



Installation Instructions

Part No: 38AP-900---41 to 38AP-900---55

CONTENTS

	Page
SAFETY CONSIDERATIONS	1
GENERAL	1
PRE-INSTALLATION	2
INSTALLATION	33
Step 1 — Install Wind Baffles	33
Step 2 — Install Accessory	33
• 30RAP AND 38AP UNIT INSTALLATION	
• 09DP UNIT INSTALLATION	
START-UP	54
Motormaster® Parameter Instructions	54
• 30RAP AND 38AP UNITS	
• 09DP UNITS	
• TROUBLESHOOTING	
• FAULTS	
• ALARMS	
APPENDIX A — ACCESSORY PACKAGE	
CONTENTS	57

SAFETY CONSIDERATIONS

Installation of this accessory can be hazardous due to system pressures, electrical components, and equipment location (such as a roof or elevated structure). Only trained, qualified installers and service technicians should install, start-up, and service this equipment.

When installing this accessory, observe precautions in the literature, labels attached to the equipment, and any other safety precautions that apply:

- Follow all safety codes
- Wear safety glasses and work gloves
- Use care in handling and installing this accessory

It is important to 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, CAUTION, and NOTE. 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 hazards 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 can cause personal injury and death. Shut off all power to this equipment during installation and service. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is completed.

GENERAL

This book contains instructions for the installation and start-up of the Motormaster® electronic low ambient control on 30RAP 010-150, 38APD 025-130, 38APS 025-065, and 09DPM/DPS 018-130 units.

This kit is not applicable for any Greenspeed unit (Models: 30RAP 011, 016-060 with Position 13: D, F, G, H, J, or K and 38APS 025-050 and 38APD 025-060 with Position 13: D, G, H, or K). See Table 1 for accessory usage. See Tables 2-6 for standard unit ambient temperature limitations, operating temperatures and wind baffle usage. See Appendix A on page 57 for accessory package contents. Refer to unit installation instructions for complete model number nomenclature.

This control varies with condenser fan speed based on the input signal from the auxiliary (AUX) board or a pressure transducer. The control is a variable frequency drive (VFD) and is compatible with standard motors on these products. The VFD input is controlled by either the main base board (MBB) and the highest saturated discharge temperature (SDT) for the circuit or unit, depending on unit size, or through a pressure setting and input via a pressure transducer.

When the SDT drops below Motormaster set point, the VFD speed is decreased based on the differential to set point. At certain ambient and load conditions, a fan running at full speed draws too much air across the condenser coil to maintain a minimum condensing pressure/temperature. When these conditions occur, the VFD will slow down the outdoor fan motor and maintain a set point depending on unit type.

The Motormaster low ambient operation kit can be used to extend the system operation down to -20°F (-28°C). Wind baffles must be installed to ensure proper operation. See Table 4 for wind baffle usage.

Refer to unit installation instructions for complete model number nomenclature.

NOTE: The drive is phase insensitive when referring to incoming line voltage. This means that the VFD will operate with any phase sequence of the incoming three-phase power.

See Fig. 1-12 for Motormaster power wiring. See Fig. 13-19 for control and relay wiring. See Fig. 20-41 for detailed views of auxiliary board and accessory installations.

PRE-INSTALLATION

Inspect the contents of the accessory package before installing. File a claim with the shipper if shipping damage is found or contact your Carrier representative if any parts are missing. See Table 1 for accessory usage and Appendix A “Accessory Package Contents” on page 57 for item package contents.

Table 1 — Accessory Usage

ACCESSORY PART NO.	UNIT SIZES	UNIT VOLTAGE (V-Ph-Hz)
38AP-900---41	30RAP 010 and 015 30RAP 018-030 38APD/APS 025-030 09DPS 018-030	208/230-3-60
38AP-900---42	30RAP 010 and 015 30RAP 018-030 38APD/APS 025-030 09DPS 018-030	380-3-60 380/415-3-50 460-3-60
38AP-900---43	30RAP 010 and 015 30RAP 018-030 38APD/APS 025-030 09DPS 018-030	575-3-60
38AP-900---44	30RAP 035-060 38APD 040-060 09DPM 035-060	208/230-3-60
38AP-900---45	30RAP 035-060 38APD 040-060 09DPM 035-060	380-3-60 380/415-3-50 460-3-60
38AP-900---46	30RAP 035-060 38APD 040-060 09DPM 035-060	575-3-60
38AP-900---47	30RAP 070-090 38APD 070-100 09DPM 065	208/230-3-60
38AP-900---48	30RAP 070-090 38APD 070-100 09DPM 065	380-3-60 380/415-3-50 460-3-60
38AP-900---49	30RAP 070-90 38APD 070-90 09DPM 065	575-3-60
38AP-900---50	38APS 040-050 38APS 065	208/230-3-60
38AP-900---51	38APS 040-050 38APS 065	380-3-60 380/415-3-50 460-3-60
38AP-900---52	38APS 040-050 38APS 065	575-3-60
38AP-900---53	30RAP 100-150 38APD 115-130 09DPM 075-130	208/230-3-60
38AP-900---54	30RAP 100-150 38APD 115-130 09DPM 075-130	380-3-60 380/415-3-50 460-3-60
38AP-900---55	30RAP 100-150 38APD 115-130 09DPM 075-130	575-3-60

**Table 2 — 30RAP Outdoor Air Temperature Limitations — Standard Units
(Non-Greenspeed® Intelligence Units)**

30RAP UNIT SIZE	MIN. OUTDOOR AIR TEMP. (Standard Unit)	MIN. OUTDOOR AIR TEMP. WITH MOTORMASTER® CONTROL ^a
010,015^b	–20°F (–28.9°C)	–20°F (–28.9°C)
018,030	45°F (7.2°C)	–20°F (–28.9°C)
035-150	32°F (0.0°C)	–20°F (–28.9°C)

NOTE(S):

- a. Requires field-installed wind baffles.
- b. Motormaster control is standard with 30RAP 010 and 015 units.

Table 3 — 38AP Outdoor Air Temperature Limitations

38APS UNIT SIZE	MIN. OUTDOOR AIR TEMP. (Standard Unit)	MIN. OUTDOOR AIR TEMP. WITH MOTORMASTER® CONTROL ^a
SINGLE CIRCUIT		
025-065	45°F (7.2°C)	–20°F (–28.9°C)
DUAL CIRCUIT		
025-040	32°F (0.0°C)	–20°F (–28.9°C)
050-060	25°F (–3.9°C)	–20°F (–28.9°C)
070-130	32°F (0.0°C)	–20°F (–28.9°C)

NOTE(S):

- a. Requires field-installed wind baffles.

Table 4 — Wind Baffle Usage

UNIT SIZE ^a	PART NO.	QUANTITY
30RAP 010 and 015	30RA-900---064	1
30RAP 018, 020	30RA-900---065	1
30RAP 025, 030	30RA-900---066	1
30RAP 035, 040	30RA-900---065	2
30RAP 045-060	30RA-900---066	2
38APD/APS 025	38RA-900---065	1
38APD/APS 027, 030	30RA-900---066	1
38APD/APS 040-060	30RA-900---066	2
09DPS 018, 020	30RA-900---055	1
09DPS 030	30RA-900---056	1
09DPM 035, 040, 050	30RA-900---055	2
09DPM 060	30RA-900---056	2
09DPM 065-130	38AP-900---005	2
38APD 070-130	38AP-900---005	1
30RAP 070-150		
09DPM 065-130		

NOTE(S):

- a. The 38APS 065 unit does not require wind baffles. The control box acts as a wind baffle on one side. The other side is a blank panel for a coil option.

Table 5 — 09DP Minimum Outdoor-Air Operating Temperature — English^{a,b,c}

UNIT 09DP	TD	MINIMUM AMBIENT (°F) WITHOUT MOTORMASTER			
		100% Capacity	75% Capacity	50% Capacity	25% Capacity
018	30	58	62	62	64
	25	63	66	65	66
	20	67	70	68	68
020	30	44	51	54	59
	25	51	58	58	62
	20	58	63	64	66
030	30	27	38	45	54
	25	37	47	51	58
	20	47	55	58	63
035	30	41	48	50	58
	25	47	53	55	60
	20	53	59	60	63
040	30	32	41	45	55
	25	39	47	50	57
	20	46	53	56	61
050	30	20	35	45	52
	25	25	42	50	56
	20	31	50	56	60
060	30	20	30	45	50
	25	25	37	50	54
	20	31	47	56	58
065	30	19	32	41	51
	25	30	42	47	56
	20	42	51	55	62
075	30	24	36	43	53
	25	35	45	50	57
	20	45	54	57	63
085	30	16	29	39	50
	25	28	40	46	55
	20	39	49	54	61
095	30	15	26	37	49
	25	25	38	44	54
	20	37	48	53	61
115	30	15	24	35	48
	25	22	36	43	54
	20	35	46	52	60
130	30	15	25	36	49
	25	23	36	43	54
	20	36	47	52	60

NOTE(S):

- Based on 80°F condensing temperature at 100% and 75% capacity and a 75°F condensing temperature at 50% and 25% capacity.
- Units 035-130 are based on dual circuit operation. Dual circuit low ambient option should be based on circuit with lowest TD [Temperature Difference (°F), Condensing Temperature – Outdoor Air Temperature].
- Operation below minimum ambient temperatures listed will require Motormaster® control.

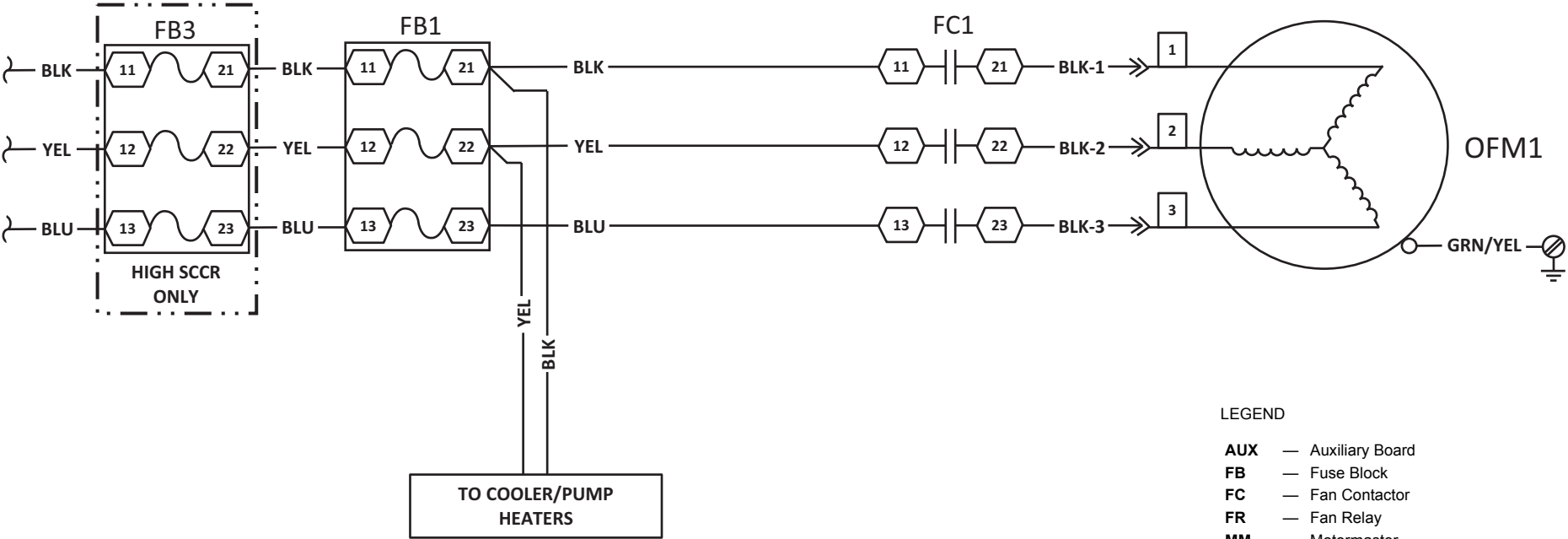
Table 6 — 09DP Minimum Outdoor-Air Operating Temperature — SI^{a,b,c}

UNIT 09DP	TD	MINIMUM AMBIENT (°C) WITHOUT MOTORMASTER			
		100% Capacity	75% Capacity	50% Capacity	25% Capacity
018	16.6	14.2	16.7	16.6	17.6
	13.9	16.9	19.1	18.2	18.7
	11.1	19.7	21.3	20.1	20.1
020	16.6	6.4	10.6	12.3	15.1
	13.9	10.5	14.2	14.7	16.8
	11.1	14.5	17.4	17.5	18.8
030	16.6	-2.8	3.3	7.2	12.2
	13.9	2.8	8.3	10.6	14.4
	11.1	8.3	12.8	14.4	17.2
035	16.6	5.0	8.9	10.2	14.2
	13.9	8.2	11.8	12.7	15.5
	11.1	11.6	14.8	15.4	17.1
040	16.6	0.1	4.9	7.2	12.5
	13.9	3.8	8.4	10.2	14.1
	11.1	7.9	11.9	13.4	16
050	16.6	-6.7	1.7	7.2	11.1
	13.9	-3.9	5.6	10	13.3
	11.1	-0.6	10	13.3	15.6
060	16.6	-6.7	-1.1	7.2	10
	13.9	-3.9	2.8	10	12.2
	11.1	-0.6	8.3	13.3	14.4
065	16.6	-7.3	-0.2	4.7	10.8
	13.9	-1.0	5.5	8.5	13.3
	11.1	5.3	10.5	12.9	16.5
075	16.6	-4.4	2.1	6.3	11.7
	13.9	1.4	7.3	9.8	14
	11.1	7.3	12	13.9	17
085	16.6	-9.0	-1.6	3.8	10.2
	13.9	-2.4	4.4	7.7	12.9
	11.1	4.2	9.6	12.4	16.2
095	16.6	-9.4	-3.1	2.7	9.6
	13.9	-4.0	3.2	6.9	12.4
	11.1	2.9	8.7	11.7	15.9
115	16.6	-9.4	-4.3	1.9	9.1
	13.9	-5.3	2.2	6.2	12
	11.1	1.9	7.9	11.2	15.6
130	16.6	-9.4	-3.9	2.1	9.3
	13.9	-5.0	2.5	6.4	12.1
	11.1	2.2	8.1	11.4	15.7

NOTE(S):

- Based on 26.7°C condensing temperature at 100% and 75% capacity and a 23.9°C condensing temperature at 50% and 25% capacity.
- Units 035 to 130 are based on dual circuit operation. Dual circuit low ambient option should be based on circuit with lowest TD [Temperature Difference (°C), Condensing Temperature – Outdoor Air Temperature].
- Operation below minimum ambient temperatures listed will require Motormaster® control.

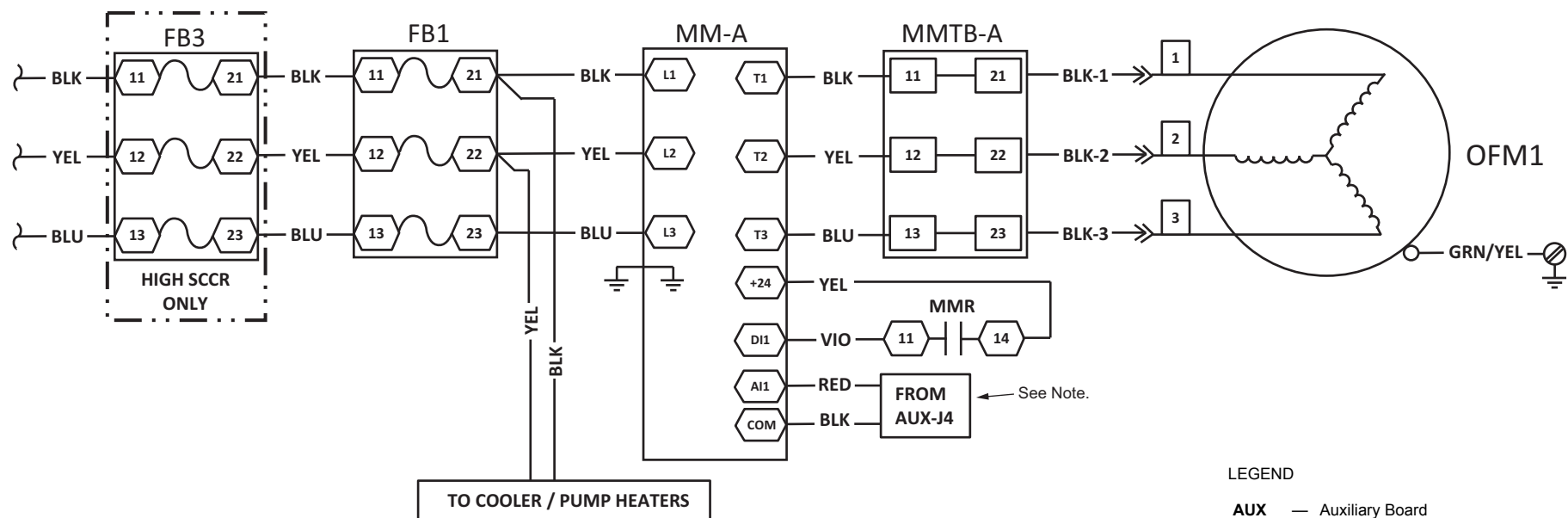
Before Motormaster Power Wiring



- LEGEND
- AUX** — Auxiliary Board
 - FB** — Fuse Block
 - FC** — Fan Contactor
 - FR** — Fan Relay
 - MM** — Motormaster
 - MMR** — Motormaster Relay
 - MMTB** — Motormaster Terminal Block
 - OFM** — Outdoor Fan Motor
 - PT** — Pressure Transducer
 - SCCR** — Short Circuit Current Rating
 - TB** — Terminal Block

Fig. 1 — Motormaster Power Wiring —30RAP 010-015 Units

After Motormaster Power Wiring



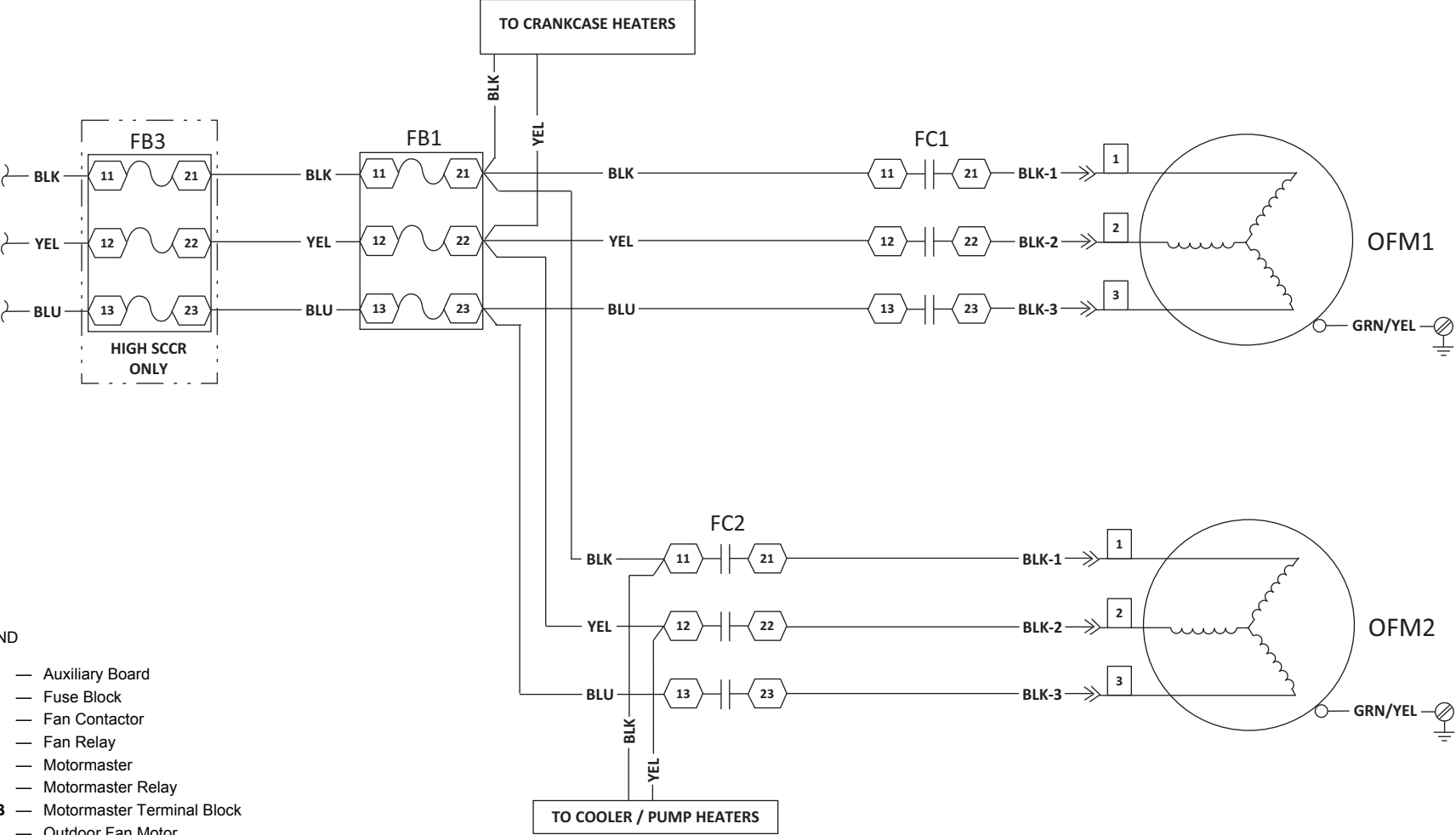
LEGEND

AUX	— Auxiliary Board
FB	— Fuse Block
FC	— Fan Contactor
FR	— Fan Relay
MM	— Motormaster
MMR	— Motormaster Relay
MMTB	— Motormaster Terminal Block
OFM	— Outdoor Fan Motor
PT	— Pressure Transducer
SCCR	— Short Circuit Current Rating
TB	— Terminal Block

NOTE: The wire harness has a plug which connects to the AUX board. See control schematics (Fig. 13) that show the wire connections to the AUX board.

Fig. 1 — Motormaster Power Wiring —30RAP 010-015 Units (cont)

Before Motormaster Power Wiring



- LEGEND
- AUX** — Auxiliary Board
 - FB** — Fuse Block
 - FC** — Fan Contactor
 - FR** — Fan Relay
 - MM** — Motormaster
 - MMR** — Motormaster Relay
 - MMTB** — Motormaster Terminal Block
 - OFM** — Outdoor Fan Motor
 - PT** — Pressure Transducer
 - SCCR** — Short Circuit Current Rating
 - TB** — Terminal Block

Fig. 2 — Motormaster Power Wiring —30RAP 018-030 Units

After Motormaster Power Wiring

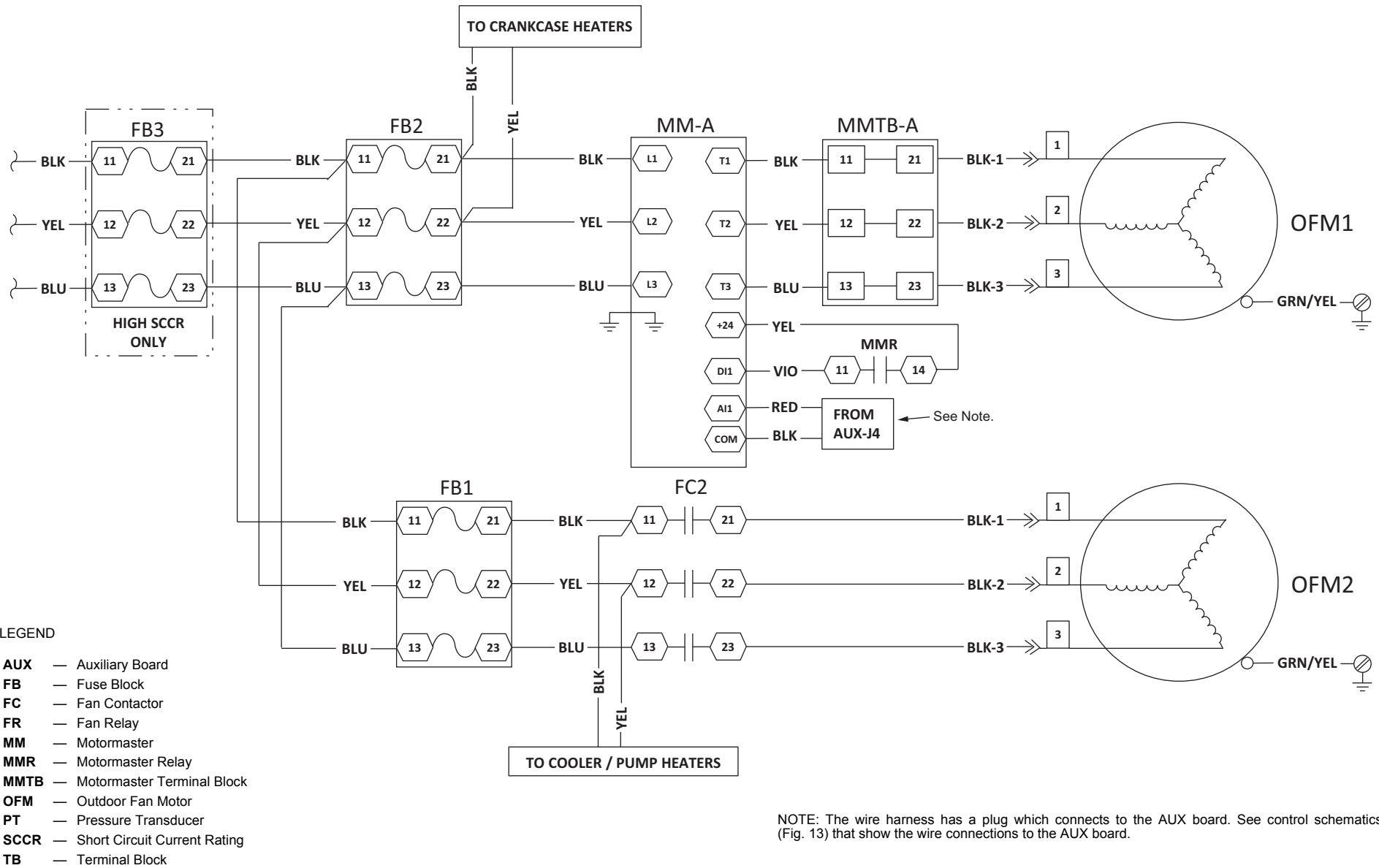


Fig. 2 — Motormaster Power Wiring —30RAP 018-030 Units (cont)

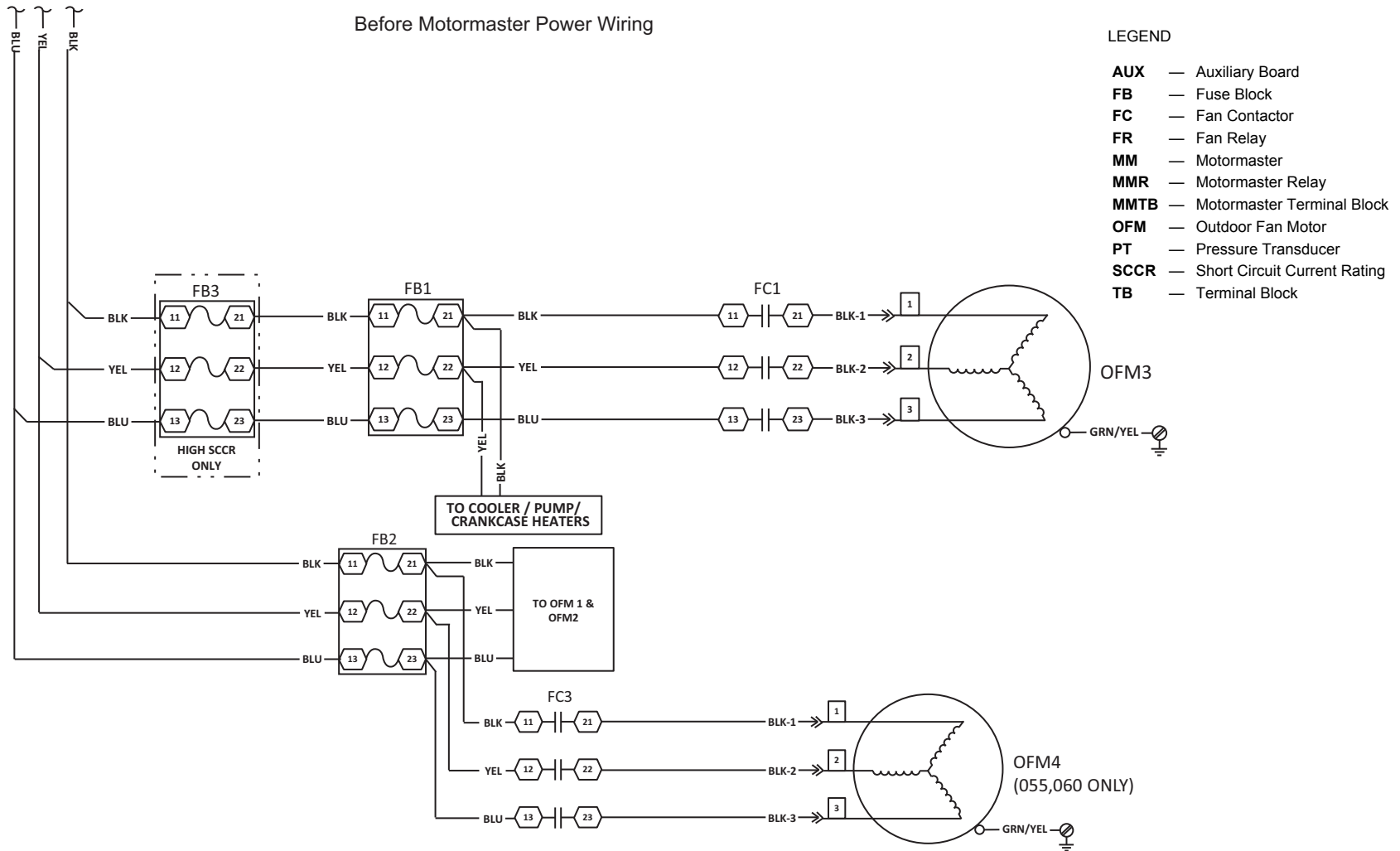
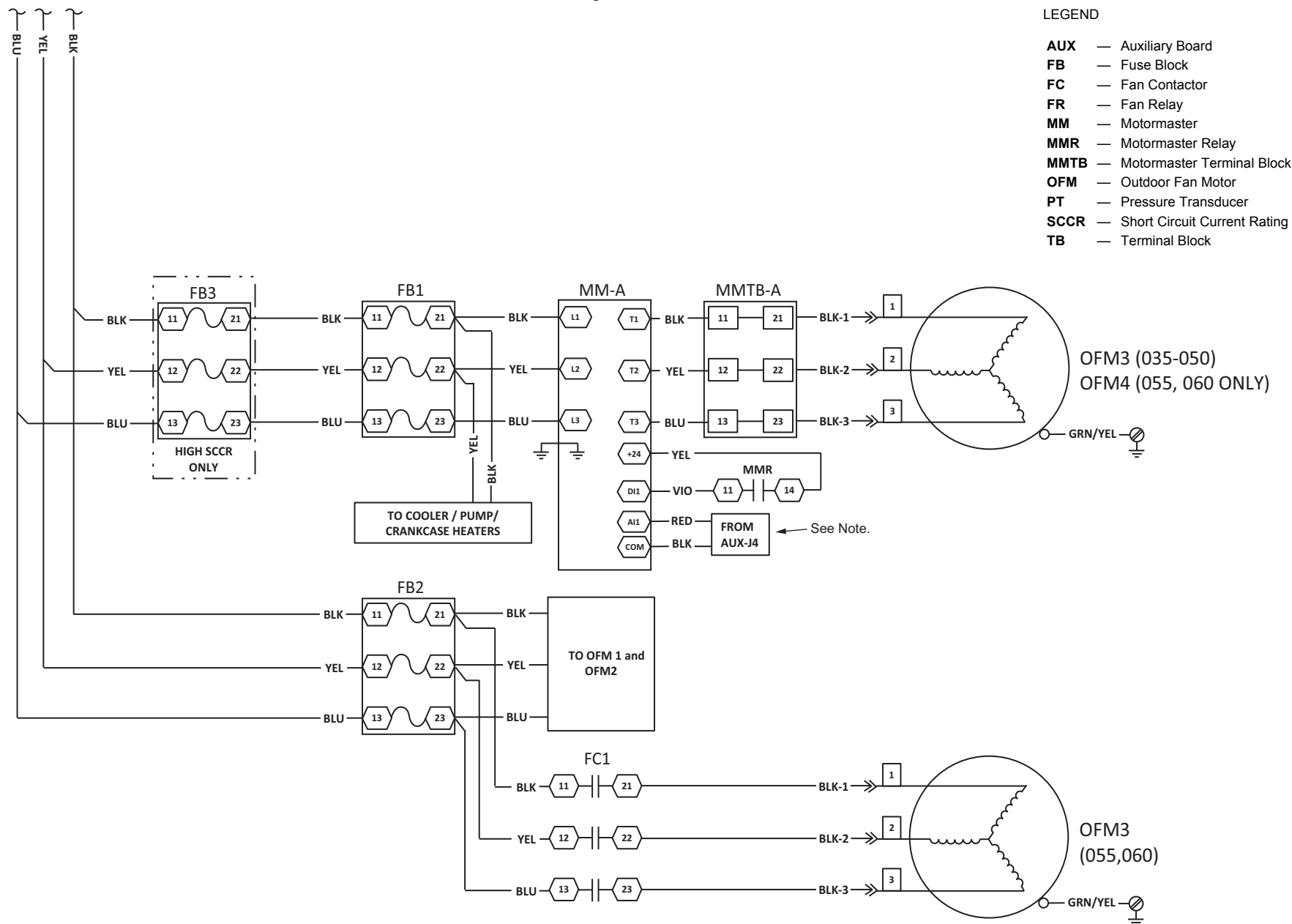


Fig. 3 — Motormaster Power Wiring —30RAP 035-060 Units

After Motormaster Power Wiring

10



NOTE: The wire harness has a plug which connects to the AUX board. See control schematics (Fig. 13) that show the wire connections to the AUX board.

Fig. 3 — Motormaster Power Wiring —30RAP 035-060 Units (cont)

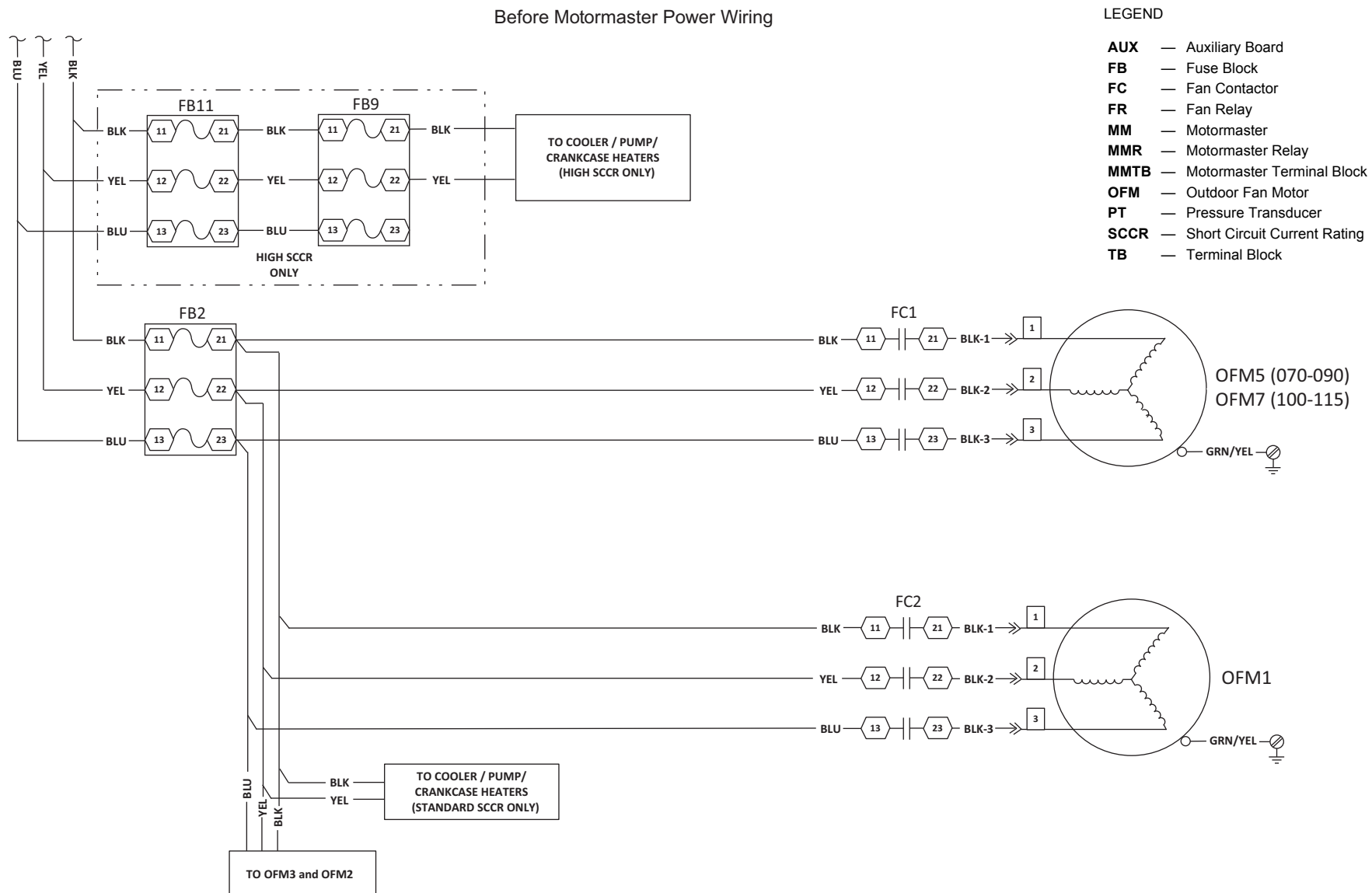
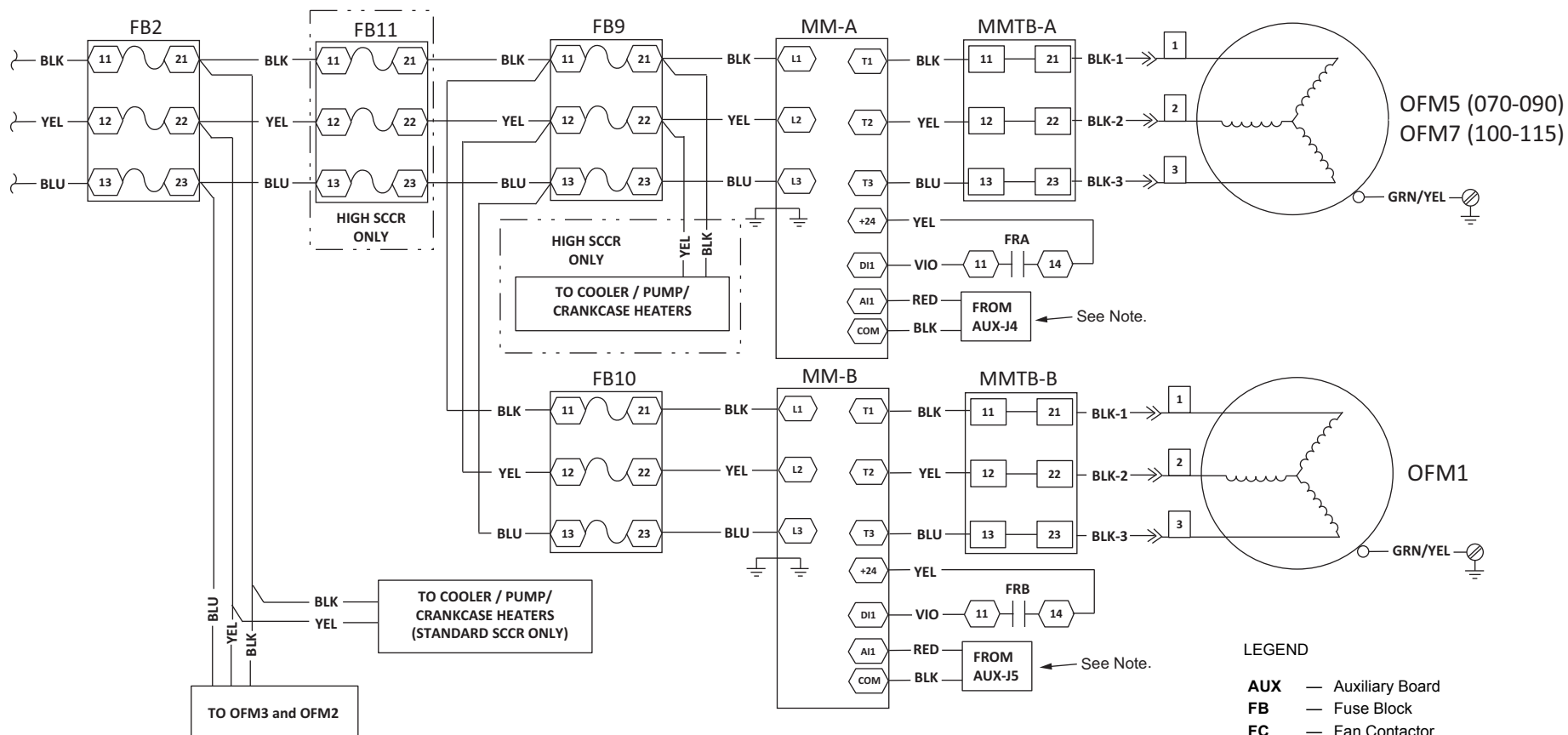


Fig. 4 — Motormaster Power Wiring — 30RAP 070-115 Units

After Motormaster Power Wiring



NOTE: The wire harness has a plug which connects to the AUX board. See control schematics (Fig. 14) that show the wire connections to the AUX board.

Fig. 4 — Motormaster Power Wiring —30RAP 070-115 Units (cont)

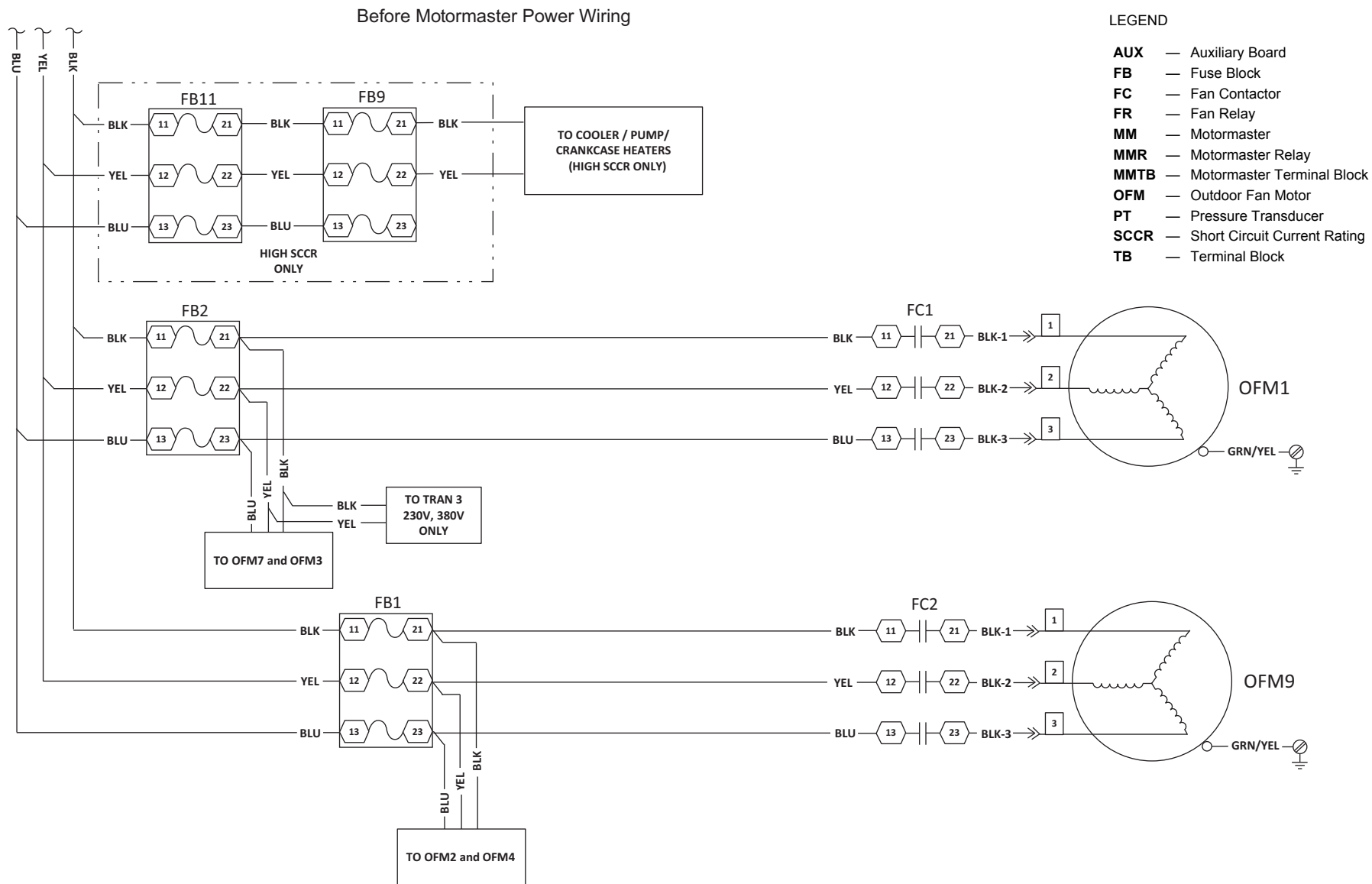
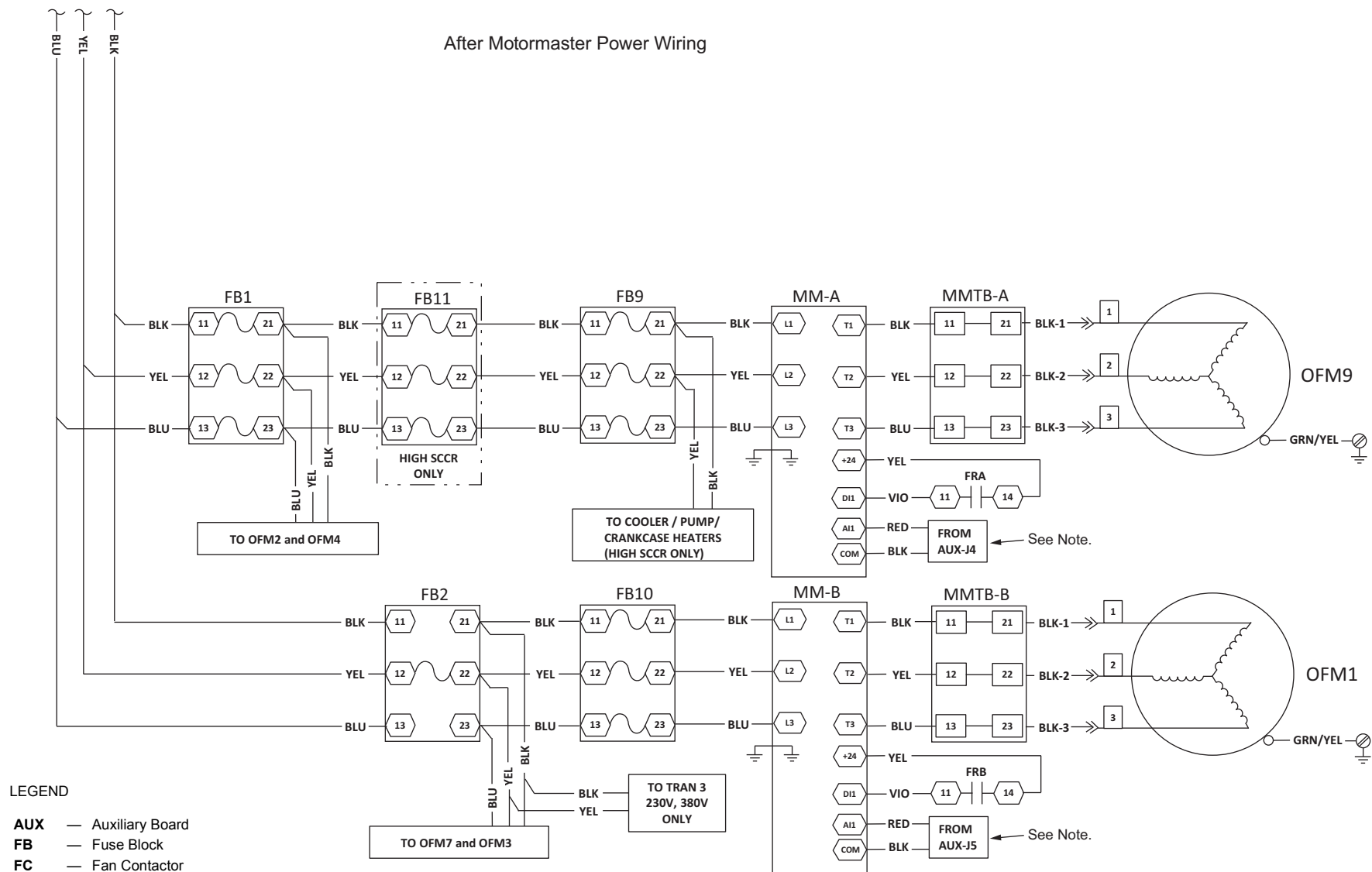


Fig. 5 — Motormaster Power Wiring —30RAP 130-150 Units

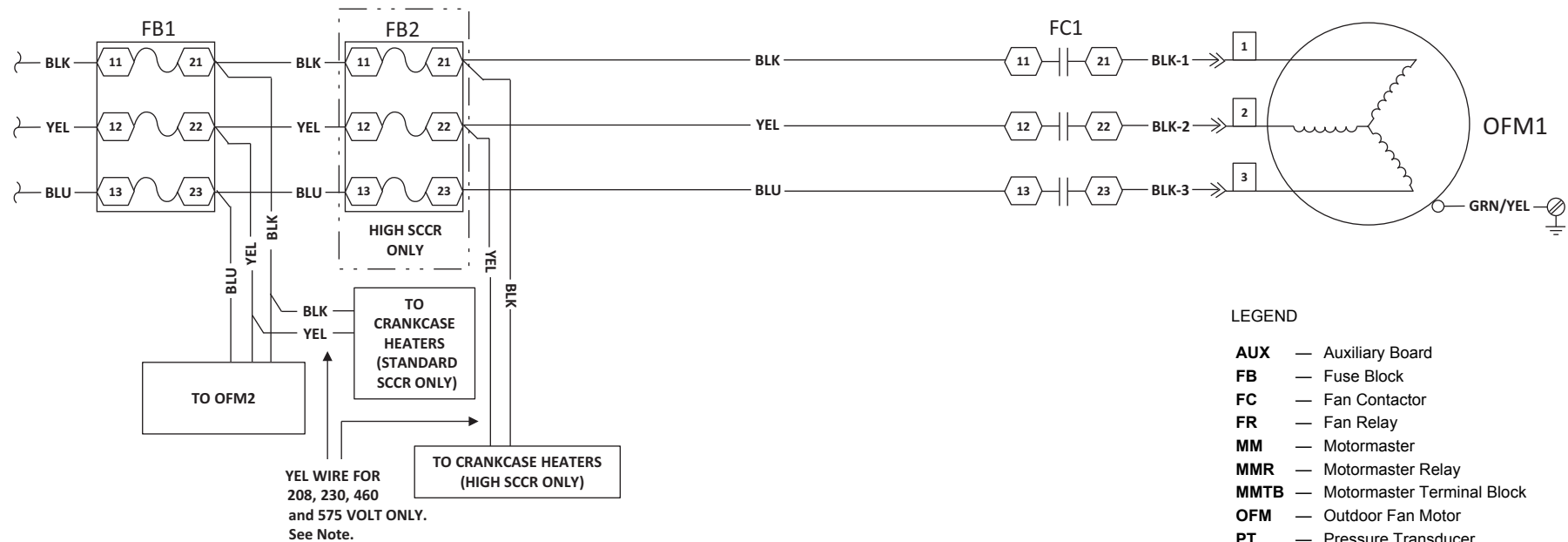
After Motormaster Power Wiring



NOTE: The wire harness has a plug which connects to the AUX board. See control schematics (Fig. 14) that show the wire connections to the AUX board.

Fig. 5 — Motormaster Power Wiring —30RAP 130-150 Units (cont)

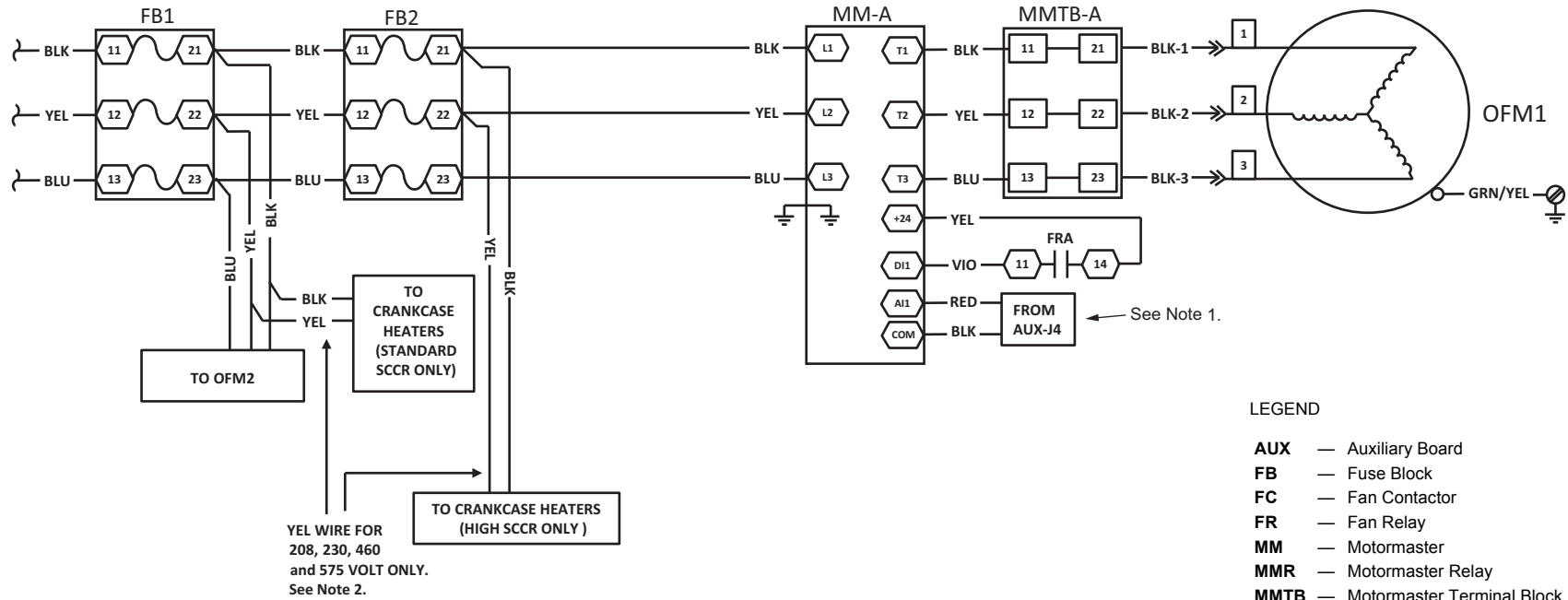
Before Motormaster Power Wiring



NOTE: For 380/400v units, the YEL CCH wire will connect to WHT neutral wire instead of terminal 22 on fuse blocks. See unit power schematic label for details.

Fig. 6 — Motormaster Power Wiring — 38APD/APS 025-030 Units

After Motormaster Power Wiring



LEGEND

AUX	— Auxiliary Board
FB	— Fuse Block
FC	— Fan Contactor
FR	— Fan Relay
MM	— Motormaster
MMR	— Motormaster Relay
MMTB	— Motormaster Terminal Block
OFM	— Outdoor Fan Motor
PT	— Pressure Transducer
SCCR	— Short Circuit Current Rating
TB	— Terminal Block

Fig. 6 — Motormaster Power Wiring — 38APD/APS 025-030 Units (cont)

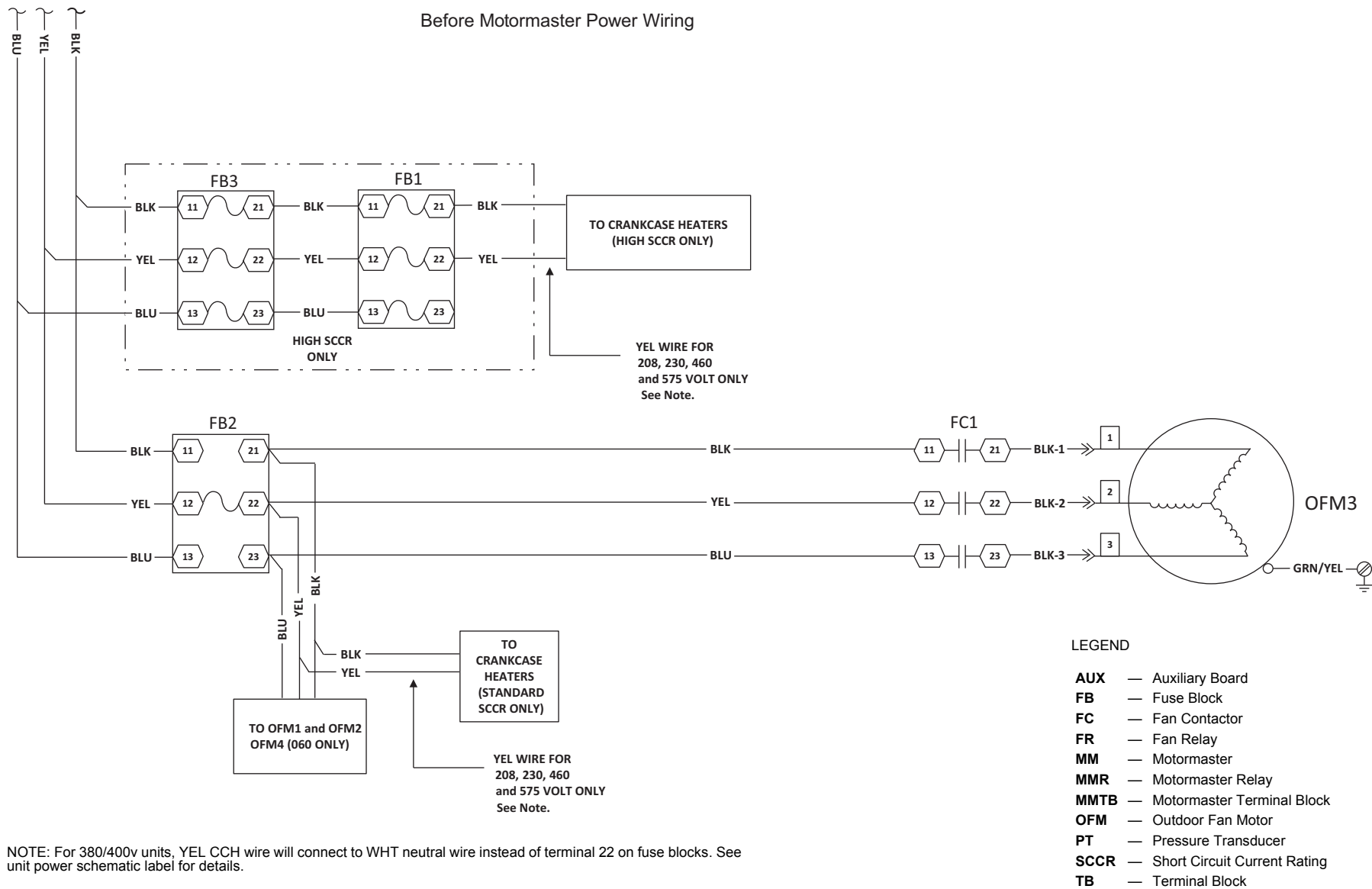
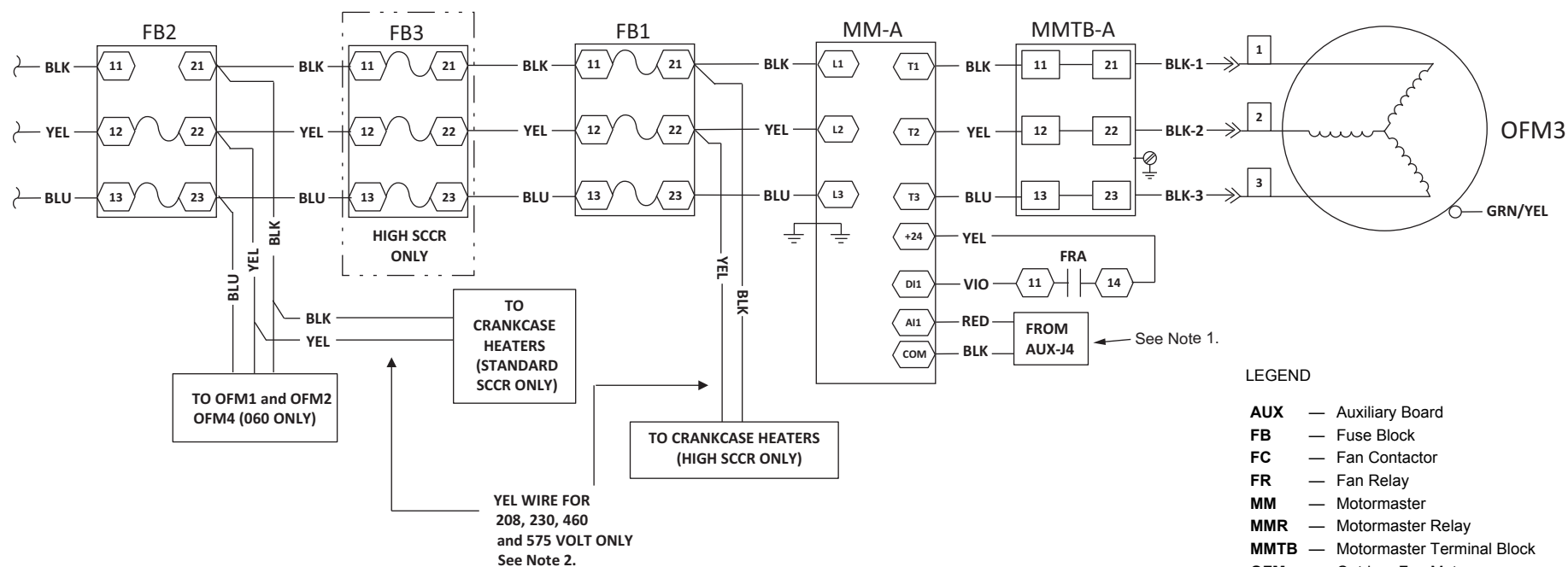


Fig. 7 — Motormaster Power Wiring — 38APS 040-050 and 38APD 040-060 Units

After Motormaster Power Wiring

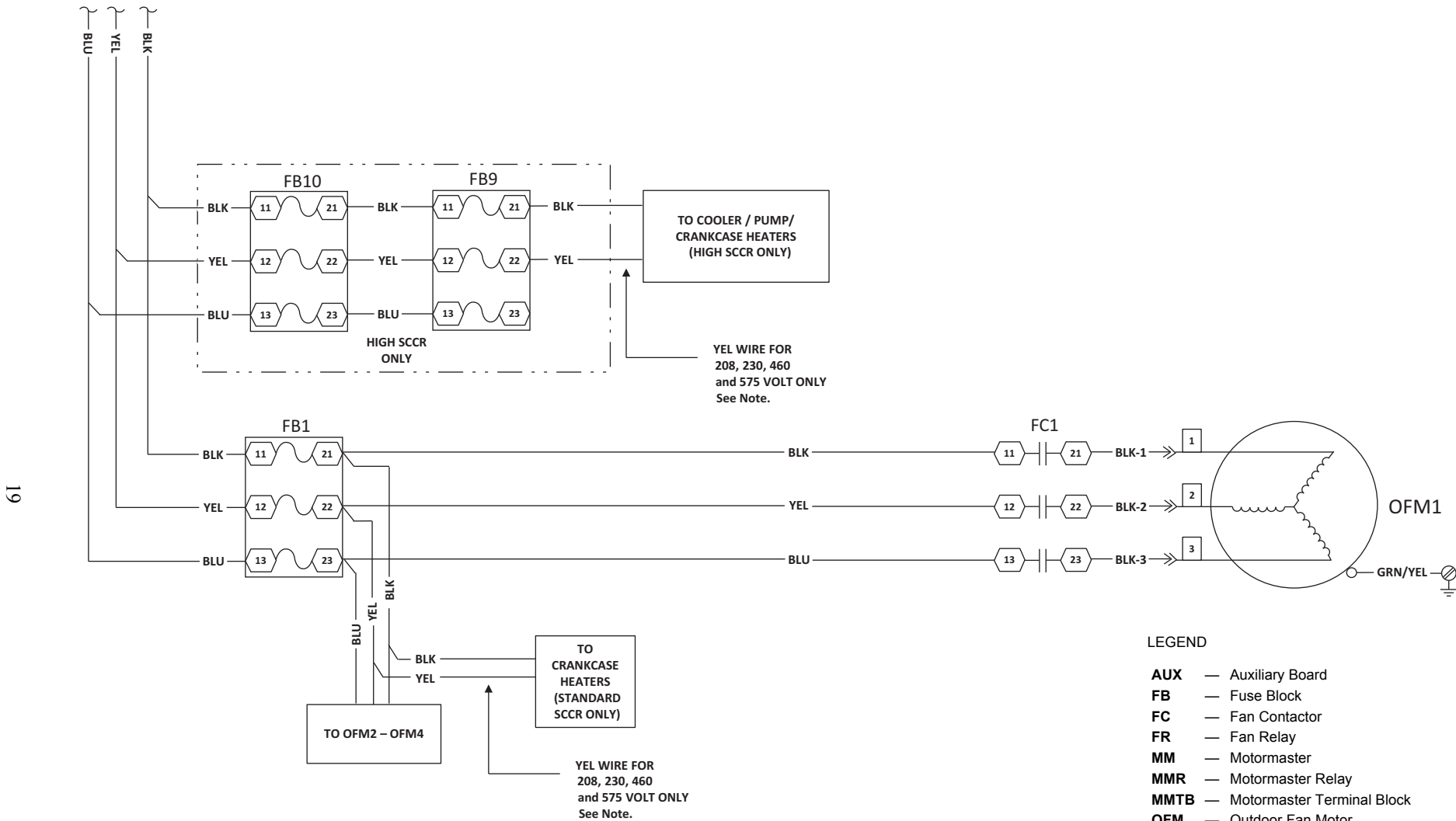


NOTE:

1. The wire harness has a plug which connects to the AUX board. See control schematics (Fig. 13) that show the wire connections to the AUX board.
2. For 380/400v units, YEL CCH wire will connect to WHT neutral wire instead of terminal 22 on fuse blocks. See unit power schematic label for details.

Fig. 7 — Motormaster Power Wiring — 38APS 040-050 and 38APD 040-060 Units (cont)

Before Motormaster Power Wiring

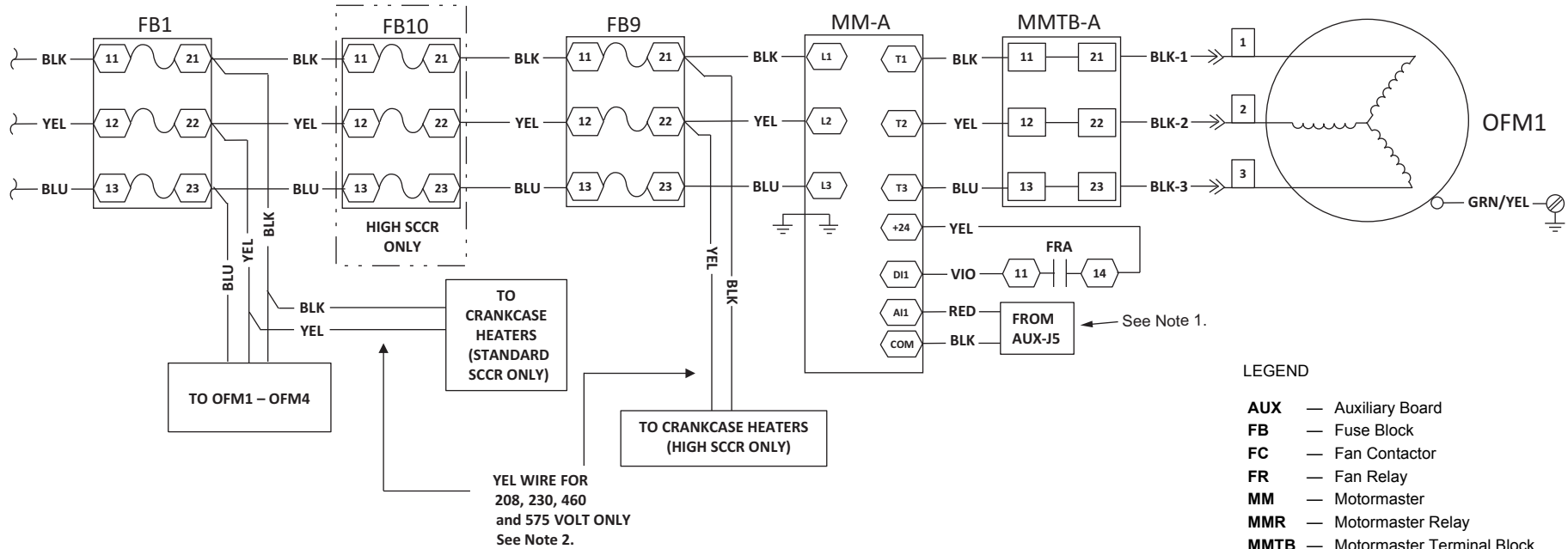


NOTE: For 380/400v units, YEL CCH wire will connect to WHT neutral wire instead of terminal 22 on fuse blocks. See unit power schematic label for details.

- LEGEND
- AUX** — Auxiliary Board
 - FB** — Fuse Block
 - FC** — Fan Contactor
 - FR** — Fan Relay
 - MM** — Motormaster
 - MMR** — Motormaster Relay
 - MMTB** — Motormaster Terminal Block
 - OFM** — Outdoor Fan Motor
 - PT** — Pressure Transducer
 - SCCR** — Short Circuit Current Rating
 - TB** — Terminal Block

Fig. 8 — Motormaster Power Wiring — 38APS 065 Units

After Motormaster Power Wiring



NOTE:

1. The wire harness has a plug which connects to the AUX board. See control schematics (Fig. 13) that show the wire connections to the AUX board.
2. For 380/400v units, YEL CCH wire will connect to WHT neutral wire instead of terminal 22 on fuse blocks. See unit power schematic label for details.

Fig. 8 — Motormaster Power Wiring — 38APS 065 Units (cont)

Before Motormaster Power Wiring

LEGEND

- AUX** — Auxiliary Board
- FB** — Fuse Block
- FC** — Fan Contactor
- FR** — Fan Relay
- MM** — Motormaster
- MMR** — Motormaster Relay
- MMTB** — Motormaster Terminal Block
- OFM** — Outdoor Fan Motor
- PT** — Pressure Transducer
- SCCR** — Short Circuit Current Rating
- TB** — Terminal Block

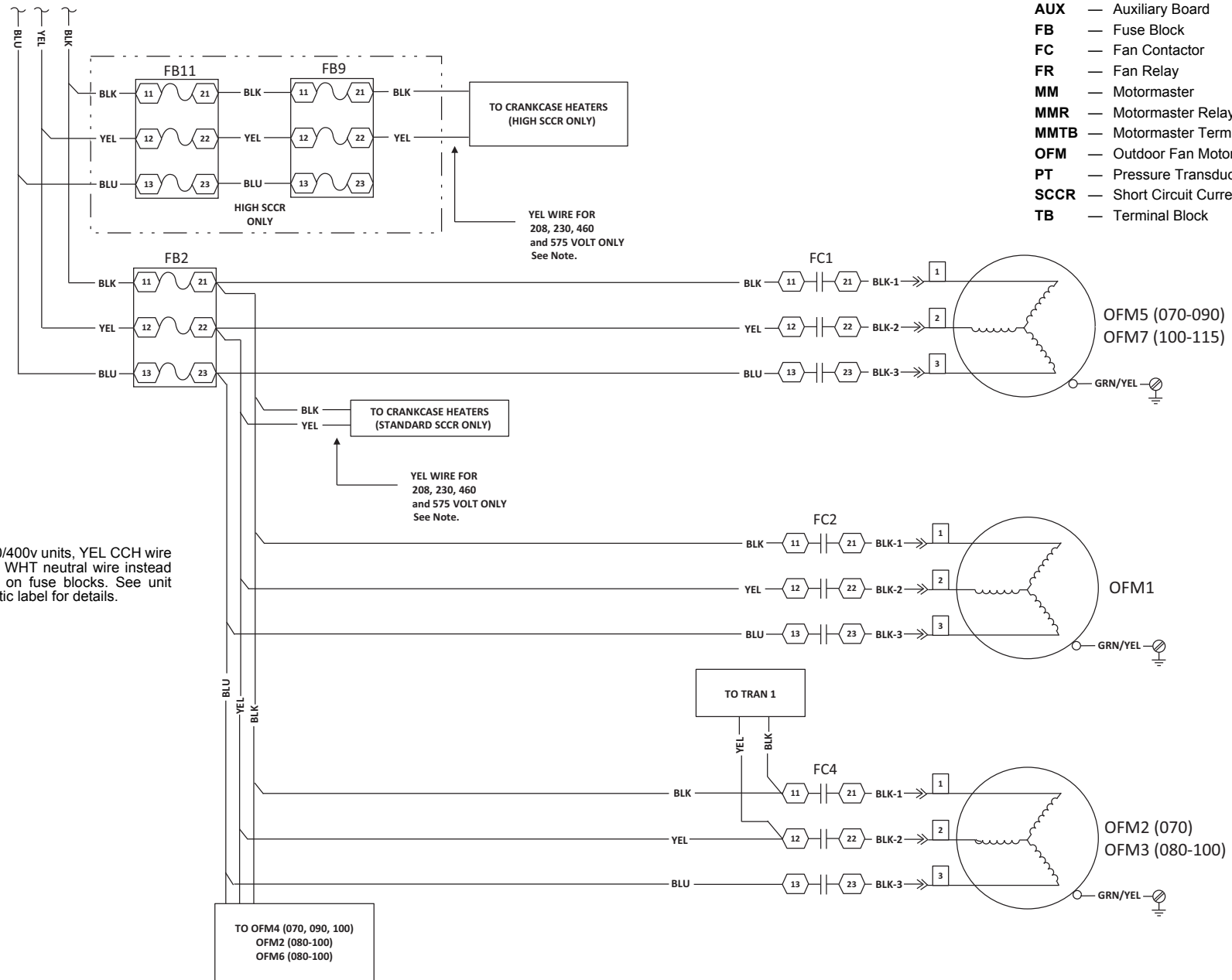
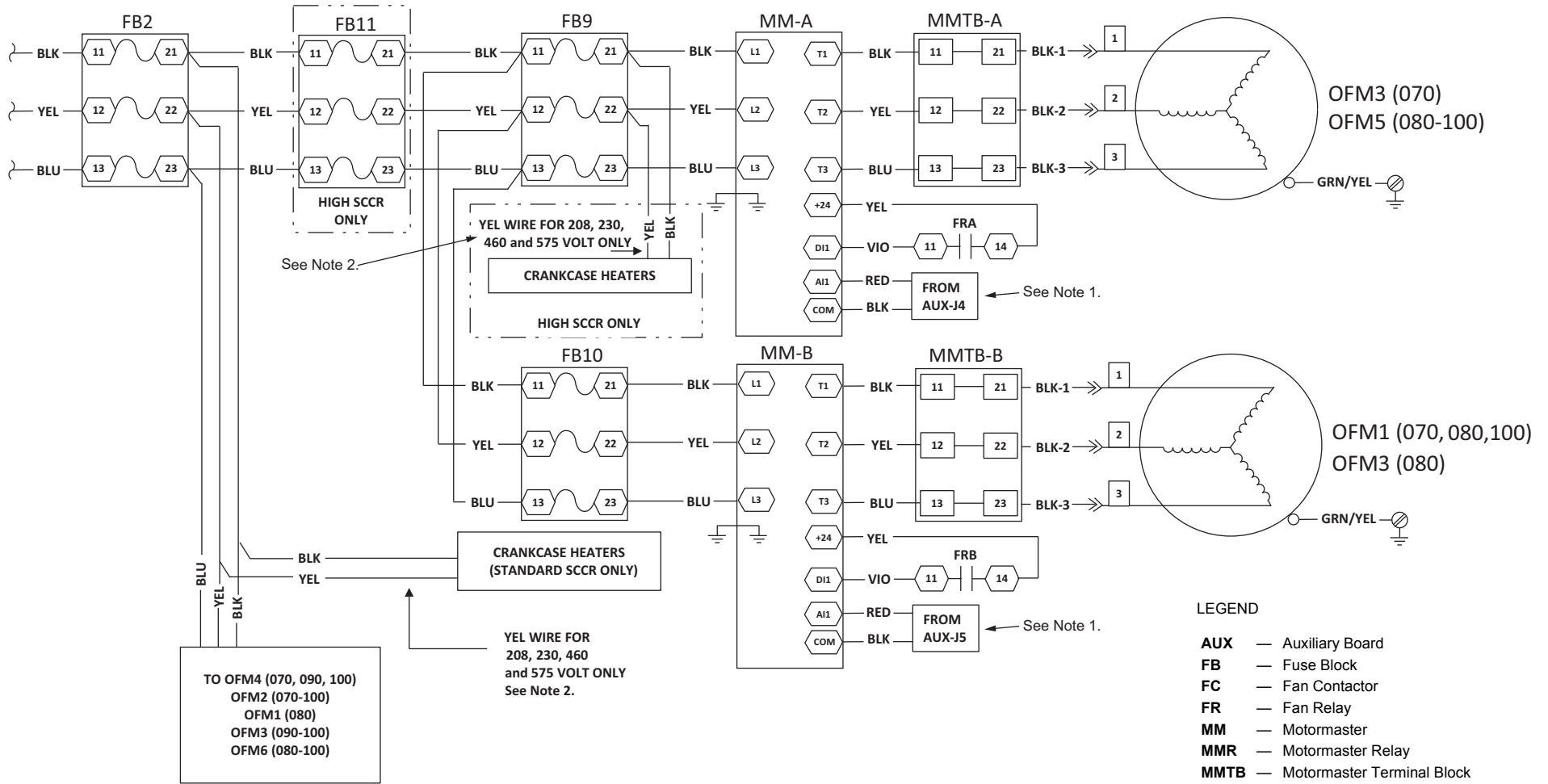


Fig. 9 — Motormaster Power Wiring — 38APD 070-100 Units

After Motormaster Power Wiring



NOTE:

1. The wire harness has a plug which connects to the AUX board. See control schematics (Fig. 14) that show the wire connections to the AUX board.
2. For 380/400v units, YEL CCH wire will connect to WHT neutral wire instead of terminal 22 on fuse blocks. See unit power schematic label for details.

Fig. 9 — Motormaster Power Wiring — 38APD 070-100 Units (cont)

Before Motormaster Power Wiring

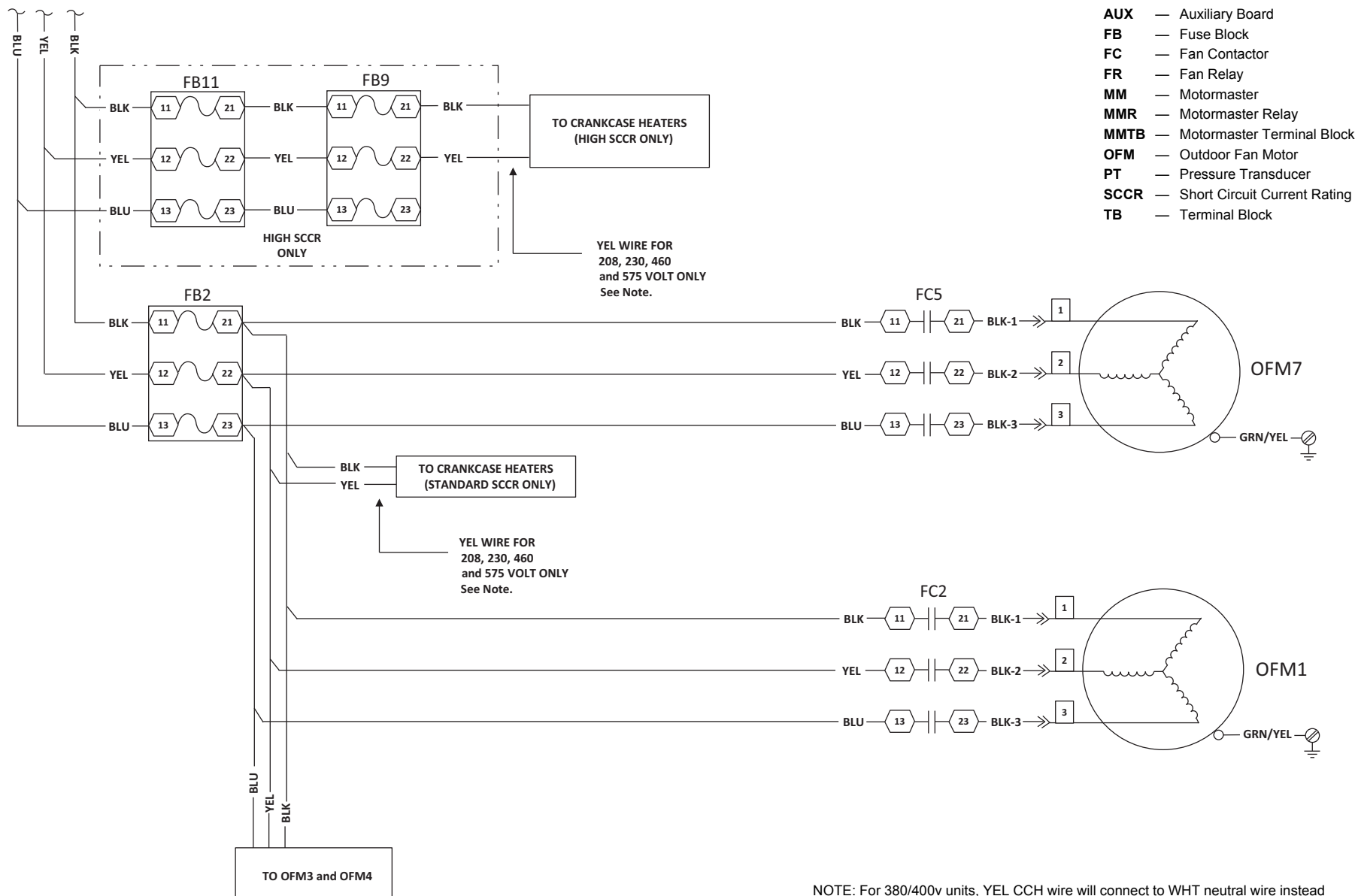
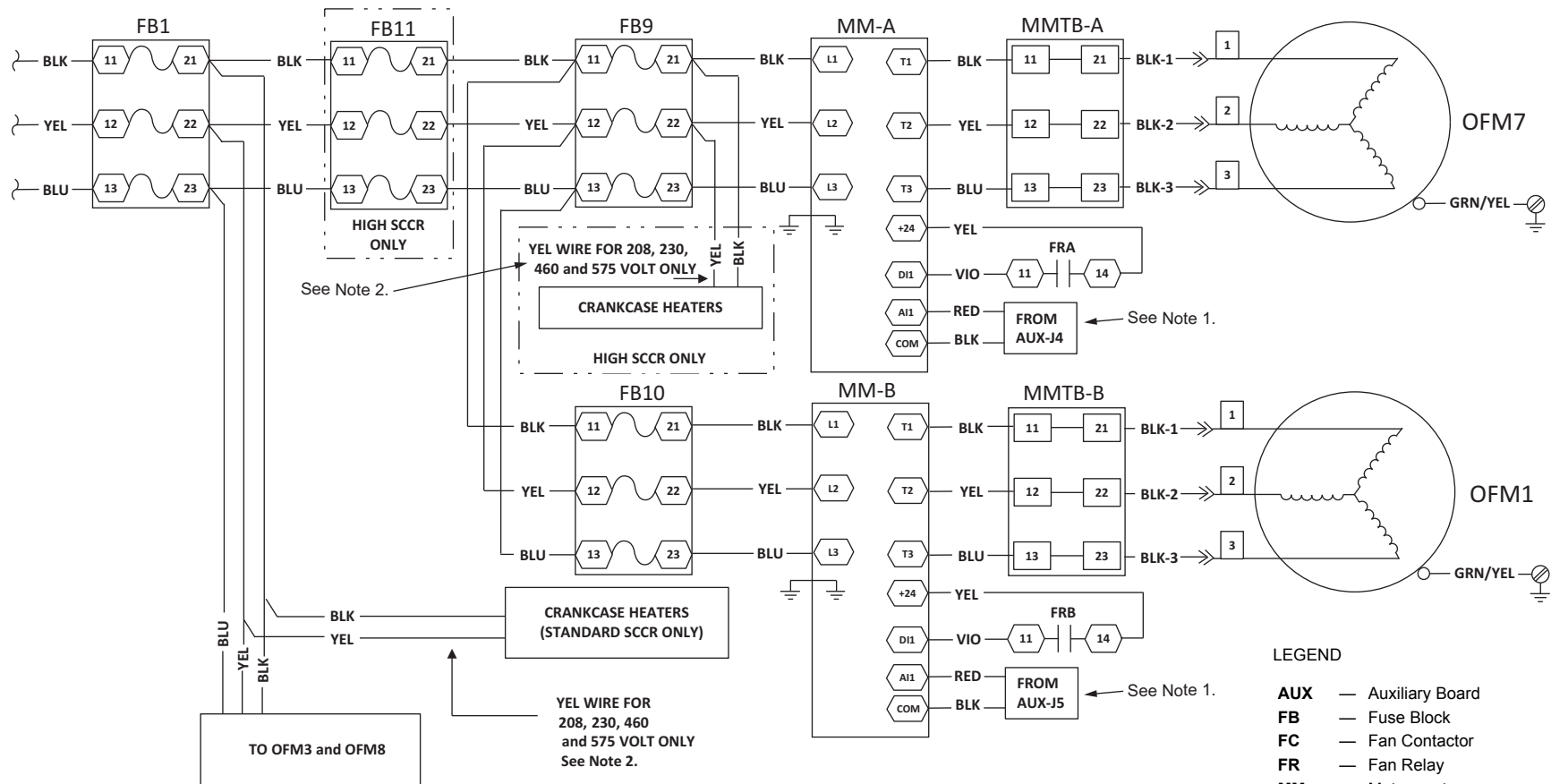


Fig. 10 — Motormaster Power Wiring — 38APD 115-130 Units

After Motormaster Power Wiring



LEGEND

AUX	— Auxiliary Board
FB	— Fuse Block
FC	— Fan Contactor
FR	— Fan Relay
MM	— Motormaster
MMR	— Motormaster Relay
MMTB	— Motormaster Terminal Block
OFM	— Outdoor Fan Motor
PT	— Pressure Transducer
SCCR	— Short Circuit Current Rating
TB	— Terminal Block

NOTE:

1. The wire harness has a plug which connects to the AUX board. See control schematics (Fig. 14) that show the wire connections to the AUX board.
2. For 380/400v units, YEL CCH wire will connect to WHT neutral wire instead of terminal 22 on fuse blocks. See unit power schematic label for details.

Fig. 10 — Motormaster Power Wiring — 38APD 115-130 Units (cont)

Before Motormaster Power Wiring

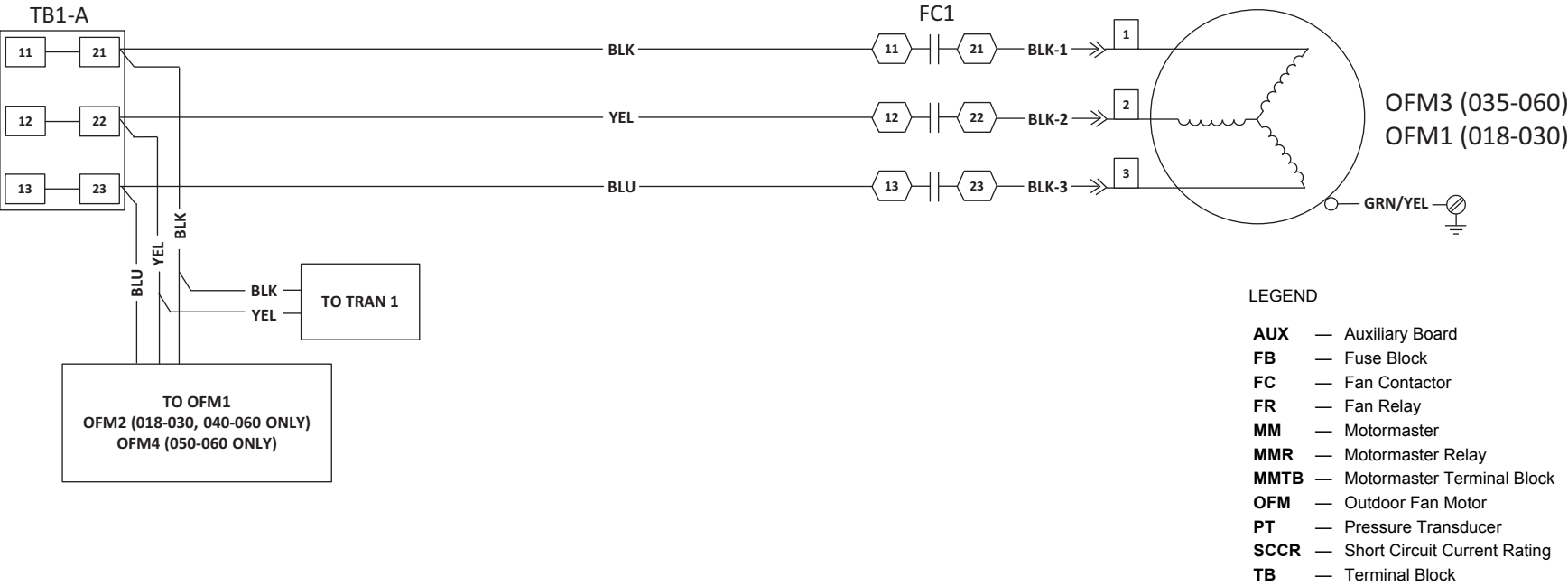


Fig. 11 — Motormaster Power Wiring — 09DPS 018-030 and 09DPM 035-060 Units

After Motormaster Power Wiring

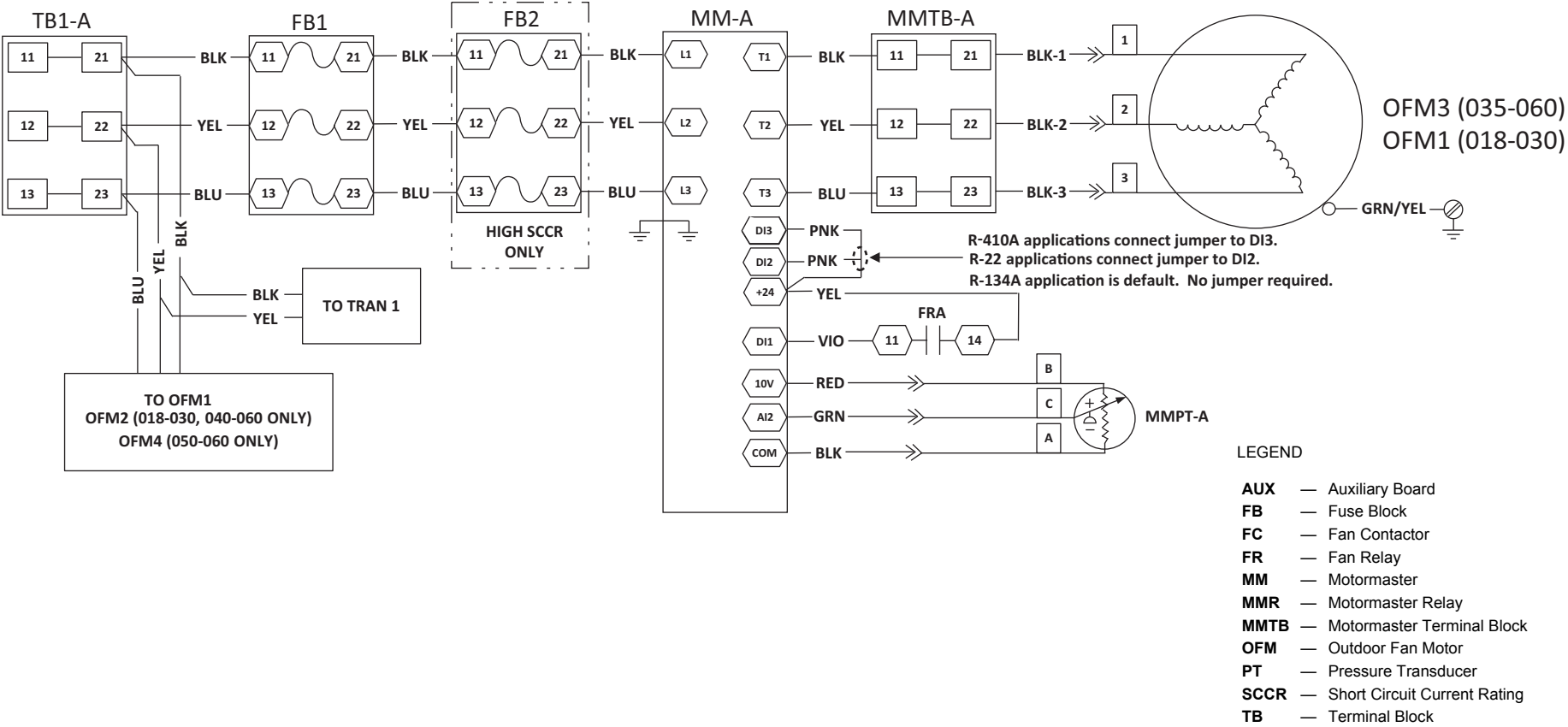


Fig. 11 — Motormaster Power Wiring — 09DPS 018-030 and 09DPM 035-060 Units (cont)

Before Motormaster Power Wiring

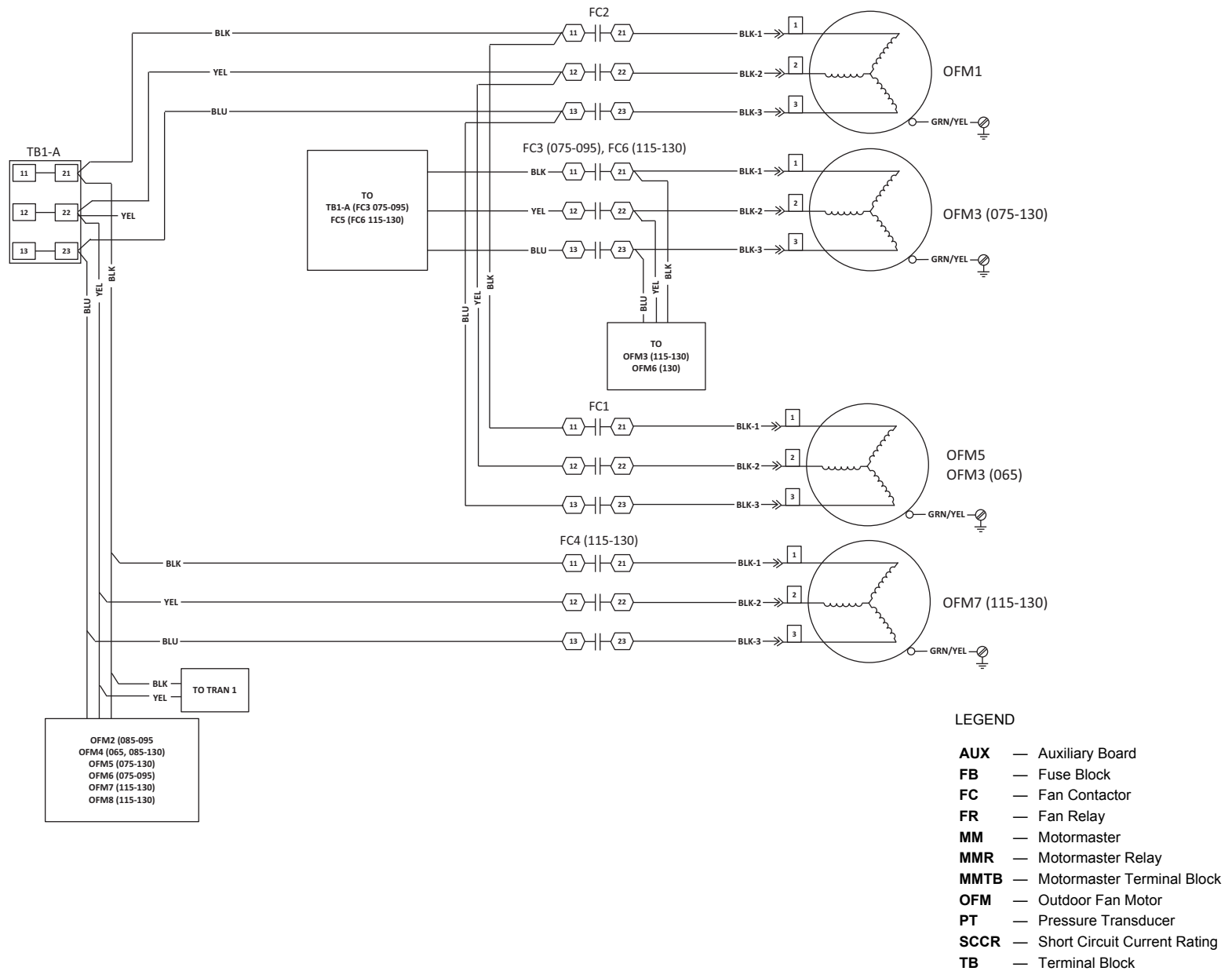
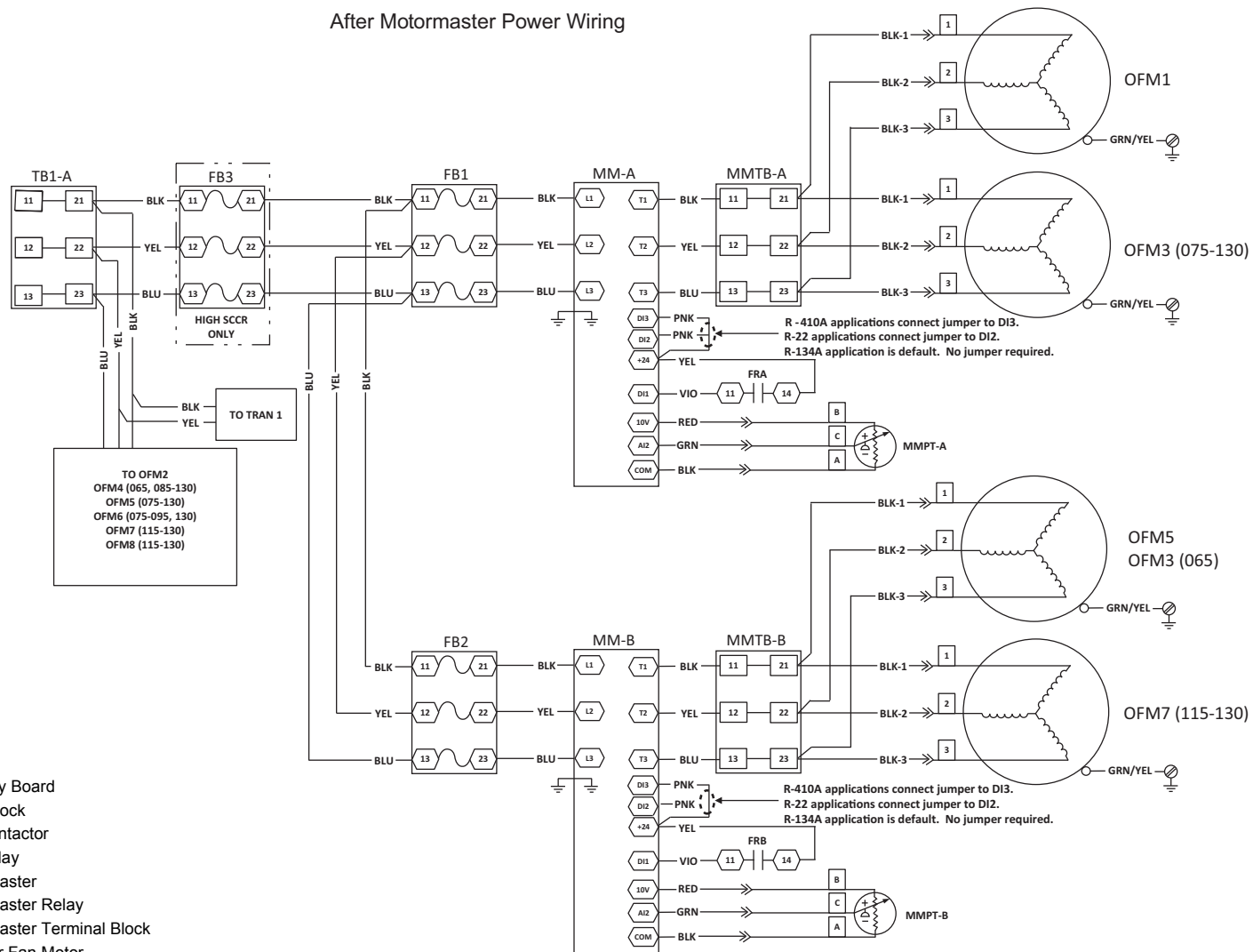


Fig. 12 — Motormaster Power Wiring — 09DPM 065-130 Units

After Motormaster Power Wiring



LEGEND

AUX	— Auxiliary Board
FB	— Fuse Block
FC	— Fan Contactor
FR	— Fan Relay
MM	— Motormaster
MMR	— Motormaster Relay
MMTB	— Motormaster Terminal Block
OFM	— Outdoor Fan Motor
PT	— Pressure Transducer
SCCR	— Short Circuit Current Rating
TB	— Terminal Block

Fig. 12 — Motormaster Power Wiring — 09DPM 065-130 Units (cont)

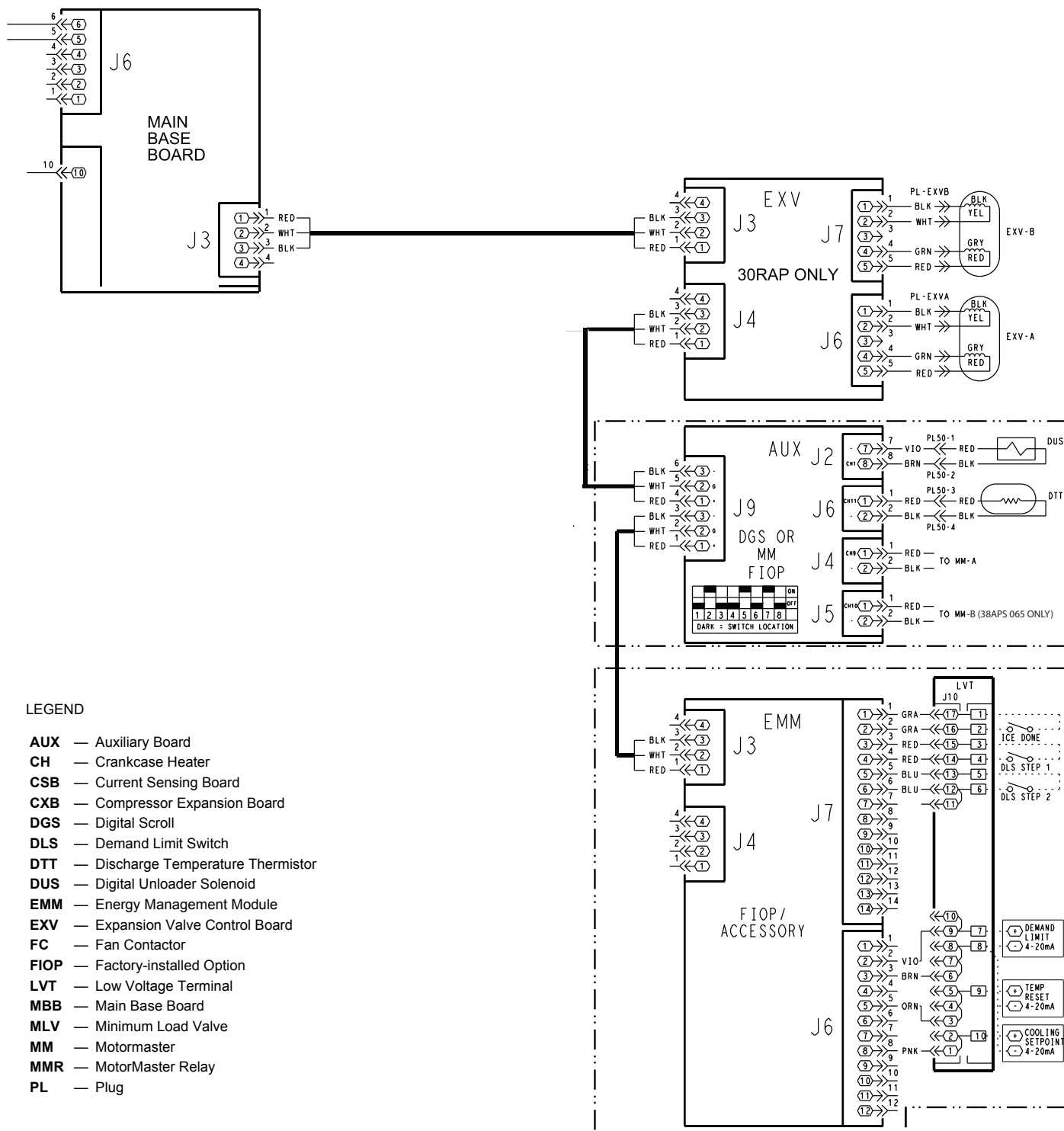


Fig. 13 — Typical Motormaster Control Wiring — 30RAP 010-060 and 38APD/APS 025-065 Units

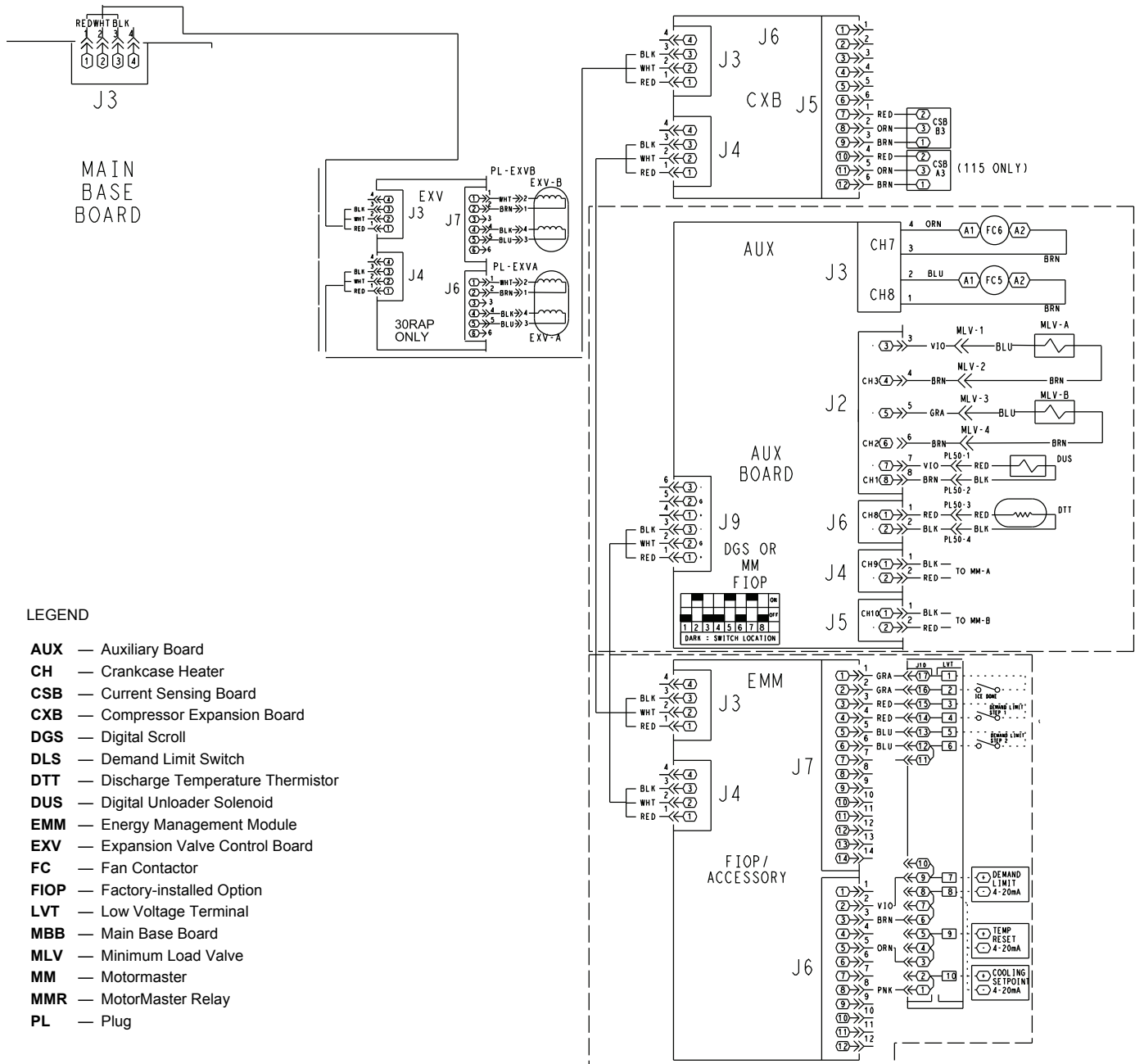


Fig. 14 — Typical Motormaster Control Wiring — 30RAP 070-150 and 38APD 070-130 Units

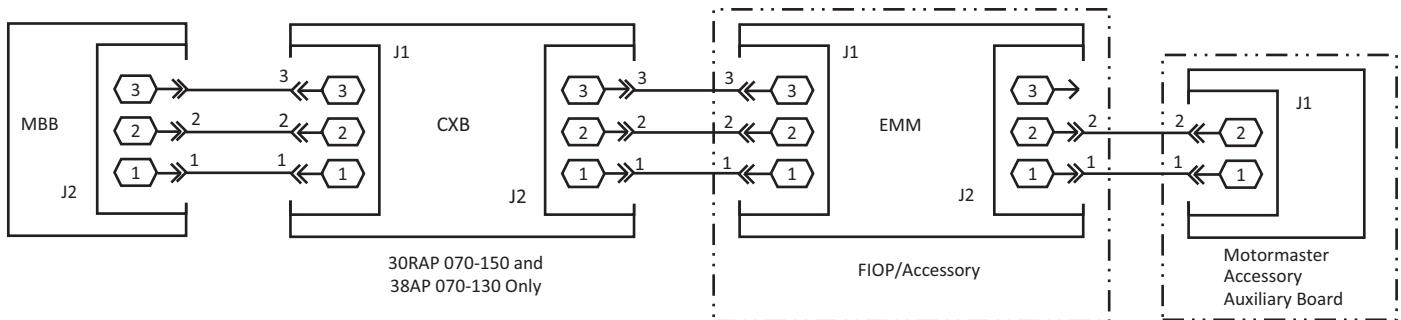


Fig. 15 — Auxiliary Board Power Wiring — 30RAP and 38AP Units

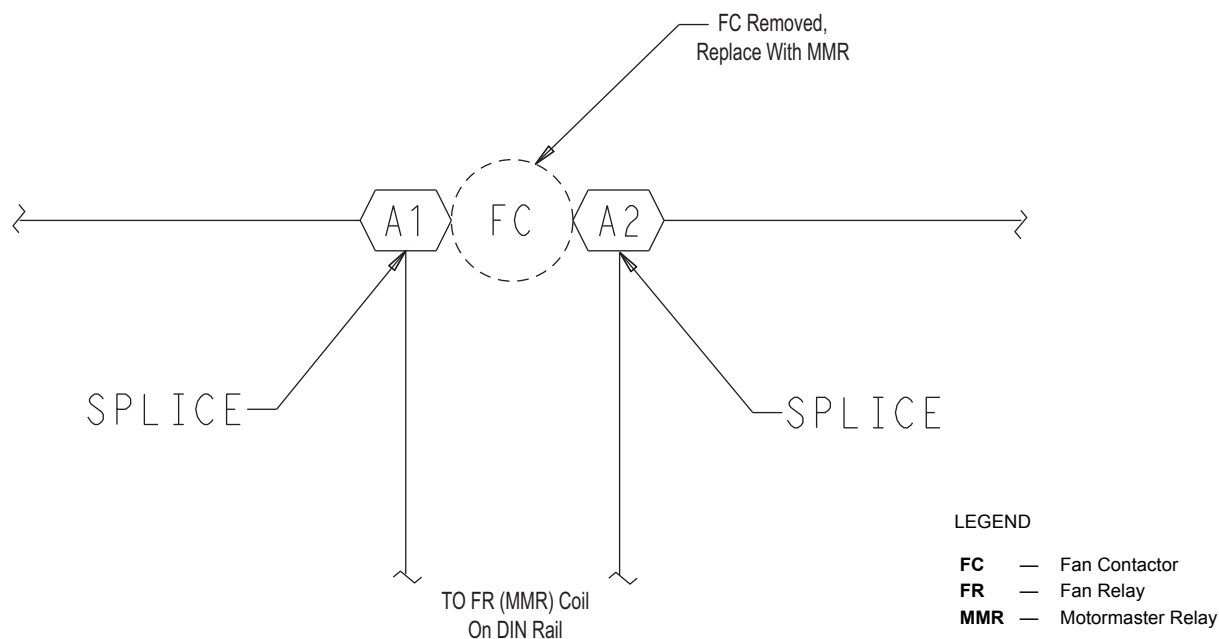
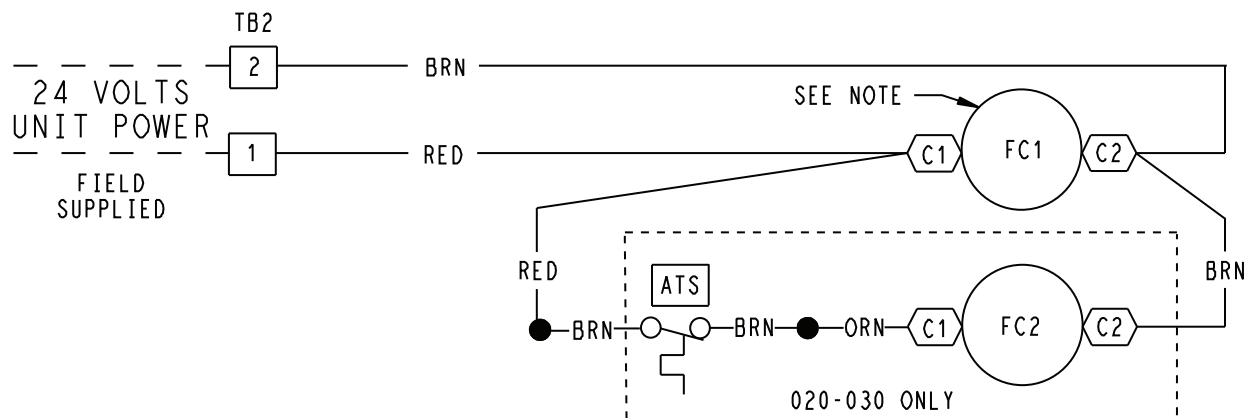


Fig. 16 — Typical Motormaster Relay Wiring — 30RAP and 38AP



NOTE: For units with low ambient Motormaster® FIOP/accessory, fan contactor FC1 is replaced with fan relay FR1.

Fig. 17 — Motormaster Control Wiring — 09DPS 018-030 and 09DP 035-060

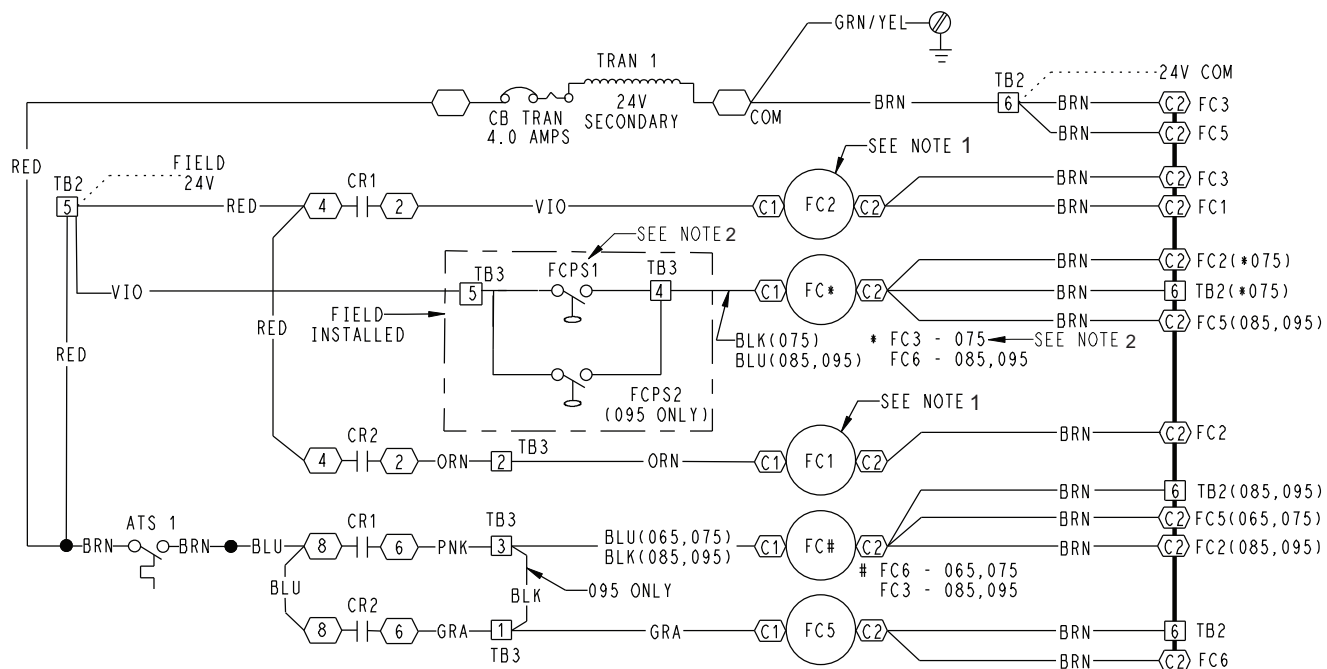


Fig. 18 — Motormaster Control Wiring — 09DPM 065-095

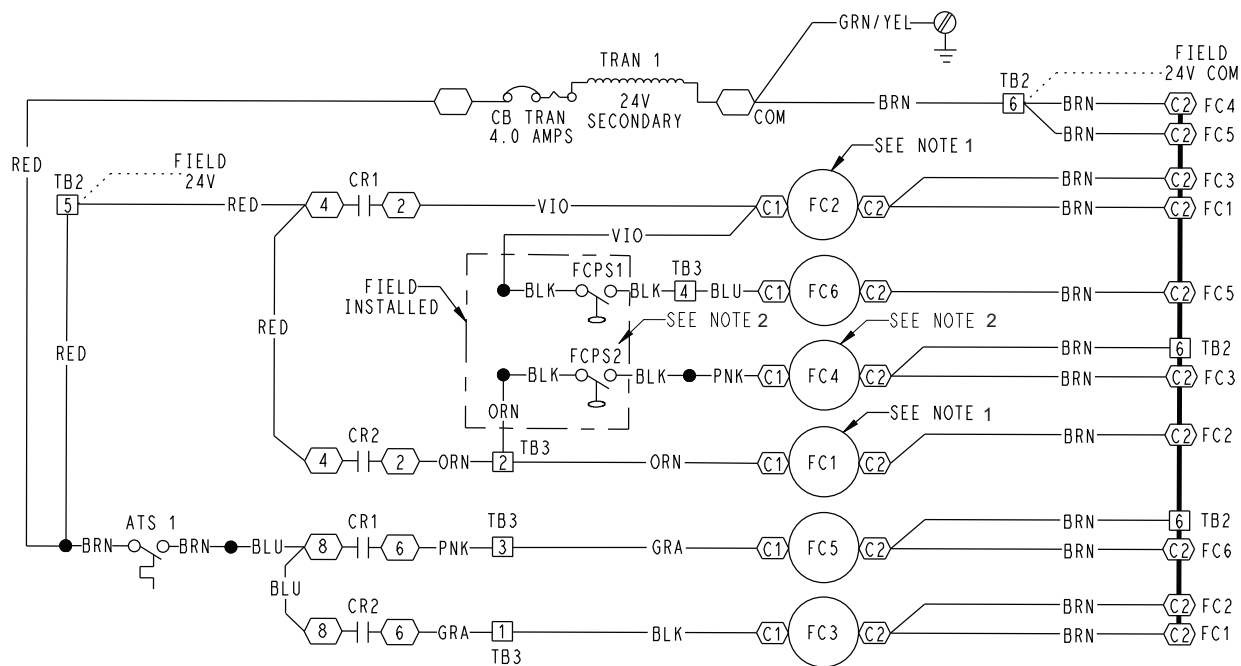


Fig. 19 — Motormaster Control Wiring — 09DPM 0115-130

INSTALLATION

Step 1 — Install Wind Baffles

Accessory wind baffles must be field-installed for all units to ensure proper operation at low-ambient temperatures with Motormaster® electronic controller. Refer to Table 4 for wind baffle usage.

Step 2 — Install Accessory

See Fig. 20-41 and corresponding unit section for detailed information.

⚠ WARNING

Electrical shock can cause serious injury or death. Wait three minutes after disconnecting incoming power before servicing drive. Capacitors retain charge after power is removed.

⚠ CAUTION

DO NOT connect incoming AC power to the output terminal T1, T2, and T3. Severe damage to the drive will result. Do not continuously cycle input power to the drive more than once every two minutes. Damage to the drive will result.

30RAP AND 38AP UNIT INSTALLATION

Refer to Table 1 for accessory usage. Refer to “Accessory Package Contents” on page 57 for corresponding item numbers. Lock out and tag out all power connections. For auxiliary board installation locations, see Fig. 20-25.

NOTE: These installation instructions are written for standard SCCR (short circuit current rating) units unless otherwise noted. High SCCR units can be identified by the 13th position (Ambient/Capacity Control/Interrupt Option) in the model number as high interrupt. These are 38AP unit options 3, 5, 9, and C and 30RAP unit options 3, 4, 5, 9, B, C, H, J, K, P, Q, and R.

30RAP 010 and 015 units

Enclosure assembly and mounting:

1. The Motormaster enclosure assembly comes with Motormaster controller(s) (Item 100), power-in harness (Item 200), power-out harness (Item 202), and control harness (Item 204) pre-installed in the Motormaster enclosure (Item 718).
2. Attach Motormaster (MM) mounting brackets (Item 723) to the unit corner post using eight AA06BS170 bolts (Item 724), sixteen AU02AB171 washers (Item 725), and eight AT30AB171 nuts (Item 726) provided. See Fig. 30.
3. Cut three 1-3/8 in. diameter holes in the corner post at the locations shown in Fig. 29. Insert the 3 plastic bushings (Item 728) into holes.
4. Remove the straight connectors from the ends of the conduit leaving the MM enclosure. Route the conduit through the holes in the corner post. See Fig. 28.
5. Mount the MM enclosure assembly to the MM mounting brackets (Item 723) using four AA06BS170 bolts (Item 724), eight AU02AB171 washers (Item 725), and four AT30AB171 nuts (Item 726) provided. See Fig. 26.
6. Cut three 1/2 in. diameter holes in the bottom of the control box below the location of the fan contactors.
7. Reassemble the straight conduit connectors and route the conduit to the new holes cut in the bottom of the control box. NOTE: For Motormaster enclosure cover assembly see Fig. 41.

Control box modifications:

8. Remove components.
 - a. Disconnect wires connected to fan contactor 1 (FC1). Remove the wires from the line side of contactor completely from the control box.
 - b. Remove FC1.
9. Install components.
 - a. Mount Motormaster terminal block A (MMTB-A) (Item 600) using two AL80AU170 screws (Item 701) while applying pressure (lug side down) in the location where FC1 was mounted.
 - b. Mount Motormaster Relay (MMR) assembly (Items 500 and 501) on DIN rail next to FB1.
 - c. Install end stop (Item 706) at each end of DIN rail.
 - d. If the unit came with an auxiliary board installed, skip to Step 10. Otherwise, install auxiliary board (Item 715) using four AC41AB100 screws (Item 731) provided. See Fig. 20. Set DIP switch 2, 5 and 7 = ON.
10. Make power connections. Refer to Fig. 1.
 - a. Connect OFM1 BLK wires labeled 1, 2, 3 to Motormaster terminal block A (MMTB-A) (Item 600) terminals 21, 22, 23. Remove wire terminals as required.
 - b. Connect MM power-out harness (Item 202) BLK, YEL, BLU wires labeled MM-A-T1, MM-A-T2, MM-A-T3 to MMTB-A terminals 11, 12, 13 respectively.
 - c. Connect MM power-in harness (Item 200) BLK, YEL, BLU wires labeled MM-A-L1, MM-A-L2, MM-A-L3 to FB1 terminals 21, 22, 23 respectively.
 - d. If the unit came with has an auxiliary board installed, skip to Step 11. Otherwise, install auxiliary power harness (Item 717). Make power connection J1 on AUX to terminal J2 of energy management module (EMM) if the unit has an EMM or to terminal J2 of main base board (MMB). Refer to Fig. 15.
11. Make communications connections. Refer to Fig. 13.
 - a. If the unit came with an auxiliary board installed, skip to Step 11b. Otherwise, install auxiliary communications harness (Item 716). Make communication connection J9 on AUX to terminal J3 of energy management module (EMM) if the unit has an EMM or to terminal J4 of electronic expansion valve (EXV).
 - b. Install auxiliary harness (Item 212). Plug terminal board connector labeled AUX J4 to AUX Board J4.
 - c. Connect MM control harness (Item 204). Connect RED and BLK wires to auxiliary harness (Item 212) AUX1 J4-1 and J4-2. Connect VIO and YEL wires to terminals 11 and 14 of relay socket (Item 501) respectively.
 - d. Install MMR harness (Item 210). Connect PNK and BRN wires to relay socket (Item 501) terminals A1 and A2 respectively. Refer to Fig. 16.
Make splice connection from BRN wire labeled OFC COM SPLICE to BRN wire labeled FC-1 COM which was removed from FC1 contactor. Make splice connection from PNK wire labeled OFC PWR SPLICE to PNK wire labeled FC-1 COIL which was removed from FC1 contactor.

30RAP 018-030 units

Enclosure assembly and mounting:

1. The Motormaster enclosure assembly comes with Motormaster controller(s) (Item 100), power-in harness (Item 200), power-out harness (Item 202), and control harness (Item 204) pre-installed in the Motormaster enclosure (Item 718).
2. Attach Motormaster (MM) mounting brackets (Item 723) to the unit corner post using eight AA06BS170 bolts (Item 724), sixteen AU02AB171 washers (Item 725), and eight AT30AB171 nuts (Item 726) provided. See Fig. 30.
3. Cut three 1-3/8 in. diameter holes in the corner post at the locations shown in Fig. 29. Insert the 3 plastic bushings (Item 728) into holes.
4. Remove the straight connectors from the ends of the conduit leaving the MM enclosure. Route the conduit through the holes in the corner post. See Fig. 28.
5. Mount the MM enclosure assembly to the MM mounting brackets (Item 723) using four AA06BS170 bolts (Item 724), eight AU02AB171 washers (Item 725), and eight AT30AB171 nuts (Item 726) provided. See Fig. 26.
6. Cut three 1/2 in. diameter holes in the bottom of the control box below the location of the fan contactors.
7. Reassemble the straight conduit connectors and route the conduit to the new holes cut in the bottom of the control box. NOTE: For Motormaster enclosure cover assembly see Fig. 41.

Control box modifications:

8. Remove components.
 - a. Disconnect wires connected to fan contactor 1 (FC1). Remove the wires from the line side of contactor completely from the control box.
 - b. Remove FC1.
9. Install components.
 - a. Mount Motormaster terminal block A (MMTB-A) (Item 600) using two AL80AU170 screws (Item 701) with terminal 11, 12, 13 side down in location where FC1 was mounted.
 - b. Mount DIN rail (Item 714) at the top of the enclosure using two AL80AU170 screws (Item 701) provided.
 - c. Mount fuse block 2 (FB2) (Item 400) to DIN rail (Item 714) at the top of the enclosure. Install 3 fuses (Item 300) in fuse block.
 - d. Mount Motormaster relay (MMR) assembly (Items 500 and 501) on DIN rail (Item 714) next to FB1.
 - e. Install end stop (Item 706) at each end of DIN rail (Item 714).
 - f. If the unit came with an auxiliary board installed, skip to Step 10. Otherwise, install auxiliary board (Item 715) using four AC41AB100 screws (Item 731) provided. See Fig. 20. Set DIP switch 2, 5 and 7 = ON.
10. Make power connections. Refer to Fig. 2.
 - a. Connect OFM1 BLK wires labeled 1, 2, 3 to Motormaster terminal block A (MMTB-A) (Item 600) terminals 21, 22, 23. Remove terminals as required.
 - b. Connect MM power-out harness (Item 202) BLK, YEL, BLU wires labeled MM-A-T1, MM-A-T2, MM-A-T3 to MMTB-A terminals 11, 12, 13 respectively.
 - c. Connect MM power-in harness (Item 200) BLK, YEL, BLU wires labeled MM-A-L1, MM-A-L2, MM-A-L3 to FB2 terminals 21, 22, 23 respectively.

- d. Install fuse block jumper (Item 206) between FB1 terminals 11, 12, and 13 and FB2 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.
 - e. If the unit came with an auxiliary board installed, skip to Step 11. Otherwise, install auxiliary power harness (Item 717). Make power connection J1 on AUX to terminal J2 of energy management module (EMM) if the unit has an EMM or to terminal J2 of main base board (MMB). Refer to Fig. 15.
11. Make communications connections. Refer to Fig. 13.
 - a. If the unit came with an auxiliary board installed, skip to Step 11b. Otherwise, install auxiliary communication harness (Item 716). Make communication connection J9 on AUX to terminal J3 of energy management module (EMM) if the unit has an EMM or to terminal J4 of electronic expansion valve (EXV).
 - b. Install auxiliary harness (Item 212). Plug terminal board connector labeled AUX J4 to AUX Board J4.
 - c. Connect MM control harness (Item 204). Connect RED and BLK wires to auxiliary harness (Item 212). Connect VIO and YEL wires to terminals 11 and 14 of relay socket (Item 501) respectively.
 - d. Install MMR harness (Item 210). Connect PNK and BRN wires to relay socket (Item 501) terminals A1 and A2 respectively. Refer to Fig. 16.
Make splice connection from BRN wire labeled OFC COM SPLICE to BRN wire labeled FC-1 COM which was removed from FC1 contactor. Make splice connection from PNK wire labeled OFC PWR SPLICE to PNK wire labeled FC-1 COIL which was removed from FC1 contactor.

30RAP 035-050 units

Enclosure assembly and mounting:

1. The Motormaster enclosure assembly comes with Motormaster controller(s) (Item 100), power-in harness (Item 200), power-out harness (Item 202), and control harness (Item 204) pre-installed in the Motormaster enclosure (Item 718).
2. Attach MM mounting brackets (Item 723) to the MM enclosure (Item 718) using four AA06BS170 bolts (Item 724), eight AU02AB171 washers (Item 725), and four AT30AB171 nuts (Item 726) provided. See Fig. 26.
3. Remove access panel from unit and cut three 1-3/8 in. diameter holes in the access panel at the locations shown in Fig. 32. Insert the 3 plastic bushings (Item 728) into holes.
4. Remove the straight connectors from the ends of the conduit leaving the MM enclosure. Route the conduit through the holes in the access panel. See Fig. 31.
5. Mount the MM enclosure assembly to the access panel using eight AA06BS170 bolts (Item 724), sixteen AU02AB171 washers (Item 725), and eight AT30AB171 nuts (Item 726) provided. Reinstall the access panel once the MM enclosure is securely mounted. See Fig. 33.
6. Cut three 1/2 in. diameter holes in the bottom of the control box below the location of the fan contactors.
7. Reassemble the straight conduit connectors and route the conduit to the new holes cut in the bottom of the control box. NOTE: For Motormaster enclosure cover assembly see Fig. 41.

Control box modifications:

8. Remove components.
 - a. Disconnect wires connected to fan contactor 1 (FC1). Remove the wires from the line side of contactor completely from the control box.
 - b. Remove FC1.
9. Install components.
 - a. Mount Motormaster terminal block A (MMTB-A) (Item 600) using two AL80AU170 screws (Item 701) with terminal 11, 12, 13 side down in location where FC1 was mounted.
 - b. Mount Motormaster relay (MMR) assembly (Items 500 and 501) on DIN rail next to FB1 and FB2.
 - c. Reinstall end stop at each end of DIN rail.
 - d. If the unit came with an auxiliary board installed, skip to Step 10. Otherwise, install auxiliary board (Item 715) to auxiliary bracket (Item 712) using four AC41AB100 screws (Item 731) provided. Mount auxiliary bracket with auxiliary board to control box using two AL80AU170 screws (Item 701). See Fig. 20. Set DIP switch 2, 5 and 7 = ON.
10. Make power connections. Refer to Fig. 3.
 - a. Connect OFM3 BLK wires labeled 1, 2, 3 to Motormaster terminal block A (MMTB-A) (Item 600) terminals 21, 22, 23. Remove terminals as required.
 - b. Connect MM power-out harness (Item 202) BLK, YEL, BLU wires labeled MM-A-T1, MM-A-T2, MMA-T3 to MMTB-A terminals 11, 12, 13 respectively.
 - c. Connect MM power-in harness (Item 200) BLK, YEL, BLU wires labeled MM-A-L1, MM-A-L2, MM-A-L3 to FB1 terminals 21, 22, 23 respectively.
 - d. If the unit came with an auxiliary board installed, skip to Step 11. Otherwise, install auxiliary power harness (Item 717).
Make power connection J1 on AUX to terminal J2 of energy management module (EMM) if the unit has an EMM or to terminal J2 of main base board (MMB).
11. Make communications connections. Refer to Fig. 13 and 16.
 - a. If the unit came with an auxiliary board installed, skip to Step 11b. Otherwise, install auxiliary communications harness (Item 716). Make communication connection J9 on AUX to terminal J3 of energy management module (EMM) if the unit has an EMM or to terminal J4 of electronic expansion valve (EXV).
 - b. Install auxiliary harness (Item 212). Plug terminal board connector labeled AUX J4 to AUX Board J4.
 - c. Connect MM control harness (Item 204). Connect RED and BLK wires to auxiliary harness (Item 212). Connect VIO and YEL wires to terminals 11 and 14 of relay socket (Item 501) respectively.
 - d. Install MMR harness (Item 210). Connect PNK and BRN wires to relay socket (Item 501) terminals A1 and A2 respectively.
Make splice connection from BRN wire labeled OFC COM SPLICE to BRN wire labeled FC-1 COM which was removed from FC1 contactor. Make splice connection from PNK wire labeled OFC PWR SPLICE to PNK wire labeled FC-1 COIL which was removed from FC1 contactor.

30RAP 055-060 units

Enclosure assembly and mounting:

1. The Motormaster enclosure assembly comes with Motormaster controller(s) (Item 100), power-in harness (Item 200), power-out harness (Item 202), and control

harness (Item 204) pre-installed in the Motormaster enclosure (Item 718).

2. Attach MM mounting brackets (Item 723) to the MM enclosure (Item 718) using four AA06BS170 bolts (Item 724), eight AU02AB171 washers (Item 725), and four AT30AB171 nuts (Item 726) provided. See Fig. 26.
3. Remove access panel from unit and cut three 1-3/8 in. diameter holes in the access panel at the locations shown in Fig. 32. Insert the 3 plastic bushings (Item 728) into holes.
4. Remove the straight connectors from the ends of the conduit leaving the MM enclosure. Route the conduit through the holes in the access panel. See Fig. 31.
5. Mount the MM enclosure assembly to the access panel using eight AA06BS170 bolts (Item 724), sixteen AU02AB171 washers (Item 725), and eight AT30AB171 nuts (Item 726) provided. Reinstall the access panel once the MM enclosure is securely mounted. See Fig. 33.
6. Cut three 1/2 in. diameter holes in the bottom of the control box below the location of the fan contactors.
7. Reassemble the straight conduit connectors and route the conduit to the new holes cut in the bottom of the control box.
NOTE: For Motormaster enclosure cover assembly see Fig. 41.

Control box modifications:

8. Remove components.
 - a. Disconnect wires connected to fan contactor 3 (FC3). Remove the wires from the line side of contactor completely.
 - b. Remove FC3.
 - c. Remove mounting hardware from FC2 and move FC2 to the FC3 position. Re-attach FC2 with the same hardware.
 - d. Disconnect FC1 line-side wires from FB1 load-side terminals.
 - e. Remove mounting hardware from FC1 and move FC1 to the old FC2 position. Re-attach FC1 with the same hardware.
9. Install components.
 - a. Mount Motormaster terminal block A (MMTB-A) (Item 600) using two AL80AU170 screws (Item 701) with terminal 11, 12, 13 side down in location where FC1 was mounted.
 - b. Mount Motormaster relay (MMR) assembly (Items 500 and 501) on DIN rail next to FB1 and FB2.
 - c. Reinstall end stop at each end of DIN rail.
 - d. If the unit came with an auxiliary board installed, skip to Step 10. Otherwise, install auxiliary board (Item 715) to auxiliary bracket (Item 712) using four AC41AB100 screws (Item 731) provided. Mount auxiliary bracket with auxiliary board to control box using two AL80AU170 screws (Item 701). See Fig. 20. Set DIP switch 2, 5 and 7 = ON.
10. Make power connections. Refer to Fig. 3.
 - a. Connect OFM4 BLK wires labeled 1, 2, 3 to Motormaster terminal block A (MMTB-A) (Item 600) terminals 21, 22, 23. Remove terminals as required.
 - b. Connect MM power-out harness (Item 202) BLK, YEL, BLU wires labeled MM-A-T1, MM-A-T2, MM-A-T3 to MMTB-A terminals 11, 12, 13 respectively.
 - c. Connect MM power-in harness (Item 200) BLK, YEL, BLU wires labeled MM-A-L1, MM-A-L2, MM-A-L3 to FB1 terminals 12, 22, 23 respectively.

- d. Connect FC1 line-side BLK, YEL, BLU wires to FB2 load side terminals 12, 22, 23 respectively.
 - e. If the unit came with an auxiliary board installed, skip to Step 11. Otherwise, install auxiliary power harness (Item 717). Make power connection J1 on AUX to terminal J2 of energy management module (EMM) if the unit has an EMM or to terminal J2 of main base board (MMB). Refer to Fig. 15.
11. Make communications connections. Refer to Fig. 13 and 16.
- a. If the unit came with an auxiliary board installed, skip to Step 11b. Otherwise, install auxiliary communications harness (Item 716). Make communication connection J9 on AUX to terminal J3 of energy management module (EMM) if the unit has an EMM or to terminal J4 of electronic expansion valve (EXV).
 - b. Install auxiliary harness (Item 212). Plug terminal board connector labeled AUX J4 to AUX board J4.
 - c. Connect MM control harness (Item 204). Connect RED and BLK wires to auxiliary harness (Item 212). Connect VIO and YEL wires to terminals 11 and 14 of relay socket (Item 501) respectively.
 - d. Install MMR harness (Item 210). Connect PNK and BRN wires to relay socket (Item 501) terminals A1 and A2 respectively.
Make splice connection from BRN wire labeled OFC COM SPLICE to BRN wire labeled FC-3 COM which was removed from FC3 contactor. Make splice connection from PNK wire labeled OFC PWR SPLICE to PNK wire labeled FC-3 COIL which was removed from FC3 contactor.

30RAP 070-115 units

Enclosure assembly and mounting:

1. The Motormaster enclosure assembly comes with Motormaster controller(s) (Item 100), power-in harness (Item 200), power-out harness (Item 202), and control harness (Item 204) pre-installed in the Motormaster enclosure (Item 718).
2. Attach MM mounting brackets (Item 722) to the MM enclosure (Item 718) using four AA06BS170 bolts (Item 724), eight AU02AB171 washers (Item 725), and four AT30AB171 nuts (Item 726) provided. See Fig. 27.
3. Mount the MM enclosure assembly to base frame and coil support using five AA06BS170 bolts (Item 724), ten AU02AB171 washers (Item 725), and five AT30AB171 nuts (Item 726) provided. Drill holes as needed. See Fig. 34-37.
4. Cut three 1/2 in. diameter holes in the bottom of the control box below the location of the fan contactors.
5. Route the conduit to the new holes cut in the bottom of the control box.
NOTE: For Motormaster enclosure cover assembly see Fig. 41.

Control box modifications:

6. Remove components.
 - a. Disconnect wires connected to fan contactor 1 (FC1) and fan contactor 2 (FC2). Remove the wires from the line side of contactors completely from the control box.
 - b. Remove FC1 and FC2.
7. Install components.
 - a. Mount Motormaster terminal blocks A and B (MMTB-A and MMTB-B) (Item 600) using four AL80AU170 screws (Item 701) with terminal 11, 12, 13 side down in location where FC1 and FC2 were mounted.

- b. Mount DIN rail (Item 707) below FB1 using two AL80AU170 screws (Item 701) provided.
 - c. For Standard SCCR units mount fuse blocks 9 and 10 (FB9 and FB10) (Item 400) to DIN rail (Item 707). Install 3 fuses (Item 300) in each fuse block.
 - d. For High SCCR units, mount fuse block 10 (FB10) (Item 400) to DIN rail (Item 707). Install 3 fuses (Item 300) in fuse block.
 - e. Mount fan relay A assembly (FRA) and fan relay B assembly (FRB) (Items 500 and 501) on DIN rail next to FB9 and FB10.
 - f. Install end stop (Item 706) at each end of DIN rail (Item 707).
 - g. If the unit came with an auxiliary board installed, skip to Step 8. Otherwise, install auxiliary board (Item 715) using four AC41AB100 screws (Item 731) provided. See Fig. 21. Set DIP switch 2, 5 and 7 = ON.
8. Make power connections. Refer to Fig. 4.
- a. Connect fan wires from fan motors to each terminal block (Item 600). Connect each set of OFM BLK wires labeled 1, 2, 3 to each Motormaster terminal block terminals 21, 22, 23. Remove terminals as required.
30RAP070-090: OFM5 to MMTB-A and OFM1 to MMTB-B.
30RAP100-115: OFM7 to MMTB-A and OFM1 to MMTB-B.
 - b. Connect MM power-out harness (Item 202). Connect BLK, YEL, BLU wires labeled MM-A-T1, MM-A-T2, MM-A-T3 to MMTB-A terminals 11, 12, 13 respectively. Connect BLK, YEL, BLU wires labeled MM-B-T1, MM-B-T2, MM-B-T3 to MMTB-B terminals 11, 12, 13 respectively.
 - c. Connect MM power-in harness (Item 200). Connect BLK, YEL, BLU wires labeled MM-A-L1, MM-A-L2, MM-A-L3 to FB9 terminals 21, 22, 23 respectively. Connect BLK, YEL, BLU wires labeled MM-B-L1, MM-B-L2, MM-B-L3 to FB10 terminals 21, 22, 23 respectively.
 - d. For Standard SCCR units install FB/FR harness (Item 209) between FB2 terminals 21, 22, and 23 and FB9 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.
 - e. For High SCCR units, remove line side wires from FB11, and install FB/FR harness (Item 209) between FB2 terminals 21, 22, and 23 and FB11 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.
 - f. Connect fuse block jumper (Item 206) between FB9 terminals 11, 12, and 13 and FB10 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.
 - g. If the unit came with an auxiliary board installed, skip to Step 9. Otherwise, install auxiliary power harness (Item 717). Make power connection J1 on AUX to J2 of energy management module (EMM) if the unit has an EMM or to terminal J2 compressor expansion board (CXB).
9. Make communications connections. Refer to Fig. 14 and 16.
- a. If the unit came with an auxiliary board installed, skip to Step 9b. Otherwise, install auxiliary communications harness (Item 716).
Make communications connection J9 on AUX to terminal J4 of energy management module (EMM) if the unit has an EMM or to terminal J4 of compressor expansion board (CXB).
 - b. Install auxiliary harness (Item 212). Plug terminal board connector labeled AUX J4 to AUX board J4 and terminal board connector labeled AUX J5 to AUX board J5.

- c. Connect MM control harness (Item 204). Connect RED and BLK wires labeled AUX-J4 to RED and BLK wires labeled AUX-J4 of auxiliary harness (Item 212) respectively.
Connect RED and BLK wires labeled AUX-J5 to RED and BLK wires labeled AUX-J5 of auxiliary harness (Item 212) respectively.
Connect VIO and YEL wires labeled FRA to terminals 11 and 14 of fan relay A (FRA) (Item 501) respectively.
Connect VIO and YEL wires labeled FRB to terminals 11 and 14 of fan relay B (FRB) (Item 501) respectively.
- d. Connect FB/FR harness (Item 209) to fan relays (Item 501). Connect PNK and BRN wires labeled FR-A-A1 and FR-A-A2 to FRA (Item 501) terminals A1 and A2 respectively.
Connect VIO and BRN wires labeled FR-B-A1 and FR-B-A2 to FRB (Item 501) terminals A1 and A2 respectively.
Make splice connection from BRN wire labeled OFC-A COM SPLICE to BRN wire labeled FC-1 COM which was removed from FC1 contactor.
Make splice connection from PNK wire labeled OFC-A PWR SPLICE to PNK wire labeled FC-1 COIL which was removed from FC1 contactor. Make splice connection from BRN wire labeled OFC-B COM SPLICE to BRN wire labeled FC-2 COM which was removed from FC2 contactor.
Make splice connection from PNK wire labeled OFC-B PWR SPLICE to ORN wire labeled FC-2 COIL which was removed from FC2 contactor.

30RAP 130-150 units

Enclosure assembly and mounting:

1. The Motormaster enclosure assembly comes with Motormaster controller(s) (Item 100), power-in harness (Item 200), power-out harness (Item 202), and control harness (Item 204) pre-installed in the Motormaster enclosure (Item 718).
2. Attach MM mounting brackets (Item 722) to the MM enclosure (Item 718) using four AA06BS170 bolts (Item 724), eight AU02AB171 washers (Item 725), and four AT30AB171 nuts (Item 726) provided. See Fig. 27.
3. Mount the MM enclosure assembly to base frame and coil support using five AA06BS170 bolts (Item 724), ten AU02AB171 washers (Item 725), and five AT30AB171 nuts (Item 726) provided. Drill holes as needed. See Fig. 34-37.
4. Cut three 1/2 in. diameter holes in the bottom of the control box below the location of the fan contactors.
5. Route the conduit to the new holes cut in the bottom of the control box.
NOTE: For Motormaster enclosure cover assembly see Fig. 41.

Control box modifications:

6. Remove components.
 - a. Disconnect wires connected to fan contactor 1 (FC1) and fan contactor 2 (FC2). Remove the wires from the line side of contactors completely from the control box.
 - b. Remove FC1 and FC2.
7. Install components.
 - a. Mount Motormaster terminal blocks A and B (MMTB-A and MMTB-B) (Item 600) using four AL80AU170 screws (item 701) with terminal 11, 12, 13 side down in location where FC1 and FC2 were mounted.
 - b. Mount DIN rail (Item 707) below FB1 using two AL80AU170 screws (Item 701) provided.

- c. For Standard SCCR units mount fuse blocks 9 and 10 (FB9 and FB10) (Item 400) to DIN rail (Item 707). Install 3 fuses (Item 300) in each fuse block.
 - d. For High SCCR units, mount fuse block 10 (FB10) (Item 400) to DIN rail (Item 707). Install 3 fuses (Item 300) in fuse block.
 - e. Mount fan relay A assembly (FRA) and fan relay B assembly (FRB) (Items 500 and 501) on DIN rail next to FB9 and FB10.
 - f. Install end stop (Item 706) at each end of DIN rail (Item 707).
 - g. If the unit came with an auxiliary board installed, skip to Step 8. Otherwise, install auxiliary board (Item 715) using four AC41AB100 screws (Item 731) provided. See Fig. 21. Set DIP switch 2, 5 and 7 = ON.
8. Make power connections. Refer to Fig. 5.
 - a. Connect fan wires from fan motors to each terminal block (Item 600). Connect OFM9 BLK wires labeled 1, 2, 3 to Motormaster terminal block A (MMTB-A) terminals 21, 22, 23. Connect OFM1 BLK wires labeled 1, 2, 3 to Motormaster terminal block B (MMTB-B) terminals 21, 22, 23. Remove terminals as required.
 - b. Connect MM power-out harness (Item 202). Connect BLK, YEL, BLU wires labeled MM-A-T1, MM-A-T2, MM-A-T3 to MMTB-A terminals 11, 12, 13 respectively. Connect BLK, YEL, BLU wires labeled MM-B-T1, MM-B-T2, MM-B-T3 to MMTB-B terminals 11, 12, 13 respectively.
 - c. Connect MM power-in harness (Item 200). Connect BLK, YEL, BLU wires labeled MM-A-L1, MM-A-L2, MM-A-L3 to FB9 terminals 21, 22, 23 respectively. Connect BLK, YEL, BLU wires labeled MM-B-L1, MM-B-L2, MM-B-L3 to FB10 terminals 21, 22, 23 respectively.
 - d. Install FB/FR harness (Item 209) between FB10 terminals 11, 12, and 13 and FB2 terminals 21, 22, and 23 with BLK, YEL, BLU wires respectively.
 - e. For Standard SCCR units connect fuse block jumper (Item 206) between FB9 terminals 11, 12, and 13 and FB1 terminals 21, 22, and 23 with BLK, YEL, BLU wires respectively.
 - f. For High SCCR units, remove line side wires from FB11, and install FB/FR harness (Item 209) between FB1 terminals 21, 22, and 23 and FB11 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.
 - g. If the unit came with an auxiliary board installed, skip to Step 9. Otherwise, install auxiliary power harness (Item 717). Make power connection J1 on AUX to J2 of energy management module (EMM) if the unit has an EMM or to terminal J2 compressor expansion board (CXB).
 9. Make communications connections. Refer to Fig. 14 and 16.
 - a. If the unit came with an auxiliary board installed, skip to Step 9b. Otherwise, install auxiliary communications harness (Item 716). Make communication connection J9 on AUX to terminal J4 of energy management module (EMM) if the unit has an EMM or to terminal J4 of compressor expansion board (CXB).
 - b. Install auxiliary harness (Item 212). Plug terminal board connector labeled AUX J4 to AUX Board J4 and terminal board connector labeled AUX J5 to AUX Board J5.
 - c. Connect MM control harness (Item 204). Connect RED and BLK wires labeled AUX-J4 to RED and BLK wires labeled AUX-J4 of auxiliary harness (Item 212) respectively.
Connect RED and BLK wires labeled AUX-J5 to RED and BLK wires labeled AUX-J5 of auxiliary harness

(Item 212) respectively.

Connect VIO and YEL wires labeled FRA to terminals 11 and 14 of fan relay A (FRA) (Item 501) respectively. Connect VIO and YEL wires labeled FRB to terminals 11 and 14 of fan relay B (FRB) (Item 501) respectively.

- d. Connect FB/FR harness (Item 209) to fan relays (Item 501). Connect PNK and BRN wires labeled FR-A-A1 and FR-A-A2 to FRA (Item 501) terminals A1 and A2 respectively.

Connect VIO and BRN wires labeled FR-B-A1 and FR-B-A2 to FRB (Item 501) terminals A1 and A2 respectively.

Make splice connection from BRN wire labeled OFC-A COM SPLICE to BRN wire labeled FC-1 COM which was removed from FC1 contactor. Make splice connection from PNK wire labeled OFC-A PWR SPLICE to PNK wire labeled FC-1 COIL which was removed from FC1 contactor.

Make splice connection from BRN wire labeled OFC-B COM SPLICE to BRN wire labeled FC-2 COM which was removed from FC2 contactor. Make splice connection from PNK wire labeled OFC-B PWR SPLICE to ORN wire labeled FC-2 COIL which was removed from FC2 contactor.

38APD/S 025-030 units

Enclosure assembly and mounting:

1. The Motormaster enclosure assembly comes with Motormaster controller(s) (Item 100), power-in harness (Item 200), power-out harness (Item 202), and control harness (Item 204) pre-installed in the Motormaster enclosure (Item 718).
2. Attach MM mounting brackets (Item 723) to the unit corner post using eight AA06BS170 bolts (Item 724), sixteen AU02AB171 washers (Item 725), and eight AT30AB171 nuts (Item 726) provided. See Fig. 30.
3. Cut three 1-3/8 in. diameter holes in the corner post at the locations shown in Fig. 29. Insert the 3 plastic bushings (Item 728) into holes.
4. Remove the straight connectors from the ends of the conduit leaving the MM enclosure. Route the conduit through the holes in the corner post. See Fig. 28.
5. Mount the MM enclosure assembly to the MM mounting brackets (Item 723) using four AA06BS170 bolts (Item 724), eight AU02AB171 washers (Item 725), and four AT30AB171 nuts (Item 726) provided. See Fig. 25.
6. Cut three 1/2 in. diameter holes in the bottom of the control box below the location of the fan contactors.
7. Reassemble the straight conduit connectors and route the conduit to the new holes cut in the bottom of the control box. NOTE: For Motormaster enclosure cover assembly see Fig. 41.

Control box modifications:

8. Remove components.
 - a. Disconnect wires connected to fan contactor 1 (FC1). Remove the wires from the line side of contactor from the control box completely from the control box.
 - b. Remove FC1.
9. Install components.
 - a. Mount Motormaster terminal block A (MMTB-A) (Item 600) using two AL80AU170 screws (Item 701) with terminal 11, 12, 13 side down in location where FC1 was mounted.
 - b. Mount DIN rail (Item 713) next to CCB-1 using two AL80AU170 screws (Item 701) provided.

- c. For standard SCCR units mount fuse block 2 (FB2) (Item 400) to DIN rail (Item 713). Install 3 fuses (Item 300) in fuse block.
- d. Mount Motormaster relay (MMR) assembly (Items 500 and 501) on DIN rail (Item 713) next to FB1 and FB2 (Item 400).
- e. Install end stop (Item 706) at each end of DIN rail.
- f. If the unit came with an auxiliary board installed, skip to Step 10. Otherwise, install auxiliary board (Item 715) using four AC41AB100 screws (Item 731) provided. See Fig. 22. Set DIP switch 2, 5 and 7 = ON.

10. Make power connections. Refer to Fig. 6.
 - a. Connect OFM2 BLK wires labeled 1, 2, 3 to Motormaster terminal block A (MMTB-A) (Item 600) terminals 21, 22, 23. Remove terminals as required.
 - b. Connect MM power-out harness (Item 202) BLK, YEL, BLU wires labeled MM-A-T1, MM-A-T2, MM-A-T3 to MMTB-A terminals 11, 12, 13 respectively.
 - c. Connect MM power-in harness (Item 200) BLK, YEL, BLU wires labeled MM-A-L1, MM-A-L2, MM-A-L3 to FB2 terminals 21, 22, 23 respectively.
 - d. For Standard SCCR units, install fuse block jumper (Item 206) between FB1 terminals 21, 22, and 23 and FB2 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.
 - e. If the unit came with an auxiliary board installed, skip to Step 11. Otherwise install auxiliary power harness (Item 717). Make power connection J1 on AUX to terminal J2 of energy management module (EMM) if the unit has an EMM or to terminal J2 of main base board (MMB). Refer to Fig. 15.
11. Make communications connections. Refer to Fig. 13 and 16.
 - a. If the unit came with an auxiliary board installed, skip to Step 11b. Otherwise, install auxiliary communications harness (Item 716). Make communication connection J9 on AUX to terminal J3 of energy management module (EMM) if the unit has an EMM or to terminal J3 of MBB.
 - b. Install auxiliary harness (Item 212). Plug terminal board connector labeled AUX J4 to AUX Board J4.
 - c. Connect MM control harness (Item 204). Connect RED and BLK wires to auxiliary harness (Item 212). Connect VIO and YEL wires to terminals 11 and 14 of relay socket (Item 501) respectively.
 - d. Install MMR harness (Item 210). Connect PNK and BRN wires to relay socket (Item 501) terminals A1 and A2 respectively.

Make splice connection from BRN wire labeled OFC COM SPLICE to BRN wire labeled FC-1 COM which was removed from FC1 contactor.

Make splice connection from PNK wire labeled OFC PWR SPLICE to PNK wire labeled FC-1 COIL which was removed from FC1 contactor.

38APS 040-050 and 38APD 040-060 units

Enclosure assembly and mounting:

1. The Motormaster enclosure assembly comes with Motormaster controller(s) (Item 100), power-in harness (Item 200), power-out harness (Item 202), and control harness (Item 204) pre-installed in the Motormaster enclosure (Item 718).
2. Attach MM mounting brackets (Item 723) to the MM enclosure (Item 718) using four AA06BS170 bolts (Item 724), eight AU02AB171 washers (Item 725), and four AT30AB171 nuts (Item 726) provided. See Fig. 26.

3. Remove access panel from unit and cut three 1-3/8 in. diameter holes in the access panel at the locations shown in Fig. 32. Insert the 3 plastic bushings (Item 728) into holes.
4. Remove the straight connectors from the ends of the conduit leaving the MM enclosure. Route the conduit through the holes in the access panel. See Fig. 31.
5. Mount the MM enclosure assembly to the access panel using eight AA06BS170 bolts (Item 724), sixteen AU02AB171 washers (Item 725), and eight AT30AB171 nuts (Item 726) provided. Reinstall the access panel once the MM enclosure is securely mounted. See Fig. 33.
6. Cut three 1/2 in. diameter holes in the bottom of the control box below the location of the fan contactors.
7. Reassemble the straight conduit connectors and route the conduit to the new holes cut in the bottom of the control box. .
NOTE: For Motormaster enclosure cover assembly see Fig. 41.

Control box modifications:

8. Remove components.
 - a. Disconnect wires connected to fan contactor 1 (FC1). Remove the wires from the line side of contactor completely from the control box.
 - b. Remove FC1.
9. Install components.
 - a. Mount Motormaster terminal block A (MMTB-A) (Item 600) using two AL80AU170 screws (Item 701) with terminal 11, 12, 13 side down in location where FC1 was mounted.
 - b. Mount DIN rail (Item 707) next to FB2 using two AL80AU170 screws (Item 701) provided.
 - c. For Standard SCCR units mount fuse block 1 (FB1) (Item 400) to DIN rail (Item 713). Install 3 fuses (Item 300) in fuse block.
 - d. Mount Motormaster relay (MMR) assembly (Items 500 and 501) on DIN rail (Item 707) next to fuse block 1 and 2 (Item 400) (FB1 and FB2).
 - e. Install end stop (Item 706) at each end of DIN rail (Item 707).
 - f. If the unit came with an auxiliary board installed, skip to Step 10. Otherwise, install auxiliary board (Item 715) using four AC41AB100 screws (Item 731) provided. See Fig. 23. Set DIP switch 2, 5 and 7 = ON.
10. Make power connections. Refer to Fig. 7.
 - a. Connect OFM3 BLK wires labeled 1, 2, 3 to Motormaster terminal block A (MMTB-A) (Item 600) terminals 21, 22, 23. Remove terminals as required.
 - b. Connect MM power-out harness (Item 202) BLK, YEL, BLU wires labeled MM-A-T1, MM-A-T2, MM-A-T3 to MMTB-A terminals 11, 12, 13 respectively.
 - c. Connect MM power-in harness (Item 200) BLK, YEL, BLU wires labeled MM-A-L1, MM-A-L2, MM-A-L3 to FB1 terminals 21, 22, 23 respectively.
 - d. For Standard SCCR units install fuse block jumper (Item 206) between FB2 terminals 21, 22, and 23 and FB1 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.
 - e. For High SCCR units, remove line side wires from FB3, and install fuse block jumper (Item 206) between FB2 terminals 21, 22, and 23 and FB3 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.
 - f. If the unit came with an auxiliary board installed, skip to Step 11. Otherwise, install auxiliary power harness (Item 717). Make power connection J1 on AUX to ter-

минаl J2 of energy management module (EMM) if the unit has an EMM or to terminal J2 of main base board (MMB). Refer to Fig. 15.

11. Make communications connections. Refer to Fig. 13 and 16.
 - a. If the unit came with an auxiliary board installed, skip to Step 11b. Otherwise, install auxiliary communications harness (Item 716). Make communication connection J9 on AUX to terminal J3 of energy management module (EMM) if the unit has an EMM or to terminal J3 of MBB.
 - b. Install auxiliary harness (Item 212). Plug terminal board connector labeled AUX J4 to AUX Board J4.
 - c. Connect MM control harness (Item 204). Connect RED and BLK wires to auxiliary harness (Item 212). Connect VIO and YEL wires to terminals 11 and 14 of relay socket (Item 501) respectively.
 - d. Install MMR harness (Item 210). Connect PNK and BRN wires to the relay socket (Item 501) terminals A1 and A2 respectively. Make splice connection from BRN wire labeled OFC COM SPLICE to BRN wire labeled FC-1 COM which was removed from FC1 contactor. Make splice connection from PNK wire labeled OFC PWR SPLICE to PNK wire labeled FC-1 COIL which was removed from FC1 contactor.

38APS 065 units

Enclosure assembly and mounting:

1. The Motormaster enclosure assembly comes with Motormaster controller(s) (Item 100), power-in harness (Item 200), power-out harness (Item 202), and control harness (Item 204) pre-installed in the Motormaster enclosure (Item 718).
2. Attach MM mounting brackets (Item 722) to the MM enclosure (Item 718) using four AA06BS170 bolts (Item 724), eight AU02AB171 washers (Item 725), and four AT30AB171 nuts (Item 726) provided. See Fig. 27.
3. Mount the MM enclosure assembly to base frame and coil support using five AA06BS170 bolts (Item 724), ten AU02AB171 washers (Item 725), and five AT30AB171 nuts (Item 726) provided. Drill holes as needed. See Fig. 34-37.
4. Cut three 1/2 in. diameter holes in the bottom of the control box below the location of the fan contactors.
5. Route the conduit to the new holes cut in the bottom of the control box.
NOTE: For Motormaster enclosure cover assembly see Fig. 41.

Control box modifications:

6. Remove components.
 - a. Disconnect wires connected to fan contactor 1 (FC1). Remove the wires from the line side of contactor completely from the control box.
 - b. Remove FC1.
7. Install components.
 - a. Mount Motormaster terminal block A (MMTB-A) (Item 600) using two AL80AU170 screws (Item 701) with terminal 11, 12, 13 side down in location where FC1 was mounted.
 - b. Mount DIN rail (Item 707) next to FB1 using two AL80AU170 screws (Item 701) provided.
 - c. For Standard SCCR units mount fuse block 9 (FB9) (Item 400) to DIN rail (Item 707). Install 3 fuses (Item 300) in fuse block.
 - d. Mount fan relay (FR) assembly (Items 500 and 501) on DIN rail next to FB9.

- e. Install end stop (Item 706) at each end of DIN rail (Item 707).
 - f. If the unit came with an auxiliary board installed, skip to Step 8. Otherwise, install auxiliary board (Item 715) using four AC41AB100 screws (Item 731) provided. See Fig. 24. Set DIP switch 2, 5 and 7 = ON.
8. Make power connections. Refer to Fig. 8.
- a. Connect OFM1 BLK wires labeled 1, 2, 3 to Motormaster terminal block A (MMTB-A) (Item 600) terminals 21, 22, 23. Remove terminals as required.
 - b. Connect MM power-out harness (Item 202) BLK, YEL, BLU wires labeled MM-A-T1, MM-A-T2, MM-A-T3 to MMTB-A terminals 11, 12, 13 respectively.
 - c. Connect MM power-in harness (Item 200) BLK, YEL, BLU wires labeled MM-A-L1, MM-A-L2, MM-A-L3 to FB9 terminals 21, 22, 23 respectively.
 - d. For Standard SCCR units install FB/FR harness (Item 211) between FB1 terminals 21, 22, and 23 and FB9 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.
 - e. For High SCCR units, remove line side wires from FB10, and install FB/FR harness (Item 211) between FB1 terminals 21, 22, and 23 and FB10 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.
 - f. If the unit came with an auxiliary board installed, skip to Step 9. Otherwise, install auxiliary power harness (Item 717). Make power connection J1 on AUX to terminal J2 of energy management module (EMM) if the unit has an EMM or to terminal J2 of main base board (MMB). Refer to Fig. 15.
9. Make communications connections. Refer to Fig. 14 and 16.
- a. If the unit came with an auxiliary board installed, skip to Step 9b. Otherwise, install auxiliary communications harness (Item 716). Make communication connection J9 on AUX to terminal J3 of energy management module (EMM) if the unit has an EMM or to terminal J3 of MBB.
 - b. Install auxiliary harness (Item 212). Plug terminal board connector labeled AUX J5 to AUX Board J5.
 - c. Connect MM control harness (Item 204). Connect RED and BLK wires to auxiliary harness (Item 212). Connect VIO and YEL wires to terminals 11 and 14 of FR (Item 501) respectively.
 - d. Connect FB/FR harness (Item 211) to fan relay (Item 501). Connect PNK and BRN wires labeled FR-A-A1 and FR-A-A2 to FRA (Item 501) terminals A1 and A2 respectively.
Make splice connection from BRN wire labeled OFC COM SPLICE to BRN wire labeled FC-1 COM which was removed from FC1 contactor. Make splice connection from PNK wire labeled OFC PWR SPLICE to PNK wire labeled FC-1 COIL which was removed from FC1 contactor.

38APD 070-100 units

Enclosure assembly and mounting:

1. The Motormaster enclosure assembly comes with Motormaster controller(s) (Item 100), power-in harness (Item 200), power-out harness (Item 202), and control harness (Item 204) pre-installed in the Motormaster enclosure (Item 718).
2. Attach MM mounting brackets (Item 722) to the MM enclosure (Item 718) using four AA06BS170 bolts (Item 724), eight AU02AB171 washers (Item 725), and four AT30AB171 nuts (Item 726) provided. See Fig. 27.

3. Mount the MM enclosure assembly to base frame and coil support using five AA06BS170 bolts (Item 724), ten AU02AB171 washers (Item 725), and five AT30AB171 nuts (Item 726) provided. Drill holes as needed. See Fig. 34-37.
4. Cut three 1/2 in. diameter holes in the bottom of the control box below the location of the fan contactors.
5. Route the conduit to the new holes cut in the bottom of the control box.
NOTE: For Motormaster enclosure cover assembly see Fig. 41.

Control box modifications:

6. Remove components.
 - a. Disconnect wires connected to fan contactors. Remove the wires from the line side of contactors completely from the control box.
38AP 070, 090, and 100: FC1 and FC2.
38AP 080: FC1 and FC4.
 - b. Remove fan contactors.
38AP 070, 090, and 100: FC1 and FC2.
38AP 080: FC1 and FC4.
7. Install components.
 - a. Mount Motormaster terminal blocks A and B (MMTB-A and MMTB-B) (Item 600) using four AL80AU170 screws (Item 701) with terminal 11, 12, 13 side down in location where FC1 and FC2 or FC4 were mounted.
 - b. Mount DIN rail (Item 707) where FC1 used to be using two AL80AU170 screws (Item 701) provided.
 - c. For Standard SCCR units mount fuse blocks 9 and 10 (FB9 and FB10) (Item 400) to DIN rail (Item 707). Install 3 fuses (Item 300) in each fuse block.
 - d. For High SCCR units, Mount fuse block 10 (FB10) (Item 400) to DIN rail (Item 707). Install 3 fuses (Item 300) in fuse block.
 - e. Mount fan relay A assembly (FRA) and fan relay B assembly (FRB) (Items 500 and 501) on DIN rail next to FB9 and FB10.
 - f. Install end stop (Item 706) at each end of DIN rail (Item 707).
 - g. If the unit came with an auxiliary board installed, skip to Step 8. Otherwise, install auxiliary board (Item 715) using four AC41AB100 screws (Item 731) provided. See Fig. 25. Set DIP switch 2, 5 and 7 = ON.
8. Make power connections. Refer to Fig. 9.
 - a. Connect fan wires from fan motors to each terminal block (Item 600). Connect each set of OFM BLK wires labeled 1, 2, 3 to each Motormaster terminal block terminals 21, 22, 23. Remove terminals as required.
38AP070, 38AP090, and 38APD100: OFM3 to MMTB-A and OFM1 to MMTB-B.
38AP080: OFM5 to MMTB-A and OFM3 to MMTB-B.
 - b. Connect MM power-in harness (Item 200). Connect BLK, YEL, BLU wires labeled MM-A-L1, MM-A-L2, MM-A-L3 to FB9 terminals 21, 22, 23 respectively. Connect BLK, YEL, BLU wires labeled MM-B-L1, MM-B-L2, MM-B-L3 to FB10 terminals 21, 22, 23 respectively.
 - c. For Standard SCCR units install FB/FR harness (Item 209) between FB2 terminals 21, 22, and 23 and FB9 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.
 - d. For High SCCR units, remove line side wires from FB11, and install FB/FR harness (Item 209) between FB2 terminals 21, 22, and 23 and FB11 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.

- e. Connect fuse block jumper (Item 206) between FB9 terminals 11, 12, and 13 and FB10 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.
 - f. If the unit came with an auxiliary board installed, skip to Step 9. Otherwise, install auxiliary power harness (Item 717). Make power connection J1 on AUX to J2 of energy management module (EMM) if the unit has an EMM or to terminal J2 compressor expansion board (CXB).
9. Make communications connections. Refer to Fig. 14 and 16.
- a. If the unit came with an auxiliary board installed, skip to Step 9b. Otherwise, install auxiliary communications harness (Item 716).
Make communication connection J9 on AUX to terminal J3 of energy management module (EMM) if the unit has an EMM or to terminal J4 of compressor expansion board (CXB).
 - b. Install auxiliary harness (Item 212). Plug terminal board connector labeled AUX J4 to AUX board J4 and terminal board connector labeled AUX J5 to AUX board J5.
 - c. Connect MM control harness (Item 204). Connect RED and BLK wires labeled AUX-J4 to RED and BLK wires labeled AUX-J4 of auxiliary harness (Item 212) respectively.
Connect RED and BLK wires labeled AUX-J5 to RED and BLK wires labeled AUX-J5 of auxiliary harness (Item 212) respectively.
Connect VIO and YEL wires labeled FRA to terminals 11 and 14 of fan relay A (FRA) (Item 501) respectively.
Connect VIO and YEL wires labeled FRB to terminals 11 and 14 of fan relay B (FRB) (Item 501) respectively.
 - d. Connect FB/FR harness (Item 209) to fan relays (Item 501). Connect PNK and BRN wires labeled FR-A-A1 and FR-A-A2 to FRA (Item 501) terminals A1 and A2 respectively.
Connect VIO and BRN wires labeled FR-B-A1 and FR-B-A2 to FRB (Item 501) terminals A1 and A2 respectively. Make splice connection from BRN wire labeled OFC-A COM SPLICE to BRN wire labeled FC-1 COM which was removed from FC1 contactor. Make splice connection from PNK wire labeled OFC-A PWR SPLICE to PNK wire labeled FC-1 COIL which was removed from FC1 contactor.
For 38AP070, 090, and 100 units:
Make splice connection from BRN wire labeled OFC-B COM SPLICE to BRN wire labeled FC-2 COM which was removed from FC2 contactor. Make splice connection from PNK wire labeled OFC-B PWR SPLICE to ORN wire labeled FC-2 COIL which was removed from FC2 contactor.
For 38AP 080 units:
Make splice connection from BRN wire labeled OFC-B COM SPLICE to BRN wire labeled FC-4 COM which was removed from FC4 contactor. Make splice connection from PNK wire labeled OFC-B PWR SPLICE to ORN wire labeled FC-4 COIL which was removed from FC4 contactor.

38APD 115-130 units

Enclosure assembly and mounting:

1. The Motormaster enclosure assembly comes with Motormaster controller(s) (Item 100), power-in harness (Item 200), power-out harness (Item 202), and control harness (Item 204) pre-installed in the Motormaster enclosure (Item 718).
 2. Attach MM mounting brackets (Item 722) to the MM enclosure (Item 718) using four AA06BS170 bolts (Item 724), eight AU02AB171 washers (Item 725), and four AT30AB171 nuts (Item 726) provided. See Fig. 27.
 3. Mount the MM enclosure assembly to base frame and coil support using five AA06BS170 bolts (Item 724), ten AU02AB171 washers (Item 725), and five AT30AB171 nuts (Item 726) provided. Drill holes as needed. See Fig. 34-37.
 4. Cut three 1/2 in. diameter holes in the bottom of the control box below the location of the fan contactors.
 5. Route the conduit to the new holes cut in the bottom of the control box.
NOTE: For Motormaster enclosure cover assembly see Fig. 41.
- Control box modifications:
6. Remove components.
 - a. Disconnect wires connected to fan contactor 5 (FC5) and fan contactor 2 (FC2). Remove the wires from the line side of contactors completely from the control box.
 - b. Remove FC5 and FC2.
 7. Install components.
 - a. Mount Motormaster terminal blocks A and B (MMTB-A and MMTB-B) (Item 600) using four AL80AU170 screws (Item 701) with terminal 11, 12, 13 side down in location where FC5 and FC2 were mounted.
 - b. Mount DIN rail (Item 707) where FC5 used to be using two AL80AU170 screws (Item 701) provided.
 - c. For Standard SCCR units mount fuse blocks 9 and 10 (FB9 and FB10) (Item 400) to DIN rail (Item 707). Install 3 fuses (Item 300) in each fuse block.
 - d. For High SCCR units, Mount fuse block 10 (FB10) (Item 400) to DIN rail (Item 707). Install 3 fuses (Item 300) in fuse block.
 - e. Mount fan relay A assembly (FRA) and fan relay B assembly (FRB) (Items 500 and 501) on DIN rail next to FB9 and FB10.
 - f. Install end stop (Item 706) at each end of DIN rail (Item 707).
 - g. If the unit came with an auxiliary board installed, skip to Step 8. Otherwise, install auxiliary board (Item 715) using four AC41AB100 screws (Item 731) provided. See Fig. 22. Set DIP switch 2, 5 and 7 = ON.
 8. Make power connections. Refer to Fig. 10.
 - a. Connect fan wires from fan motors to each terminal block (Item 600). Connect OFM7 BLK wires labeled 1, 2, 3 to Motormaster terminal block A (MMTB-A) terminals 21, 22, 23. Connect OFM1 BLK wires labeled 1, 2, 3 to Motormaster terminal block B (MMTB-B) terminals 21, 22, 23. Remove terminals as required.
 - b. Connect MM power-out harness (Item 202). Connect BLK, YEL, BLU wires labeled MM-A-T1, MM-A-T2, MM-A-T3 to MMTB-A terminals 11, 12, 13 respectively. Connect BLK, YEL, BLU wires labeled MM-B-T1, MM-B-T2, MM-B-T3 to MMTB-B terminals 11, 12, 13 respectively.
 - c. Connect MM power-in harness (Item 200) BLK, YEL, BLU wires labeled MM-A-L1, MM-A-L2, MM-A-L3 to FB9 terminals 21, 22, 23 respectively. Connect BLK, YEL, BLU wires labeled MM-B-L1, MM-B-L2, MM-B-L3 to FB10 terminals 21, 22, 23 respectively.
 - d. For Standard SCCR units install FB/FR harness (Item 209) between FB2 terminals 11, 12, and 13 and FB9 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.
 - e. For High SCCR units, remove line side wires from FB11, and install FB/FR harness (Item 209) between

FB2 terminals 21, 22, and 23 and FB11 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.

- f. Connect fuse block jumper (Item 206) between FB9 terminals 21, 22, and 23 and FB10 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.
 - g. If the unit came with an auxiliary board installed, skip to Step 9. Otherwise, install auxiliary power harness (Item 717). Make power connection J1 on AUX to J2 of energy management module (EMM) if the unit has an EMM or to terminal J2 compressor expansion board (CXB).
9. Make communications connections. Refer to Fig. 14 and 16.
- a. If the unit came with an auxiliary board installed, skip to Step 9b. Otherwise, install auxiliary communications harness (Item 716). Make communication connection J9 on AUX to terminal J3 of energy management module (EMM) if the unit has an EMM or to terminal J4 of compressor expansion board (CXB).
 - b. Install auxiliary harness (Item 212). Plug terminal board connector labeled AUX J4 to AUX Board J4 and terminal board connector labeled AUX J5 to AUX Board J5.
 - c. Connect MM control harness (Item 204). Connect RED and BLK wires labeled AUX-J4 to RED and BLK wires labeled AUX-J4 of auxiliary harness (Item 212) respectively.
Connect RED and BLK wires labeled AUX-J5 to RED and BLK wires labeled AUX-J5 of auxiliary harness (Item 212) respectively.
Connect VIO and YEL wires labeled FRA to terminals 11 and 14 of fan relay A (FRA) (Item 501) respectively.
Connect VIO and YEL wires labeled FRB to terminals 11 and 14 of fan relay B (FRB) (Item 501) respectively.
 - d. Connect FB/FR harness (Item 209) to fan relays (Item 501). Connect PNK and BRN wires labeled FR-A-A1 and FR-A-A2 to FRA (Item 501) terminals A1 and A2 respectively. Connect VIO and BRN wires labeled FR-B-A1 and FR-B-A2 to FRB (Item 501) terminals A1 and A2 respectively. Make splice connection from BRN wire labeled OFC-A COM SPLICE to BRN wire labeled FC-1 COM which was removed from FC1 contactor.
Make splice connection from PNK wire labeled OFC-A PWR SPLICE to PNK wire labeled FC-1 COIL which was removed from FC1 contactor.
Make splice connection from BRN wire labeled OFC-B COM SPLICE to BRN wire labeled FC-5 COM which was removed from FC5 contactor. Make splice connection from PNK wire labeled OFC-B PWR SPLICE to ORN wire labeled FC-5 COIL which was removed from FC5 contactor.

09DP UNIT INSTALLATION

See Table 1 for accessory usage. Refer to “Accessory Package Contents” on page 57 for corresponding item numbers.

NOTE: These instructions are written to include the option for High SCCR (Short Circuit Current Rating) applications. High SCCR units can be identified by the 13th position (Ambient/Interrupt Option) in the model number as high interrupt. These are 09DP unit options 3 and 9.

IMPORTANT: This procedure will show installation for high SCCR applications. Perform the following steps to modify corresponding unit with the accessory. All accessory installations should be installed and wired as such for ease of installation. NOTE: Lock out and tag out all power connections.

09DP 018-060 Units

Enclosure assembly and mounting:

1. The Motormaster enclosure assembly comes with Motormaster controller(s) (Item 100), power-in harness (Item 200), power-out harness (Item 202), and control harness (Item 204) pre-installed in the Motormaster enclosure (Item 718).
2. For 09DP 035-060 units:
Attach MM mounting brackets (Item 723) to the MM enclosure (Item 718) using four AA06BS170 bolts (Item 724), eight AU02AB171 washers (Item 725), and four AT30AB171 nuts (Item 726) provided. See Fig. 26.
3. For 09DP 018-030 units:
Attach MM mounting brackets (Item 723) to the unit corner post using eight AA06BS170 bolts (Item 724), sixteen AU02AB171 washers (Item 725), and eight AT30AB171 nuts (Item 726) provided. See Fig. 29.
4. Cut three 1-3/8 in. diameter holes in the corner post for 09DP 018-030 units or into the access panel for 09DP 035-060 units, at the locations shown in Fig. 29 for 09DP 018-030 or Fig. 32 for 09DP 035-060. Insert the 3 plastic bushings (Item 728) into holes.
5. Remove the straight connectors from the ends of the conduit leaving the MM enclosure. Route the conduit through the holes in the corner post. See Fig. 28 for 09DP 018-030 and Fig. 31 for 09DP 035-060.
6. For 09DP 018-30 units:
Mount the MM enclosure assembly to the MM mounting brackets using four AA06BS170 bolts (Item 724), eight AU02AB171 washers (Item 725), and four AT30AB171 nuts (Item 726) provided. See Fig. 26.
7. For 09DP 035-060 units:
Remove the access panel and mount the MM enclosure assembly to the access panel using eight AA06BS170 bolts (Item 724), sixteen AU02AB171 washers (Item 725), and eight AT30AB171 nuts (Item 726) provided. Reinstall the access panel once the MM enclosure is securely mounted. See Fig. 32.
8. Cut three 1/2 in. diameter holes in the bottom of the control box below the location of the fan contactors.
9. Reassemble the straight conduit connectors and route the conduit to the new holes cut in the bottom of the control box. NOTE: For Motormaster enclosure cover assembly see Fig. 41.

Control box modifications:

10. Remove components.
 - a. Disconnect wires connected to fan contactor 1 (FC1). Remove the wires from the line side of contactor completely from the control box.
 - b. Remove FC1.
11. Install components.
 - a. Mount Motormaster terminal block A (MMTB-A) (Item 600) with terminal 11, 12, 13 side down using two AL80AU170 screws (Item 701) next to DIN rail (Item 714).
 - b. Mount DIN rail (Item 714) where FC1 used to be using two AL80AU170 screws (Item 701) provided.
 - c. For Standard SCCR units, mount fuse block 1 (FB1) (Item 400) to DIN rail (Item 714). Install 3 fuses (Item 300) in fuse block.

- d. For High SCCR units mount fuse blocks 1 and 2 (FB1 and FB2) (Item 400) to DIN rail (Item 714). Install 3 fuses (Item 300) in each fuse block.
 - e. Mount fan relay (FR) assembly (Items 500 and 501) on DIN rail (item 714) next to fuse block 1 (FB1) (Item 400).
 - f. Install end stop (Item 706) at each end of DIN rail (Item 714).
 - g. Install Motormaster pressure transducer (MMPT-A) (Item 711) on liquid line per Fig. 38 for 09DP 018-030 and Fig. 39 for 09DP 035-060.
12. Make power connections Refer to Fig. 12.
- a. Connect fan OFM BLK wires labeled 1, 2, 3 to Motormaster terminal block A (MMTB-A) (Item 600) terminals 21, 22, 23. Remove terminals as required.
09DP 018-030: OFM1 to MMTB-A.
09DP 035-060: OFM3 to MMTB-A.
 - b. Connect MM power-out harness (Item 202) to terminal block (Item 600) BLK, YEL, BLU wires labeled MM-A-T1, MM-A-T2, MMA-T3 to MMTB-A terminals 11, 12, 13 respectively.
 - c. For High SCCR units connect MM power-in harness (Item 200) BLK, YEL, BLU wires labeled MM-A-L1, MM-A-L2, MM-A-L3 to FB2 terminals 21, 22, 23 respectively.
 - d. For Standard SCCR units, connect MM power-in harness (Item 200) BLK, YEL, BLU wires labeled MM-A-L1, MM-A-L2, MM-A-L3 to FB1 terminals 21, 22, 23 respectively.
 - e. For High SCCR units install fuse block jumper (Item 206) between FB1 terminals 21, 22, and 23 and FB2 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.
 - f. Install FB1/FB3 to TB1 harness (Item 208) between TB1A terminals 21, 22, 23 and FB1 terminals 11, 12, 13 with BLK, YEL, BLU wires respectively.
13. Make communications connections. Refer to Fig. 17.
- a. Connect MM control harness (Item 204). Connect YEL and VIO wires to terminal 14 and 11 of FR (Item 501) respectively. Connect BLK, GRN, and RED wires to BLK, GRN and RED wires of MM pressure transducer harness (Item 727) respectively.
 - b. Route pressure transducer harness (Item 727) out of the bushing in the bottom of the control box and connect to the MM pressure transducer (Item 711).
 - c. Install MMR harness (Item 210). Connect PNK and BRN wires to FR (Item 501) terminals C1 and C2 respectively.
Make splice connection from BRN wire labeled OFC COM SPLICE to BRN wire labeled FC-1 COM which was removed from FC1 contactor.
Make splice connection from PNK wire labeled OFC PWR SPLICE to RED (09DP 018-030) or VIO (09DP 035-060) wire labeled FC-1 COIL which was removed from FC1 contactor.
 - d. For R-410A applications install MM jumper harness (Item 732) between MM-A terminals +24 and DI3.
 - e. For R-22 applications install MM jumper harness (Item 732) between MM-A terminals +24 and DI2.
2. Attach MM mounting brackets (Item 722) to the MM enclosure (Item 718) using four AA06BS170 bolts (Item 724), eight AU02AB171 washers (Item 725), and four AT30AB171 nuts (Item 726) provided. See Fig. 27.
3. Mount the MM enclosure assembly to base frame and coil support using five AA06BS170 bolts (Item 724), ten AU02AB171 washers (Item 725), and five AT30AB171 nuts (Item 726) provided. Drill holes as needed. See Fig. 34-37.
4. Cut three 1/2 in. diameter holes in the bottom of the control box below the location of the fan contactors.
5. Route the conduit to the new holes cut in the bottom of the control box.
NOTE: For Motormaster enclosure cover assembly see Fig. 41.
- Control box modifications:
6. Remove components.
- a. Disconnect wires connected to fan contactor 1 (FC1) and fan contactor 2 (FC2). Remove the wires from the line side of contactors completely from the control box.
 - b. Remove FC1 and FC2.
7. Install components.
- a. Mount Motormaster terminal blocks A and B (MMTB-A and MMTB-B) (Item 600) with terminal 11, 12, 13 side down using 4 AL80AU170 screws (Item 701) next to DIN rail (Item 707).
 - b. Mount DIN rail (Item 707) where FC1 used to be using two AL80AU170 screws (Item 701) provided.
 - c. For Standard SCCR units, mount fuse blocks 1, and 2 (FB1 and FB2) (Item 400) to DIN rail (Item 707). Install 3 fuses (Item 300) in each fuse block.
 - d. For High SCCR units mount fuse blocks 1, 2 and 3 (FB1, FB2, and FB3) (Item 400) to DIN rail (Item 707). Install 3 fuses (Item 300) in each fuse block.
 - e. Mount fan relay A assembly (FRA) and fan relay B assembly (FRB) (Items 500 and 501) on DIN rail next to FB1 and FB2.
 - f. Install end stop (Item 706) at each end of DIN rail (Item 714).
 - g. Install Motormaster pressure transducers (MMPT-A and MMPT-B) (Item 711) on liquid line. See Fig. 40. Only one Motormaster pressure transducer (MMPT) needs to be installed on single circuit units.
8. Make power connections. Refer to Fig. 12.
- a. Connect fan wires from fan motor to terminal blocks (Item 600). Connect each set of OFM BLK wires labeled 1, 2, 3 to each Motormaster terminal block terminals 21, 22, 23. Remove terminals as required.
09DP 065: Connect OFM1 to MMTB-A. Connect OFM3 to MMTB-B.
09DP 075-095: Connect OFM1 to MMTB-A. Connect OFM5 to MMTB-B. Disconnect OFM3 from FC3 and connect to MMTB-A.
09DP 115-130: Connect OFM1 to MMTB-A. Connect OFM5 to MMTB-B. Disconnect OFM3 from FC6 and connect to MMTB-A. Disconnect OFM7 from FC4 and connect to MMTB-B.
 - b. Connect MM Power-out harness (Item 202). Connect BLK, YEL, BLU wires labeled MM-A-T1, MM-A-T2, MM-A-T3 to MMTB-A terminals 11, 12, 13 respectively. Connect BLK, YEL, BLU wires labeled MM-B-T1, MM-B-T2, MM-B-T3 to MMTB-B terminals 11, 12, 13 respectively.
 - c. Connect MM power-in harness (Item 200). Connect BLK, YEL, BLU wires labeled MM-A-L1, MM-A-L2,

09DP 065-130 units

Enclosure assembly and mounting:

1. The Motormaster enclosure assembly comes with Motormaster controller(s) (Item 100), power-in harness (Item 200), power-out harness (Item 202), and control harness (Item 204) pre-installed in the Motormaster enclosure (Item 718).

MM-A-L3 to FB1 terminals 21, 22, 23 respectively. Connect BLK, YEL, BLU wires labeled MM-B-L1, MM-B-L2, MM-B-L3 to FB2 terminals 21, 22, 23 respectively.

- d. For High SCCR units install FB/FR harness (Item 209) between FB1 terminals 11, 12, and 13 and FB3 terminals 21, 22, and 23 with BLK, YEL, BLU wires respectively.
 - e. Connect FB jumper (Item 206) between FB1 terminals 11, 12, and 13 and FB2 terminals 11, 12, and 13 with BLK, YEL, BLU wires respectively.
 - f. For Standard SCCR units, install FB1/FB3 to TB1 harness (Item 208) between TB1A terminals 21, 22, 23 and FB1 terminals 11, 12, 13 with BLK, YEL, BLU wires respectively.
 - g. For High SCCR units install FB1/FB3 to TB1 harness (Item 208) between TB1A terminals 21, 22, 23 and FB3 terminals 11, 12, 13 with BLK, YEL, BLU wires respectively.
9. Make communications connections. Refer to Fig. 18 for 09DP 065-095 or Fig. 19 for 09DP 115-130.
 - a. Connect MM control harness (Item 204). Connect VIO and YEL wires labeled FRA to terminals 11 and 14 of fan relay A (FRA) (Item 501) respectively. Connect VIO and YEL wires labeled FRB to terminals 11 and 14 of fan relay B (FRB) (Item 501) respectively. Connect BLK, GRN, and RED wires to BLK, GRN and RED wires of each MM pressure transducer harness (Item 727) respectively.
 - b. Route pressure transducer harness (Item 727) out of the bushing in the bottom of the control box and connect to the MM pressure transducers (Item 711). Be sure to connect the proper circuit cable to the appropriate transducer. See Fig. 40.
 - c. Connect FB/FR harness (Item 209) to fan relays (Item 501). Connect PNK and BRN wires labeled FR-A-A1 and FR-A-A2 to FRA (Item 501) terminals C1 and C2 respectively. Connect VIO and BRN wires labeled FR-B-A1 and FR-B-A2 to FRB (Item 501) terminals C1 and C2 respectively. Make splice connection from BRN wire labeled OFC-A COM SPLICE to BRN wire labeled FC-1 COM which was removed from FC1 contactor. Make splice connection from PNK wire labeled OFC-A PWR SPLICE to ORN wire labeled FC-1 COIL which was removed from FC1 contactor. Make splice connection from BRN wire labeled OFC-B COM SPLICE to BRN wire labeled FC-2 COM which was removed from FC2 contactor. Make splice connection from VIO wire labeled OFC-B PWR SPLICE to VIO wire labeled FC-2 COIL which was removed from FC2 contactor.
 - d. For R-410A applications install MM jumper harness (Item 732) between MM-A terminals +24 and DI3 and between MM-B terminals +24 and DI3.
 - e. For R-22 applications install MM jumper harness (Item 732) between MM-A terminals +24 and DI2 and between MM-B terminals +24 and DI2.

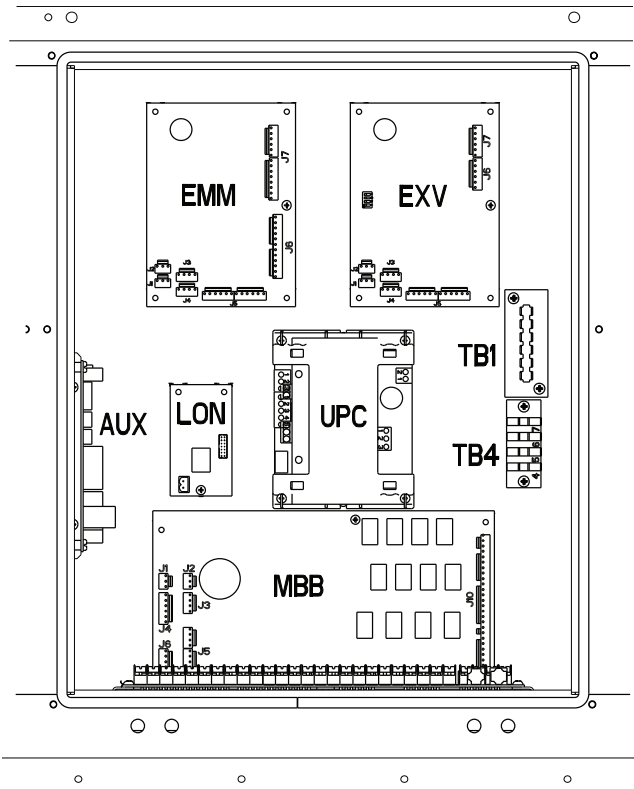


Fig. 20 — Auxiliary Board Installation Location — 30RAP 010-060 Units (Sizes 035-060 Shown)

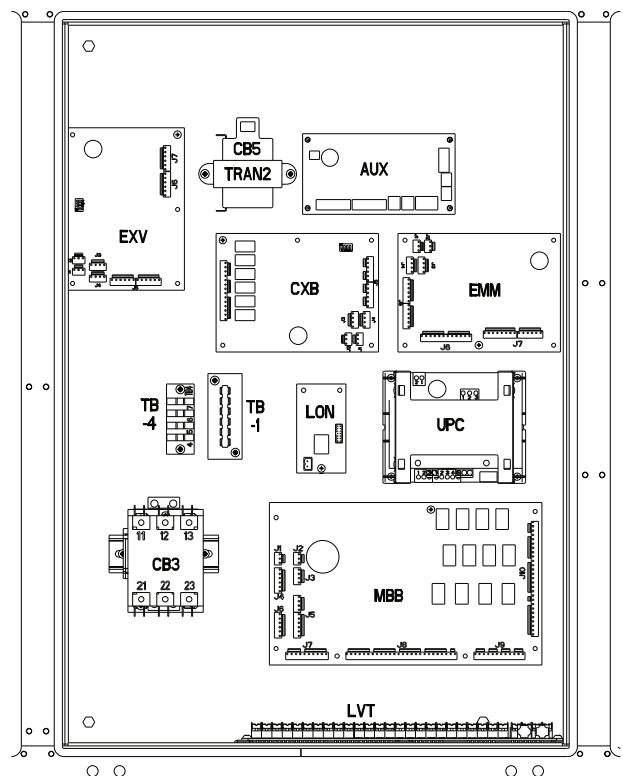


Fig. 21 — Auxiliary Board Installation Location — 30RAP 070-150 Units

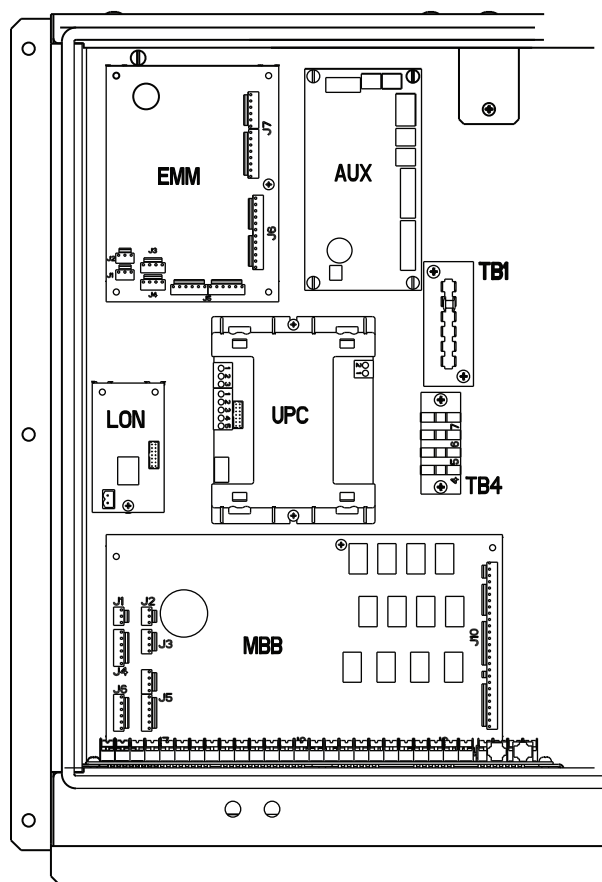


Fig. 22 — Auxiliary Board Installation Location — 38APD/S 025-030 Units

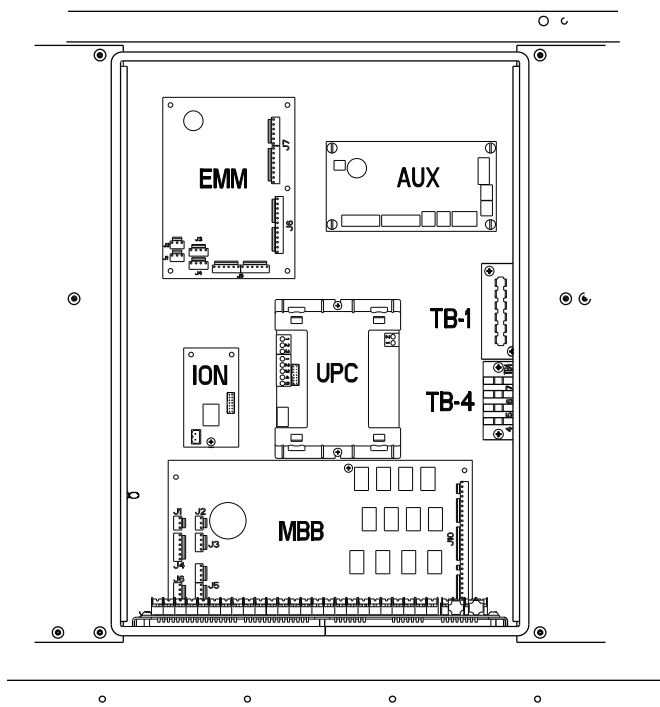


Fig. 23 — Auxiliary Board Installation Location — 38APD/S 040-060 Units

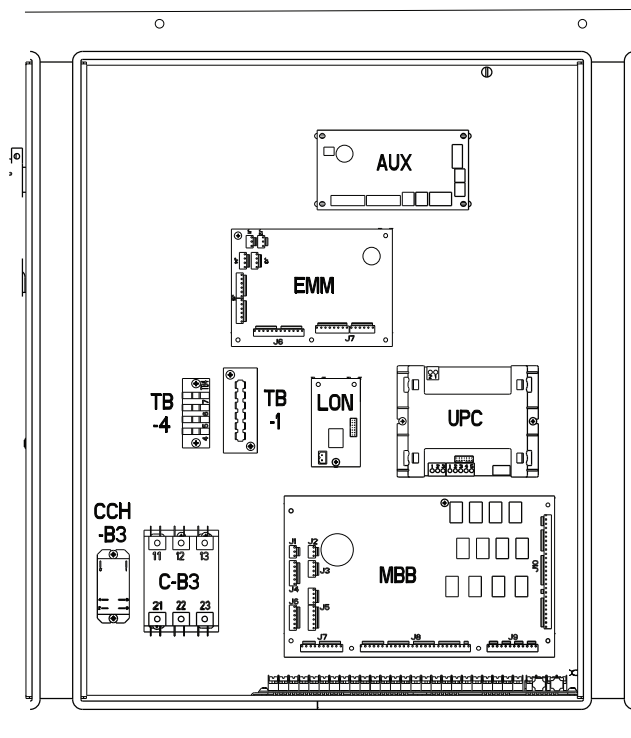


Fig. 24 — Auxiliary Board Installation Location — 38APS 065 Units

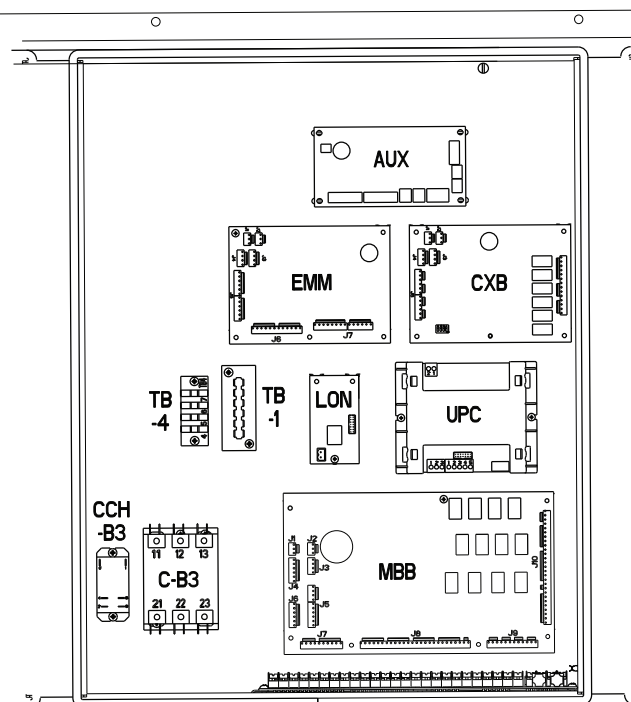


Fig. 25 — Auxiliary Board Installation Location — 38APD 070-130 Units

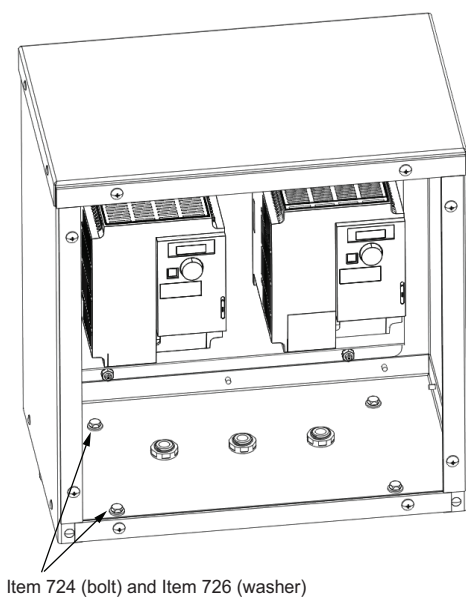
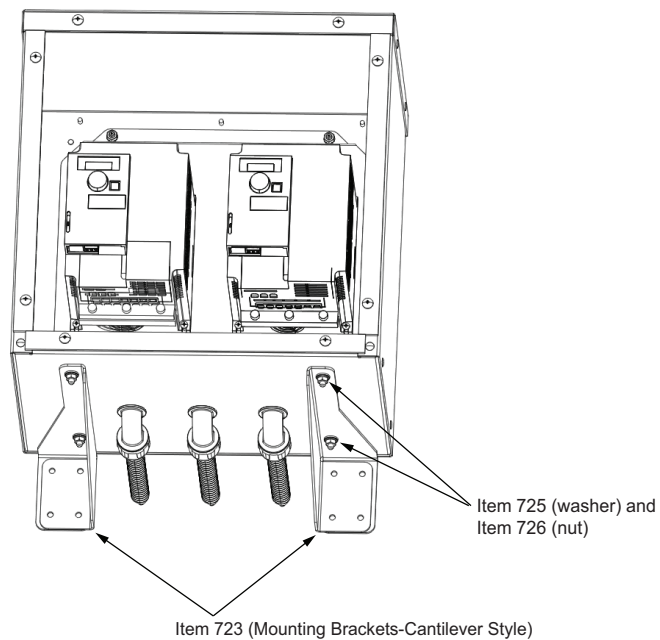


Fig. 26 — Motormaster Cantilever Bracket Installation - 30RAP 010-060, 38AP 025-060, and 09DP 018-060 Units

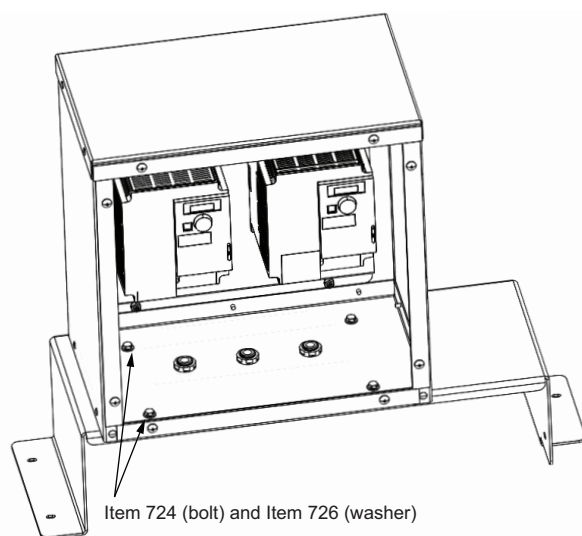
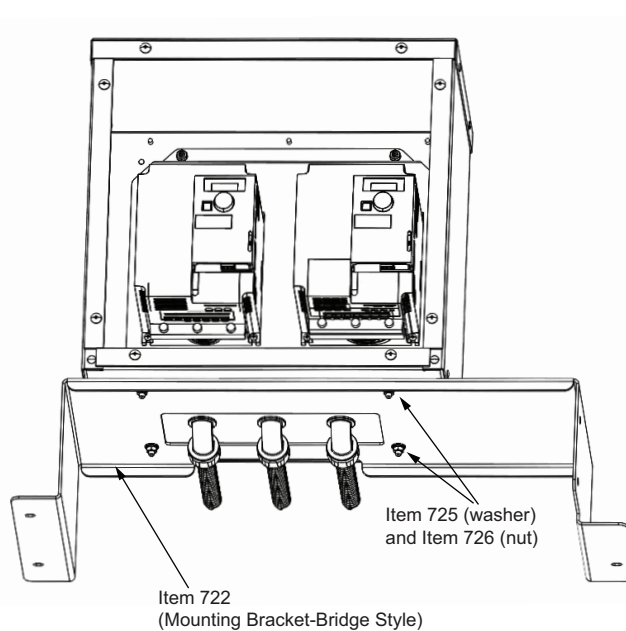


Fig. 27 — Motormaster Bridge Bracket Installation — 30RAP 070-150, 38AP 065-130, and 09DP 065-130 Units

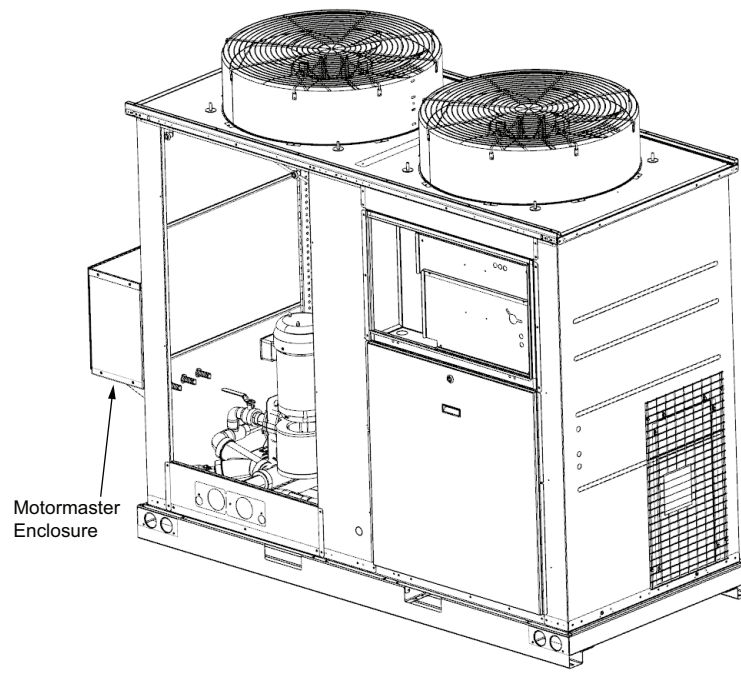


Fig. 28 — Motormaster Location — 30RAP 010-030, 38AP 025-030 and 09DP 018-030 Units (30RAP 030 Shown)

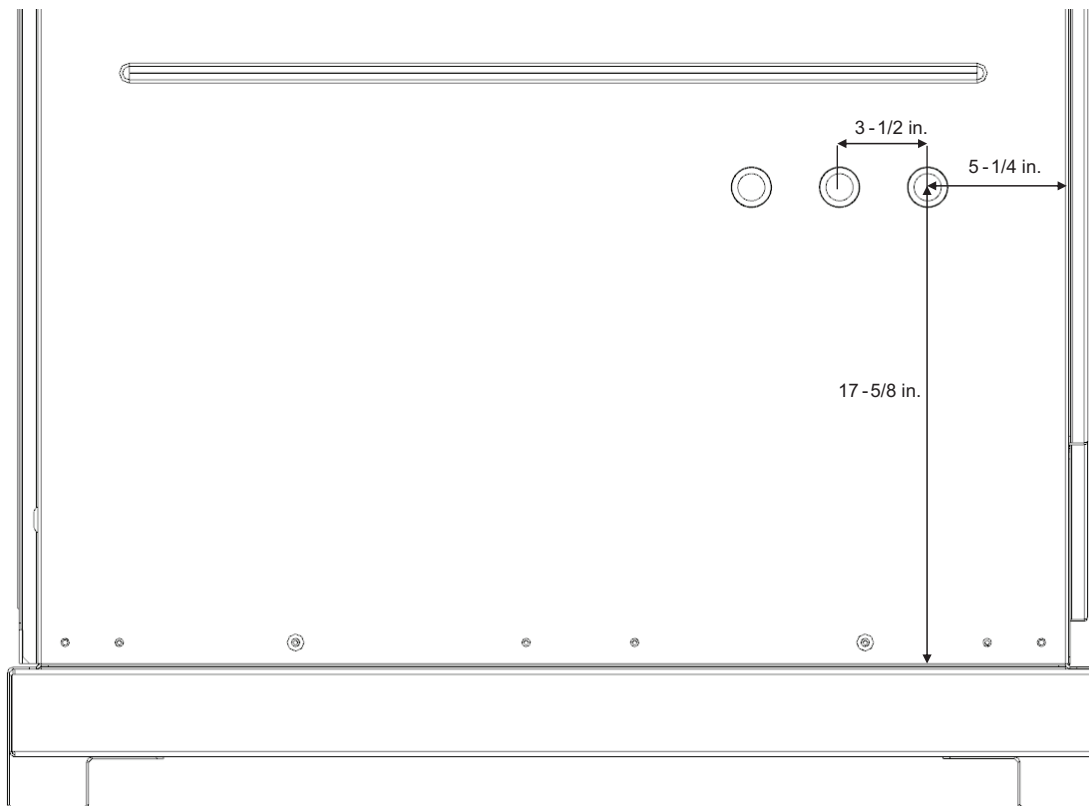


Fig. 29 — Motormaster Conduit Hole Locations — 30RAP 010-030, 38AP 025-030 and 09DP 018-030 Units (30RAP 030 Shown)

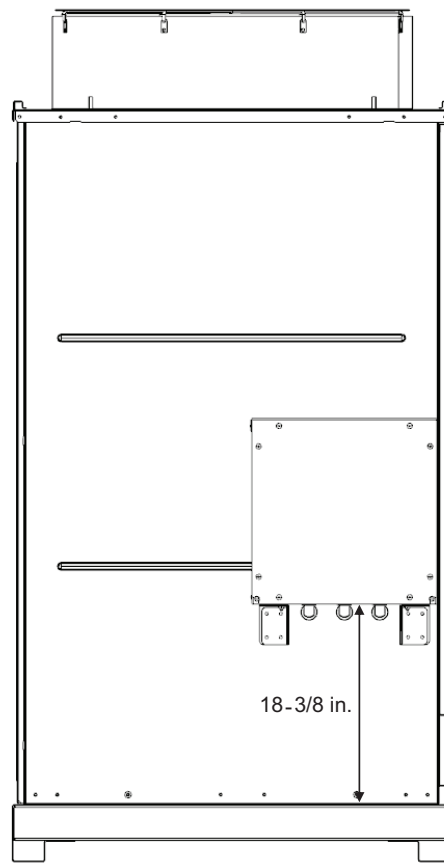


Fig. 30 — Motormaster Enclosure Mounting Location — 30RAP 010-030, 38AP 025-030, and 09DP 018-030 Units (30RAP 030 Shown)

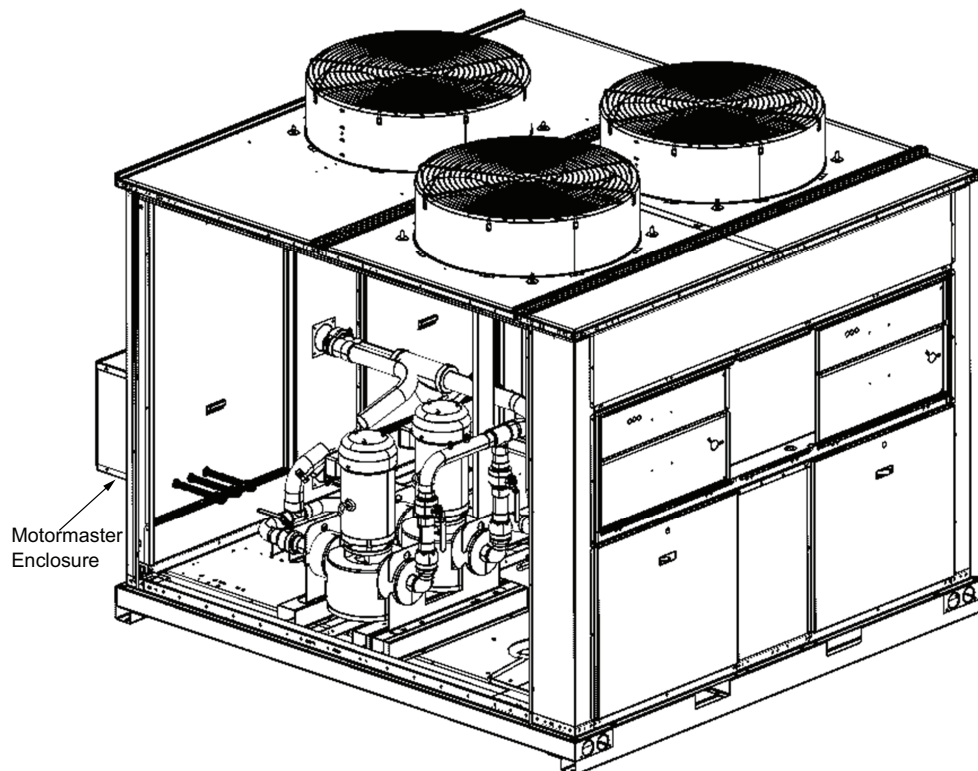


Fig. 31 — Motormaster Location — 30RAP 035-060, 38AP 035-060 and 09DP 035-060 Units (30RAP 040 Shown)

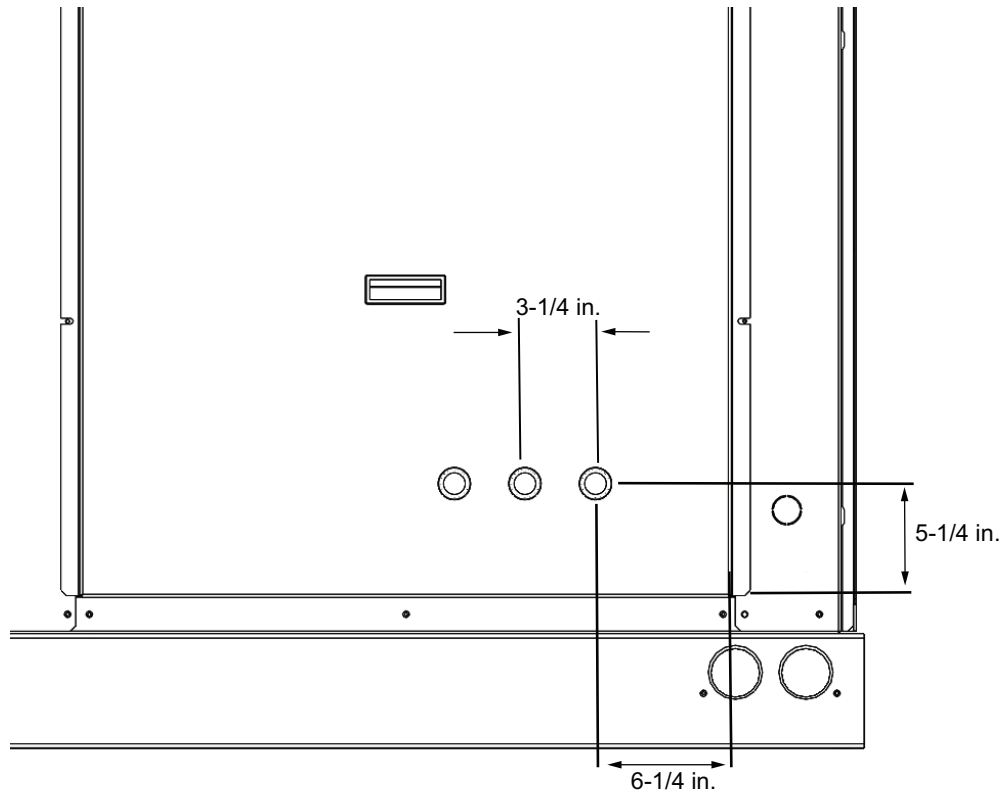


Fig. 32 — Motormaster Conduit Hole Locations — 30RAP 035-060, 38AP 035-060 and 09DP 035-060 Units (30RAP 040 Shown)

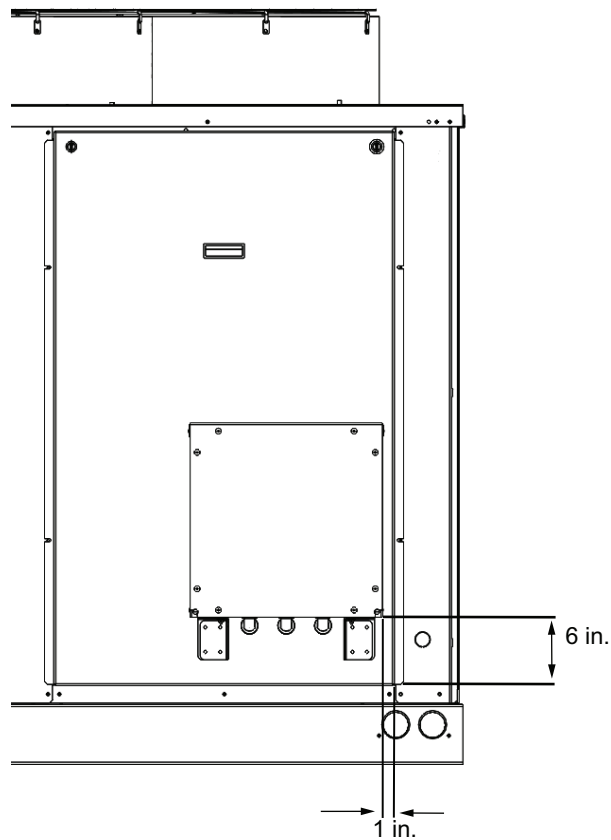
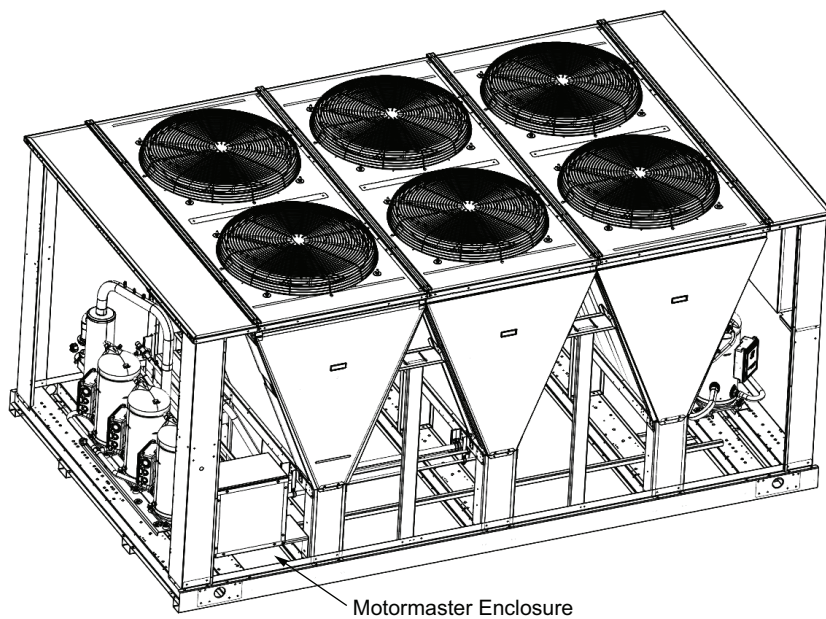
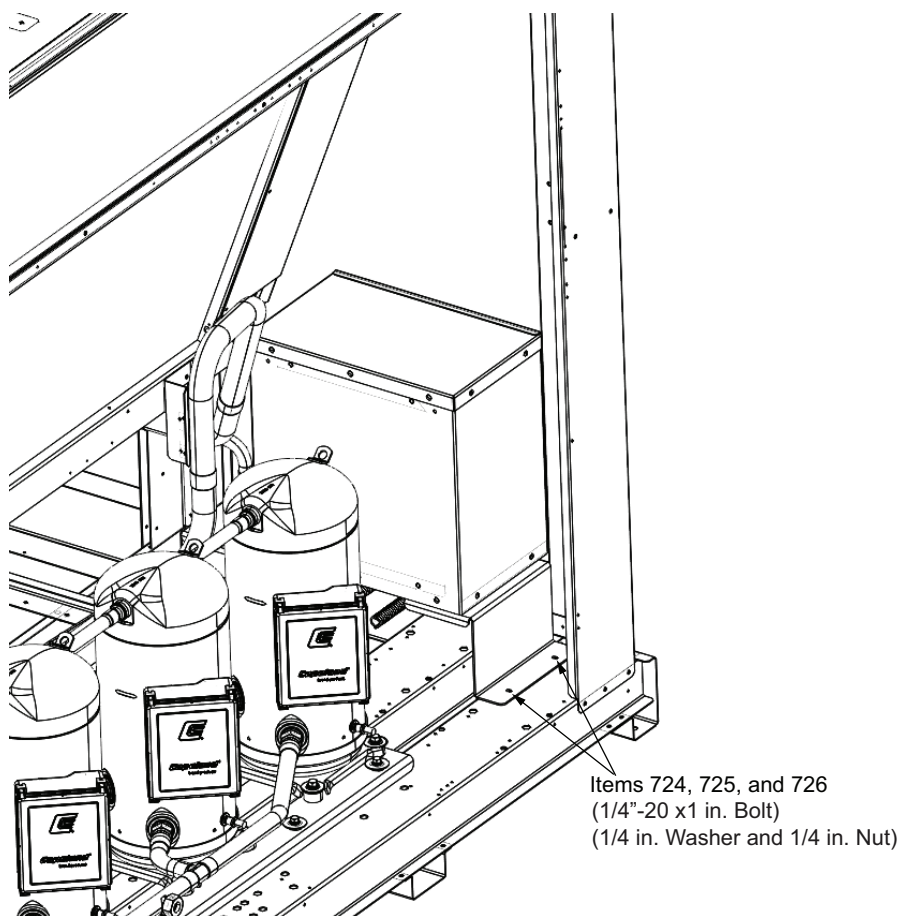


Fig. 33 — Motormaster Enclosure Mounting Location — 30RAP 035-060, 38AP 035-060, and 09DP 035-060 Units (30RAP 040 Shown)



**Fig. 34 — Motormaster Enclosure Mounting Location - 30RAP 070-150, 38AP 065-130, and 09DP 065-130 Units
(38APD 100 Shown)**



**Fig. 35 — Motormaster Enclosure Mounting Location — 30RAP 070-150, 38AP 065-130, and 09DP 065-130 Units
(38APD 100 Left Side View Shown)**

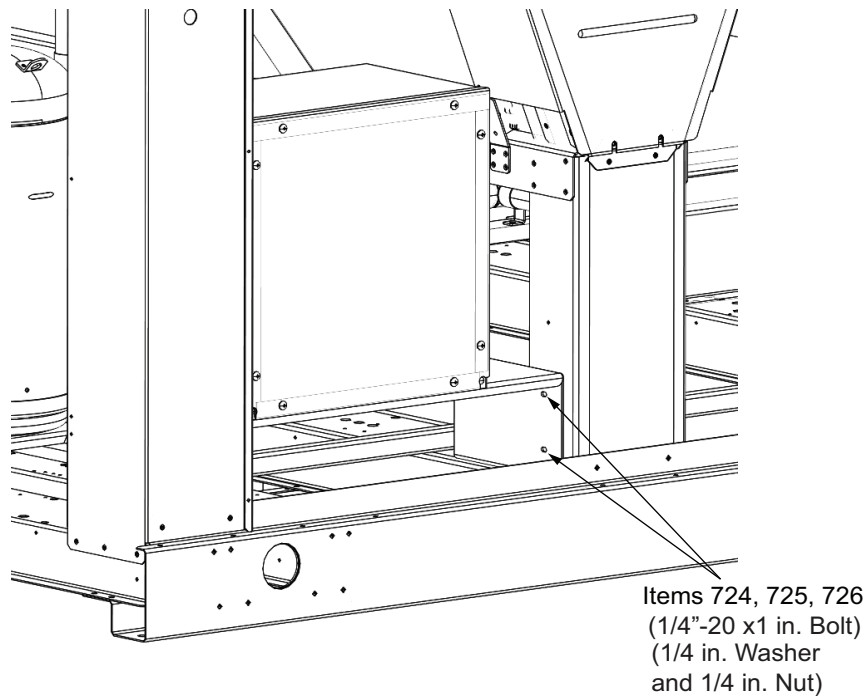


Fig. 36 — Motormaster Enclosure Mounting Location — 30RAP 070-150, 38AP 065-130, and 09DP 065-130 Units (38APD 100 Right Side View Shown)

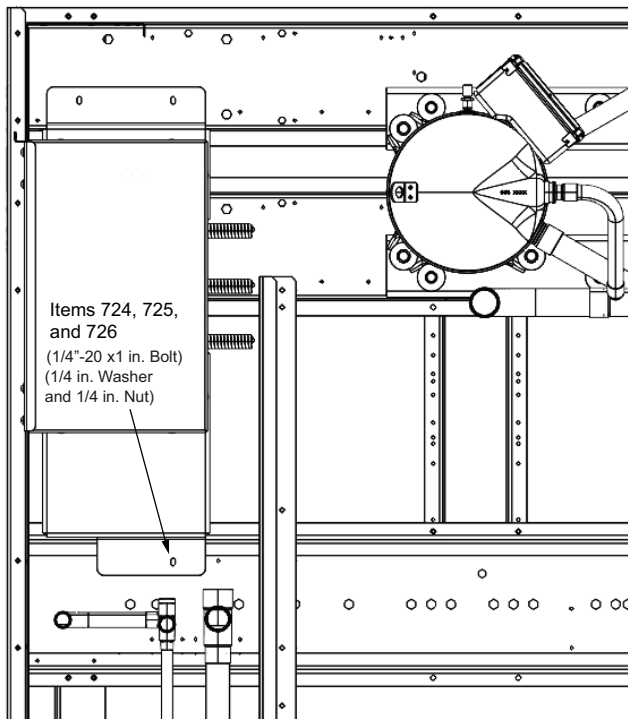


Fig. 37 — Motormaster Enclosure Mounting Location — 30RAP 070-150, 38AP 065-130, and 09DP 065-130 Units (38APD 100 Top View Shown)

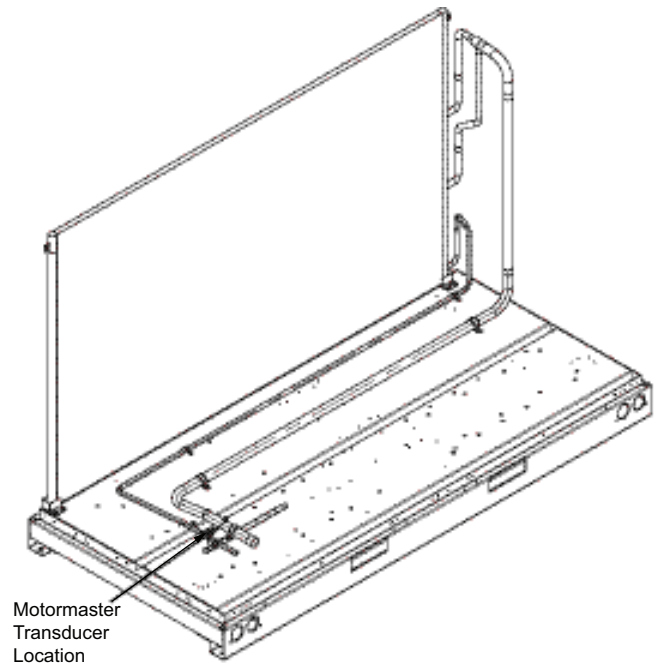


Fig. 38 — Motormaster Pressure Transducer Location — 09DP 018-030 Units

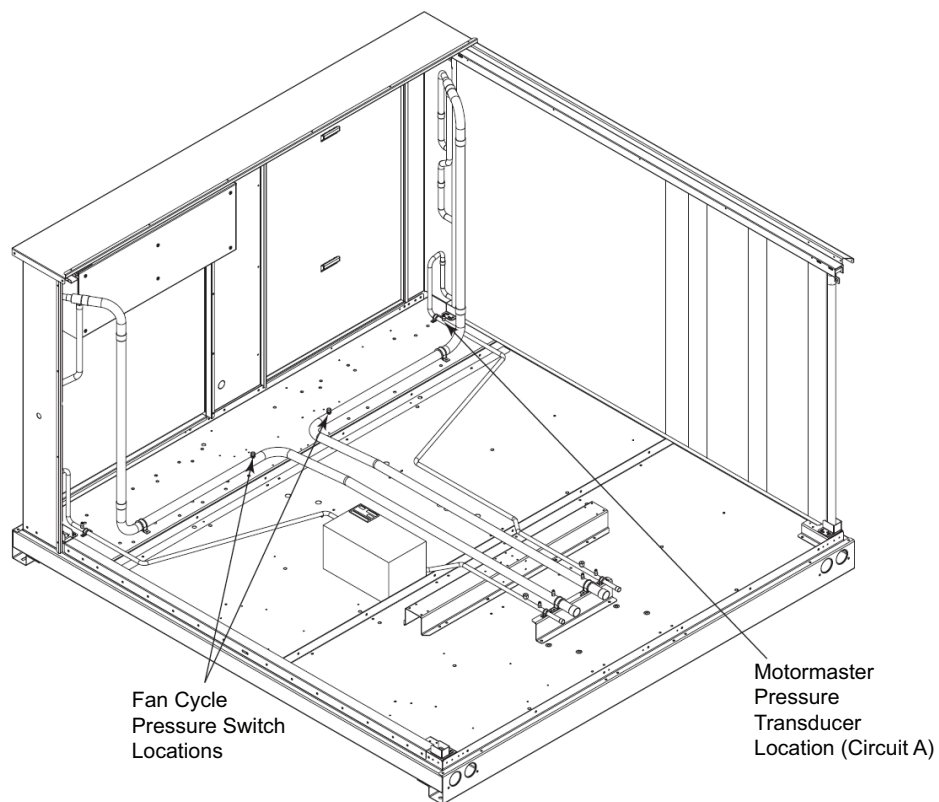


Fig. 39 — Motormaster Pressure Transducer Location — 09DP 035-060 Units

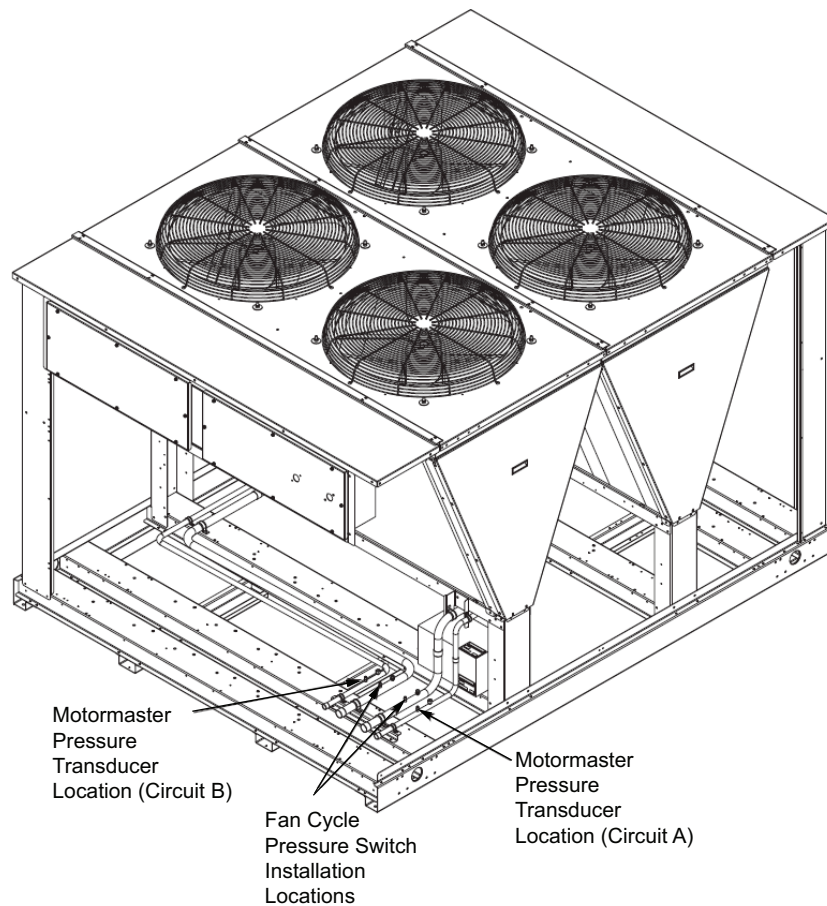


Fig. 40 — Motormaster Pressure Transducer Location — 09DP 065-130 Units

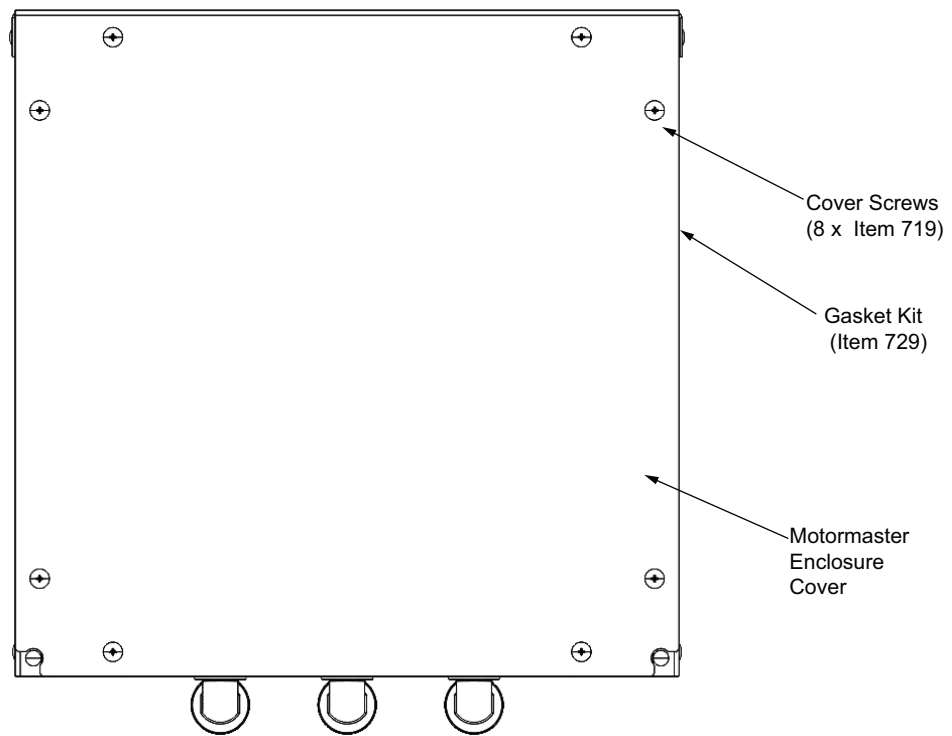


Fig. 41 — Motormaster Enclosure Cover Assembly

START-UP

Motormaster® Parameter Instructions

30RAP AND 38AP UNITS

ATV320 drives will come preprogrammed to accept a 0 to 10 vdc signal from the auxiliary board. No programming is required for this type of installation.

09DP UNITS

When installing this kit on a 09DP unit, the ATV320 drive will need to utilize the PID regulator function. The PID will receive an input from the pressure transducer ranging from 0.5-v to 4.5-v.

1. In order to activate PID controls the operator will need to set PIF (PID feedback assign) to AI2 (Analog input A2). Follow the steps below to set PIF to AI2.

DrI → CONF → FULL → FUN → PID → PIF → AI2

2. The operator will need to set the PR2 and PR4 (second and fourth PID Preset Assignments). PR2 must be set to DI2 (Digital Input 2), and PR4 must be set to DI3 (Digital Input 3). Follow the steps below to set PR2 and PR4.

DrI → CONF → FULL → FUN → PrI → Pr2 → DI2

DrI → CONF → FULL → FUN → PrI → Pr4 → DI3

PID references

The reference setpoints are a reflection of the psi being read by the pressure transducer. The feedback range of the pressure transducer is 14.5 to 667 psi. When scaled by a factor of 10 for higher resolution of control, the effective PID reference feedback range is from 145 to 6670. The setpoint of the PID will depend on what type of refrigerant is being used in the system. The following is a list of refrigerants and their respective reference setpoint.

Refrigerant	psi	PID Preset Reference	Reference Code	PID Preset Assignment
R-134a	104.3	1043	RPI (Internal PID Reference)	None
R-22	168.4	1684	RP2 (2nd PID Preset Reference)	DI2 (Digital Input 2)
R-410a	274.3	2743	RP4 (4th PID Preset Reference)	DI3 (Digital Input 3)

Selecting a refrigerant setpoint

Once the parameter PIF has been set to AI2, the default reference code is RPI (Internal PID Reference). The PID Reference (refrigerant setpoint) can be set to RP2 (second PID Preset Reference) by connecting a jumper wire from +24 to DI2. Similarly, the PID Reference (refrigerant setpoint) can be set to RP4 (fourth PID Preset Reference) by connecting a jumper wire from +24 to DI3.

TROUBLESHOOTING

Making Adjustments to a PID Preset Reference

If the PID Preset Reference needs to be adjusted, start by configuring the drive normally for the refrigerant that the system uses using the information in the “Selecting a Refrigerant Setpoint” section. Once configured, the operator should push the ESC button until they are presented with the current operating frequency or the “ready” status message. Once here, the operator will be able to push in the rotating knob once to display the current reference. Push the knob in once more and the operator will then be able to adjust the current PID Preset Reference. Once the adjustment is complete, push the knob in once more and then press the ESC button until the display reads the current operating frequency or the “ready” status message.

Slow response from drive

If the drive does not respond fast enough to rising pressure in the system, the PrP (PID ramp) may be lowered or the rPG (PID Proportional Gain) may be increased.

Making adjustments to the PID Ramp

Follow the steps below to change the value of the PID ramp.

DRI → CONF → FULL → SET → PrP

Be careful to not set the PID ramp time too low as this may trigger an overbraking fault in the drive.

Making adjustments to the PID proportional gain

Follow the steps below to change the value of the PID proportional gain.

DRI → CONF → FULL → SET → rPG

Be careful to not set the PID proportional gain too high as this will cause overshoot and lead to oscillations. Any changes to the PID proportional gain will cause an imbalance with the rIG (PID Integral Gain). Please refer to the Schneider ATV320 Programming Manual before adjusting these values.

FAULTS

If it appears that a fault has occurred in the drive, the interface allows the operator to check for a fault code. To check for a fault code, follow the steps below:

DRI → MON → PFL

Table 7 shows a list of fault codes and their descriptions.

Table 7 — PFL Fault List

PFL	CURRENT FAULT LIST
nOF	No Fault (nOF): No detected fault stored.
ASF	Angle Error (ASF): Angle setting detected fault.
bLF	Brake Control (bLF): Brake's motor 3-phases loss.
brF	Brake Feedback (brF): Brake contactor detected error.
CFF	Incorrect Config. (CFF): Invalid configuration at power on.
CF12	Bad Config. (CF12): Configuration transfer detected error.
CnF	Com. Network (CnF): NET option communication interruption.
COF	CAN Com. (COF): CANopen® communication interruption.
CrF	Capa. Charg. (CrF): Load relay detected fault.
CSF	Channel Sw. Fault (CSF): Channel switching detected error.
dLF	Load Fault (dLF): Dynamic load detected error.
EEF1	Control EEPROM (EEF1): Control EEPROM detected error.
EEF2	Power EEPROM (EEF2): Power EEPROM detected error.
EPF1	External Fault LI/Bit (EPF1): External detected fault from LI or local link.
EPF2	External Fault Com. (EPF2): External interruption from communication board.
FbE	FB Fault (FbE): Function block detected error.
FbES	FB Stop Fly (FbES): Function block stop detected error.
FCF1	Output Contactor Stuck (FCF1): Output contactor: closed contactor.
FCF2	Output Contactor Open (FCF2): Output contactor: opened contactor.
HCF	Cards Pairing (HCF): Hardware configuration detected error.
HdF	IGBT Desaturation (HdF): Hardware detected error.
ILF	Option Internal Link (ILF): Option internal link interruption.
InF1	Rating Error (InF1): Unknown drive rating.
InF2	PWR Calib. (InF2): Unknown or incompatible power board.
InF3	Internal Serial Link (InF3): Internal serial link communication interruption.
InF4	Internal Mfg Area (InF4): Invalid industrialization zone.
InF6	Internal-option (InF6): Unknown or incompatible option board.
InF9	Internal- I Measure (InF9): Current measurement circuit detected error.
InFA	Internal-Mains Circuit (InFA): Input phase loss circuit detected error.
InFb	Internal- Thermal sensor (InFb): Thermal sensor detected error (OC or SC).
InFE	Internal-CPU (InFE): CPU detected fault (ram, flash, task ...).
LCF	Input Contactor (LCF): Line contactor detected error.
LFF3	AI3 4-20mA loss (LFF3): AI3 4-20 mA loss.
ObF	Overbraking (ObF): Overbraking.
OCF	Overcurrent (OCF): Overcurrent.
OHF	Drive Overheat (OHF): Drive overheating.
OLC	Proc.Overload Flt (OLC): Torque overload.
OLF	Motor Overload (OLF): Motor overload.
OPF1	1 Output Phase Loss (OPF1): Motor 1-phase loss.
OPF2	3 Output Phase Loss] (OPF2): Motor 3-phases loss.
OSF	Mains Overvoltage] (OSF): Oversupply detected fault.
OtFL	PTC Fault (OtFL): Motor overheating detected error from PTCL: standard product.
PHF	Input Phase Loss (PHF): Main input 1-phase loss.
PtFL	LI6=PTC Probe (PtFL): PTCL detected error (OC or SC).
SAFF	Safety (SAFF): Safety function.
SCF1	Motor Short circuit (SCF1): Motor short circuit (hard detection).
SCF3	Ground short Circuit (SCF3): Direct ground short-circuit (hard detection).
SCF4	IGBT Short Circuit (SCF4): IGBT short-circuit (hard detection).
SCF5	Motor Short Circuit (SCF5): Load short-circuit during Igon load sequence (hard detection).
SLF1	Modbus Comm. (SLF1): Modbus local serial communication interruption.
SLF2	PC Comm. (SLF2): PC Software communication interruption.
SLF3	HMI Comm. (SLF3): Remote terminal communication interruption.
SOF	Overspeed (SOF): Overspeed.
SPF	Speed Feedback Loss (SPF): Speed feedback loss.
SSF	Torque/current Limitation (SSF): Torque current limitation detected fault.
tJF	IGBT overheat (tJF): IGBT overheating.
tnF	Auto-tuning (tnF): Tune detected fault.
ULF	Pr.Underload Flt (ULF): Torque underload.
USF	Undervoltage (USF): Undervoltage.

ALARMS

If it appears that an alarm has been triggered in the drive, the interface allows the operator to check for an alarm code. To check for an alarm code, follow the steps below.

DRI→ MON→ ALR

Table 8 shows a list of alarm codes and their descriptions.

In the event that the drive is not responding as expected, it is suggested that the operator cycles power to the drive. If this does not resolve the issue, the operator may have to perform a factory reset on the drive. NOTE: In performing a factory reset, the drive's preprogrammed settings will be erased and the operator will then have to reprogram the drive by hand.

How to Factory Reset ATV320 Drive

Resolution:

To perform a factory reset from power up:

1. Enter on dial.
2. Scroll to CONF menu and enter.
3. Scroll to FCS- and enter.
4. Scroll to FRY- and enter.
5. Select All so that " mark is at top instead of bottom.
6. Now go to GFS parameter.
7. Set it to YES and hold enter for 2 seconds until display LEDs stop flashing.
8. VFD is reset to factory defaults.

Table 8 — Alarm Codes^a

ALARM CODE	ALARMS (ALr)
nOAL	No Alarm (nOAL)
PtCL	PTC Alarm (PtCL)
EtF	External Fault (EtF)
USA	UnderV. al. (USA)
CtA	I Attained (CtA)
FtA	Freq. Th. attain. (FtA)
F2A	Freq. Th. 2 attained (F2A)
SrA	Freq.ref.att (SrA)
tSA	Th.mot. att. (tSA)
tS2	Th.mot2 att. (tS2)
tS3	Th.mot3 att. (tS3)
UPA	Underv. prev. (UPA)
FLA	HSP attain. (FLA)
tHA	Al. °C drv] (tHA)
AG1	Alarm Group 1 (AG1)
AG2	Alarm Group 2 (AG2)
AG3	Alarm Group 3 (AG3)
PEE	PID error al (PEE)
PFA	PID fdbk al. (PFA)
AP3	AI3 Al. 4-20mA (AP3)
SSA	Lim T/I att. (SSA)
tAd	Th.drv.att. (tAd)
tJA	IGBT Alarm (tJA)
bOA	Brake R. al. (bOA)
ULA	Underload. Proc. Al. (ULA)
OLA	Overload. Proc. Al. (OLA)
rSdA	Rope Slack Alarm (rSdA)
ttHA	High Torque Alarm (ttHA)
ttLA	Low Torque Alarm (ttLA)
dLdA	Dynamic Load Alarm (dLdA)
FqLA	Freq. Meter Alarm (FqLA)

NOTE(S):

- a. List of current alarms. If an alarm is present, a ? appears on the graphic display terminal.

APPENDIX A — ACCESSORY PACKAGE CONTENTS

ACCESSORY PART NO.	ITEM NUMBER	PART NO.	QTY	PART DESCRIPTION
38AP-900---41	100	HR46TN038	1	Motormaster Controller, 230-v
	200	38APHAAAFVP-A10	1	Power-In Harness
	202	38APHAAAFVP-A90	1	Power-Out Harness
	204	38APHAAAFVC-A10	1	Control Harness
	206	38APHLSCFW-A00	1	Fuse Block Jumper
	208	09DPHLDAFW-A01	1	FB1/FB3 to TB1 Harness
	210	38APHSCMFV-A01	1	MMR Harness
	212	38APHSCALXCA20	1	Auxiliary Harness
	300	HY10KB300	6	Fuse, 30AMP
	400	HY11MR033	2	Fuse Block
	500	HN61ZP032	1	SPDT Relay
	501	HY11TC032	1	Relay Socket
	600	HY84MR022	1	Terminal Block
	701	AL80AU170	10	No. 8-18 x 1/2 in. Screw
	704	HY76TB162	10	Wire Tie
	706	KA99FT060	2	DIN Rail End Stop
	711	HK05ZZ010	1	Motormaster Pressure Transducer
	713	XBANS3575P-4	1	DIN Rail, 0.3 x 4.0
	714	XBANS3575P-6	1	DIN Rail, 0.3 x 6.0
	715	HK50AA067	1	Auxiliary Board
	716	38APHSCALXCA00	1	Auxiliary Communications Harness
	717	38APHSCALXCA10	1	Auxiliary Power Harness
	718	38AP1ES000	1	Enclosure Assembly
	719	AL04AG306	8	1/4"-20 x 1/2 in. Screw
	723	38AP1BS001	1	Mounting Brackets, Cantilever Style (2x)
	724	AA06BS170	14	1/4"-20 x 1 in. Bolt
	725	AU02AB171	28	1/4 in. Washer
	726	AT30AB171	14	1/4 in. Nut
	727	38APHAAAL--A00	1	Motormaster Pressure Transducer Harness (2x)
	728	HY93NH085	3	Bushing
	729	38AP1GS001	1	Gasket Kit
	731	AC41AB100	4	No. 8-32 x 3/8 in. Screw
	732	09DPHADAF--A00	1	Motormaster Jumper Harness

LEGEND

FB	— Fuse Block
FR	— Fan Relay
MMR	— Motormaster Relay
OFC	— Outdoor Fan Contactor
SPDT	— Single Pole Double Throw
TB	— Terminal Block

APPENDIX A — ACCESSORY PACKAGE CONTENTS (CONT)

ACCESSORY PART NO.	ITEM NUMBER	PART NO.	QTY	PART DESCRIPTION
38AP-900--42	100	HR46TN040	1	Motormaster Controller, 460-v
	200	38APHAAAFVP-A10	1	Power-In Harness
	202	38APHAAAFVP-A90	1	Power-Out Harness
	204	38APHAAAFVC-A10	1	Control Harness
	206	38APHLSCFW-A00	1	Fuse Block Jumper
	208	09DPHLDAFW-A01	1	FB1/FB3 to TB1 Harness
	210	38APHSCMFV-A01	1	MMR Harness
	212	38APHSCALXCA20	1	Auxiliary Harness
	300	HY10KB200	6	Fuse, 20AMP
	400	HY11MR033	2	Fuse Block
	500	HN61ZP032	1	SPDT Relay
	501	HY11TC032	1	Relay Socket
	600	HY84MR022	1	Terminal Block
	701	AL80AU170	10	No. 8 x 1/2 in. Screw
	704	HY76TB162	10	Wire Tie
	706	KA99FT060	2	DIN Rail End Stop
	711	HK05ZZ010	1	Motormaster Pressure Transducer
	713	XBANS3575P-4.00	1	DIN Rail, 0.3 x 4.0
	714	XBANS3575P-6	1	DIN Rail, 0.3 x 6.0
	715	HK50AA067	1	Auxiliary Board
	716	38APHSCALXCA00	1	Auxiliary Communications Harness
	717	38APHSCALXCA10	1	Auxiliary Power Harness
	718	38AP1ES000	1	Enclosure Assembly
	719	AL04AG306	8	1/4"-20 x 1/2 in. Screw
	723	38AP1BS001	1	Mounting Brackets, Cantilever Style (2x)
	724	AA06BS170	14	1/4"-20 x 1 in. Bolt
	725	AU02AB171	28	1/4 in. Washer
	726	AT30AB171	14	1/4 in. Nut
	727	38APHAAAL--A00	1	Motormaster Pressure Transducer Harness (2x)
	728	HY93NH085	3	Bushing
	729	38AP1GS001	1	Gasket Kit
	731	AC41AB100	4	No. 8-32 x 3/8 in. Screw
	732	09DPHADAF--A00	1	Motormaster Jumper Harness

LEGEND

FB	— Fuse Block
FR	— Fan Relay
MMR	— Motormaster Relay
OFC	— Outdoor Fan Contactor
SPDT	— Single Pole Double Throw
TB	— Terminal Block

APPENDIX A — ACCESSORY PACKAGE CONTENTS (CONT)

ACCESSORY PART NO.	ITEM NUMBER	PART NO.	QTY	PART DESCRIPTION
38AP-900---43	100	HR46TN042	1	Motormaster Controller, 575-v
	200	38APHAAAFVP-A10	1	Power-In Harness
	202	38APHAAAFVP-A90	1	Power-Out Harness
	204	38APHAAAFVC-A10	1	Control Harness
	206	38APHLSCFW-A00	1	40-100T Fuse Block Jumper
	208	09DPHLDAFW-A01	1	FB1/FB3 to TB1 Harness
	210	38APHSCMFV-A01	1	MMR Harness
	212	38APHSCALXCA20	1	Auxiliary Harness
	300	HY10KB200	6	Fuse, 20AMP
	400	HY11MR033	2	Fuse Block
	500	HN61ZP032	1	SPDT Relay
	501	HY11TC032	1	Relay Socket
	600	HY84MR022	1	Terminal Block
	701	AL80AU170	10	No. 8 x 1/2 in. Screw
	704	HY76TB162	10	Wire Tie
	706	KA99FT060	2	DIN Rail End Stop
	711	HK05ZZ010	1	Motormaster Pressure Transducer
	713	XBANS3575P-4	1	DIN Rail, 0.3 x 4.0
	714	XBANS3575P-6	1	DIN Rail, 0.3 x 6.0
	715	HK50AA067	1	Auxiliary Board
	716	38APHSCALXCA00	1	Auxiliary Communications Harness
	717	38APHSCALXCA10	1	Auxiliary Power Harness
	718	38AP1ES000	1	Enclosure Assembly
	719	AL04AG306	8	1/4"-20 x 1/2 in. Screw
	723	38AP1BS001	1	Mounting Brackets, Cantilever Style (2x)
	724	AA06BS170	14	1/4"-20 x 1 in. Bolt
	725	AU02AB171	28	1/4 in. Washer
	726	AT30AB171	14	1/4 in. Nut
	727	38APHAAAL--A00	1	Motormaster Pressure Transducer Harness (2x)
	728	HY93NH085	3	Bushing
	729	38AP1GS001	1	Gasket Kit
	731	AC41AB100	4	No. 8-32 x 3/8 in. Screw
	732	09DPHADAF--A00	1	Motormaster Jumper Harness

LEGEND

FB	—	Fuse Block
FR	—	Fan Relay
MMR	—	Motormaster Relay
OFC	—	Outdoor Fan Contactor
SPDT	—	Single Pole Double Throw
TB	—	Terminal Block

APPENDIX A — ACCESSORY PACKAGE CONTENTS (CONT)

ACCESSORY PART NO.	ITEM NUMBER	PART NO.	QTY	PART DESCRIPTION
38AP-900---44	100	HR46TN038	1	Motormaster Controller, 230-v
	200	38APHAAAFVP-A30	1	Power-In Harness
	202	38APHAAAFVP-AB0	1	Power-Out Harness
	204	38APHAAAFVC-A30	1	Control Harness
	206	38APHLSCFW-A00	1	Fuse Block Jumper
	208	09DPHLDAFW-A01	1	FB1/FB3 to TB1 Harness
	210	38APHSCMFV-A01	1	MMR Harness
	212	38APHSCALXCA20	1	Auxiliary Harness
	300	HY10KB300	6	Fuse, 30AMP
	400	HY11MR033	2	Fuse Block
	500	HN61ZP032	1	SPDT Relay
	501	HY11TC032	1	Relay Socket
	600	HY84MR022	1	Terminal Block
	701	AL80AU170	10	No. 8 x 1/2 in. Screw
	704	HY76TB162	10	Wire Tie
	706	KA99FT060	2	DIN Rail End Stop
	707	XBANS3575P-8	1	DIN Rail, 0.3 x 8.0
	711	HK05ZZ010	1	Motormaster Pressure Transducer
	712	38APMSCLCA-A00	1	Auxiliary Bracket
	714	XBANS3575P-6	1	DIN Rail, 0.3 x 6.0
	715	HK50AA067	1	Auxiliary Board
	716	38APHSCALXCA00	1	Auxiliary Communications Harness
	717	38APHSCALXCA10	1	Auxiliary Power Harness
	718	38AP1ES000	1	Enclosure Assembly
	719	AL04AG306	8	1/4"-20 x 1/2 in. Screw
	723	38AP1BS001	1	Mounting Brackets, Cantilever Style (2x)
	724	AA06BS170	14	1/4"-20 x 1 in. Bolt
	725	AU02AB171	28	1/4 in. Washer
	726	AT30AB171	14	1/4 in. Nut
	727	38APHAAAL--A00	1	Motormaster Pressure Transducer Harness (2x)
	728	HY93NH085	3	Bushing
	729	38AP1GS001	1	Gasket Kit
	731	AC41AB100	4	No. 8-32 x 3/8 in. Screw
	732	09DPHADAF--A00	1	Motormaster Jumper Harness

LEGEND

FB	— Fuse Block
FR	— Fan Relay
MMR	— Motormaster Relay
OFC	— Outdoor Fan Contactor
SPDT	— Single Pole Double Throw
TB	— Terminal Block

APPENDIX A — ACCESSORY PACKAGE CONTENTS (CONT)

ACCESSORY PART NO.	ITEM NUMBER	PART NO.	QTY	PART DESCRIPTION
38AP-900---45	100	HR46TN040	1	Motormaster Controller, 460-v
	200	38APHAAAFVP-A30	1	Power-In Harness
	202	38APHAAAFVP-AB0	1	Power-Out Harness
	204	38APHAAAFVC-A30	1	Control Harness
	206	38APHLSCFW-A00	1	Fuse Block Jumper
	208	09DPHLDAFW-A01	1	FB1/FB3 to TB1 Harness
	210	38APHSCMFV-A01	1	MMR Harness
	212	38APHSCALXCA20	1	Auxiliary Harness
	300	HY10KB200	6	Fuse, 20AMP
	400	HY11MR033	2	Fuse Block
	500	HN61ZP032	1	SPDT Relay
	501	HY11TC032	1	Relay Socket
	600	HY84MR022	1	Terminal Block
	701	AL80AU170	10	No. 8 x 1/2 in. Screw
	704	HY76TB162	10	Wire Tie
	706	KA99FT060	2	DIN Rail End Stop
	707	XBANS3575P-8	1	DIN Rail, 0.3 x 8.0
	711	HK05ZZ010	1	Motormaster Pressure Transducer
	712	38APMSCLCA-A00	1	Auxiliary Bracket
	714	XBANS3575P-6	1	DIN Rail, 0.3 x 6.0
	715	HK50AA067	1	Auxiliary Board
	716	38APHSCALXCA00	1	Auxiliary Communications Harness
	717	38APHSCALXCA10	1	Auxiliary Power Harness
	718	38AP1ES000	1	Enclosure Assembly
	719	AL04AG306	8	1/4"-20 x 1/2 in. Screw
	723	38AP1BS001	1	Mounting Brackets, Cantilever Style (2x)
	724	AA06BS170	14	1/4"-20 x 1 in. Bolt
	725	AU02AB171	28	1/4 in. Washer
	726	AT30AB171	14	1/4 in. Nut
	727	38APHAAAL--A00	1	Motormaster Pressure Transducer Harness (2x)
	728	HY93NH085	3	Bushing
	729	38AP1GS001	1	Gasket Kit
	731	AC41AB100	4	No. 8-32 x 3/8 in. Screw
	732	09DPHADAF--A00	1	Motormaster Jumper Harness

LEGEND

FB	— Fuse Block
FR	— Fan Relay
OFC	— Outdoor Fan Contactor
MMR	— Motormaster Relay
SPDT	— Single Pole Double Throw
TB	— Terminal Block

APPENDIX A — ACCESSORY PACKAGE CONTENTS (CONT)

ACCESSORY PART NO.	ITEM NUMBER	PART NO.	QTY	PART DESCRIPTION
38AP-900---46	100	HR46TN042	1	Motormaster Controller, 575-v
	200	38APHAAAFVP-A30	1	Power-In Harness
	202	38APHAAAFVP-AB0	1	Power-Out Harness
	204	38APHAAAFVC-A30	1	Control Harness
	206	38APHLSCFW-A00	1	Fuse Block Jumper
	208	09DPHLDAFW-A01	1	FB1/FB3 to TB1 Harness
	210	38APHSCMFV-A01	1	MMR Harness
	212	38APHSCALXCA20	1	Auxiliary Harness
	300	HY10KB200	6	Fuse, 20AMP
	400	HY11MR033	2	Fuse Block
	500	HN61ZP032	1	SPDT Relay
	501	HY11TC032	1	Relay Socket
	600	HY84MR022	1	Terminal Block
	701	AL80AU170	10	No. 8 x 1/2 in. Screw
	704	HY76TB162	10	Wire Tie
	706	KA99FT060	2	DIN Rail End Stop
	707	XBANS3575P-8	1	DIN Rail, 0.3 x 8.0
	711	HK05ZZ010	1	Motormaster Pressure Transducer
	712	38APMSCLCA-A00	1	Auxiliary Bracket
	714	XBANS3575P-6	1	DIN Rail, 0.3 x 6.0
	715	HK50AA067	1	Auxiliary Board
	716	38APHSCALXCA00	1	Auxiliary Communications Harness
	717	38APHSCALXCA10	1	Auxiliary Power Harness
	718	38AP1ES000	1	Enclosure Assembly
	719	AL04AG306	8	1/4"-20 x 1/2 in. Screw
	723	38AP1BS001	1	Mounting Brackets, Cantilever Style (2x)
	724	AA06BS170	14	1/4"-20 x 1 in. Bolt
	725	AU02AB171	28	1/4 in. Washer
	726	AT30AB171	14	1/4 in. Nut
	727	38APHAAAL--A00	1	Motormaster Pressure Transducer Harness (2x)
	728	HY93NH085	3	Bushing
	729	38AP1GS001	1	Gasket Kit
	731	AC41AB100	4	No. 8-32 x 3/8 in. Screw
	732	09DPHADAF--A00	1	Motormaster Jumper Harness

LEGEND

FB	— Fuse Block
FR	— Fan Relay
OFC	— Outdoor Fan Contactor
MMR	— Motormaster Relay
SPDT	— Single Pole Double Throw
TB	— Terminal Block

APPENDIX A — ACCESSORY PACKAGE CONTENTS (CONT)

ACCESSORY PART NO.	ITEM NUMBER	PART NO.	QTY	PART DESCRIPTION
38AP-900---47	100	HR46TN038	2	Motormaster Controller, 230-v
	200	38APHAAAFVP-A40	1	Power-In Harness (Dual)
	202	38APHAAAFVP-AC0	1	Power-Out Harness (Dual)
	204	38APHAAAFVC-A40	1	Control Harness (Dual)
	206	38APHLSCFW-A00	1	Fuse Block Jumper
	209	38APHLSLFV-A01	1	OFC to FR and FB1 to FB10/11 Harness
	212	38APHSCALXCA20	1	Auxiliary Harness
	300	HY10KB300	9	Fuse, 30AMP
	400	HY11MR033	3	Fuse Block
	500	HN61ZP032	2	SPDT Relay
	501	HY11TC032	2	Relay Socket
	600	HY84MR022	2	Terminal Block
	701	AL80AU170	10	No. 8 x 1/2 in. Screw
	704	HY76TB162	10	Wire Tie
	706	KA99FT060	2	DIN Rail End Stop
	707	XBANS3575P-8	1	DIN Rail, 0.3 x 8.0
	711	HK05ZZ010	2	Motormaster Pressure Transducer
	715	HK50AA067	1	Auxiliary Board
	716	38APHSCALXCA00	1	Auxiliary Communications Harness
	717	38APHSCALXCA10	1	Auxiliary Power Harness
	718	38AP1ES000	1	Enclosure Assembly
	719	AL04AG306	8	1/4"-20 x 1/2 in. Screw
	722	38AP1BS000	1	Mounting Bracket, Bridge Style
	724	AA06BS170	14	1/4"-20 x 1 in. Bolt
	725	AU02AB171	28	1/4 in. Washer
	726	AT30AB171	14	1/4 in. Nut
	727	38APHAAAL--A00	1	Motormaster Pressure Transducer Harness (2x)
	729	38AP1GS001	1	Gasket Kit
	731	AC41AB100	4	No. 8-32 x 3/8 in. Screw
	732	09DPHADAF--A00	2	Motormaster Jumper Harness

LEGEND

FB	— Fuse Block
FR	— Fan Relay
OFC	— Outdoor Fan Contactor
SPDT	— Single Pole Double Throw
TB	— Terminal Block

APPENDIX A — ACCESSORY PACKAGE CONTENTS (CONT)

ACCESSORY PART NO.	ITEM NUMBER	PART NO.	QTY	PART DESCRIPTION
38AP-900---48	100	HR46TN040	2	Motormaster Controller, 460-v
	200	38APHAAAFVP-A40	1	Power-In Harness (Dual)
	202	38APHAAAFVP-AC0	1	Power-Out Harness (Dual)
	204	38APHAAAFVC-A40	1	Control Harness (Dual)
	206	38APHLSCFW-A00	1	Fuse Block Jumper
	209	38APHLSLFV-A01	1	OFC to FR and FB1 to FB10/11 Harness
	212	38APHSCALXCA20	1	Auxiliary Harness
	300	HY10KB200	9	Fuse, 20AMP
	400	HY11MR033	3	Fuse Block
	500	HN61ZP032	2	SPDT Relay
	501	HY11TC032	1	Relay Socket
	600	HY84MR022	2	Terminal Block
	701	AL80AU170	10	No. 8 x 1/2 in. Screw
	704	HY76TB162	10	Wire Tie
	706	KA99FT060	2	DIN Rail End Stop
	707	XBANS3575P-8	1	DIN Rail, 0.3 x 8.0
	711	HK05ZZ010	2	Motormaster Pressure Transducer
	715	HK50AA067	1	Auxiliary Board
	716	38APHSCALXCA00	1	Auxiliary Communications Harness
	717	38APHSCALXCA10	1	Auxiliary Power Harness
	718	38AP1ES000	1	Enclosure Assembly
	719	AL04AG306	8	1/4"-20 x 1/2 in. Screw
	722	38AP1BS000	1	Mounting Bracket, Bridge Style (2x)
	724	AA06BS170	14	1/4"-20 x 1 in. Bolt
	725	AU02AB171	28	1/4 in. Washer
	726	AT30AB171	14	1/4 in. Nut
	727	38APHAAAL--A00	1	Motormaster Pressure Transducer Harness (2x)
	729	38AP1GS001	1	Gasket Kit
	731	AC41AB100	4	No. 8-32 x 3/8 in. Screw
	732	09DPHADAF--A00	2	Motormaster Jumper Harness

LEGEND

FB	— Fuse Block
FR	— Fan Relay
OFC	— Outdoor Fan Contactor
SPDT	— Single Pole Double Throw
TB	— Terminal Block

APPENDIX A — ACCESSORY PACKAGE CONTENTS (CONT)

ACCESSORY PART NO.	ITEM NUMBER	PART NO.	QTY	PART DESCRIPTION
38AP-900--49	100	HR46TN042	2	Motormaster Controller, 575-v
	200	38APHAAAFVP-A40	1	Power-In Harness (Dual)
	202	38APHAAAFVP-AC0	1	Power-Out Harness (Dual)
	204	38APHAAAFVC-A40	1	Control Harness (Dual)
	206	38APHLSCFW-A00	1	Fuse Block Jumper
	209	38APHLSLFV-A01	1	OFC to FR and FB1 to FB10/11 Harness
	212	38APHSCALXCA20	1	Auxiliary Harness
	300	HY10KB200	9	Fuse, 20AMP
	400	HY11MR033	3	Fuse Block
	500	HN61ZP032	2	SPDT Relay
	501	HY11TC032	2	Relay Socket
	600	HY84MR022	2	Terminal Block
	701	AL80AU170	10	No. 8 x 1/2 in. Screw
	704	HY76TB162	10	Wire Tie
	706	KA99FT060	2	DIN Rail End Stop
	707	XBANS3575P-8	1	DIN Rail, 0.3 x 8.0
	711	HK05ZZ010	2	Motormaster Pressure Transducer
	715	HK50AA067	1	Auxiliary Board
	716	38APHSCALXCA00	1	Auxiliary Communications Harness
	717	38APHSCALXCA10	1	Auxiliary Power Harness
	718	38AP1ES000	1	Enclosure Assembly
	719	AL04AG306	8	1/4"-20 x 1/2 in. Screw
	722	38AP1BS000	1	Mounting Bracket, Bridge Style
	724	AA06BS170	14	1/4"-20 x 1 in. Bolt
	725	AU02AB171	28	1/4 in. Washer
	726	AT30AB171	14	1/4 in. Nut
	727	38APHAAAL--A00	1	Motormaster Pressure Transducer Harness (2x)
	729	38AP1GS001	1	Gasket Kit
	731	AC41AB100	4	No. 8-32 x 3/8 in. Screw
	732	09DPHADAF--A00	2	Motormaster Jumper Harness

LEGEND

FB	— Fuse Block
FR	— Fan Relay
OFC	— Outdoor Fan Contactor
SPDT	— Single Pole Double Throw
TB	— Terminal Block

APPENDIX A — ACCESSORY PACKAGE CONTENTS (CONT)

ACCESSORY PART NO.	ITEM NUMBER	PART NO.	QTY	PART DESCRIPTION
38AP-900---50	100	HR46TN038	1	Motormaster Controller, 230-v
	200	38APHAAAFVP-A60	1	Power-In Harness
	202	38APHAAAFVP-AE0	1	Power-Out Harness
	204	38APHAAAFVC-A60	1	Control Harness
	210	38APHSCMFV-A01	1	MMR Harness
	211	38APHLSMFV-A01	1	FB/FR/OFC Harness
	212	38APHSCALXCA20	1	Auxiliary Harness,
	300	HY10KB300	6	Fuse, 20AMP
	400	HY11MR033	2	Fuse Block
	500	HN61ZP032	1	SPDT Relay
	501	HY11TC032	1	Relay Socket
	600	HY84MR022	1	Terminal Block
	701	AL80AU170	10	No. 8 x 1/2 in. Screw
	704	HY76TB162	10	Wire Tie
	706	KA99FT060	2	DIN Rail End Stop
	707	XBANS3575P-8	1	DIN Rail, 0.3 X 8.0
	715	HK50AA067	1	Auxiliary Board
	716	38APHSCALXCA00	1	Auxiliary Communications Harness
	717	38APHSCALXCA10	1	Auxiliary Power Harness
	718	38AP1ES000	1	Enclosure Assembly
	719	AL04AG306	8	1/4-20 x 1/2 in. Screw
	722	38AP1BS000	1	Mounting Bracket, Bridge Style
	723	38AP1BS001	1	Mounting Brackets, Cantilever Style (2X)
	724	AA06BS170	14	1/4-20 X 1-in. Bolt
	725	AU02AB171	28	1/4-in. Washer
	726	AT30AB171 (14)	14	1/4-in. Nut
	728	HY93NH085	3	Bushing
	729	38AP1GS001	1	Gasket Kit
	731	AC41AB100	4	No. 8-32 x 3/8 in. Screw
	732	09DPHADAF--A00	1	Motormaster Jumper Harness

LEGEND

FB	— Fuse Block
FR	— Fan Relay
OFC	— Outdoor Fan Contactor
MMR	— Motormaster Relay
SPDT	— Single Pole Double Throw
TB	— Terminal Block

APPENDIX A — ACCESSORY PACKAGE CONTENTS (CONT)

ACCESSORY PART NO.	ITEM NUMBER	PART NO.	QTY	PART DESCRIPTION
38AP-900---51	100	HR46TN040	1	Motormaster Controller, 460-v
	200	38APHAAAFVP-A60	1	Power-In Harness
	202	38APHAAAFVP-AE0	1	Power-Out Harness
	204	38APHAAAFVC-A60	1	Control Harness
	210	38APHSCMFV-A01	1	MMR Harness
	211	38APHLSMFV-A01	1	FB/FR/OFC Harness
	212	38APHSCALXCA20	1	Auxiliary Harness
	300	HY10KB200	6	Fuse, 20AMP
	400	HY11MR033	2	Fuse Block
	500	HN61ZP032	1	SPDT Relay
	501	HY11TC032	1	Relay Socket
	600	HY84MR022	1	Terminal Block
	701	AL80AU170	10	No. 8 x 1/2 in. Screw
	704	HY76TB162	10	Wire Tie
	706	KA99FT060	2	DIN Rail End Stop
	707	XBANS3575P-8	1	DIN Rail, 0.3 x 8.0
	715	HK50AA067	1	Auxiliary Board
	716	38APHSCALXCA00	1	Auxiliary Communications Harness
	717	38APHSCALXCA10	1	Auxiliary Power Harness
	718	38AP1ES000	1	Enclosure Assembly
	719	AL04AG306	8	1/4"-20 x 1/2 in. Screw,
	722	38AP1BS000	1	Mounting Bracket, Bridge Style
	723	38AP1BS001	1	Mounting Brackets, Cantilever Style (2x)
	724	AA06BS170	14	1/4"-20 x 1 in. Bolt
	725	AU02AB171	28	1/4 in. Washer
	726	AT30AB171	14	1/4 in. Nut
	728	HY93NH085	3	Bushing
	729	38AP1GS001	1	Gasket Kit
	731	AC41AB100	4	No. 8-32 x 3/8 in. Screw
	732	09DPHADAF--A00	1	Motormaster Jumper Harness

LEGEND

FB — Fuse Block
FR — Fan Relay
MMR — Motormaster Relay
OFC — Outdoor Fan COntactor
SPDT — Single Pole Double Throw
TB — Terminal Block

APPENDIX A — ACCESSORY PACKAGE CONTENTS (CONT)

ACCESSORY PART NO.	ITEM NUMBER	PART NO.	QTY	PART DESCRIPTION
38AP-900---52	100	HR46TN042	1	Motormaster Controller, 575-v
	200	38APHAAAFVP-A60	1	Power-In Harness
	202	38APHAAAFVP-AE0	1	Power-Out Harness
	204	38APHAAAFVC-A60	1	Control Harness
	210	38APHSCMFV-A01	1	MMR Harness
	211	38APHLSMFV-A01	1	FB/FR/OFC Harness
	212	38APHSCALXCA20	1	Auxiliary Harness
	300	HY10KB200	6	Fuse, 20AMP
	400	HY11MR033	2	Fuse Block
	500	HN61ZP032	1	SPDT Relay
	501	HY11TC032	1	Relay Socket
	600	HY84MR022	1	Terminal Block
	701	AL80AU170	10	No. 8 x 1/2 in. Screw
	704	HY76TB162	10	Wire Tie
	706	KA99FT060	2	DIN Rail End Stop
	707	XBANS3575P-8	1	DIN Rail- 0.3 x 8.0
	715	HK50AA067	1	Auxiliary Board
	716	38APHSCALXCA00	1	Auxiliary Communications Harness
	717	38APHSCALXCA10	1	Auxiliary Power Harness
	718	38AP1ES000	1	Enclosure Assembly
	719	AL04AG306	8	1/4"-20 x 1/2 in. Screw
	722	38AP1BS000	1	Mounting Bracket, Bridge Style
	723	38AP1BS001	1	Mounting Brackets, Cantilever Style (2x)
	724	AA06BS170	14	1/4"-20 x 1 in. Bolt
	725	AU02AB171	28	1/4 in. Washer
	726	AT30AB171	14	1/4 in. Nut
	728	HY93NH085	3	Bushing
	729	38AP1GS001	1	Gasket Kit
	731	AC41AB100	4	No. 8-32 x 3/8 in. Screw
	732	09DPHADAF--A00	1	Motormaster Jumper Harness

LEGEND

FB	— Fuse Block
FR	— Fan Relay
OFC	— Outdoor Fan COntactor
MMR	— Motormaster Relay
SPDT	— Single Pole Double Throw
TB	— Terminal Block

APPENDIX A — ACCESSORY PACKAGE CONTENTS (CONT)

ACCESSORY PART NO.	ITEM NUMBER	PART NO.	QTY	PART DESCRIPTION
38AP-900---53	100	HR46TN038	2	Motormaster Controller, 230-v
	200	38APHAAAFVP-A70	1	Power-In Harness
	202	38APHAAAFVP-AF0	1	Power-Out Harness
	204	38APHAAAFVC-A70	1	Control Harness
	206	38APHLSCFW-A00	1	Fuse Block Jumper
	208	09DPHLDAFW-A01	1	FB1/FB3 to TB1 Harness
	209	38APHLSLFV-A01	1	OFC to FR and FB1 to FB10/11 Harness
	212	38APHSCALXCA20	1	Auxiliary Harness
	300	HY10KB300	9	Fuse, 30AMP
	400	HY11MR033	3	Fuse Block
	500	HN61ZP032	2	SPDT Relay
	501	HY11TC032	2	Relay Socket
	600	HY84MR022	2	Terminal Block
	701	AL80AU170	10	No. 8 x 1/2 in. Screw
	704	HY76TB162	10	Wire Tie
	706	KA99FT060	2	DIN Rail End Stop
	707	XBANS3575P-8	1	DIN Rail, 0.3 x 8.0
	711	HK05ZZ010	2	Motormaster Pressure Transducer
	715	HK50AA067	1	Auxiliary Board
	716	38APHSCALXCA00	1	Auxiliary Communications Harness
	717	38APHSCALXCA10	1	Auxiliary Power Harness
	718	38AP1ES000	1	Enclosure Assembly
	719	AL04AG306	8	1/4"-20 x 1/2 in. Screw
	722	38AP1BS000	1	Mounting Bracket, Bridge Style
	724	AA06BS170	14	1/4"-20 x 1 in. Bolt
	725	AU02AB171	28	1/4 in. Washer
	726	AT30AB171	14	1/4 in. Nut
	727	38APHAAAL--A00	1	Motormaster Pressure Transducer Harness (2x)
	729	38AP1GS001	1	Gasket Kit
	731	AC41AB100	4	No. 8-32 x 3/8 in. Screw
	732	09DPHADAF--A00	2	Motormaster Jumper Harness

LEGEND

FB	— Fuse Block
FR	— Fan Relay
OFC	— Outdoor Fan Contactor
SPDT	— Single Pole Double Throw
TB	— Terminal Block

APPENDIX A — ACCESSORY PACKAGE CONTENTS (CONT)

ACCESSORY PART NO.	ITEM NUMBER	PART NO.	QTY	PART DESCRIPTION
38AP-900---54	100	HR46TN040	2	Motormaster Controller, 460-v
	200	38APHAAAFVP-A70	1	Power-In Harness (Dual)
	202	38APHAAAFVP-AF0	1	Power-Out Harness (Dual)
	204	38APHAAAFVC-A70	1	Control Harness (Dual)
	206	38APHLSCFW-A00	1	Fuse Block Jumper
	208	09DPHLDAFW-A01	1	FB1/FB3 to TB1 Harness
	209	38APHLSLFV-A01	1	OFC to FR and FB1 to FB10/11 Harness
	212	38APHSCALXCA20	1	Auxiliary Harness
	300	HY10KB200	9	Fuse, 20AMP
	400	HY11MR033	3	Fuse Block
	500	HN61ZP032	2	SPDT Relay
	501	HY11TC032	2	Relay Socket
	600	HY84MR022	2	Terminal Block
	701	AL80AU170	10	No. 8 x 1/2 in. Screw
	704	HY76TB162	10	Wire Tie
	706	KA99FT060	2	DIN Rail End Stop
	707	XBANS3575P-8	1	DIN Rail, 0.3 x 8.0
	711	HK05ZZ010	2	Motormaster Pressure Transducer
	715	HK50AA067	1	Auxiliary Board
	716	38APHSCALXCA00	1	Auxiliary Communications Harness
	717	38APHSCALXCA10	1	Auxiliary Power Harness
	718	38AP1ES000	1	Enclosure Assembly
	719	AL04AG306	8	1/4"-20 x 1/2 in. Screw
	722	38AP1BS000	1	Mounting Bracket, Bridge Style
	724	AA06BS170	14	1/4"-20 x 1 in. Bolt
	725	AU02AB171	28	1/4 in. Washer
	726	AT30AB171	14	1/4 in. Nut
	727	38APHAAAL--A00	1	Motormaster Pressure Transducer Harness (2x)
	729	38AP1GS001	1	Gasket Kit
	731	AC41AB100	4	No. 8-32 x 3/8 in. Screw
	732	09DPHADAF--A00	2	Motormaster Jumper Harness

LEGEND

FB	— Fuse Block
FR	— Fan Relay
OFC	— Outdoor Fan Contactor
SPDT	— Single Pole Double Throw
TB	— Terminal Block

APPENDIX A — ACCESSORY PACKAGE CONTENTS (CONT)

ACCESSORY PART NO.	ITEM NUMBER	PART NO.	QTY	PART DESCRIPTION
38AP-900---55	100	HR46TN042	2	Motormaster Controller, 575-v
	200	38APHAAAFVP-A70	1	Power-In Harness (Dual)
	202	38APHAAAFVP-AF0	1	Power-Out Harness (Dual)
	204	38APHAAAFVC-A70	1	Control Harness (Dual)
	206	38APHLSCFW-A00	1	Fuse Block Jumper
	208	09DPHLDAFW-A01	1	FB1/FB3 to TB1 Harness
	209	38APHLSLFV-A01	1	OFC to FR and FB1 to FB10/11 Harness
	212	38APHSCALXCA20	1	Auxiliary Harness
	300	HY10KB200	9	Fuse, 20AMP
	400	HY11MR033	3	Fuse Block
	500	HN61ZP032	2	SPDT Relay
	501	HY11TC032	2	Relay Socket
	600	HY84MR022	2	Terminal Block
	701	AL80AU170	10	No. 8 x 1/2 in. Screw
	704	HY76TB162	10	Wire Tie
	706	KA99FT060	2	DIN Rail End Stop
	707	XBANS3575P-8	1	DIN Rail, 0.3 x 8.0
	711	HK05ZZ010	2	Motormaster Pressure Transducer
	715	HK50AA067	1	Auxiliary Board
	716	38APHSCALXCA00	1	Auxiliary Communications Harness
	717	38APHSCALXCA10	1	Auxiliary Power Harness
	718	38AP1ES000	1	Enclosure Assembly
	719	AL04AG306	8	1/4"-20 x 1/2 in. Screw
	722	38AP1BS000	1	Mounting Bracket, Bridge Style
	724	AA06BS170	14	1/4"-20 x 1 in. Bolt
	725	AU02AB171	28	1/4 in. Washer
	726	AT30AB171	14	1/4 in. Nut
	727	38APHAAAL--A00	1	Motormaster Pressure Transducer Harness (2x)
	729	38AP1GS001	1	Gasket Kit
	731	AC41AB100	4	No. 8-32 x 3/8 in. Screw
	732	09DPHADAF--A00	2	Motormaster Jumper Harness

LEGEND

FB — Fuse Block
FR — Fan Relay
OFC — Outdoor Fan Contactor
SPDT — Single Pole Double Throw
TB — Terminal Block

