

Installation Instructions

CPLOWAMB001A00

HEAD PRESSURE CONTROLLER 60 HZ FOR:
SMALL ROOFTOP UNITS, GAS HEAT/ELECTRIC COOLING,
ELECTRIC COOLING AND HEAT PUMP UNITS, 3 to 10 Tons

IMPORTANT: Read these instructions completely before attempting to install this accessory.

PACKAGE CONTENTS

ITEM	QTY	CONTENTS
AL56AU216	4	Screws 10B-16 x 1/2 LG
50DK402769	1	Conductive Grease
AU27AS131	2	Lockwashers, #10
50HS500288	1	Bracket
502 06 1001 00	1	Instructions

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 cause personal injury or death.

Before performing service or maintenance operations on unit, turn off main power switch to unit and install lockout tag. Ensure electrical service to rooftop unit agrees with voltage and amperage listed on the unit rating plate.



WARNING

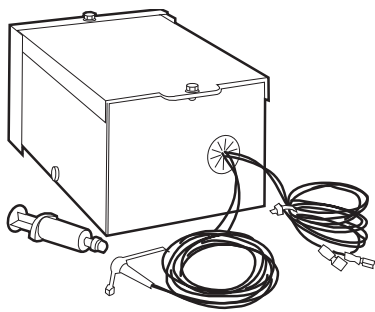
ELECTRICAL SHOCK HAZARD

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

Open all remote disconnects and install lockout tag(s) before servicing this equipment.

INTRODUCTION

The Motormaster II head pressure controller is a cycle control device activated by a temperature sensor mounted on a header tube of the outdoor coil. (See Fig. 1.) It is designed to cycle the outdoor-fan motors to maintain the saturated condensing temperature within normal operating limits of approximately 130° to 110°F high, 70° to 50°F low. The controller maintains working head pressure at low ambient temperatures down to -20°F. The controller is for use with 60 Hz units only. The controller can be used with both single-phase and 3-phase units.



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Fig. 1 – Motormaster II Controller

1. Disconnect power to unit, install lockout tag.
2. Disconnect outdoor-fan motor (OFM) wires at the contactor.
3. Remove OFM wires from unit control box.
4. Mount Motormaster II controller on unit. Refer to Fig. 2.

NOTE: The controller must be mounted vertically with the leads at the bottom.

Using the template supplied on the last page in this book, drill mounting holes. To ensure electrical ground, insert star washers (supplied with the controller) under the heads of mounting screws.

5. Determine sensor location by referring to Fig. 3-12. Route sensor wire through bottom of Motormaster II controller (Fig. 13) to sensor location specified. Prior to installation, apply conductive grease supplied with accessory to contact surface of sensor.

⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

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

Sensor assembly is delicate. Handle with care.

6. Attach sensor to top half of header tube as shown in Fig. 14. Installed sensor must be left uninsulated.
7. Power wiring must comply with all local and National Electrical Code (NEC) requirements. Refer to Fig. 15-18 for power wiring connections. Coil up all excess wire and secure it next to the controller.
8. The transformer is factory wired for 460-v operation. It must be rewired for 208/230-v use. Remove the black wire from L2 to 460-v black and connect red wire (208 v) or orange wire (230 v) to L2 for desired operation. Install wire nuts over wires not in use.

NOTE: Refer to Fig. 19 for thermistor resistance vs temperature.

9. Wind baffles are required to prevent wind cross-currents from causing abnormally low condensing temperatures. Wind baffle fabrication details are described in Fig. 20 and 21.
10. Reconnect power to the unit.

The Motormaster II head pressure controller is equipped with an alternate operating mode. When this mode is selected, the controller shifts the fan cycle sequence to effectively raise the average condensing temperature approximately 20°F higher than the standard operating mode. In this alternate mode, the outdoor fan begins cycling at higher outdoor ambient temperatures. This mode should only be used if the evaporator coil shows signs of frosting at low outdoor ambient temperatures.

To select the alternate operating mode, move the jumper wire on the Motormaster II control board from terminal T1 to terminal T2.

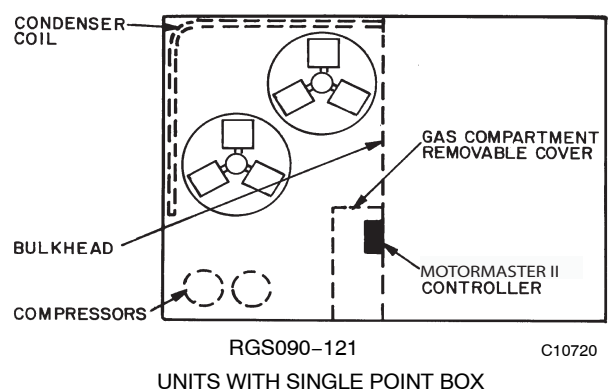
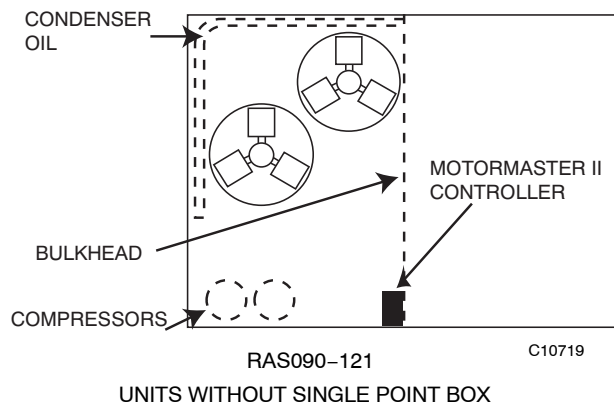
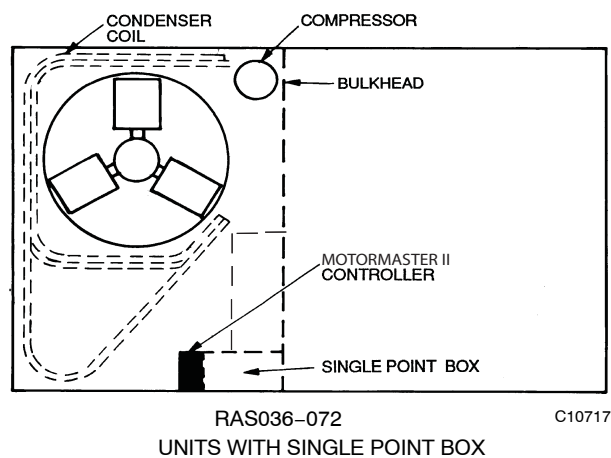
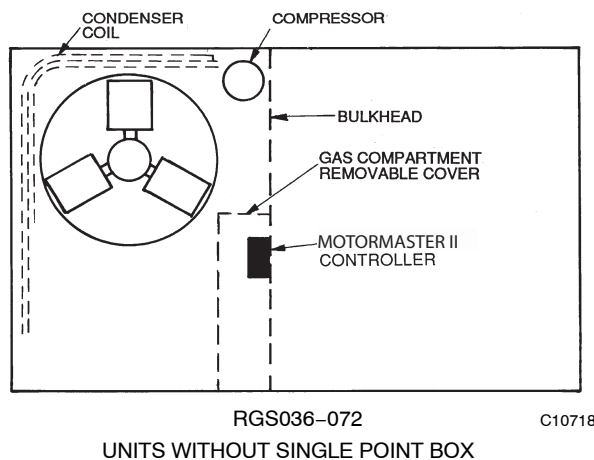
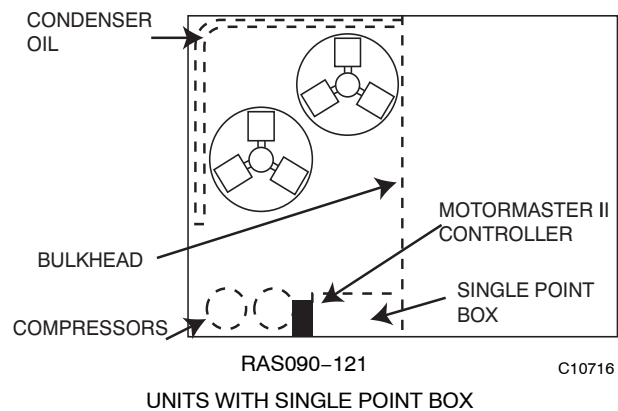
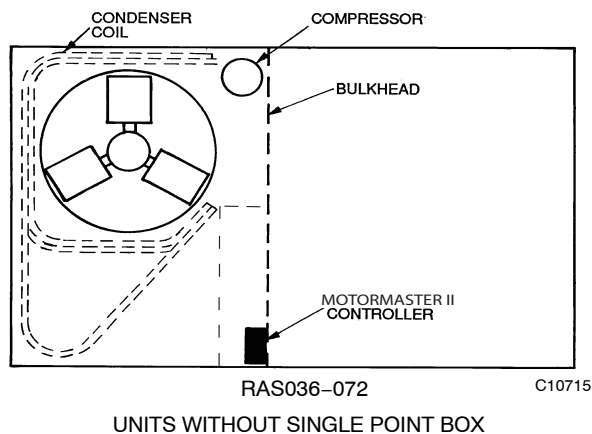


Fig. 2 – Motormaster II Controller Location

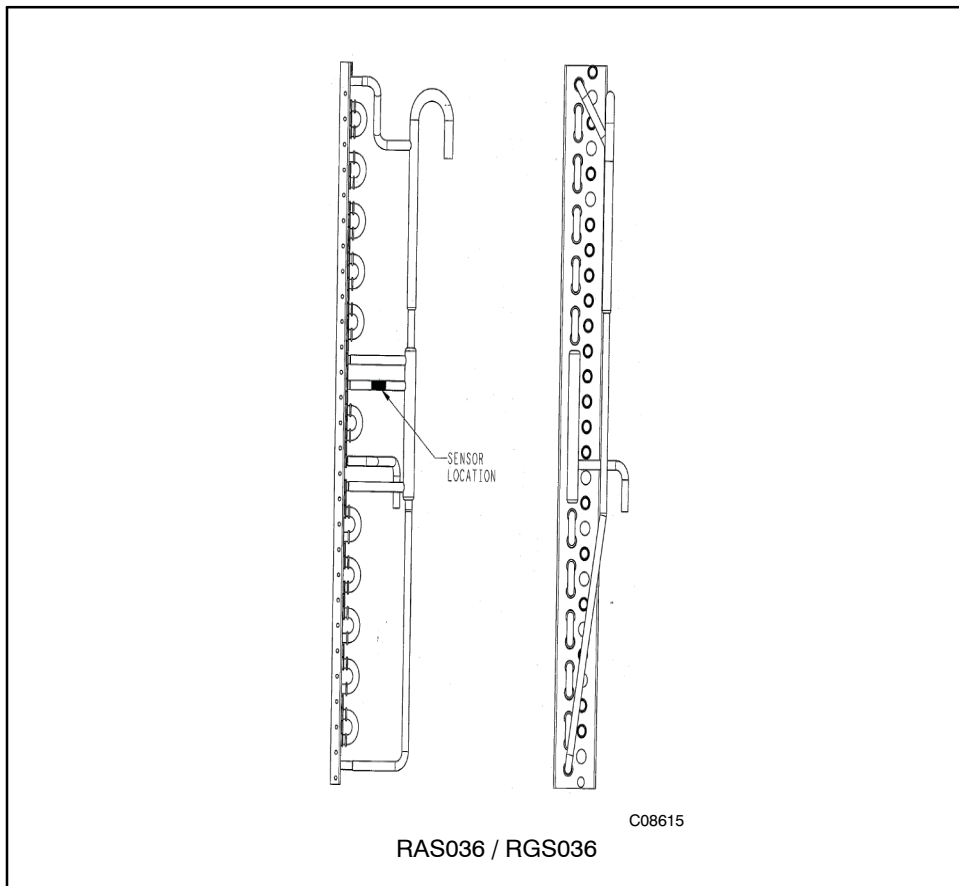


Fig. 3 – Motormaster® II Sensor Locations – 3 Ton Cooling Units

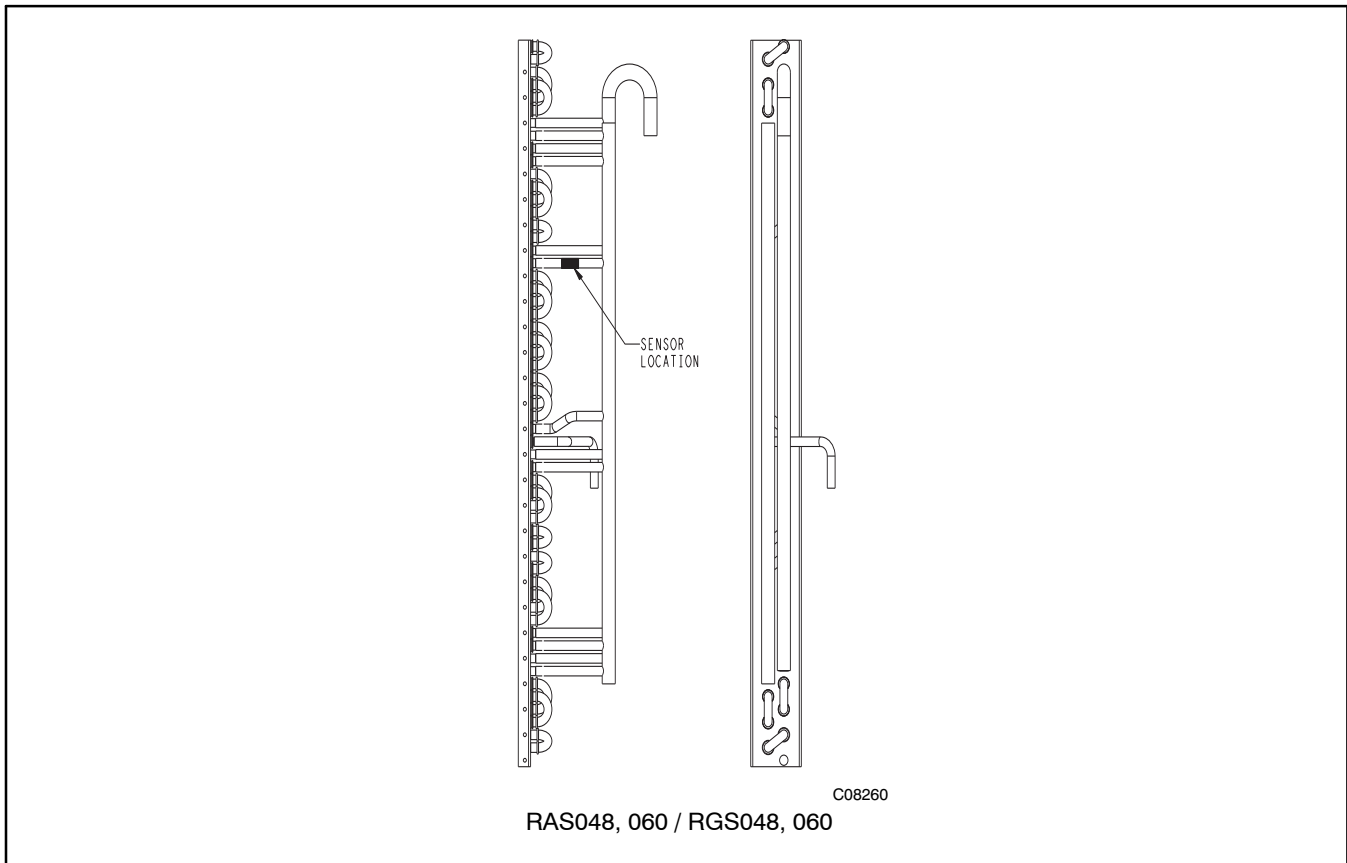


Fig. 4 – Motormaster® II Sensor Locations – 4 and 5 Ton Cooling Units

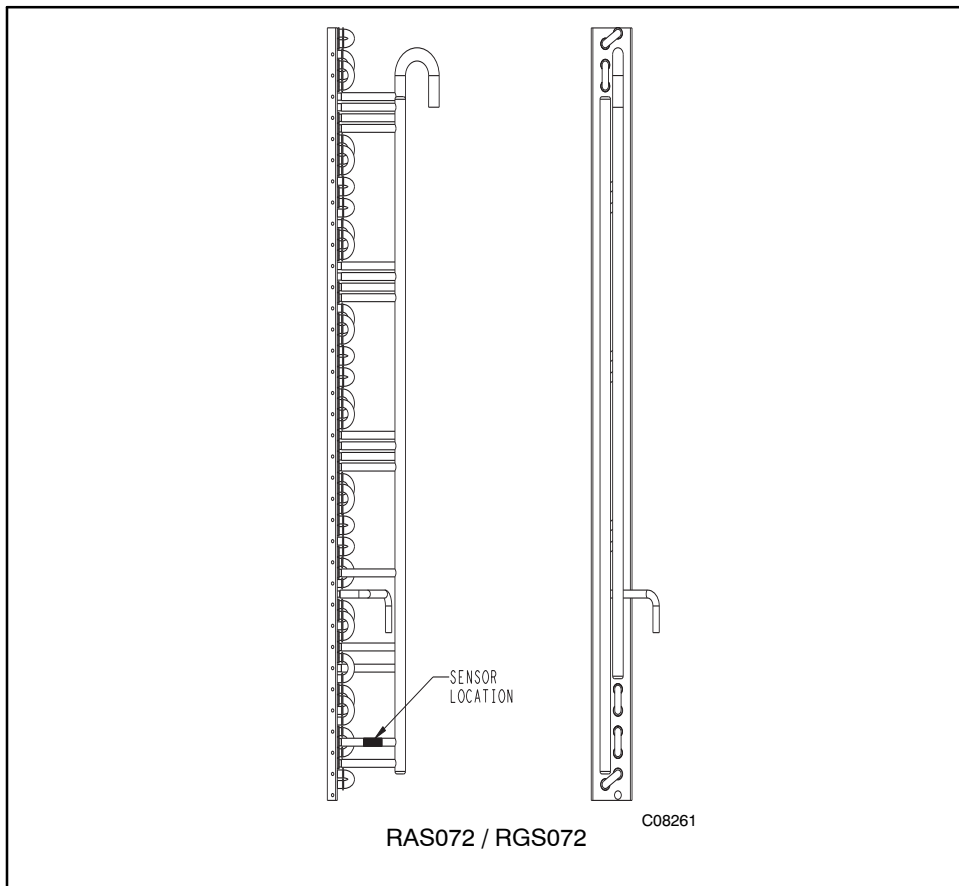


Fig. 5 – Motormaster® II Sensor Locations – 6 Ton Cooling Units

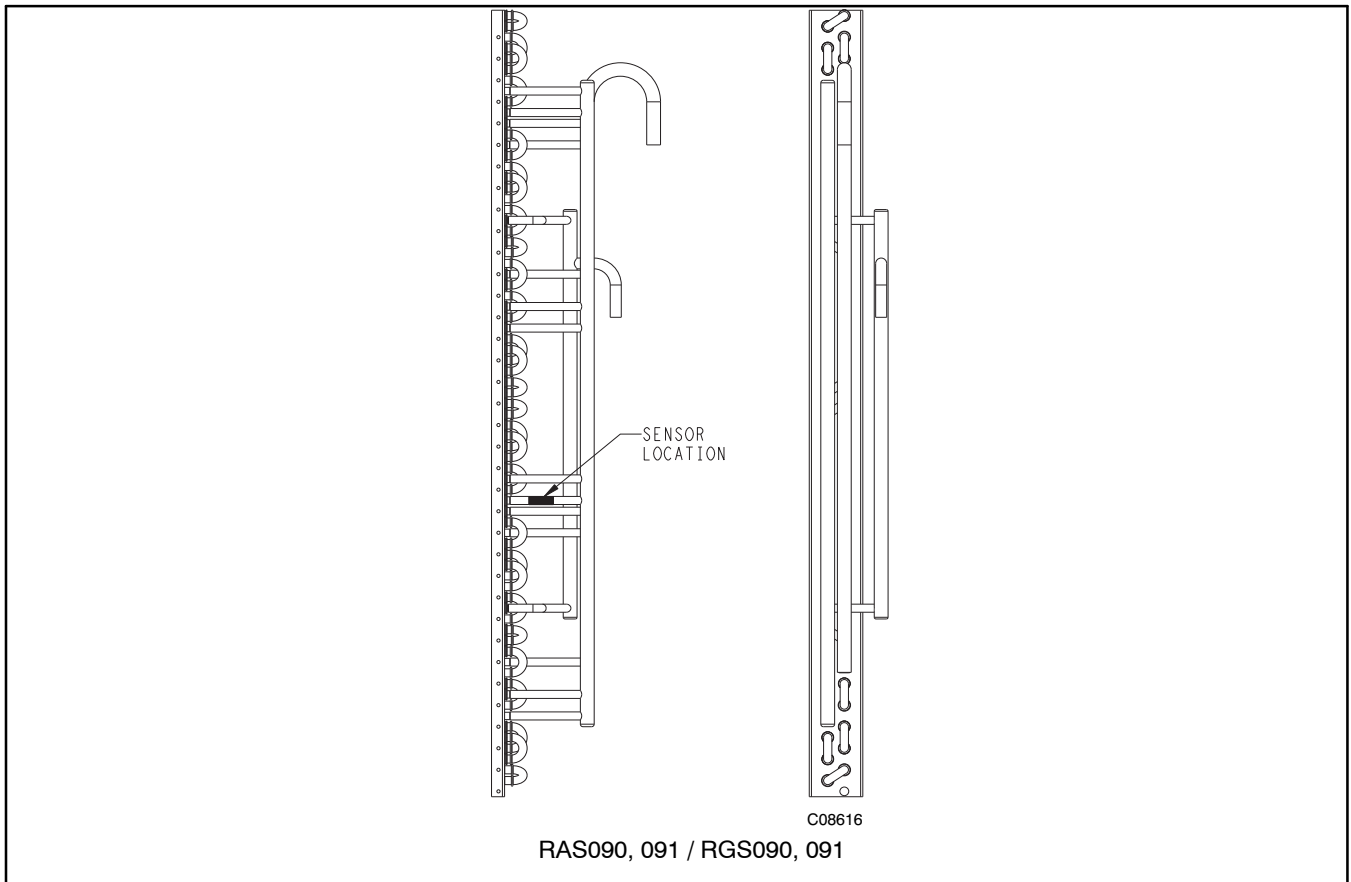


Fig. 6 – Motormaster® II Sensor Locations – 7-1/2 Ton Cooling Units

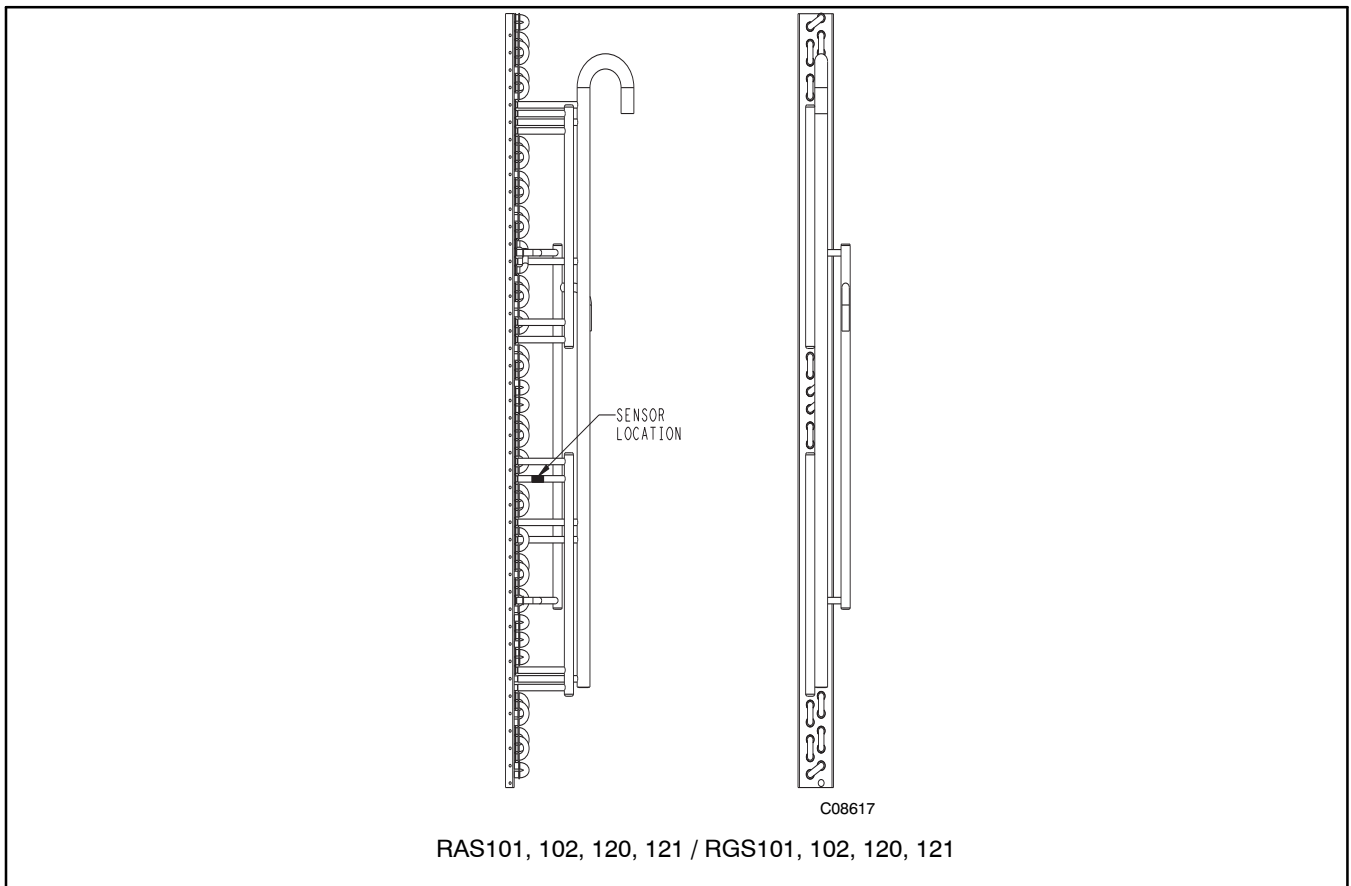


Fig. 7 – Motormaster® II Sensor Locations – 8-1/2 and 10 Ton Cooling Units

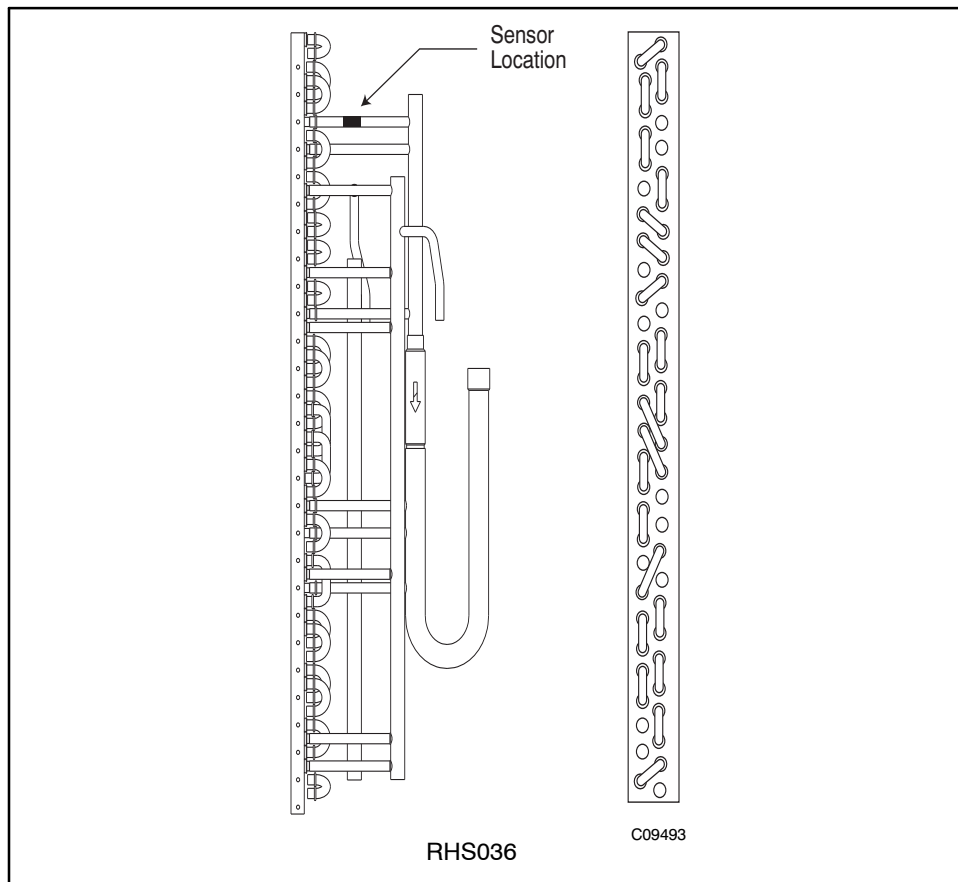


Fig. 8 – Motormaster® II Sensor Locations – 3 Ton Heat Pump Units

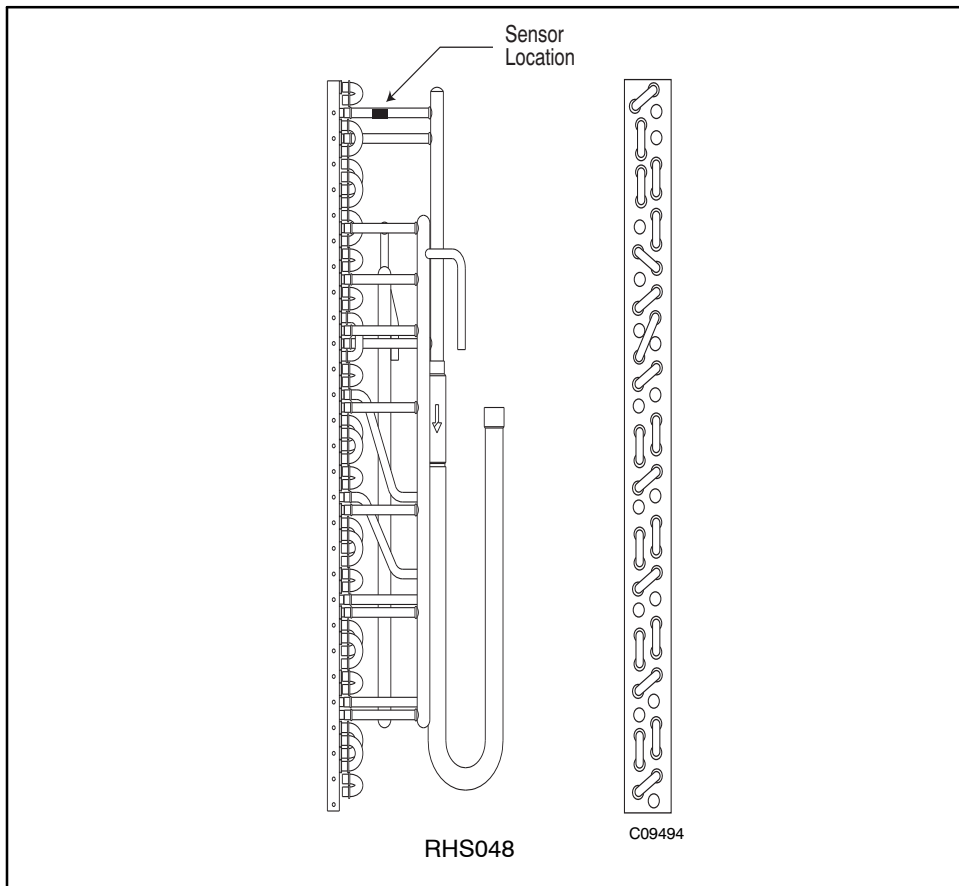


Fig. 9 – Motormaster® II Sensor Locations – 4 Ton Heat Pump Units

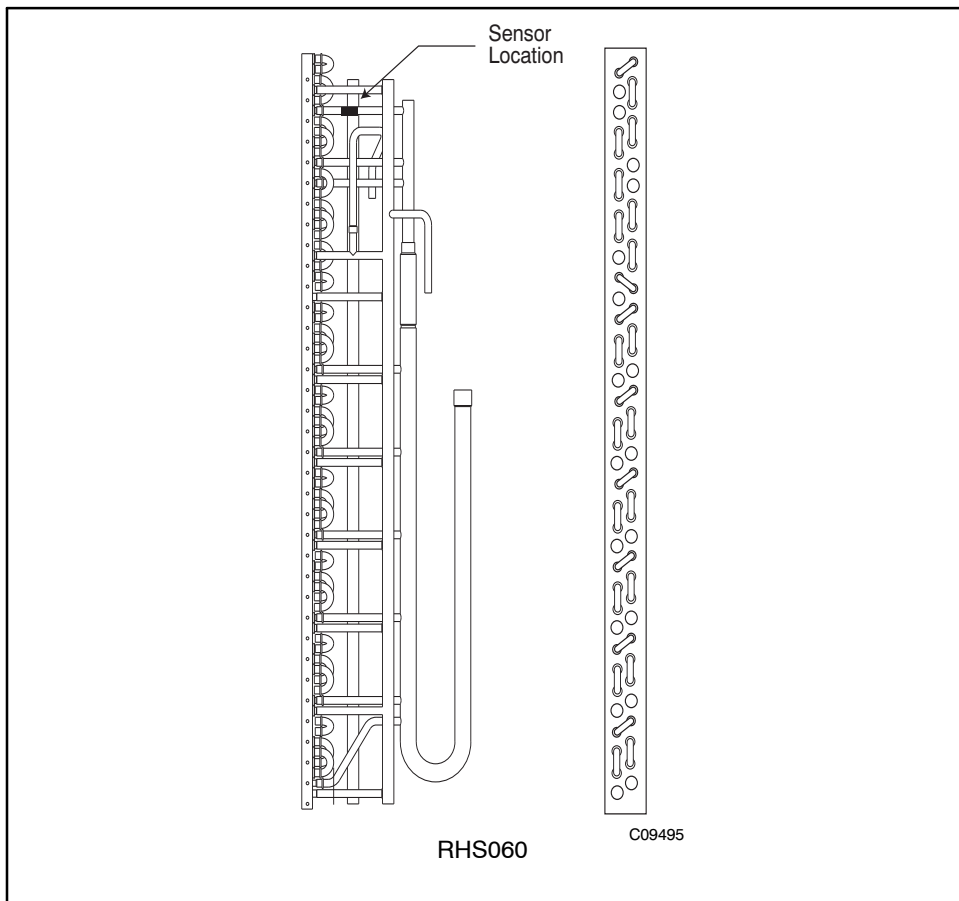


Fig. 10 – Motormaster® II Sensor Locations – 5 Ton Heat Pump Units

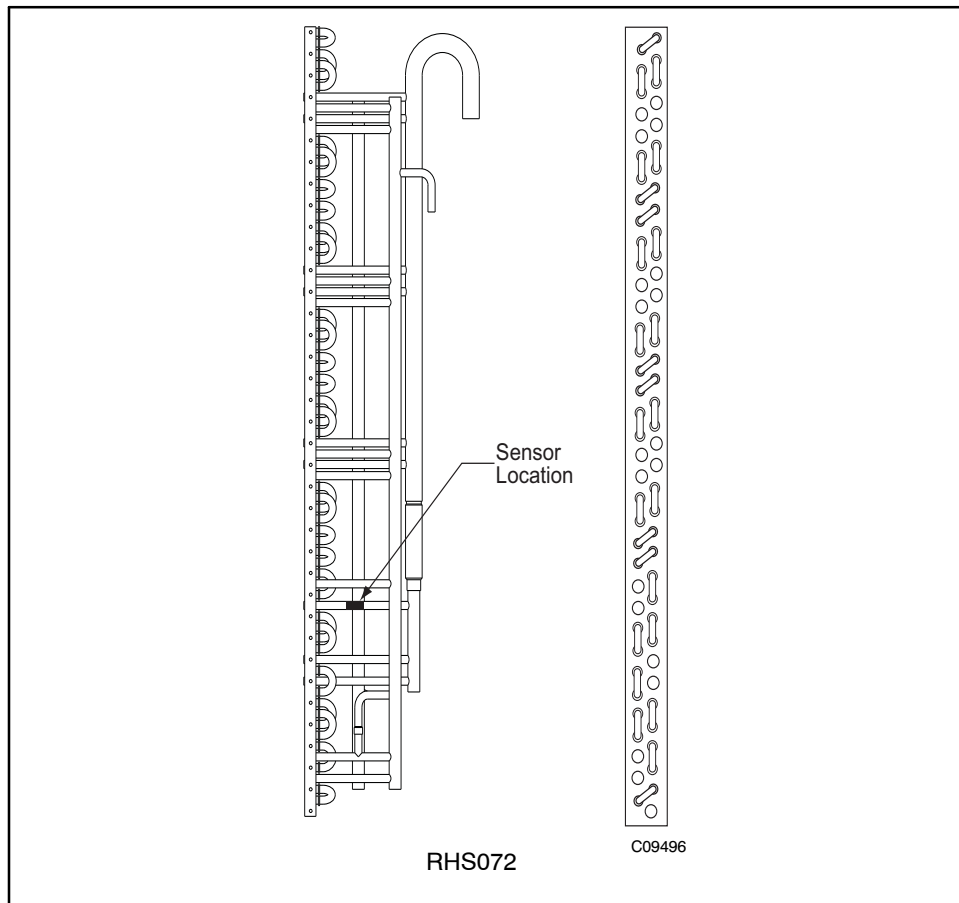


Fig. 11 – Motormaster® II Sensor Locations – 6 Ton Heat Pump Units

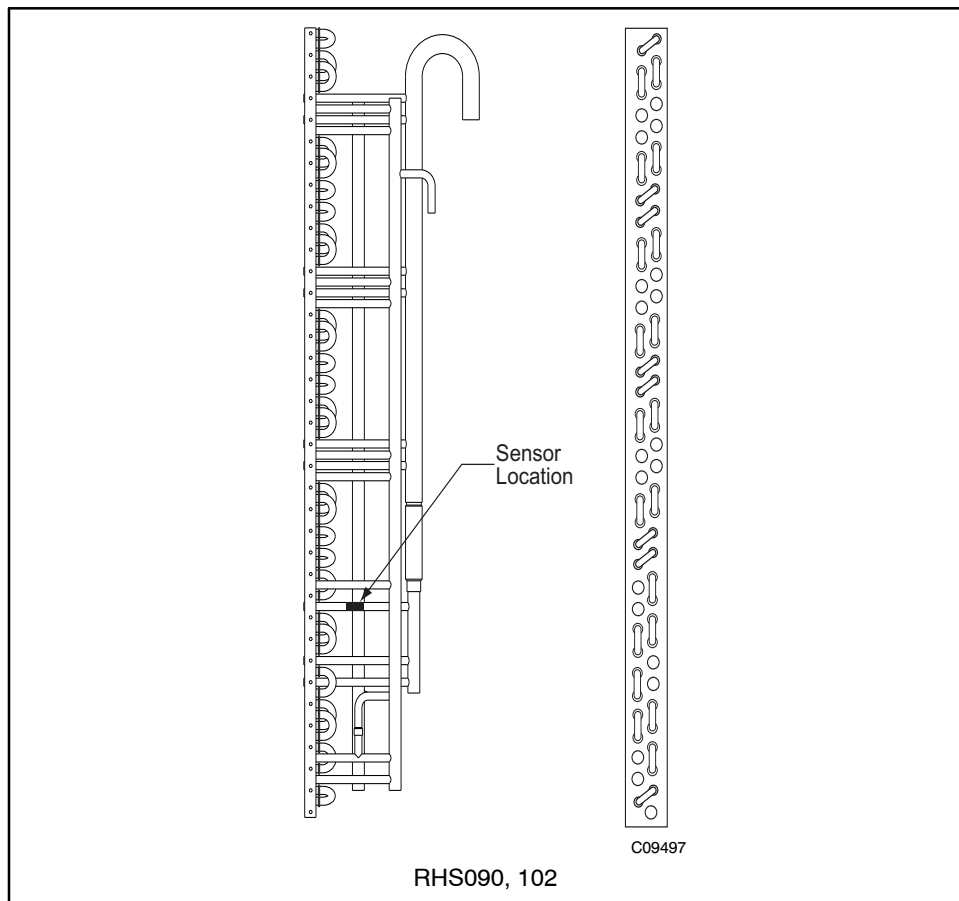
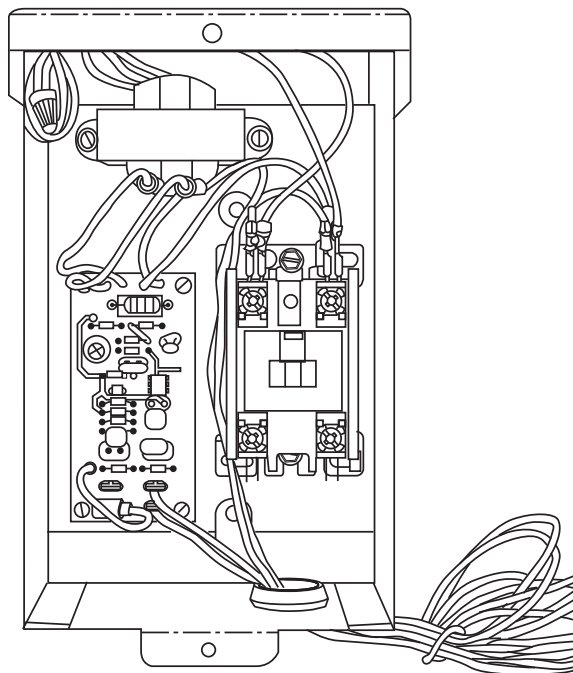
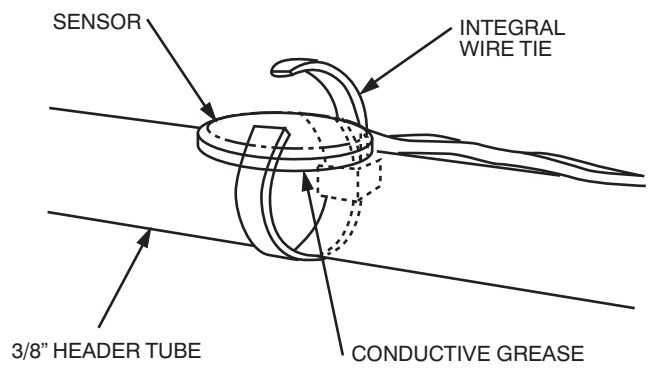


Fig. 12 – Motormaster® II Sensor Locations – 7-1/2 and 8-1/2 Ton Heat Pump Units



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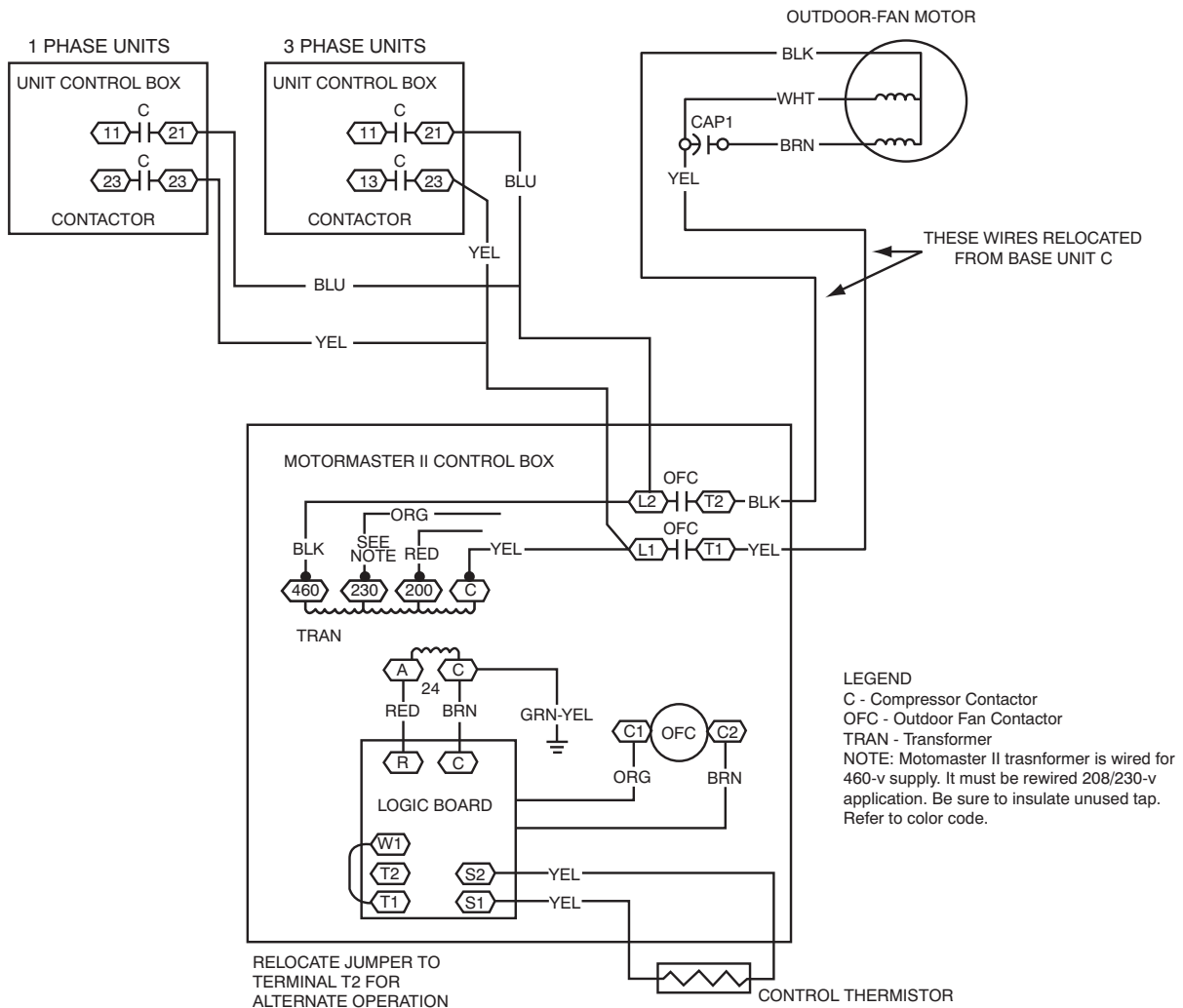
Fig. 13 – Motormaster® II Controller Interior



NOTE: INSTALLED SENSOR MUST BE LEFT UNINSULATED.

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Fig. 14 – Sensor Connection Details



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**Fig. 15 – Wiring Schematic, 3 to 6 Ton Electric Cooling Units
(RAS/RGS036-072)**

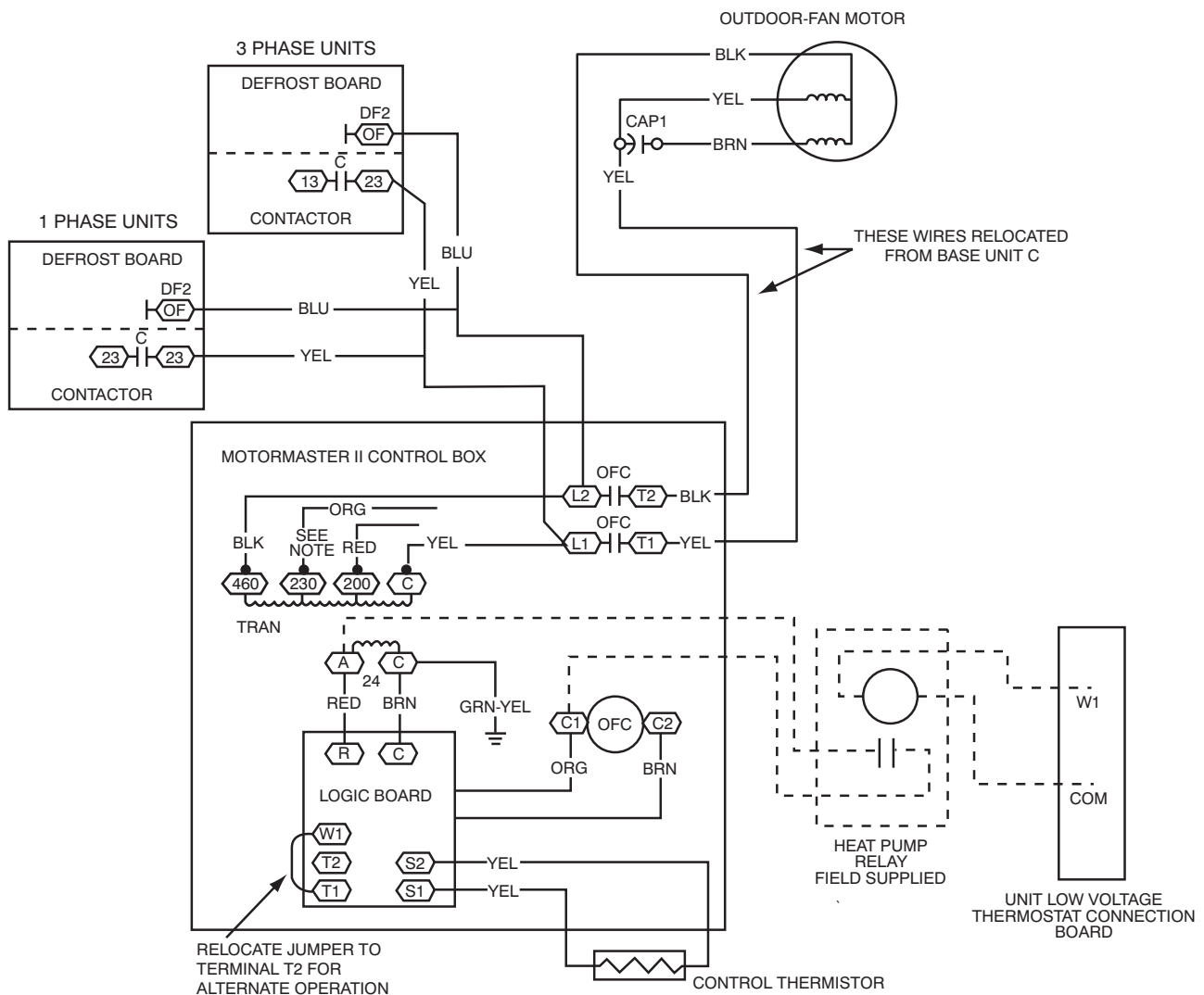


Fig. 16 – Wiring Schematic, 3 to 6 Ton Heat Pump Units

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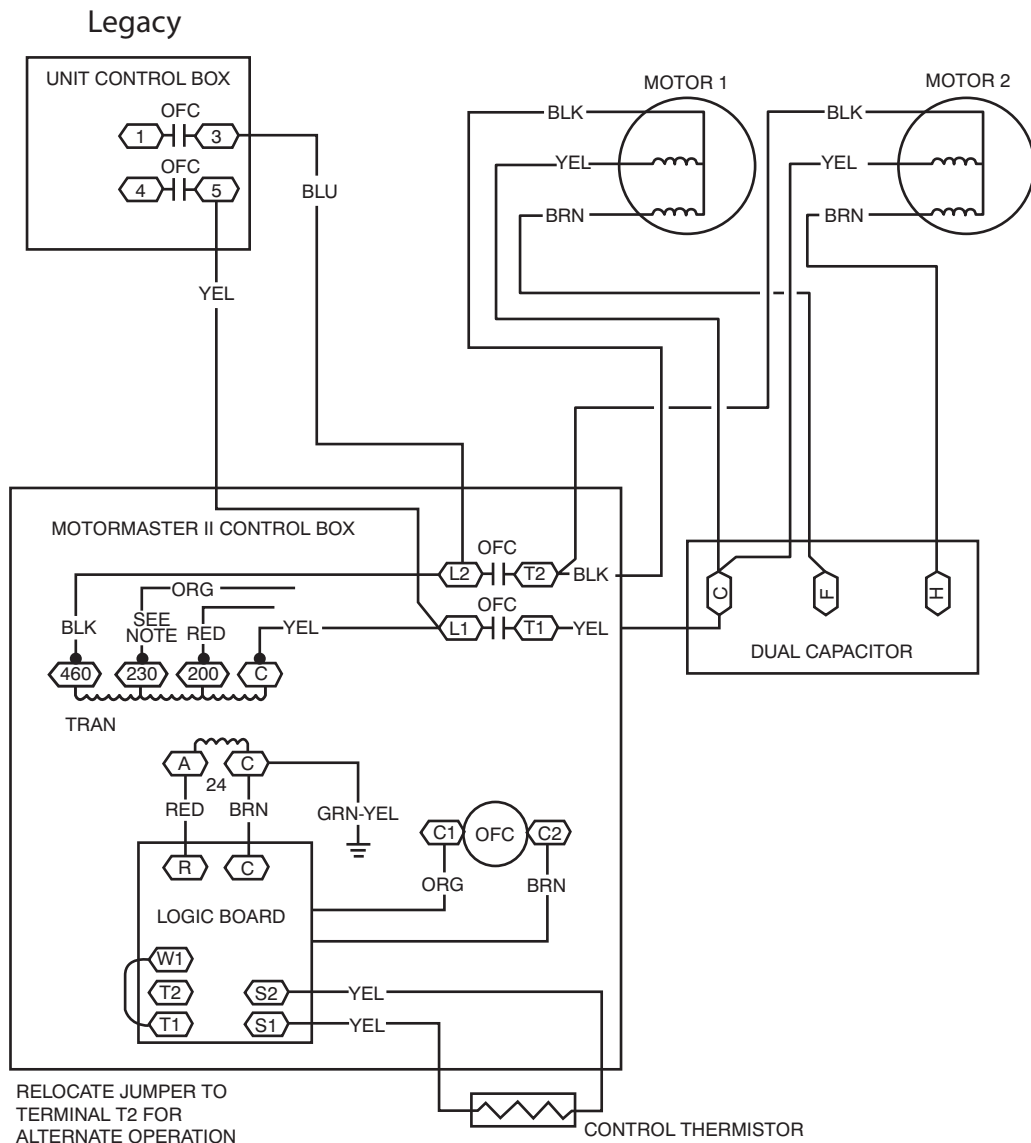


Fig. 17 – Wiring Schematic, Dual Fan Motor, 7-1/2 to 10 Ton Electric Cooling Units (RAS/RGS090-121)

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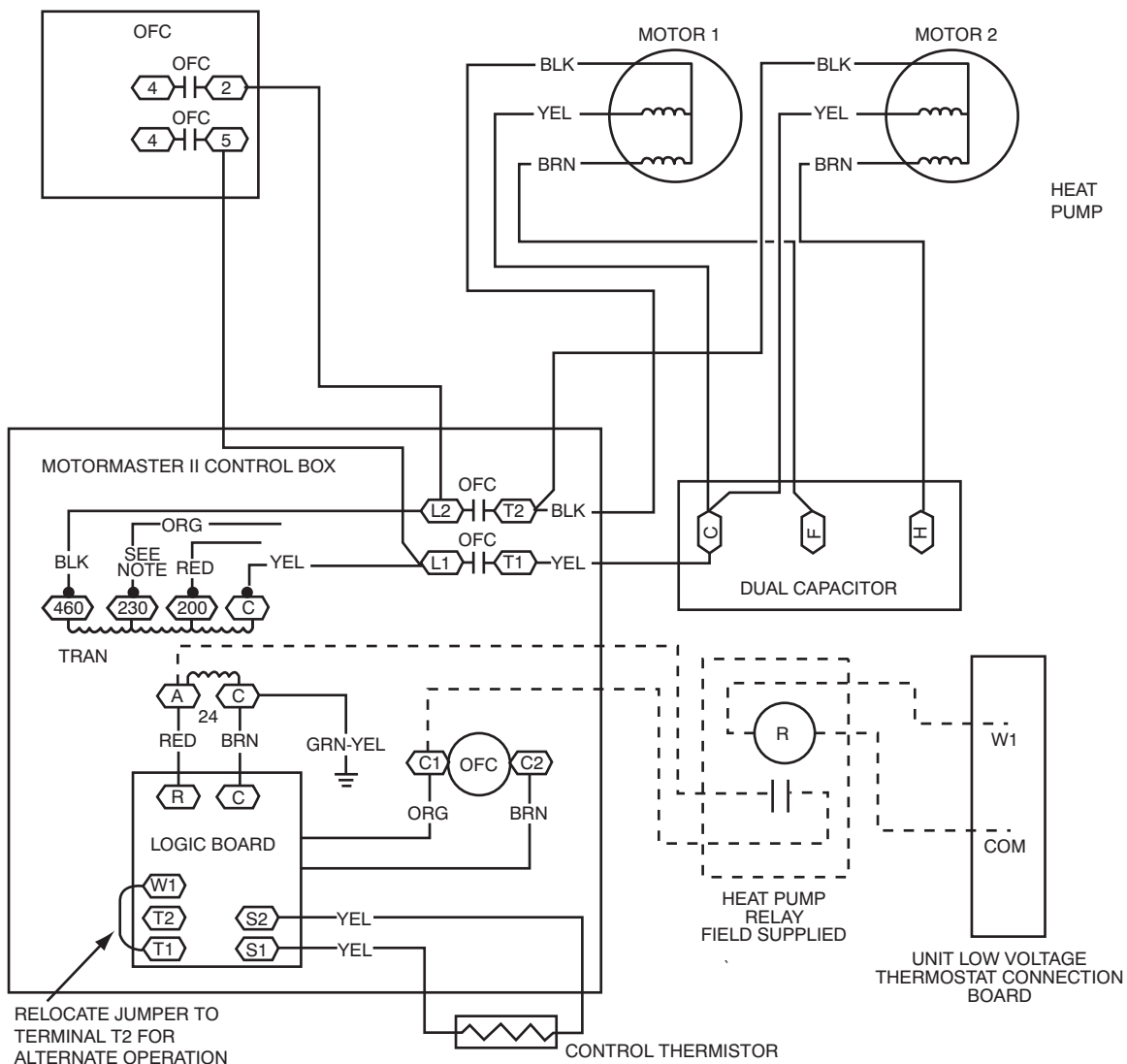


Fig. 18 – Wiring Schematic, 7-1/2 to 8-1/2 Ton Heat Pump Units

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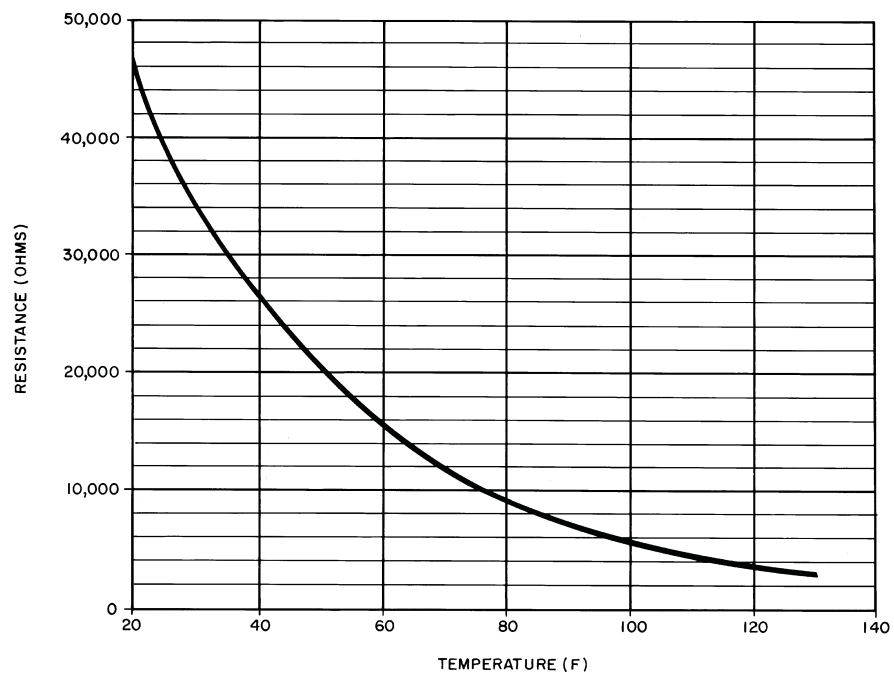


Fig. 19 – Thermistor Resistance vs Temperature

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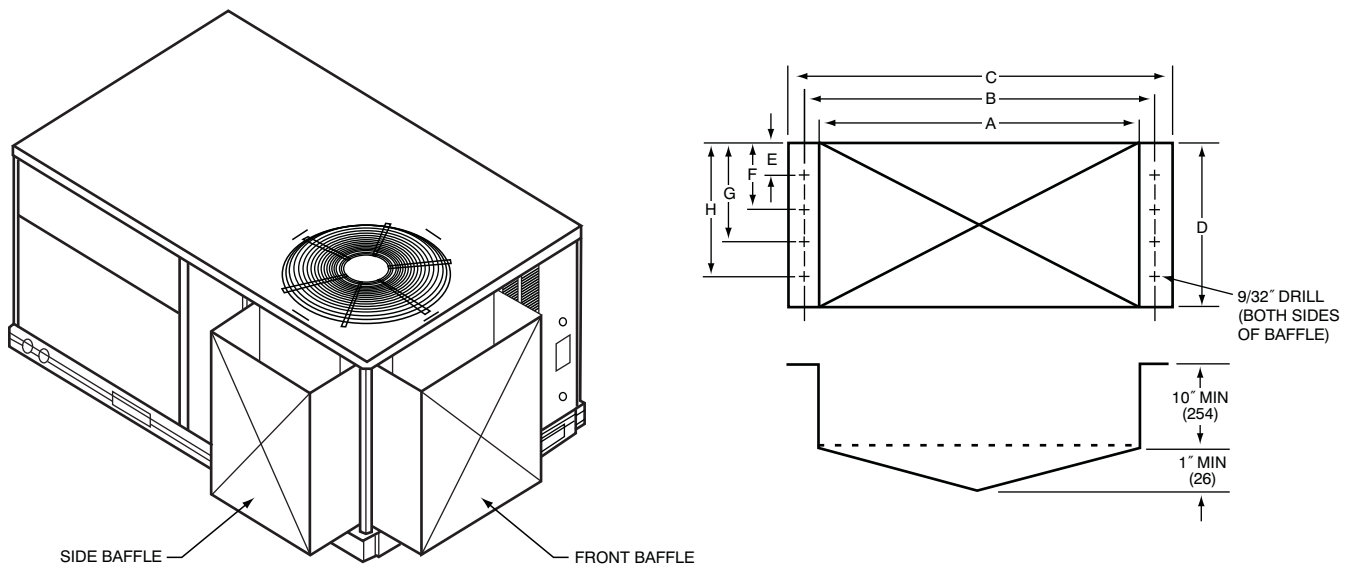


Fig. 20 – Wind Baffles – 3 to 6 Ton Units
RAS/RGS036–072, RHS036–072

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DIMENSIONS

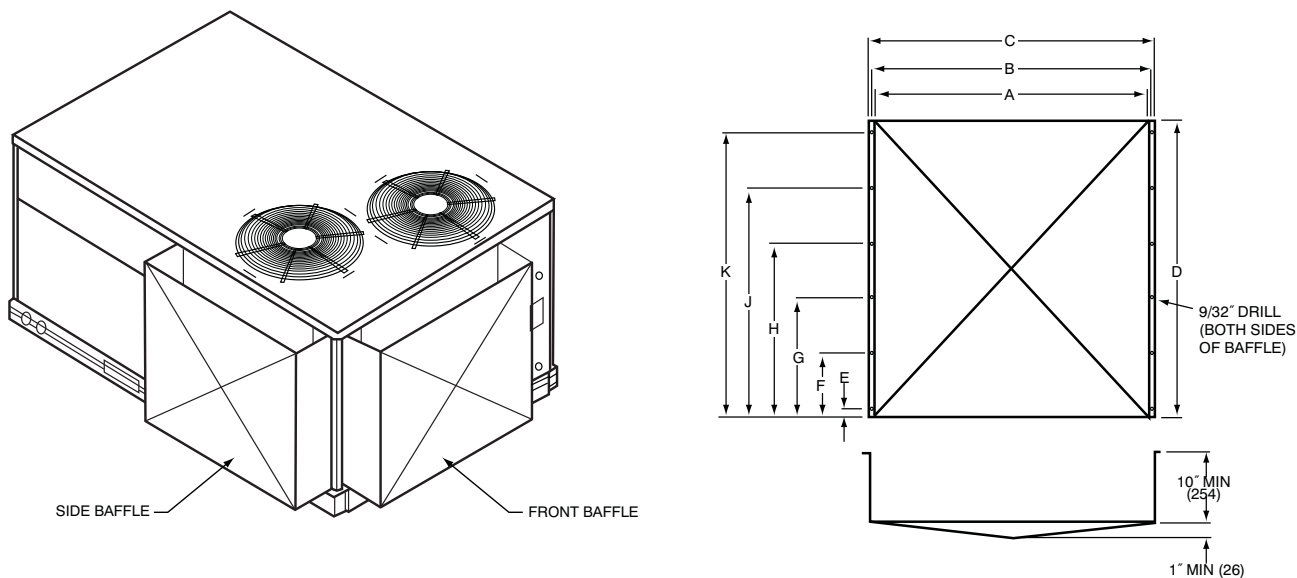
UNIT	SIZE	FRONT BAFFLE INCHES (mm)								
		A	B	C	D	E	F	G	H	J
RAS/RGS	036	25 (635.0)	25 1/2 (647.7)	26 (660.4)	27 1/4 (108.0)	4 1/4 (108.0)	11 1/4 (285.8)	18 1/4 (463.6)	25 1/4 (641.4)	N/A
	048	28 5/8 (727.1)	29 1/8 (739.8)	29 5/8 (752.5)	27 1/4 (108.0)	4 1/4 (108.0)	11 1/4 (285.8)	18 1/4 (463.6)	25 1/4 (641.4)	N/A
	060	28 5/8 (727.1)	29 1/8 (739.8)	29 5/8 (752.5)	27 1/4 (108.0)	4 1/4 (108.0)	11 1/4 (285.8)	18 1/4 (463.6)	25 1/4 (641.4)	N/A
	072	28 5/8 (727.1)	29 1/8 (739.8)	29 5/8 (752.5)	35 3/8 (904.9)	4 1/4 (108.0)	11 1/4 (285.8)	18 1/4 (463.6)	25 1/4 (641.4)	32 1/4 (819.2)

UNIT	SIZE	SIDE BAFFLE INCHES (mm)								
		A	B	C	D	E	F	G	H	J
RAS/RGS	036	20 7/8 (530.2)	21 3/8 (549.3)	21 7/8 (555.6)	27 1/4 (108.0)	4 1/4 (108.0)	11 1/4 (285.8)	18 1/4 (463.6)	25 1/4 (641.4)	N/A
	048	20 7/8 (530.2)	21 3/8 (549.3)	21 7/8 (555.6)	27 1/4 (108.0)	4 1/4 (108.0)	11 1/4 (285.8)	18 1/4 (463.6)	25 1/4 (641.4)	N/A
	060	20 7/8 (530.2)	21 3/8 (549.3)	21 7/8 (555.6)	27 1/4 (108.0)	4 1/4 (108.0)	11 1/4 (285.8)	18 1/4 (463.6)	25 1/4 (641.4)	N/A
	072	20 7/8 (530.2)	21 3/8 (549.3)	21 7/8 (555.6)	35 3/8 (904.9)	4 1/4 (108.0)	11 1/4 (285.8)	18 1/4 (463.6)	25 1/4 (641.4)	32 1/4 (819.2)

BACK BAFFLE INCHES (mm)											
UNIT	SIZE	A	B	C	D	E	F	G	H	J	K
RHS	036	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
	048	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
	060	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
	072	20 7/8 (530.2)	21 3/8 (549.3)	21 7/8 (555.6)	35 3/8 (904.9)	4 1/4 (108.0)	11 1/4 (285.8)	18 1/4 (463.6)	25 1/4 (641.4)		

LEFT BAFFLE (mm)											
UNIT	SIZE	A	B	C	D	E	F	G	H	J	K
RHS	036	25 (635.0)	25 1/2 (647.7)	26 (660.4)	27 1/4 (692.2)	4 1/4 (108.0)	11 1/4 (285.8)	18 1/4 (463.6)	25 1/4 (641.4)		
	048	28 5/8 (727.1)	29 1/8 (739.8)	29 5/8 (752.5)	27 1/4 (692.2)	4 1/4 (108.0)	11 1/4 (285.8)	18 1/4 (463.6)	25 1/4 (641.4)		
	060	25 (635.0)	25 1/2 (647.7)	26 (660.4)	35 3/8 (904.9)	4 1/4 (108.0)	11 1/4 (285.8)	18 1/4 (463.6)	25 1/4 (641.4)	32 1/4 (819.2)	
	072	28 5/8 (727.1)	29 1/8 (739.8)	29 5/8 (752.5)	35 3/8 (904.9)	4 1/4 (108.0)	11 1/4 (285.8)	18 1/4 (463.6)	25 1/4 (641.4)	32 1/4 (819.2)	

Table 1 — Wind Baffle Details – 3 to 6 Ton Unit



**Fig. 21 – Wind Baffles – 7.5 to 10 Ton Units
(RAS/RGS090–121, RHS090–120)**

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UNIT	SIZE	FRONT BAFFLE INCHES (mm)									
		A	B	C	D	E	F	G	H	J	K
RAS/RGS	090, 091	40 ⁵ / ₈ (1031.9)	41 ¹ / ₈ (1044.6)	41 ⁵ / ₈ (1057.3)	35 ³ / ₈ (904.9)	1 ¹ / ₄ (31.8)	9 ¹ / ₄ (235.0)	17 ¹ / ₄ (438.2)	25 ¹ / ₄ (641.4)	33 ¹ / ₄ (844.6)	N/A
	101, 102	28 ⁵ / ₈ (727.1)	29 ¹ / ₈ (739.8)	29 ⁵ / ₈ (752.5)	43 ³ / ₈ (1108.1)	1 ¹ / ₄ (31.8)	9 ¹ / ₄ (235.0)	17 ¹ / ₄ (438.2)	25 ¹ / ₄ (641.4)	33 ¹ / ₄ (844.6)	41 ¹ / ₄ (1047.8)
	120, 121	40 ⁵ / ₈ (1031.9)	41 ¹ / ₈ (1044.6)	41 ⁵ / ₈ (1057.3)	43 ³ / ₈ (1108.1)	1 ¹ / ₄ (31.8)	9 ¹ / ₄ (235.0)	17 ¹ / ₄ (438.2)	25 ¹ / ₄ (641.4)	33 ¹ / ₄ (844.6)	41 ¹ / ₄ (1047.8)

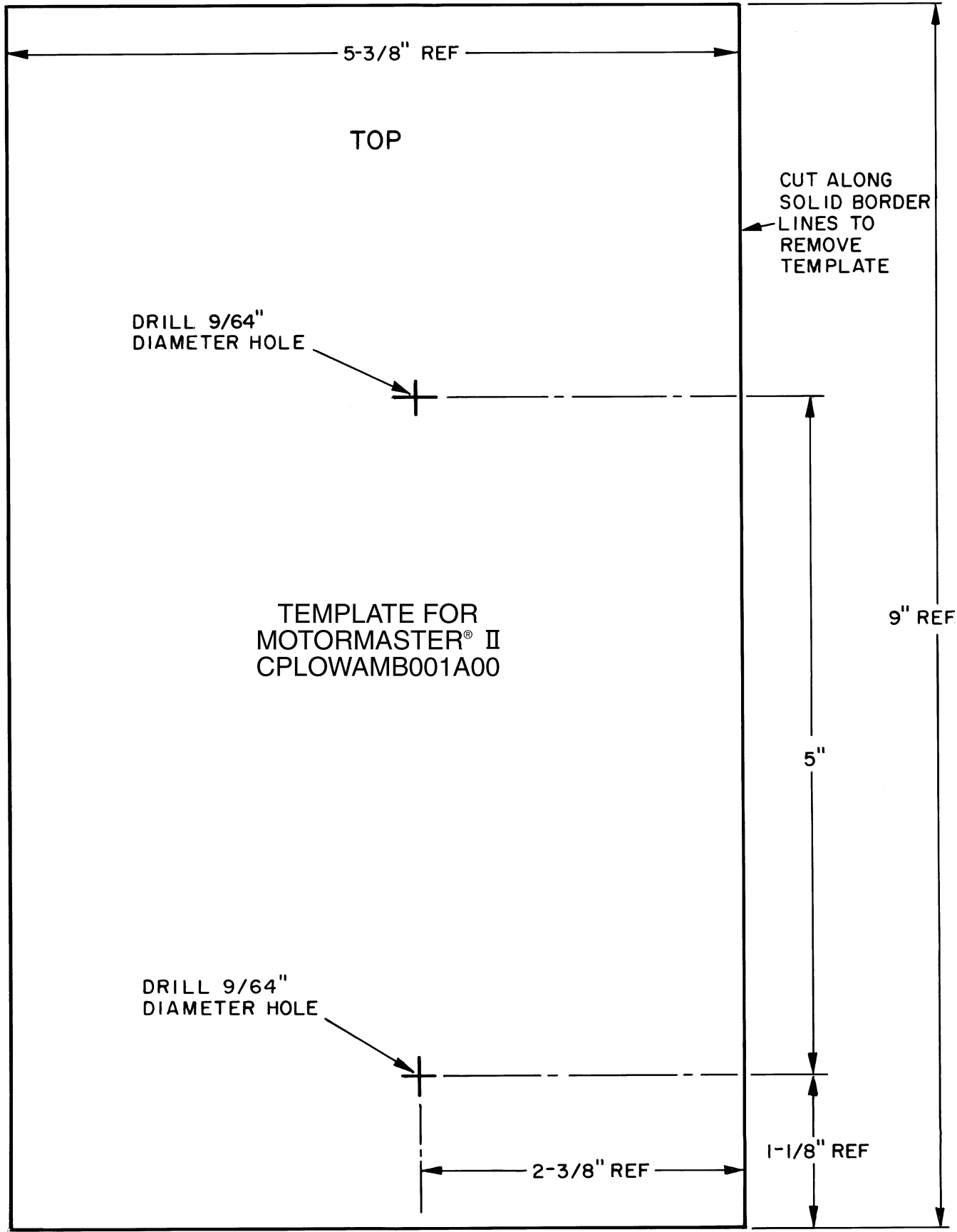
UNIT	SIZE	SIDE BAFFLE INCHES (mm)									
		A	B	C	D	E	F	G	H	J	K
RAS/RGS	090, 091	40 ⁷ / ₈ (1038.2)	41 ³ / ₈ (1057.3)	41 ⁷ / ₈ (1063.6)	35 ³ / ₈ (904.9)	4 ¹ / ₄ (108.0)	11 ¹ / ₄ (285.8)	18 ¹ / ₄ (463.6)	25 ¹ / ₄ (641.4)	32 ¹ / ₄ (819.2)	N/A
	101, 102	40 ⁷ / ₈ (1038.2)	41 ³ / ₈ (1057.3)	41 ⁷ / ₈ (1063.6)	43 ³ / ₈ (1108.1)	4 ¹ / ₄ (108.0)	11 ¹ / ₄ (285.8)	18 ¹ / ₄ (463.6)	25 ¹ / ₄ (641.4)	32 ¹ / ₄ (819.2)	39 ³ / ₁₆ (995.4)
	120, 121	40 ⁷ / ₈ (1038.2)	41 ³ / ₈ (1057.3)	41 ⁷ / ₈ (1063.6)	43 ³ / ₈ (1108.1)	4 ¹ / ₄ (108.0)	11 ¹ / ₄ (285.8)	18 ¹ / ₄ (463.6)	25 ¹ / ₄ (641.4)	32 ¹ / ₄ (819.2)	39 ³ / ₁₆ (995.4)

BACK BAFFLE INCHES (mm)											
UNIT	SIZE	A	B	C	D	E	F	G	H	J	K
RHS	090	40 7/8 (1038.2)	41 3/8 (1057.3)	41 7/8 (1063.6)	43 3/8 (1108.1)	4 1/4 (108.0)	11 1/4 (285.8)	18 1/4 (463.6)	25 1/4 (641.4)	32 1/4 (819.2)	39 3/16 (995.4)
	102	40 7/8 (1038.2)	41 3/8 (1057.3)	41 7/8 (1063.6)	43 3/8 (1108.1)	4 1/4 (108.0)	11 1/4 (285.8)	18 1/4 (463.6)	25 1/4 (641.4)	32 1/4 (819.2)	39 3/16 (995.4)
	120	40 7/8 (1038.2)	41 3/8 (1057.3)	41 7/8 (1063.6)	43 3/8 (1108.1)	4 1/4 (108.0)	11 1/4 (285.8)	18 1/4 (463.6)	25 1/4 (641.4)	32 1/4 (819.2)	39 3/16 (995.4)

LEFT BAFFLE INCHES (mm)											
UNIT	SIZE	A	B	C	D	E	F	G	H	J	K
RHS	090	40 5/8 (1031.9)	41 1/8 (1044.6)	41 5/8 (1057.3)	43 3/8 (1108.1)	1 1/4 (31.8)	9 1/4 (235.0)	17 1/4 (438.2)	25 1/4 (641.4)	33 1/4 (844.6)	41 1/4 (1047.8)
	102	40 5/8 (1031.9)	41 1/8 (1044.6)	41 5/8 (1057.3)	43 3/8 (1108.1)	1 1/4 (31.8)	9 1/4 (235.0)	17 1/4 (438.2)	25 1/4 (641.4)	33 1/4 (844.6)	41 1/4 (1047.8)
	120	40 5/8 (1031.9)	41 1/8 (1044.6)	41 5/8 (1057.3)	43 3/8 (1108.1)	1 1/4 (31.8)	9 1/4 (235.0)	17 1/4 (438.2)	25 1/4 (641.4)	33 1/4 (844.6)	41 1/4 (1047.8)

Table 3 — Wind Baffle Details – 7.5 to 10 Ton Units (Continued)

MOUNTING TEMPLATE



C10732