED FOR 0" PLENUM AND DUCT CLEARANCE

NOTES:

1. **TUBING MUST BE ROUTED TO ALLOW FOR FILTER REMOVAL AND COMPONENT SERVICE.**

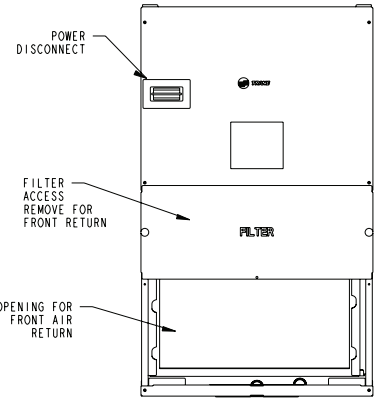
MODEL NO.	FLOW CONTROL	GAS LINE SIZE	LIQUID LINE SIZE	A	B	C
2TFB4018A	FCCV	5/8 BRAZE	1/4 BRAZE	37.00	4.80	12.23
2TFB4024A	FCCV	3/4 BRAZE	5/16 BRAZE			
2TFB4030A	FCCV	3/4 BRAZE	5/16 BRAZE			
2TFE3025A	TXV	3/4 BRAZE	5/16 BRAZE			
2TFB4036A	FCCV	7/8 BRAZE	3/8 BRAZE	39.00	6.80	14.23
2TFB3F18B	TXV	5/8 BRAZE	1/4 BRAZE	37.00	4.80	12.23
2TFE3F25B	TXV	3/4 BRAZE	5/16 BRAZE	39.00	6.80	14.23
4TFE3F25B	TXV	5/8 BRAZE	1/4 BRAZE			
2TFB3F24B	TXV	3/4 BRAZE	5/16 BRAZE			
2TFB3F30B	TXV	3/4 BRAZE	5/16 BRAZE			
2TFB3F36B	TXV	7/8 BRAZE	3/8 BRAZE			
4TFB3F18	TXV	1/2 BRAZE	3/8 BRAZE			
4TFB3F24	TXV	5/8 BRAZE	3/8 BRAZE			
4TFB3F30/4TFB3F36	TXV	3/4 BRAZE	3/8 BRAZE			

METRIC CONVERSION
INCHES X 25.4 MM

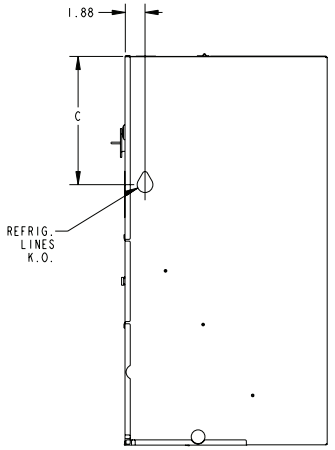


SIDE VIEW

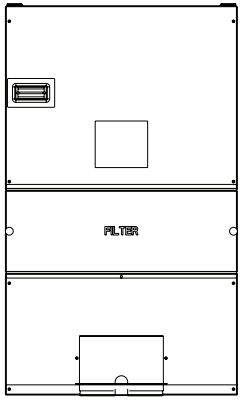
AIRFLOW



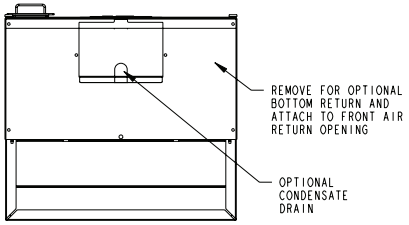
VERTICAL UPFLOW
SHOWING FRONT RETURN AIR



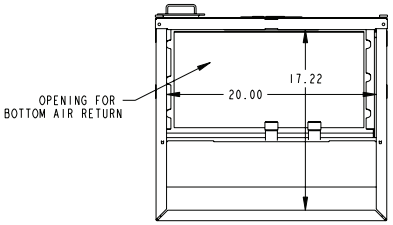
SIDE VIEW



VERTICAL UPFLOW



BOTTOM VIEW



BOTTOM VIEW
SHOWING BOTTOM RETURN AIR

From Drawing D800913P01 Rev 9

CHECKOUT PROCEDURES

After installation has been completed, it is recommended that the Air Handler be checked against the following checklist.

1. Make sure power is "OFF" at power disconnect switch..... [ ]
2. Check all field wiring for tight connections. See that grounding of unit is in accord with code ..... [ ]
3. Make sure unit suspension (if used) is secure and that there are no tools or loose debris in, around or on top of the unit ..... [ ]
4. Check all duct outlets; they must be open and unrestricted ..... [ ]
5. Check drain lines and be sure all joints are tight ..... [ ]
6. Make sure secondary drain pan is installed ..... [ ]
7. Check power supply for correct requirements per unit nameplate ..... [ ]
8. Check filters for proper size. Inform owner of proper procedure for removal and reinstallation [ ]
9. Energize the system and carefully observe its operation; make any necessary adjustment . [ ]
10. Instruct owner, engineer (if applicable) on proper operating procedure and leave Use and Care Manual with owner ..... [ ]

SUPPLEMENTARY HEATERS CHECKOUT PROCEDURES

1. Be sure the disconnect switch is "OFF", and safety label (if any) is attached..... [ ]
2. Check on field wiring for tight connections and grounding according to codes..... [ ]
3. Check circuit protection for proper size per nameplate specifications..... [ ]
4. Check control box panel — in place and secured ..... [ ]

NOTE:
OPERATION OF HEATERS MUST BE CHECKED DURING THE OPERATIONAL CHECK OF THE TOTAL SYSTEM.

The following warning complies with State of California law, Proposition 65.

⚠ WARNING

THIS PRODUCT CONTAINS FIBERGLASS WOOL INSULATION!

Fiberglass dust and ceramic fibers are believed by the State of California to cause cancer through inhalation. Glasswool fibers may also cause respiratory, skin, or eye irritation.

PRECAUTIONARY MEASURES

- Avoid breathing fiberglass dust.
- Use a NIOSH approved dust/mist respirator.
- Avoid contact with the skin or eyes. Wear long-sleeved, loose-fitting clothing, gloves, and eye protection.
- Wash clothes separately from other clothing: rinse washer thoroughly.
- Operations such as sawing, blowing, tear-out, and spraying may generate fiber concentrations requiring additional respiratory protection. Use the appropriate NIOSH approved respirator in these situations.

FIRST AID MEASURES

Eye Contact – Flush eyes with water to remove dust. If symptoms persist, seek medical attention.

Skin Contact – Wash affected areas gently with soap and warm water after handling.

6200 Troup Highway
Tyler, TX 75707

For more information contact your local dealer (distributor)

11/08