CRLOWAMB039A00
CRLOWAMB040A00
CRTRXKIT002A00
CRLWHPKT001A00

ACCESSORY MOTORMASTER I HEAD PRESSURE CONTROL KIT 12.5 TON HEAT PUMP

Installation Instructions

TABLE OF CONTENTS

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

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

Printed in U.S.A. Edition Date: 4/10 **Catalog No:IIK−CRLOWAMB39−01**

Replaces: NEW

PRODUCT USAGE

UNIT	UNIT VOLTAGE	PART NUMBER	OPERATING TEMPERATURE LIMIT
12.5 Ton Heat Pump	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.

GENERAL

IMPORTANT: This accessory is designed for 12.5 ton heat pump units with 3 fans.

The accessory Motormaster® I Solid-State Head Pressure Control is a fan speed control device actuated by a temperature sensor. It is specifically designed for use on Carrier equipment and 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 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 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.

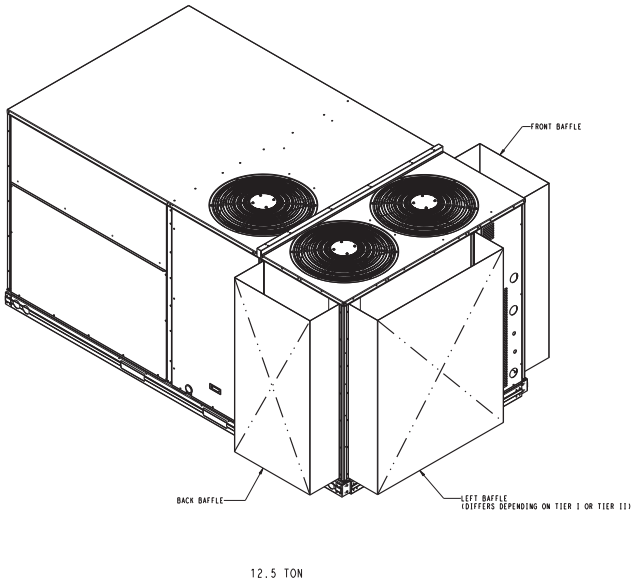
⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

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

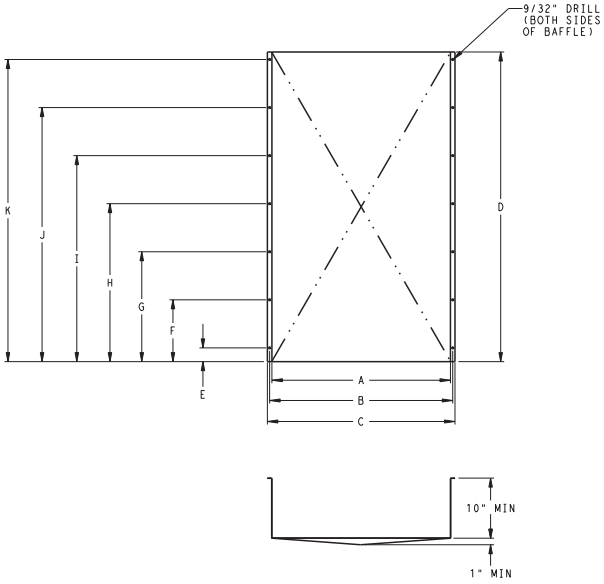
Use extreme care when drilling holes and screwing in fasteners near outdoor coil to avoid damage to tubing.

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.



C10411

Fig. 1 – Wind Baffle



C10412

Fig. 2 – Wind Baffle

FRONT BAFFLE											
SIZE	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
12.5–Ton Heat Pump	25 5/8	26 2/8	26 7/8	51 2/4	2 2/8	10 2/8	18 2/8	26 2/8	34 2/8	42 2/8	50 2/8
BACK BAFFLE											
MODEL	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
12.5–Ton Heat Pump	23 4/8	24 1/8	24 6/8	51 2/4	2 2/8	10 2/8	18 2/8	26 2/8	34 2/8	42 2/8	50 2/8
LEFT BAFFLE											
MODEL	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
12.5–Ton Heat Pump	42 6/8	43 3/8	44	51 2/4	2 2/8	10 2/8	18 2/8	26 2/8	34 2/8	42 2/8	50 2/8

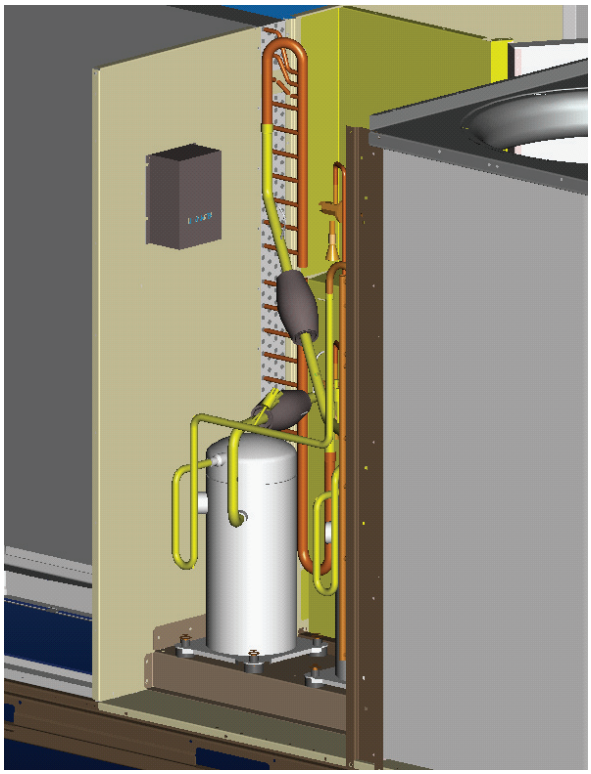
Step 2 — Replace Outdoor Fan Motors

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. 9.
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. Secure sensor wires with wire ties provided. It might be necessary to remove the coil post to facilitate attaching the sensor.



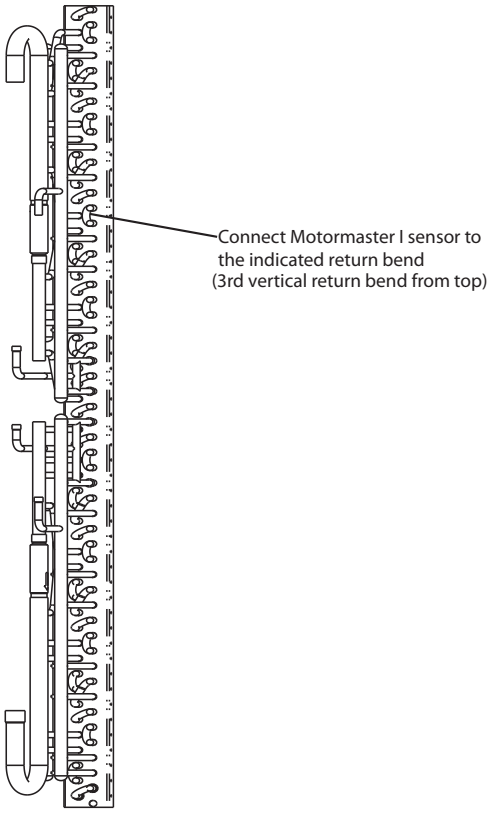
C10413

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. 6 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. 5 and attach with self-drilling screws provided.
5. Attach motor master to transformer bracket as indicated in Fig. 5.
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.



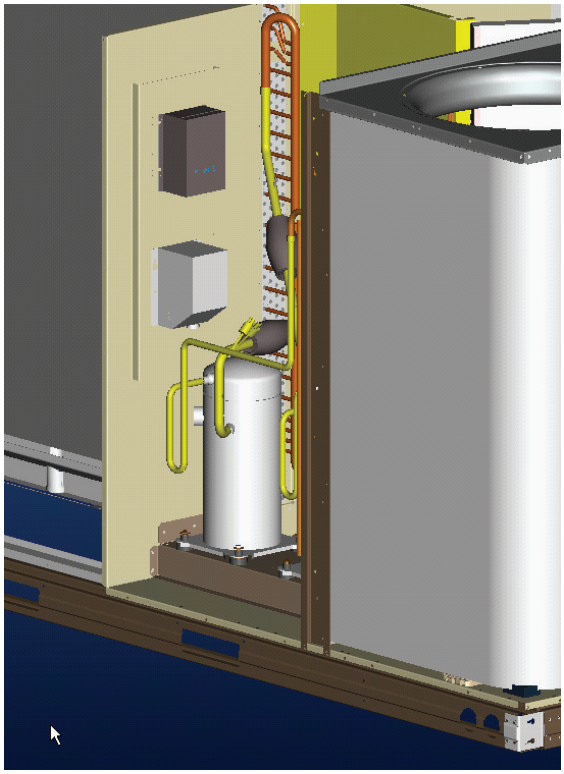
C10415

Fig. 4 - Sensor Location

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 tighten 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 as indicated in Fig. 4. 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. 7. For 575V, the label from CRTRXKIT002A00 and Fig. 6 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. 5 - 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. 8 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)

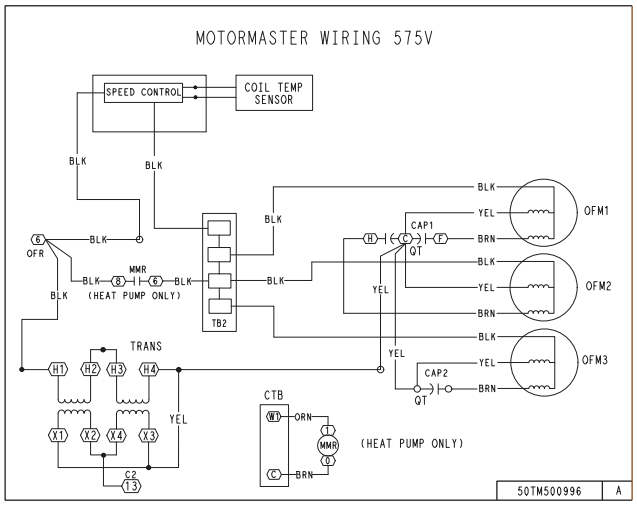
1. Install the MMR next to the CCHR in the control box. The MMR is used to bypass the Motormaster Controller I during heating to ensure that the outdoor fans always run full speed during heating.
2. MMR coil wiring. Connect the orange wire to W1 on the Central Terminal Board and the MMR at MMR-1 (coil). 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.

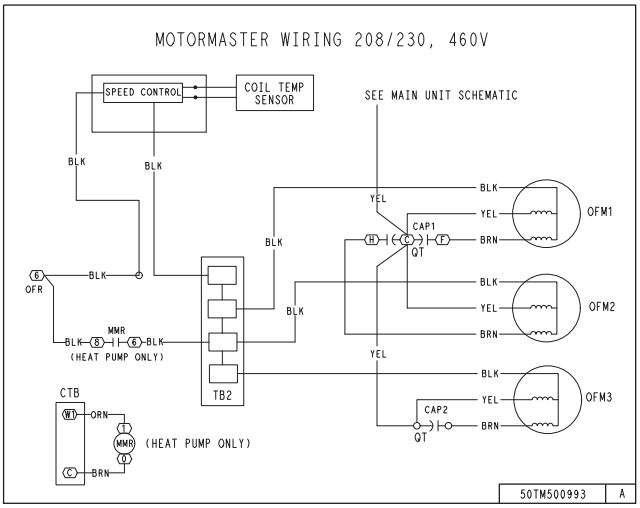
Step 9 — Outdoor Fan Operation Check

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 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.



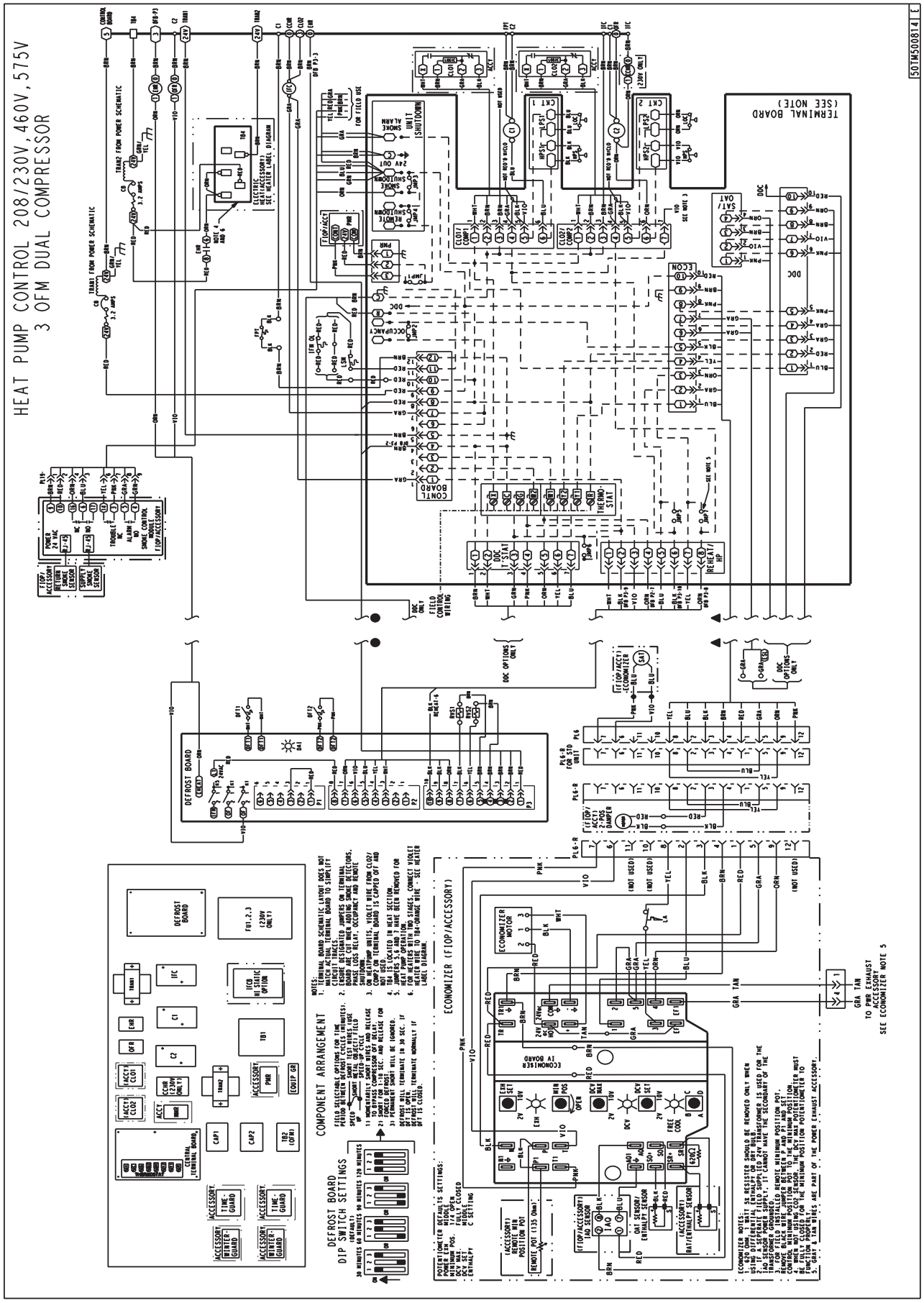
C10416

Fig. 6 - Motormaster Wiring, 575V



C10417

Fig. 7 - Motormaster Wiring, 208/230V, 460V



C10418

Fig. 8 - Control Box Layout

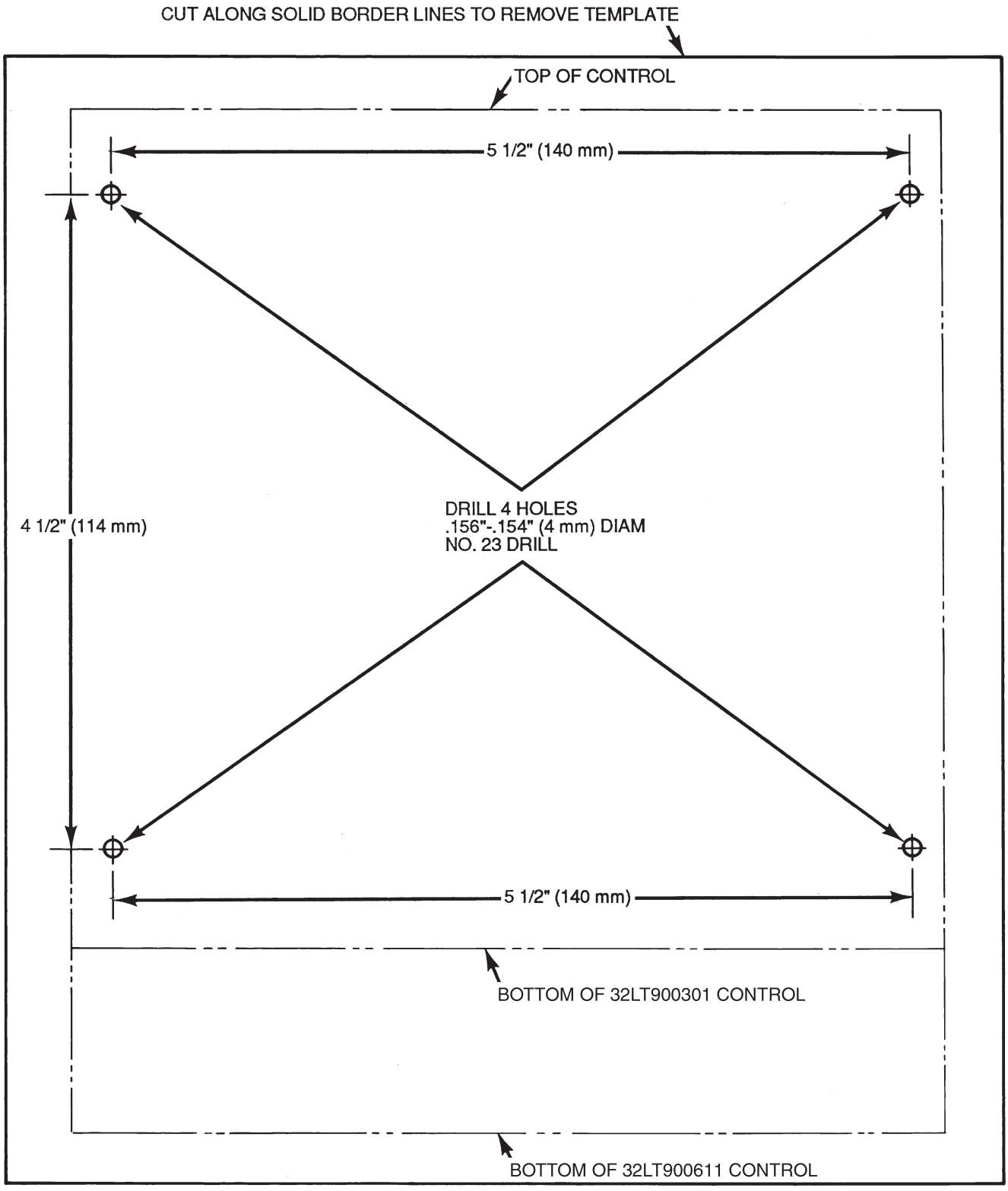


Fig. 9 - Bottom of 230V Motormaster I Controller for (301) and 460V (611)