



38AK007-012, 38AKS008-012
Air-Cooled Condensing Units
38AQS008
Split System Heat Pump
50/60 Hz



Wiring Diagrams

UNITS PRODUCED AFTER MARCH, 1994

DIAGRAM INDEX

UNIT	VOLTAGE DESIGNATION	ELECTRICAL CHARACTERISTICS (V-Ph-Hz)	LABEL DIAGRAM NO. 38AK	FIGURE NO.
38AK007-012 (Except 575-V)	501, 601	208/230-3-60, 460-3-60	500254	1
	803	220-3-50	500680	2
	903	400-3-50	500681	3
38AK007 (575-V)	101	575-3-60	500253	4
38AK008,012 (575-V)	101	575-3-60	500269	5
38AKS008-012	501, 601	208/230-3-60, 460-3-60	500270	6
	803	220-3-50	500682	7
	203	380-3-60	501147	8
	903	400-3-50	500683	9
	101	575-3-60	500271	10
38AQS008	501, 601	208/230-3-60, 460-3-60	501340	11
	803	220-3-50	501341	12
	903	400-3-50	501342	13

SEQUENCE OF OPERATION, 38AK and 38AKS UNITS

At start-up, the thermostat calls for cooling. With all safety devices satisfied, the compressor contactor and fan contactor energize, causing the compressor and outdoor (condenser) fan motor to operate. Contacts close, allowing the field-supplied and -installed indoor (evaporator) fan contactor to function. A field-supplied and -installed liquid line solenoid valve will also open, allowing the system to function in cooling.

As cooling demand is satisfied, the thermostat contacts break, deenergizing the contactor and causing the system to shut off. The liquid line solenoid valve closes, minimizing the potential for refrigerant migration. The compressor does not restart until the thermostat again calls for cooling. If a demand for cooling occurs within 5 minutes after the thermostat is satisfied, the system does not restart due to Time Guard® II device operation. After the 5-minute time period, the system restarts normally on thermostat demand.

The system is protected by a Cycle-LOC™ device so that the compressor does not start if a high-pressure or low-pressure fault occurs. To reset the Cycle-LOC device, set the thermostat to eliminate the cooling demand, then return to the original set point. This should be done only once. If system shuts down due to the same fault, determine the problem before attempting to reset the Cycle-LOC device.

SEQUENCE OF OPERATION, 38AQS008

When power is supplied to unit, the transformer (TRAN) is energized. The crankcase heater is also energized.

Cooling — With the thermostat in the cooling position, and when the space temperature comes within 2° F (1° C) of the cooling set point, the thermostat makes circuit R-O. This

energizes the reversing valve solenoid (RVS) and places the unit in standby condition for cooling.

As the space temperature continues to rise, the second stage of the thermostat makes, closing circuit R-Y. When compressor time delay (5 ± 2 minutes) is completed, a circuit is made to contactor (C), starting the compressor (COMP) and outdoor-fan motor (OFM). Circuit R-G is made at the same time, energizing the indoor-fan contactor (IFC) and starting the indoor-fan motor (IFM) after a 1-second delay.

When the thermostat is satisfied, contacts open, deenergizing C. The COMP, IFM, and OFM stop.

Heating — On a call for heat, thermostat makes circuits R-Y and R-G. When compressor time delay (5 ± 2 minutes) is completed, a circuit is made to C, starting COMP and OFM. Circuit R-G also energizes IFC and starts IFM after a 1-second delay.

Should room temperature continue to fall, circuit R-W is made through second-stage thermostat bulb. If optional electric heat package is used, a relay is energized, bringing on supplemental electric heat. When thermostat is satisfied, contacts open, deenergizing contactor and relay; motors and heaters deenergize.

Defrost — Defrost board (DB) is a time and temperature control, which includes a field-selectable time period (30, 50, and 90 minutes) between checks for frost. Electronic timer and defrost cycle start only when contactor is energized and defrost thermostat (DFT) is closed (below 28 F [-2.2 C]).

Defrost mode is identical to Cooling mode, except outdoor-fan motor (OFM) stops and a bank of supplemental electric heat turns on to warm air supplying the conditioned space. Defrost mode is terminated when DFT reaches 65 F (18.3 C).

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

LEGEND, Fig. 1 - 13

AHA	- Adjustable Heat Anticipator
AUTO	- Automatic
C	- Contactor, Compressor
CAP	- Capacitor
CB	- Circuit Breaker
CC	- Cooling Compensator
CH	- Crankcase Heater
CLO	- Compressor Lockout
COMP	- Compressor Motor
COTP	- Compressor Overtemperature Protection
DFT	- Defrost Thermostat
EQUIP	- Equipment
GND	- Ground
HPS	- High-Pressure Switch
IFC	- Indoor-Fan Contactor
LCS	- Loss of Charge Switch
LLSV	- Liquid Line Solenoid Valve
LPS	- Low-Pressure Switch
NEUT	- Neutral
OFC	- Outdoor-Fan Contactor
OFM	- Outdoor-Fan Motor
OL	- Overload Relay
QT	- Quadruple Terminal
RC	- Relay, Cooling
RH	- Relay, Heating

RVS	- Reversing Valve
TB	- Terminal Block
TC	- Thermostat, Cooling
TDR	- Time Delay Relay
TH	- Thermostat, Heating
TRAN	- Transformer
VA	- Volt-Ampere

	Field Splice
	Terminal (Marked)
	Terminal (Unmarked)
	Terminal Block
	Splice
	Factory Wiring
	Field Control Wiring
	Field Power Wiring
	Accessory or Optional Wiring
	To indicate common potential only, not to represent wiring.

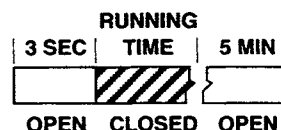
NOTES, Fig. 1 - 10

1. If any of the original wire furnished must be replaced, replace with type 90 C or its equivalent.
2. Recommended accessory thermostats: HH07AT170, 172, 174 and P272-2783. Recommended subbases: HH93AZ176, 178; P272-1882, 1883; HH93AZ177, 179.
3. Sealed VA for IFC and LLSV is not to exceed 22.
4. Use copper conductors only.
5. The 3-phase motors are protected under primary single-phasing conditions.

6. The following control circuit protection is supplied:

VOLTAGE RATING	CB	MUST TRIP AMPS
	MFR, PT NO.	
24V	Potter & Brumfield W28X-1024-3.2	3.2

7. The Time Guard® II control timing sequence follows:

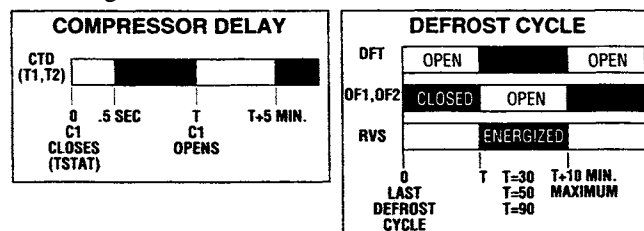


NOTES, Fig. 11 - 13

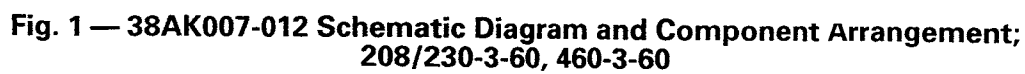
1. If any of the original wire furnished must be replaced, replace with type 90 C or its equivalent.
2. Recommended thermostat: HH07AT171. Recommended subbase: HH93AZ188.
3. Set heat anticipator at 0.6.
4. Use copper conductors only. The 3-phase motors are protected under primary single-phasing conditions.
5. The following control circuit protection is supplied:

VOLTAGE RATING	CB	MUST TRIP AMPS
	MFR, PT NO.	
24V	Potter & Brumfield W28X-1024-3.2	3.2

6. The 38AQS008 compressor delay and defrost cycle timing are as follows:



7. For 208/230 and 460 V units only; 39 VA available for field-installed accessories. Control power requirement for outdoor unit is 36 VA (sealed). Supplied control transformer is 75 VA.



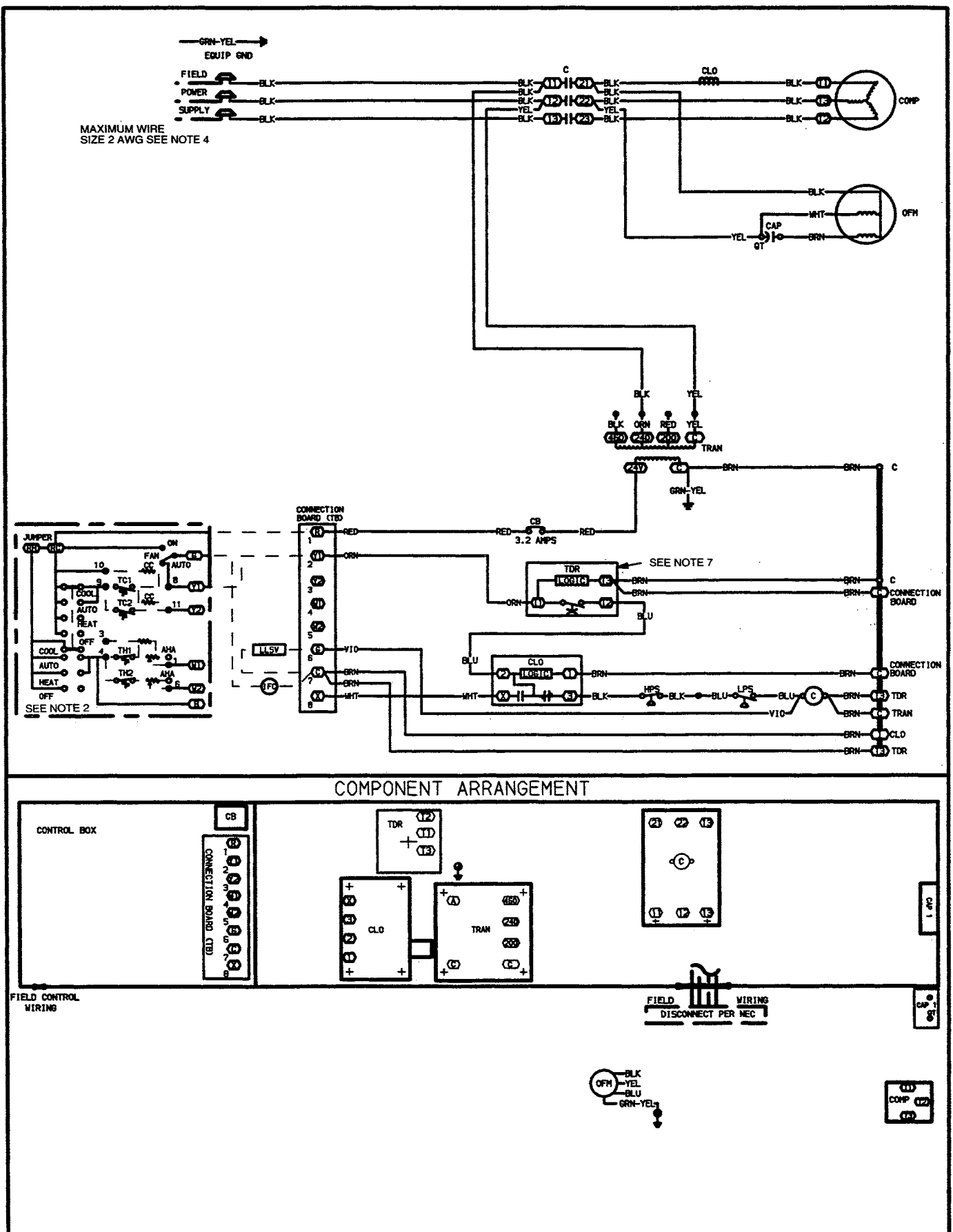


Fig. 2 — 38AK007-012 Schematic Diagram and Component Arrangement; 220-3-50

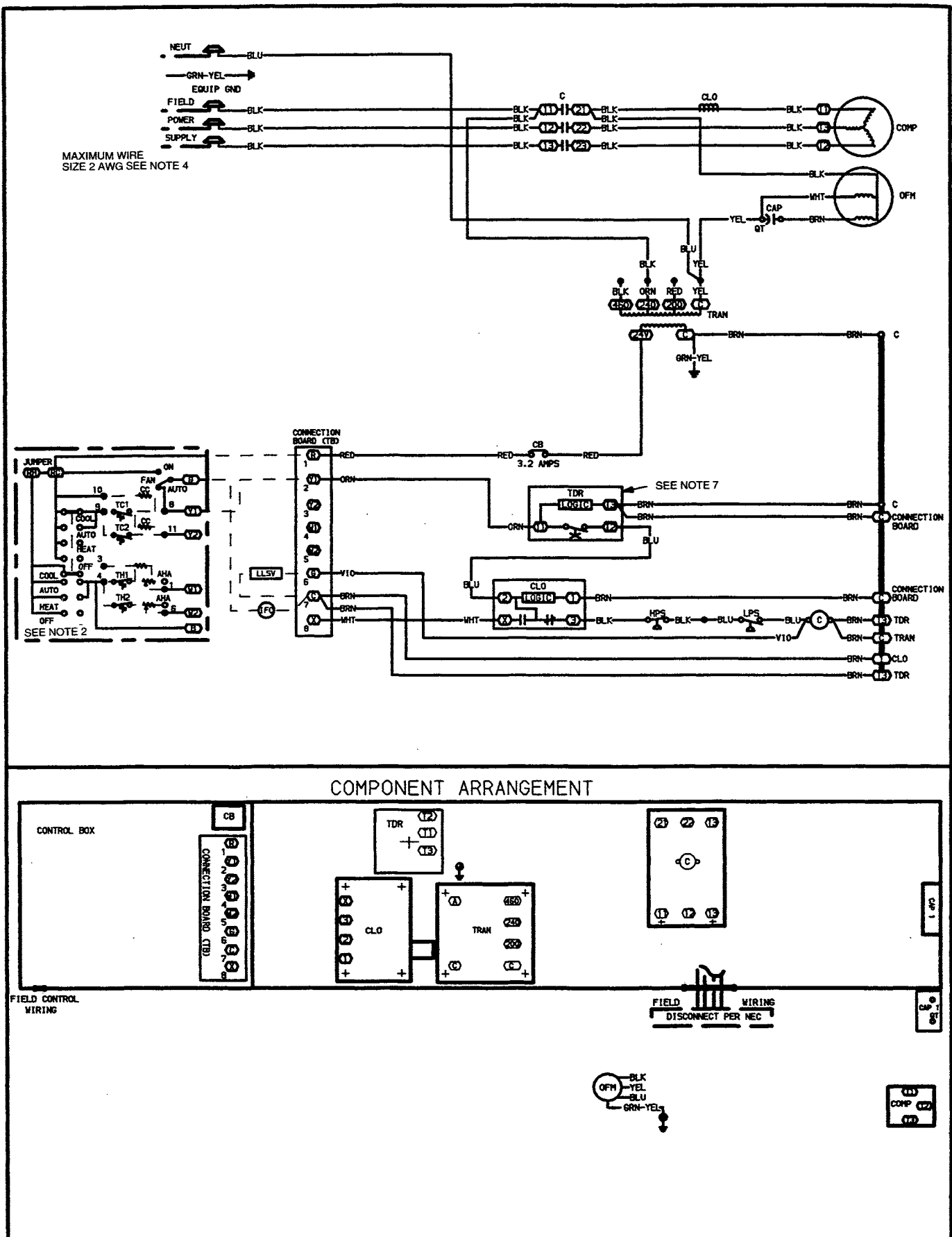


Fig. 3 — 38AK007-012 Schematic Diagram and Component Arrangement; 400-3-50

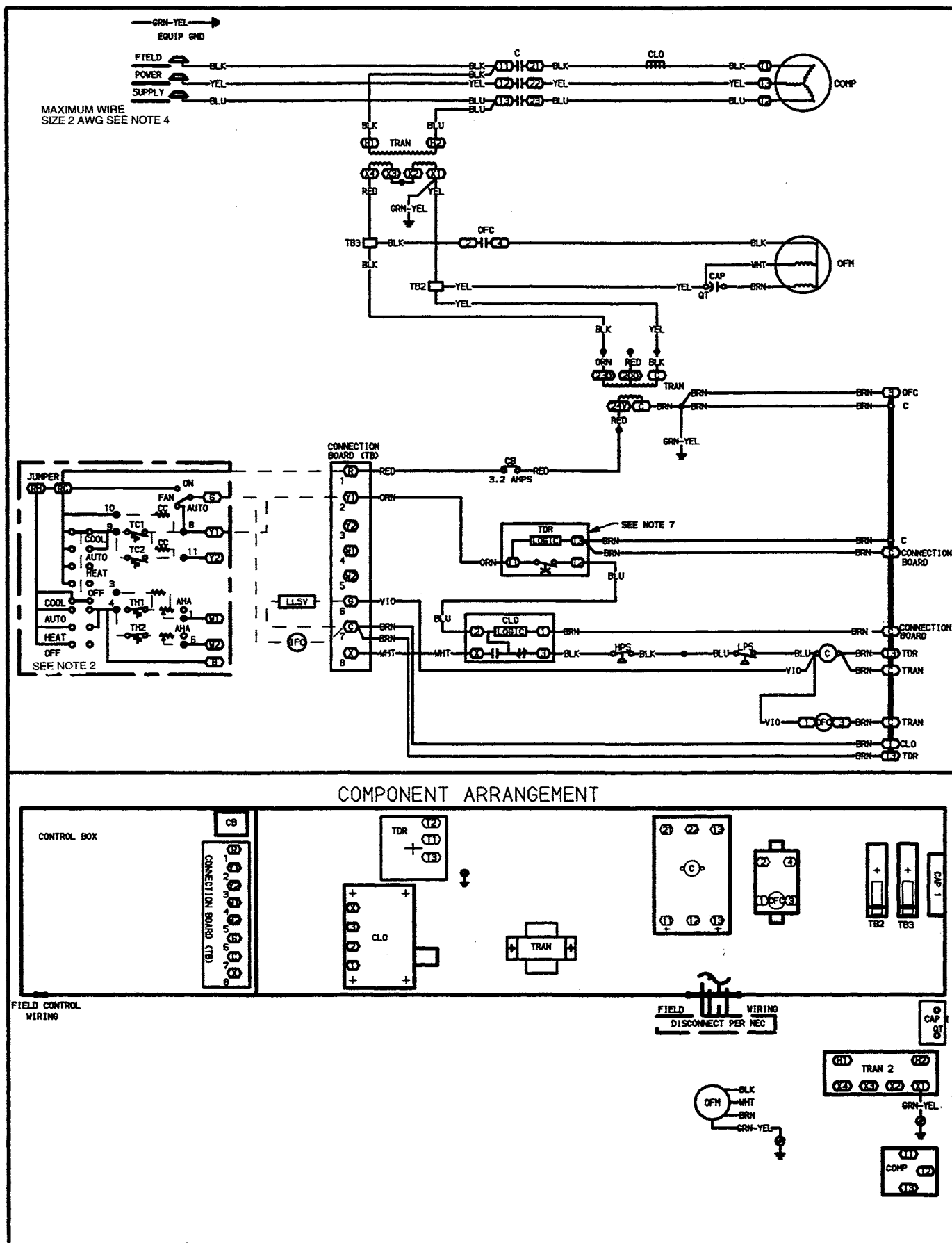


Fig. 4 — 38AK007 Schematic Diagram and
Component Arrangement; 575-3-60

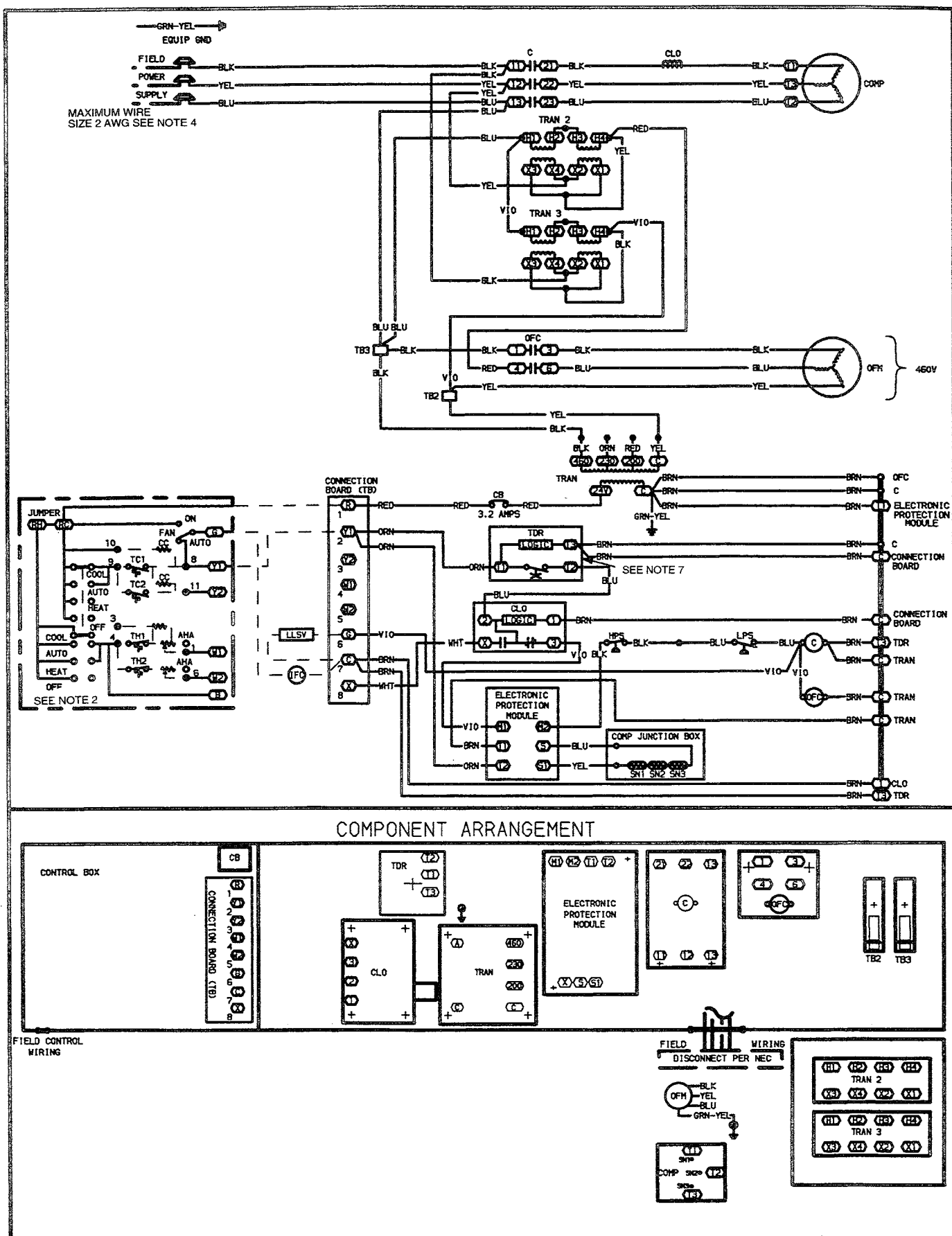
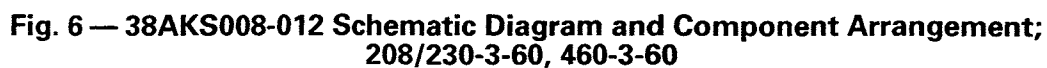


Fig. 5 — 38AK008,012 Schematic Diagram and Component Arrangement; 575-3-60





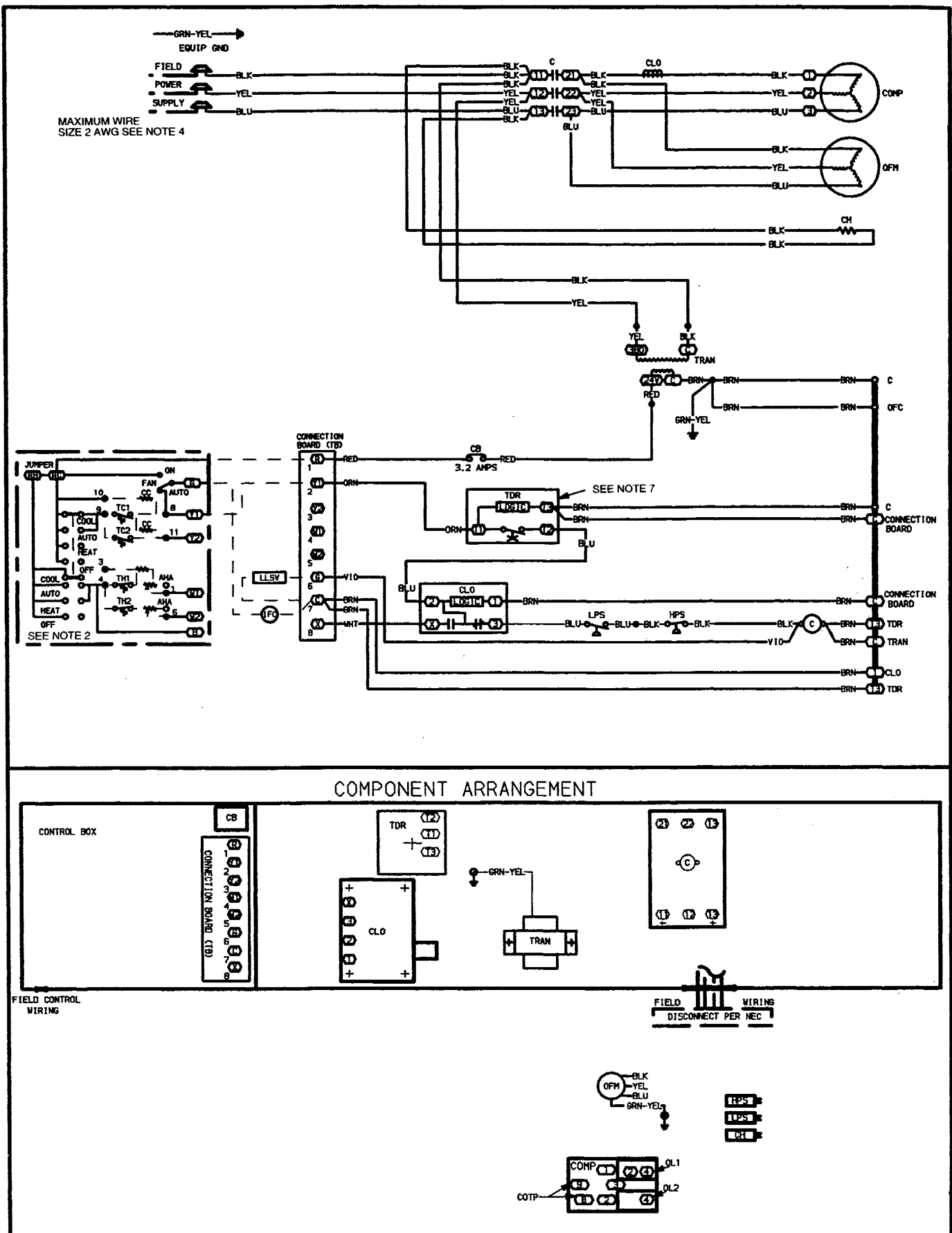


Fig. 8 — 38AKS008-012 Schematic Diagram and Component Arrangement; 380-3-60

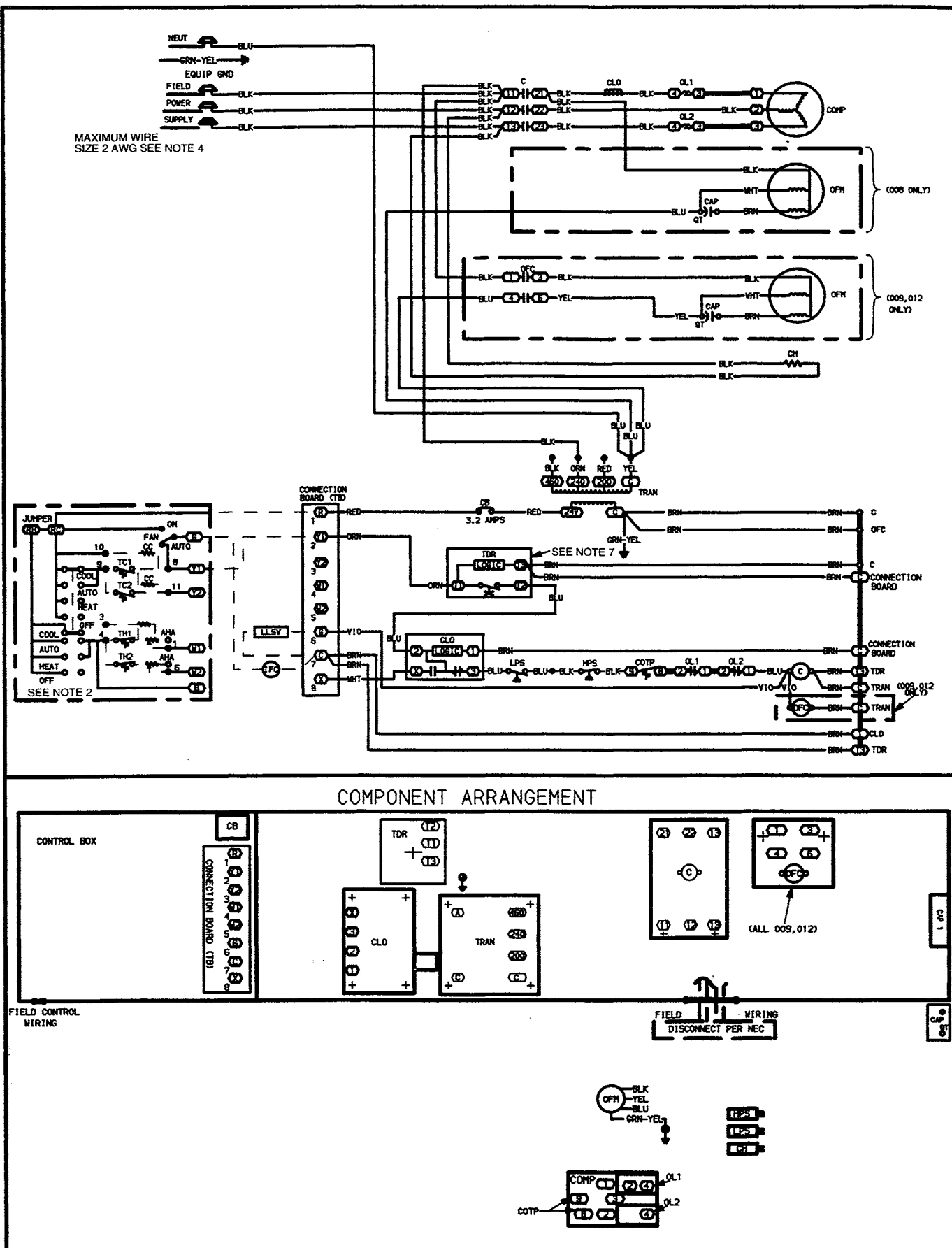


Fig. 9 — 38AKS008-012 Schematic Diagram and Component Arrangement; 400-3-50



