09DK054-084
Accessory Fan Control Kit

Installation Instructions

Part No. 09DK900001, 09DK900002, 09DK900003

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 fan control kit.

INTRODUCTION

These instructions are for field installation of the accessory fan control kit. The kit is used on 09DK condensers with 67/33%, 33/33/33%, and 33/33/17/17% typical capacity split applications. Fans 2, 4, and 6 are ''shared'' by the 67 and 33% refrigerant circuits on 67/33% applications. With 33/33/33% and 33/33/17/17% applications, fans 1,3,5 and 2,4,6 are shared by either 33% and/or 17% refrigerant circuit. The fan control kit ensures that the fans will operate when needed for efficient control. See Table 1 for fan control kit numbers and voltage information.

NOTE: Fans 5 and 6 are used on 09DK074 and 084 units only.

Three FCPSs (Fan Cycle Pressure Switches) are used on units with 67/33% and four FCPSs are used on units with 33/33/33% and 33/33/17/17% capacity split applications. The kit includes a control panel (Fig. 1), valve cores and bodies, pressure switches, and fastener hardware for installation. See Table 2 for kit contents.

Table 1 — Fan Control Kit Number Information

MAIN SUPPLY VOLTAGE	FAN CONTROL KIT NUMBER
208/230 v 460 v	09DK900001
575 v	09DK900002
380-3-60 380/415-3-50	09DK900003

NOTES:
1. The 208/230 v, 460 v, and 575 v 3-phase, 60 Hz kits are UL (Underwriters' Laboratories) and CSA (Canadian Standards Association) approved.
2. The control panels for these kits are shown in Fig. 2 and 3.

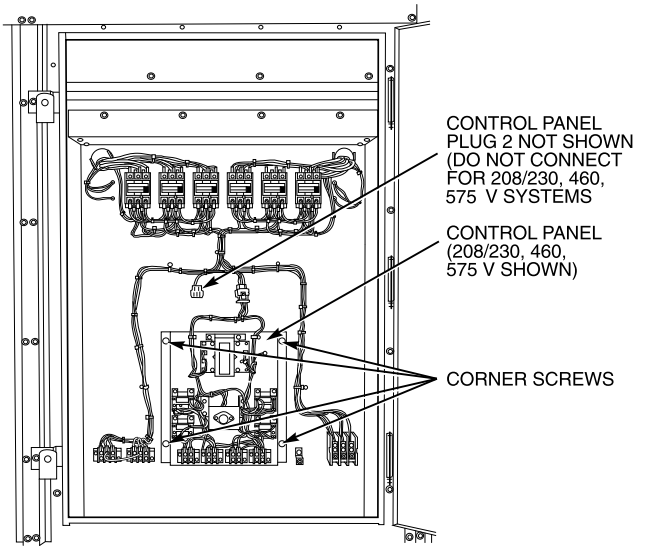


Fig. 1 — Accessory Fan Control Kit (074,084 Control Box Shown)

Table 2 — Fan Control Kit Contents

QUANTITY	ITEM
1	Control Panel
2	Valve Cores
2	Valve Bodies
2	Pressure Switches
4	¼-14 x ⅝ in. long, type AB serrated head screw

INSTALLATION

Use these instructions in conjunction with the 09DK base unit installation instructions.

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. See Table 2 for kit contents; if any item is missing, notify your Carrier representative.

NOTE: Be sure the control panel matches the unit voltage. See Fig. 2 and 3 for control panel details.

Step 2 — Mount Control Panel in Control Box

1. Open control box door.
2. Remove and save 4 corner hold-down screws, and detach control box cover.
3. Remove plug located in the center of the cover.
4. Mount control panel in control box using the 4 screws provided at the location shown in Fig. 1.

Step 3 — Complete Electrical Connections —

All wiring must be in accordance with national and applicable local codes.

MAKE CONTROL PANEL PLUG CONNECTION — With 208/230 v, 460 v, and 575 v main supply voltages, connect control panel plug PL1 to unit control box plug PL1. **Do not connect plug PL2.**

With 380 v and 380/415 v main supply voltages, connect control panel plug PL2 to unit control box plug PL2. **Do not connect plug PL1.**

See Fig. 4 and 5 for wiring details.

⚠ CAUTION

Carefully check control panel plug connection. An incorrect connection will cause damage to the unit controls.

MAKE FIELD POWER CONNECTIONS — Follow main power wiring details described in the 09DK base unit installation instructions.

For control circuit power wiring, provide a separate single-phase power source for each control circuit with the required overcurrent protection (fuses or circuit breakers). See Table 3 for control circuit overcurrent protection amps and voltage data. The number of control circuits needed depends upon the coil refrigerant circuit split.

NOTE: Jumpers from both TB2-1 to TB3-1 and TB2-2 to TB3-2 must be connected.

The fan control kit control panel is factory wired for a 67/33% capacity split, and utilizes TB4 for the 67% control circuit and TB6 for the 33% control circuit. See Fig. 4, 5, and 6 for wiring details for 67/33%, 33/33/33%, and 33/33/17/17% capacity splits. To determine fan control and refrigeration circuit connections for each capacity split, see Fig. 7.

Factory punched access holes under the control box are provided for incoming wires. See Fig. 6 for access hole details. Terminal block connections utilize no. 8 screws. Wiring must be class 1, 14 AWG (American Wire Gage) 2.5 mm^2 copper conductors only. Fuse replacement details are shown in Table 3.

INSTALL FCPSs AND VALVES — Install these switches and valves according to the instructions specified in the 09DK base unit installation instructions.

Step 4 — Complete Installation

1. Check that all connections are correct and tight.
2. Replace control box cover.
3. Close and secure control box door.
4. Restore power to the unit.

Table 3 — Control Circuit Data

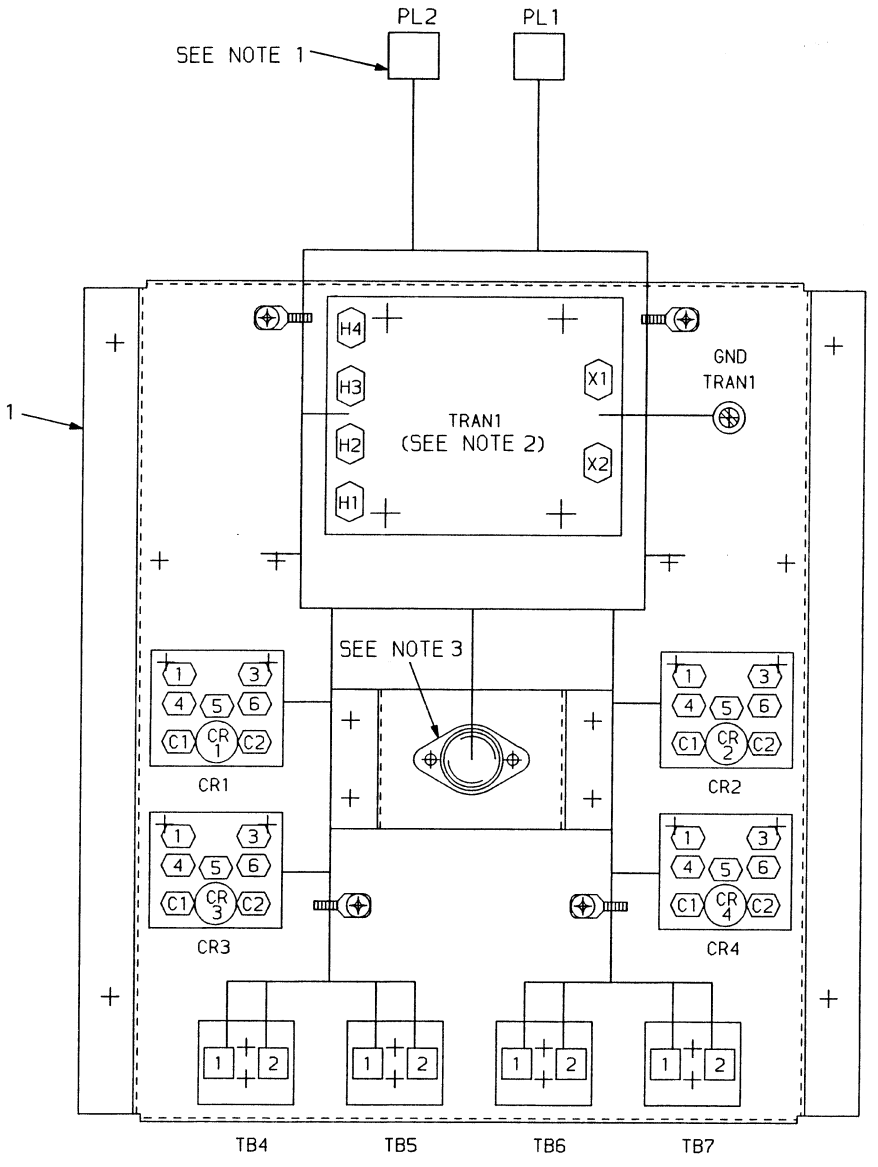
MAIN POWER VOLTAGE V-PH-HZ	CONTROL POWER VOLTAGE V-PH-HZ	CONTROL POWER VOLTAGE LIMITS*		OVERCURRENT PROTECTION AMPS	CONTROL PANEL FUSE SIZE†	
		Min	Max		Amps	Volt Rating
208/230-3-60	115-1-60	103	127	10	1	500
460-3-60	115-1-60	103	127	10	1	500
575-3-60	115-1-60	103	127	10	.75	600
380-3-60	230-1-60	207	253	10	N/A	N/A
380/415-3-50	230-1-50	207	253	10	N/A	N/A

LEGEND

CSA — Canadian Standards Association
N/A — Not Applicable
UL — Underwriters' Laboratories

*Units are suitable for use on electrical systems where voltage supplied to the unit terminals is within listed minimum and maximum limits.
†Transformer fuse. Time delay fuse-type preferable.

NOTES:
1. Fan control kit is UL and CSA approved for 208/230, 460, and 575 v applications.
2. Number 8 screws are provided on terminal blocks for control circuit power connections.

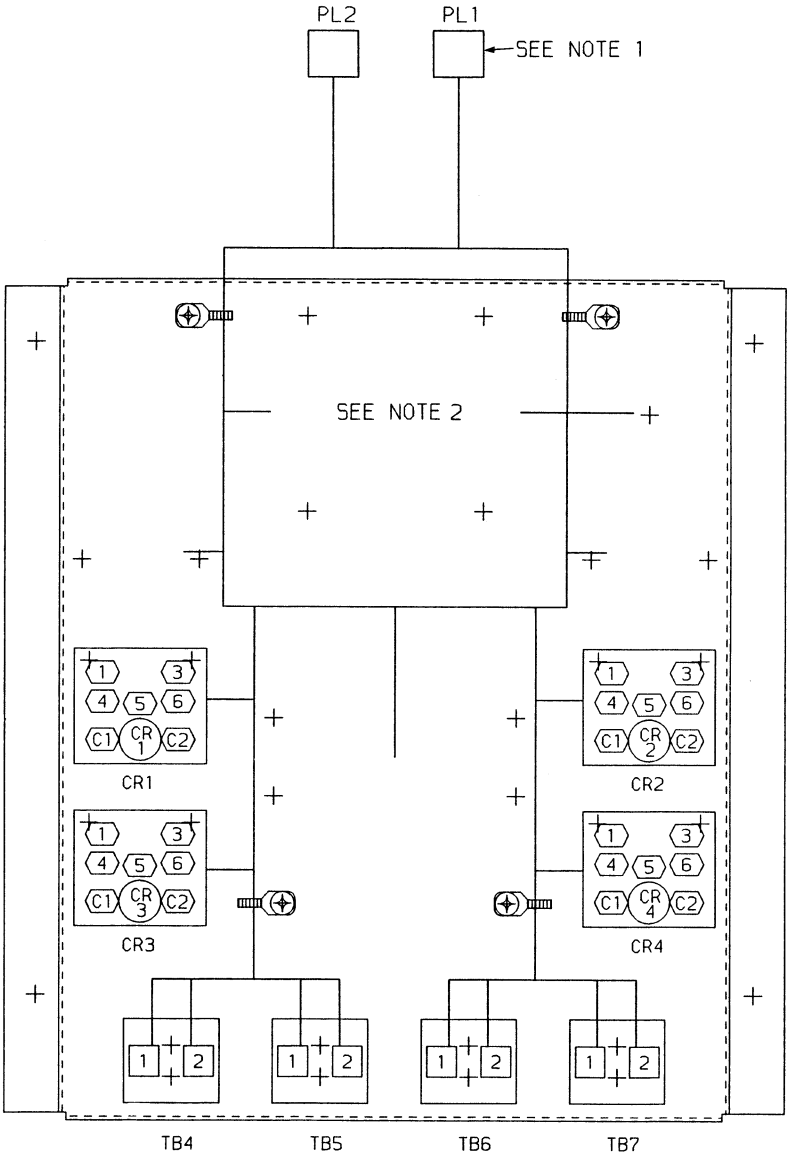


LEGEND

CR — Control Relay
GND — Ground
PL — Plug
TB — Terminal Block
TRAN — Transformer

NOTES:
1. Do not connect plug PL2 for 208/230, 460, and 575 v systems.
2. Kit 09DK900001 utilizes a 200/230/460 v to 115 v transformer and kit 09DK900002 utilizes a 230/460/575 v to 115 v transformer.
3. Refer to Table 3 for fuse details.

Fig. 2 — 208/230, 460, 575 v Control Panel



LEGEND

CR — Control Relay
PL — Plug
TB — Terminal Block

NOTES:
1. Do not connect plug PL1 for 380, 380/415 v systems.
2. Kit 09DK900003 control panel does not utilize a transformer.

Fig. 3 — 380, 380/415 v Control Panel

LEGEND AND NOTES FOR FIG. 4

LEGEND

AWG	—	American Wire Gage
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 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.

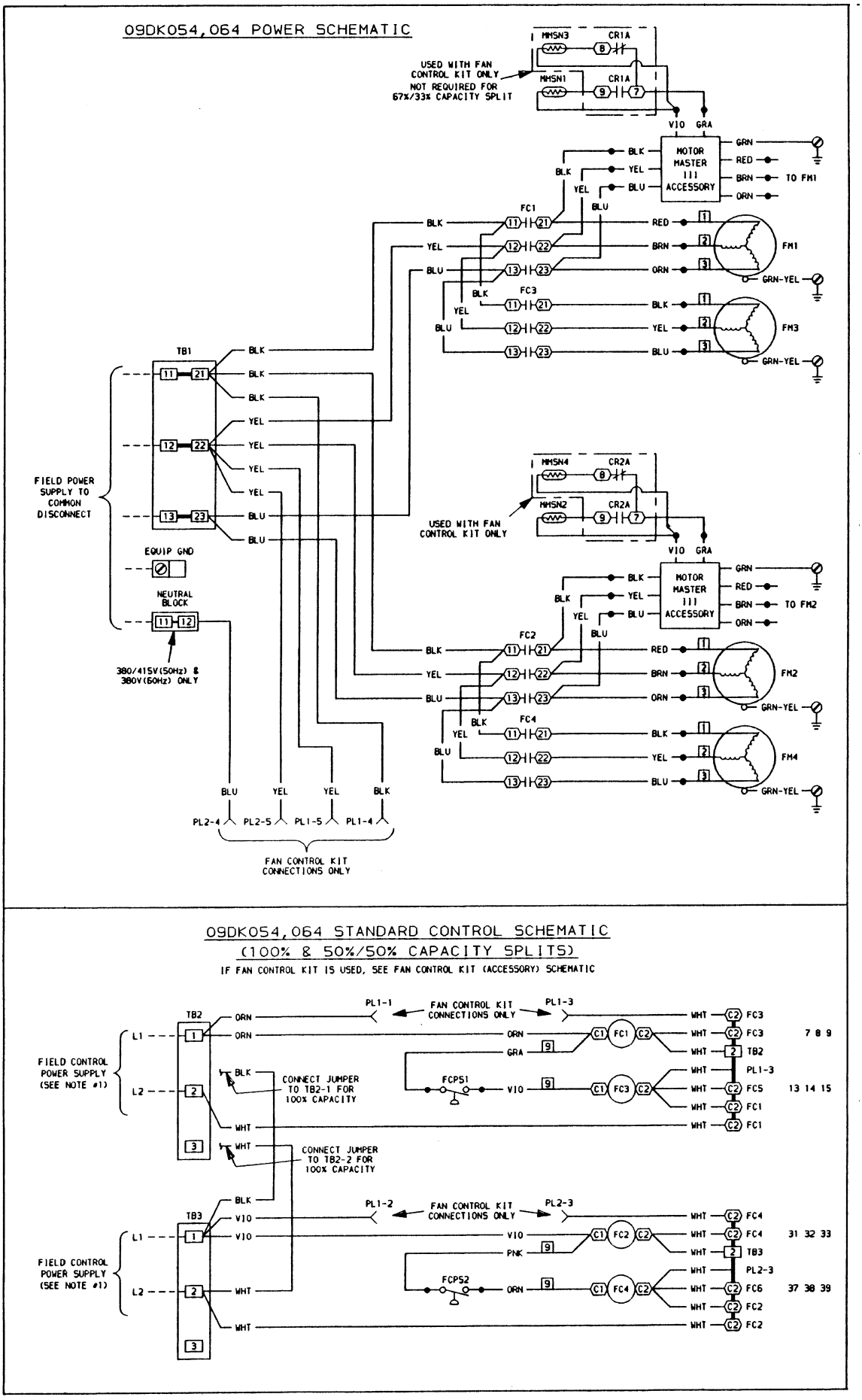


Fig. 4 — Wiring Diagram and Component Arrangement; 054 and 064 Units

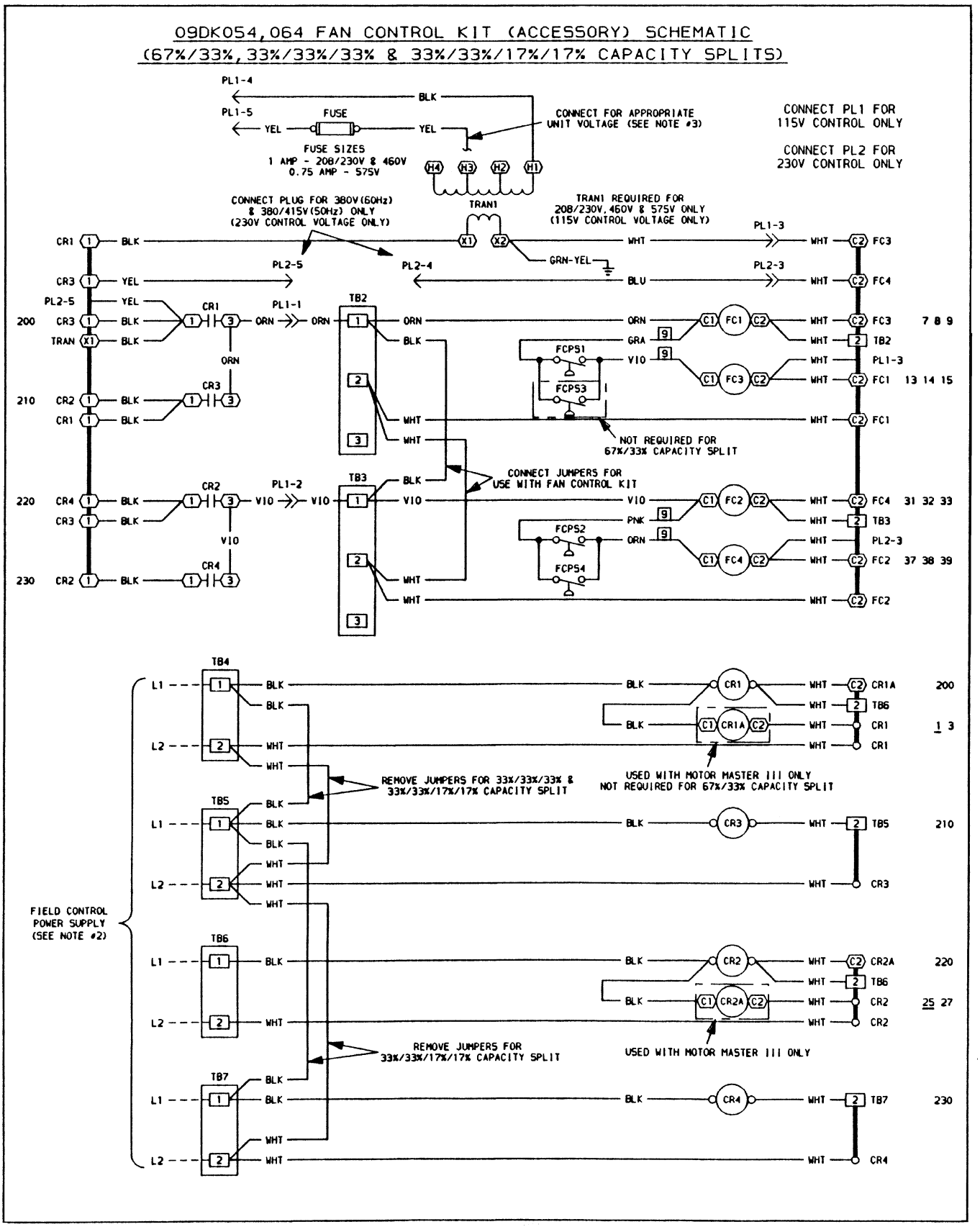


Fig. 4 — Wiring Diagram and Component Arrangement; 054 and 064 Units (cont)

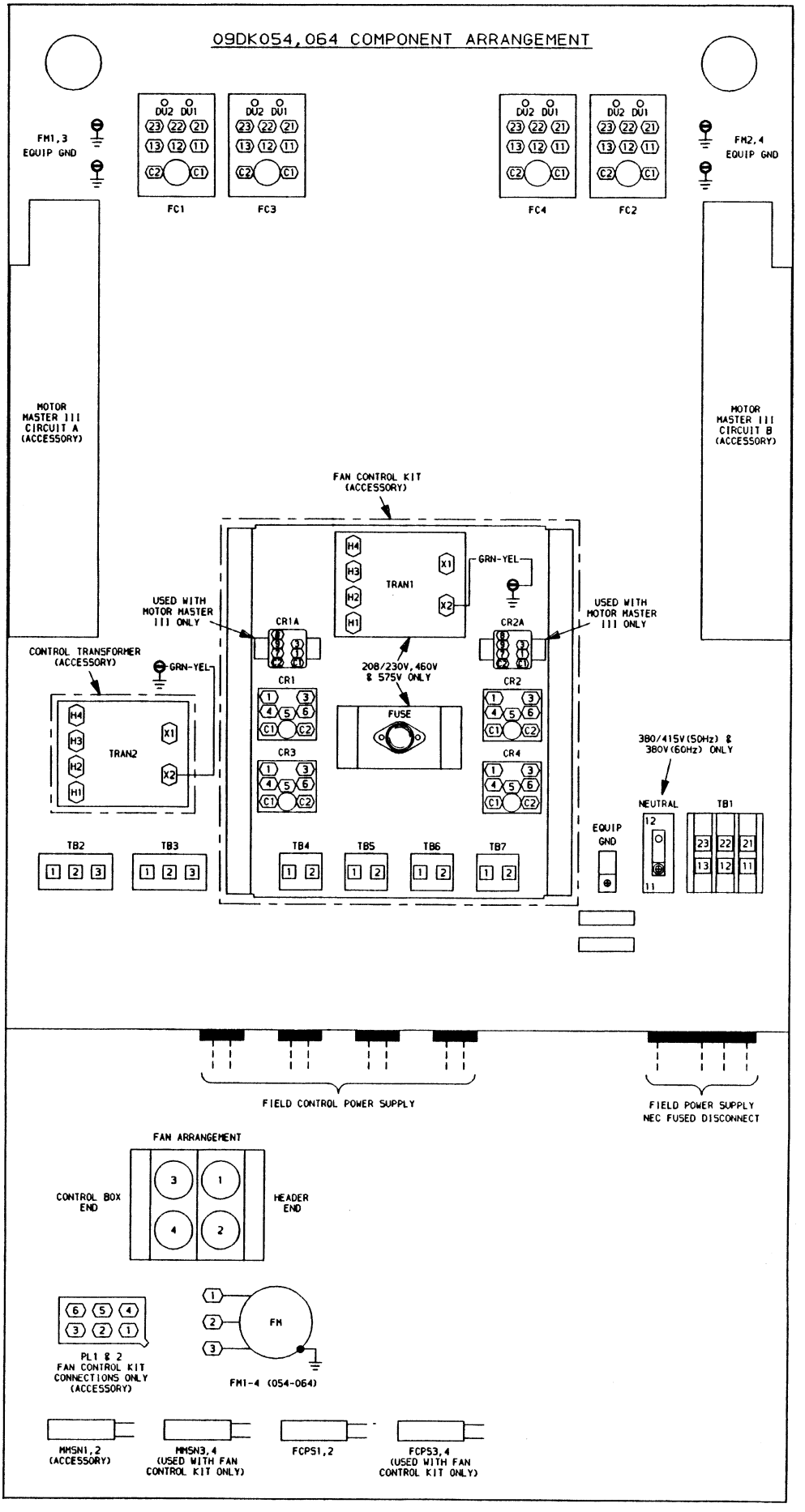


Fig. 4 — Wiring Diagram and Component Arrangement; 054 and 064 Units (cont)

LEGEND AND NOTES FOR FIG. 5

LEGEND

AWG	—	American Wire Gage
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 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.

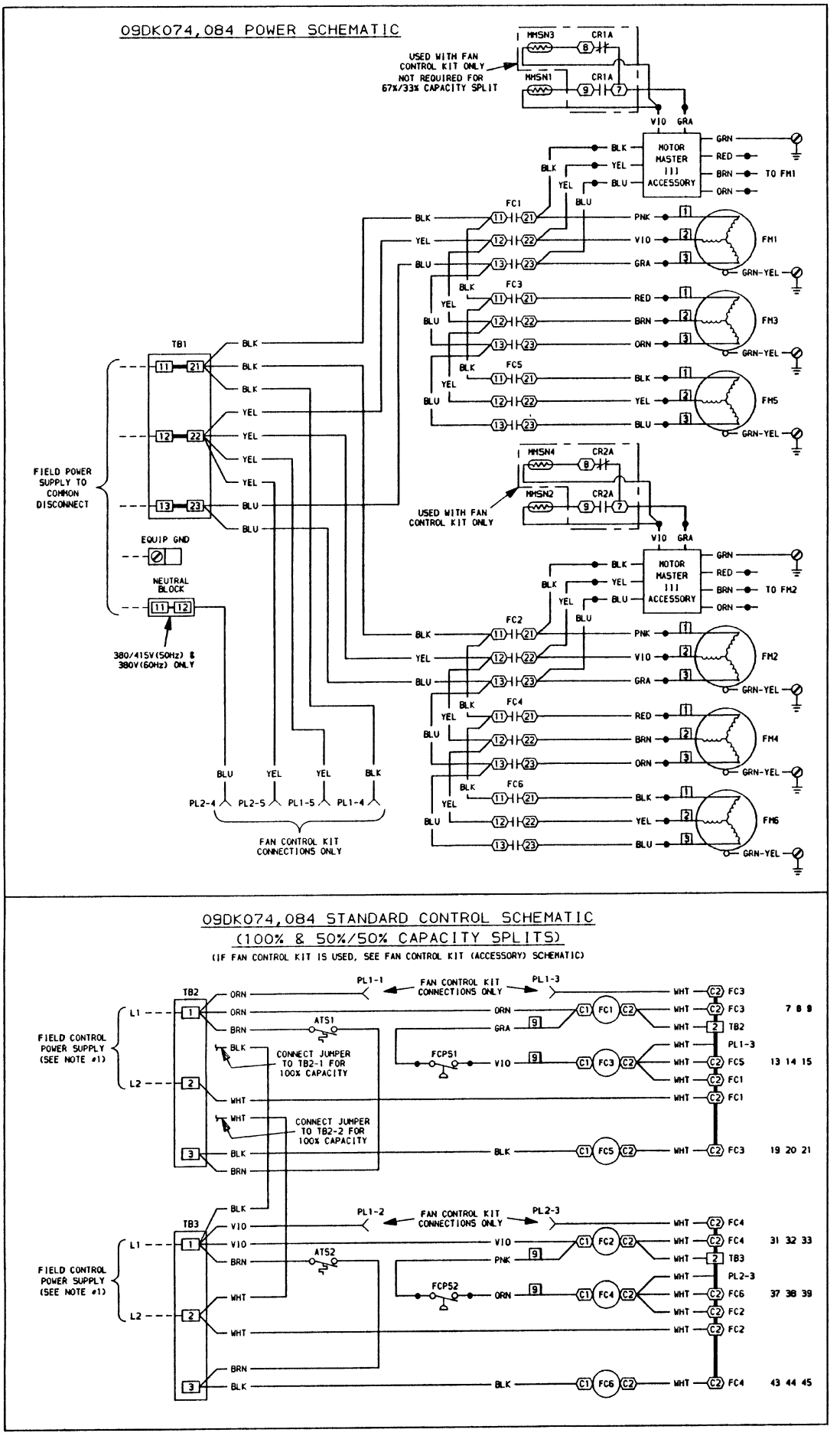


Fig. 5 — Wiring Diagram and Component Arrangement; 074 and 084 Units

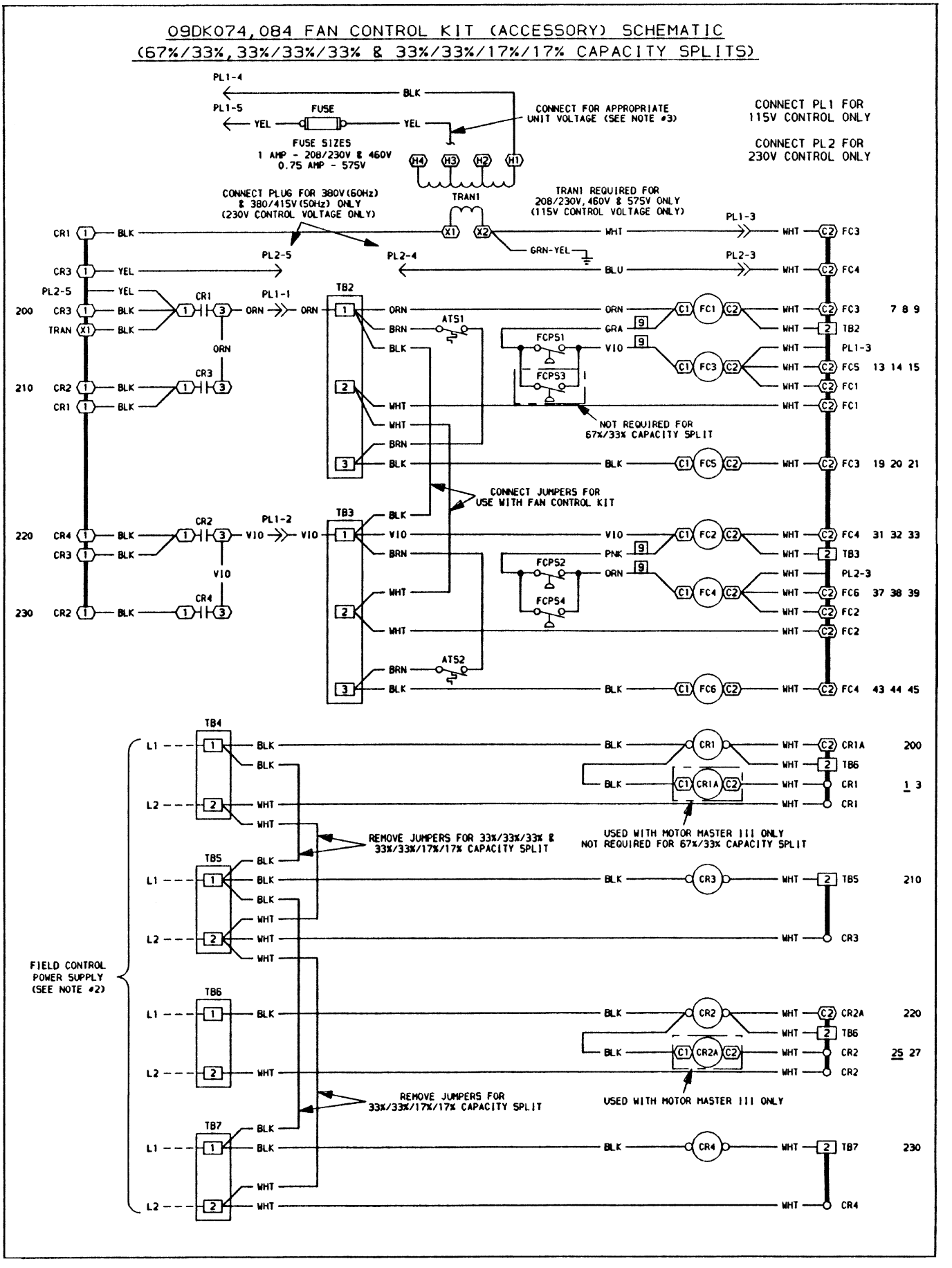


Fig. 5 — Wiring Diagram and Component Arrangement; 074 and 084 Units (cont)

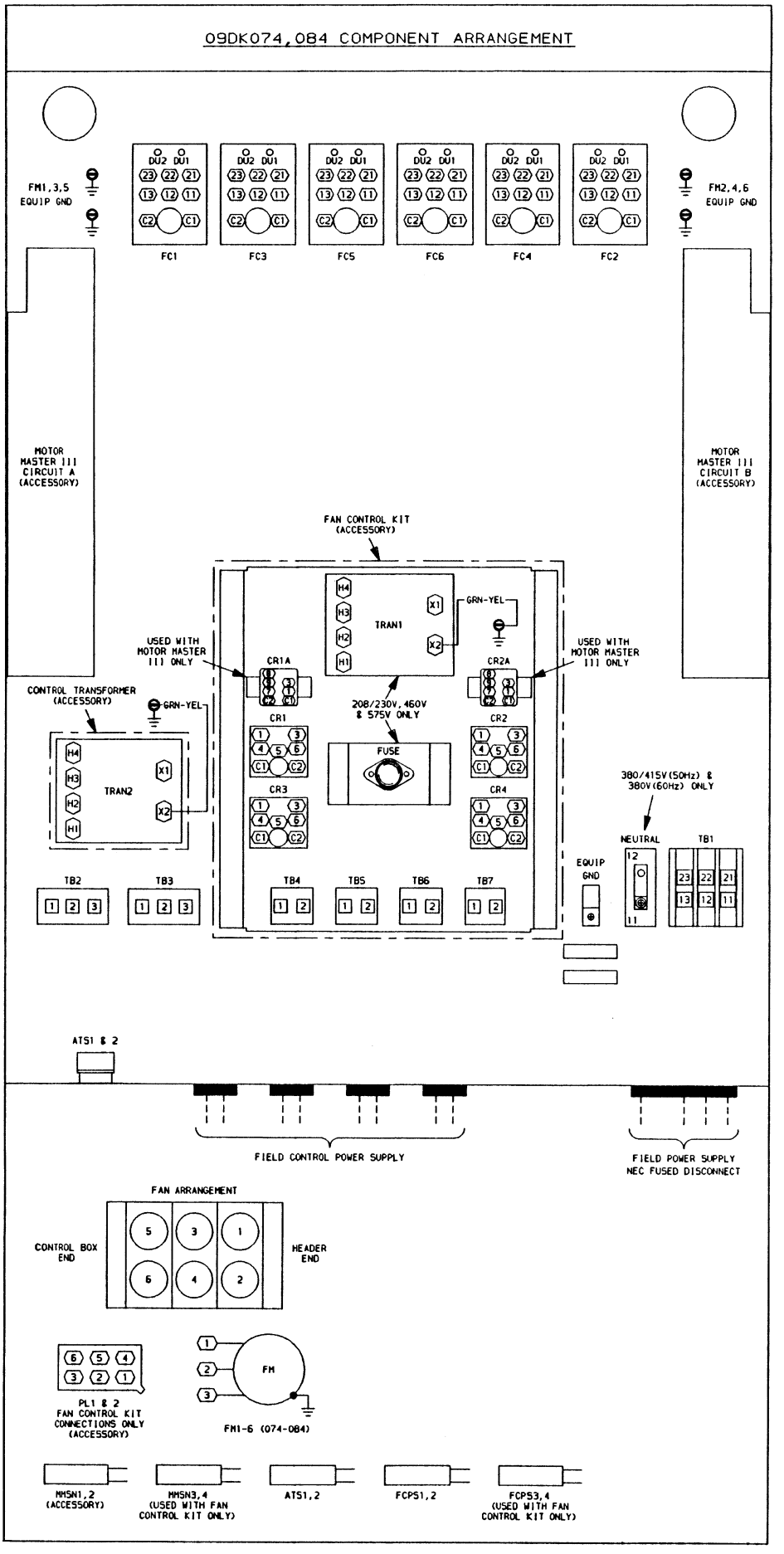
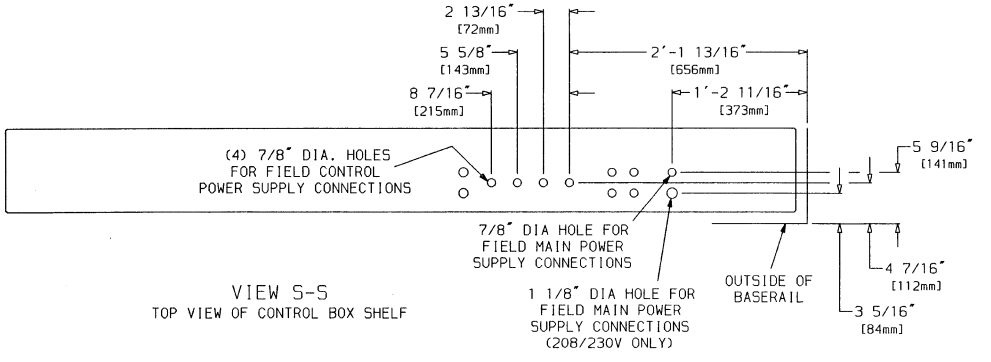


Fig. 5 — Wiring Diagram and Component Arrangement; 074 and 084 Units (cont)

NOTES:
1. Factory wiring is in accordance with National Electrical Code (NEC), field modifications or additions must be in compliance with all applicable codes.
2. 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.
3. Terminal blocks TB2, TB3, TB4, TB5, TB6, and TB7 are for external field control connections. Control connections are to be class 1 wiring.
4. Replacement of factory wires must be with type 105 C or its equivalent.
5. Units are factory wired for a 50/50% capacity split. If 100% capacity is required, connect the factory supplied jumpers from TB2-1 to TB3-1 and from TB2-2 to TB3-2.
6. If a fan control kit is to be used, the jumper from TB2-1 to TB3-1 and the jumper from TB2-2 to TB3-2 must be connected. The fan control kit is factory wired for a 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.
7. On fan control kits, 208/230-v units are factory wired for 230-v power supply. See Fig. 4 and 5, Note 3, for details.



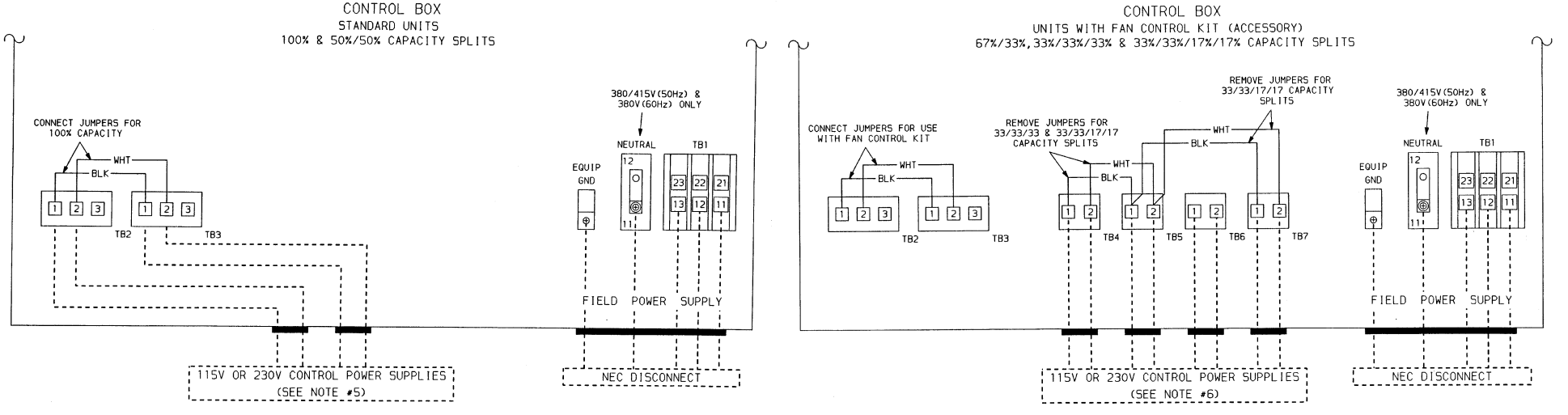
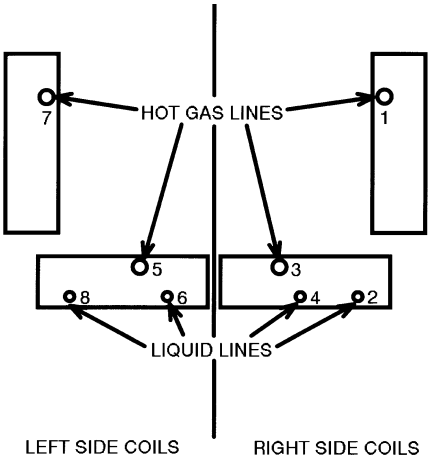
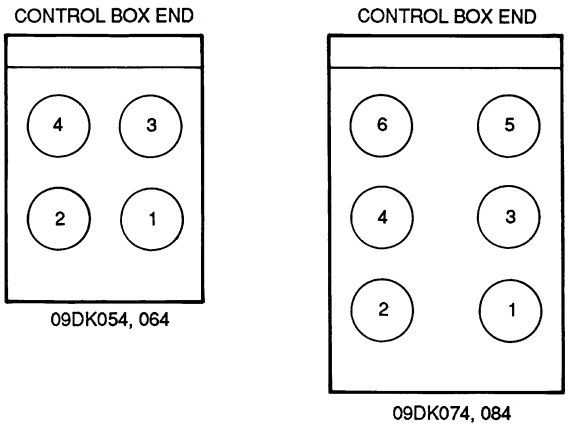


Fig. 6 — Field Wiring Details; 054-084 Units



COIL CONNECTION DIAGRAM



FAN NUMBER DESIGNATIONS

CAPACITY SPLIT%*	COIL CONNECTION TYPE	COIL CONNECTION NO.	TERMINAL BLOCK NO.	FANS CONTROLLED†
67	Hot Gas Line Liquid Line	1, 3, 5 2, 4, 6	TB4	1, 3, 5, 2, 4, 6
33	Hot Gas Line Liquid Line	7 8	TB6	2, 4, 6
33	Hot Gas Line Liquid Line	1 2	TB4	1, 3, 5
33	Hot Gas Line Liquid Line	7 8	TB6	2, 4, 6
33	Hot Gas Line Liquid Line	3, 5 4, 6	TB5	1, 3, 5, 2, 4, 6
33	Hot Gas Line Liquid Line	1 2	TB4	1, 3, 5
33	Hot Gas Line Liquid Line	7 8	TB6	2, 4, 6
17	Hot Gas Line Liquid Line	3 4	TB5	1, 3, 5
17	Hot Gas Line Liquid Line	5 6	TB7	2, 4, 6

*Typical percent capacity shown. See coil connection data detailed in 09DK base unit installation instructions for more information.
†Fans 5 and 6 are used on 09DK074, 084 units only.

This example uses 67/33% to explain how to determine the line connections and fan operations for a split application.

For the 67% circuit, hot gas lines are connected to coil connections 1, 3, and 5, and liquid lines are connected to 2, 4, and 6. The control circuit power will be connected at TB4, which controls all fans (1-6).

For the 33% circuit, the hot gas line is connected to coil connection no. 7 and the liquid line is connected to no. 8. The control circuit power is connected to TB6, which controls fans 2, 4, and 6.

Note that fans 2, 4, and 6 are shared by both the 67% and the 33% refrigerant circuits. The fan control kit ensures the fans will operate if needed for efficient control. If either circuit needs fans 2, 4, and 6 to operate, they will be on. If neither circuit needs these fans to operate, they will be off.

Fig. 7 — Coil Connection and Fan Control Details