Installation, Start-Up and Service Instructions

Part No. 09DK900004, 09DK900006

SAFETY CONSIDERATIONS

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

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

ELECTRIC SHOCK HAZARD

Separate power sources (main and control circuit power) are used for these units. Be sure both main power and control circuit power are disconnected before installing the Motormaster III Relay/Sensor Kit.

GENERAL

These instructions are for field installation of the accessory Motormaster III Relay/Sensor kit. The kit is used to provide efficient control of the *primary* fans (fans 1 and 2) on 09DK condensers with 67/33%, 33/33/33%, and 33/33/17/17% typical capacity split applications. On 67/33% applications, fan no. 2 is shared by the 67% and 33% refrigerant circuits. With 33/33/33% and 33/33/17/17% applications, fan no. 1 and 2 are shared by either the 33% or 17% refrigerant circuits. This accessory ensures that the first circuits on and the last circuits off control the Motormaster III device. One kit is required for 67/33% applications. Two kits are required for 33/33/33% and 33/33/17/17% applications. See Table 1 for voltage and kit number information.

Table 1 — Motormaster III Relay/Sensor Kit Information

MAIN SUPPLY VOLTAGE	MOTORMASTER III RELAY/SENSOR PART NO.
208/230-3-60 460-3-60 575-3-60	09DK900004
380-3-60 380/415-3-50	09DK900006

INSTALLATION

Use these instructions in conjunction with the accessory Motormaster III control installation instructions.

The accessory fan control kit must be used for efficient unit operation with 67/33%, 33/33/33%, and 33/33/17/17% capacity split applications. Refer to the fan control kit installation instructions for more information. Install the fan control kit **before** installing the Motormaster III Relay/Sensor kit.

Step 1 — Examine Package Contents — Check kit for shipping damage or missing parts. If damage is found, file a claim with the shipping agency immediately. Each kit includes a relay, a sensor, and the fastener hardware for installation. See Table 2 for kit contents. If any item is missing, notify your Carrier representative.

Table 2 — Motormaster III Relay/Sensor Kit Contents

QUANTITY	ITEM
1	Relay
1	Sensor*
2	Pan Head Screw, Type B (no. 6-20 x ¾ in. long)

*Each Motormaster III accessory controller also comes with one sensor.

Step 2 — Mount Relay in Control Box

1. Open control box door.
2. Remove and save 4 corner holddown screws and detach control box cover.
3. Mount relay on the fan control kit control panel in the control box using the screws provided. See Fig. 1 and 2 for specific locations. Each kit contains one relay. Two kits are required for 33/33/33% and 33/33/17/17% applications.

NOTE: For 67/33% applications, the relay (CR2A) is mounted on the right side of the control panel. Relay CR1A is not needed for 67/33% applications. See Fig. 1 and 2.

Step 3 — Install Sensors — For sensor wiring connections, two field-supplied, 3⁄16 in. insulated quick connects are required for each relay. Sensor 3 and Motormaster® III relay CR1A are not required for 67/33% capacity split applications.

1. Install sensor for thermistor input control on the condenser coils as shown in Fig. 3.
2. Factory-punched access holes are provided under the control box for incoming wires. Route sensor leads under the unit to the control box at the opposite end using one of the available access holes.
3. For 33/33/33% and 33/33/17/17% **only,** connect one sensor lead from sensors 1 and 3 to the violet control signal lead on the circuit A Motormaster III control using a wire nut. Connect the remaining lead of sensor 1 to a field-supplied 3⁄16 in. insulated quick connect and attach to terminal 9 on relay CR1A. Connect the remaining lead of sensor 3 to a field-supplied 3⁄16 in. insulated quick connect and attach to terminal 8 on relay CR1A. See Fig. 1 and 2 for wiring details.

NOTE: For 67/33% applications, wire sensor 1 according to the accessory Motormaster III control installation instructions.

4. For sensors 2 and 4, connect one sensor lead from each of the sensors to the violet control signal lead on the circuit B Motormaster III control using a wire nut. Connect the remaining lead of sensor 2 to a field-supplied 3⁄16 in. insulated quick connect and attach to terminal 9 on relay CR2A. Connect the remaining lead of sensor 4 to a field-supplied 3⁄16 in. insulated quick connect and attach to terminal 8 on relay CR2A. See Fig. 1 and 2 for wiring details.
5. Wrap and tie excess sensor wiring under the unit.

Step 4 — Complete Electrical Connections — For electrical wiring connections, Motormaster III relays use 3⁄16 in. male quick connects. The fan control kit relays use 1⁄4 in. male quick connects.

All wires are field supplied. Wiring must be 16 AWG (American Wire Gage) (1.5 mm^2) appliance wiring material, rated 105 C or its equivalent. All wiring must comply with NEC (National Electrical Code) and applicable local codes.

To complete electrical connections:

NOTE: Motormaster III Relay (CR1A) is not required on 67/33% capacity split applications.

1. For 33/33/33% and 33/33/17/17% **only,** connect gray control signal lead on circuit A Motormaster III control to a field-supplied 3⁄16 in. insulated quick connect and attach to terminal 7 on Motormaster III relay CR1A, using the 16 AWG (1.5 mm^2) wire. See Fig. 1 and 2.
2. Connect gray control signal lead on circuit B Motormaster III control to a field-supplied 3⁄16 in. insulated quick connect and attach to terminal 7 on Motormaster III relay CR2A, using the 16 AWG (1.5 mm^2) size wire. See Fig. 1 and 2.
3. For 33/33/33% and 33/33/17/17% **only,** run a field-supplied 16 AWG (1.5 mm^2) size black wire between C1 on the Motormaster III relay coil (CR1A) and the power side of the fan control kit relay coil (CR1). Run a field-supplied 16 AWG (1.5 mm^2) size white wire between C2 on the Motormaster III relay coil (CR1A) and the common side of the fan control kit relay coil (CR1). See Fig. 1 and 2 for wiring details.
4. Run a field-supplied 16 AWG (1.5 mm^2) size black wire between C1 on the Motormaster III relay coil (CR2A) and the power side of the fan control kit relay coil (CR2). Run a field-supplied 16 AWG (15 mm^2) size white wire between C2 on the Motormaster III relay coil (CR2A) and the common side of the fan control kit relay coil (CR2). See Fig. 1 and 2 for wiring details.
5. Be sure that all connections are correct and tight.

Step 5 — Complete Installation

1. Replace control box cover.
2. Close and secure control box door.
3. Restore power to the unit.

LEGEND AND NOTES FOR FIG. 1

ATS — Air Temperature Switch
CR — Control Relay
DU — Dummy Terminal
EQUIP — Equipment
FC — Fan Contactor
FCPS — Fan Cycling Pressure Switch
FIOP — Factory-Installed Option
FM — Fan Motor
GND — Ground
MMSN — Motormaster® Sensor
PL — Plug Assembly
PRI — Primary
SEC — Secondary
TB — Terminal Block
TRAN — Transformer
XL — Across-The-Line Start


Terminal Block Connection


Marked Terminal


Unmarked Terminal

Unmarked Splice


Marked Wire

Factory Wiring

Field Wiring


Indicates common potential, does not represent wiring.

NOTES:
1. When a fan control kit is used, the jumper from TB2-1 to TB3-1 and from TB2-2 to TB3-2 must be connected. The fan control kit is factory wired for 67/33% capacity split. If a 33/33/33% capacity split is required, remove the jumper from TB4-1 to TB5-1 and from TB4-2 to TB5-2. If a 33/33/17/17% capacity split is required, remove the jumpers from TB4-1 to TB5-1 to TB7-1 and from TB4-2 to TB5-2 to TB7-2.
2. On fan control kits, 208/230-v units are factory wired for 230-v power supply. For 208-v power supply, connect yellow wire to terminal marked H2.
3. Terminal blocks TB2, TB3, TB4, TB5, TB6, and TB7 are for external field control connections. Control connections are to be class 1 wiring, 14 AWG (American Wire Gage) copper conductors only.
4. Wiring for field power supply must be rated 75 C minimum. Use copper, copper-clad aluminum, or aluminum conductors. Maximum incoming wire size for each terminal block is 2/0.
5. Replacement of factory wires must be with 105 C appliance wiring material or its equivalent.
6. Factory wiring is in accordance with National Electrical Code (NEC). Field modifications or additions must be in compliance with all applicable codes.
7. Fan motors are thermally protected. Three-phase motors are protected against primary single-phasing conditions.
8. Line numbers on the left side of the label diagrams indicate the contact number. The numbers on the right side of label diagrams match the contacts with their corresponding coils. A plain number indicates normally-open contacts. An underlined number indicates normally-closed contacts.

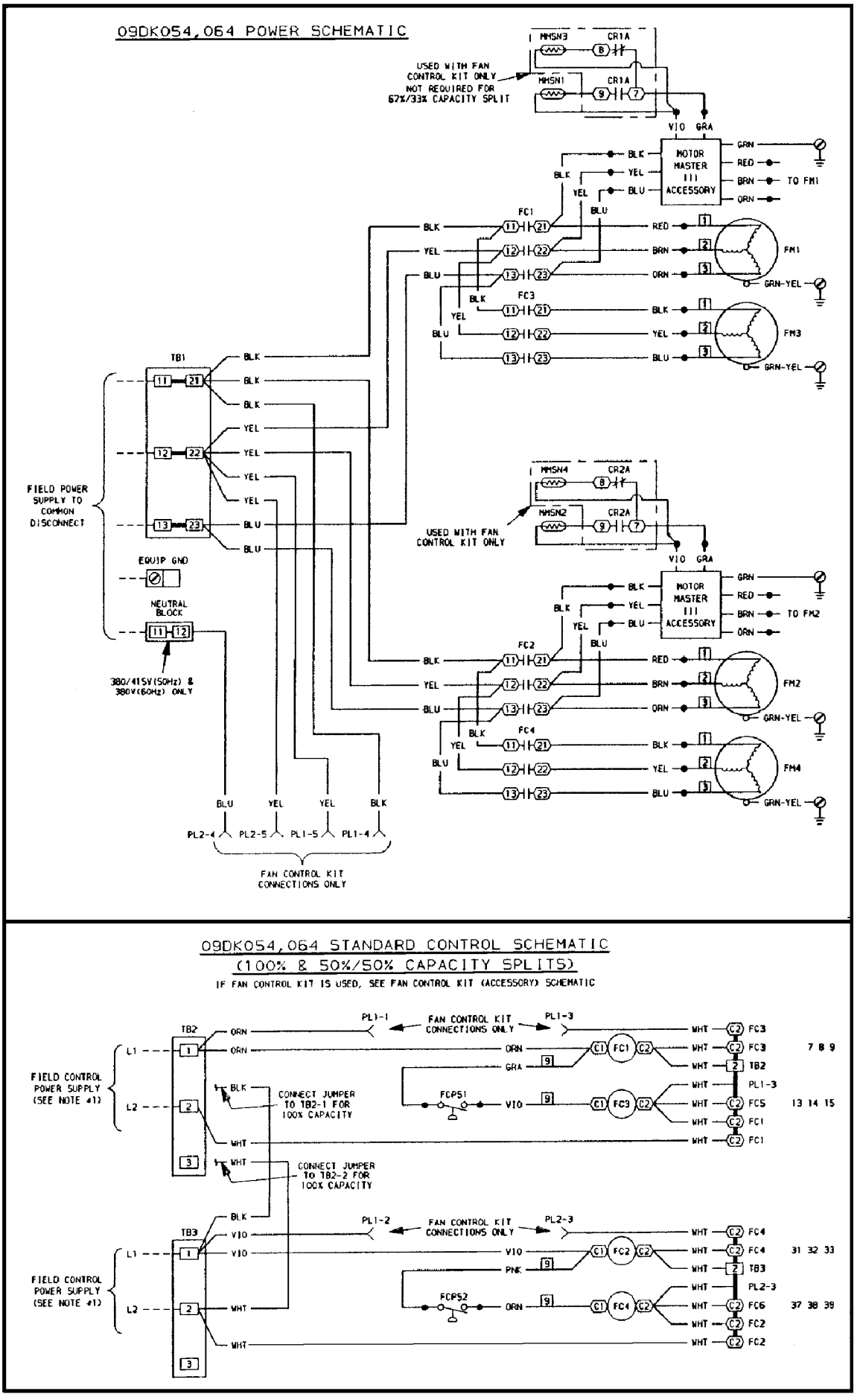

Fig. 1 — Wiring Diagram and Component Arrangement; 054 and 064 Units

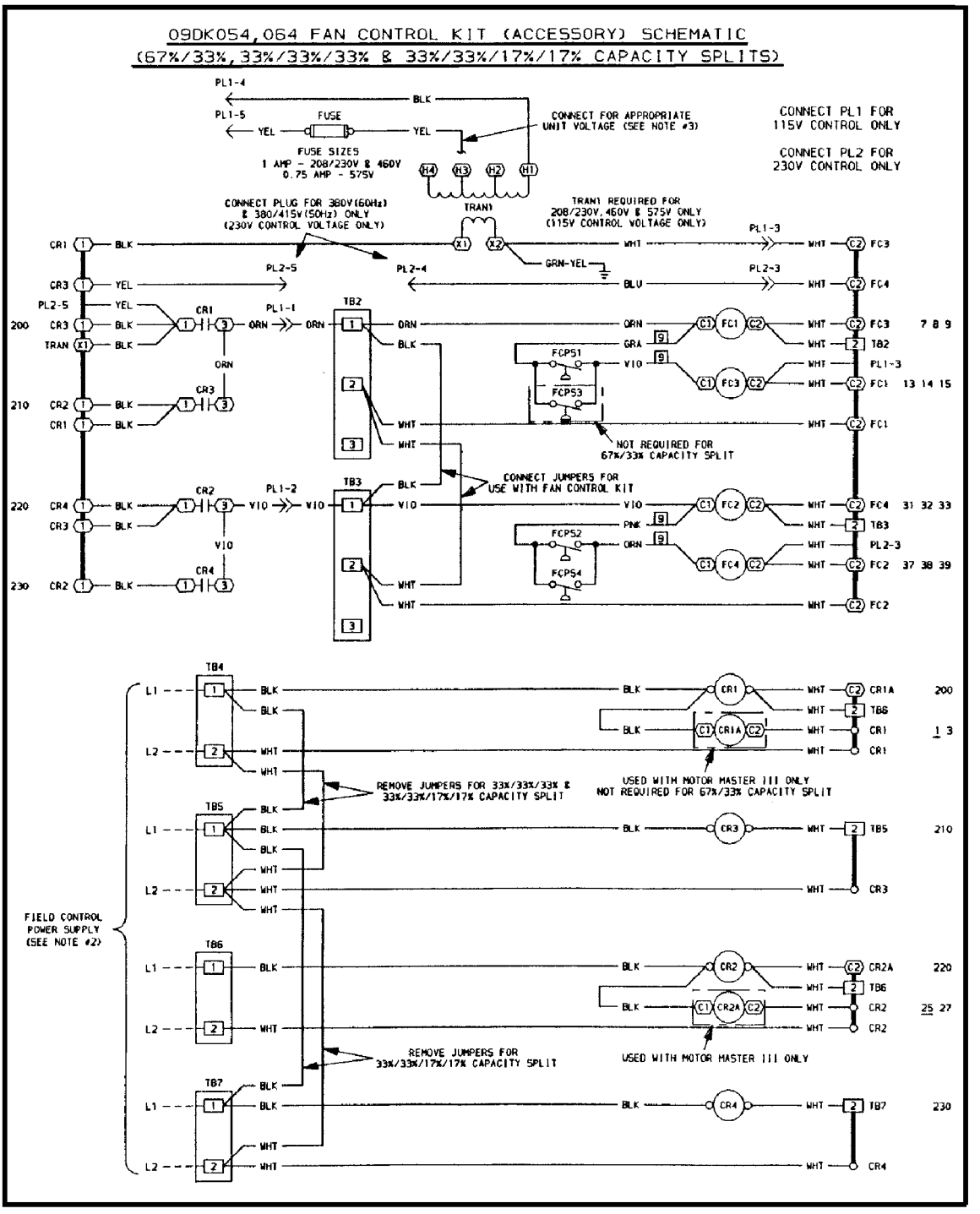

Fig. 1 — Wiring Diagram and Component Arrangement; 054 and 064 Units (cont)

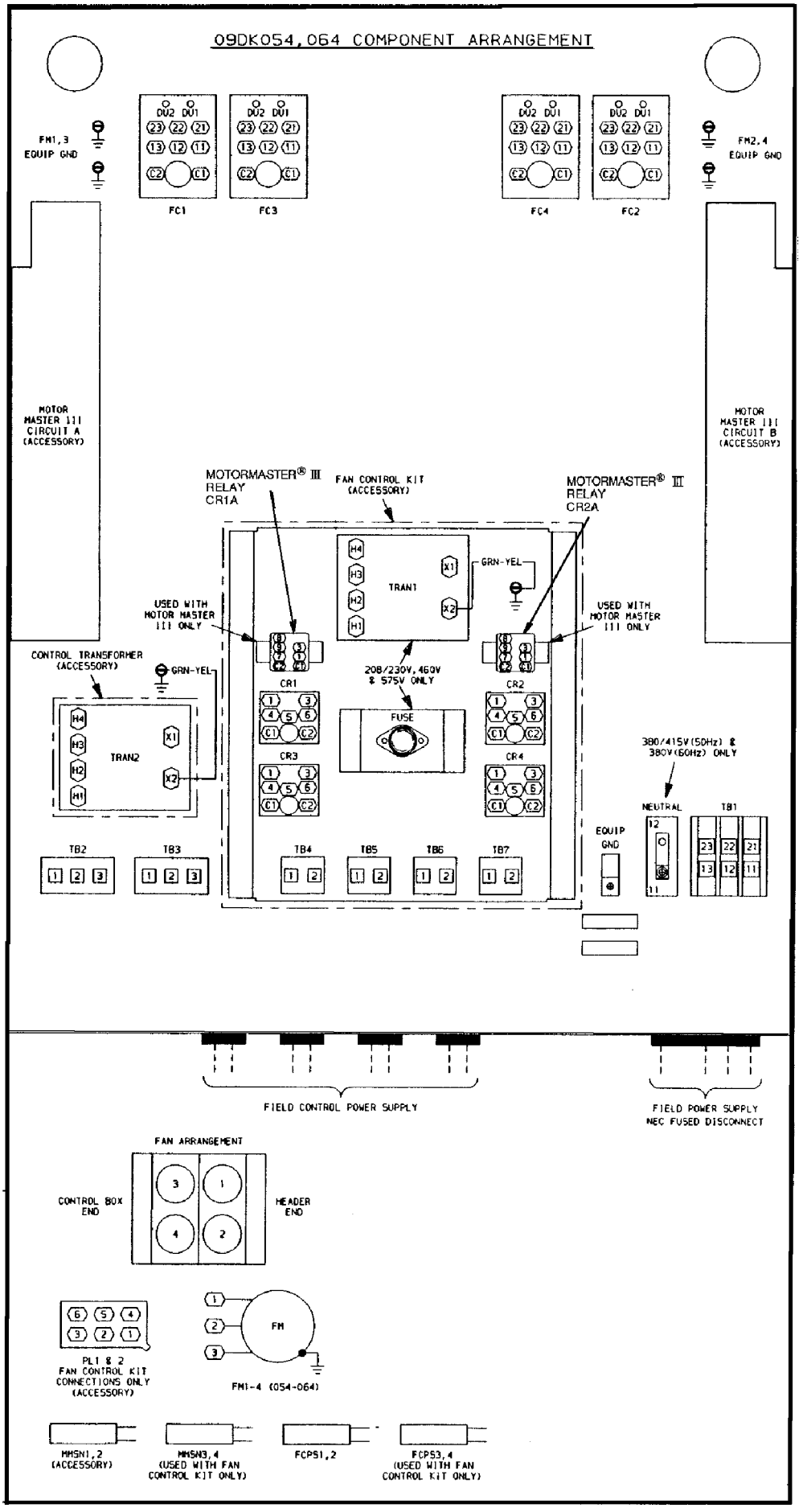

Fig. 1 — Wiring Diagram and Component Arrangement; 054 and 064 Units (cont)

LEGEND AND NOTES FOR FIG. 2

ATS	—	Air Temperature Switch
CR	—	Control Relay
DU	—	Dummy Terminal
EQUIP	—	Equipment
FC	—	Fan Contactor
FCPS	—	Fan Cycling Pressure Switch
FIOP	—	Factory-Installed Option
FM	—	Fan Motor
GND	—	Ground
MMSN	—	Motormaster® Sensor
PL	—	Plug Assembly
PRI	—	Primary
SEC	—	Secondary
TB	—	Terminal Block
TRAN	—	Transformer
XL	—	Across-The-Line Start


Terminal Block Connection


Marked Terminal


Unmarked Terminal

Unmarked Splice


Marked Wire

Factory Wiring

Field Wiring


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NOTES:

1. When a fan control kit is used, the jumper from TB2-1 to TB3-1 and from TB2-2 to TB3-2 must be connected. The fan control kit is factory wired for 67/33% capacity split. If a 33/33/33% capacity split is required, remove the jumper from TB4-1 to TB5-1 and from TB4-2 to TB5-2. If a 33/33/17/17% capacity split is required, remove the jumpers from TB4-1 to TB5-1 to TB7-1 and from TB4-2 to TB5-2 to TB7-2.
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3. Terminal blocks TB2, TB3, TB4, TB5, TB6, and TB7 are for external field control connections. Control connections are to be class 1 wiring, 14 AWG (American Wire Gage) copper conductors only.
4. Wiring for field power supply must be rated 75 C minimum. Use copper, copper-clad aluminum, or aluminum conductors. Maximum incoming wire size for each terminal block is 2/0.
5. Replacement of factory wires must be with 105 C appliance wiring material or its equivalent.
6. Factory wiring is in accordance with National Electrical Code (NEC). Field modifications or additions must be in compliance with all applicable codes.
7. Fan motors are thermally protected. Three-phase motors are protected against primary single-phasing conditions.
8. Line numbers on the left side of the label diagrams indicate the contact number. The numbers on the right side of label diagrams match the contacts with their corresponding coils. A plain number indicates normally-open contacts. An underlined number indicates normally-closed contacts.

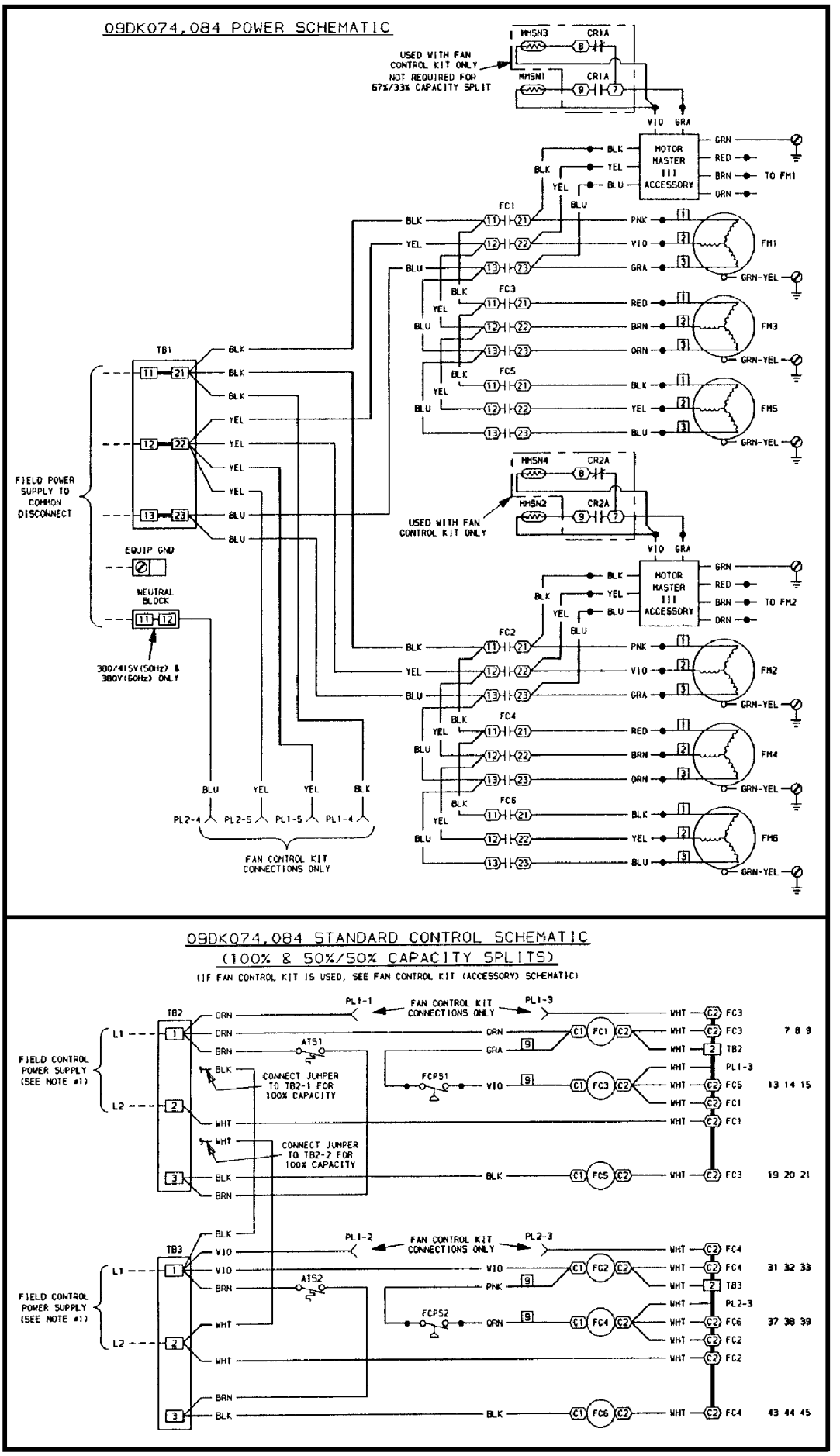

Fig. 2 — Wiring Diagram and Component Arrangement; 074 and 084 Units

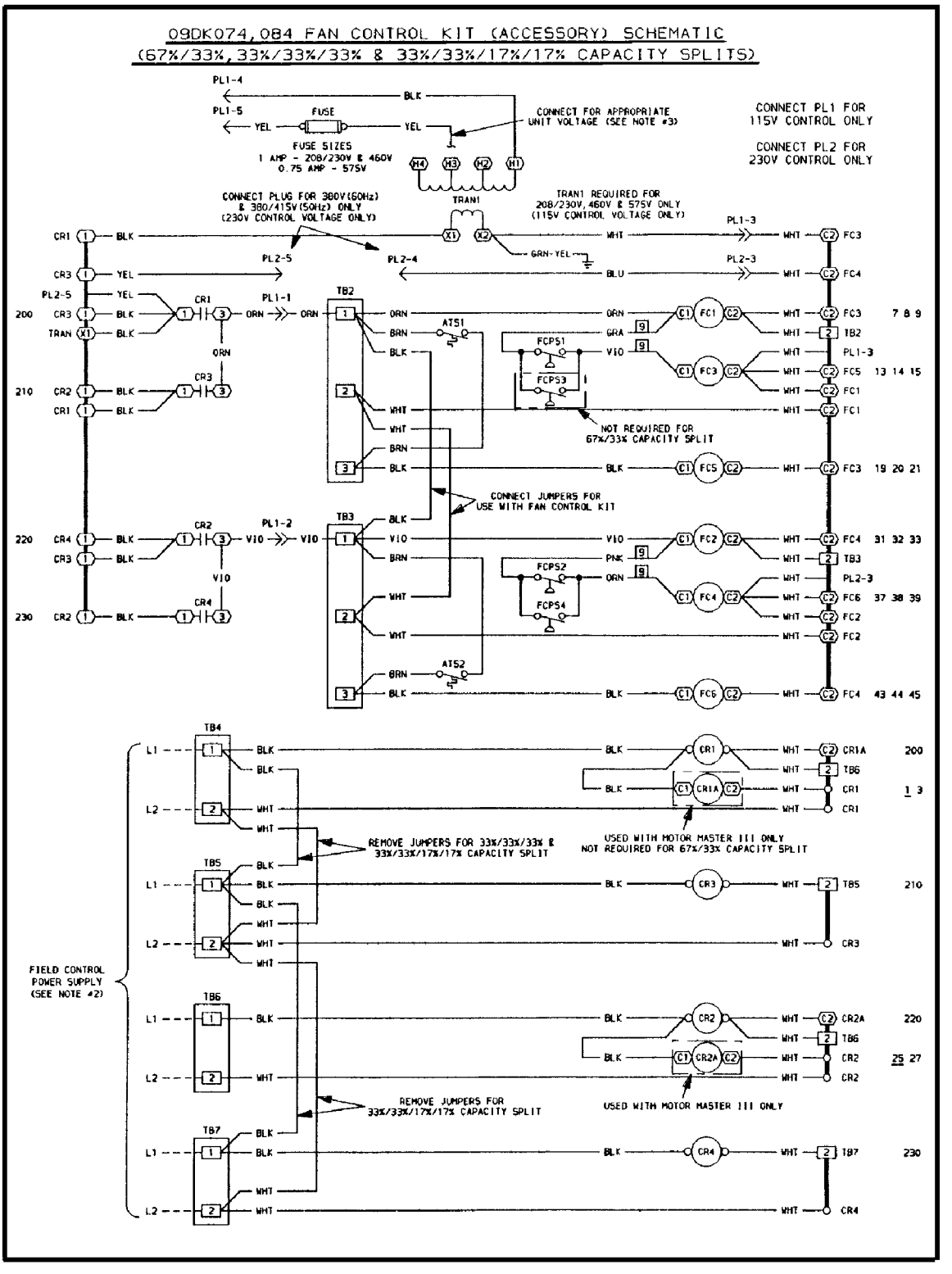

Fig. 2 — Wiring Diagram and Component Arrangement; 074 and 084 Units (cont)

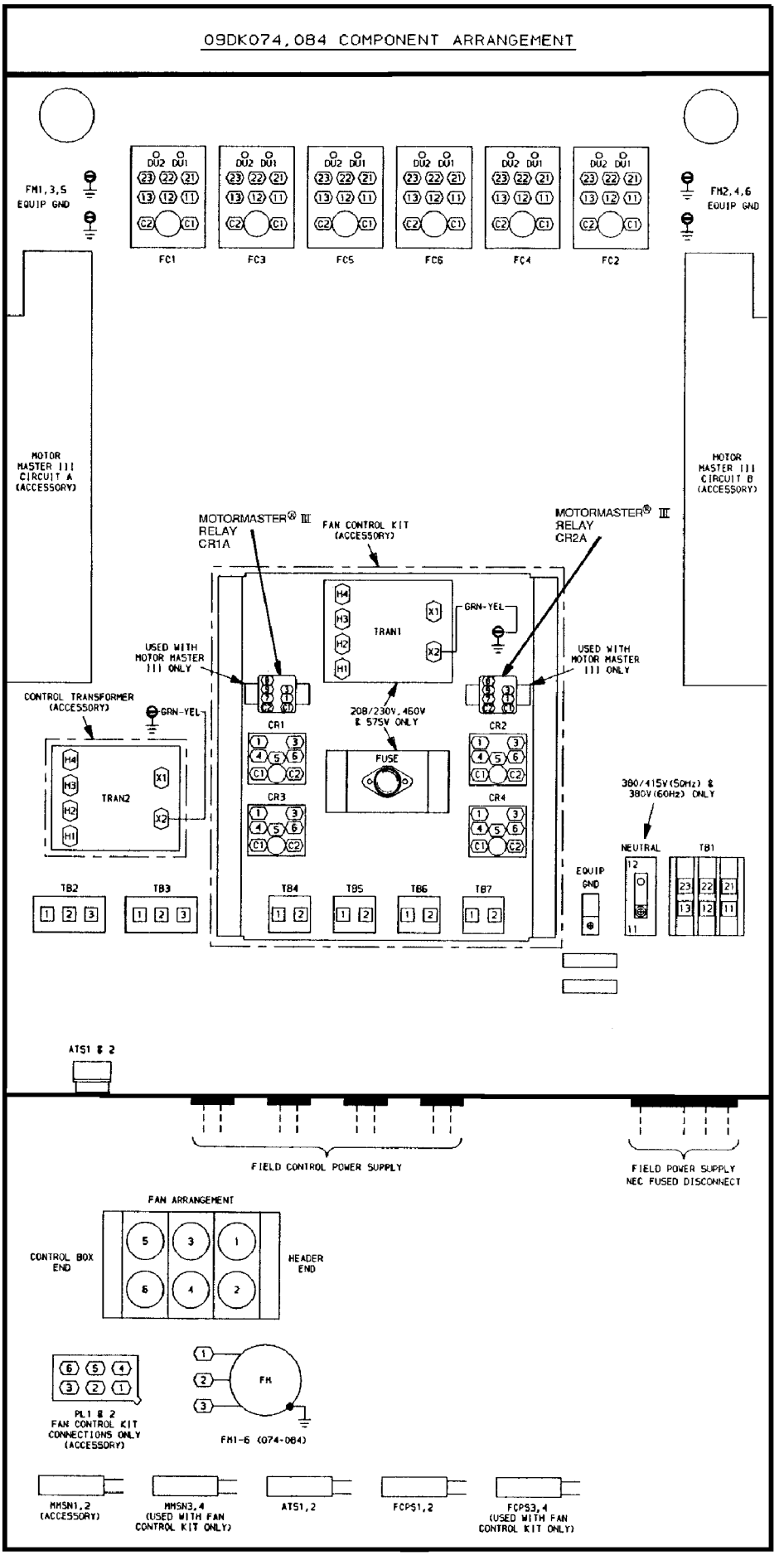

Fig. 2 — Wiring Diagram and Component Arrangement; 074 and 084 Units (cont)

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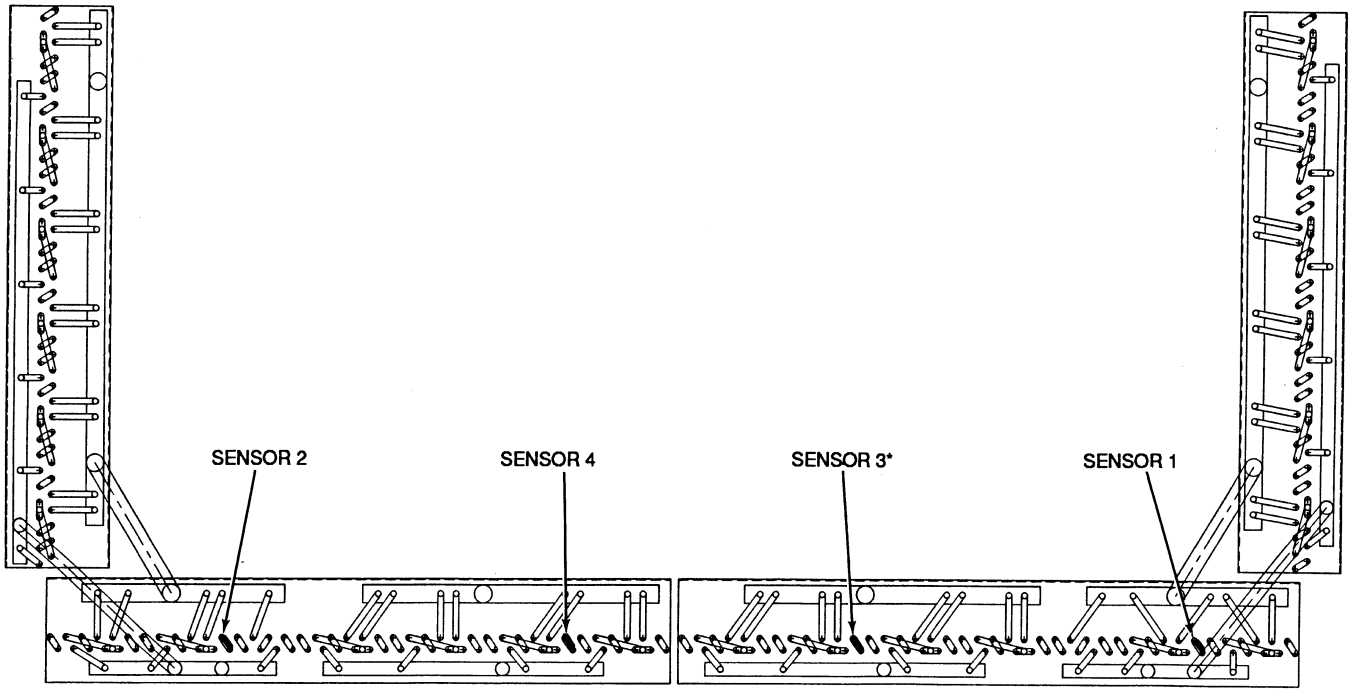

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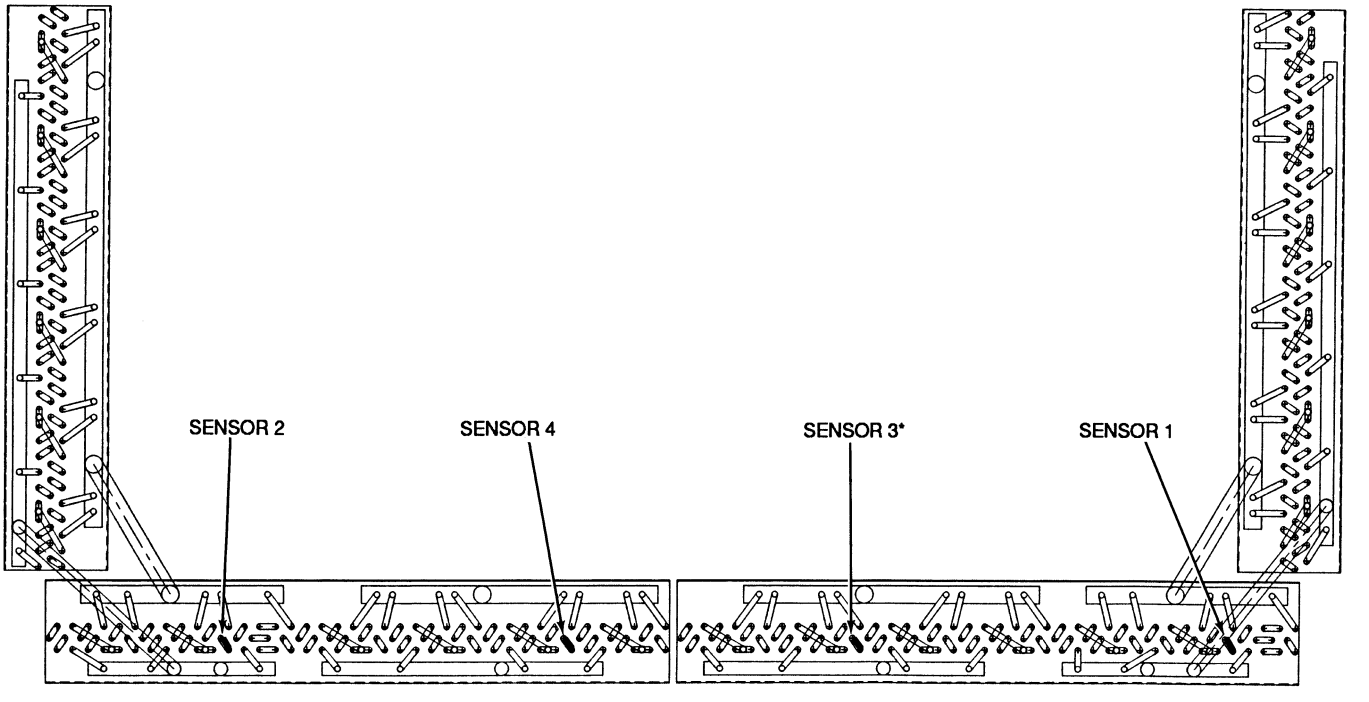
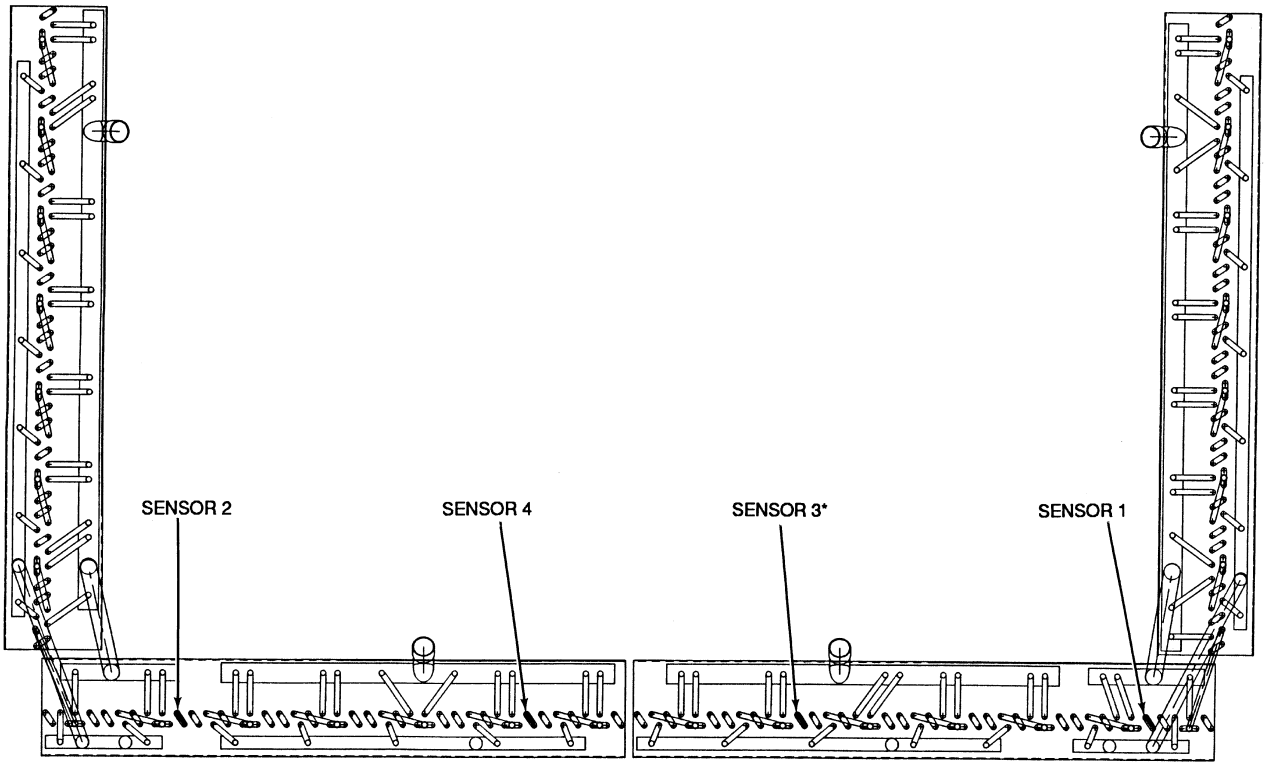


*Sensor 3 is not required on 67/33% capacity split applications.

NOTES:
1. The circuit A Motormaster III controls fan motor no. 1, which utilizes sensors 1 and 3.
2. The circuit B Motormaster III controls fan motor no. 2, which utilizes sensors 2 and 4.

Fig. 3 — Motormaster® III Sensor Locations

09DK074



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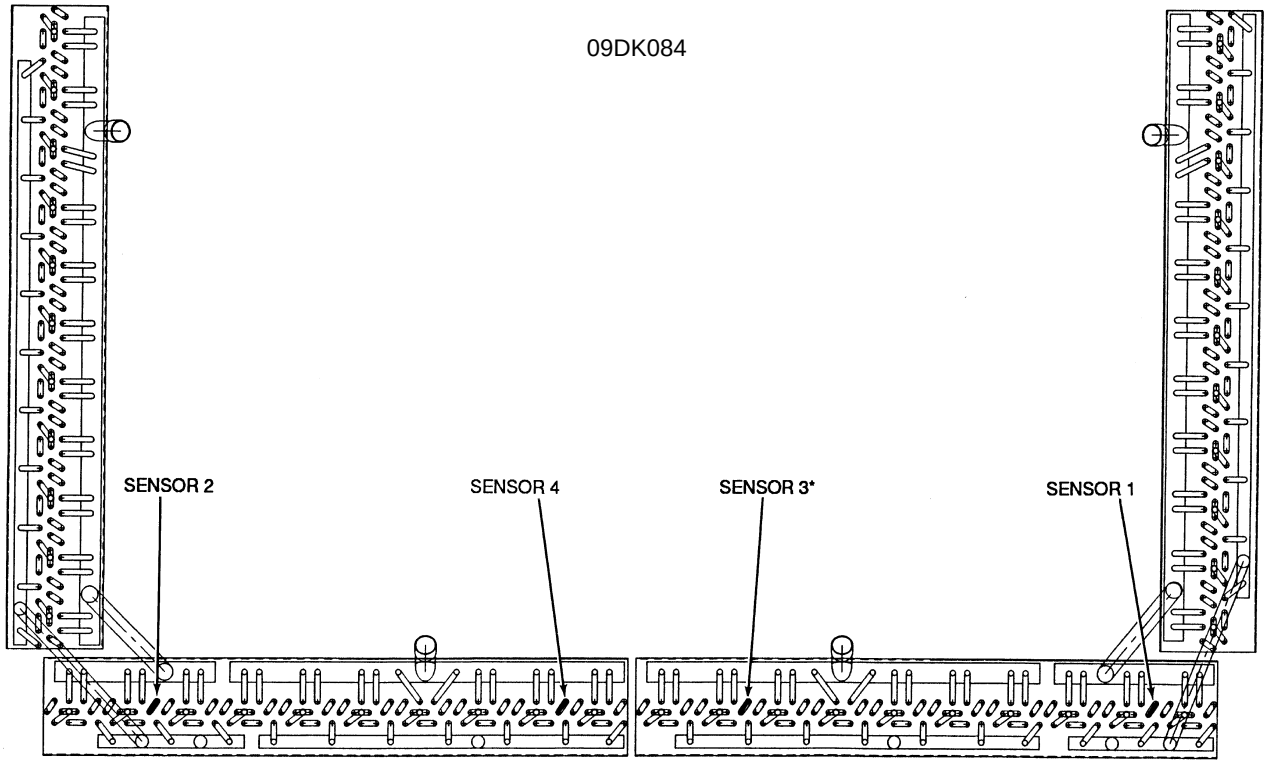

*Sensor 3 is not required on 67/33% capacity split applications.

NOTES:
1. The circuit A Motormaster III controls fan motor no. 1, which utilizes sensors 1 and 3.
2. The circuit B Motormaster III controls fan motor no. 2, which utilizes sensors 2 and 4.

Fig. 3 — Motormaster III Sensor Locations (cont)