CRLOWAMB039A00
CRLOWAMB040A00
CRTRXKIT002A00
CRLWHPKT001A00

ACCESSORY MOTORMASTER I HEAD PRESSURE CONTROL KIT FOR SELECT 12 to 16 SIZE MODELS

Installation Instructions

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

NOTE: See last page of this manual for models and sizes.

PACKAGE CONTENTS

CRLOWAMB039A00, CRLOWAMB040A00

ITEM	QTY
Motormaster I Controller (32LT900300)	1 (CRLOWAMB039A00 Only)
Motormaster I Controller (32LT900610)	1 (CRLOWAMB040A00 Only)
Motor (HC40GE239)	3 (CRLOWAMB039A00 Only)
Motor (HC40GE469)	3 (CRLOWAMB040A00 Only)
Snap−in Wire Tie	6
Wire Tie	8
Schematic Diagram	1
Warning Label	3
Star Washer	6
#8−32 Nut	4
#10−5/8 Screw	3
#10−3/4 Self−Drilling Screw	4
Seal Strip	2

NOTES:
1. The Motormaster I control is rated at 8 amps.

CRTRXKIT002A00*

ITEM	QTY
Bracket	1
Transformer (HT01AH858)	1
Wire (long black stripped and piggy−back terminal)	1
Dual Capacitor (10uF and 10uF)	1
Single Capacitor (10uF)	1
Wire (long yellow stripped and male quick connect)	1
Wire (long yellow stripped and female quick connect)	1
Wire (short yellow stripped and stripped)	1
Schematic Diagram	1
Wiring Nuts	5
Two−Screw Connector	1
Varnish Cloth	1
#10−5/8 Screw	4
¼ Self−Drilling Screw	6
Seal Strip	2

* For 575−v only

CRLWHPKT001A00

ITEM	QTY
Relay	1
Wire − Black~ 150” (3800 mm)	1
Wire − Black~ 21” (530 mm)	1
Wire − Orange~ 40” (1000 mm)	1
Wire − Brown~ 36” (900 mm)	1
Wire − Black~ 30” (750 mm)	1
Label Diagrams	2
Screws	2
Wire Ties	8

PRODUCT USAGE

UNIT	UNIT VOLTAGE	PART NUMBER	OPERATING TEMPERATURE LIMIT
48HC Gas Heat/Electric Cool Size 14 48TC Gas Heat/Electric Cool Size 16 50HC Cooling Only Size 14 50HCQ Size 12 50TC Cooling Only/Electric Heat Size 16 50TCQ Heat Pump Size 14	208/230	CRLOWAMB039A00 CRLWHPKT001A00	–20°F (–29°C)
	460	CRLOWAMB040A00 CRLWHPKT001A00	
	575	CRLOWAMB039A00 CRTRXKIT002A00 CRLWHPKT001A00	

UNIT	UNIT VOLTAGE	PART NUMBER	OPERATING TEMPERATURE LIMIT
549J Heat Pump Size 12 548J Heat Pump Size 14 551J Cooling Only Size 14 558J Cooling Only/Electric Heat Size 16 580J Gas Heat/Electric Cool Size 16 581J Gas Heat/Electric Cool Size 14	208/230	CRLOWAMB039A00 CRLWHPKT001A00	–20°F (–29°C)
	460	CRLOWAMB040A00 CRLWHPKT001A00	
	575	CRLOWAMB039A00 CRTRXKIT002A00 CRLWHPKT001A00	

UNIT	UNIT VOLTAGE	PART NUMBER	OPERATING TEMPERATURE LIMIT
RAH Cooling Only Size 150 RAS Cooling Only/Electric Heat Size 160 RGH Gas Heat/Electric Cool Size 150 RGS Gas Heat/Electric Cool Size 160 RHH Heat Pump Size 120 RHS Heat Pump Size 150	208/230	CRLOWAMB039A00 CRLWHPKT001A00	–20°F (–29°C)
	460	CRLOWAMB040A00 CRLWHPKT001A00	
	575	CRLOWAMB039A00 CRTRXKIT002A00 CRLWHPKT001A00	

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 and/or death.

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

⚠ CAUTION

CUT HAZARD

Failure to follow this caution may result in personal injury. When removing access panels 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 and wear appropriate protective clothing, safety glasses and gloves when handling parts or reaching into the unit.

GENERAL

IMPORTANT: This accessory is designed for 3 fan models listed in the back of this document.

The accessory Motormaster® I Solid-State Head Pressure Control is a fan speed control device actuated by a temperature sensor. It controls the outdoor-fan motor speed in response to the saturated condensing temperature. For outdoor temperatures down to –20°F (–29°C), it maintains condensing temperatures at 100°F ± 10°F (38°C ± 5.5°C). The condensing temperature can exceed 100°F during higher ambient conditions.

The Motormaster I control consists of a solid-state circuit on a printed circuit board in an aluminum extrusion and a sensor assembly (to be mounted to a hairpin header or feeder tube of unit outdoor coil). A wire from the sensor is connected to the circuit board control box with wirenuts.

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.

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

INSTRUCTION REFERENCE TABLE

VOLTAGE	INSTRUCTION STEP(S)
208/230V	1, 2, 3, 5, 7, 8 and 9
460V	
575V	1, 2, 4, 5, 6, 7, 8 and 9

INSTALLATION

Step 1 — Install Wind Baffles

Wind baffles must be field fabricated for all units to ensure proper cooling cycle operation at low-ambient temperatures. See Fig. 1-2 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. Screw length should be ½-in. or less. Drill required screw holes for mounting baffles.

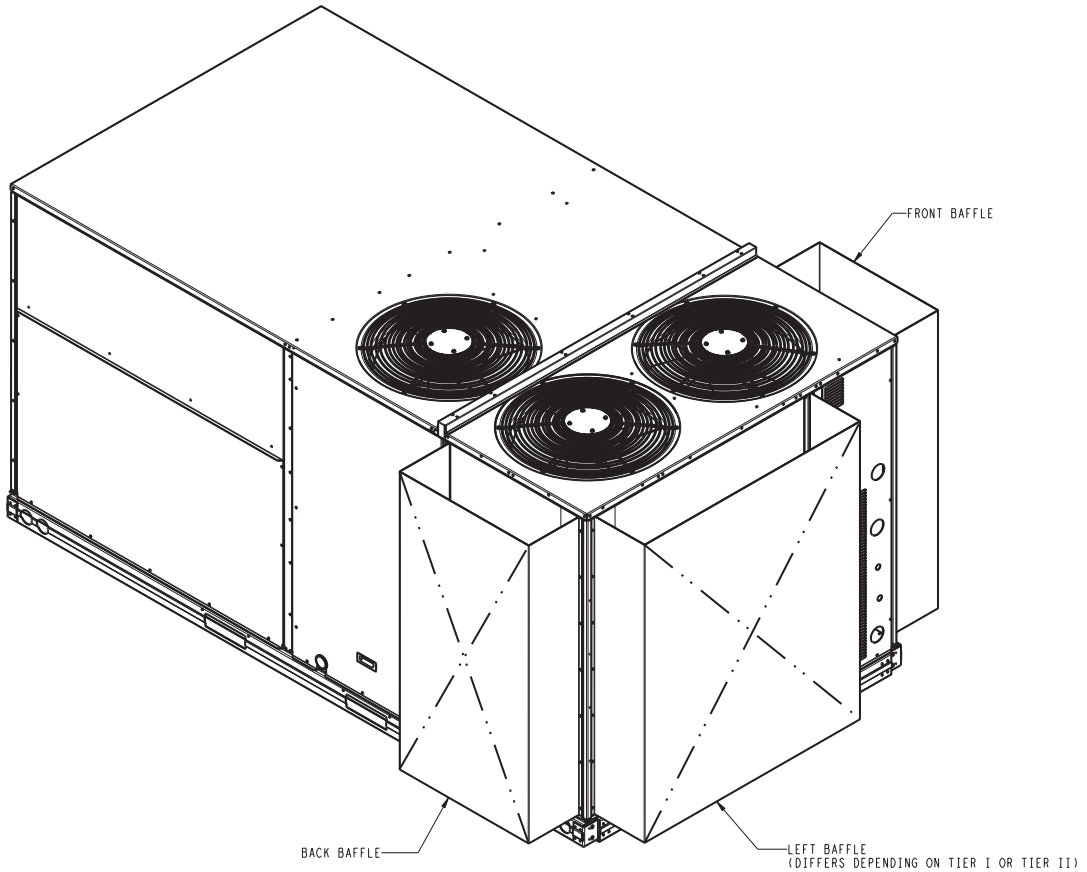

Fig. 1 - Wind Baffle

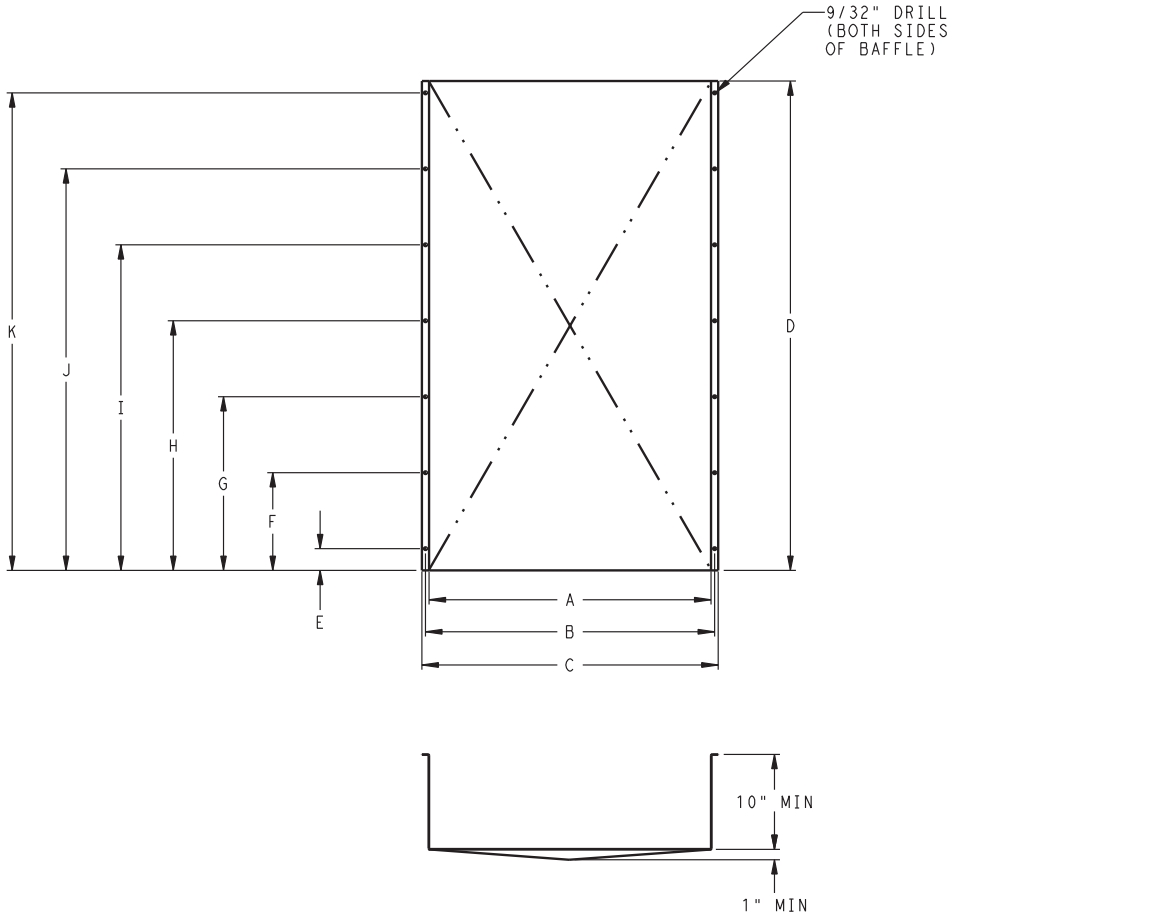

Fig. 2 - Wind Baffle

FRONT BAFFLE											
SIZE	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
50HCQ, 549J Heat Pump Size 12, 120 50TCQ, 548J Heat Pump Size 14, 150	25 5/8	26 1/4	26 7/8	51 1/2	1 1/4	9 1/4	17 1/4	25 1/4	33 1/4	41 1/4	49 1/4
48TC, 580J Gas Heat/Electric Cool Size 16	25 5/8	26 1/4	26 7/8	51 1/2	1 1/4	9 1/4	17 1/4	25 1/4	33 1/4	41 1/4	49 1/4
50TC, 558J Cooling Only / Electric Heat Size 16	25 5/8	26 1/4	26 7/8	51 1/2	1 1/4	9 1/4	17 1/4	25 1/4	33 1/4	41 1/4	49 1/4
50HC, 551J Cooling Only / Electric Heat Size 14	25 5/8	26 1/4	26 7/8	51 1/2	1 1/4	9 1/4	17 1/4	25 1/4	33 1/4	41 1/4	49 1/4
48HC, 581J Gas Heat/Electric Cool Size 14	25 5/8	26 1/4	26 7/8	51 1/2	1 1/4	9 1/4	17 1/4	25 1/4	33 1/4	41 1/4	49 1/4
BACK BAFFLE											
MODEL	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
50HCQ, 549J Heat Pump Size 12, 120 50TCQ, 548J Heat Pump Size 14, 150	23 1/2	24 1/8	24 3/4	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
48TC, 580J Gas Heat/Electric Cool Size 16	23 1/2	24 1/8	24 3/4	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
50TC, 558J Cooling Only / Electric Heat Size 16	23 1/2	24 1/8	24 3/4	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
50HC, 551J Cooling Only / Electric Heat Size 14	23 1/2	24 1/8	24 3/4	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
48HC, 581J Gas Heat/Electric Cool Size 14	23 1/2	24 1/8	24 3/4	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
LEFT BAFFLE											
MODEL	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
50HCQ, 549J Heat Pump Size 12, 120	42 3/4	43 3/8	44	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
50TCQ, 548J Heat Pump Size 14, 150	42 3/4	43 3/8	35 7/8	51 1/2	1 1/4	9 1/4	17 1/4	25 1/4	33 1/4	41 1/4	49 1/4
48TC, 580J Gas Heat/Electric Cool Size 16	42 3/4	43 3/8	44	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
50TC, 558J Cooling Only / Electric Heat Size 16	42 3/4	43 3/8	44	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
50HC, 551J Cooling Only / Electric Heat Size 14	42 3/4	43 3/8	44	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
48HC, 581J Gas Heat/Electric Cool Size 14	42 3/4	43 3/8	44	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4

FRONT BAFFLE											
SIZE	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
RHH Heat Pump Size 120 RHS Heat Pump Size 150	25 5/8	26 1/4	26 7/8	51 1/2	1 1/4	9 1/4	17 1/4	25 1/4	33 1/4	41 1/4	49 1/4
RGS Gas Heat/Electric Cool Size 160	25 5/8	26 1/4	26 7/8	51 1/2	1 1/4	9 1/4	17 1/4	25 1/4	33 1/4	41 1/4	49 1/4
RAS Cooling Only / Electric Heat Size 160	25 5/8	26 1/4	26 7/8	51 1/2	1 1/4	9 1/4	17 1/4	25 1/4	33 1/4	41 1/4	49 1/4
RAH Cooling Only / Electric Heat Size 150	25 5/8	26 1/4	26 7/8	51 1/2	1 1/4	9 1/4	17 1/4	25 1/4	33 1/4	41 1/4	49 1/4
RGH Cooling Only / Electric Heat Size 150	25 5/8	26 1/4	26 7/8	51 1/2	1 1/4	9 1/4	17 1/4	25 1/4	33 1/4	41 1/4	49 1/4
BACK BAFFLE											
MODEL	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
RHH Heat Pump Size 120 RHS Heat Pump Size 150	23 1/2	24 1/8	24 3/4	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
RGS Gas Heat/Electric Cool Size 160	23 1/2	24 1/8	24 3/4	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
RAS Cooling Only / Electric Heat Size 160	23 1/2	24 1/8	24 3/4	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
RAH Cooling Only / Electric Heat Size 150	23 1/2	24 1/8	24 3/4	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
RGH Cooling Only / Electric Heat Size 150	23 1/2	24 1/8	24 3/4	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
LEFT BAFFLE											
MODEL	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
RHH Heat Pump Size 120	42 3/4	43 3/8	44	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
RHS Heat Pump Size 150	42 3/4	43 3/8	35 7/8	51 1/2	1 1/4	9 1/4	17 1/4	25 1/4	33 1/4	41 1/4	49 1/4
RGS Gas Heat/Electric Cool Size 160	42 3/4	43 3/8	44	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
RAS Cooling Only / Electric Heat Size 160	42 3/4	43 3/8	44	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
RAH Cooling Only / Electric Heat Size 150	42 3/4	43 3/8	44	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4
RGH Gas Heat/Electric Cool Size 150	42 3/4	43 3/8	44	51 1/2	1 3/4	9 3/4	17 3/4	25 3/4	33 3/4	41 3/4	49 3/4

Step 2 — Replace Outdoor Fan Motors

NOTE: On 575V units, an additional accessory kit (CRTRXKIT002A00) MUST BE USED. This kit provides a transformer for dropping the voltage down to 460V for proper operation.

1. Turn off power to unit. Install lock-out tag on unit disconnect.
2. Remove control box cover, retain screws. Using a volt meter, check that no power is present at the unit terminal block.
3. Remove the panel located beneath the control box, retain screws.
4. All 3 motors must be replaced with the motors supplied with the accessory. Disconnect all outdoor fan wires from TB2 and CAP 1 and 2. Pull wires from the control box. Remove wire ties as necessary to free all outdoor fan motors. Remove the wire ties from the top cover.
5. For each motor complete the following steps.
   a. Remove screws securing the fan grill. One screw has a star washer. Do not lose the star washer. If lost, it must be replaced to ensure proper grounding. Six washers have been supplied with this accessory. In addition, three extra grill screws have been provided with this accessory.
   b. Remove fan assembly from orifice.
   c. Note position of blade relative to grill. Loosen set screw from fan blade and remove fan blade and retain to be installed with the new motor.
   d. Remove 4 nuts holding motor to grill. One nut has a star washer. Do not lose the star washer. If lost, it must be replaced to ensure proper grounding. Four extra nuts have been provided with this accessory.
   e. Remove motor by feeding wires through the conduit.
   f. Install new motor by reversing these steps.
   g. Ensure that motor wires do not interfere with fan blades by installing the snap-in wire ties into the top cover.

Step 3 — Mount Motormaster I Controller (230 and 460 V Units)

1. Remove the compressor access panel, retain screws.
2. Place seal strip on back side of both flanges of the Motormaster I controller.
3. Locate Motormaster I controller on outdoor partition as indicated in Fig. 3 and attach with self-drilling screws provided. A drill template is provided in Fig. 14.
4. Route two black wires through the unit to the control box. Secure with wire ties.
5. Connect Motormaster I controller sensor to the appropriate coil return bend as indicated in Fig. 4-7. Secure sensor wires with wire ties provided. It might be necessary to remove the coil post to facilitate attaching the sensor.

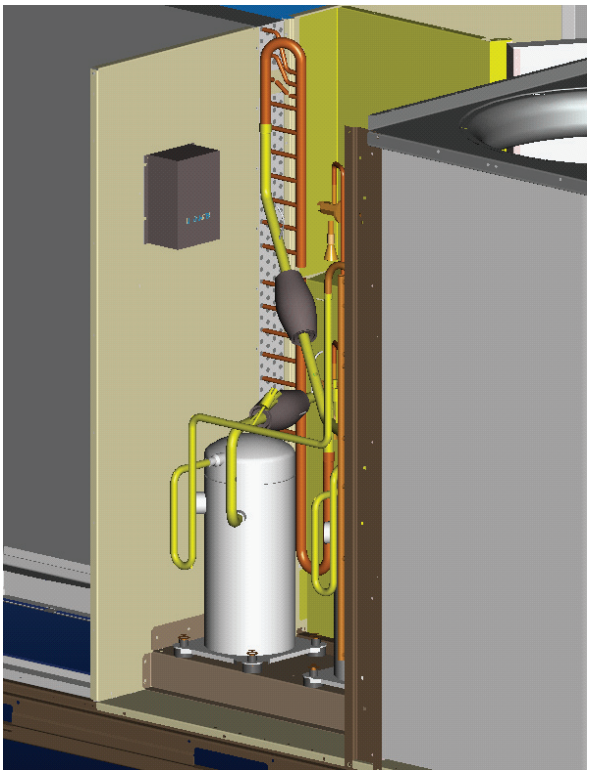

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Fig. 3 - Motormaster Installed on Outdoor Base 230/460V

Step 4 — Transformer Wiring and Motormaster I Controller Mounting (575V Units Only)

NOTE: The 575V to 460V transformer provided with CRTRXKIT002A00 is used as an auto-transformer (buck boost transformer), not as a traditional step down isolation transformer therefore it must be wired per Fig. 9 and the instruction listed below.

1. Remove the compressor access panel, retain screws.
2. Remove transformer from the transformer bracket.
3. Place seal strip on back side of both flanges of the transformer bracket.
4. Locate transformer bracket on the outdoor partition as indicated in Fig. 8 and attach with self-drilling screws provided.
5. Attach motor master to transformer bracket as indicated in Fig. 8.
6. Open the transformer and install two-screw connector in the bottom of the transformer.
7. Use a wire nut to connect the long yellow wire (one end stripped and the other end a female quick connect) to X2 and X4 in the transformer. Route the yellow wire through the two-screw connector.
8. Use a wire nut to connect H2 to H3 in the transformer.
9. Use a wire nut to connect X1, X3 and the 6” yellow wire in the transformer.

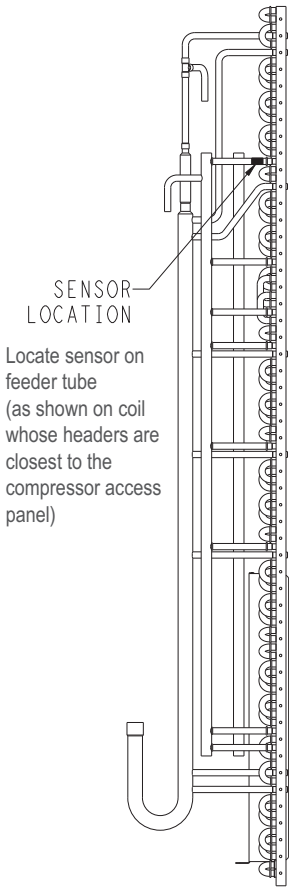

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Fig. 4 - 50HCQ, 549J, RHH Sensor Location - Size 12, 120

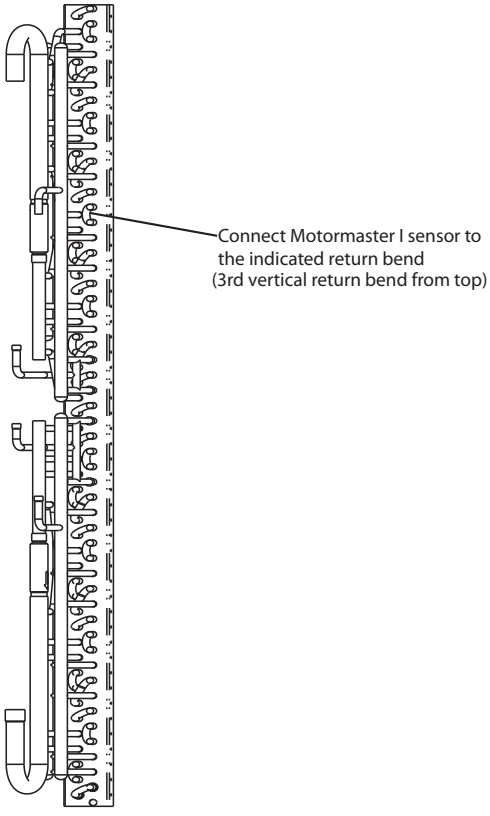

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Fig. 5 - 50TCQ, 548J, RHS Sensor Location - Size 14, 150

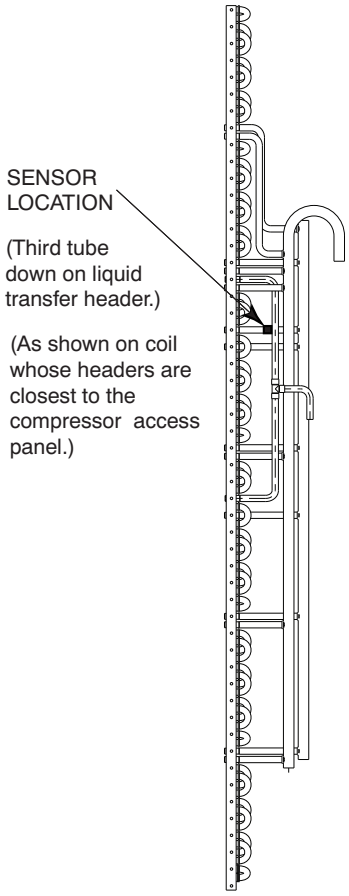

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Fig. 6 - 48TC, 50TC, 558J, 580J, RAS, RGS Sensor Location - Size 16, 160

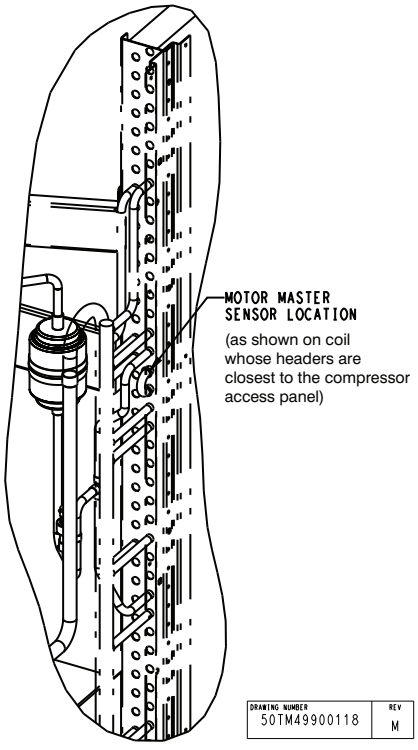

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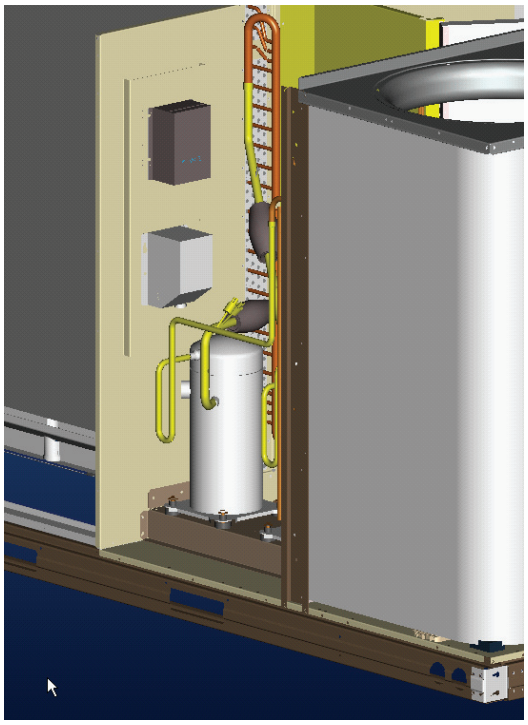
Fig. 7 - 48/50HC, 551J, 581J RAH, RGH Sensor Location - Size 14

10. Use a wire nut to connect the other end of the 6” yellow to H4 and the long yellow wire with the male quick connect. Route the yellow wire through the two-screw connector.
11. Use a wire nut to connect the long black wire to H1. Route the black wire through the two-screw connector.
12. Insert the varnish cloth into the connector and secure the wires in the connector by tightening the screws.
13. Attach the transformer to the transformer bracket.
14. Route two black wires from the Motormaster I controller and the three power wires from the transformer through the unit to the control box. Secure with wire ties.
15. Connect Motormaster I controller sensor to the appropriate coil return bend or feeder tube as indicated in Fig. 4-7. Secure sensor wires with wire ties provided. It might be necessary to remove the coil post to facilitate attaching the sensor.

Step 5 — Control Box Rewire (All Voltages)

1. The updated wiring for 208/230-V and 460-V units are show on the label provided with the CRLOWAMB039A00 and 040A00 and in Fig. 10. For 575V, the label from CRTRXKIT002A00 and Fig. 9 detail the wiring changes.
2. Feed the new outdoor motor wires back into the control box though the same bushing the original motor wires were removed through in Step 1.



C10414

Fig. 8 - Motormaster and Transformer Installed on Outdoor Base for 575V

3. Connect each wire of all three motors as indicated on the unit schematic located on the back of the control box cover. Refer to Fig. 11 for all component locations within the control box throughout these instructions.
4. Feed the Motormaster I controller power wires and the transformer wires (575V only) through the control-wire bushing into the control box.
5. Disconnect the black wire that connects OFR-6 to TB2 from a terminal on TB2. Connect this wire to Motormaster I controller black wire with the male quick connect.
6. Connect the Motormaster I black wire with the female quick connect to TB2.

Step 6 — Additional Control Box Rewiring for 575V Units

1. Remove CAP 1 and CAP 2 (5uF capacitors) and replace with the dual 10-uF and single 10-uF capacitors provided with transformer accessory.
2. Disconnect the black wire from OFR-6. Locate the long black wire from the transformer and connect the piggy-back terminal to OFR-6. Reconnect the disconnected wire to OFR-6.
3. Disconnect the yellow wire that connects C2-13 to CAP 1 from the C2-13 terminal. Connect the long yellow wire from the transformer (male quick connect) to this disconnected wire.
4. Connect the long yellow wire from the transformer (female quick connect) to C2-13.

Step 7 — MMR (Motormaster Relay) Installation and Wiring (All Voltages)

(Applies ONLY to heat pumps)

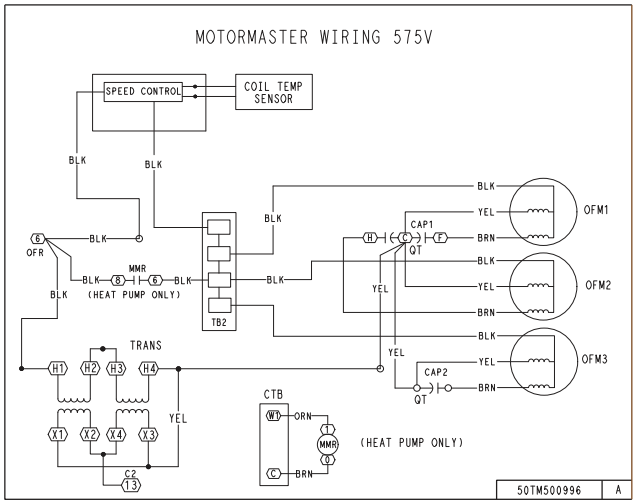
1. Install the MMR next to the CCHR in the control box. The MMR is used to bypass the Motormaster Controller I during heating to ensure that the outdoor fans always run full speed during heating.
2. MMR coil wiring. Connect the orange wire to W1 on the Central Terminal Board and the MMR at MMR-1 (coil). Connect the brown wire to C on the Central Terminal Board and the MMR at MMR-0 (coil). Trim both wires as necessary to improve wire routing.
3. MMR contact wiring. Locate the short black wire with the piggy-back terminal. Disconnect the black wires from OFR-6 and connect the piggy-back terminal to OFR-6. Reconnect the disconnected wires to OFR-6. Connect the other end to MMR-8. Locate the black wire with female quick connects on both ends. Connect one end to TB2 and the other end to MMR-6.

Step 8 — Dress Wires and Re-attach Panels

1. Use wires to make sure all wires are secured properly.
2. Place the schematic diagram on the back of the control box cover. For 575V units, use the schematic diagram provided with transformer accessory.
3. Place a warning label on the outdoor top cover near each outdoor fan motor.
4. Attach the compressor access panel.
5. Attach the panel between the control box cover.
6. Attach the control box cover.
7. Restore power to the unit.

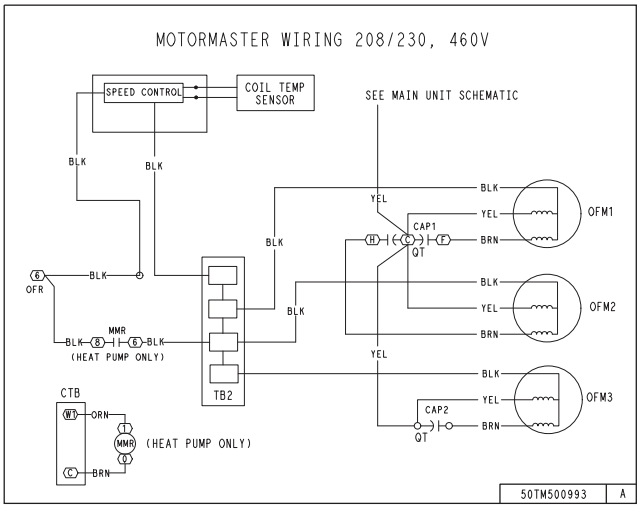
Step 9 — Outdoor Fan Operation Check

1. Place the unit in cooling and verify that the fans are operating properly. The condensing temperature should be 100 F +/- 10F at higher outdoor temperatures and 80 +/- 10F at lower outdoor temperatures. The condensing temperature can exceed 100F during higher ambient conditions. During these conditions, the fan will operate at full speed (~1100 RPM).
2. Place the unit in heating (heat pumps models only) by energizing W1 and verify that the outdoor fans are operating at full speed (~1100 RPM).
3. To override the Motormaster I controller for full fan speed operation during service or maintenance, apply 24V across the MMR coil.



C10416

Fig. 9 - Motormaster Wiring, 575V



C10417

Fig. 10 - Motormaster Wiring, 208/230V, 460V

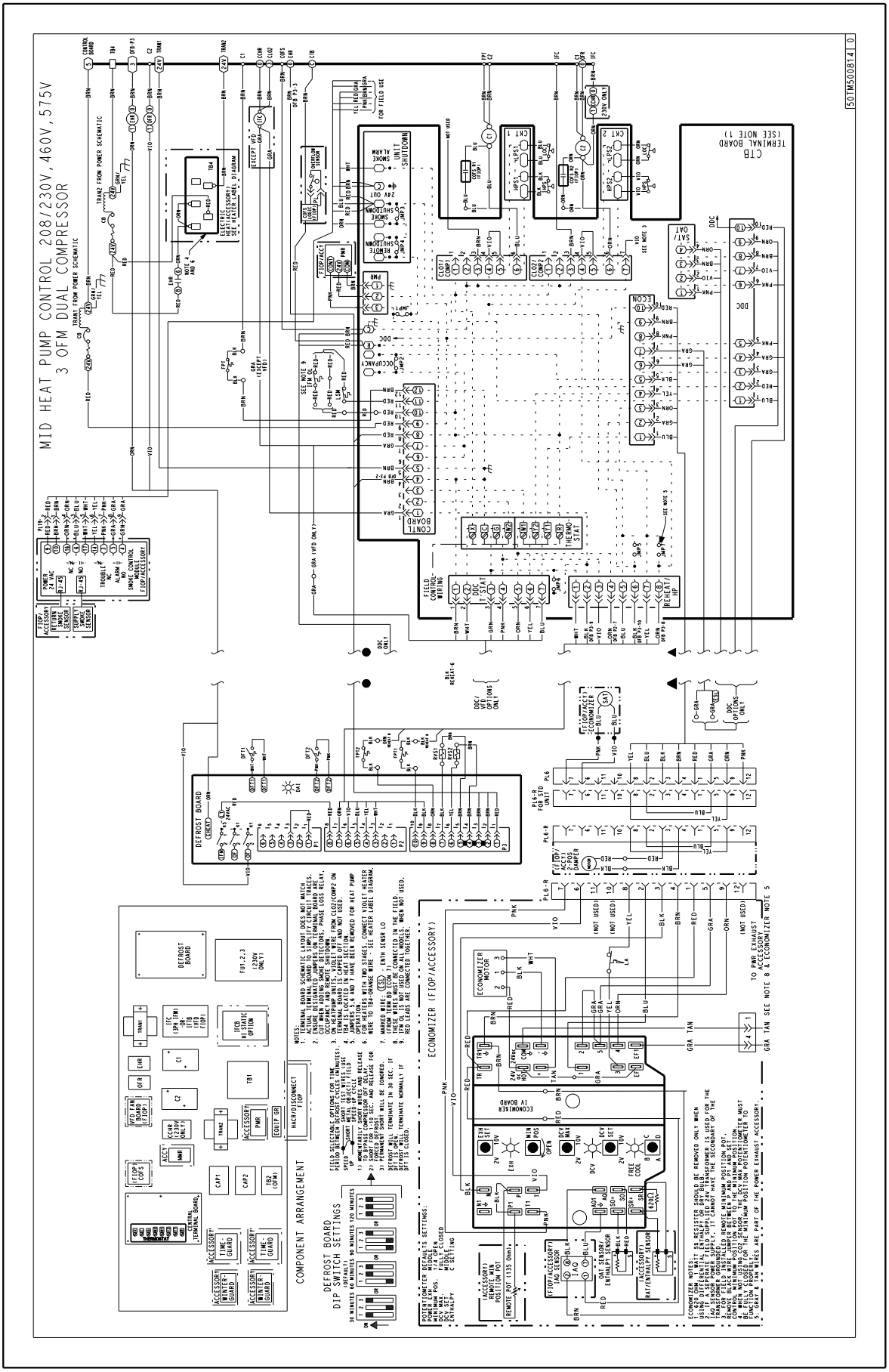
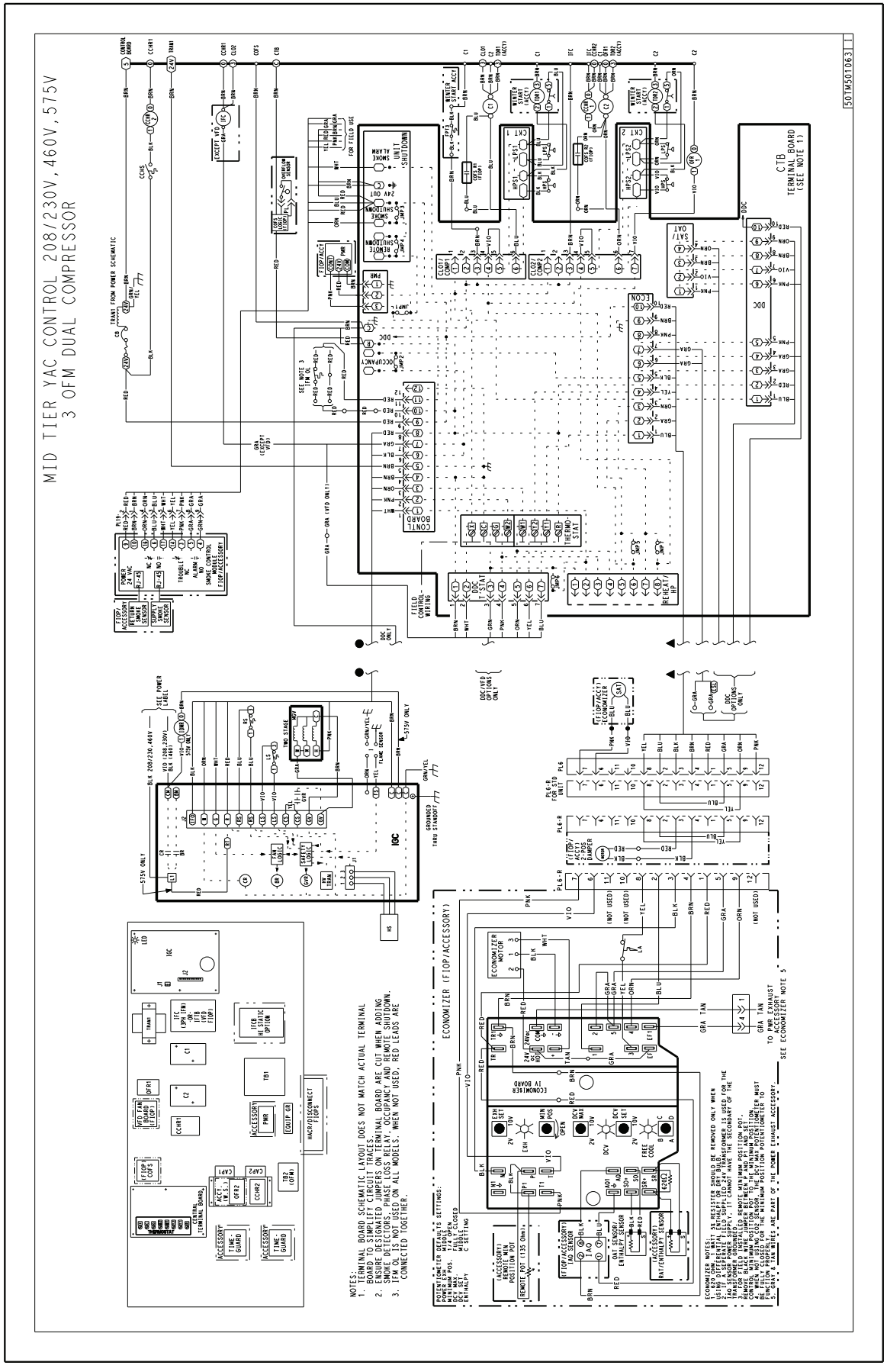
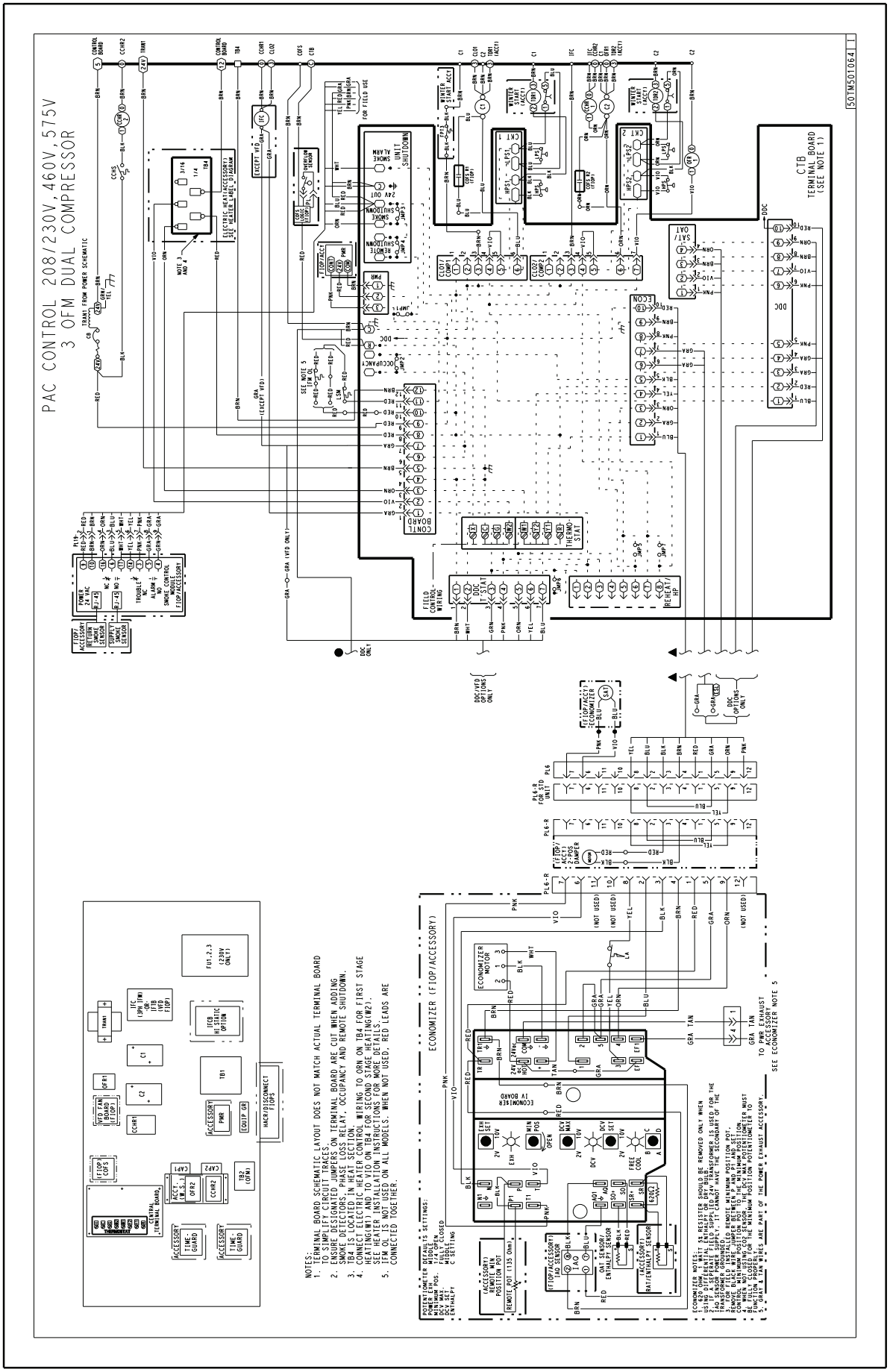


Fig. 11 – Control Box Layout – Heat Pumps



C13856

Fig. 12 – Control Box Layout – Packaged Gas Heat/Electric Cool



C13857

Fig. 13 - Control Box Layout - Packaged Air Conditioner

CUT ALONG SOLID BORDER LINES TO REMOVE TEMPLATE

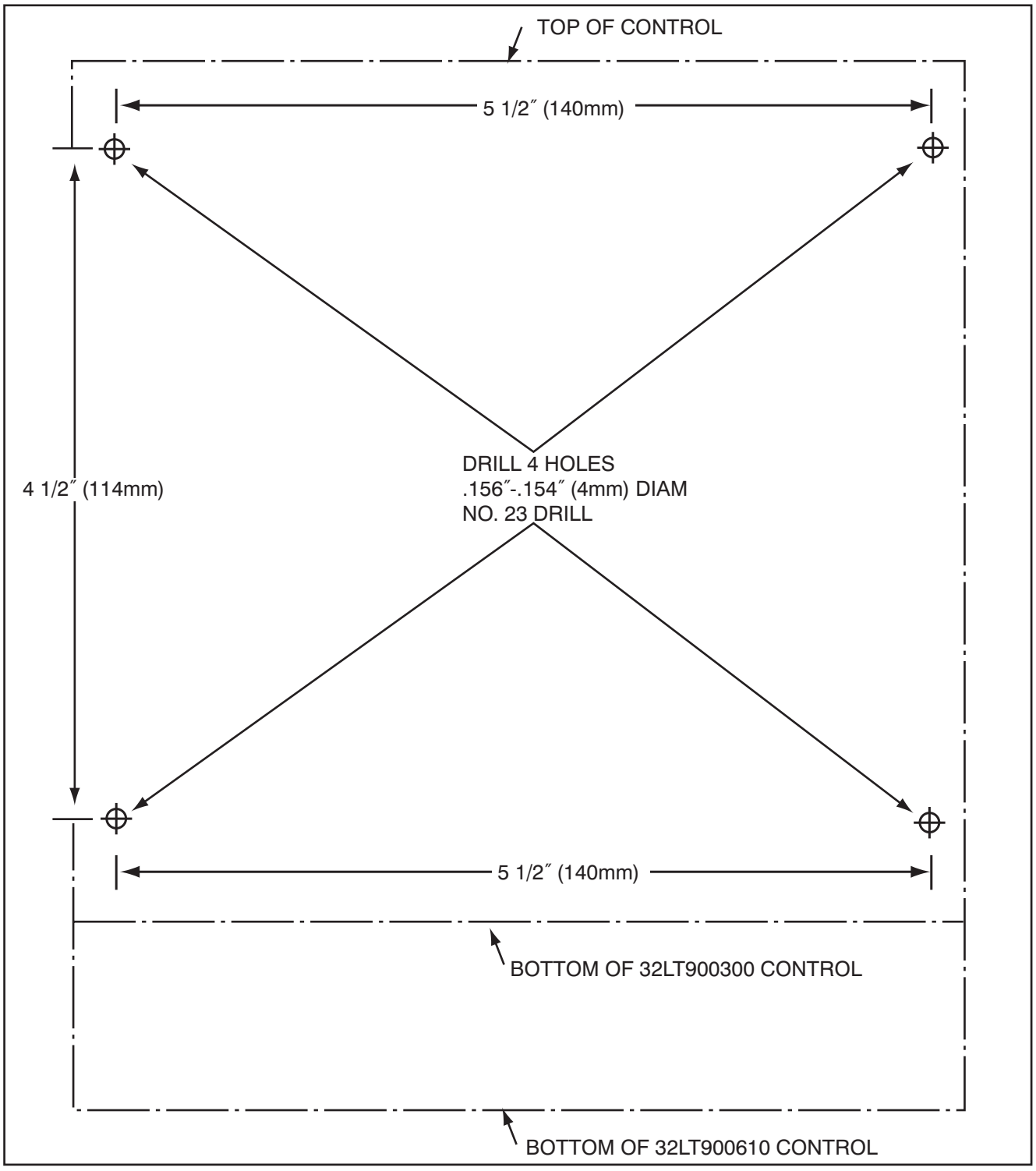


Fig. 14 - Bottom of 230V Motormaster I Controller for (300) and 460V (610)

MODELS AND SIZES

MODEL	SIZE
48HC	14
48TC	16
50HC	14
50TC	16
50TCQ	14
50HCQ	12
548J	14
549J	12
551J	14
558J	16
580J	16
581J	14
RAH	150
RAS	160
RGS	160
RHS	150
RGH	150
RHH	120

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