



48/50HJ004-007 Single Package Rooftop Gas Heating/Electric Cooling and Electric Cooling Units

Wiring Diagrams

UNIT LABEL DIAGRAM				
Unit	Voltage-Phase-Hertz	Type	Label Diagram	Figure No.
48HJD,HJE,HJF004,005	208/230-3-60	Schematic/Component Arrangement	50HJ501028	1
48HJG,HJH,HJK,HJL,HJM,HJN004,005	208/230-3-60*	Schematic/Component Arrangement	50HJ540077	2
48HJD,HJE,HJF004,005	460-3-60	Schematic/Component Arrangement	50HJ501029	3
48HJG,HJH,HJK,HJL,HJM,HJN004,005	460-3-60*	Schematic/Component Arrangement	50HJ540225	4
48HJD,HJE,HJF004,005	575-3-60†	Schematic/Component Arrangement	50HJ501030	5
48HJD,HJE,HJF004-006	208/230-1-60**	Schematic/Component Arrangement	50HJ501027	6
48HJG,HJH,HJK,HJL,HJM,HJN006	208/230-1-60*	Schematic/Component Arrangement	50HJ540226	7
	460-3-60*	Schematic/Component Arrangement	50HJ540227	8
48HJD,HJE,HJF007	208/230-3-60	Schematic/Component Arrangement	50HJ501031	9
	460-3-60	Schematic/Component Arrangement	50HJ501032	10
	575-3-60	Schematic/Component Arrangement	50HJ501033	11
50HJ004-006	208/230-1-60	Schematic/Component Arrangement	50HJ501034	12
50HJ004,005	208/230-3-60	Schematic/Component Arrangement	50HJ501035	13
	460-3-60	Schematic/Component Arrangement	50HJ501036	14
	575-3-60††	Schematic/Component Arrangement	50HJ501037	15
50HJ006	208/230-3-60	Schematic/Component Arrangement	50HJ501024	16
	460-3-60	Schematic/Component Arrangement	50HJ501025	17
	575-3-60	Schematic/Component Arrangement	50HJ501026	18
50HJ007	208/230-3-60, 460-3-60	Schematic/Component Arrangement	50HJ501038	19
	575-3-60	Schematic/Component Arrangement	50HJ501039	20
	400-3-50	Schematic/Component Arrangement	50HJ501040	21

*Low NO_x/California Compliant Units.

†Standard Indoor Motor.

**Applies to Low NO_x Units.

††004-005 High-Static Indoor Motor.

ELECTRIC HEATING (50HJ Only)				
Unit (Voltage-Phase)	Unit Size	Electric Heater (kW)	Label Diagram	Fig. No.
208/230-3	004-006	ALL	3-05531	22
	004-007	ALL	3-05607	23
	008-014	18.0/24.0	3-05626	24
	008-014	7.8/10.4, 12.0/16.0	3-05623	25
		24.0/32.0, 31.8/42.4	3-05626	24
	012-014	37.6/50.0	3-05626	
460-3	004-007	ALL	3-05536	26
	008-009	13.9	3-05624	27
	008-014	16.5	3-05624	
		27.8/33.0/41.7	3-05625	28
	012-014	50.0	3-05625	
575-3	008-014	17.0	3-05624	27
	008-014	34.0	3-05625	28
	012-014	51.0	3-05625	

ACCESSORY WIRING		
Description	Unit Size	Fig. No.
Motormaster® Wiring Details	004-014	29
Motormaster II Wiring Schematic	004-007	30
	008-014	31
Time Guard® II Device	004-014	32
Solid-State Enthalpy Control	004-014	33
Differential Enthalpy Control	004-014	34
EconoMi\$er Wiring	004-007	35
EconoMi\$er Sensor Wiring	004-014	36
EconoMi\$er Power Exhaust Wiring	004-007	37
Enthalpy Control/Board Wiring	004-014	38

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

48HJ OPERATING SEQUENCE

Cooling, Units Without Economizer — When thermostat calls for cooling, terminals G and Y1 are energized. The indoor (evaporator) fan motor (IFM), compressor (C), and outdoor (condenser) fan motor (OFM) start. The OFM runs continuously while the unit is in cooling. When the thermostat is satisfied, C is deenergized and the compressor and OFM shut off. After a 30-second delay, the (IFM) shuts off. If the thermostat fan selector switch is in the ON position, the evaporator motor will run continuously.

Heating, Units Without Economizer — When the thermostat calls for heating, terminal W1 is energized. The induced-draft motor is energized and the burner ignition sequence begins. The indoor (evaporator) fan motor (IFM) is energized 45 seconds after a flame is ignited. When additional heat is needed, W2 is energized and the high-fire solenoid on the main gas valve (MGV) is energized. When the thermostat is satisfied and W1 is deenergized, the IFM stops after a 45-second time-off delay.

Cooling, Units With Durablade Economizer — When the outdoor-air temperature is above the outdoor-air thermostat (OAT) setting and the room thermostat calls for cooling, compressor contactor is energized to start compressor and the outdoor (condenser) fan motor (OFM). The indoor (evaporator) fan motor (IFM) is energized and the economizer damper moves to the minimum position. After the thermostat is satisfied, there is a 30-second delay before the evaporator fan turns off. The damper then moves to the fully closed position. When using continuous fan, the damper moves to the minimum position.

When the outdoor-air temperature is below the OAT setting and the thermostat calls for cooling, the economizer damper move to the minimum position. If the supply-air temperature is above 57 F, the damper continues to open until it reaches the fully open position or until the supply-air temperature drops below 52 F.

When the supply-air temperature falls between 57 F and 52 F, the damper will remain at an intermediate open position. If the supply-air temperature falls below 52 F, the damper will modulate closed until it reaches the minimum position or until the supply-air temperature is above 52 F. When the thermostat is satisfied, the damper moves to the fully closed position when using AUTO. fan or to the minimum position when using continuous fan.

If the outdoor air alone cannot satisfy the cooling requirements of the conditioned space, economizer cooling is integrated with mechanical cooling, providing two stages of cooling. Compressor and the condenser fan will be energized and the position of the economizer damper will be determined by the supply-air temperature. When the second stage of cooling is satisfied, the compressor and OFM will be deenergized. The damper position will be determined by the supply-air temperature. When the first stage of cooling is satisfied, there is a 30-second delay before the evaporator fan shuts off. The damper then moves to the fully closed position. When using a continuous fan, the damper moves to the minimum position.

Cooling, Units With EconoMi\$er — When the Outdoor Air Temperature (OAT) is above the ECON SP set point and the room thermostat calls for Stage 1 cooling (R to G + Y1), the indoor-fan motor (IFM) is energized and the EconoMi\$er damper modulates to minimum position. The compressor contactor is energized starting the compressor and outdoor-fan motor (OFM). After the thermostat is satisfied, the damper modulates to the fully closed position when the IFM is deenergized.

When the OAT is below the ECON SP set point and the room thermostat calls for Stage 1 cooling (R to G + Y1), the EconoMi\$er modulates to the minimum position when the

IFM is energized. The EconoMi\$er provides Stage 1 of cooling by modulating the return and outdoor air dampers to maintain a 55 F supply air set point. If the supply-air temperature (SAT) is greater than 57 F, the EconoMi\$er modulates open, allowing a greater amount of outdoor air to enter the unit. If the SAT drops below 53 F, the outdoor-air damper modules closed to reduce the amount of outdoor air. When the SAT is between 53 and 57 F, the EconoMi\$er maintains its position.

Heating, Units With Economizer — When the thermostat calls for heating, terminal W1 is energized. The induced-draft motor is energized and the burner ignition sequence begins. The indoor (evaporator) fan motor (IFM) is energized 45 seconds after a flame is ignited and the damper moves to the minimum position. When additional heat is needed, W2 energized and the high-fire solenoid on the main gas valve (MGV) is energized. When the thermostat is satisfied and W1 is deenergized, the IFM stops after a 45-second time-off delay. The economizer damper then moves to the fully closed position. When using continuous fan, the damper will remain in the minimum position.

Units With MoistureMiser Dehumidification Package — When thermostat calls for cooling, terminals G and Y1 is energized. The indoor (evaporator) fan motor (IFM), compressor (C), and outdoor (condenser) fan motor (OFM) start. The OFM runs continuously while the unit is in cooling. As shipped from the factory, MoistureMiser dehumidification circuit is always energized. If MoistureMiser circuit modulation is desired, a field-installed, wall-mounted LC Humidistat or humidistat are required.

If the MoistureMiser humidistat is installed and calls for the MoistureMiser subcooler coil to operate, the humidistat internal switch closes. This energizes and closes the liquid line solenoid valve coil (LLSV) of the MoistureMiser circuit, forcing the hot liquid refrigerant of the liquid line to enter the subcooler coil. As the hot liquid passes through the subcooler coil, it is exposed to the cold supply airflow coming off from the evaporator coil and the liquid is further cooled to a temperature approaching the evaporator coil leaving-air temperature. The state of the refrigerant leaving the subcooler coil is a highly subcooled liquid refrigerant. The liquid then enters a thermostatic expansion valve (TXV) where the liquid is dropped to a lower pressure. The TXV does not have a pressure drop great enough to change the liquid to a 2-phase fluid. The TXV can throttle the pressure drop of the liquid refrigerant and maintain proper conditions at the compressor suction valve over a wide range of operating conditions. The liquid then enters a second fixed restrictor expansion device for a second pressure drop to a 2-phase fluid. The liquid proceeds to the evaporator coil at a temperature lower than normal cooling operation. This lower temperature is what increases the latent capacity of the rooftop. The 2-phase refrigerant passes through the evaporator and is changed into a vapor. The air passing over the evaporator coil will become colder than during normal operation as a result of the colder refrigerant temperatures. However, as it passes over the subcooler coil, the air will be warmed slightly.

As the refrigerant leaves the evaporator, the refrigerant passes a low-pressure switch in the suction line. This low-pressure switch will de-activate the MoistureMiser package when the suction pressure reaches 60 psig. The low-pressure switch is an added safety device to protect against evaporator coil freeze-up. The low-pressure switch will only de-activate and open the liquid line solenoid valve in the MoistureMiser circuit. The compressors will continue to run as long as there is a call for cooling, regardless of the position of the low-pressure switch. The solenoid valve and the MoistureMiser package will be re-activated only when the call for cooling has been satisfied, the low-pressure switch has closed, and a new call for cooling exists. The crankcase heaters on the scroll compressor

provide additional protection for the compressor due to the additional refrigerant charge in the subcooler.

When the humidistat is satisfied, the humidistat internal switch opens cutting power to and opening the LLSV. The refrigerant is routed back through the evaporator and the sub-cooler coil is removed from the refrigerant loop.

When the thermostat is satisfied, C1 is deenergized and the compressor and OFM shut off. After a 30-second delay, the IFM shuts off. If the thermostat fan selector switch is in the ON position, the IFM will run continuously.

50HJ OPERATING SEQUENCE

Cooling, Units Without Economizer — When the thermostat calls for cooling, terminals G and Y1 are energized. The indoor (evaporator) fan contactor (IFC), and compressor contactor no. 1 (C1) are energized and the indoor (evaporator) fan motor (IFM), compressor no. 1, and condenser fan start. The outdoor (condenser) fan motor (OFM) runs continuously while unit is cooling.

Cooling, Units With Durablade Economizer — When the outdoor-air temperature is above the outdoor-air temperature (OAT) setting and the room thermostat calls for cooling, the compressor contactor is energized to start the compressor and outdoor (condenser) fan motor (OFM). The indoor (evaporator) fan motor (IFM) is energized and the economizer damper moves to the minimum position. After the thermostat is satisfied, the damper moves to the fully closed position when IFM is deenergized.

When the outdoor-air temperature is below the OAT setting and the thermostat calls for Y1 and G (cooling), the economizer damper moves to the minimum position when the evaporator fan starts. The first stage of cooling is provided by the economizer. If the supply-air temperature is above 57 F, a switch on the supply-air thermostat is closed between the T2 terminal and the 24 vac terminal. This causes the damper to continue to modulate open until the supply-air temperature falls below 55 F or the damper reaches the fully open position.

When the supply-air temperature is between 55 F and 52 F, the supply-air thermostat has open switches between the T2 and 24 vac terminals and between the T1 and 24 vac terminals. This causes the economizer damper to remain in an intermediate open position.

If the supply-air temperature falls below 52 F, a switch on the supply-air thermostat is closed between the T1 terminal and the 24 vac terminal. This causes the damper to modulate closed until the supply-air temperature rises above 55 F or the damper reaches the minimum position.

When the supply-air temperature is between 55 F and 57 F, the supply-air thermostat has open switches between the T2 and 24 vac terminals. This causes the economizer damper to remain in an intermediate open position.

If the outdoor air alone cannot satisfy the cooling requirements of the conditioned space, economizer cooling is integrated with mechanical cooling, providing second stage cooling. The compressor and condenser fan will be energized and the position of the economizer damper will be determined by the supply-air temperature.

When the second stage of cooling is satisfied, the compressor and OFM will be deenergized. The damper position will be determined by the supply-air temperature.

When the first stage of cooling is satisfied, there is a 30-second delay before the evaporator fan shuts off on size 004-007 units. The damper will move to fully closed position.

Cooling, Units With EconoMi\$er — When the outdoor-air temperature (OAT) is above the ECON SP set point and the

room thermostat calls for Stage 1 cooling (R to G + Y1), the indoor (evaporator) fan motor (IFM) is energized and the EconoMi\$er damper modulates to minimum position. The compressor contactor is energized to start the compressor and outdoor (condenser) fan motor (OFM). After the thermostat is satisfied, the damper modulates to the fully closed position when the IFM is deenergized.

When the OAT is below the ECON SP setting and the room thermostat calls for Stage 1 cooling (R to G + Y1), the EconoMi\$er modulates to the minimum position when the IFM is energized. The EconoMi\$er provides Stage 1 of cooling by modulating the return and outdoor air dampers to maintain a 55 F supply air set point. If the supply-air temperature (SAT) is greater than 57 F, the EconoMi\$er modulates open, allowing a greater amount of outdoor air to enter the unit. If the SAT drops below 53 F, the outdoor air damper modulates closed to reduce the amount of outdoor air. When the SAT is between 53 and 57 F, the EconoMi\$er maintains its position.

If outdoor air alone cannot satisfy the cooling requirements of the conditioned space, and the OAT is above the MECH CLG LOCKOUT set point, the EconoMi\$er integrates free cooling with mechanical cooling. This is accomplished by the strategies below.

NOTE: Compressor has a 2-minute Minimum On, Minimum Off, and Interstage delay timer.

1. If Y1 is energized, and the room thermostat calls for Y2 (2-stage thermostat), the compressor and OFM are energized. The position of the EconoMi\$er damper is maintained at its current value.
2. If Y1 is energized for more than 20 minutes, and Y2 is not energized (whether or not a 2-stage thermostat is used), the compressor and OFM are energized. The position of the EconoMi\$er damper is maintained at its current value.
3. If Y1 is energized, and the compressor is already energized (see Step 2) and the room thermostat calls for Y2, the compressor continues to operate.
4. If the compressor is energized and the thermostat is satisfied, the compressor, the OFM, and IFM are de-energized and the EconoMi\$er modulates closed.

When the OAT is below the MECH CLG LOCKOUT set point, the compressors remain off.

Heating, Units With Electric Heat — For units without economizer, on a call for heating through terminal W1, IFC and heater contactor no. 1 (HC1) are energized. On units equipped for 2 stages of heat, when additional heat is needed HC2 is energized through W2.

For units with economizer or accessory two-position damper, on a call for heat through W1, the IFC energizes to start the evaporator fan and the economizer damper blade opens to the minimum position. If the accessory two-position damper is used, the outdoor-air damper opens to the minimum position whenever the evaporator fan runs. If unit is equipped with 2 stages of heat, when additional heat is needed a call is made through W2.

As space temperature approaches the heating temperature set point, heating stages cycle off. Economizer or accessory two-position damper returns to fully closed position.

Units With MoistureMiser Dehumidification Package — When thermostat calls for cooling, terminals G and Y1 is energized. The indoor (evaporator) fan motor (IFM), compressor (C), and outdoor (condenser) fan motor (OFM) start. The OFM runs continuously while the unit is in cooling. As shipped from the factory, MoistureMiser dehumidification circuit is always energized. If MoistureMiser circuit modulation is desired, a field-installed, wall-mounted LC Humidistat or humidistat are required.

If the MoistureMiser humidistat is installed and calls for the MoistureMiser subcooler coil to operate, the humidistat internal switch closes. This energizes and closes the liquid line solenoid valve coil (LLSV) of the MoistureMiser circuit, forcing the hot liquid refrigerant of the liquid line to enter the subcooler coil. As the hot liquid passes through the subcooler coil, it is exposed to the cold supply airflow coming off from the evaporator coil and the liquid is further cooled to a temperature approaching the evaporator coil leaving-air temperature. The state of the refrigerant leaving the subcooler coil is a highly subcooled liquid refrigerant. The liquid then enters a thermostatic expansion valve (TXV) where the liquid is dropped to a lower pressure. The TXV does not have a pressure drop great enough to change the liquid to a 2-phase fluid. The TXV can throttle the pressure drop of the liquid refrigerant and maintain proper conditions at the compressor suction valve over a wide range of operating conditions. The liquid then enters a second fixed restrictor expansion device for a second pressure drop to a 2-phase fluid. The liquid proceeds to the evaporator coil at a temperature lower than normal cooling operation. This lower temperature is what increases the latent capacity of the rooftop. The 2-phase refrigerant passes through the evaporator and is changed into a vapor. The air passing over the evaporator coil will become colder than during normal operation as a result of the colder refrigerant temperatures. However, as it passes over the subcooler coil, the air will be warmed slightly.

As the refrigerant leaves the evaporator, the refrigerant passes a low-pressure switch in the suction line. This low-pressure switch will de-activate the MoistureMiser package when the suction pressure reaches 60 psig. The low-pressure switch is an added safety device to protect against evaporator coil freeze-up. The low-pressure switch will only de-activate and open the liquid line solenoid valve in the MoistureMiser circuit. The compressors will continue to run as long as there is a call for cooling, regardless of the position of the low-pressure switch. The solenoid valve and the MoistureMiser package will be re-activated only when the call for cooling has been satisfied, the low-pressure switch has closed, and a new call for cooling exists. The crankcase heaters on the scroll compressor provide additional protection for the compressor due to the additional refrigerant charge in the subcooler.

When the humidistat is satisfied, the humidistat internal switch opens cutting power to and opening the LLSV. The refrigerant is routed back through the evaporator and the subcooler coil is removed from the refrigerant loop.

When the thermostat is satisfied, C1 is deenergized and the compressor and OFM shut off. After a 30-second delay, the IFM shuts off. If the thermostat fan selector switch is in the ON position, the IFM will run continuously.

LEGEND

AHA	— Adjustable Heat Anticipator
C	— Contactor, Compressor
CAP	— Capacitor
CB	— Circuit Breaker
CC	— Cooling Compensator
CH	— Crankcase Heater
CLO	— Compressor Lockout
COMP	— Compressor Motor
D	— Diode
EC	— Enthalpy Control
ECON	— Economizer
EPS	— Emergency Power Supply (Nine Volt Battery)
EQUIP	— Equipment
ER	— Economizer Relay
FPT	— Freeze-Up Protection Thermostat
FSS	— Filter Status Switch
FU	— Fuse
GND	— Ground
HPS	— High-Pressure Switch
HS	— Hall Effect Sensor
I	— Ignitor
IDM	— Induced-Draft Motor
IFC	— Indoor-Fan Contactor
IFM	— Indoor-Fan Motor

IGC	— Integrated Gas Unit Controller
LED	— Light-Emitting Diode
LPS	— Low-Pressure Switch
LS	— Limit Switch
LSM	— Limit Switch (Manual Reset)
MGV	— Main Gas Valve
MTR	— Motor
OAT	— Outdoor-Air Thermostat
OFM	— Outdoor-Fan Motor
OLR	— Overload Relay
P	— Plug
PL	— Plug Assembly
QT	— Quadruple Terminal
R	— Relay
RS	— Rollout Switch
SAT	— Supply-Air Thermostat
SW1	— Switch Fully Open
SW2	— Switch Fully Closed
SW3	— Switch Minimum Vent Position
SW4	— Switch Maximum Vent Position
TB	— Terminal Block
TC	— Thermostat-Cooling
TDR	— Time-Delay Relay
TH	— Thermostat-Heating
TRAN	— Transformer

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

NOTES FOR FIG. 1, 2, 7, 9

1. If any or the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
2. Three-phase motors are protected under primary single phasing conditions.
3. Thermostat: HH07AT170, 172
Subbase: HH93AZ176, 177, 178, and 179
4. Set heat anticipator at .14 amp for 1st stage and .14 amp for 2nd stage.
5. Use copper conductors only.
6. TRAN is wired for 230-v unit. If unit is to be run with 208-v power supply disconnect BLK wire from 230-v tap (ORN) and connect to 208-v tap (RED). Insulate end of 230-v tap.

NOTES FOR FIG. 3, 4, 5, 8, 10, 11

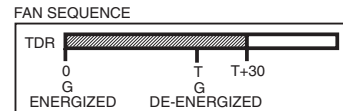
1. If any or the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
2. Three-phase motors are protected under primary single phasing conditions.
3. Thermostat: HH07AT170, 172
Subbase: HH93AZ176, 177, 178, and 179
4. Set heat anticipator at .14 amp for 1st stage and .14 amp for 2nd stage.
5. Use copper conductors only.

NOTES FOR FIG. 6

1. If any or the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
2. Thermostat: HH07AT170, 172
Subbase: HH93AZ176, 177, 178, and 179
3. Set heat anticipator at .14 amp for 1st stage and .14 amp for 2nd stage.
4. Use copper conductors only.
5. TRAN is wired for 230-v unit. If unit is to be run with 208-v power supply disconnect BLK wire from 230-v tap (ORN) and connect to 208-v tap (RED). Insulate end of 230-v tap.

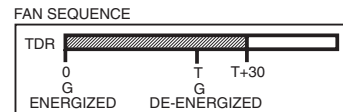
NOTES FOR FIG. 12

1. If any or the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
2. Thermostat: HH07AT170, 172
Subbase: HH93AZ176, 177, 178, and 179
3. Set heat anticipator at .8 amp for 1st stage and .3 amp for 2nd stage.
4. Use copper conductors only.
5. TRAN is wired for 230-v unit. If unit is to be run with 208-v power supply disconnect BLK wire from 230-v tap (ORN) and connect to 208-v tap (RED). Insulate end of 230-v tap.
6. Use copper, copper-clad aluminum or aluminum conductors.



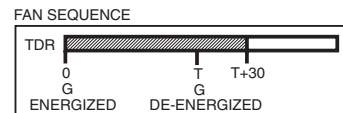
NOTES FOR FIG. 13, 16, 19

1. If any or the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
2. Three-phase motors are protected under primary single phasing conditions.
3. Thermostat: HH07AT170, 172
Subbase: HH93AZ176, 177, 178, and 179
4. Set heat anticipator at .8 amp for 1st stage and .3 amp for 2nd stage.
5. Use copper conductors only.
6. TRAN is wired for 230-v unit. If unit is to be run with 208-v power supply disconnect BLK wire from 230-v tap (ORN) and connect to 208-v tap (RED). Insulate end of 230-v tap.
7. Use copper, copper-clad aluminum or aluminum conductors.



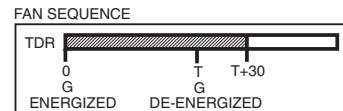
NOTES FOR FIG. 14, 17

1. If any or the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
2. Three-phase motors are protected under primary single phasing conditions.
3. Thermostat: HH07AT170, 172
Subbase: HH93AZ176, 177, 178, and 179
4. Set heat anticipator at .8 amp for 1st stage and .3 amp for 2nd stage.
5. Use copper conductors only.
6. Use copper, copper-clad aluminum or aluminum conductors.



NOTES FOR FIG. 15, 18

1. If any or the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
2. Three-phase motors are protected under primary single phasing conditions.
3. Thermostat: HH07AT170, 172
Subbase: HH93AZ176, 177, 178, and 179
4. Set heat anticipator at .8 amp for 1st stage and .3 amp for 2nd stage.
5. Use copper conductors only.

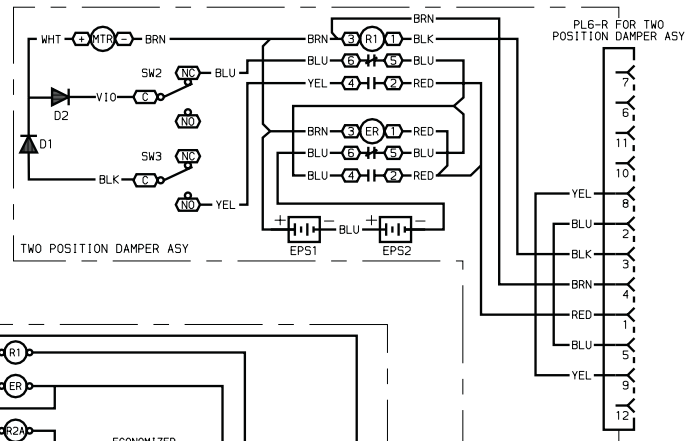


NOTES FOR FIG. 20

1. If any or the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
2. Three-phase motors are protected under primary single phasing conditions.
3. Thermostat: HH07AT170, 172
Subbase: HH93AZ176, 177, 178, and 179
4. Set heat anticipator at .8 amp for 1st stage and .3 amp for 2nd stage.
5. Use copper conductors only.

NOTES FOR FIG. 21

1. If any or the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
2. Three-phase motors are protected under primary single phasing conditions.
3. Thermostat: HH07AT170, 172
Subbase: HH93AZ176, 177, 178, and 179
4. Set heat anticipator at .8 amp for 1st stage and .3 amp for 2nd stage.
5. Use copper conductors only.
6. Use copper, copper-clad aluminum or aluminum conductors.



SEE NOTE #5



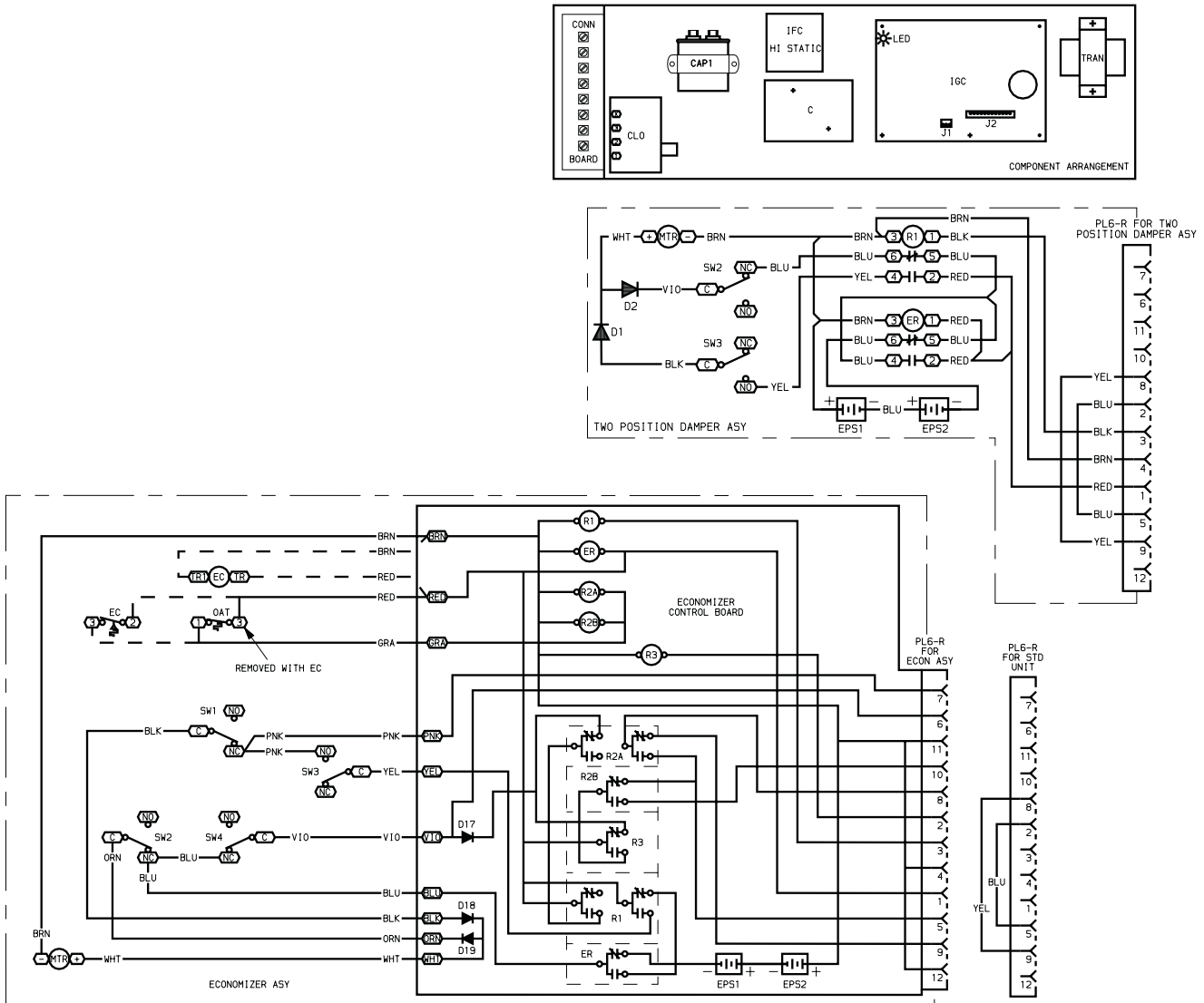


**Fig. 2 — Schematic/Component Arrangement, 48HJG,HJH,HJK,HJL,HJM,HJN004,005;
208/230-3-60**

[illegible]

**Fig. 2 — Schematic/Component Arrangement, 48HJG,HJH,HJK,HJL,HJM,HJN004,005;
208/230-3-60 (cont)**

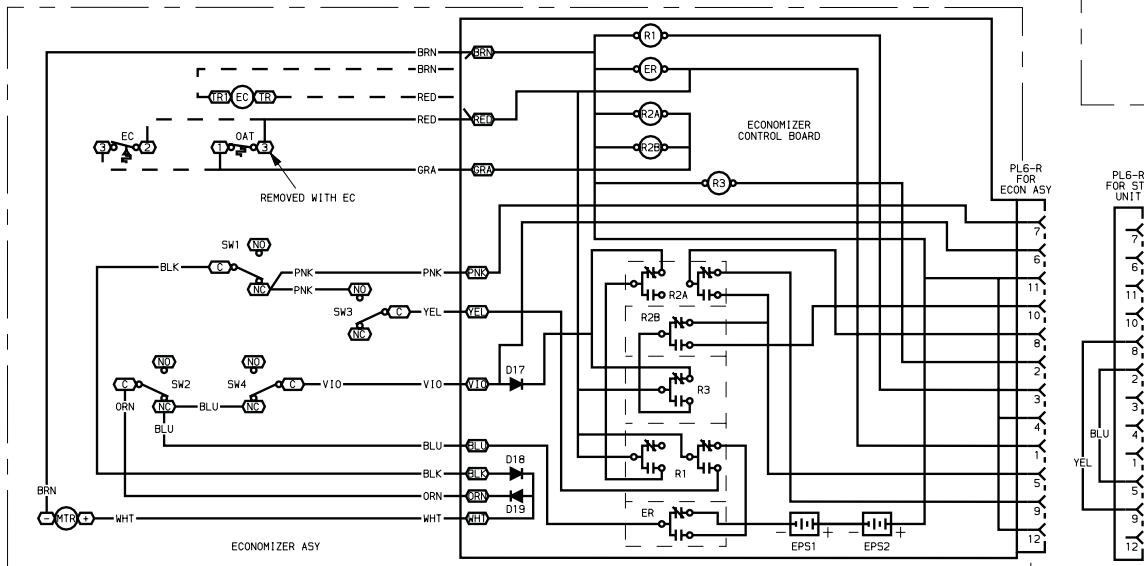
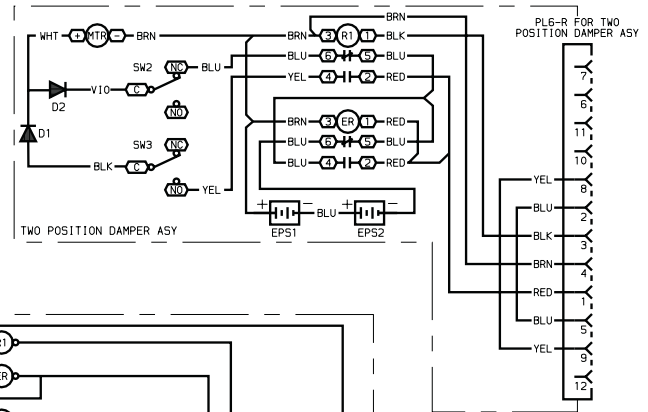
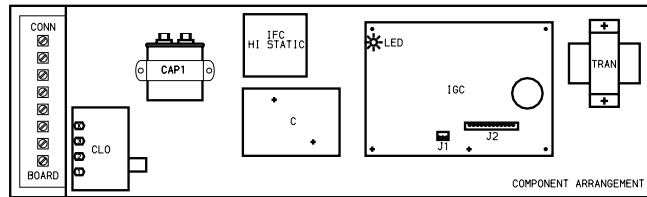


**Fig. 3 — Schematic/Component Arrangement, 48HJD,HJE,HJF004,005;
460-3-60**

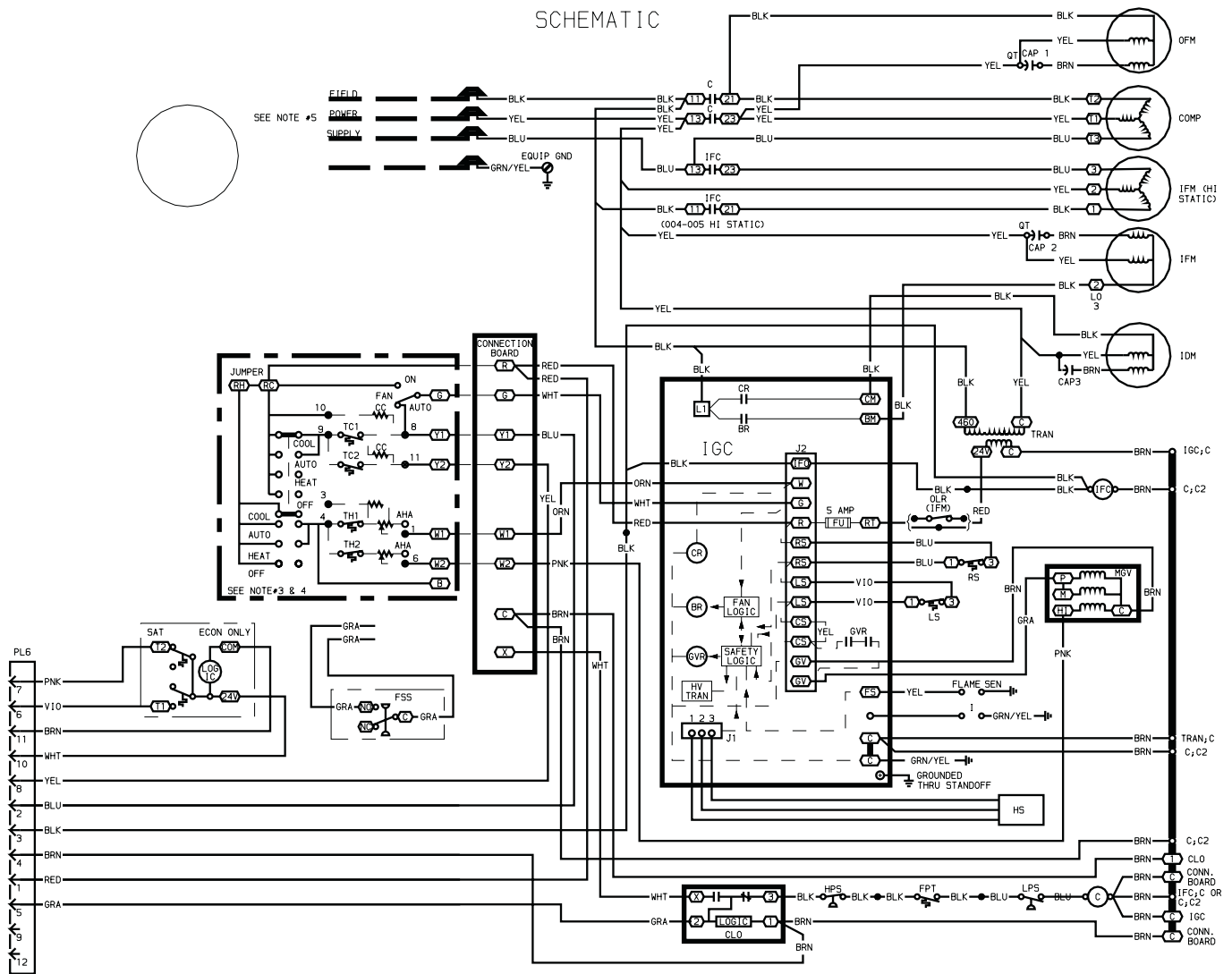
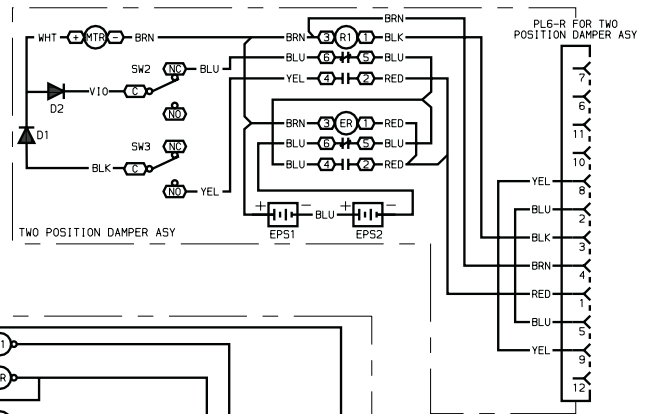


**Fig. 3 — Schematic/Component Arrangement, 48HJD,HJE,HJF004,005;
460-3-60 (cont)**



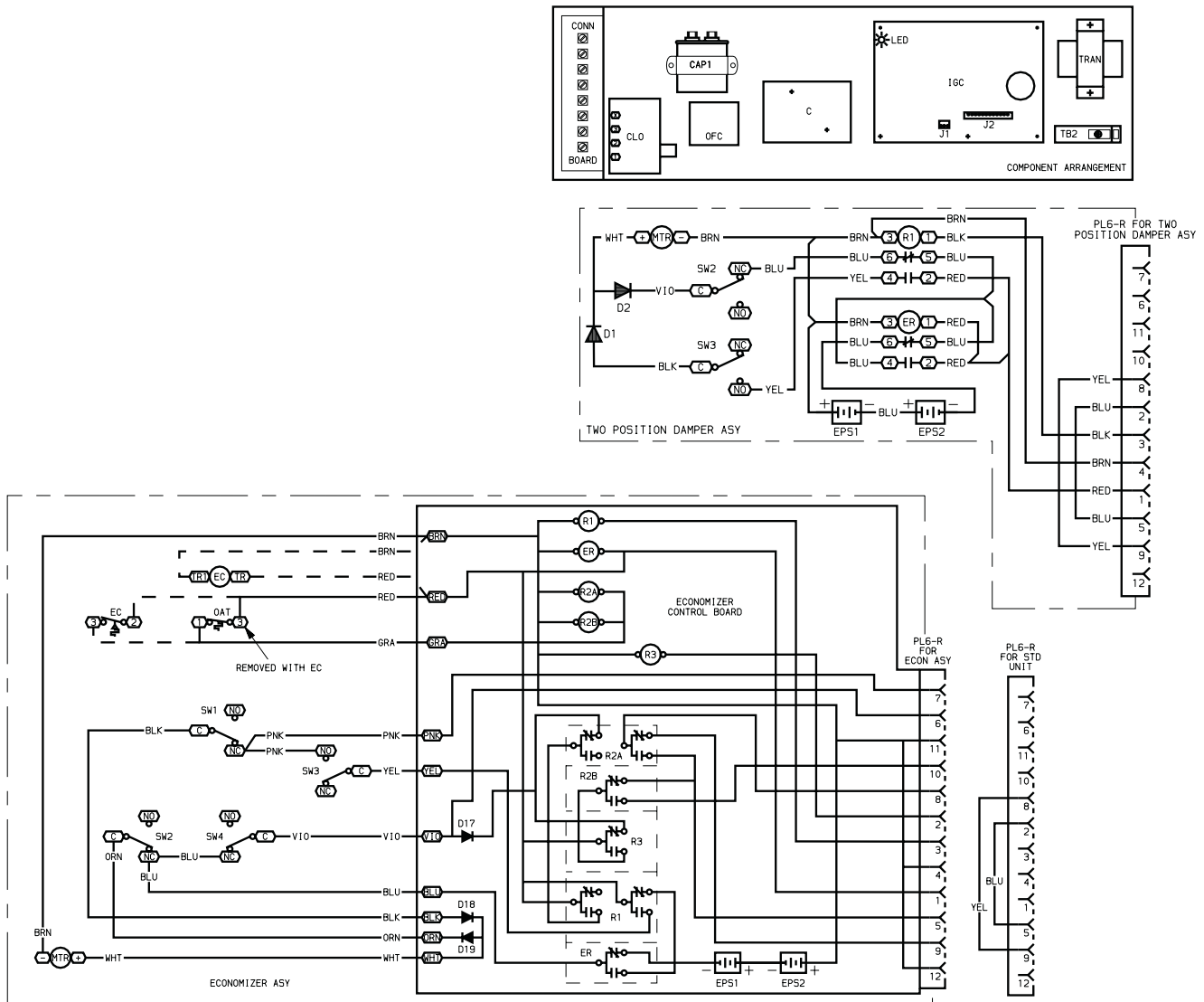


**Fig. 5 — Schematic/Component Arrangement, 48HJD,HJE,HJF004,005;
575-3-60**



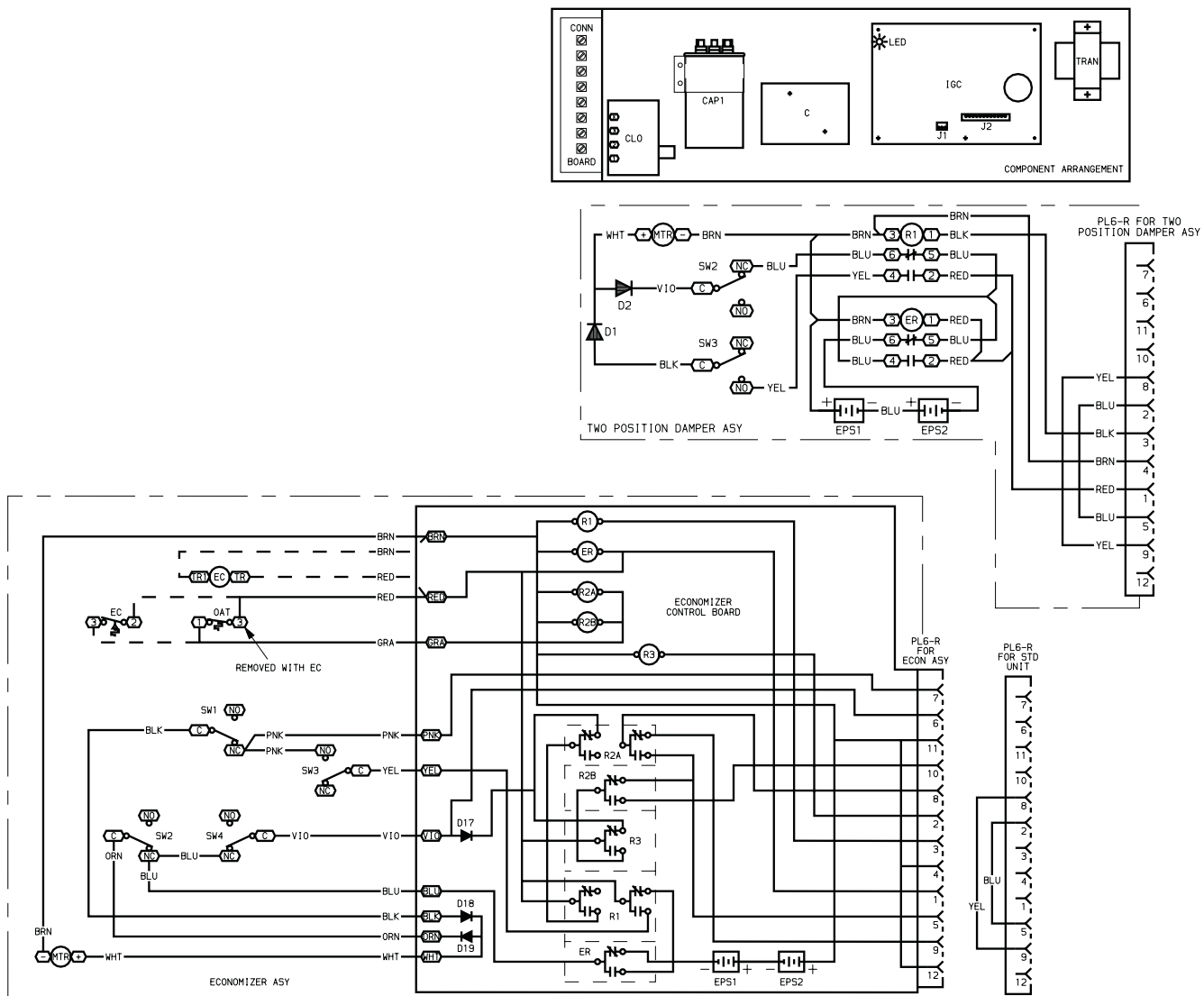
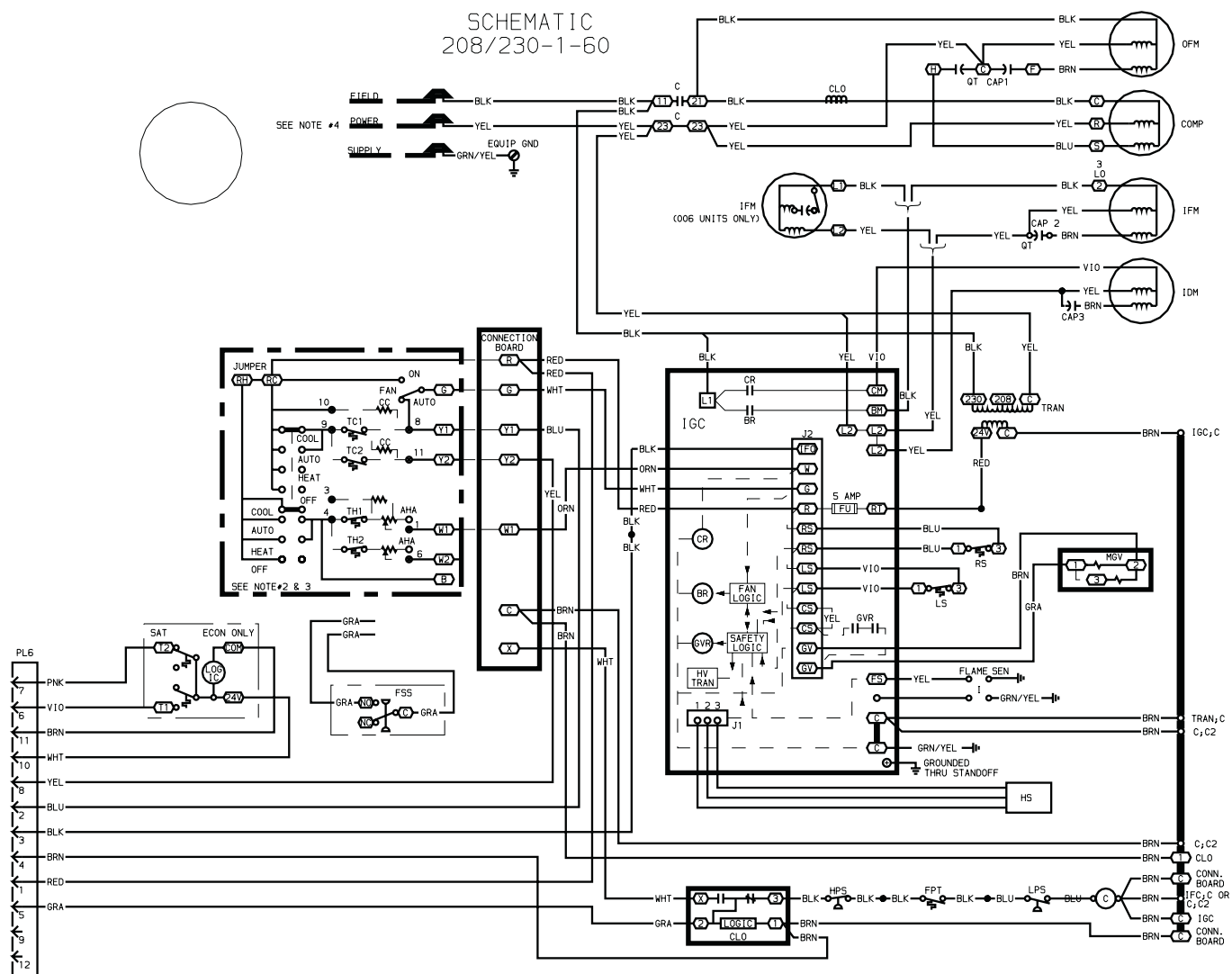


**Fig. 6 — Schematic/Component Arrangement, 48HJD,HJE,HJF004-006;
208/230-1-60**



17

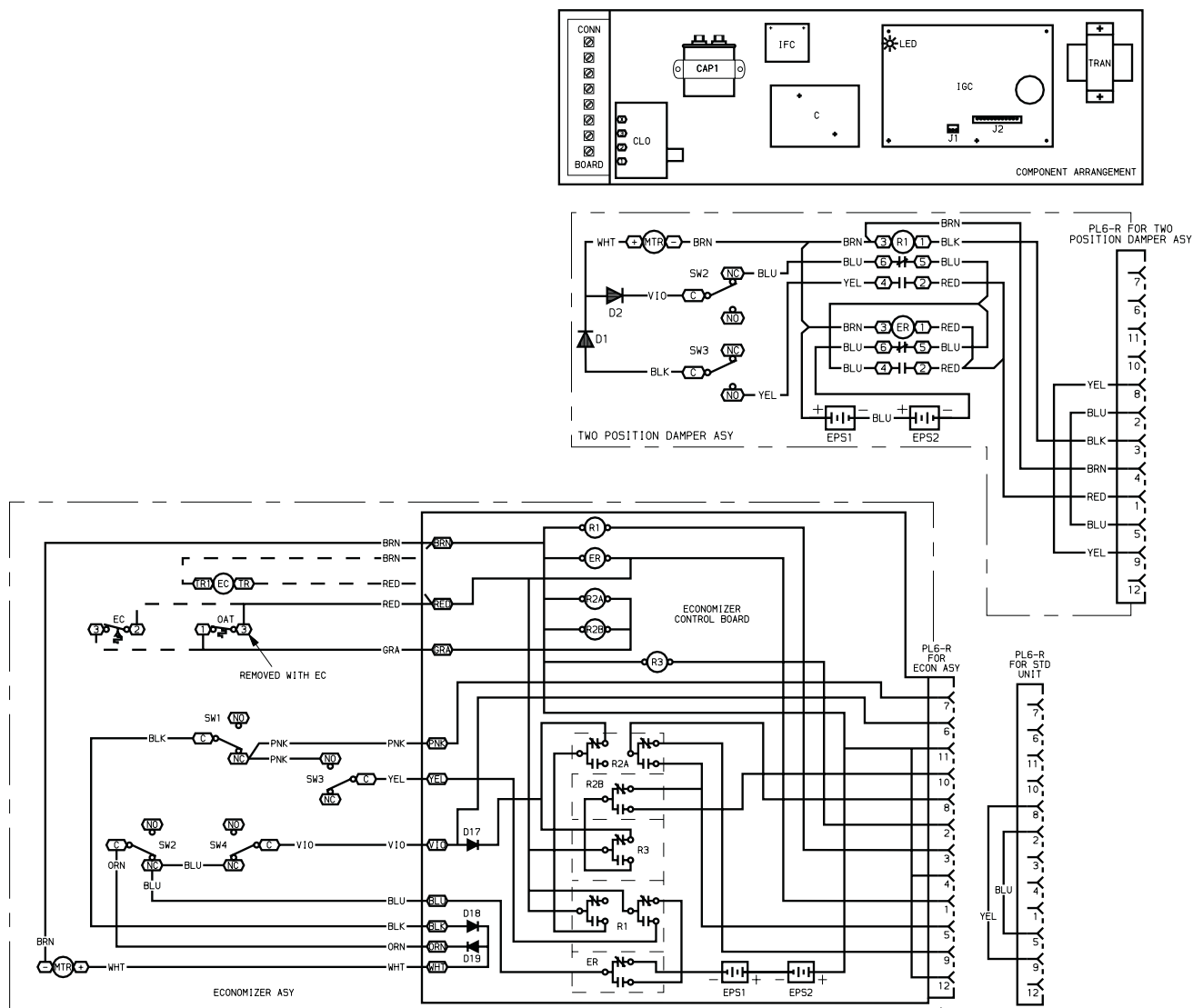


**Fig. 7 — Schematic/Component Arrangement, 48HJG,HJH,HJK,HJL,HJM,HJN006;
208/230-3-60**

SCHEMATIC
208/230-3-60

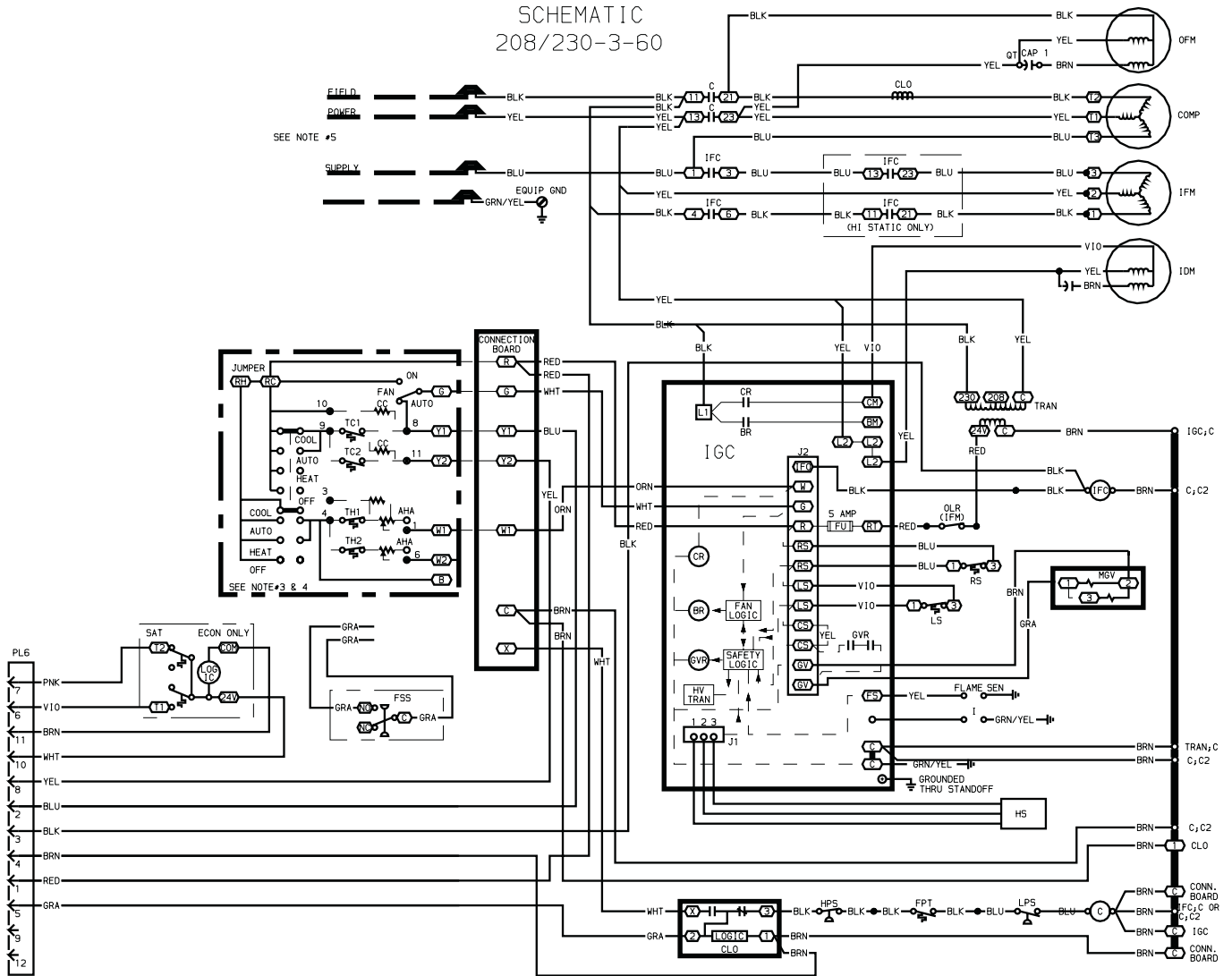


Fig. 7 — Schematic/Component Arrangement, 48HJG,HJH,HJK,HJL,HJM,HJN006;
208/230-3-60 (cont)

SCHEMATIC 460-3-60

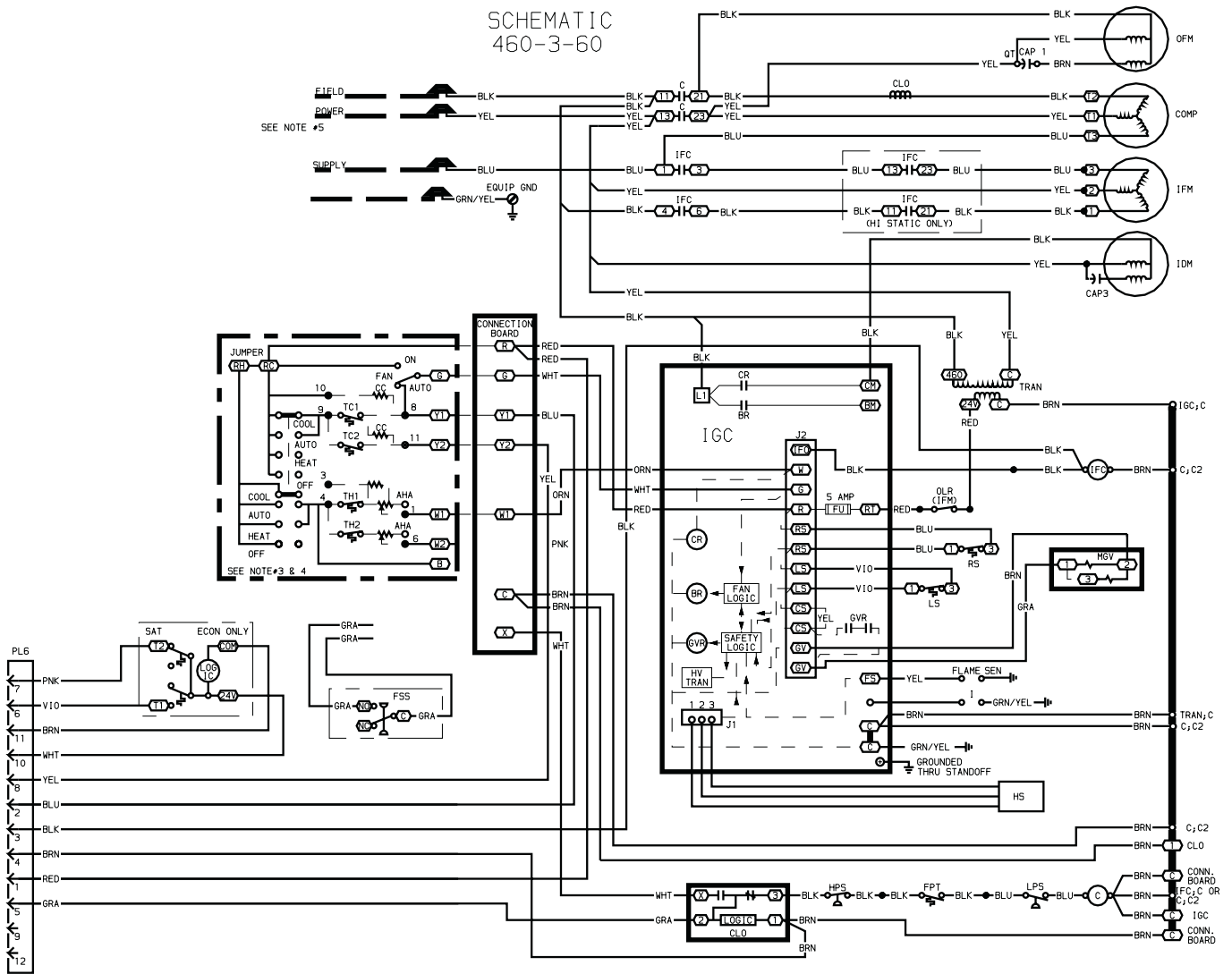


Fig. 8 — Schematic/Component Arrangement, 48HJG,HJH,HJK,HJL,HJM,HJN006;
460-3-60 (cont)

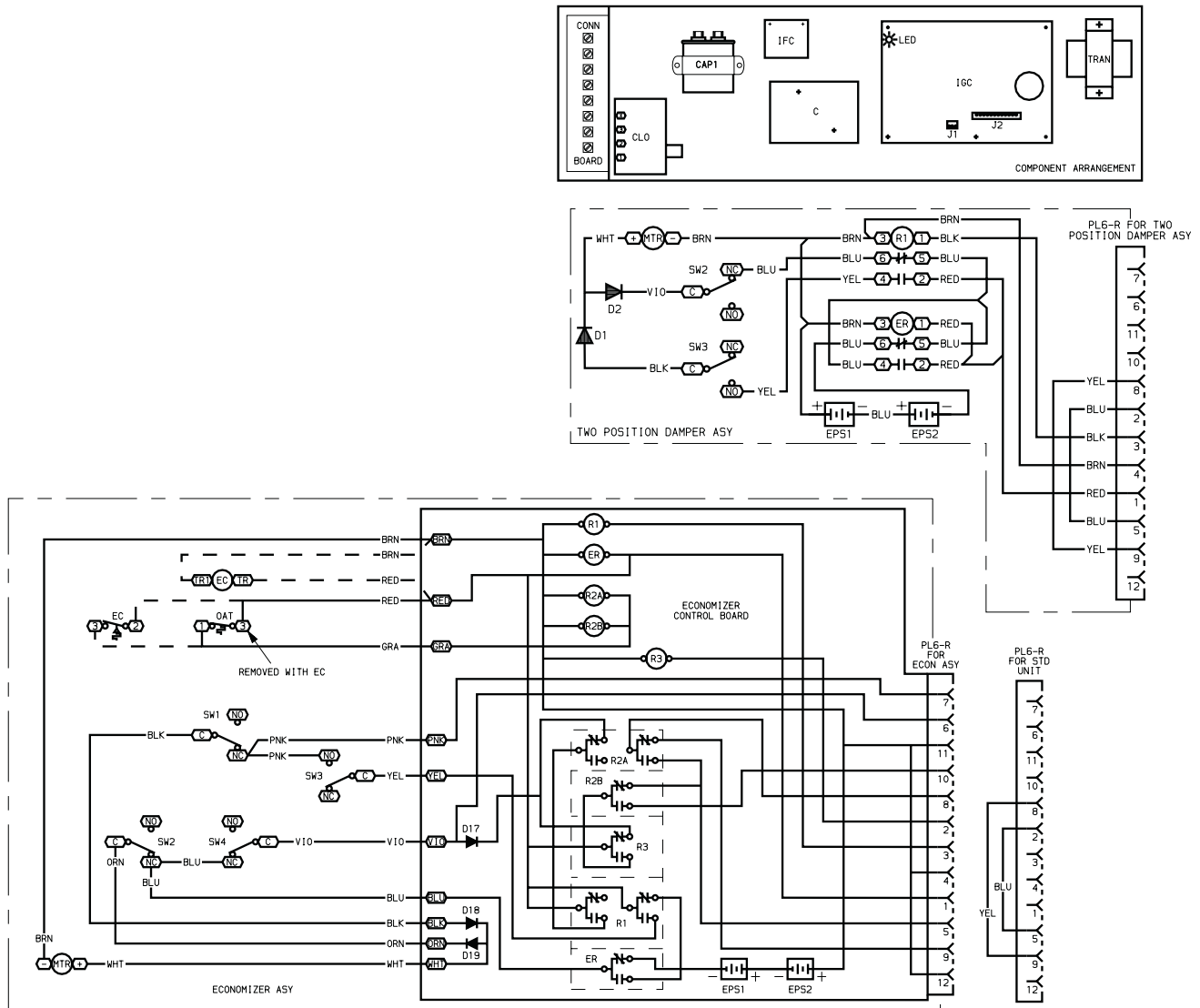


**Fig. 9 — Schematic/Component Arrangement, 48HJD,HJE,HJF007;
208/230-1-60**

[illegible]

23

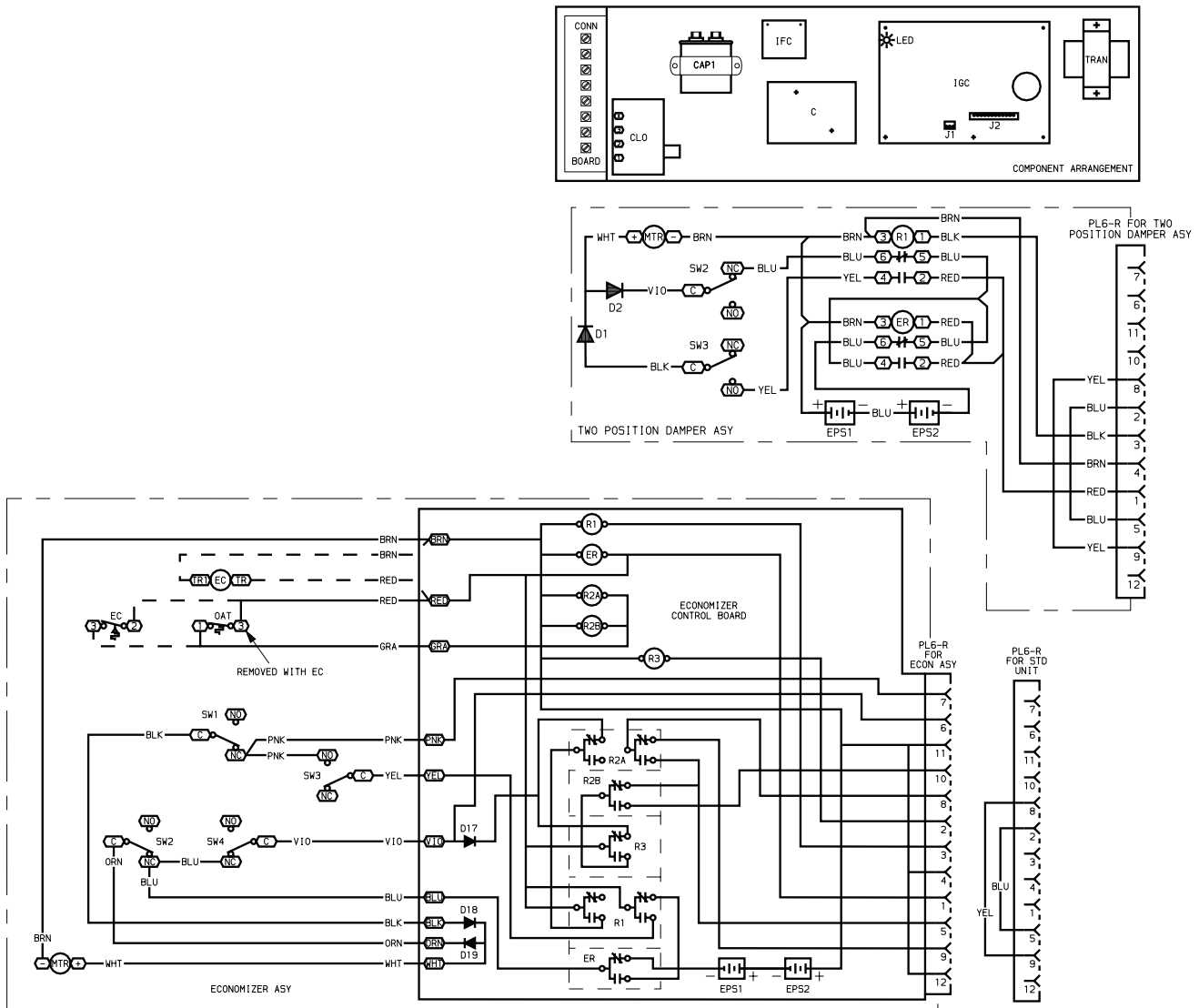


**Fig. 10 — Schematic/Component Arrangement, 48HJD,HJE,HJF007;
460-3-60**

SCHEMATIC 460-3-60

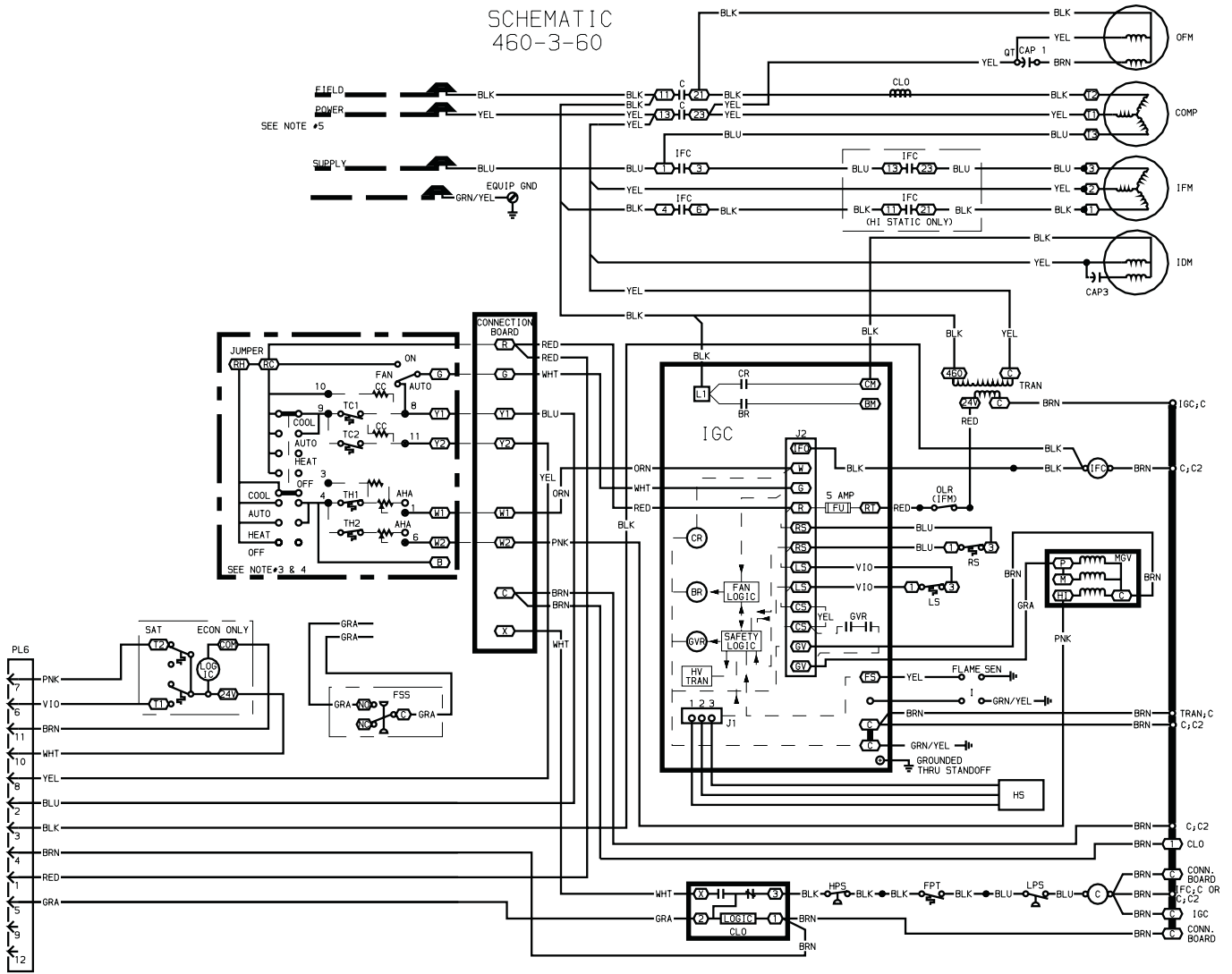
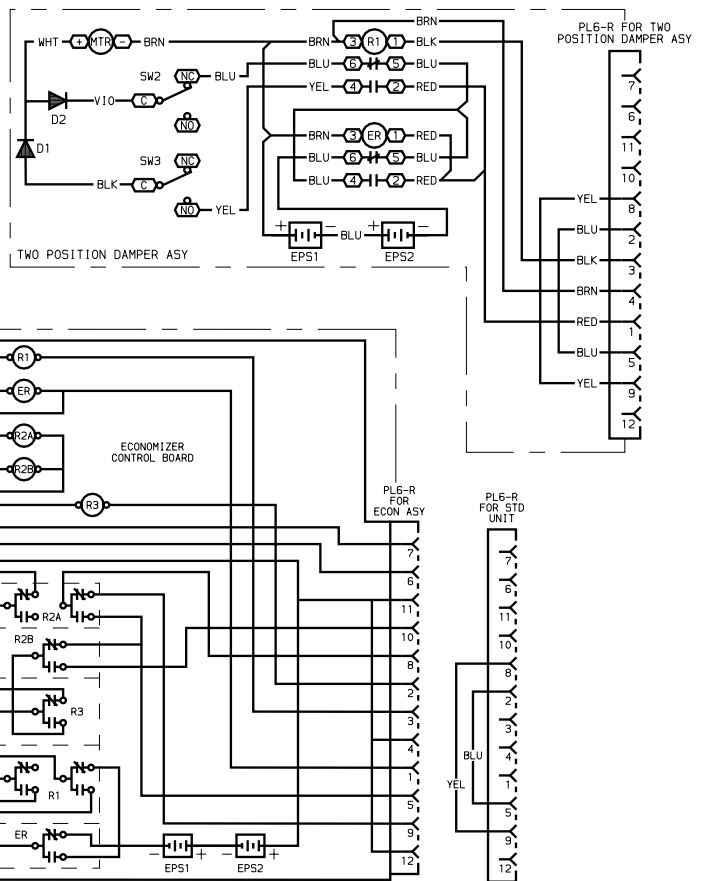


Fig. 10 — Schematic/Component Arrangement, 48HJD,HJE,HJF007;
460-3-60 (cont)



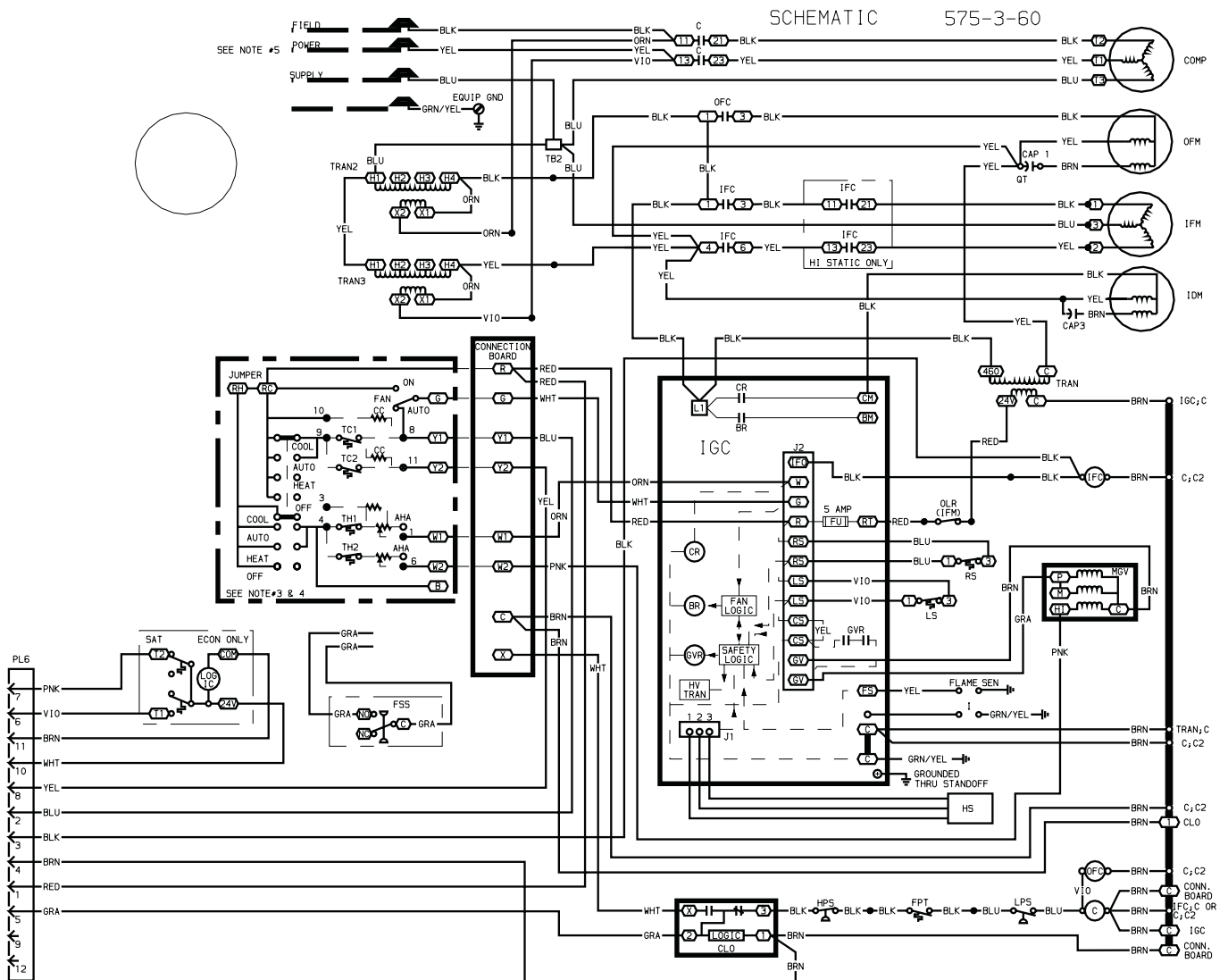


Fig. 11 — Schematic/Component Arrangement, 48HJD,HJE,HJF007;
575-3-60 (cont)

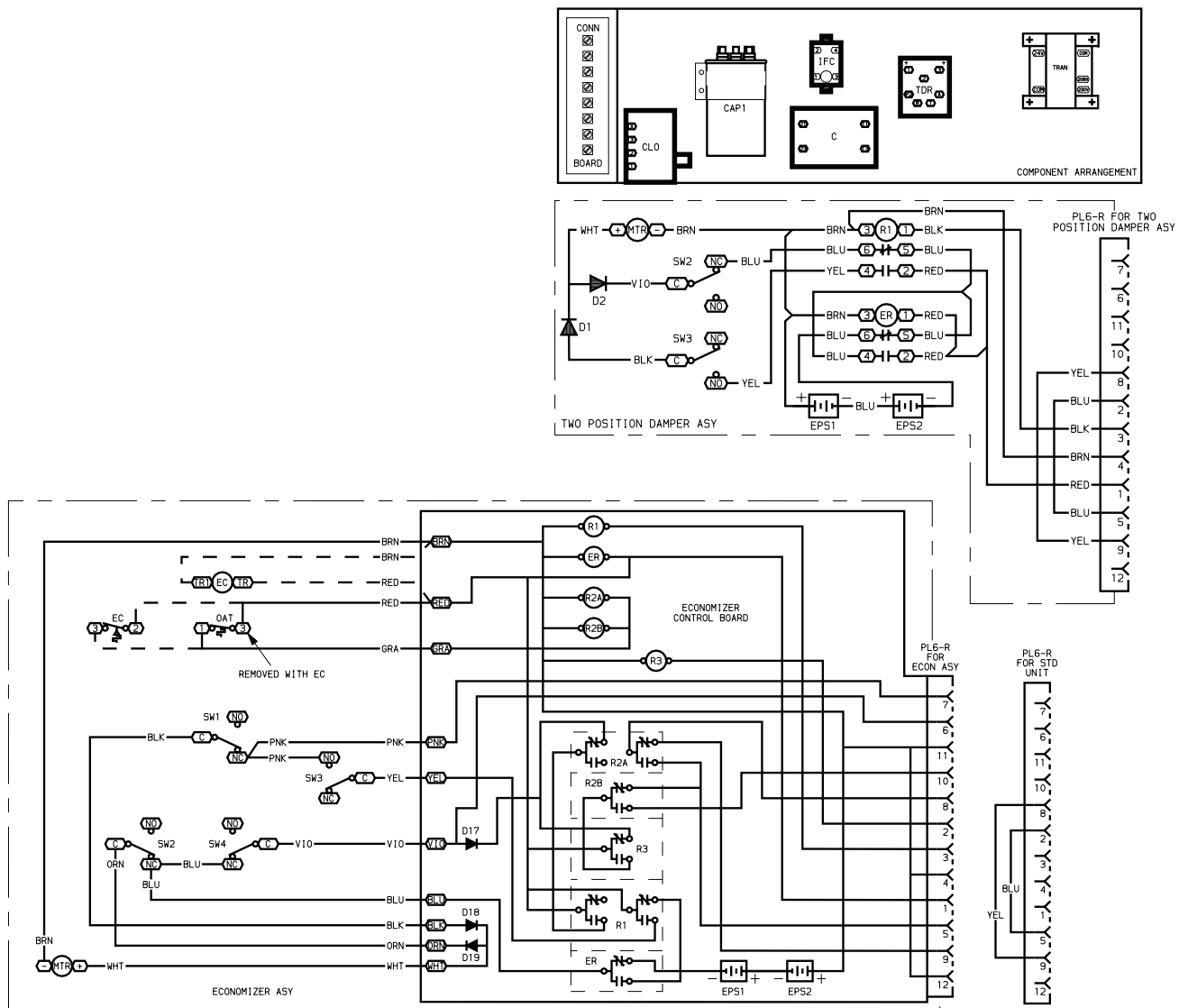


**Fig. 12 — Schematic/Component Arrangement, 50HJ004-006;
208/230-1-60**

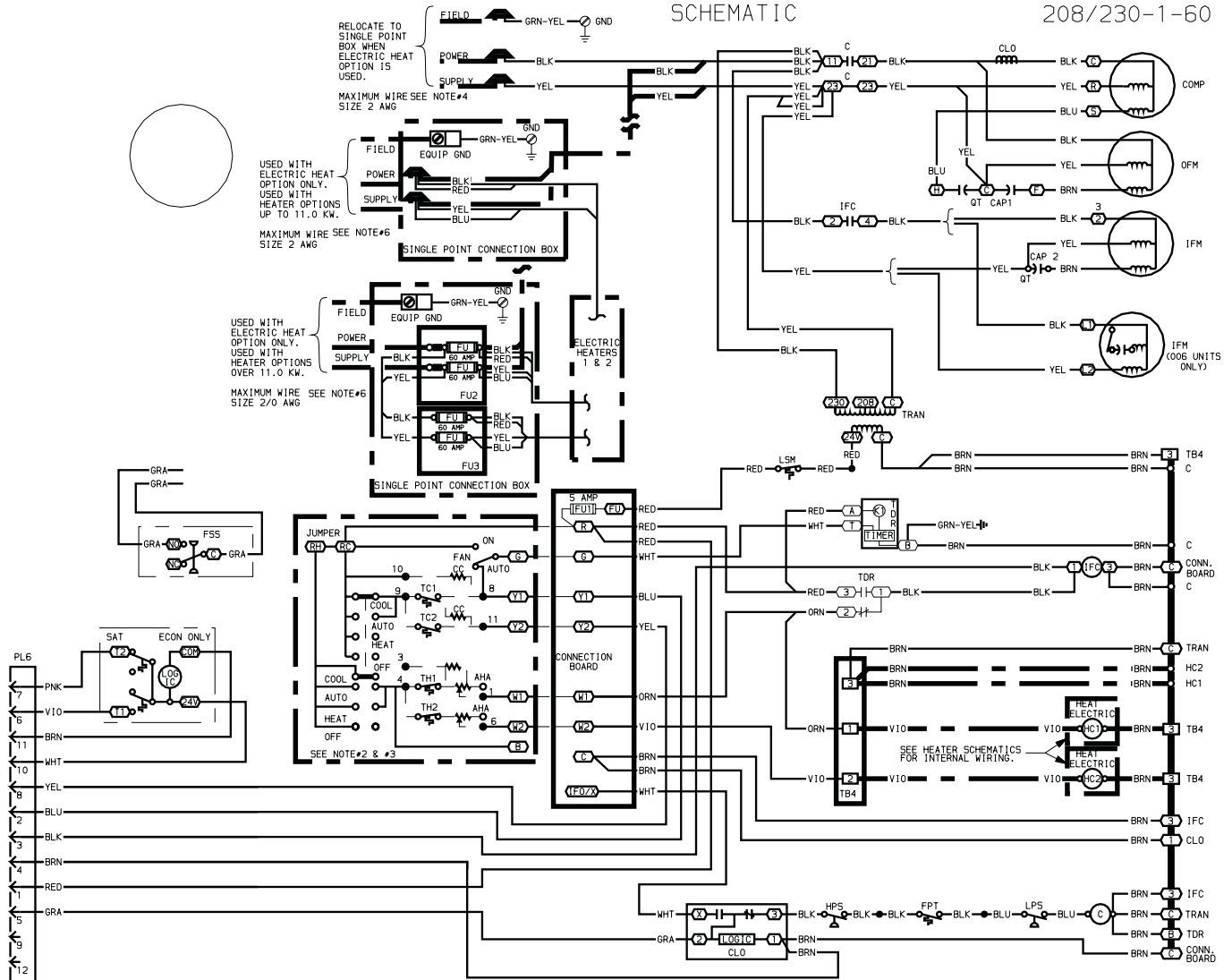


**Fig. 12 — Schematic/Component Arrangement, 50HJ004-006;
208/230-1-60 (cont)**

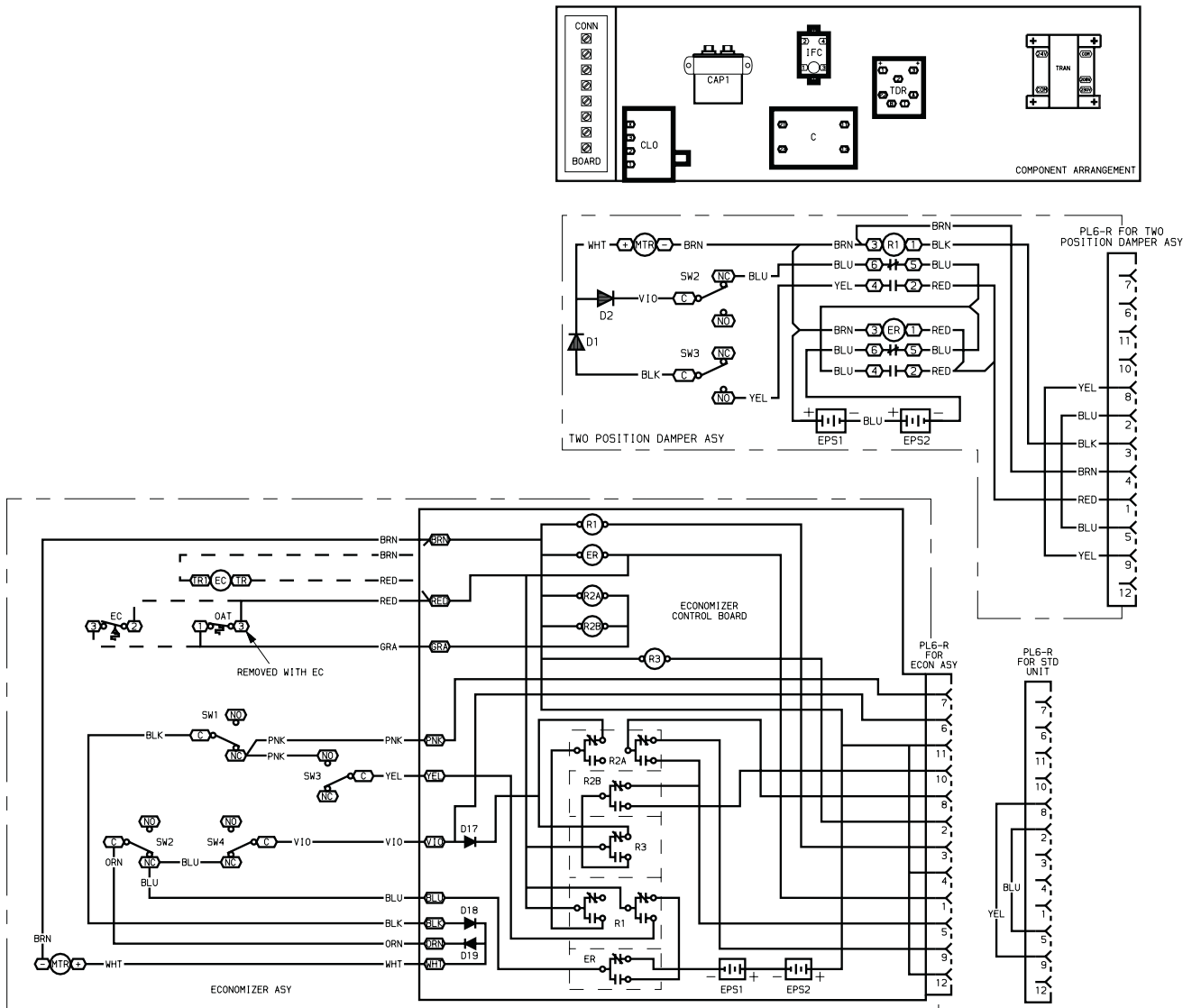
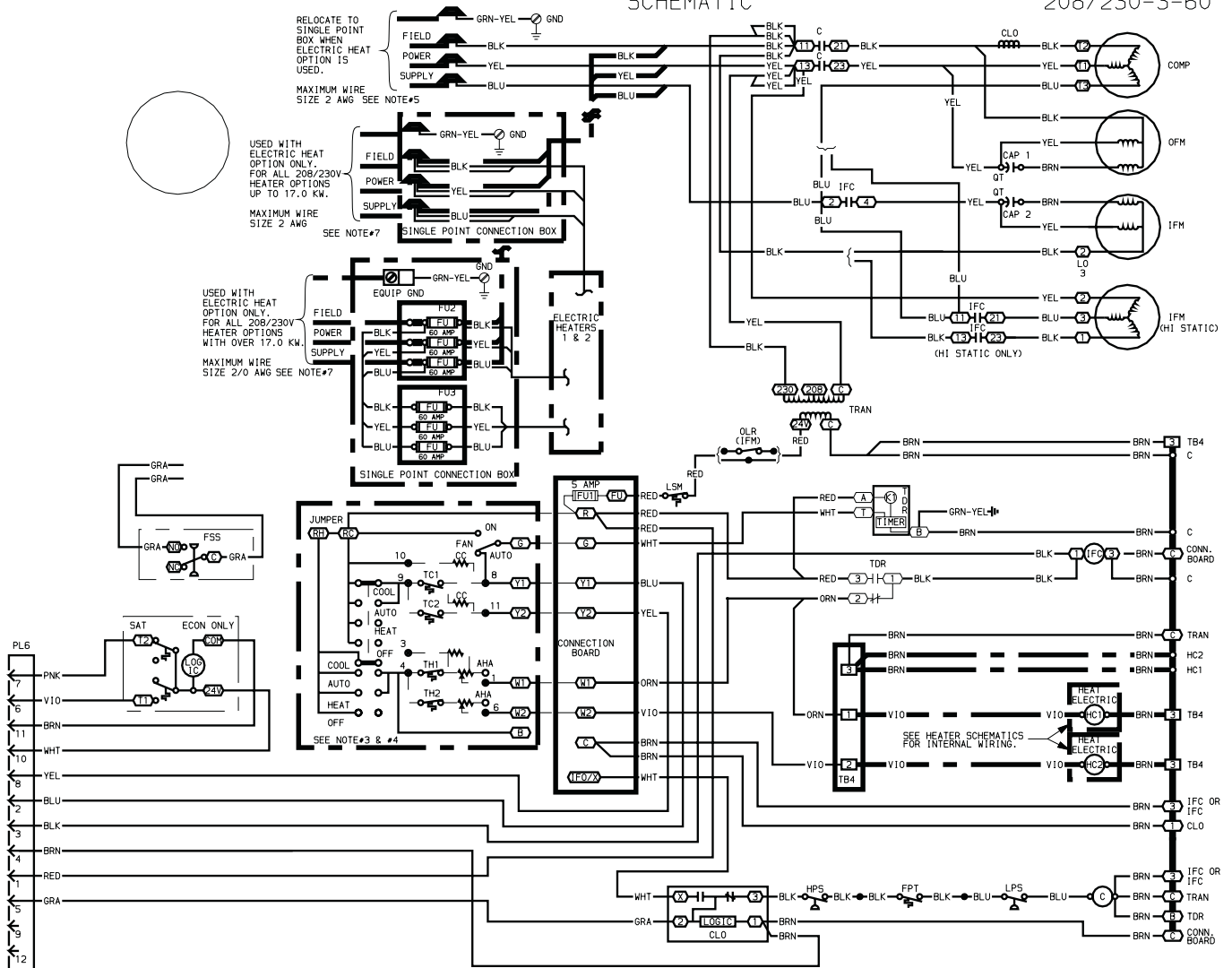
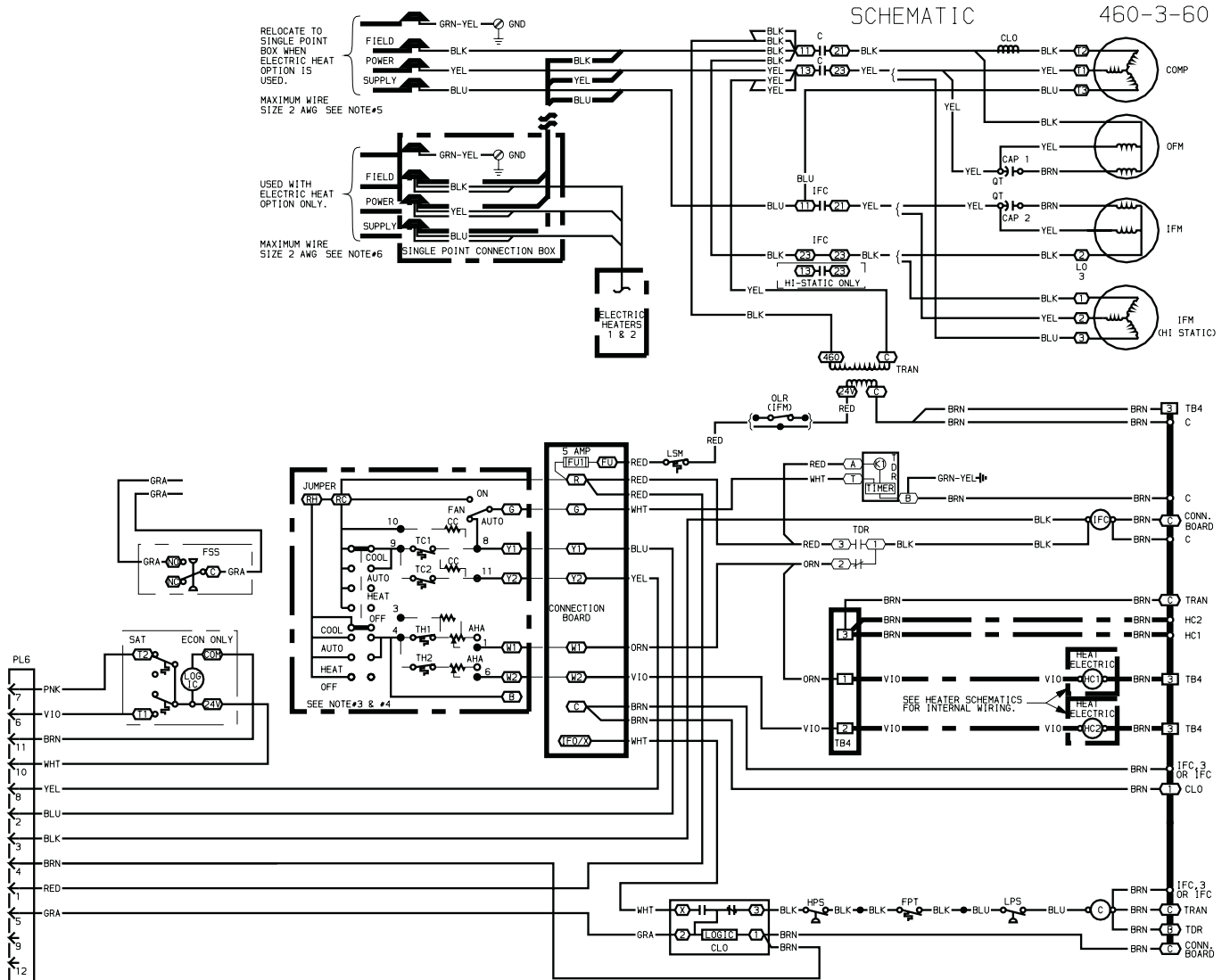


**Fig. 13 — Schematic/Component Arrangement, 50HJ004,005;
208/230-3-60**





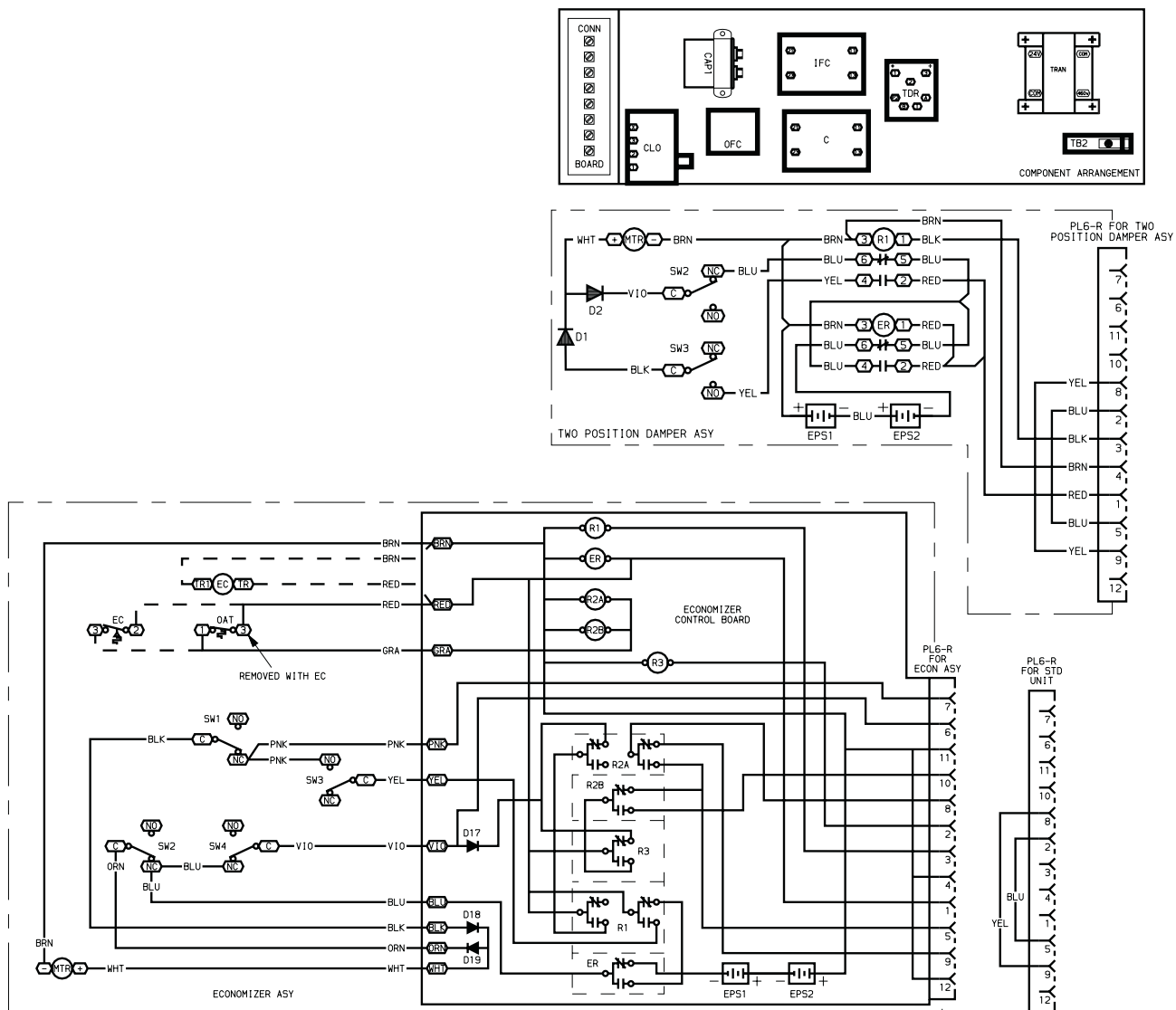
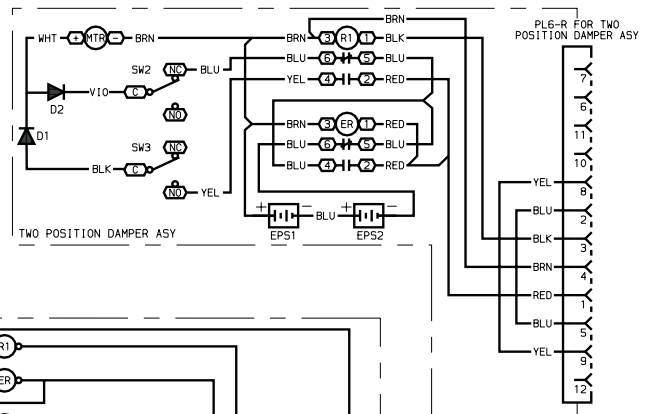
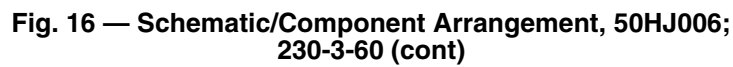


**Fig. 15 — Schematic/Component Arrangement, 50HJ004,005;
575-3-60**





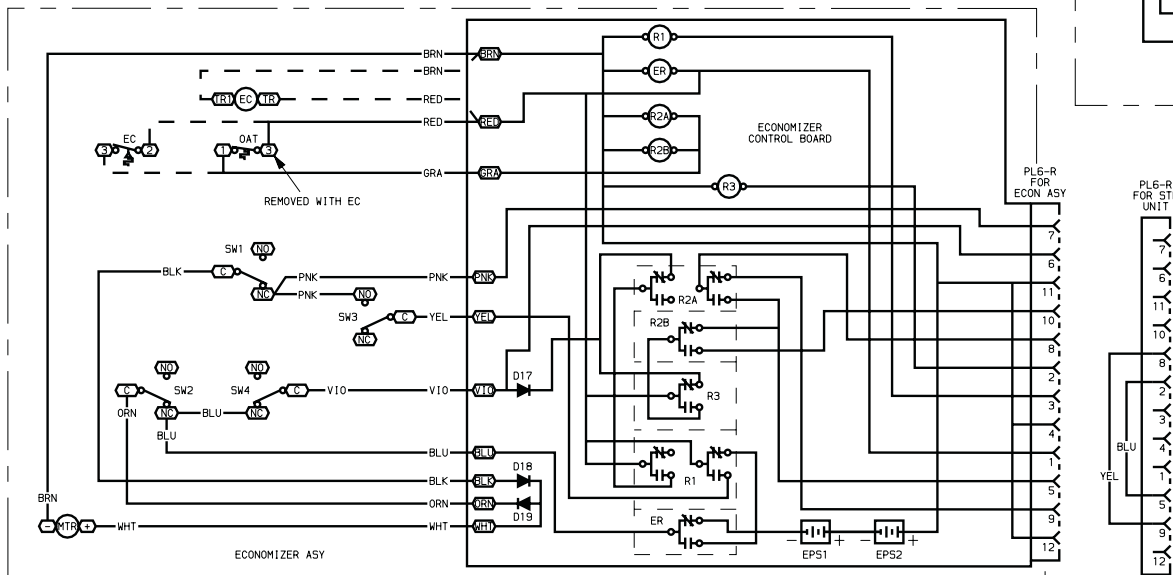
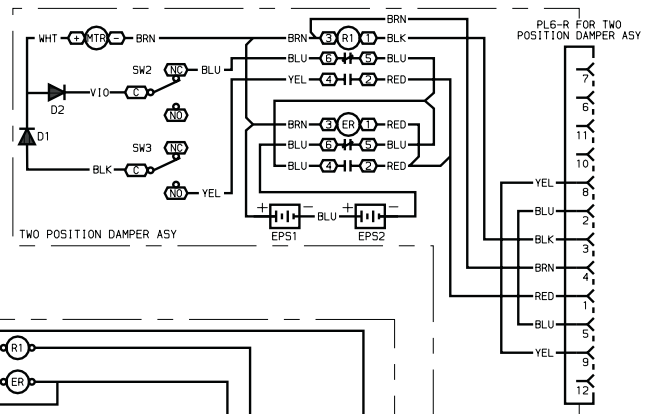
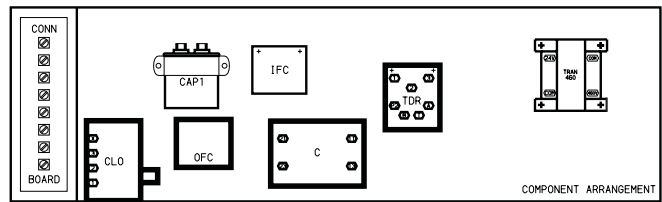
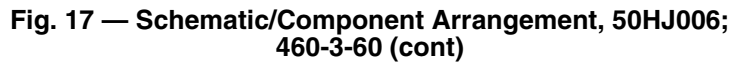
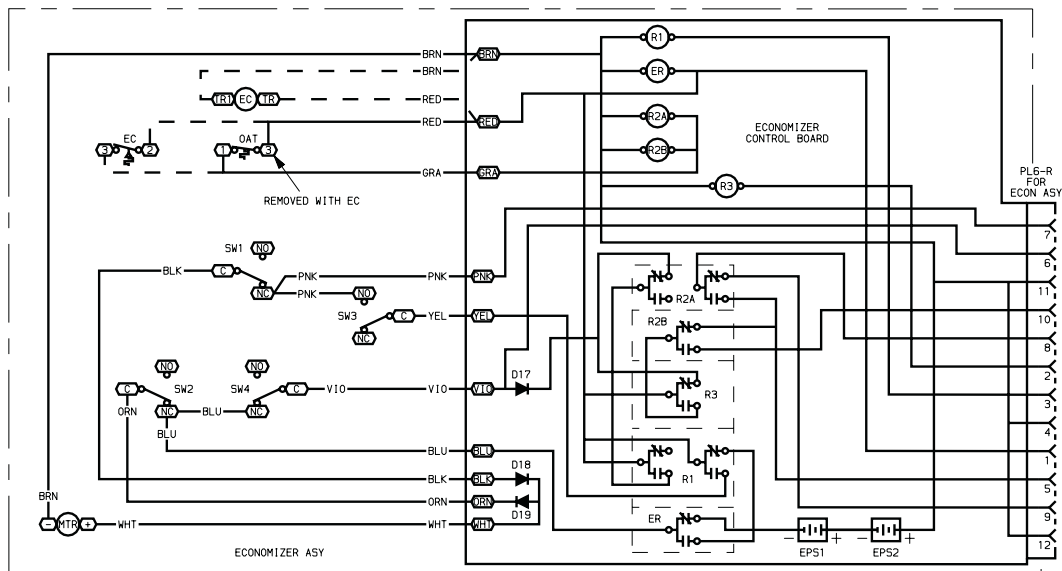
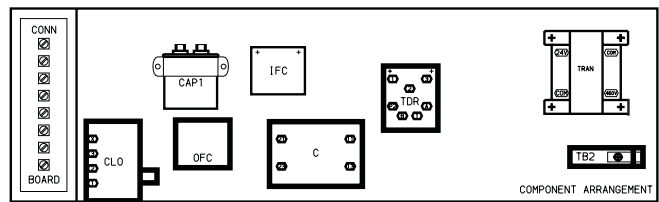


Fig. 17 — Schematic/Component Arrangement, 50HJ006;
460-3-60





40

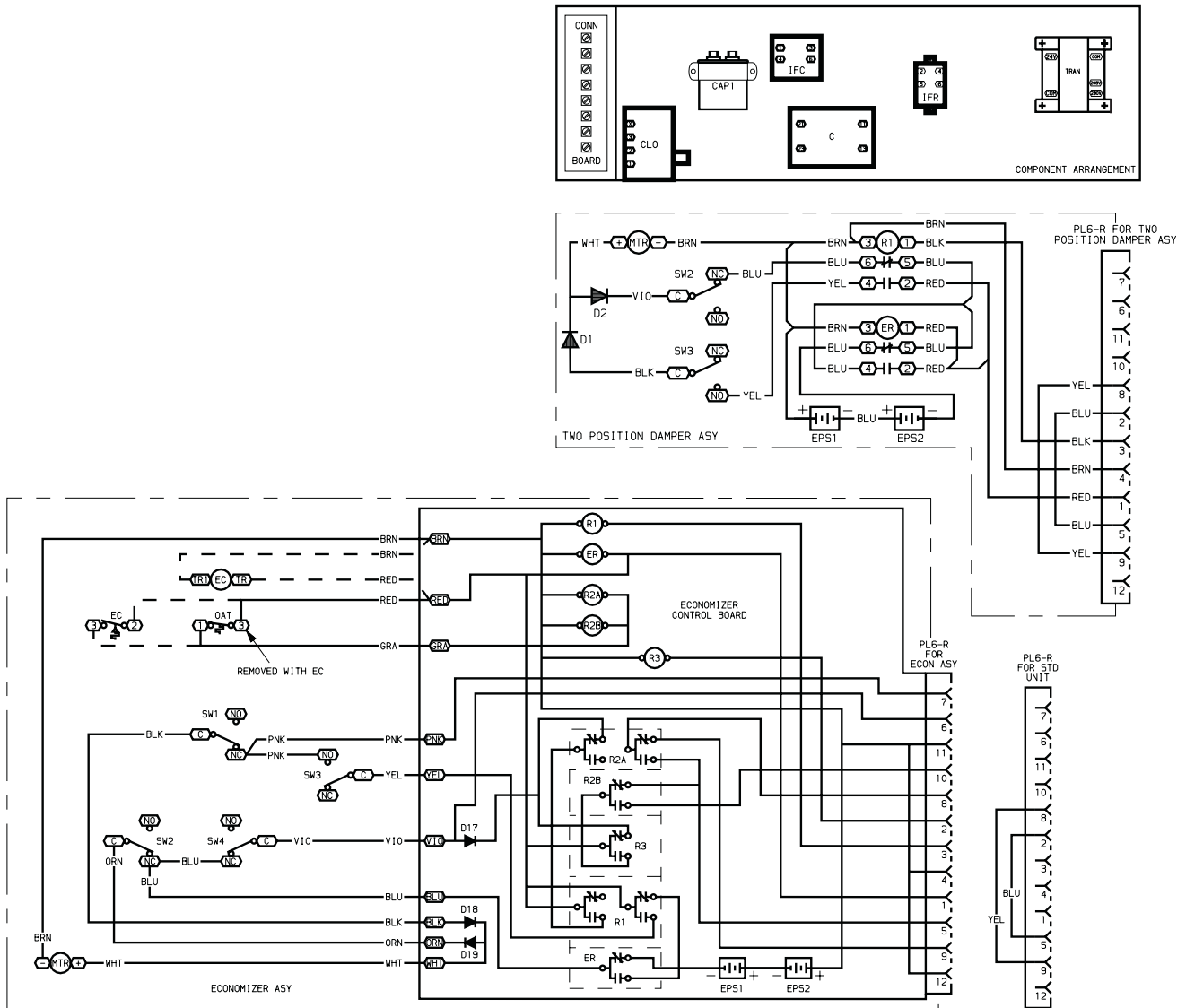
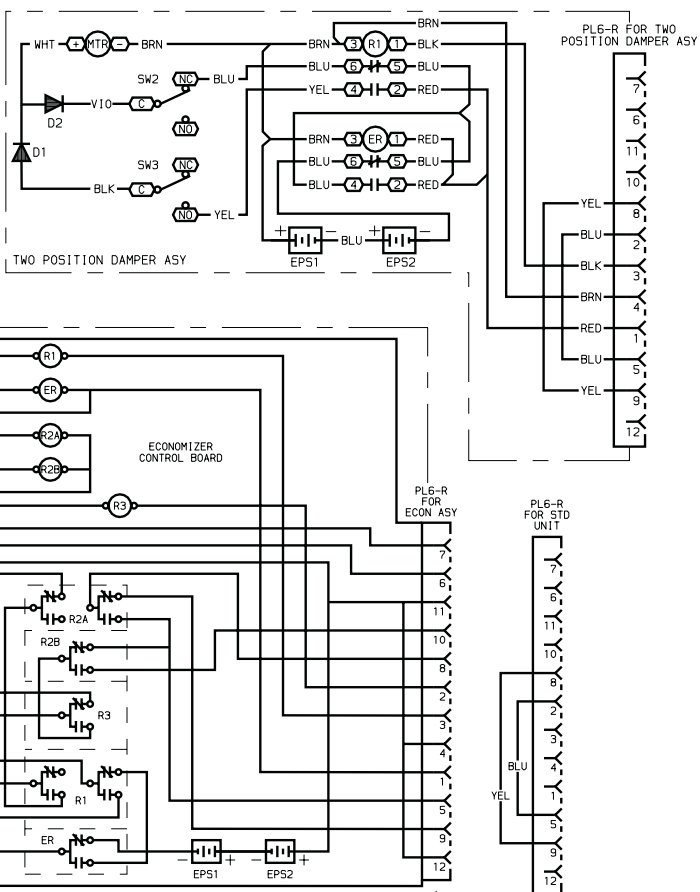


**Fig. 19 — Schematic/Component Arrangement, 50HJ007;
208/230-3-60, 460-3-60**



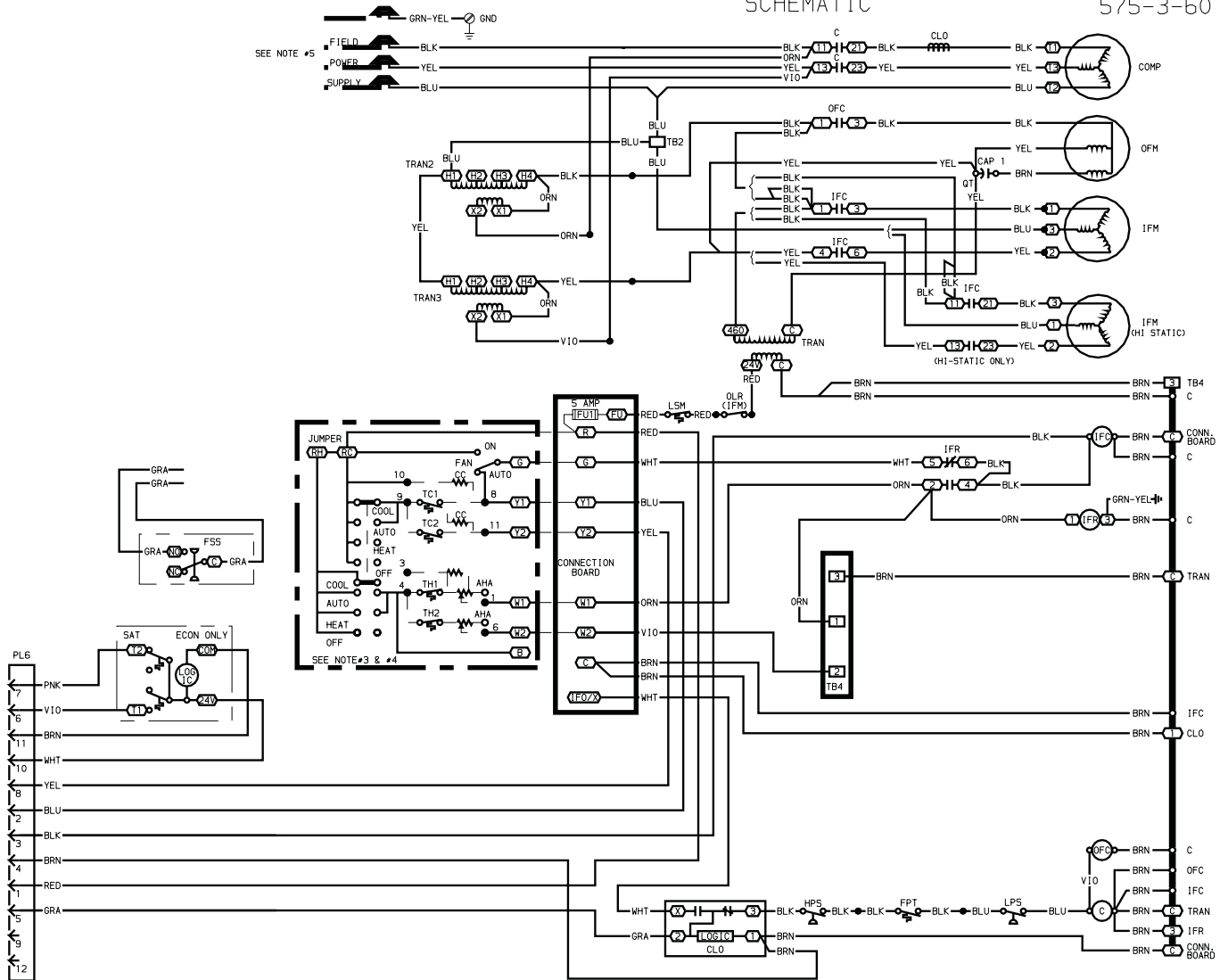


Fig. 20 — Schematic/Component Arrangement, 50HJ007;
575-3-60 (cont)

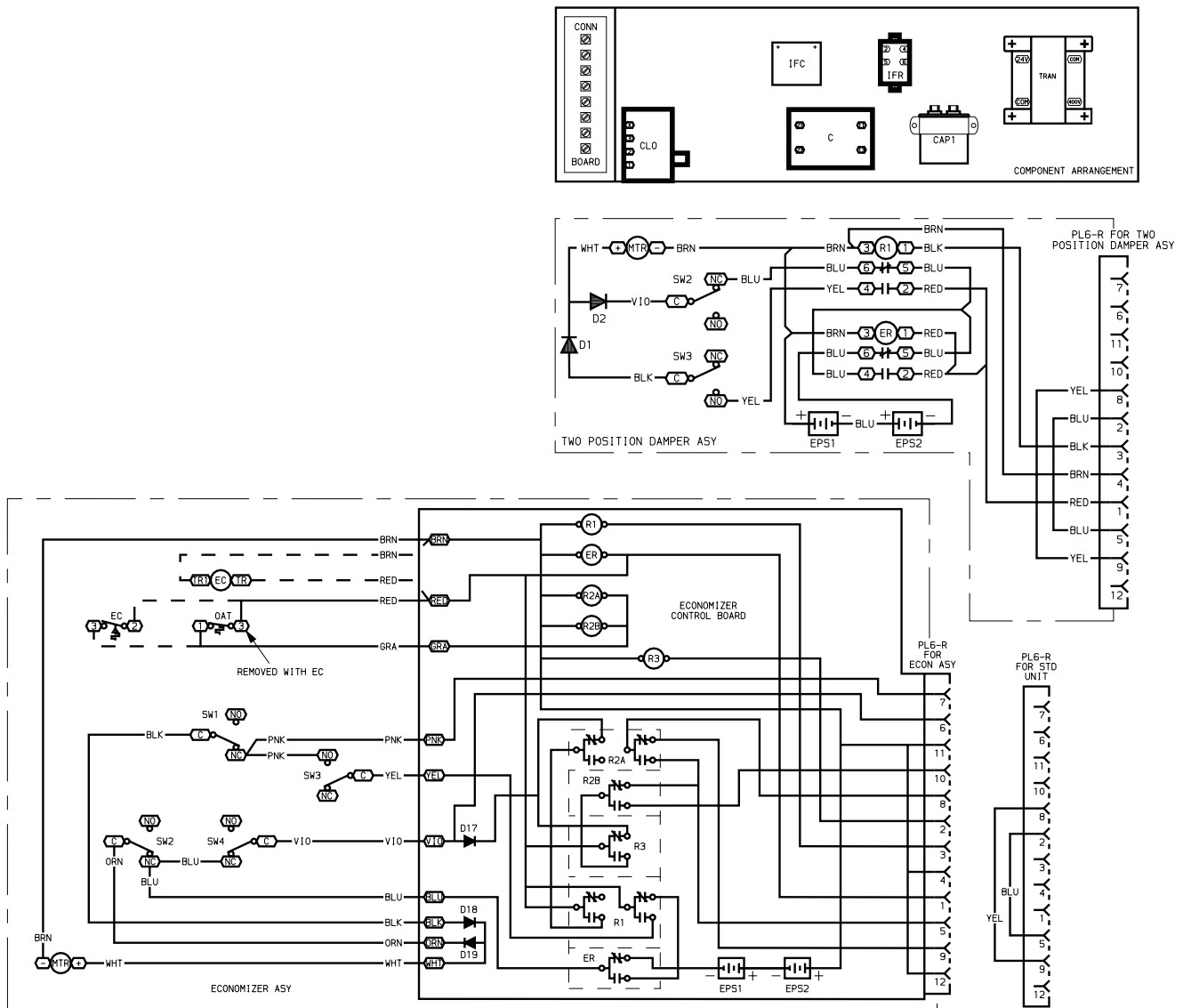
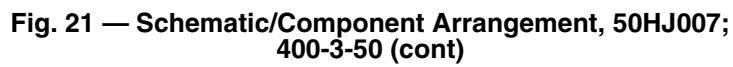


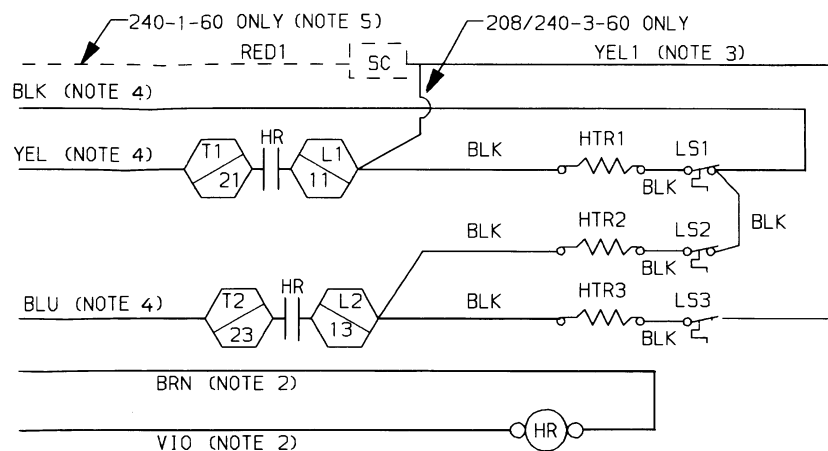
**Fig. 21 — Schematic/Component Arrangement, 50HJ007;
400-3-50**

400-3-50



SCHEMATIC DIAGRAM

COMPONENT ARRANGEMENT

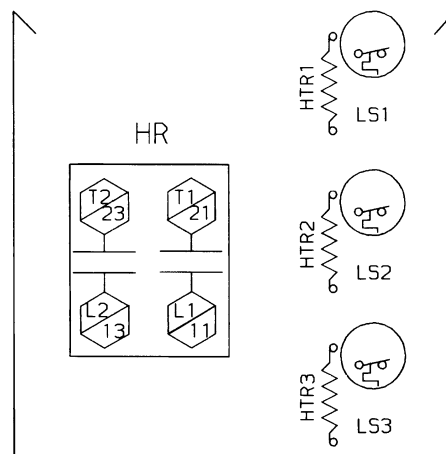


WARNING

Electric shock hazard — Disconnect all branch circuits before removing this cover.

NOTES:

1. To be wired in accordance with NEC and local codes.
2. Brown and violet 24-vac wires are supplied with heater and connected at installation to base unit as shown on base unit wiring diagram.
3. For single phase, disconnect YEL1 wire from terminal L1/11 and connect RED1 wire and splice connector to loose terminal on YEL1 as shown above.
4. Power wires are supplied with heater and connected at installation to base unit field power connection box as shown on base unit wiring diagram. For field installation of electric heaters, field power connection box shown on equipment nameplate must be used.
5. For single phase operation, disconnect YEL1 from L1/11 and splice to RED1 with a splice connector.



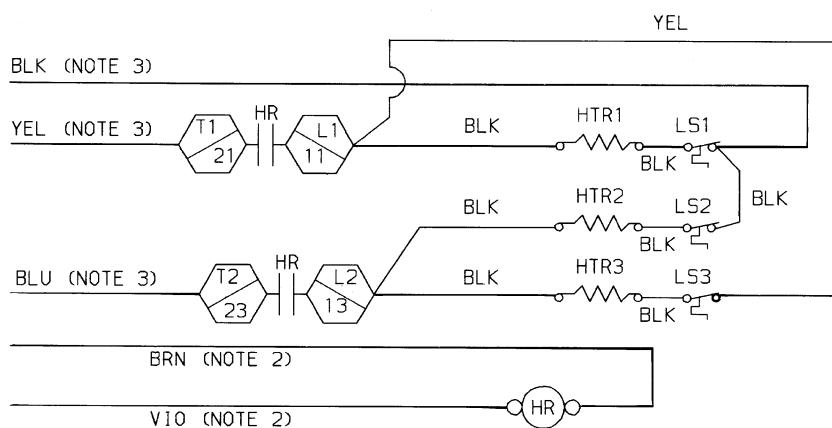
LEGEND

- Sylvania Marked Terminal Elmwood
 Unmarked Terminal
HTR — Heater
HR — Heater Relay
LS — Limit Switch
NEC — National Electrical Code
SC — Splice Connector

Fig. 22 — Label Diagram, Accessory Electric Heater; 50HJ004-006; 208/240 V, Single Phase

SCHEMATIC DIAGRAM

COMPONENT ARRANGEMENT

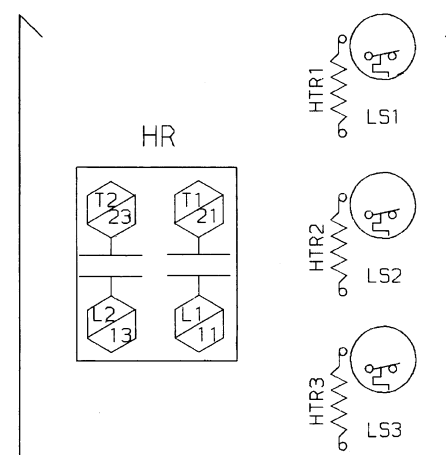


WARNING

Electric shock hazard — Disconnect all branch circuits before removing this cover.

NOTES:

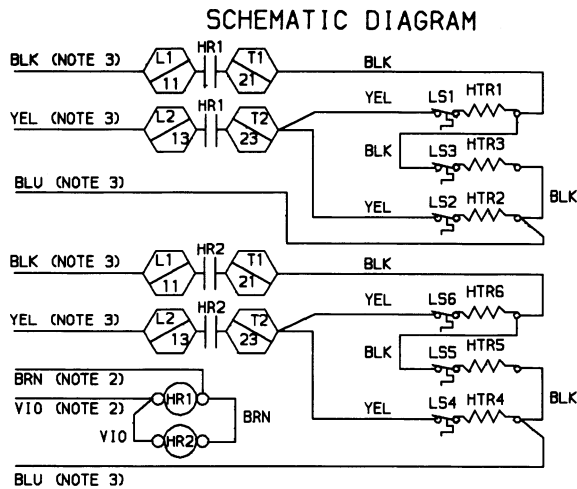
1. To be wired in accordance with NEC and local codes.
2. Brown and violet 24-vac wires are supplied with heater and connected at installation to base unit as shown on base unit wiring diagram.
3. Power wires are supplied with heater and connected at installation to base unit field power connection box as shown on base unit wiring diagram. For field installation of electric heaters, field power connection box shown on equipment nameplate must be used.



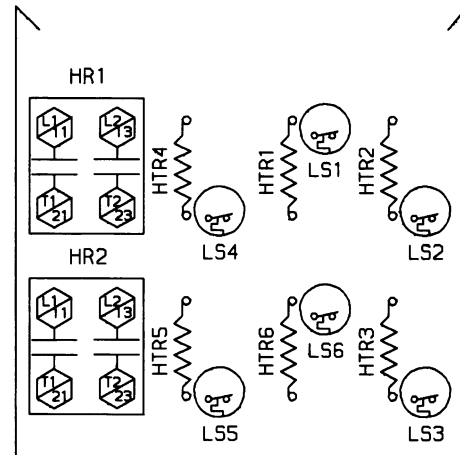
LEGEND

- Sylvania Marked Terminal Elmwood
 Unmarked Terminal
HTR — Heater
HR — Heater Relay
LS — Limit Switch
NEC — National Electrical Code

Fig. 23 — Label Diagram, Accessory Electric Heater; 50HJ004-007; 208/240 V, 3 Phase



COMPONENT ARRANGEMENT



⚠ WARNING

Electric shock hazard — Disconnect all branch circuits before removing this cover.

NOTES:

1. To be wired in accordance with NEC and local codes.
2. Brown and violet 24-vac wires are supplied with heater and connected at installation to base unit as shown on base unit wiring diagram.
3. Power wires are supplied with heater and connected at installation to base unit field power connection box as shown on base unit wiring diagram. For field installation of electric heaters, field power connection box shown on equipment nameplate must be used.

LEGEND



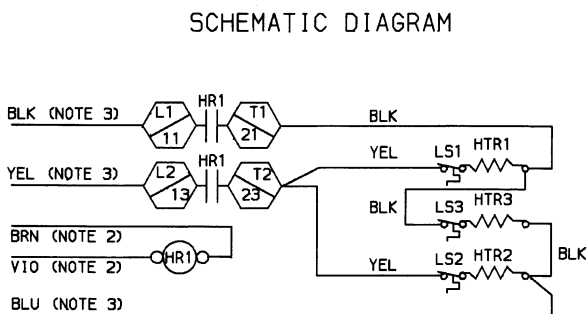
Sylvania
Marked Terminal
Elmwood



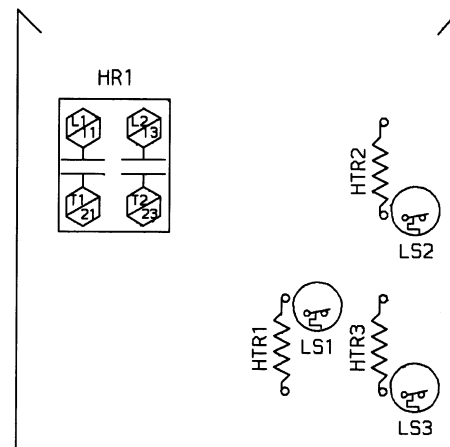
Unmarked Terminal

HTR — Heater
HR — Heater Relay
LS — Limit Switch
NEC — National Electrical Code

**Fig. 24 — Label Diagram, Accessory Electric Heater; 50HJ008-014;
18.0/24.0 kW, 24.0/32.0 kW, 31.8/42.4 kW, and 37.6/50.0 kW; 208/240 V, 3 Phase**



COMPONENT ARRANGEMENT



⚠ WARNING

Electric shock hazard — Disconnect all branch circuits before removing this cover.

NOTES:

1. To be wired in accordance with NEC and local codes.
2. Brown and violet 24-vac wires are supplied with heater and connected at installation to base unit as shown on base unit wiring diagram.
3. Power wires are supplied with heater and connected at installation to base unit field power connection box as shown on base unit wiring diagram. For field installation of electric heaters, field power connection box shown on equipment nameplate must be used.

LEGEND



Sylvania
Marked Terminal
Elmwood

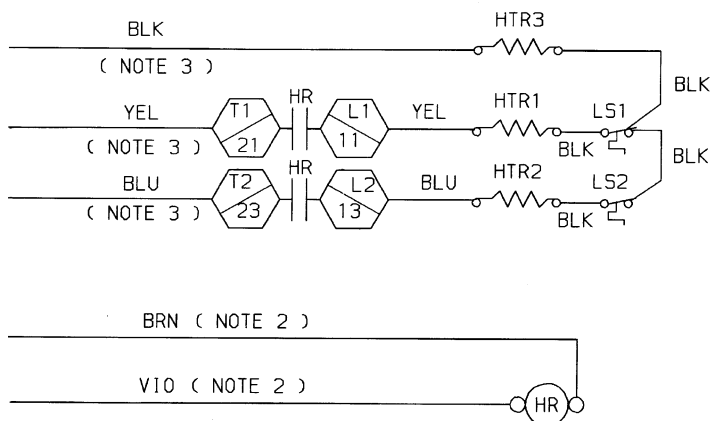


Unmarked Terminal

HTR — Heater
HR — Heater Relay
LS — Limit Switch
NEC — National Electrical Code

**Fig. 25 — Label Diagram, Accessory Electric Heater; 50HJ008-014;
7.8/10.4 kW, and 12.0/16.0 kW; 208/240 V, 3 Phase**

SCHEMATIC DIAGRAM



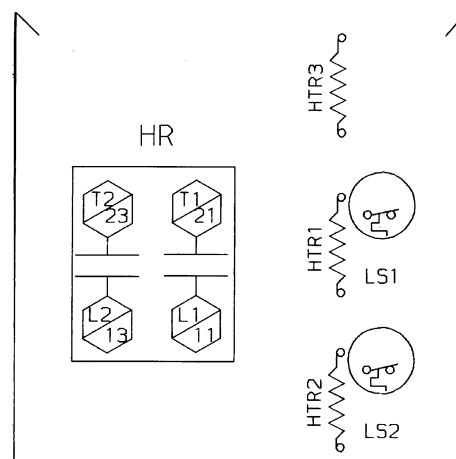
⚠ WARNING

Electric shock hazard — Disconnect all branch circuits before removing this cover.

NOTES:

1. To be wired in accordance with NEC and local codes.
2. Brown and violet 24-vac wires are supplied with heater and connected at installation to base unit as shown on base unit wiring diagram.
3. Power wires are supplied with heater and connected at installation to base unit field power connection box as shown on base unit wiring diagram. For field installation of electric heaters, field power connection box shown on equipment nameplate must be used.

COMPONENT ARRANGEMENT



LEGEND



Sylvania
Marked Terminal
Elmwood



Unmarked Terminal

HTR — Heater

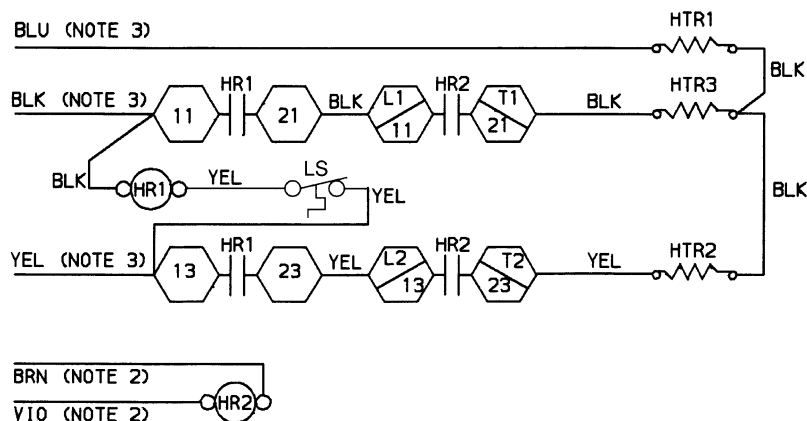
HR — Heater Relay

LS — Limit Switch

NEC — National Electrical Code

Fig. 26 — Label Diagram, Accessory Electric Heater; 50HJ004-007; 480 V, 3 Phase

SCHEMATIC DIAGRAM



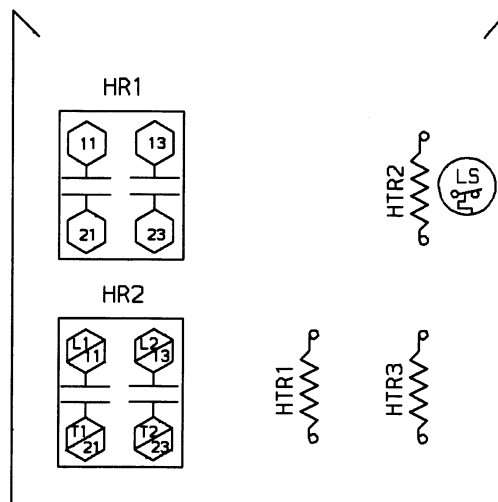
⚠ WARNING

Electric shock hazard — Disconnect all branch circuits before removing this cover.

NOTES:

1. To be wired in accordance with NEC and local codes.
2. Brown and violet 24-vac wires are supplied with heater and connected at installation to base unit as shown on base unit wiring diagram.
3. Power wires are supplied with heater and connected at installation to base unit field power connection box as shown on base unit wiring diagram. For field installation of electric heaters, field power connection box shown on equipment nameplate must be used.

COMPONENT ARRANGEMENT



LEGEND



Sylvania
Marked Terminal
Elmwood



Unmarked Terminal

HTR — Heater

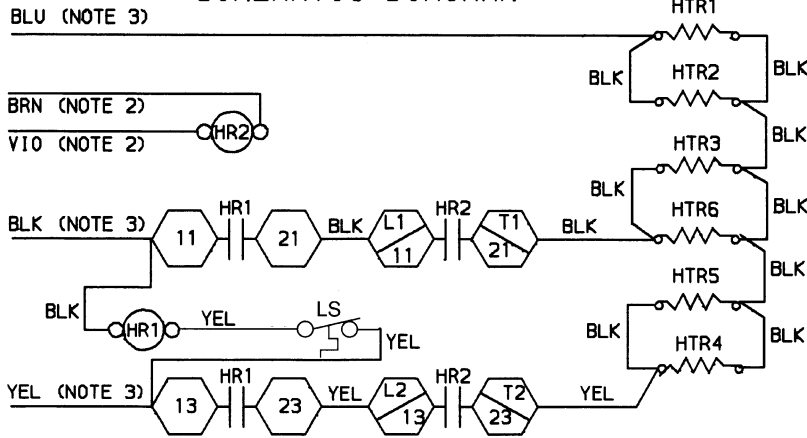
HR — Heater Relay

LS — Limit Switch

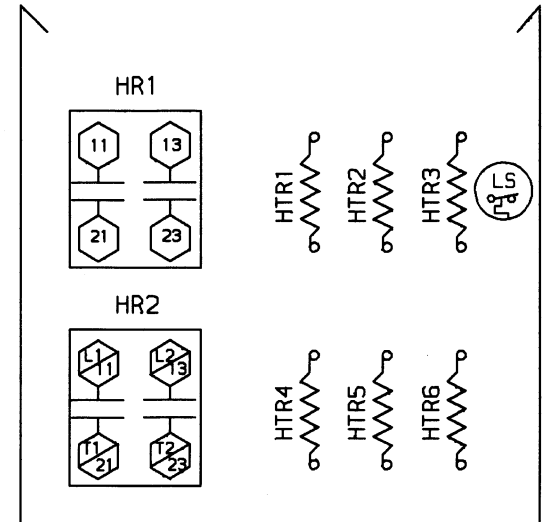
NEC — National Electrical Code

**Fig. 27 — Label Diagram, Accessory Electric Heater; 50HJ008;
13.9 kW and 16.5 kW, 480 V; 17.0 kW, 575 V**

SCHEMATIC DIAGRAM



COMPONENT ARRANGEMENT



⚠ WARNING

Electric shock hazard — Disconnect all branch circuits before removing this cover.

NOTES:

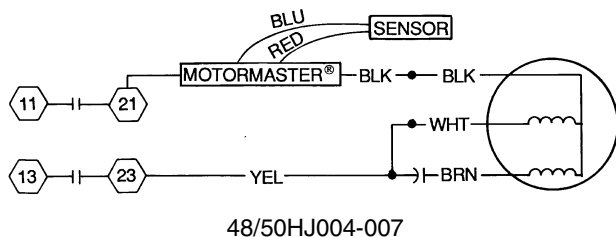
1. To be wired in accordance with NEC and local codes.
2. Brown and violet 24-vac wires are supplied with heater and connected at installation to base unit as shown on base unit wiring diagram.
3. Power wires are supplied with heater and connected at installation to base unit field power connection box as shown on base unit wiring diagram. For field installation of electric heaters, field power connection box shown on equipment nameplate must be used.

LEGEND



- Sylvania Marked Terminal Elmwood
- Unmarked Terminal
- HTR** — Heater
- HR** — Heater Relay
- LS** — Limit Switch
- NEC** — National Electrical Code

**Fig. 28 — Label Diagram, Accessory Electric Heater; 50HJ008-014;
27.8 kW, 33.0 kW, 41.7 kW, and 50.0 kW, 460 V; 34.0 kW and 51.0 kW, 575 V**



LEGEND
C — Contactor

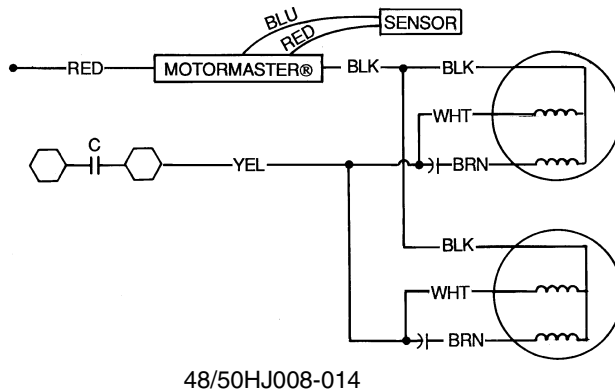
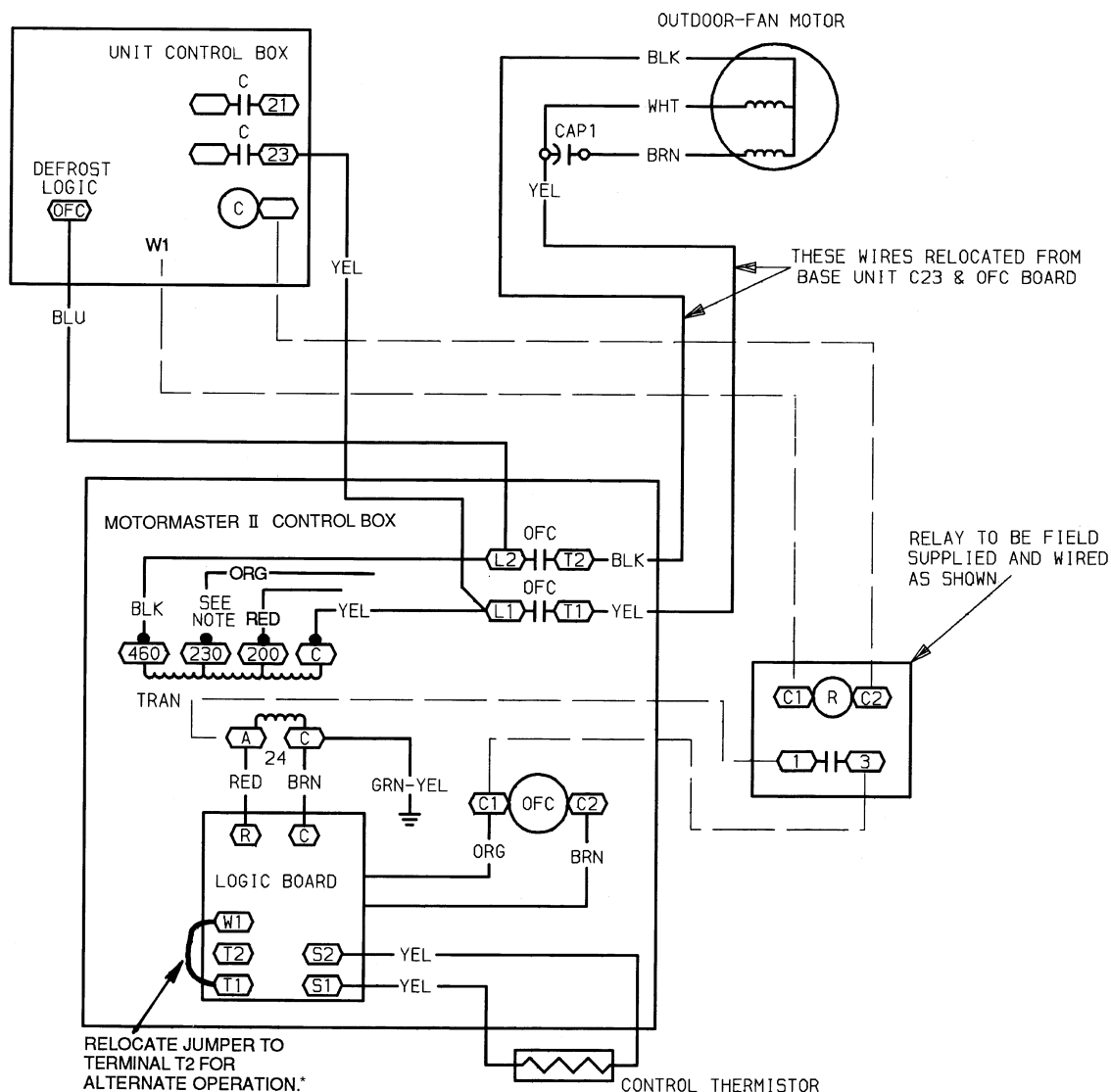


Fig. 29 — Motormaster® I Control Wiring Details



LEGEND
C — Contactor
OFC — Outdoor-Fan
TRAN — Transformer

*The Motormaster II head pressure controller is equipped with an alternate operating mode. When this mode is selected, the controller shifts the fan cycle sequence to effectively raise the average condensing temperature approximately 20 F higher than the standard

operating mode. In this alternate mode, the outdoor fan begins cycling at higher outdoor ambient temperatures. This mode should only be used if the evaporator coil shows signs of frosting at low outdoor ambient temperatures. To select the alternate operating mode, move the jumper wire on the Motormaster II control board from terminal T1 to terminal T2.

NOTE: Motormaster II transformer is wired for 460-v supply; it must be rewired for 208/230-v application. Be sure to insulate unused tap. Refer to color code.

Fig. 30 — Motormaster II Control Wiring Schematic, 48/50HJ004-007

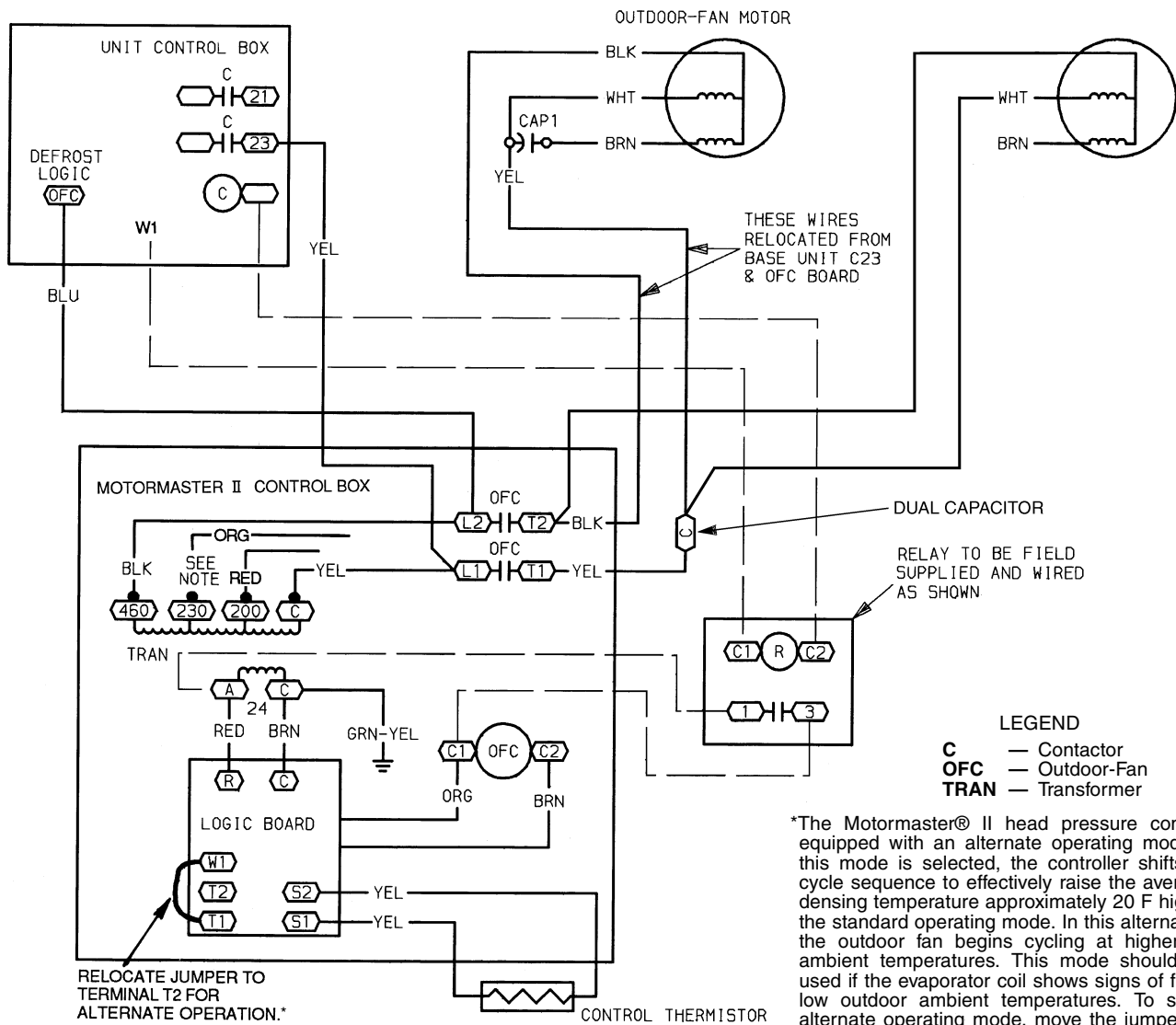


Fig. 31 — Motormaster II Control Wiring Schematic, 48/50HJ008-014

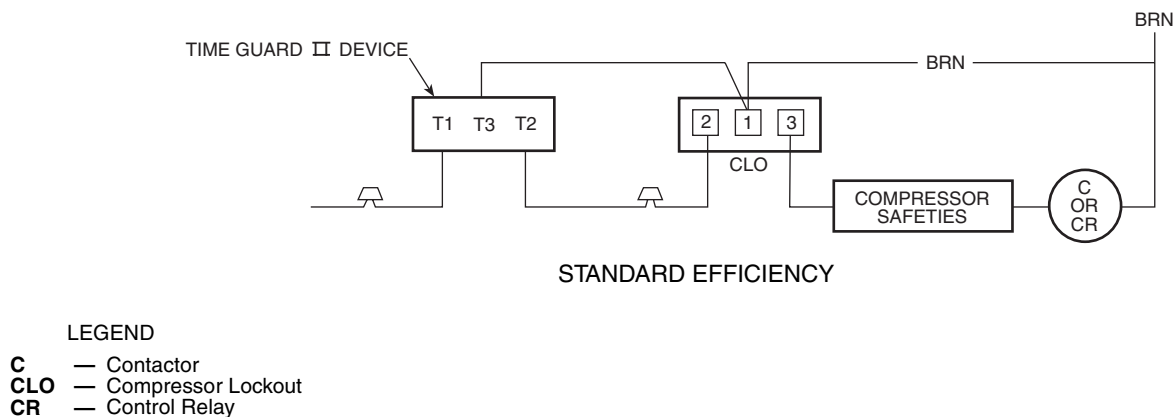
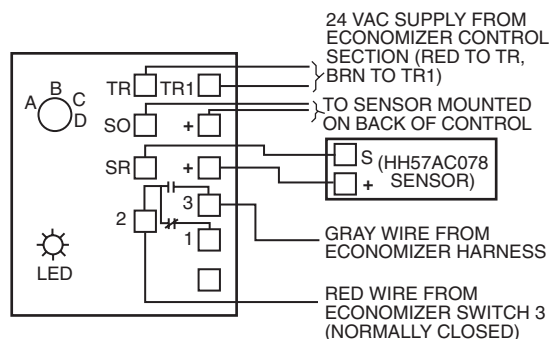


Fig. 32 — Time Guard® II Device, 48/50HJ004-014



NOTES:

1. Remove factory-installed jumper across SR and + before connecting wires from HH57AC078 sensor.
2. Switches shown in high outdoor-air enthalpy state. Terminals 2 and 3 close on low outdoor air enthalpy relative to indoor air enthalpy.

Fig. 34 — Wiring Connections for Differential Enthalpy Control (HH57AC077 and HH57AC078)



Fig. 35 — EconoMi\$er Wiring

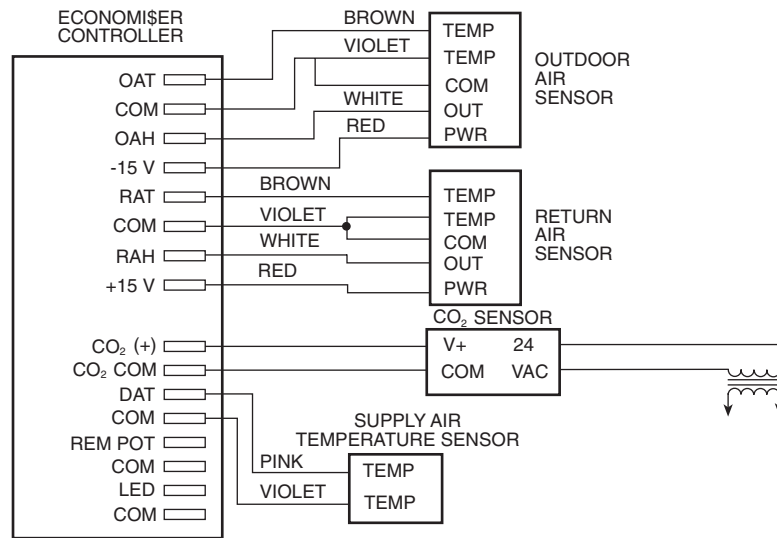


Fig. 36 — EconoMi\$er Sensor Wiring, 48/50HJ004-014

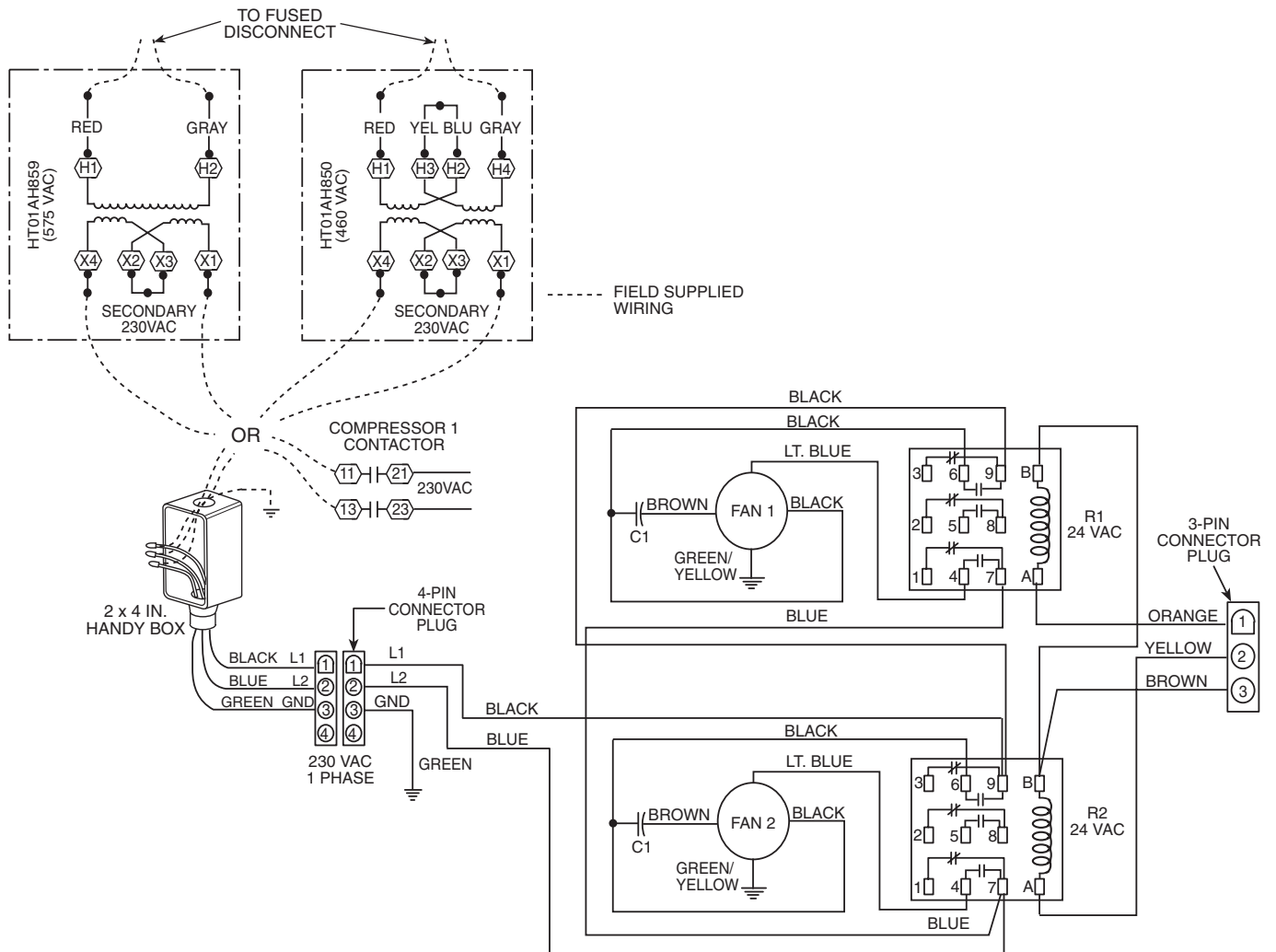
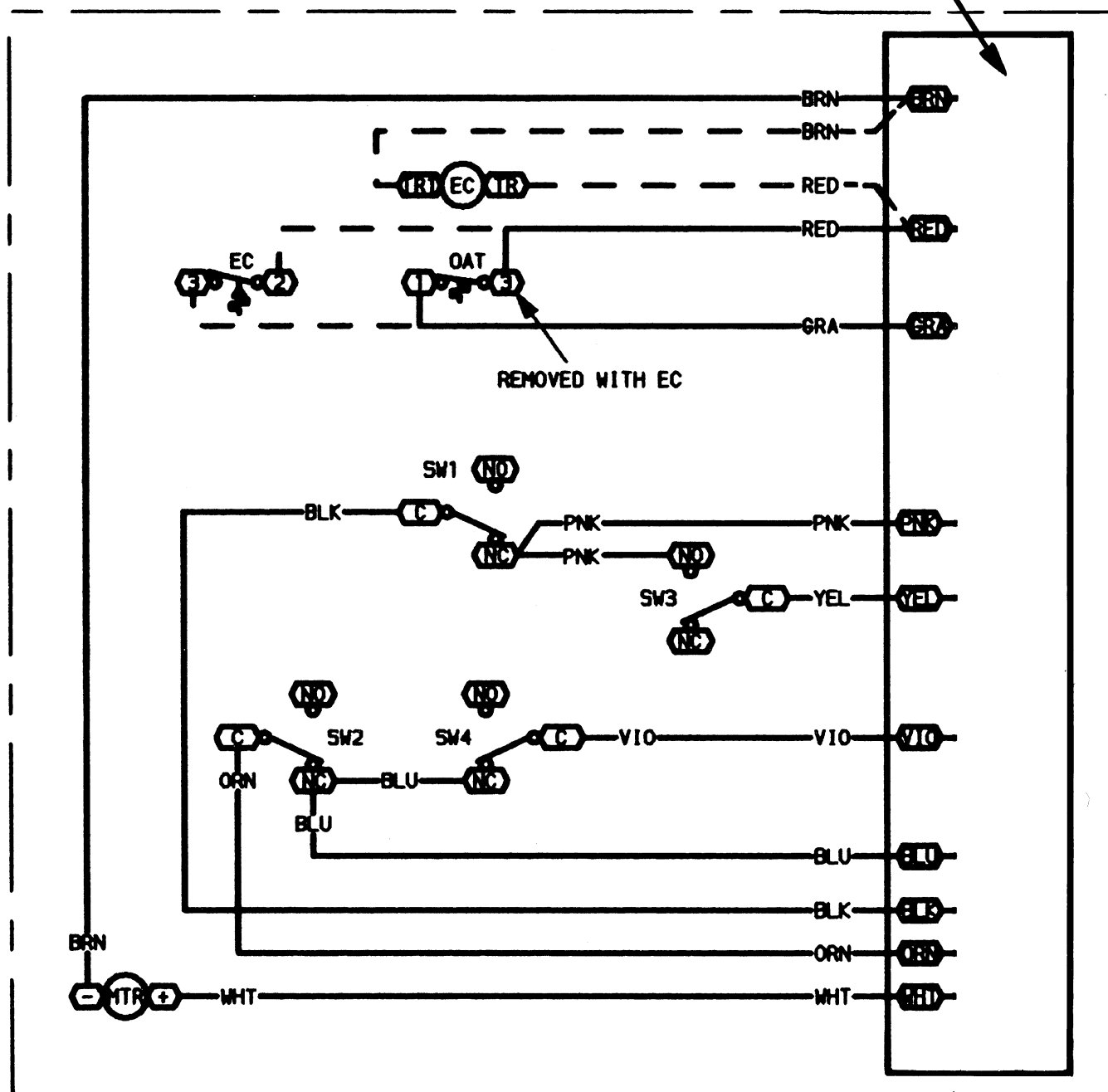


Fig. 37 — Wiring Diagram for EconoMi\$er Power Exhaust Systems

ECONOMIZER (DURABLADE)
CONTROL BOARD



LEGEND

- EC — Enthalpy Control
- MTR — Motor
- OAT — Outdoor-Air Thermostat
- SW1 — Switch Fully Open
- SW2 — Switch Fully Closed
- SW3 — Switch Minimum Vent Position
- SW4 — Switch Maximum Vent Position

Fig. 38 — Enthalpy Control and Durablade Economizer Control Board Wiring