

**CRLOWAMB027A00
CRLOWAMB028A00
CRLOWAMB041A00
CRLOWAMB042A00
CRTRXKIT001A00**

**MEDIUM ROOFTOP UNITS
ACCESSORY MOTORMASTER I
HEAD PRESSURE CONTROL KIT
15 to 27.5 TON
SIZES 17–30 and 181–336**

Installation Instructions

TABLE OF CONTENTS

SAFETY CONSIDERATIONS	1
PACKAGE CONTENTS	2
PRODUCT USAGE	3
GENERAL	3
BEFORE INSTALLING	3
INSTALLATION	5

IMPORTANT: Read these instructions completely before attempting to install the head pressure control accessory.

NOTE: See end of document for Models and Sizes covered.

SAFETY CONSIDERATIONS

Installation, start-up and servicing of this equipment can be hazardous due to system pressures, electrical components and equipment location (roofs, elevated structures, etc.)

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

Follow all safety codes. Wear safety glasses and work gloves.

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

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

WARNING

ELECTRICAL SHOCK HAZARD

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

Before performing service or maintenance operations on unit, turn off main power switch to unit.

PACKAGE CONTENTS

CRLOWAMB027A00, CRLOWAMB028A00, CRLOWAMB041A00, CRLOWAMB042A00

Materials Description	CRLOWAMB			
	027A00	028A00	041A00	042A00
Motormaster I, Voltage/Sensor	230-v, MCHX	460-v, MCHX	230-v, RTPF	460-v, RTPF
Motors	2 x 230-v	2 x 460-v	2 x 230-v	2 x 460-v
Capacitor, Dual 10 mfd	--	1	--	1
Pressure Switch (LOC)	2	2	2	2
Check Valve Tee	2	2	2	2
Relay, DPST-NO (6 QC terminals)	1	1	2	2
Switch, Temp LAS	1	1	1	1
Switch, Temp FPT	2	2	2	2
Bracket, Spd Cntrl	1	1	1	1
Screws, 10-16x1/2, Self Drilling	4	4	4	4
Screws, #10x5/8	6	6	6	6
Screws, #8x1/2	2	2	2	2
Screws, 8-18x1/2	8	8	8	8
Adapter Harn, BLK 2-Mx1-F QC, 4-in	1	1	3	3
Adapter Harn, BLK 3-Mx1-F QC, 4-in	--	--	1	1
Wires, 18-ga				
BLK x 20-in	1	1	1	1
VIO x 140-in	1	1	1	1
BRN x 140-in	1	1	1	1
ORN x 15-in, mix	1	1	1	1
ORN x 15-in, mix	1	1	1	1
BLK x 6-in, mix	1	1	1	1
BLK x 6-in, mix	1	1	1	1
ORN x 152-in	--	--	1	1
BRN x 14-in, PB	--	--	1	1
Wires, 16-ga				
BLK x 6-in, FxF	2	2	--	--
BLK x 8-in, FxF	--	--	2	2
BLK x 35-in,	1	1	--	--
BLK x 40-in, Male	1	1	--	--
BLK x 15-in, FxF	--	--	3	3
BLK x 24-in, FxF	--	--	1	1
Wire Connector	2	2	--	--
Wire Ties	12	12	12	12
Labels				
Caution	2	2	2	2
Wiring, Cooling	2	2	5	5
Wiring, HP	--	--	2	2

CRTRXKIT001A00*

ITEM	QTY
Transformer, 240x480/120x240	1
Bracket, Mounting	1
Screw, 10-16x1/2 in.	2
Screw, 1/4-14x5/8	4
Label	
Cooling 575-v	5
Heat Pump 575-v	2
Wires, 18-ga	
BLK, 2540 mm, no terminals	1
BLK, 2540 mm, one female QC	1
YEL, 2540 mm, one male QC	1
YEL, 2540 mm, one female QC	1
VIO, 2540 mm, one female QC	1
VIO, 152 mm no terminals	1
Wire Connections	5
Snap Bushing	1

PRODUCT USAGE

CARRIER MODEL NUMBER	UNIT VOLTAGE	PART NUMBER	OPERATING TEMPERATURE LIMIT
48TC Gas Heat / Electric Cool 17–28 Size Novation 50TC Cooling Only / Electric Heat 17–28 Size Novation	460	CRLOWAMB028A00	-20°F (-29°C)
	208/230	CRLOWAMB027A00	
	575	CRLOWAMB028A00 CRTRXKIT001A00	
48HC Gas Heat / Electric Cool 17–28 Size RTPF 48TC Gas Heat / Electric Cool 17–30 Size RTPF 50HC Cooling Only / Electric Heat 17–28 Size RTPF 50TC Cooling Only / Electric Heat 17–30 Size RTPF 50TCQ Heat Pump 17–24 Size RTPF	460	CRLOWAMB042A00	-20°F (-29°C)
	208/230	CRLOWAMB041A00	
	575	CRLOWAMB042A00 CRTRXKIT001A00	
BRYANT MODEL NUMBER	UNIT VOLTAGE	PART NUMBER	OPERATING TEMPERATURE LIMIT
580J Gas Heat / Electric Cool 17–28 Size Novation 558J Cooling Only / Electric Heat 17–28 Size Novation	460	CRLOWAMB028A00	-20°F (-29°C)
	208/230	CRLOWAMB027A00	
	575	CRLOWAMB028A00 CRTRXKIT001A00	
581J Gas Heat / Electric Cool 17–28 Size RTPF 580J Gas Heat / Electric Cool 17–30 Size RTPF 551J Cooling Only / Electric Heat 17–28 Size RTPF 558J Cooling Only / Electric Heat 17–30 Size RTPF 548J Heat Pump 17–24 Size RTPF	460	CRLOWAMB042A00	-20°F (-29°C)
	208/230	CRLOWAMB041A00	
	575	CRLOWAMB042A00 CRTRXKIT001A00	
ICP MODEL NUMBER	UNIT VOLTAGE	PART NUMBER	OPERATING TEMPERATURE LIMIT
RGH Gas Heat / Electric Cool 181–303 Size RGS Gas Heat / Electric Cool 210–336 Size RAH Cooling Only / Electric Heat 181–303 Size RAS Cooling Only / Electric Heat 210–336 Size RHS Heat Pump 181–243 Size	460	CRLOWAMB042A00	-20°F (-29°C)
	208/230	CRLOWAMB041A00	
	575	CRLOWAMB042A00 CRTRXKIT001A00	

IMPORTANT: This accessory is designed for specific-model mid-range rooftop units in nominal capacity range of 15 to 27.5 tons equipped with 3, 4 or 6 outdoor-fan motors. Unit sizes include 17-30 (on ICP models, 181-336). Refer to PRODUCT USAGE table on page 3 for valid model-size applications.

Do not attempt to install this accessory package on a size 16 or smaller unit (ICP unit size 180 or smaller unit). **DO NOT ATTEMPT TO INSTALL ON MODELS AND SIZES NOT INCLUDED IN THE PRODUCT USAGE table.**

BEFORE INSTALLING

Inspect the contents of this accessory package before installing. File a claim with the shipper if contents are damaged or parts are missing.

GENERAL

Motormaster I solid--state head pressure control regulates outdoor (condenser) fan speed during Cooling mode operation. A temperature sensor, mounted on a return bend of the outdoor (condenser) coil, controls the speed of approved outdoor (condenser) fan motors in order to maintain a constant head pressure in the outdoor (condenser) coil. When properly installed, the control will maintain the appropriate head pressure at low ambient temperatures down to -20°F (-28°C).

On all units, the single Motormaster I control is connected to two (of three, four or six) outdoor (condenser) fan motors. A Low Ambient Switch controls the operation of the remaining fans, de-energizing these fan motors are outside air temperature below 42°F (6°C) through relay LAR.

Parts necessary for mounting the control and sensor are included in the package. If the sensor assembly is damaged, it can be replaced separately.

Heat Pump ONLY:

Motormaster Relay MMR is energized during the Heating mode. The MMR bypasses the Motormaster controller output and LAR relay to force all outdoor (condenser) fan motors to run at full speed during Heating mode.

575-V Units ONLY: Transformer with 460-V Motors and Control

On 575-v units, two of the 575-v motors installed by factory are replaced with 460-v fan motors, powered through a stepdown (575-v to 460-v) autotransformer and controlled through a 460-v Motormaster controller.

Identify Unit Outdoor Coil Type

The accessory kits described in this installation manual are specifically designed to work with either 3/8-in copper tube coils (designated RTPF, for Round Tube/Plate Fin) or all aluminum Novation coils (also designated MCHX, for microchannel heat exchanger). Sensor location, mounting method and wiring instructions vary by coil type.

This unit's coil type can be identified from the unit's Model Number as printed on the unit's informative data plate. Refer to the table below to determine position and code value that identify this unit's coil type.

Identifying Outdoor Coil Type

Brand	Model Number Position	Value in Model Number	
CARRIER	11	A,B,C,D,E,F, M,N,P,Q,R,S	G,H,J,K,L, T,U,V,W,X
BRYANT	12		
ICP	13		
Coil Type		RTPF	Novation/ MCHX

Check voltage of kit parts against unit voltage

Before starting, check controller and motor voltage against unit voltage.

NOTE: 575-v units use 460-v controller and motors with stepdown autotransformer.

WARNING

FIRE, EXPLOSION, ELECTRICAL SHOCK HAZARD

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

A qualified installer or agency must use only factory-authorized kits or accessories when modifying this product.



CAUTION

CUT HAZARD

Failure to follow this caution may result in personal injury.

When removing access panels (see Fig. 1) or performing maintenance functions inside your unit, be aware of sharp sheet metal parts and screws. Although special care is taken to reduce sharp edges to a minimum, be extremely careful when handling parts or reaching into the unit.

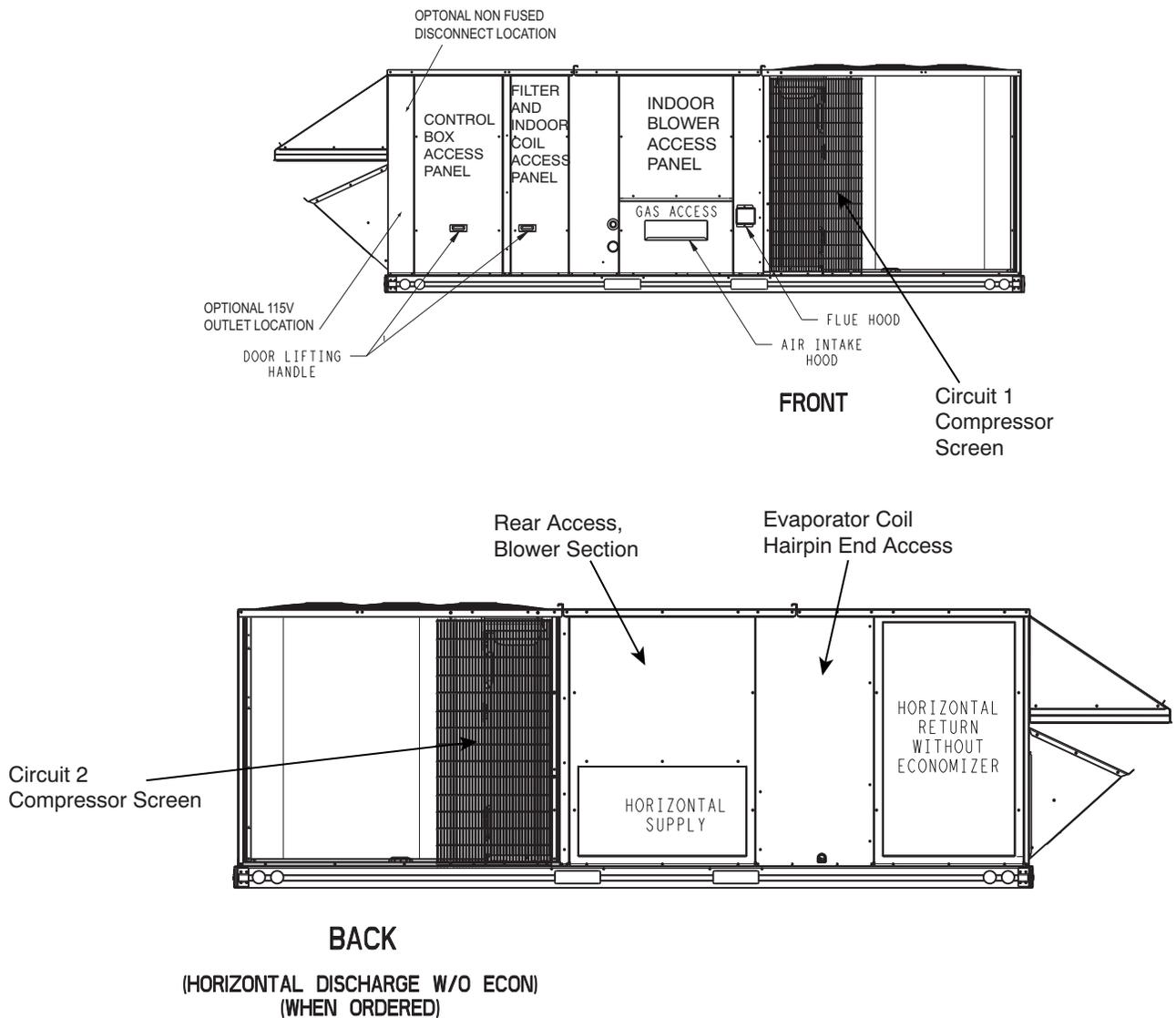


Fig. 1 - Unit Access Panels, Typical All Sizes

C13422

Front (Left to Right):

- Control box access and cover
- Evaporator coil (for wire routing)
- Supply fan (blower) access
- Compressor 1 screen

Rear (Left to Right):

- Compressor 2 screen
- Supply fan (blower) compartment
- Evaporator hairpin tube end
- For units with Novation/MCHX outdoor coil, the end access panel will also be removed to reach the coil header end.

INSTALLATION

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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

Before installing or servicing system, always turn off main power to system and install lockout tag. There may be more than one disconnect switch. Turn off accessory heater power switch if applicable.

1. Disconnect power to the unit. Lock-out/tag-out on unit disconnect switch.
2. Open and remove the access panel and cover to the main control box.
3. Use a voltmeter to check that no power is present at unit terminal block.
4. Remove the Compressor 1 screen and the supply fan access panel.

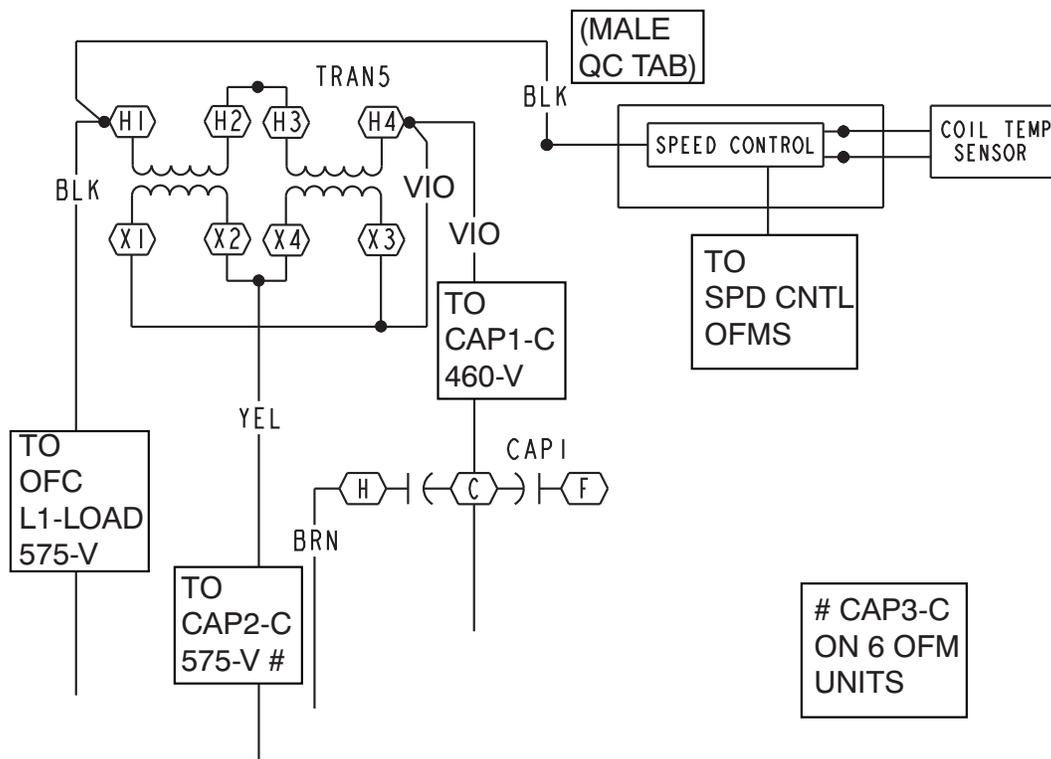


Fig. 2 - 575-V Transformer Connections

C13423

575-v only – Transformer

1. Open the CRTXRKIT001A00 package and remove the transformer, mounting bracket, screws, wires, connectors and labels.
2. Remove the transformer access plate and extract the eight winding leads.
3. Locate snap bushing. Install in bottom opening in transformer box. Route strip-back ends of all 2.5 m (100-in) long wires through the bushing.
4. Identify winding leads H2 and H3. Splice together using connector provided.
5. Identify winding leads X1 and X3. Locate the 152 mm (6-in) VIO wire. Splice X1, X3 and VIO leads together using connector provided.
6. Identify winding lead H4. Locate the 2.5 m (100-in) VIO wire with strip-back end. Splice the VIO lead to H4 and the VIO lead from step 5 above with connector provided.
7. Identify winding leads X2 and X4. Locate the 2.5 m (100-in) YEL wire with strip-back end. Splice X2, X4 and YEL leads together using connector provided.
8. Identify winding lead H1. Locate the two 2.5 m (100-in) BLK wires with strip-back ends. Splice the two BLK leads to H1 using the connector provided.
9. Replace the transformer access plate.
10. Locate the transformer mounting bracket and four ¼-14x5/8 screws. Start two screws in upper holes.
11. Handling the transformer assembly carefully to not damage the four long leads, slip the transformer flange keyholes over the two screws. Insert the two

lower screws through flange and tighten to bracket. Tighten two upper screws.

12. See Fig. 3 and identify the existing basepan screw to left of pan seam. Remove this screw and save.
13. Handling the transformer-bracket assembly carefully to not damage the four long leads, position the transformer-bracket assembly across the pan seam. Secure bracket to basepan using screw removed in Step 12.
14. Using #10 self-drilling screw, secure second bracket foot to basepan.
15. Route the four wires from the transformer through the slot at the top of the left-side panel into the supply fan compartment.

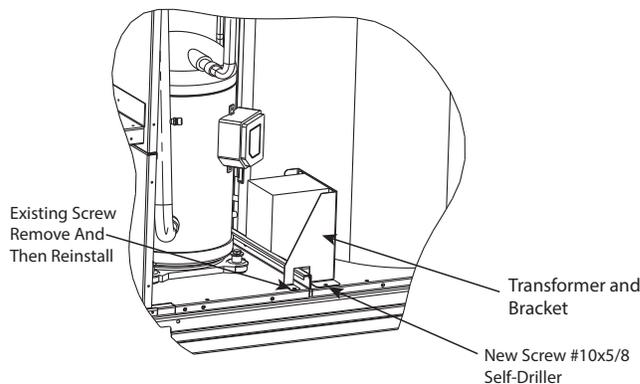


Fig. 3 - Transformer Location

C13424

Prepare CRLOWAMB027A, 028A Motormaster:

Materials required

- (2) BLK wires, 45-in (1140 mm) long
- (2) Wire connectors
 1. Select BLK wire, 45-in (1140 mm) long with Female quick-connect terminal.
 2. Splice strip-back end to Motormaster BLK lead with connector provided.
 3. Select BLK wire, 45-in (1140 mm) long with Male quick-connect terminal.
 4. Splice strip-back end to Motormaster BLK/WHT lead with connector provided.

Prepare/Attach the Motormaster Plate (Bracket)

Materials required

- Motormaster mounting plate
- Screws, #10 self-drilling (4)
- Serrated Washer Face Screws, #10x5/8 (4)

1. See Fig. 4. Locate two screw holes for Motormaster left-side mounting.

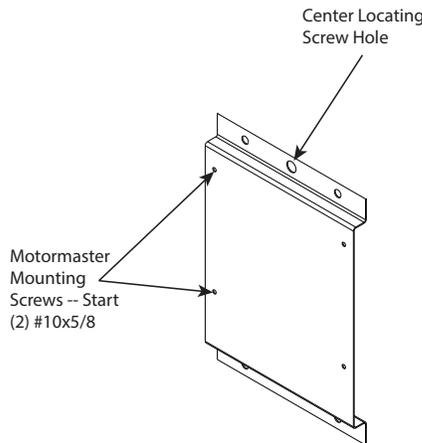


Fig. 4 - Motormaster Mounting Plate

C13425

2. Start two #10x5/8 screws in these holes. Engage half-length.
3. Locate the existing screw in unit end wall (engages into compressor partition), approx. 6-7 in. (150-175 mm) below unit top. Remove and save this screw.
4. Insert the screw through the mounting plate's top center hole and position the mounting plate on the end wall of the supply fan compartment over the existing hole. Tighten screw into compressor partition.
5. Using four self-drilling screws, mount the plate to the unit end wall.
6. Handling the Motormaster assembly carefully to not damage the three long leads and the sensor cable, with leads exiting the control housing from the bottom, position the side mounting slots under the two mounting screws and hold in place. Insert a #10 serrated washer face screw at the side flange screw slot and tighten. Insert a second screw in the side slot and tighten. Tighten the two screws at the left side mounting slots.

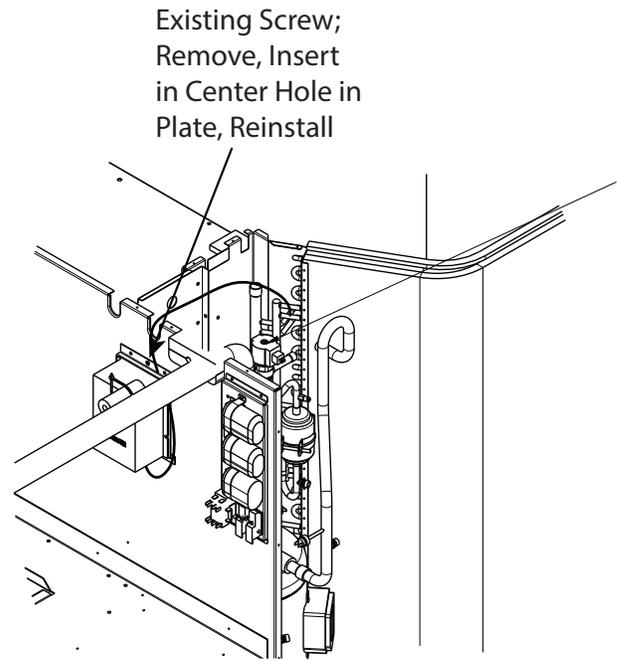


Fig. 5 - Mounting Motormaster Plate

C13427

7. Route the Motormaster sensor cord to the Circuit 1 coil.

Changing outdoor fan motors OFM1, OFM3 (all units)

Refer to Fig. 8 to identify the locations of OFM1 and OFM3.

Use of a fish tape or similar tool will aid in pulling motor leads through grommets in unit end wall.

OFM1 (208/230-v)

1. Identify the BLK, BRN and YEL (or WHT) leads from OFM1. BRN and YEL (or WHT) leads connect to capacitor CAP1 on the capacitor plate on the unit end wall. BLK lead connects at terminal board OFTB. See Fig. 6.
2. Disconnect the BRN and YEL (or WHT) OFM1 leads at CAP1.
3. Disconnect the BLK OFM1 lead at OFTB.

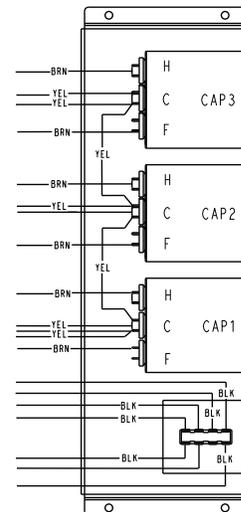


Fig. 6 - Capacitor Plate View (6-OFM Depicted)

C13426

OFM1 (460, 575-v)

Material required

Capacitor

1. Identify the BLK, BRN and YEL (or WHT) leads from OFM1. BRN and YEL (or WHT) leads connect to capacitor CAP1 on the capacitor plate on the unit end wall. BLK lead connects at terminal board OFTB. See Fig. 6.
2. Disconnect the BLK OFM1 lead at OFTB.
3. Disconnect all wires at capacitor CAP1.
4. Unscrew the capacitor strap at CAP1 carefully so that it can be reused.
5. Remove the capacitor and store it in a safe place or discard properly.
6. Using the capacitor strap, safely secure the new 10mfdx10mfd capacitor in the original CAP1 capacitor location.

OFM1 Motor Replacement

Materials required

Motor (1)

1. Remove the screws securing the OFM1 fan grille from the unit top cover. Save these screws.
2. Remove the fan grille assembly at OFM1 by lifting the assembly straight up until the prop blades clear the fan deck and pulling the motor leads through the unit end panel. Invert the grille assembly and place on a support surface.
3. Mark the hub to indicate motor location. Measure and record the dimension of the top edge of the prop blade to the grille.
4. Remove the prop fan from the motor shaft.
5. Observe the orientation of the fan motor wires at the grille and motor shell opening. Remove the fan motor from the grille center plate.
6. Attach the motor from the accessory kit to the grille. Torque the mounting nuts onto the motor throughbolts to 20 in-lbs (2260 mNm). Do not overtighten the nuts onto the motor throughbolt ends. Secure wires to grille as noted in step 5.
7. Mount the prop fan onto the motor shaft. Locate the prop at the distance from the grille measured in step 3 above. If the prop blade contacts the motor housing, adjust prop position until the prop clears the motor by 1/2-in (12 mm). Rotate the hub on the motor shaft to position the set screw over the shaft flat. Torque the prop set screws to 84 in-lbs (9.5 Nm).
8. Using a fish tape or similar tool, direct the motor leads to the grommet in the end panel and pull through from the fan compartment.
9. Position the OFM1 grille assembly over its top panel opening and carefully insert the motor wires and prop through the opening and lower into place. Secure using screws removed in step 1.
10. Rotate the prop fan to ensure there is no interference or contact with unit piping or motor wiring.

OFM3 Motor Replacement (all units)

Materials required

Motor (1)

Colored tape or wire markers

1. Remove Compressor 2 screen on unit rear side. Remove rear access panel to blower compartment. Save all screws.
2. Trace the OFM3's three leads (BLK, BRN and YEL (or WHT)) from the motor through the grommet in the end panel to the quick-connect terminals. Disconnect all three leads.
3. Remove OFM3 grille assembly and replace the motor per instructions under "OFM Motor Replacement" above.

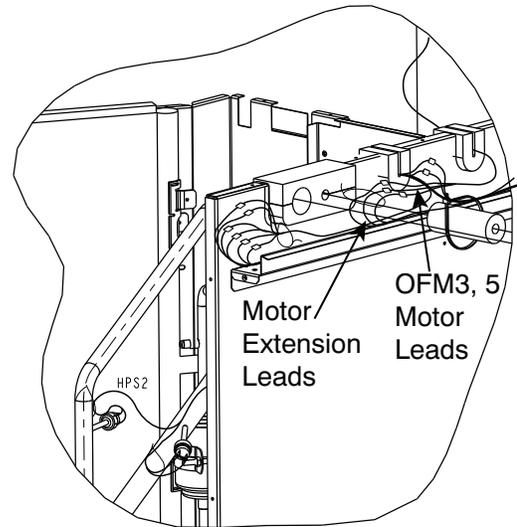
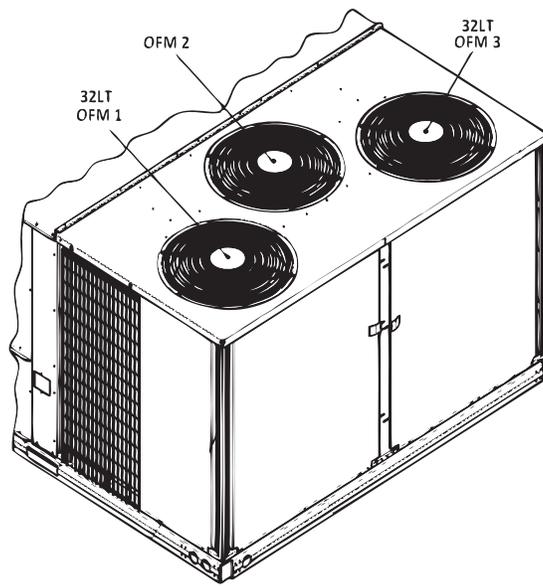


Fig. 7 - OFM3 Motor Lead Connections

C13436

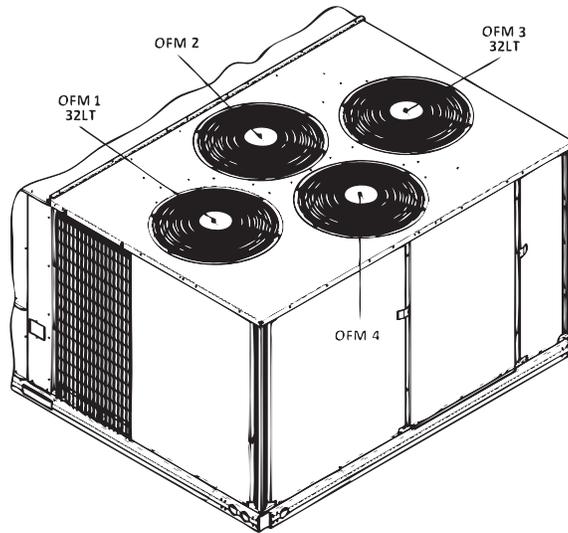
NOTE: On 6 OFM units, before replacing the OFM3 grille assembly back into the unit, trace the leads from OFM5 back into the unit cabinet and mark these leads for future use.

4. Reconnect the OFM3 BRN and YEL (or WHT) leads to terminals on factory extension wires.
5. Before reconnecting the BLK motor lead, trace the factory BLK lead back to capacitor plate end and mark or tape this wire's end for future identification.
6. Reconnect the BLK motor lead to the the terminal on the BLK extension wire.



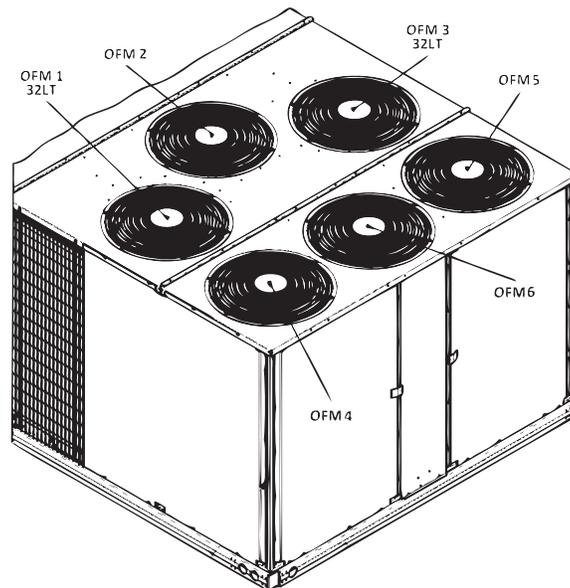
3-Fan

C12764



4-Fan

C12765



6-Fan

C12766

Fig. 8 - OFM Locations

Install Fan Staging Controls (LAR and LAS)

Materials required

Temperature switch HH18HA286

Relay HN51PC005

#8x1/2 screws

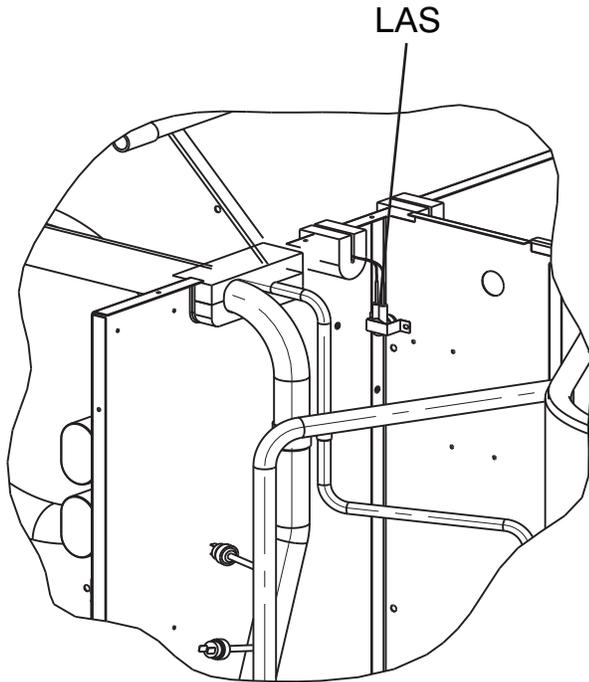
Wires

VIO, 140-in (3.5 m)

BRN, 140-in (3.5 m)

BLK, 22-in (559 mm)

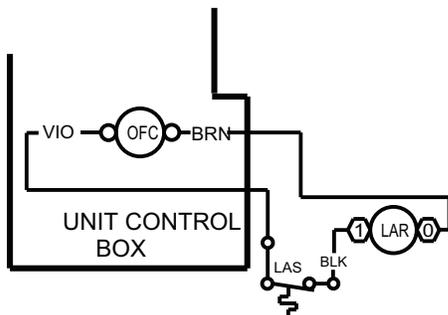
1. Hold the Low Ambient staging temperature Switch (LAS, PNO HH18HA286) above Compressor 1.



C13429

Fig. 9 - LAS Location

2. Route LAS sensor leads from compressor compartment through panel notch and grommet until lead terminals are on the supply fan side.
3. Mount the Low Ambient Relay (LAR, PNO HN61PC005) on the capacitor plate next to terminal block OFTB, using #8x1/2 screw provided.
4. Connect BLK 22-in wire at LAR coil terminal. Connect other end to male terminal on lead from LAS. See Fig. 10.



C13431

Fig. 10 - LAS, LAR Wiring

5. Connect VIO 140-in wire's male terminal to female terminal on lead from LAS.

6. Connect BRN 140-in wire's female terminal to LAR coil.

NOTE: If unit is a heat pump, locate the 140 in. (3.5 m) ORN wire and route between capacitor plate and control box with VIO and BRN leads in following step.

7. Route VIO and BRN leads through fan section and coil section into unit control box. Pull to location of OFC-1.
8. Connect VIO female terminal to OFC1 coil with BLK wire.
9. At other side of OFC1 coil, disconnect BRN lead, connect BRN lead from LAR to OFC1 coil terminal and reconnect existing BRN lead to male terminal on new BRN wire.

Cooling Only Models

Mount Evaporator Freeze Protection Temperature (FPT) Switches

Materials required

(2) Temperature switches HH18HB015

Colored tape or wire markers

Wire ties

1. Remove evaporator rear access panel. Save screws.
2. Attach two FPT switches (PNO HH18HB015) to evaporator hairpin tubes in locations indicated in Fig. 13. FPT1 is on lower half of the coil; FPT2 is located on upper half of the coil.
3. Mark the lead ends from FPT2 for future identification.
4. Route the switch leads through the fan section along the suction tube. Secure these leads to the tube with wire ties.
5. Route the FPT leads through the evaporator coil section and into the main control box. Pull up to vicinity of the terminal board CTB.

Mount Loss-of-Charge (LOC) Switches

Materials required

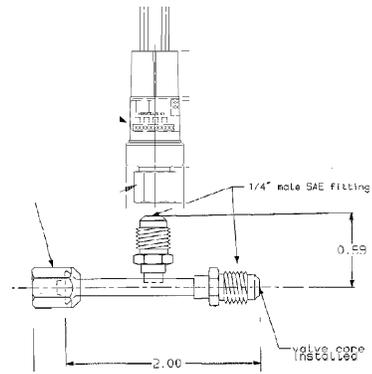
(2) Pressure switches HK02ZB080

(2) Check valve tee assemblies

Wire ties

1. Pre-assemble the pressure switches onto the check valve tees at the center flare connector per Fig. 11. Torque low pressure switch to 8 to 10 ft-lb (10.8 to 13.6 Nm).

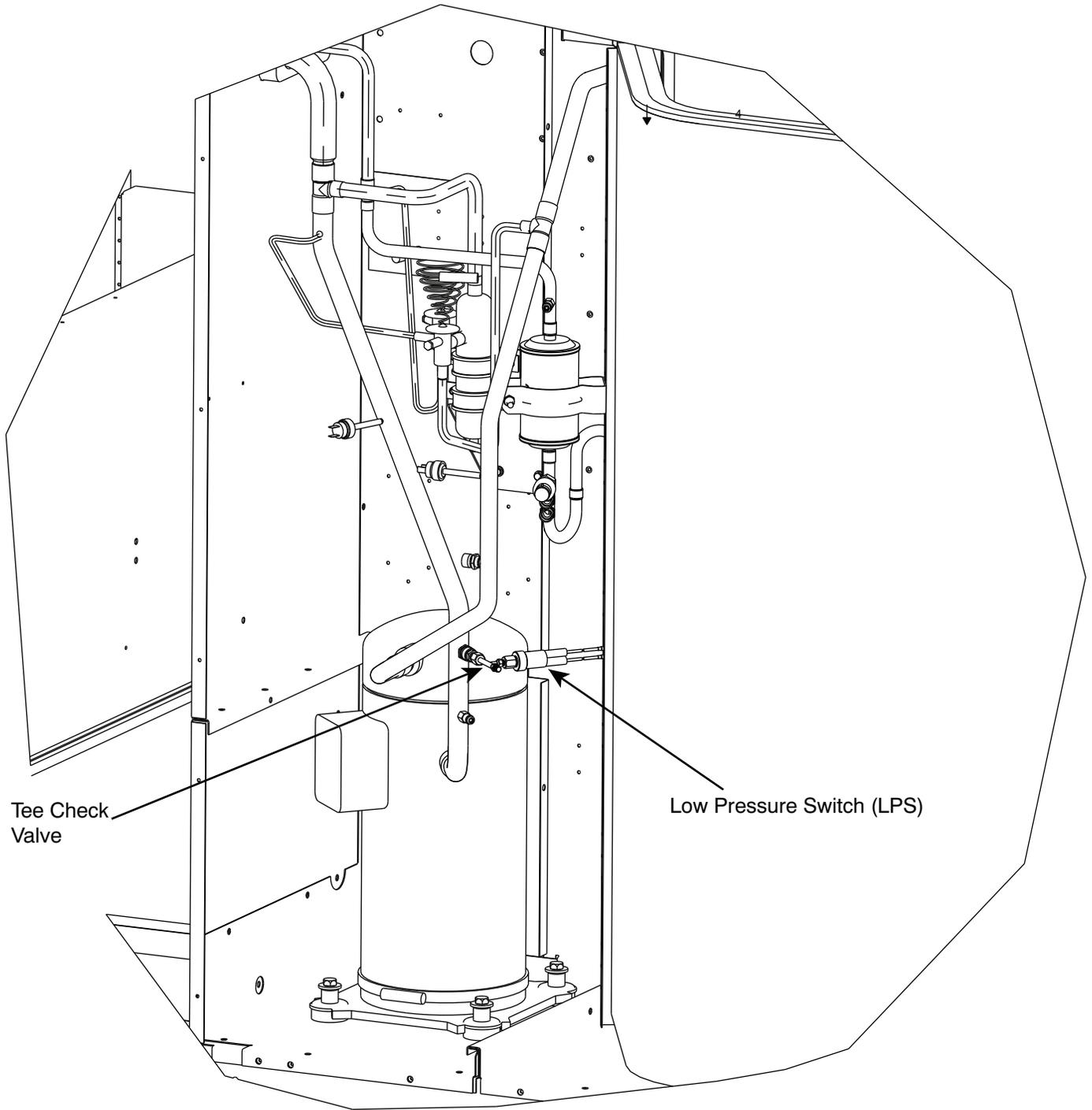
2. At Compressor 1, locate the service access port on the suction line. Remove the cap and reinstall on the tee's end flare connector. See Fig. 12.
3. Attach the tee-switch assembly to the service access port.
4. At the factory LPS1, trace the leads to the connections to factory ORN wires. Disconnect the two factory ORN leads from factory LPS1 leads.
5. Reconnect the two factory ORN leads to the leads from new pressure switch.
6. At Compressor 2, locate the service access port on the suction line. Remove the cap and reinstall on the second tee's end flare connector.
7. Attach the tee-switch assembly to the service access port.
8. At the factory LPS2, trace the leads to the connections to factory ORN wires. Disconnect the two factory ORN leads from factory LPS2 leads.



C13430

Fig. 11 - LOC Pressure Switch - Tee Assembly

9. Reconnect the two factory ORN leads to the leads from new pressure switch.
10. Coil excess length wires and dress with wire ties to prevent strain on existing and new pressure switches.

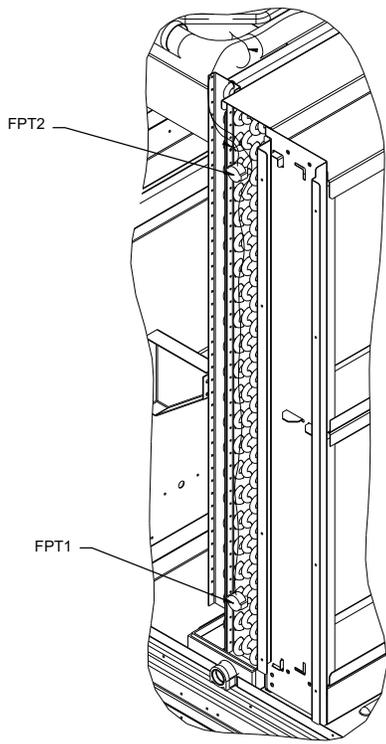


Tee Check Valve

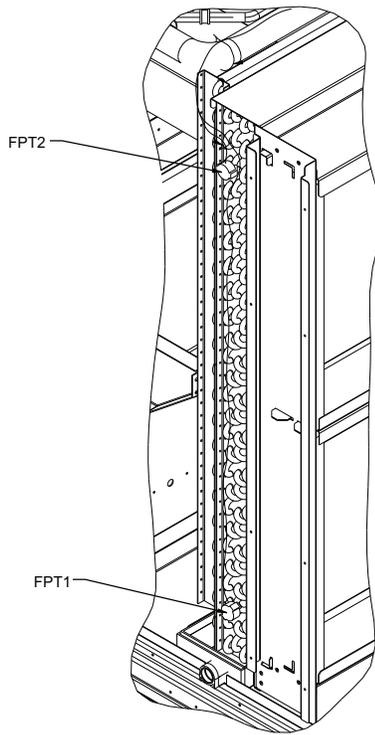
Low Pressure Switch (LPS)

Fig. 12 - LPS Installation

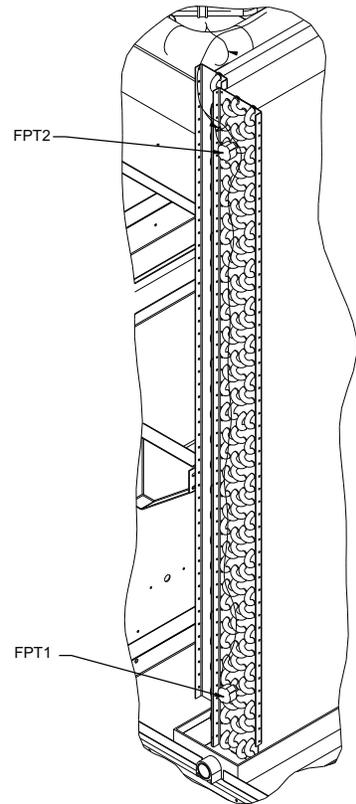
C13263



Location A

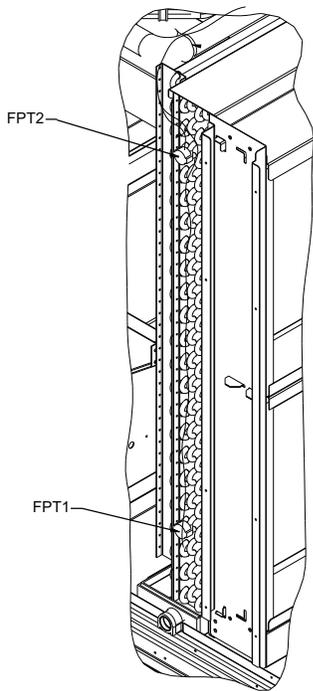


Location B

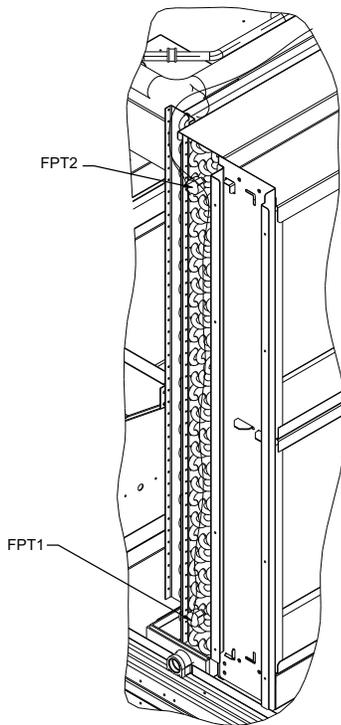


Location C

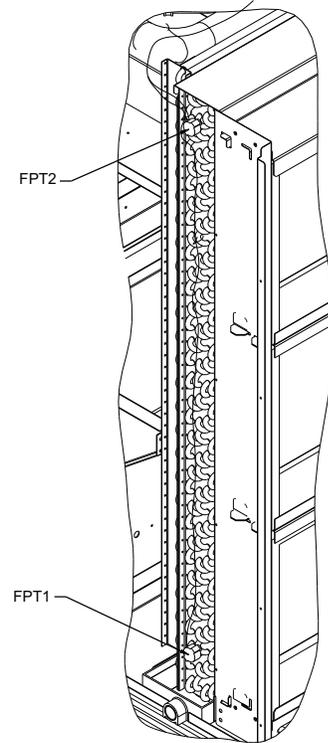
MOUNT FPT1 AND 2 TO HAIRPIN TUBES AS SHOWN.



Location D



Location E



Location F

MOUNT FPT1 AND 2 TO HAIRPIN TUBES AS SHOWN.

Fig. 13 - FPT Location

C13264

UNIT WIRING DIAGRAMS

The wiring diagrams depict the unit wiring after installing this accessory. There are separate diagrams for each tier group, for different fan motor quantities and unit power supply. Determine the correct diagram for your unit from Table 1; the figures begin on page TBD. Refer to the appropriate unit figure for the following wiring steps.

This accessory package contains labels of the 208/230-v and 460-v unit diagrams. The accessory 575-v transformer kit contains the 575-v unit labels.

Table 1 – Wiring Diagrams with Motormaster

Fig.	Unit	Reference Drawing Number
26	Standard/Mid Tier, 208/230, 460 – 3 OFM	50HE503752
27	Standard Tier, 280/230,460 – 4 OFM	50HE503753
28	Standard Tier, 208/230, 460 – 6 OFM	50HE503754
29	Standard/Mid Tier, 575 – 3 OFM	50HE503759
30	Standard Tier, 575 – 4 OFM	50HE503760
31	Standard Tier, 575 – 6 OFM	50HE503761
32	Mid Tier, 208/230, 460 – 4 OFM	50HE503757
33	Mid Tier, 208/230, 460 – 6 OFM	50HE503758
34	Mid Tier, 575 – 4 OFM	50HE503762
35	Mid Tier, 575 – 6 OFM	50HE503763
36	Heat Pump, 208/230, 460 – 3 OFM	50HE503755
37	Heat Pump, 208/230, 460 – 4 OFM	50HE503756
38	Heat Pump, 575 – 3 OFM	50HE503764
39	Heat Pump, 575 – 4 OFM	50HE503765

Cooling Unit Wiring

At the Capacitor Plate:

Materials required

Adapter Harness, BLK, 2-Male x 1-Female terminals

1. Connect Adapter Harness female terminal to the Motormaster lead with male tab connector.
2. Connect BLK lead from motor OFM1 to a male tab on the Adapter Harness.
3. Connect BLK extension wire from OFM3 (previously marked) to remaining male tab connector on the Adapter Harness.

208/230, 460-v Only

Connect the BLK lead (with female connector) from the Motormaster to terminal block OFTB.

575-v Unit Only

1. Connect the BLK lead (with female connector) from the Motormaster to BLK lead from the stepdown transformer with male tab connector.

2. Connect the BLK lead from the stepdown transformer with female connector to terminal board OFTB.
3. Connect YEL wire from transformer to capacitor CAP2 terminal C (quad terminal).
4. Connect VIO wire from transformer to capacitor CAP1 terminal C (quad terminal).
5. At capacitor CAP1 terminal C, identify the YEL wire from contactor OFC terminal 23 (located in main control box) and disconnect at CAP1 terminal C. Reconnect YEL wire to CAP2 terminal C (3 or 4 OFM unit) or CAP3 terminal C (6 OFM unit).

Standard Tier Units (Cooling)

CARRIER	BRYANT	ICP
48TC	558J	RAS
50TC	580J	RGS

NOTE: Refer to Fig. 26–31 for these units.

3 OFM Unit:

Materials required

BLK Jumper, 6-in (150 mm), Female x Female terminals

1. At OFTB, disconnect the BLK lead from OFM2 and reconnect BLK lead to relay LAR terminal 2.
2. Connect one end of the BLK jumper wire to LAR terminal 4.
3. Connect the other end of the BLK jumper wire to OFTB.

4 OFM Unit:

Materials required

(2) BLK Jumper, 6-in (150 mm), Female x Female terminals

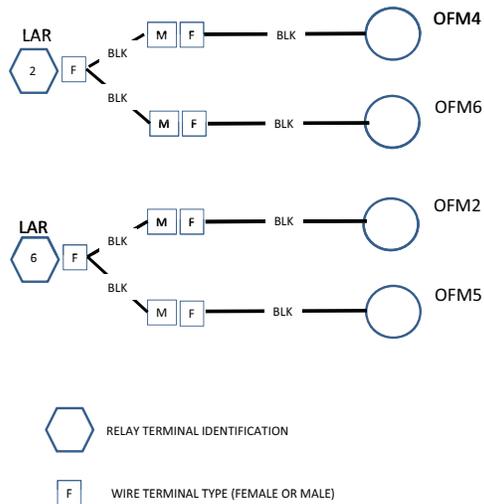
1. Locate the BLK lead from OFM2 (located on the unit center between OFM1 and OFM3, with extension leads to far notch in unit end panel).
2. At OFTB, disconnect BLK lead from OFM2 and reconnect to relay LAR terminal 2.
3. Connect one end of first BLK jumper wire to LAR terminal 4.
4. Connect the other end of the BLK jumper wire to OFTB.
5. At OFTB, disconnect the remaining BLK lead (from OFM4) and reconnect to relay LAR terminal 6.
6. Connect one end of the second BLK jumper wire to LAR terminal 8.
7. Connect the other end of the BLK jumper wire to OFTB.

6 OFM Unit:

Materials required

(2) Adapter Harness, BLK, 2-Male x 1-Female terminals
(2) BLK Jumper, 6-in (150 mm), Female x Female terminals

1. Connect one harness (female terminal) at relay LAR terminal 2. Connect other harness at LAR terminal 6. See Fig. 14.



C13428

Fig. 14 - LAR Connections 6-OFM Unit Using Harness Adapter

2. Locate the BLK lead from OFM2 (located on the unit center between OFM1 and OFM3, with extension leads to far notch in unit end panel) and trace to OFTB.
3. At OFTB, disconnect BLK lead from OFM2 and reconnect to harness tab at relay LAR terminal 2.
4. Locate BLK lead from OFM5, marked earlier, and trace to OFTB. Disconnect at OFTB and reconnect to other harness tab at relay LAR terminal 2.
5. Connect one end of the first BLK jumper wire to LAR terminal 4.
6. Connect the other end of the BLK jumper wire to OFTB.
7. Remaining BLK leads at OFTB are from motors OFM4 and OFM6. Disconnect each lead and reconnect these leads to male tab connectors on harness at relay LAR terminal 6.
8. Connect one end of the second BLK jumper wire to LAR terminal 8. Connect the other end of the BLK jumper wire to OFTB.

CHECK WIRING: Check all wiring connections by reading all steps and tracing each wire between connection points.

Medium Tier Units Cooling

CARRIER	BRYANT	ICP
48HC	551J	RAH
50HC	581J	RGH

NOTE: Refer to Fig. 26, 29, 32–35 for these units.

3 OFM Unit:

Materials required

BLK Jumper, 6-in (150 mm), Female x Female terminals

1. At OFTB, disconnect BLK lead from OFM2 and reconnect to relay LAR terminal 2.

2. Connect one end of the BLK jumper wire to LAR terminal 4.
3. Connect the other end of the BLK jumper wire to OFTB.

4 OFM Unit:

Materials required

(2) BLK Jumper, 6-in (150 mm), Female x Female terminals

1. At OFTB, disconnect the BLK extension lead from OFM2 (located on the unit center between OFM1 and OFM3, with extension leads to far notch in unit end panel).
2. Connect BLK lead from OFM2 to relay LAR terminal 2.
3. Connect one end of the first BLK jumper wire to LAR terminal 4.
4. Connect the other end of the BLK jumper wire to OFTB.
5. At OFTB2, disconnect the BLK lead (from OFM4) and reconnect to relay LAR terminal 6.
6. Connect one end of the second BLK jumper wire to LAR terminal 8.
7. Connect the other end of the BLK jumper wire to OFTB2.

6 OFM Unit:

Materials required

(2) Adapter Harness, BLK, 2-Male x 1-Female terminals
 (2) BLK Jumper, 6-in (150 mm), Female x Female terminals

1. Connect one Adapter Harness (female terminal) at relay LAR terminal 2. Connect other harness at LAR terminal 6. See Fig. 14
2. At OFTB, locate the BLK lead from OFM2 (located on the unit center between OFM1 and OFM3, with extension leads to far notch in unit end panel) and the BLK extension lead from OFM5 (marked earlier). Disconnect both BLK leads.
3. Connect BLK lead from OFM2 to harness tab at relay LAR terminal 2.
4. Connect BLK lead from OFM5 to other harness tab at relay LAR terminal 2.
5. Connect one end of first BLK jumper wire to LAR terminal 4.
6. Connect the other end of the BLK jumper wire to OFTB.
7. At OFTB2, remaining BLK leads are from motors OFM4 and OFM6. Disconnect both leads and reconnect these leads to male tab connectors on harness at relay LAR terminal 6.
8. Connect one end of second BLK jumper wire to LAR terminal 8. Connect the other end of the BLK jumper wire to OFTB2.

CHECK WIRING: Check all wiring connections by reading all steps and tracing each wire between connection points.

ALL COOLING UNITS

At the unit Main Control Box:

Materials required

BLK Jumper wire, 6-in (150 mm), Male-3/16 x Male-1/4
 ORN Jumper wire, 15-in (380 mm), Female-3/16 x Male-1/4

BLK Jumper wire, 6-in (150 mm), Male-1/4 x Male-1/4
 ORN Jumper wire, 15-in (380 mm), Female-1/4 x Male-1/4

1. Locate the terminal board CTB and identify the LPS1-IN terminal, under label CIRCUIT 1. See Fig. 15.
2. Disconnect the ORN wire at CTB LPS1-IN. Connect the BLK jumper with Male-3/16 terminal to ORN wire.
3. Identify the FPT1 leads (previously marked). Connect one FPT1 lead to BLK jumper used in Step 2 above.
4. Connect the other FPT1 lead to ORN jumper with mixed-size terminals at 1/4-in tab.
5. Connect the ORN jumper's 3/16 connector to CTB LPS1-IN terminal.
6. At the terminal board CTB, identify the LPS2-IN terminal, under label CIRCUIT 2. See Fig. 15.
7. Disconnect the ORN wire at CTB LPS2-IN. Connect the BLK jumper with Male-1/4 terminal to ORN wire.
8. Identify the FPT2 leads (previously marked). Connect one FPT2 lead to BLK jumper used in Step 7 above.
9. Connect the other FPT2 lead to second ORN jumper.
10. Connect the ORN jumper's female connector to CTB LPS2-IN terminal.

Table 2 – Heat Pump Models Only

CARRIER	BRYANT	ICP
48TCQ	548J	RHS

NOTE: Refer to Fig. 36–39 for these units.

Mount /Wire Motormaster Relay MMR

Materials required

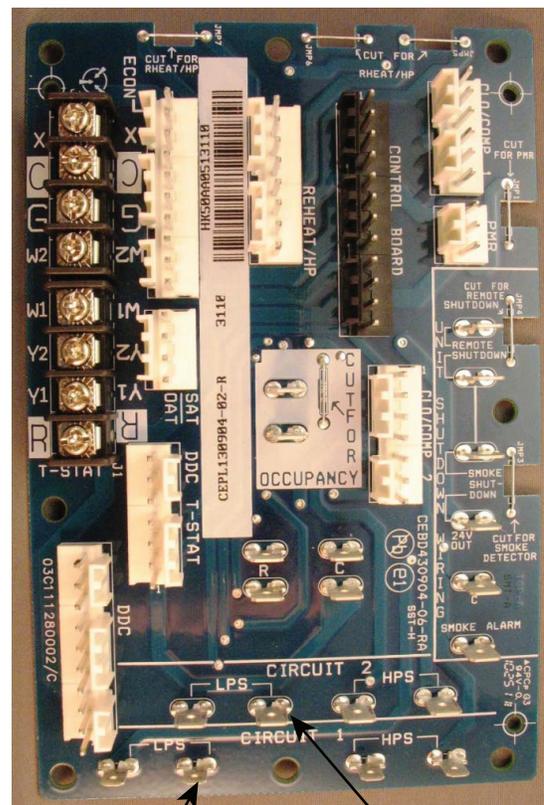
Relay PNO HN61PC005

Screw #8x1/2

ORN wire, 140-in. (3.5 m) (already pulled through unit)

BRN wire, 15-in. (380 mm)

1. Mount the relay MMR on the capacitor plate above the capacitor CAP2. See Fig. 16. Use #8x1/2 screws provided.



LPS1-IN LPS2-IN

Fig. 15 - LPS1, LPS2 Connections

C13432

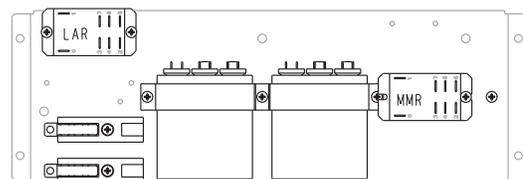


Fig. 16 - MMR Location (3-OFM Shown)

C13433

2. Locate 140 in. (3.5 m) ORN wire already pulled through supply fan section to control box.
3. Connect ORN wire to relay MMR terminal 1 (coil).
4. Connect the BRN wire's female terminal to MMR terminal 0 (coil).
5. Route other end with piggy back terminal to relay LAR. Disconnect the BRN lead at LAR coil, connect the piggy back terminal to the LAR coil and reconnect the BRN wire to the piggy back terminal's male tab.

At the Capacitor Plate:

Materials required

Adapter Harness, BLK wires, 3-Male x 1-Female

(2) Terminal blocks (OFTB and OFTB2)

(2) Screws, #8x1/2

(2) BLK Jumper wires, 6-in (150 mm)

(3) BLK Jumper wires, 15-in (380 mm)

(1) BLK Jumper wire, 25-in (635 mm)

1. Connect Adapter Harness's female terminal to the Motormaster lead with male tab connector.
2. Connect BLK lead from motor OFM1 to a male tab on the Adapter Harness.
3. Connect BLK extension wire to OFM3 (previously marked) to a male tab connector on the Adaptor Harness.
4. Connect BLK Jumper (25-in) at MMR terminal 6. Connect other end to remaining male tab in the Adapter Harness.
5. At terminal board TB2, disconnect BLK leads (two on 3 OFM unit, three on 4 OFM unit). Remove TB2.
6. Mount the two small terminal boards and mount on capacitor plate as OFTB and OFTB2. See Fig. 16.
7. Reconnect the BLK lead from contactor OFC1 (located in the main control box) to OFTB.
8. Reconnect the BLK leads from OFM2 and OFM4 (on 4 OFM unit) to terminal board OFTB2.
9. Connect BLK jumper (6-in) at OFTB. Connect other end to relay LAR terminal 4.
10. Connect BLK jumper (6-in) at relay LAR terminal 2. Connect the other end to OFTB2.
11. Connect BLK jumper wire (15-in) to MMR terminal 2. Connect other end to OFTB2.
12. Connect second BLK 15-in jumper wire to MMR terminal 8. Connect other end to OFTB2.
13. Connect the third BLK 15-in jumper wire to MMR terminal 4. Connect other end to OFTB.
14. Connect the fourth BLK 15-in jumper wire to MMR terminal 6. Connect other end to the last male tab connector on the Adaptor Harness.

208/230, 460-v Only

Connect the BLK lead (with female connector) from the Motormaster to terminal block OFTB.

575-v Unit Only

1. Connect the BLK lead (with female connector) from the Motormaster to BLK lead from the stepdown transformer with male tab connector.
2. Connect the BLK lead from the stepdown transformer with female connector to terminal board OFTB.
3. Connect YEL wire from transformer to capacitor CAP2 terminal C (quad terminal).
4. Connect VIO wire from transformer to capacitor CAP1 terminal C (quad terminal).
5. At capacitor CAP1 terminal C, identify the YEL wire from contactor OFC terminal 23 (located in

main control box) and disconnect at CAP1 terminal C. Reconnect YEL wire to CAP2 terminal C.

CHECK WIRING: Check all wiring connections by reading all steps and tracing each wire between connection points.

At the unit Main Control Box:

Locate the ORN pulled from the Capacitor Plate and MMR. Connect the fork terminal to the CTB terminal board's W1 terminal.

ALL UNITS:

Replace access panels to evaporator and supply fan sections on both sides of the unit.

Affix the appropriate unit wiring label to the control box cover near the factory label.

Affix Motormaster Caution labels (see Fig. 17) to unit fan deck near OFM1 and OFM3 grilles.

Referring to unit operating sequence, restart the unit and observe the operation of the OFM1 and OFM3 fans and the starting/stopping sequences of other fan positions.

Replace compressor screens on both sides of unit. Replace control box cover and access panel.



C13434

Fig. 17 - Motormaster Caution Labels

Motormaster Coil Sensor

Routing the Sensor

Route the sensor from the Motormaster controller through the fan section end wall into Compressor 1 compartment, through the grommet used by the LAS wiring.

CRLOWAMB027A00,028A00 Installation

Materials required

Black nylon wire tie

1. Remove access panel on unit end between the two condenser coils. See Fig. 18. Save all screws.
2. Route the sensor through the hole in the coil support.
3. Pull the sensor and cable from the compressor compartment to the Circuit 1 coil header (on left-hand side facing into unit).
4. Determine the height location for the coil temperature sensor:

Brand	Model	Size	Height (A)
Carrier	48TC,	17,20,24	22 in (559 mm)
	50TC	28	26 in (660 mm)
Bryant	558J,	17,20,24	22 in (559 mm)
	580J	28	26 in (660 mm)
ICP	RAS,	210,213,240,243,	22 in (559 mm)
	RGS	300,303	26 in (660 mm)

5. Slip the wire tie behind Circuit 1 coil header and around the temperature sensor and pull until snug.
6. Recheck sensor location, then tighten the wire tie.
7. Rotate the fans at OFM1 and OFM4 (if equipped) to ensure no interference with sensor cable.
8. Replace the access panel.

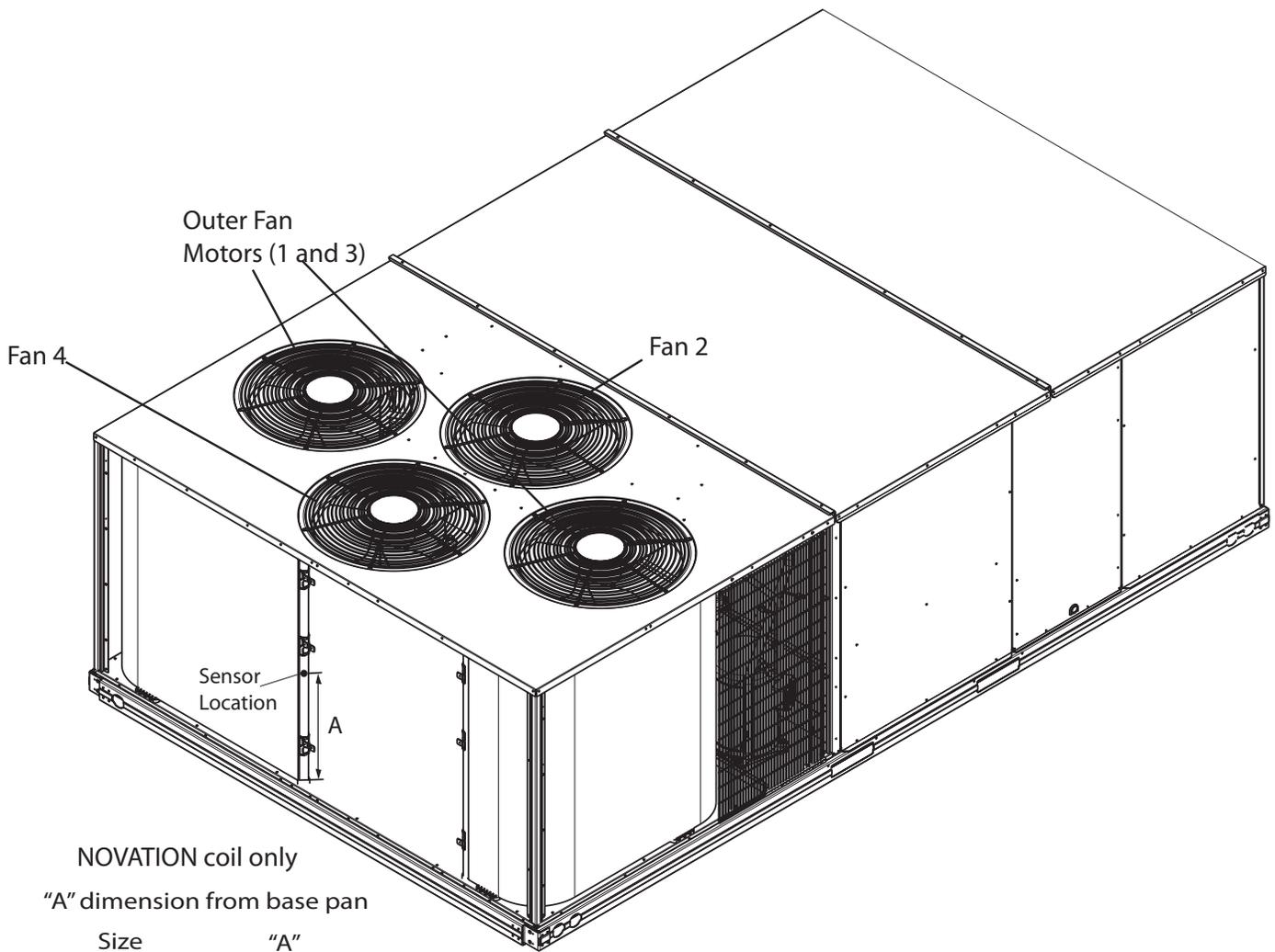
CRLOWAMB041A00,042A00 Installation

1. Route the sensor behind the compressor to the Circuit 1 coil's header end.

2. Locate the sensor location (on header tube or on return bend) per Table 3 and Fig. 20.
3. Secure temperature sensor to designated location with #4 machine screw and nut.

Table 3 – Sensor Location, 041A,042A

MODEL	UNIT SIZE	SENSOR LOCATION
48HC 50HC	17	A
	20	C
	24	B
	28	
48TC 50TC	17	A
	20	
	24	
	28	B
	30	
50TCQ	17	D
	24	
MODEL	UNIT SIZE	SENSOR LOCATION
548J	17	D
	24	
551J 581J	17	A
	20	C
	24	B
	28	
558J 580J	17	A
	20	
	24	
	28	B
30		
MODEL	UNIT SIZE	SENSOR LOCATION
RAH RGH	181,183	A
	210,213	C
	240,243	B
300,303		
RAS RGS	210,213	A
	240,243	
	300,303	B
	333,336	
RHS	181,183	D
	240,243	



NOVATION coil only

"A" dimension from base pan

Size	"A"
17, 20, 24	22"
28	26"

C09599

Fig. 18 - Sensor Location for NOVATION only / OFM Locations excludes 6-Fans (CRLOAMB027A00 and CRLOAMB028A00)

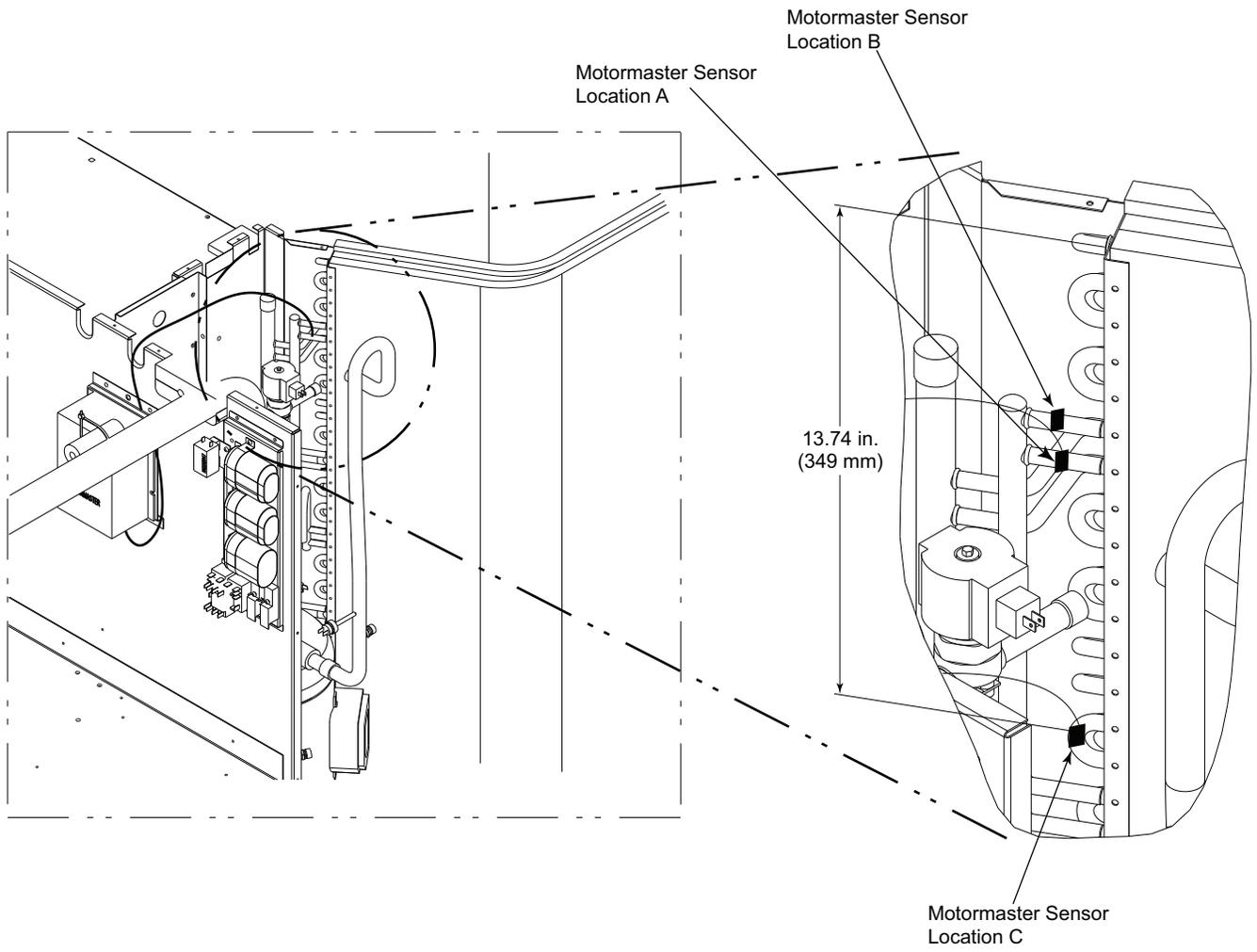


Fig. 19 - Sensor Location for Cooling RTPF (CRLOAMB041A00 and CRLOAMB042A00)

C12494

MOTOR MASTER SENSOR
LOCATION D
INSTALL TO CLOSEST
DIAGONAL HAIRPIN AT
17.00" (430.0 MM) FROM TOP

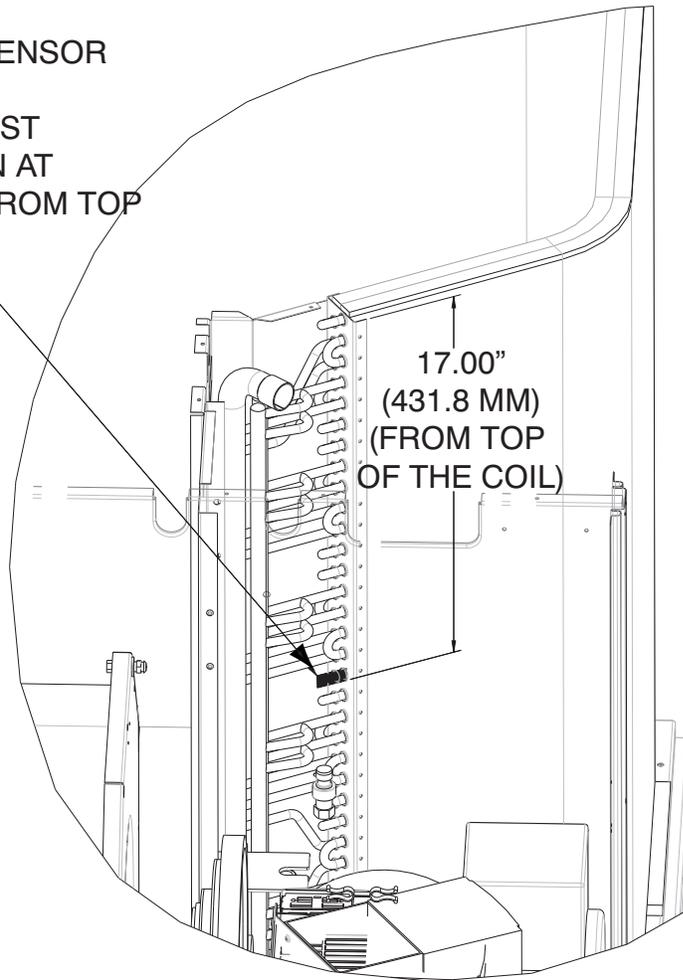


Fig. 20 - Sensor Location for RTPF Heat Pump (CRLOAMB041A00 and CRLOAMB042A00)

C12769

Install Wind Baffles

Wind baffles must be field fabricated for all units to ensure proper cooling cycle operation at low-ambient temperatures. See Fig. 21-23 for baffle details.

Use 20-gauge (4.1-mm diameter) galvanized sheet metal or similar corrosion-resistant materials for the baffles.

⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in damage to equipment.

Use extreme care when drilling holes and screwing in fasteners near outdoor coil to avoid damage to tubing.

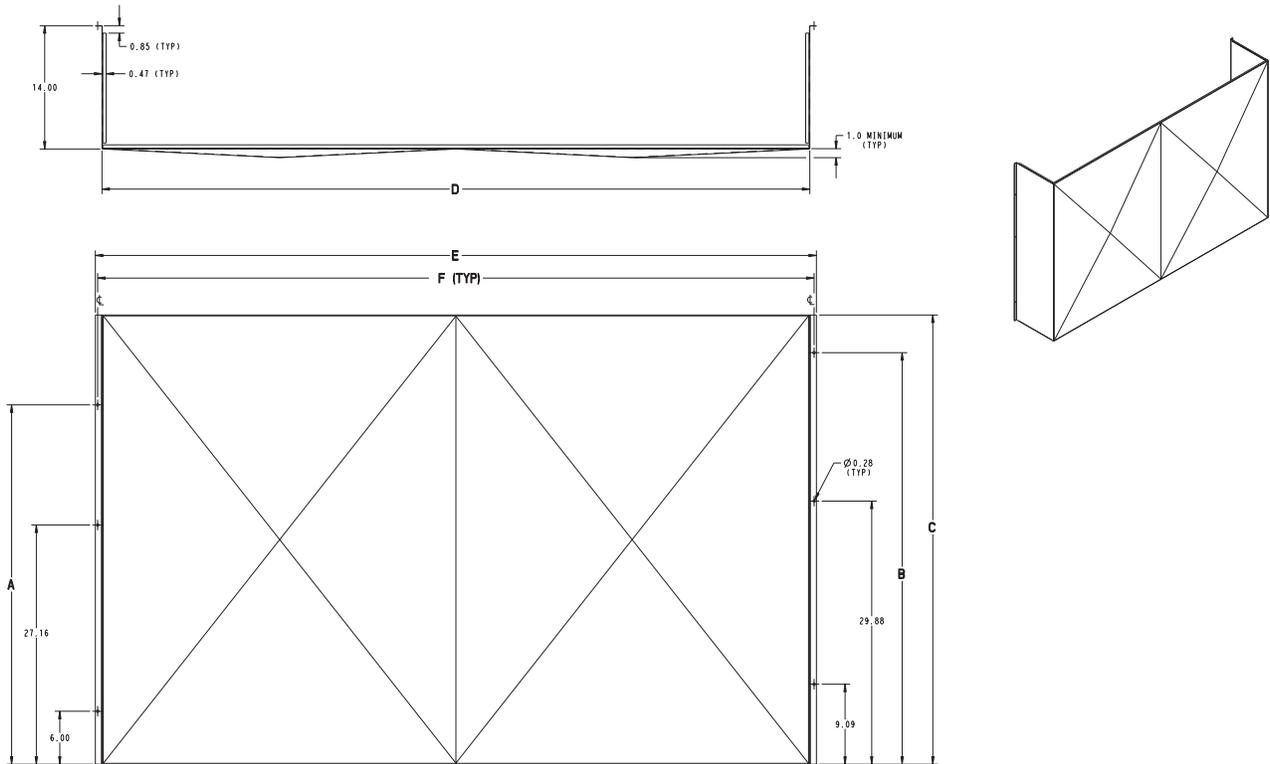
Use field-supplied screws to attach baffles to the unit. Screws should be 1/4-in. (6-mm) diameter or larger. Drill required screw holes for mounting baffles.

Wind Baffles

Fabricate wind baffles needed based on application. Refer to diagrams of wind baffles for application. (See Fig. 21-23.)

Required baffles:

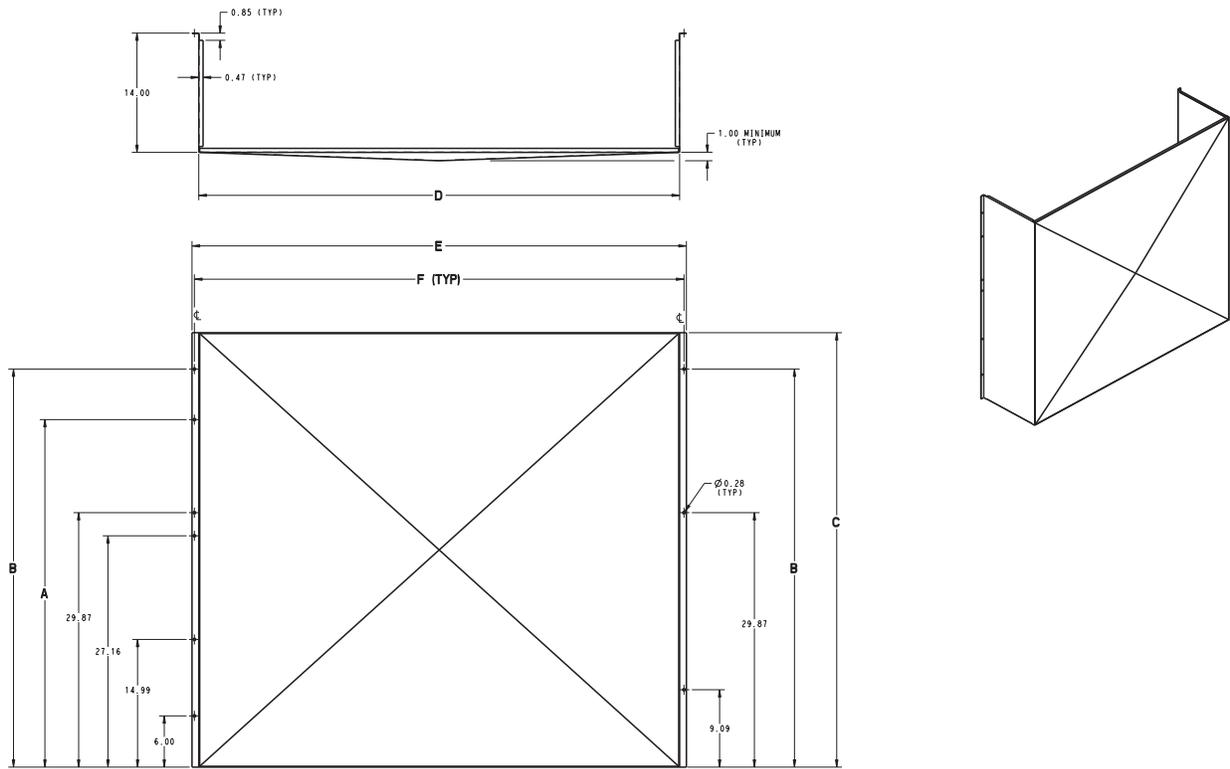
Secure wind baffles to unit as shown in diagram. (See Fig. 24.)



C101082

CARRIER MODEL	SIZE	A	B	C	D	E	F
48TC, 50TC, 50TCQ	17, 20, 24	-	-	43.00	80.25	81.75	81.22
48TC, 50TC	28, 30	40.80	46.72	51.00	80.25	81.75	81.22
48HC, 50HC	17, 20	-	-	43.00	80.25	81.75	81.22
48HC, 50HC	24, 28	40.80	46.72	51.00	80.25	81.75	81.22
BRYANT MODEL	SIZE	A	B	C	D	E	F
580J, 558J, 548J	17, 20, 24	-	-	43.00	80.25	81.75	81.22
580J, 558J	28, 30	40.80	46.72	51.00	80.25	81.75	81.22
551J, 581J	17, 20	-	-	43.00	80.25	81.75	81.22
551J, 581J	24, 28	40.80	46.72	51.00	80.25	81.75	81.22
ICP MODEL	SIZE	A	B	C	D	E	F
RGS RAS, RHS	181, 183, 210, 213, 240, 243	-	-	43.00	80.25	81.75	81.22
RGS RAS	300, 303, 333, 336	40.80	46.72	51.00	80.25	81.75	81.22
RAH, RGH	181, 183, 210, 213	-	-	43.00	80.25	81.75	81.22
RAH, RGH	240, 243, 300, 303	40.80	46.72	51.00	80.25	81.75	81.22

Fig. 21 - End Wind Baffle



C09597

CARRIER MODEL	SIZE	A	B	C	D	E	F	UNIT HEIGHT
48TC, 50TC, 50TCQ	17, 20	-	-	43.00	39.50	41.00	40.47	44.00
48TC, 50TC, 50TCQ	24	-	-	43.00	53.13	54.63	54.09	44.00
48TC, 50TC	28	40.80	46.72	51.00	53.13	54.63	54.09	52.00
48TC, 50TC	30	40.80	46.72	51.00	69.25	70.75	70.22	52.00
48HC, 50HC	17	-	-	43.00	39.50	41.00	40.47	44.00
48HC, 50HC	20	-	-	43.00	53.13	54.63	54.09	44.00
48HC, 50HC	24	40.80	46.72	51.00	53.13	54.63	54.09	52.00
48HC, 50HC	28	40.80	46.72	51.00	69.25	70.75	70.22	52.00
BRYANT MODEL	SIZE	A	B	C	D	E	F	UNIT HEIGHT
548J, 558J, 580J	17, 20	-	-	43.00	39.50	41.00	40.47	44.00
548J, 558J, 580J	24	-	-	43.00	53.13	54.63	54.09	44.00
558J, 580J	28	40.80	46.72	51.00	53.13	54.63	54.09	52.00
558J, 580J	30	40.80	46.72	51.00	69.25	70.75	70.22	52.00
551J, 581J	17	-	-	43.00	39.50	41.00	40.47	44.00
551J, 581J	20	-	-	43.00	53.13	54.63	54.09	44.00
551J, 581J	24	40.80	46.72	51.00	53.13	54.63	54.09	52.00
551J, 581J	28	40.80	46.72	51.00	69.25	70.75	70.22	52.00
ICP MODEL	SIZE	A	B	C	D	E	F	UNIT HEIGHT
RAS, RGS, RHS	181, 183, 210, 213	-	-	43.00	39.50	41.00	40.47	44.00
RAS, RGS, RHS	240, 243	-	-	43.00	53.13	54.63	54.09	44.00
RAS, RGS	300, 303	40.80	46.72	51.00	53.13	54.63	54.09	52.00
RAS, RGS	333, 336	40.80	46.72	51.00	69.25	70.75	70.22	52.00
RAH, RGH	181, 183	-	-	43.00	39.50	41.00	40.47	44.00
RAH, RGH	210, 213	-	-	43.00	53.13	54.63	54.09	44.00
RAH, RGH	240, 243	40.80	46.72	51.00	53.13	54.63	54.09	52.00
RAH, RGH	300, 306	40.80	46.72	51.00	69.25	70.75	70.22	52.00

Fig. 22 - Side Wind Baffle

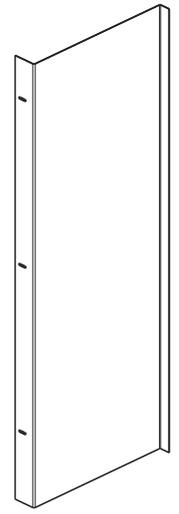
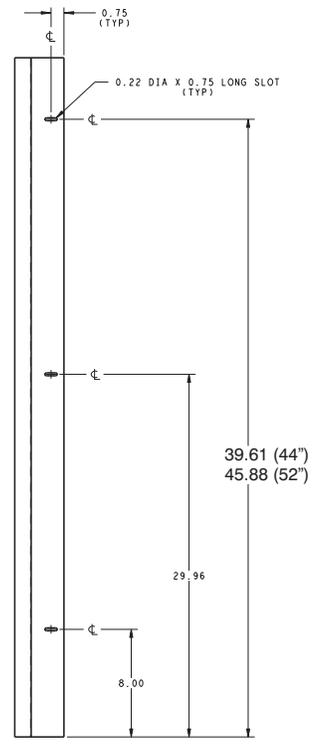
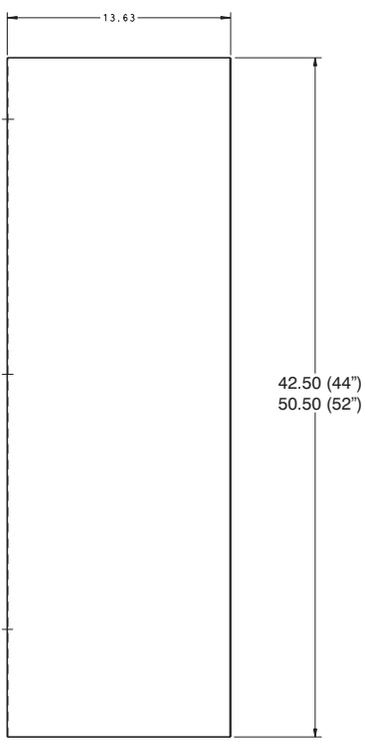
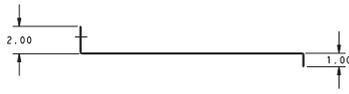


Fig. 23 - End Wind Baffle Support

C12758

Description	Quantity
End Wind Baffle	1
Side Wind Baffle	1
End Wind Baffle Support	1 (2*)

*Support for 6 fan unit.

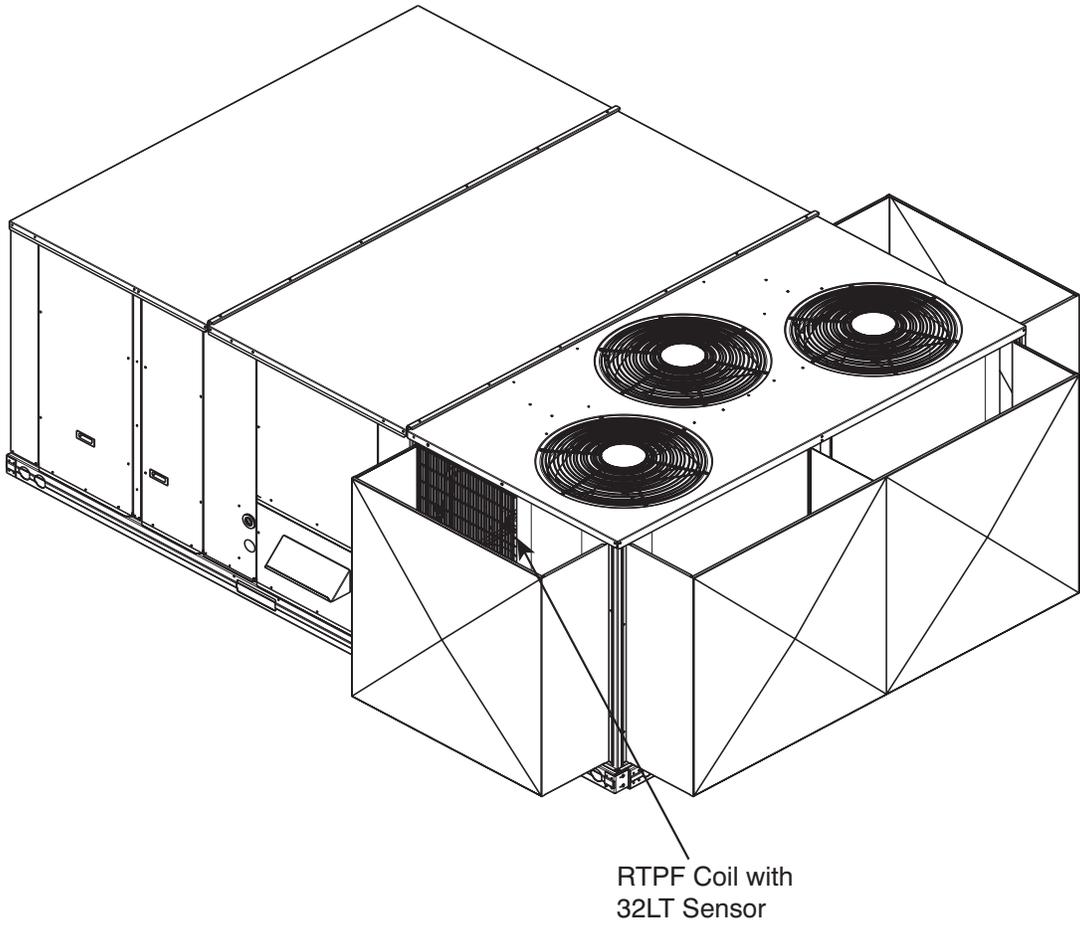


Fig. 24 - Wind Baffles Secured to Unit

C09600

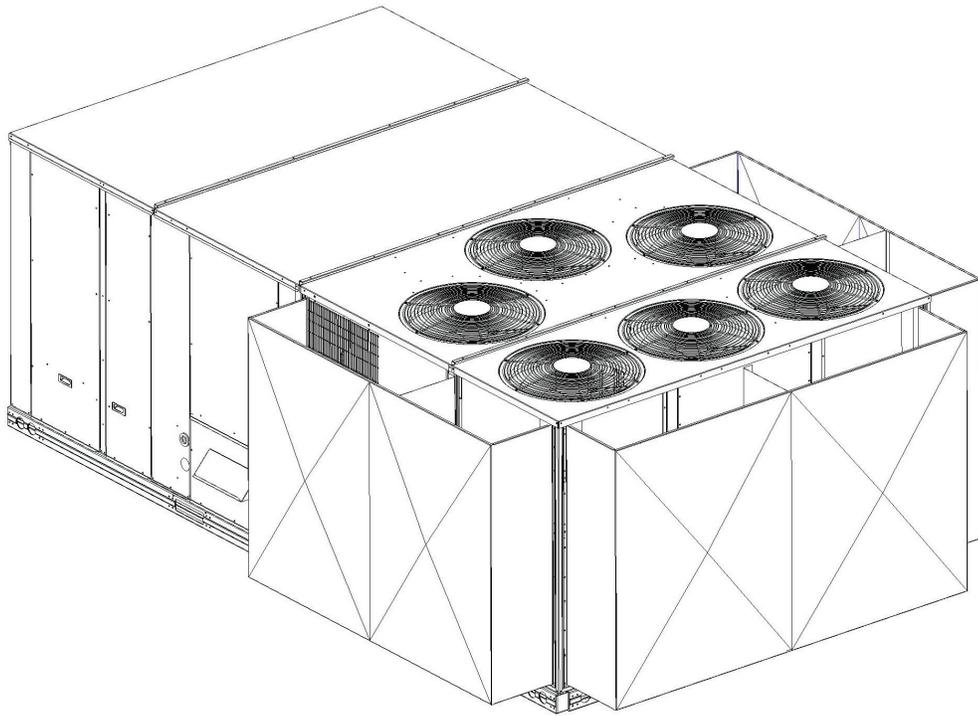


Fig. 25 - Wind Baffle Secured to 6 Fan Unit

C12767

OPERATING SEQUENCE

FAN SYSTEM OPERATION WITH MOTORMASTER

This accessory head pressure control for system operation in mild and low ambient temperature conditions is a mix of outdoor fan staging and speed control on two outdoor fans.

SPEED CONTROL (MOTORMASTER)

General

As low outdoor ambient conditions or reduced condenser loads allow the Saturated Condensing Temperature to approach 100 F (38 C) at the Motormaster temperature sensor location, the Motormaster controller will reduce the outdoor fan motor speed in two outdoor fan motors, at positions OFM1 and OFM3. The reduction in motor speed reduces the condenser fan air quantity until the condensing temperature decrease is stabilized. While operating in this reduced load range, the Motormaster controller may command motor speeds between full rpm and zero rpm.

FAN STAGING CONTROL

This accessory control also provides staging control of all fan motors not controlled by Motormaster. Temperature switch LAS senses outdoor air temperature (entering the Compressor 1 compartment). The LAS switch opens on temperature fall at 42 F (6 C) and resets closed at 57 F (14 C). When LAS opens, relay LAR is de-energized, its contacts open and the non-speed control fan motors are de-energized.

COOLING Models

The unit's outdoor fans are controlled through contactor OFC. On a thermostat Y1 call for Cooling, the OFC is energized, the Motormaster controller is energized. If the ambient temperature is above the LAS reset temperature, relay LAR is energized, its contacts close and all fan motors not managed by Motormaster controller will start and run. Until Compressor 1 starts and runs to increase the coil temperature, the two Motormaster-controlled fan motors will remain at zero rpm. When Compressor 1 runs, the condenser coil temperature at the coil temperature sensor location will increase and the Motormaster will command motor speeds to increase.

The Motormaster controller temperature sensor is mounted on Circuit 1 only. If Circuit 1's compressor operation is not available, then both outdoor fan motors will be ramped down to zero rpm as Circuit 1 coil temperature cools below 80°F (27°C). Circuit 2 operation is not available when Circuit 1 is off.

LOC Switches -- The unit's two factory Low Pressure Switches (LPS1 and LPS2) are replaced by LOC of Charge (LOC) switches. The setpoint for the LOC switches is open on pressure fall at 27 psig (185 kPa), reset closed at 44 psig (303 kPa). If the LOC opens due to low suction pressure, the contactor coil in that circuit is de-energized and compressor shuts off. On Circuit 1, all outdoor fans also stop. Reset is automatic when suction pressure increases to reset level.

FPT Switches -- The low ambient control accessory adds Freeze Protection Thermostats (FPT) on each evaporator circuit. The FPT setpoint is open on temperature fall at

30°F (-1°C) and reset closed at 45°F (7°C). If the FPT opens due to low evaporator surface temperature, the contactor coil in that circuit is de-energized and compressor shuts off. On Circuit 1, all outdoor fans also stop. Reset is automatic when coil temperature increases to reset level.

HEAT PUMP Models

The heat pump unit's three or four outdoor fans are controlled through contactor OFC with sequence logic from Defrost Board via output OF. OFM1 and OFM3 are also controlled through a Motormaster head pressure controller during Cooling mode. OFM2 and OFM4 (when used) are also controlled through Fan Staging Control. Relay Motormaster Relay (MMR) is energized during Heating to bypass the Motormaster control.

On a thermostat Y1 call for Cooling, the Defrost Board output OF will energize contactor OFC; outdoor fan motor operation is enabled. OFM2 and OFM4 (on 4-OFM unit) start immediately. If the CADM anti-recycle timer has expired and compressor operation is permitted, contactor C1 will be energized, Compressor 1 will start and run and condenser coil temperature will increase. Fan motors OFM1 and OFM3 will start and speed will ramp up as condenser coil temperature increases, reaching full speed rpm as coil temperature rises above 100°F (38°C).

On a thermostat W1 call for Heating, relay MMR is energized; its contacts bypass the Motormaster output, forcing fan motors OFM1 and OFM3 to run at full speed when enabled by contactor OFC. Defrost Board output OF energizes contactor OFC; outdoor fan motors OFM2 and OFM4 also start and run at full speed.

During Heating, a Defrost cycle will cause the Defrost Board output OF to be removed; contactor OFC is de-energized and all fan motors will stop for the duration of the Defrost cycle.

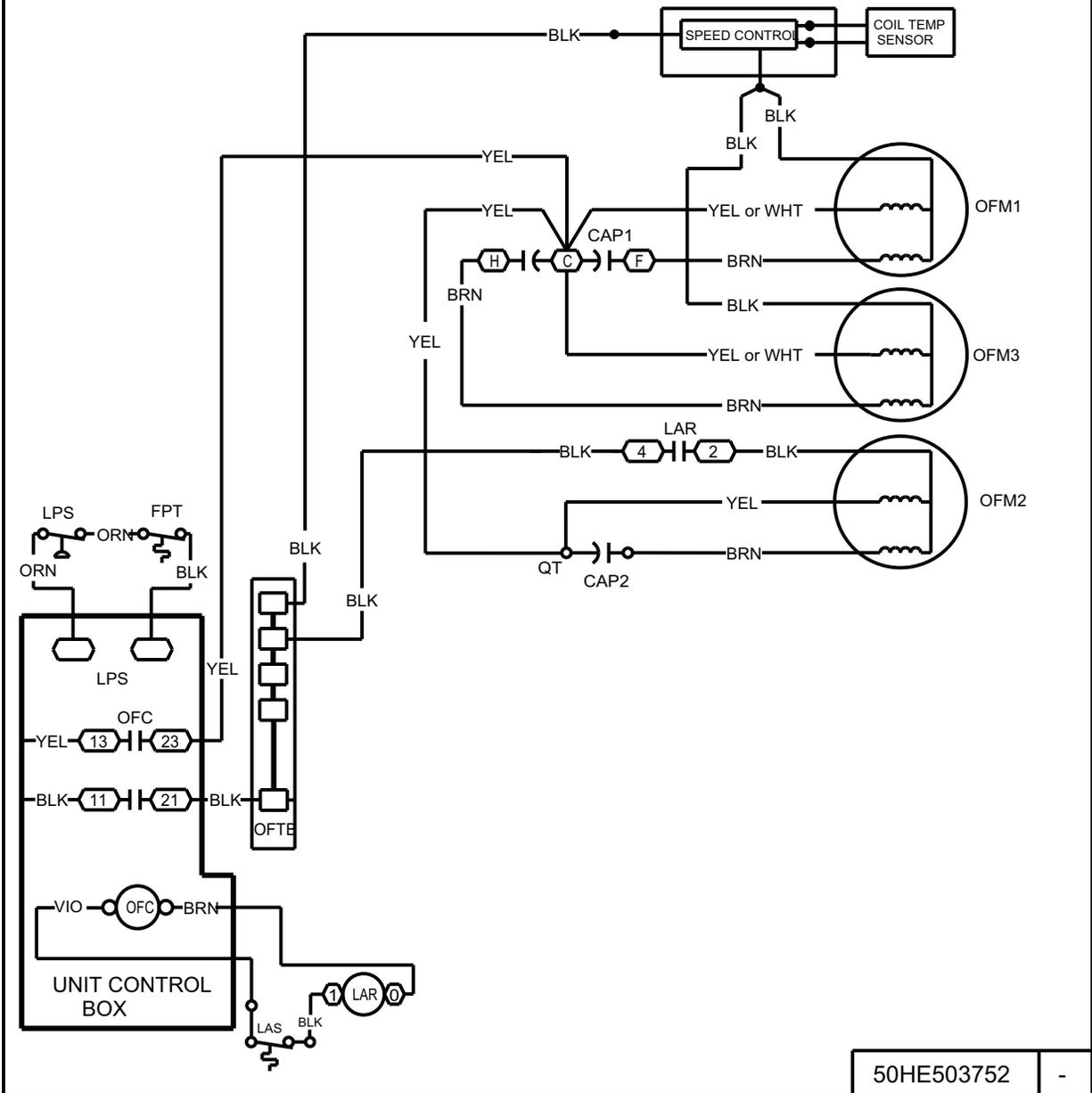
TROUBLESHOOTING

OBSERVATION	POSSIBLE REMEDY
Fans won't start	All fans: Check power & wiring Check outdoor fan relay (OFR) Check speed control sensor location Check speed sensor resistance
Cooling – Slow fan speed for fans at start or during low outdoor ambient	Normal operation
Cooling – Slow fan speed for fans above 85°F (29°F) outdoor ambient (should be full speed)	Check speed control sensor location Check speed control sensor resistance Check fan motor capacitor
Cooling – motor current into speed control is greater than motor name-plate FLA	Normal operation Up to 30% higher amps at partial speed at low ambient

Speed Control Sensor Resistance

TEMPERATURE		RESISTANCE
°F +/-2°F°	°C +/-1C	Ohms, nominal
-22	-30	88350
-4	-20	48485
14	-10	27650
32	0	16325
50	10	9950
68	20	6245
77	25	5000
86	30	4028
104	40	2663
122	50	1801
140	60	1244
158	70	876

STD TIER MOTORMASTER WIRING 208/230, 460V 3FAN UNIT



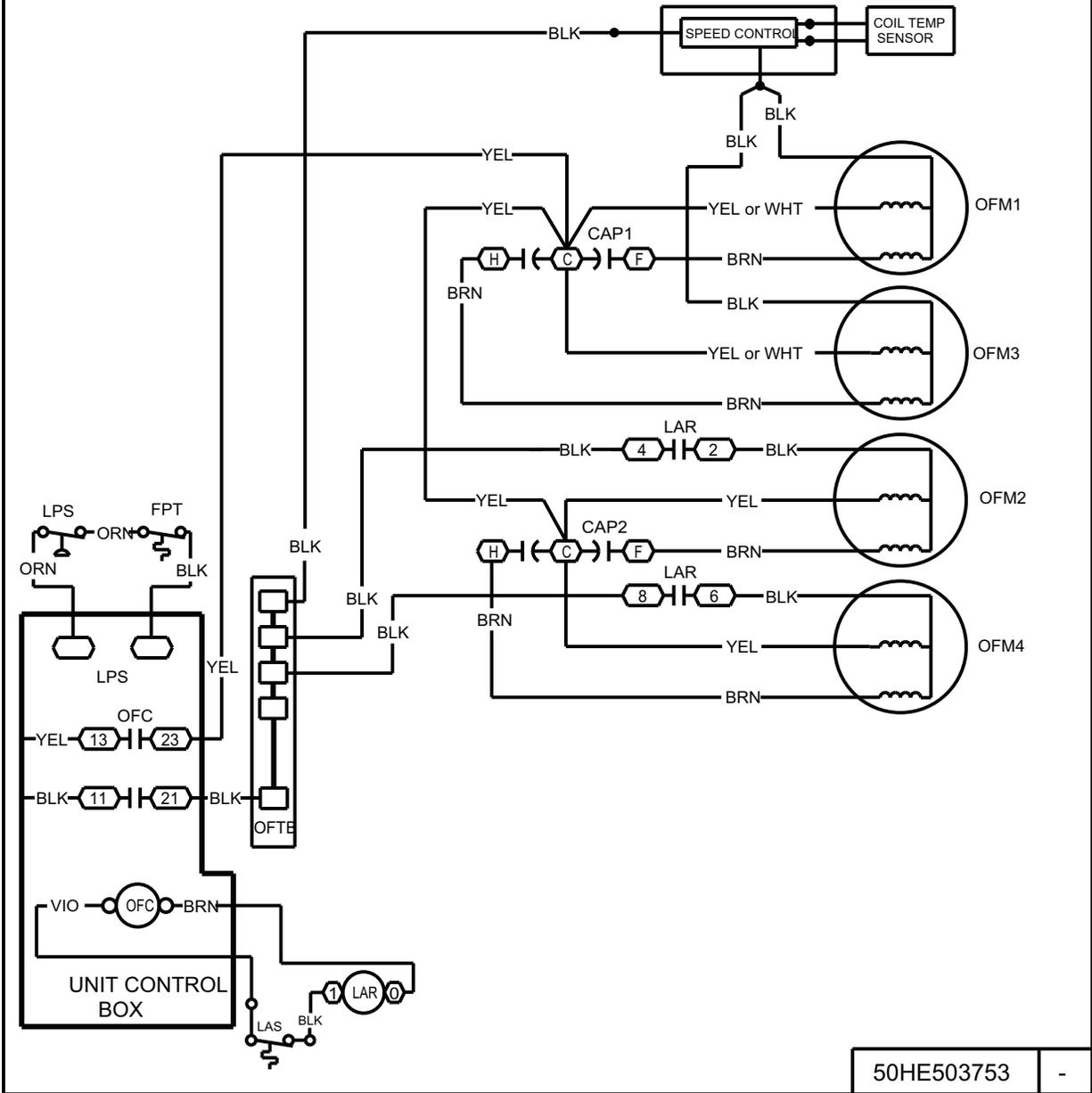
50HE503752

-

Fig. 26 - Motormaster Wiring Diagram 208/230, 460v Standard Tier 3-Fan Unit

C13395

STD TIER MOTORMASTER WIRING 208/230, 460V 4 FAN UNIT



50HE503753

-

Fig. 27 - Motormaster Wiring 208/230, 460v Standard Tier 4-Fan Unit

C13407

STD TIER MOTORMASTER WIRING 208/230, 460V 6FAN UNIT

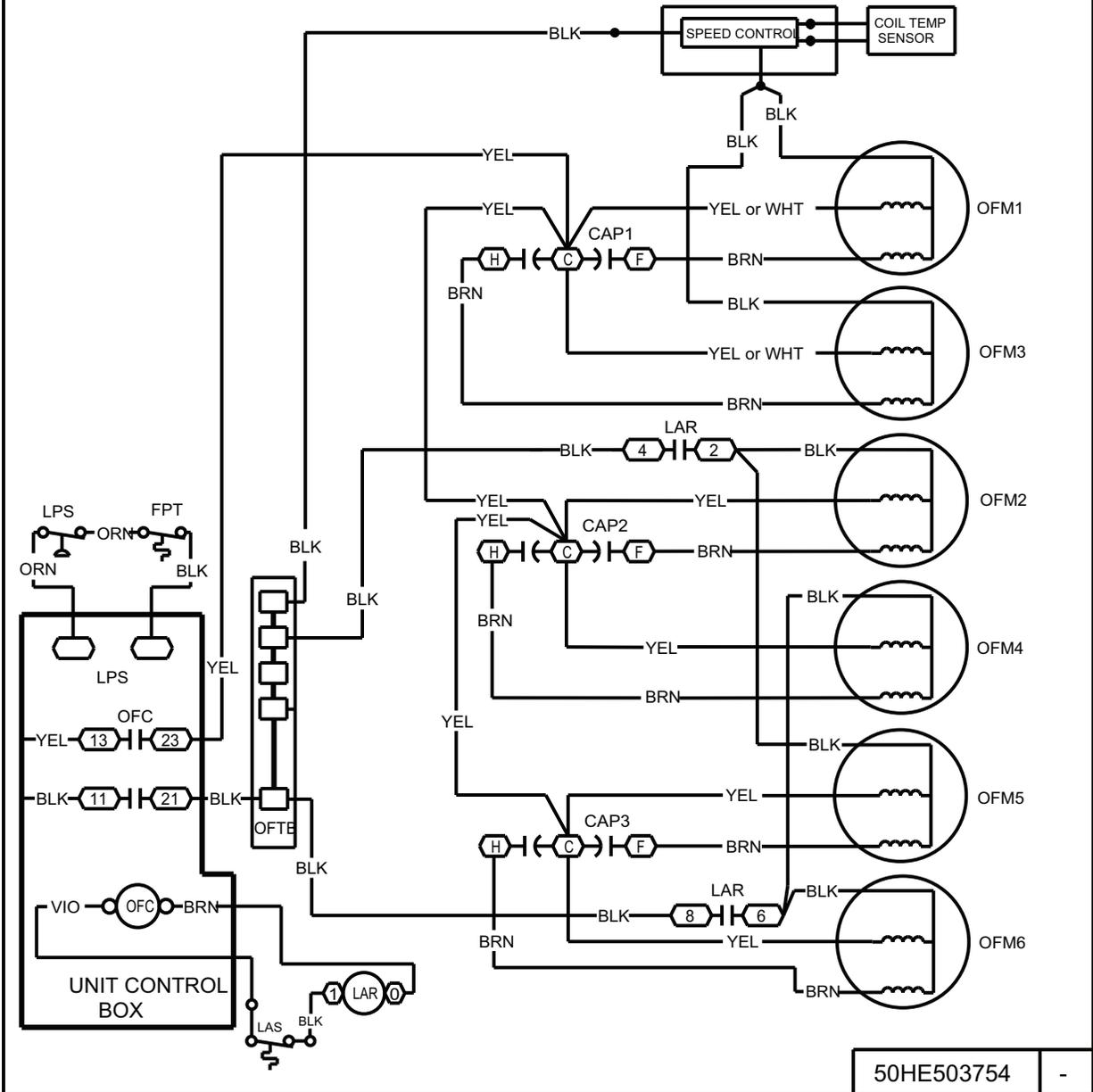
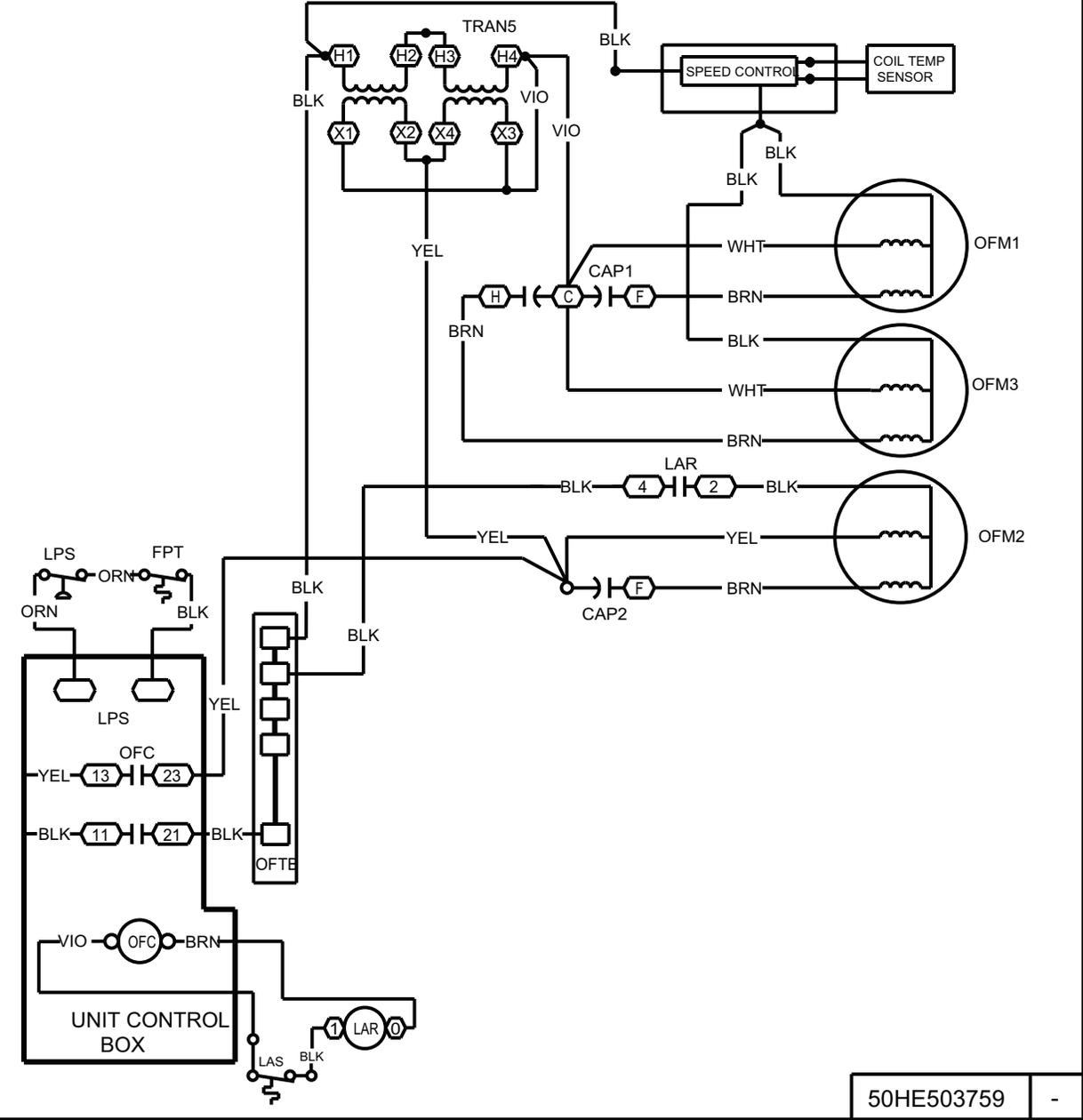


Fig. 28 - Motormaster Wiring Diagram 208/230, 460v Standard Tier 6-Fan Unit

C13404

STD TIER MOTORMASTER TRANSFORMER WIRING 575V TO 460V 3FAN UNIT



50HE503759 -

Fig. 29 - Motormaster Transformer Wiring 575v to 460v Standard Tier 3-Fan Unit

C13398

STD TIER MOTORMASTER TRANSFORMER WIRING 575V TO 460V 4FAN UNIT

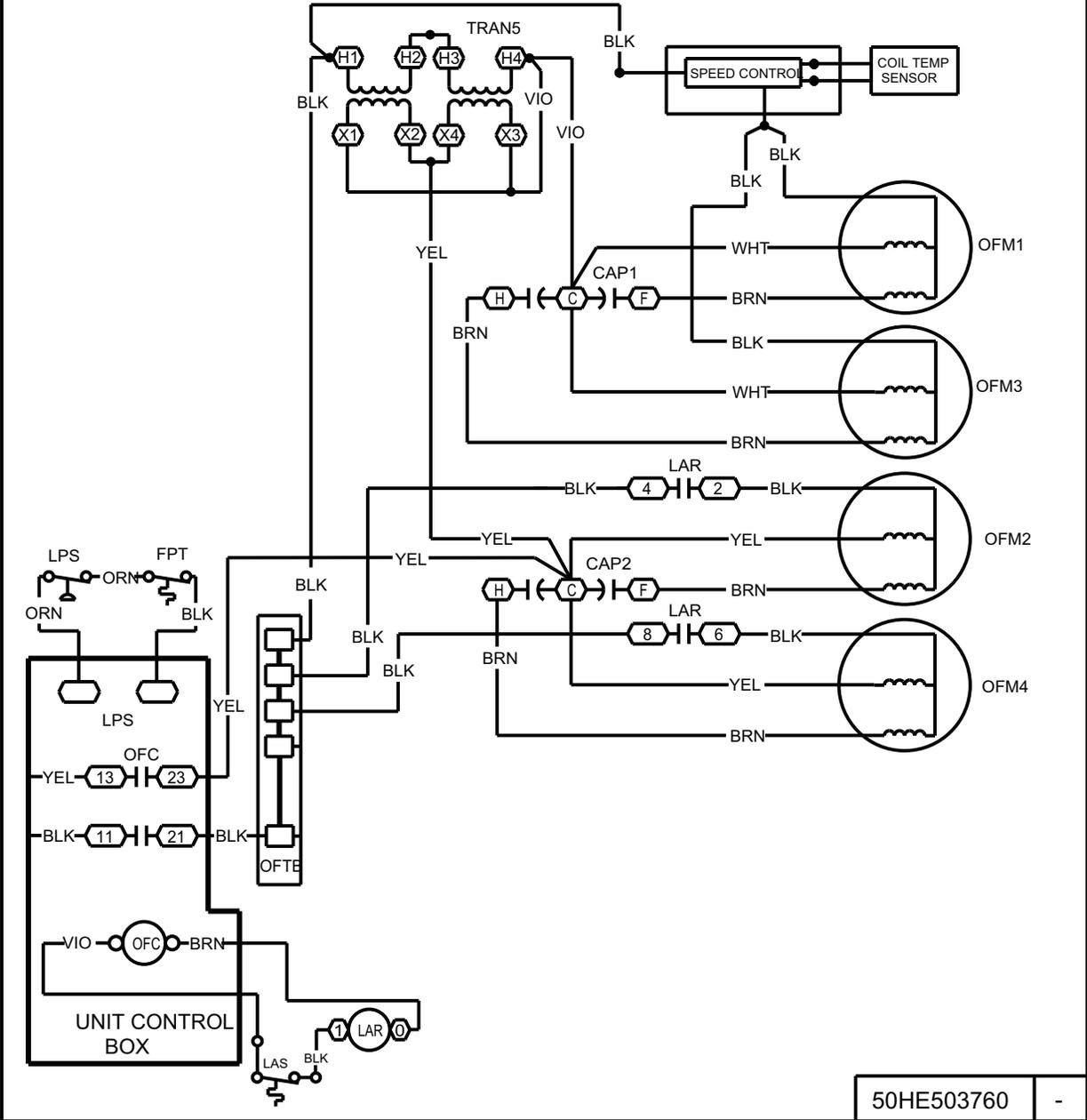


Fig. 30 - Motormaster Transformer Wiring 575v to 460v Standard Tier 4-Fan Units

C13401

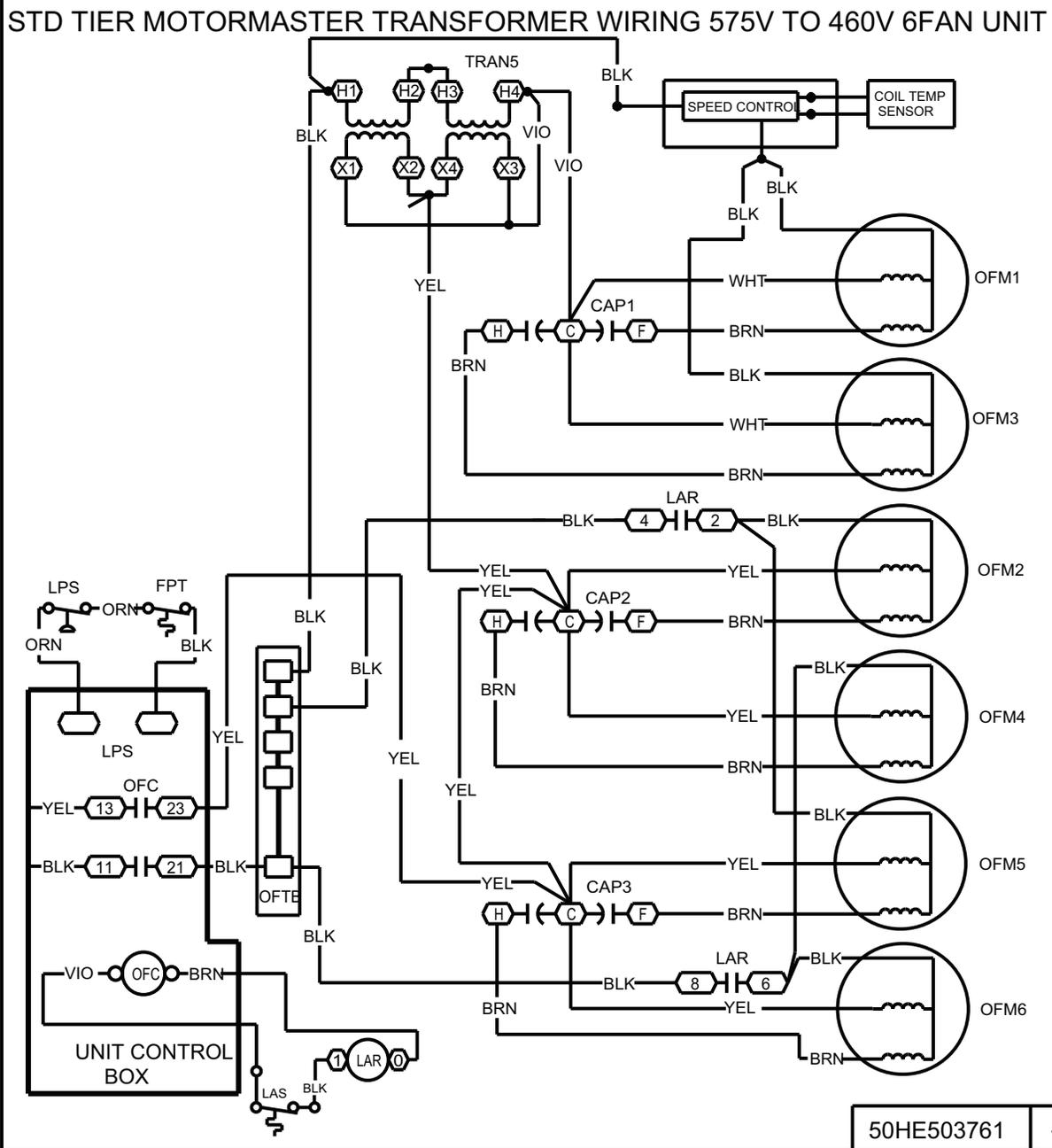
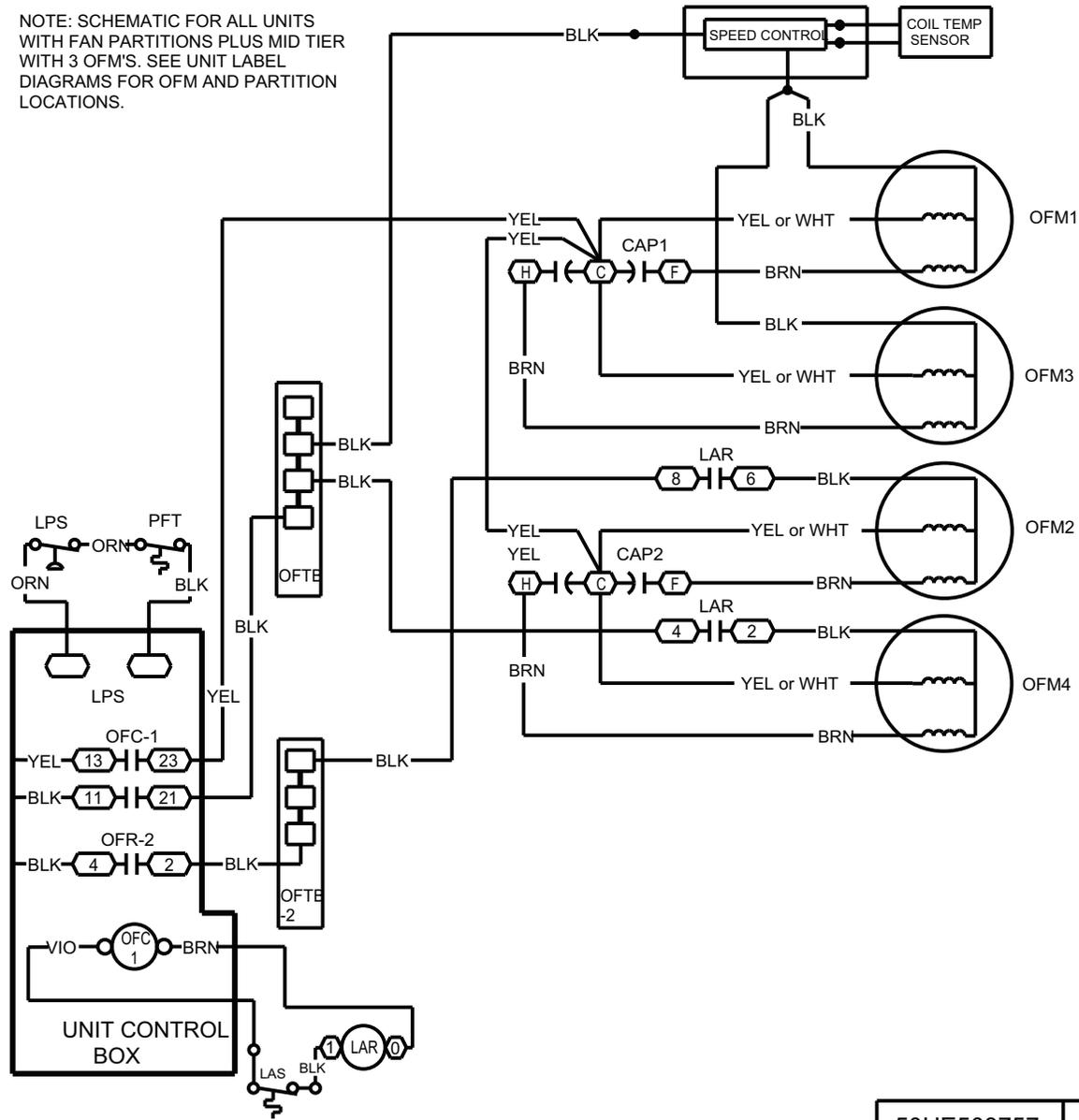


Fig. 31 - Motormaster Transformer Wiring 575v to 460v Standard Tier 6-Fan Unit

C13405

MID TIER MOTORMASTER WIRING 208/230, 460V 4FAN UNIT

NOTE: SCHEMATIC FOR ALL UNITS WITH FAN PARTITIONS PLUS MID TIER WITH 3 OFM'S. SEE UNIT LABEL DIAGRAMS FOR OFM AND PARTITION LOCATIONS.



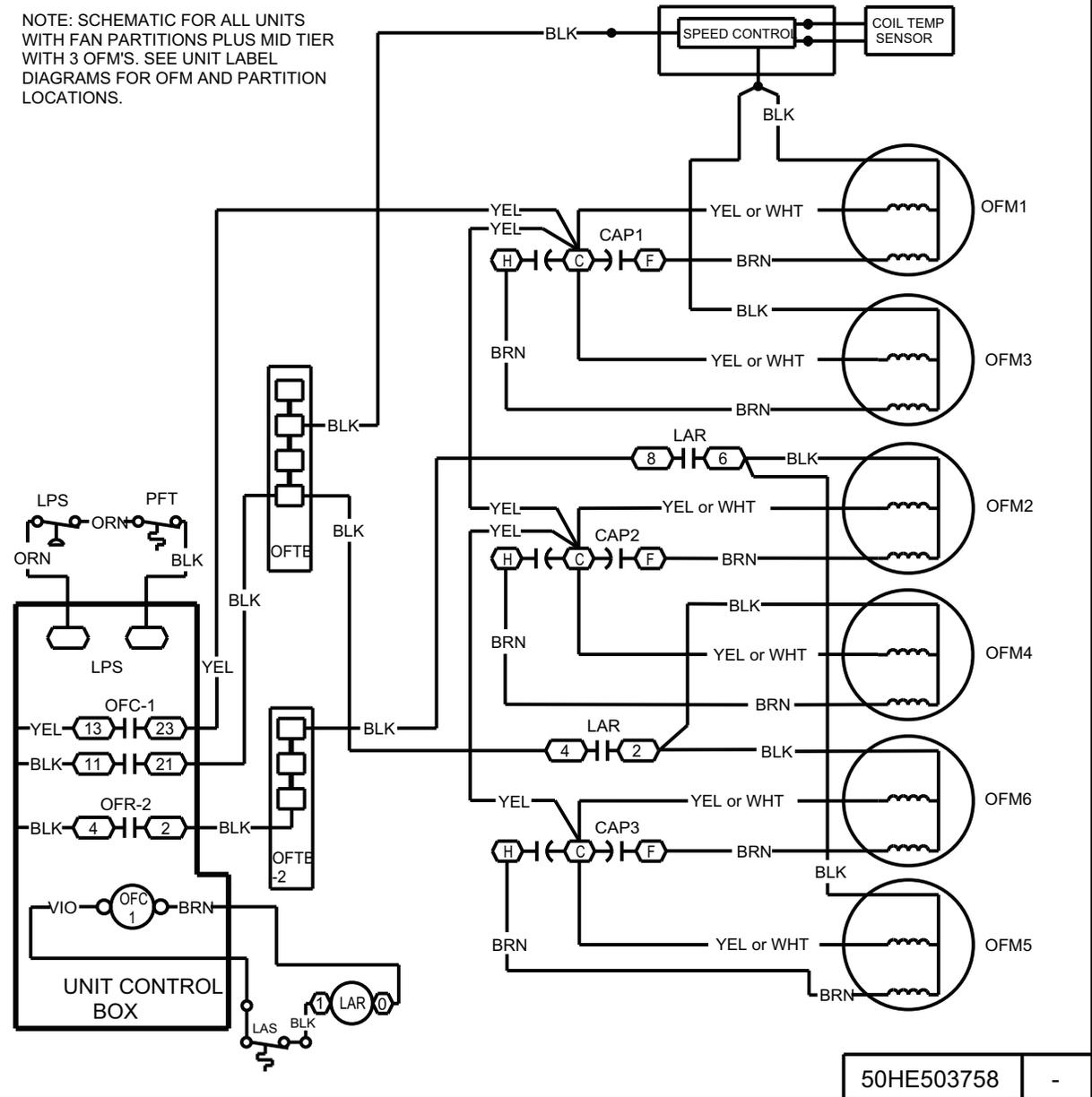
50HE503757 -

Fig. 32 - Motormaster Wiring 208/230, 460v Mid Tier 4-Fan Unit

C13402

MID TIER MOTORMASTER WIRING 208/230, 460V 6FAN UNIT

NOTE: SCHEMATIC FOR ALL UNITS WITH FAN PARTITIONS PLUS MID TIER WITH 3 OFM'S. SEE UNIT LABEL DIAGRAMS FOR OFM AND PARTITION LOCATIONS.



50HE503758

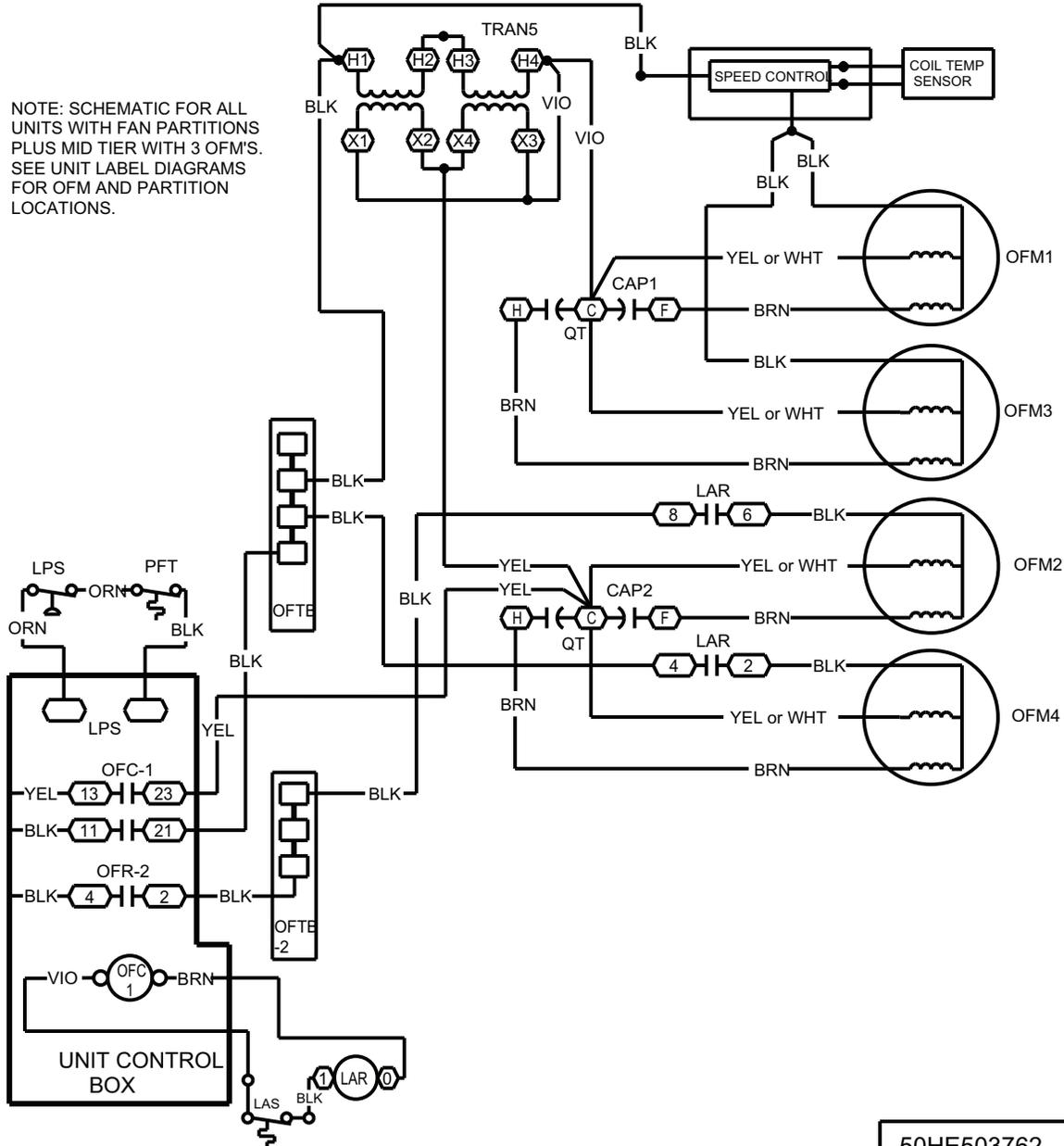
-

Fig. 33 - Motormaster Wiring 208/230, 460v Mid Tier 6-Fan Unit

C13406

MID TIER MOTORMASTER TRANSFORMER WIRING 575V TO 460V 4FAN UNIT

NOTE: SCHEMATIC FOR ALL UNITS WITH FAN PARTITIONS PLUS MID TIER WITH 3 OFM'S. SEE UNIT LABEL DIAGRAMS FOR OFM AND PARTITION LOCATIONS.



50HE503762

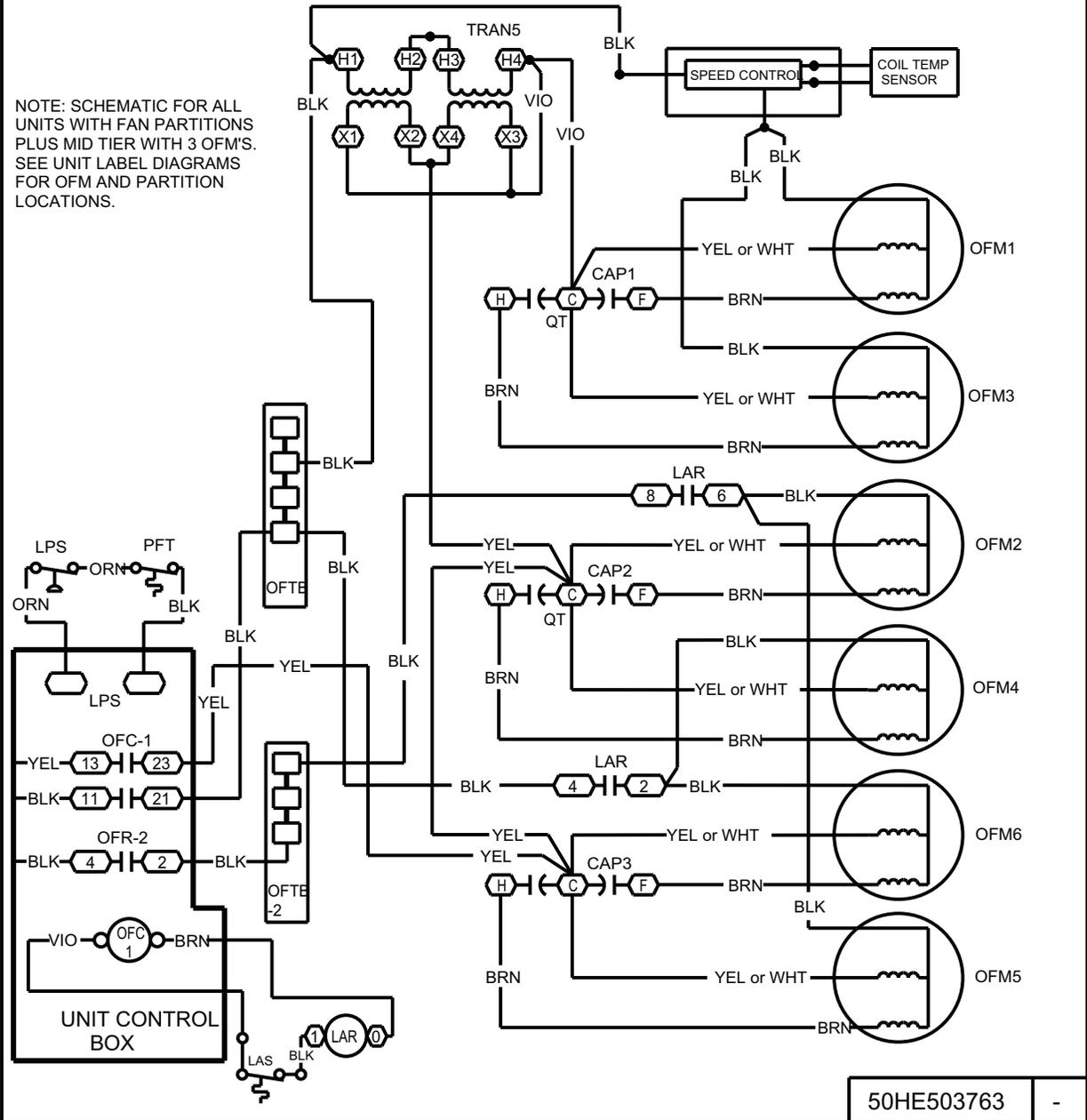
-

Fig. 34 - Motormaster Transformer Wiring 575v to 460v Mid Tier 4-Fan Units

C13403

MID TIER MOTORMASTER TRANSFORMER WIRING 575V TO 460V 6FAN UNIT

NOTE: SCHEMATIC FOR ALL UNITS WITH FAN PARTITIONS PLUS MID TIER WITH 3 OFM'S. SEE UNIT LABEL DIAGRAMS FOR OFM AND PARTITION LOCATIONS.

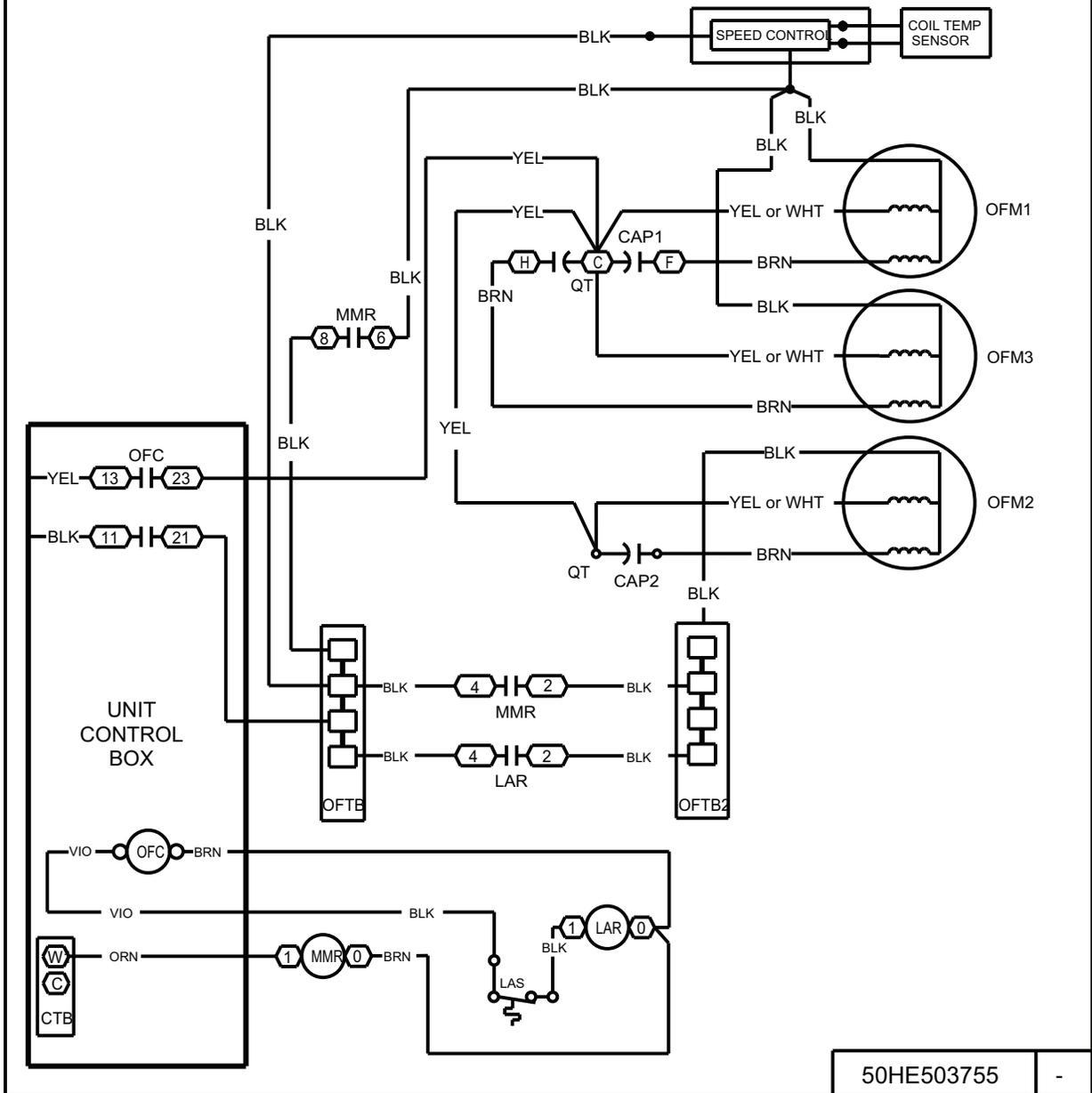


50HE503763 -

Fig. 35 - Motormaster Transformer Wiring 575v to 460v Mid Tier 6-Fan Unit

C13397

STD TIER HEAT PUMP MOTORMASTER WIRING 208/230, 460V 3FAN

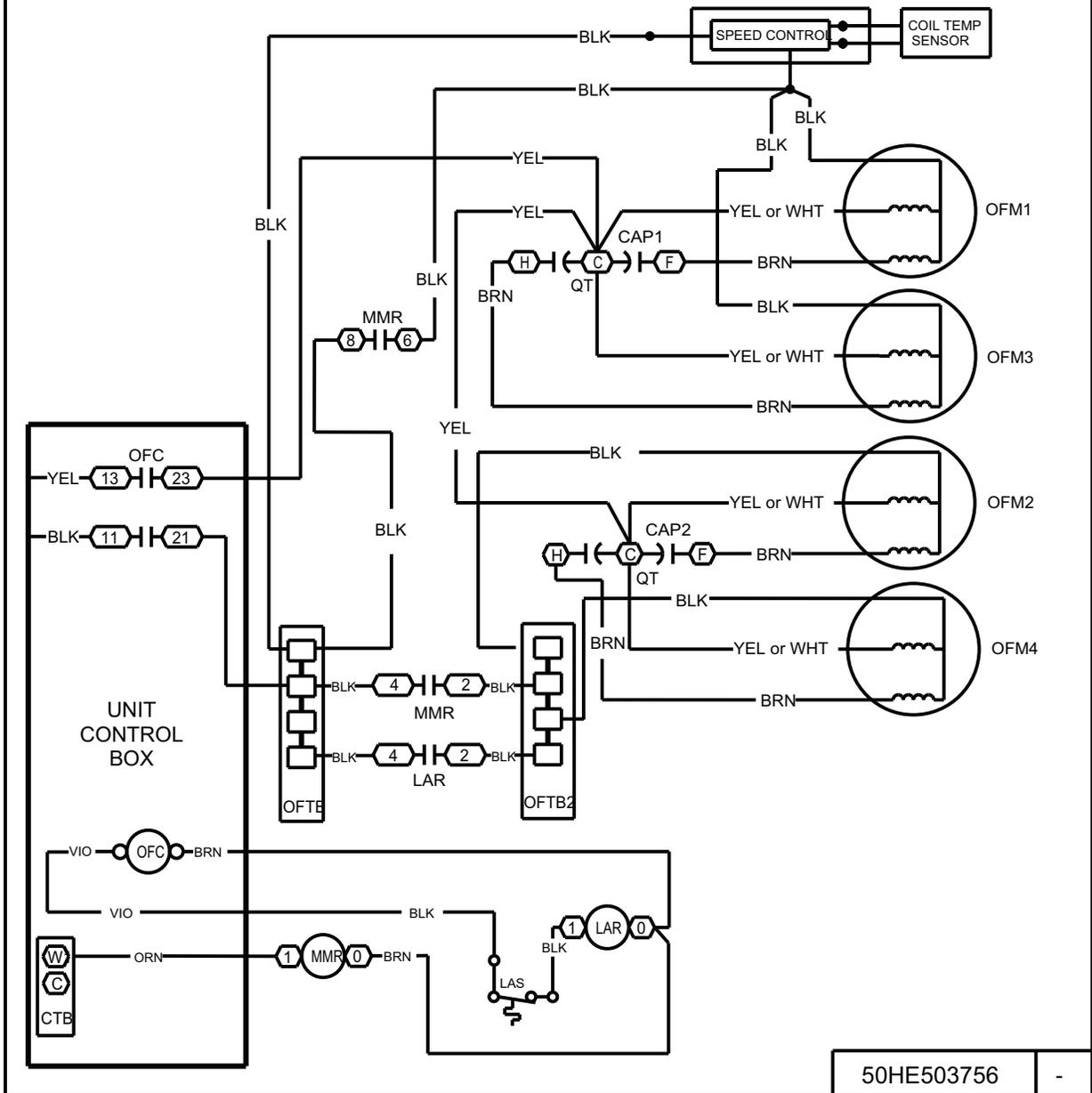


50HE503755 -

Fig. 36 - Motormaster Wiring Diagram 208/230, 460v Standard Tier 3-Fan Unit

C13396

STD TIER HEAT PUMP MOTORMASTER WIRING 208/230, 460V 4FAN

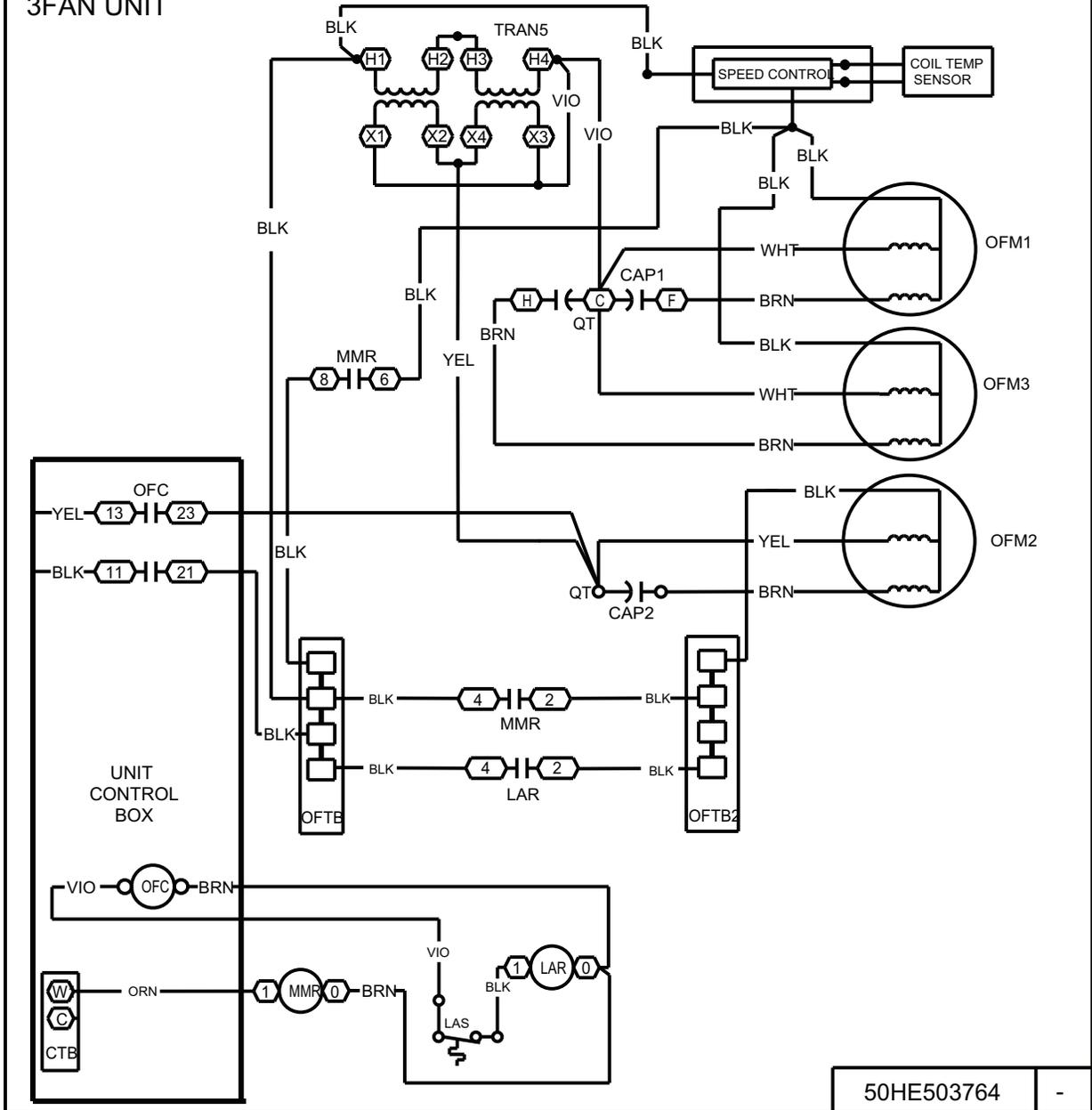


50HE503756 -

Fig. 37 - Motormaster Wiring 208/230, 460v Standard Tier 4-Fan Unit

C13399

STD TIER HEAT PUMP MOTORMASTER TRANSFORMER WIRING 575V TO 460V
3FAN UNIT



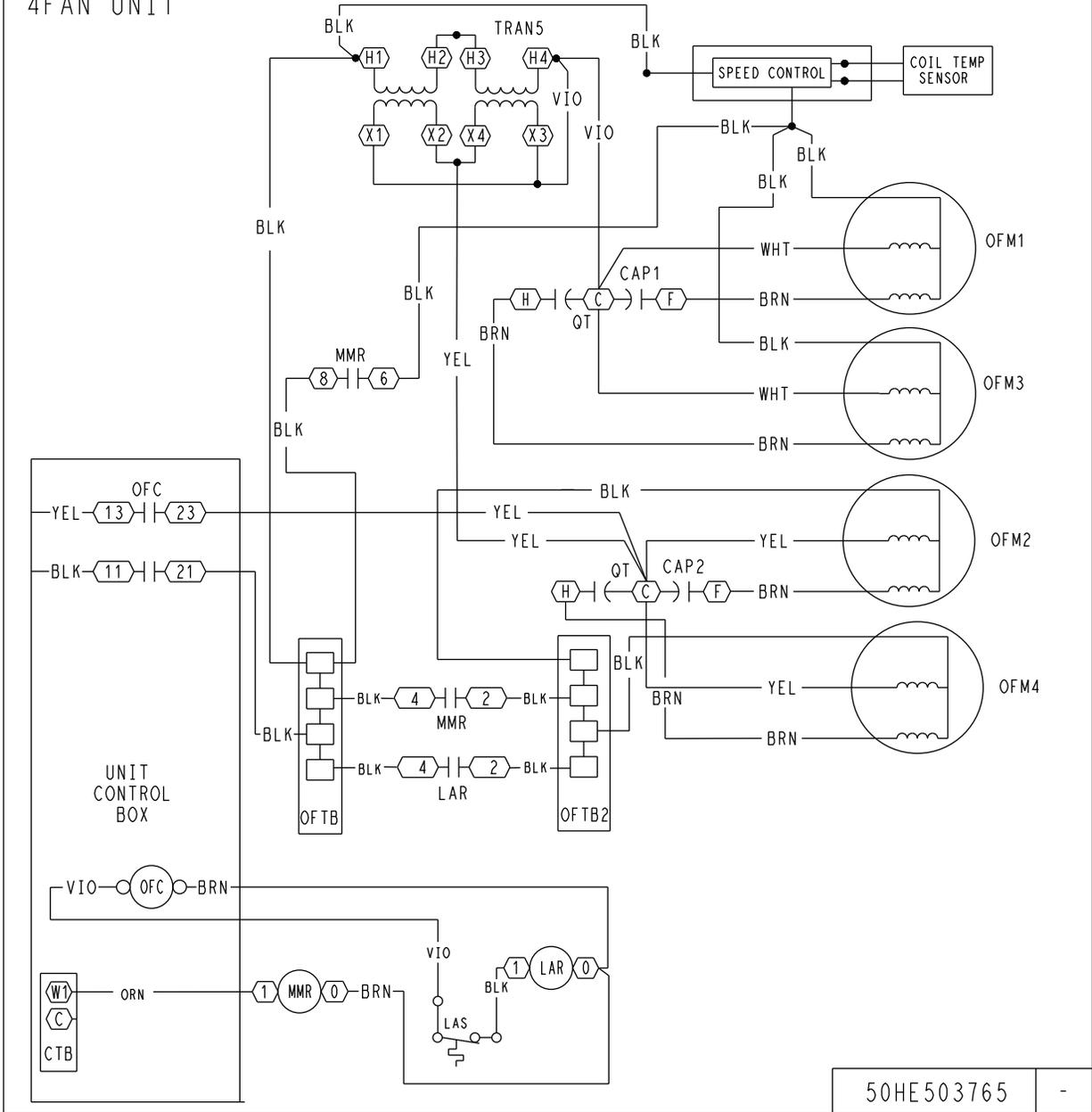
50HE503764

-

Fig. 38 - Motormaster Transformer Wiring 575v to 460v Standard Tier Heat Pump 3-Fan Unit

C13400

STD TIER HEAT PUMP MOTORMASTER TRANSFORMER WIRING 575V TO 460V
4FAN UNIT



50HE503765

-

C13435

Fig. 39 - Motormaster Wiring 575v Standard Tier 4-Fan Unit

