

Single-Package Water Source Heat Pumps

INDEX

MODEL 50HQ,VQ	V-PH (60-Hz)	FIG. NO.
014		2
018 033 022 048 027 060	208/230-1	3
042	230-1	3
033 060 042 080 048	208/230-3	4
033 060 042 080 048	460-3	5

MODEL 50BQ	V-PH (60-Hz)	FIG. NO.
007 009	208/230-1 277-1	6
012 016 019	208/230-1 277-1	7

50HQ,VQ Refrigerant and Water Flow Diagrams Fig. 1

LEGEND (Fig. 2-5)

C — Contactor
Comp — Compressor
FC — Fan Capacitor
FM — Fan Motor
FR — Fan Relay
HPS — High Pressure Switch
LOR — Lock Out Relay
LPS — Low Pressure Switch
LWTC — Low Water Temperature Cutout
OL — Overload
QT — Quad Terminal
RC — Run Capacitor
RECP — Receptacle Assembly
RVS — Reversing Valve Solenoid

ST — Start Thermistor
TB — Terminal Board
Tran — Transformer
 Component Connection (Marked)
 Component Connection (Unmarked)
 Field Splice
 Common Potential Only (Not to represent wire)
 Field Power Wiring
 Field Control Wiring
 Junction
 Alternate ST Wiring

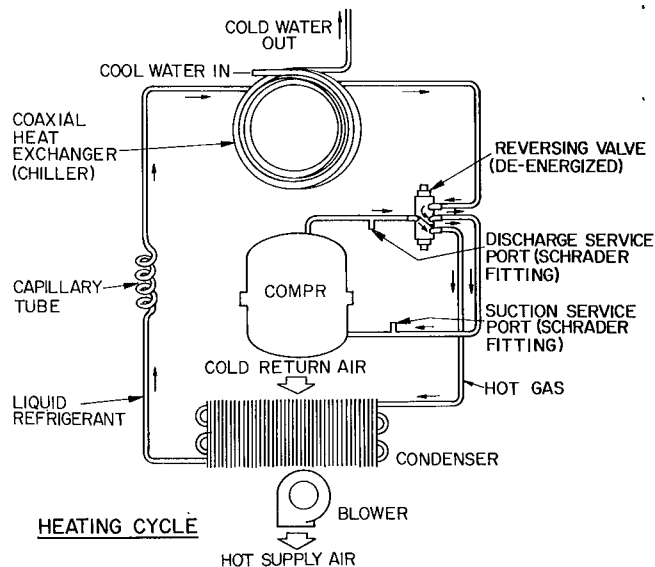
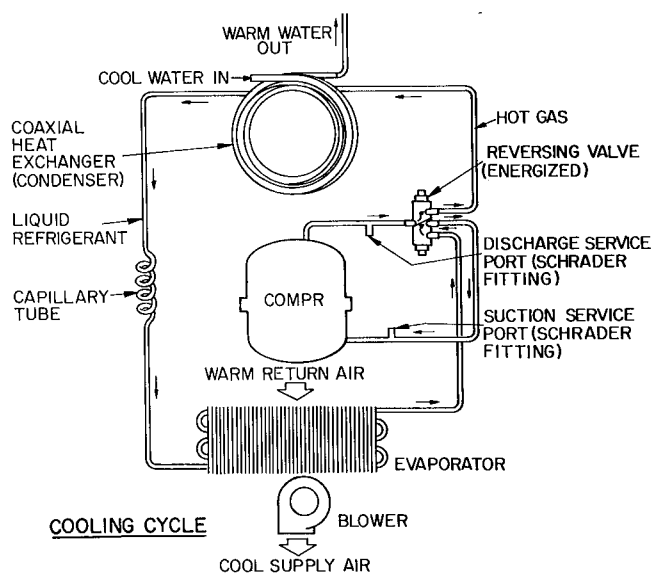


Fig. 1 — 50HQ,VQ Refrigerant and Water Flow Diagrams

SEQUENCE OF OPERATION (50HQ,VQ)

Fan Switch — If the fan switch is at the ON position, fan motor will run when power is supplied to the unit. At the AUTO. position, fan motor cycles with the compressor.

THERMOSTAT CALLS FOR COOLING (reversing valve solenoid [RVS] is energized in cooling position) — Control voltage (24 v) is available at thermostat terminal O and RVS is energized. The control voltage is also available at Y and if low water temperature cutout (LWTC), pressure switches (LPS and HPS) and lockout relay (LOR) are closed, the contactor is energized and the compressor runs. With the RVS energized, refrigerant flows thru the heat exchanger (HX) which is acting as a condenser, and thru the capillary to the evaporator (see Fig. 1).

When room thermostat is satisfied, cooling thermostat breaks the connection at Y and the compressor stops. Power (24 v) to O keeps the RVS energized during compressor OFF cycle.

THERMOSTAT CALLS FOR HEATING (reversing valve solenoid [RVS] is de-energized in heating position) — Voltage is not supplied to O because of the resistance of the cooling compensator (CC) ahead of it. Control voltage (24 v) is applied to W and the field-supplied jumper carries voltage to Y

and energizes the contactor (C) if the switches are closed. The compressor starts and, since the RVS is de-energized, the refrigerant flows to the indoor coil which is now a condenser, then thru the capillary and the heat exchanger (HX), which acts as an evaporator (see Fig. 1).

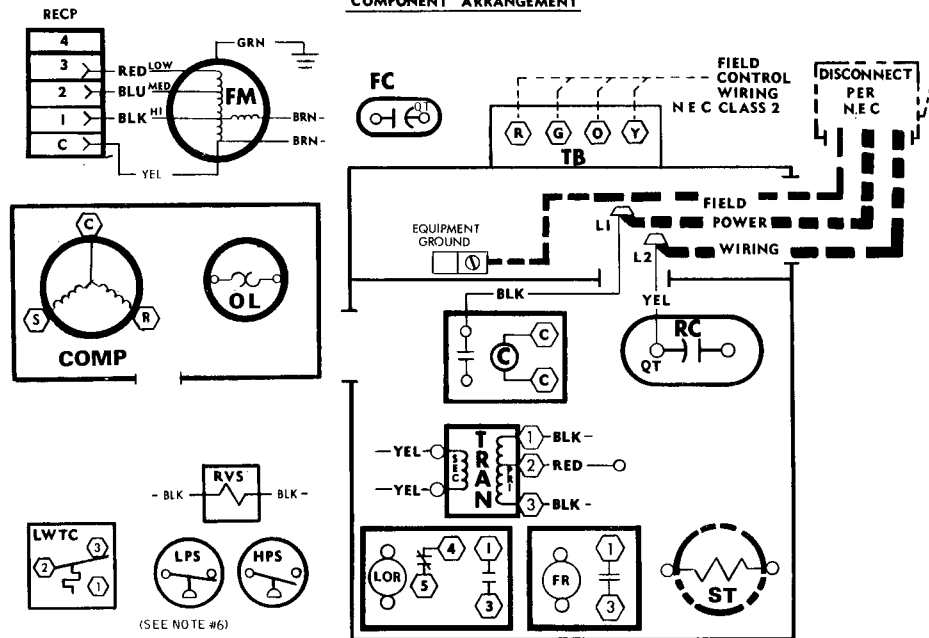
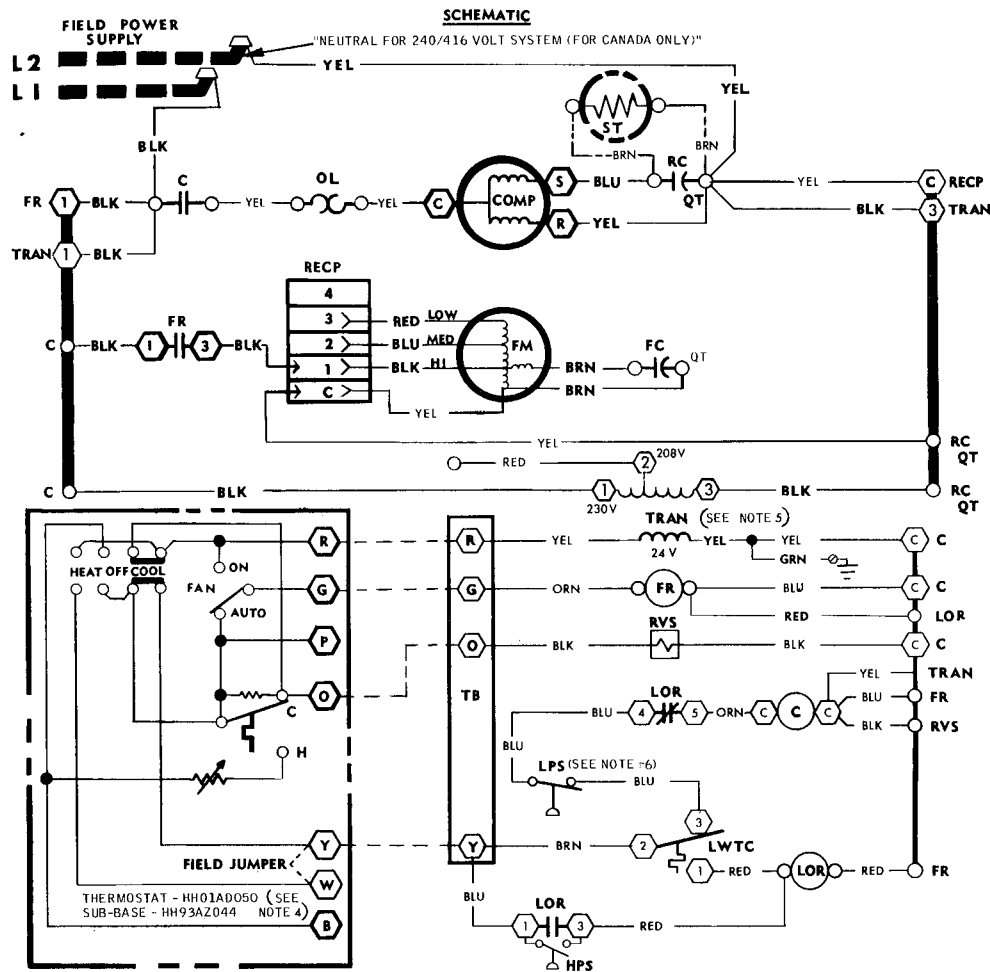
When the thermostat is satisfied, the heating thermostat breaks, de-energizing C by the loss of voltage to W.

There is no defrost cycle with a water-to-air heat pump.

See Freeze-Up Protection under "Unit Safety Devices" in the Installation Instructions for an explanation of the operation of low water temperature cutout (LWTC) and the lockout relay (LOR). As described, these controls offer a manual reset if the entering water temperature falls below 36 F.

50BQ Console Model Units — On console model units with unit mounted controls, raise hinged access door on top of unit for access to control panel. Select operation using pushbutton switch and adjust thermostat knob for desired room temperature. The unit can be operated on cooling or heating during any season.

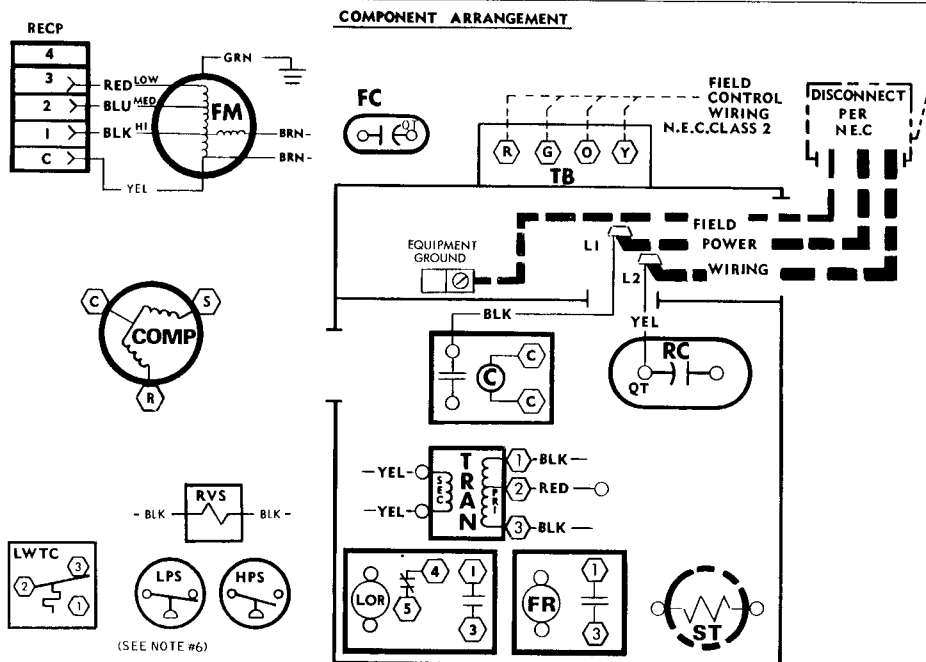
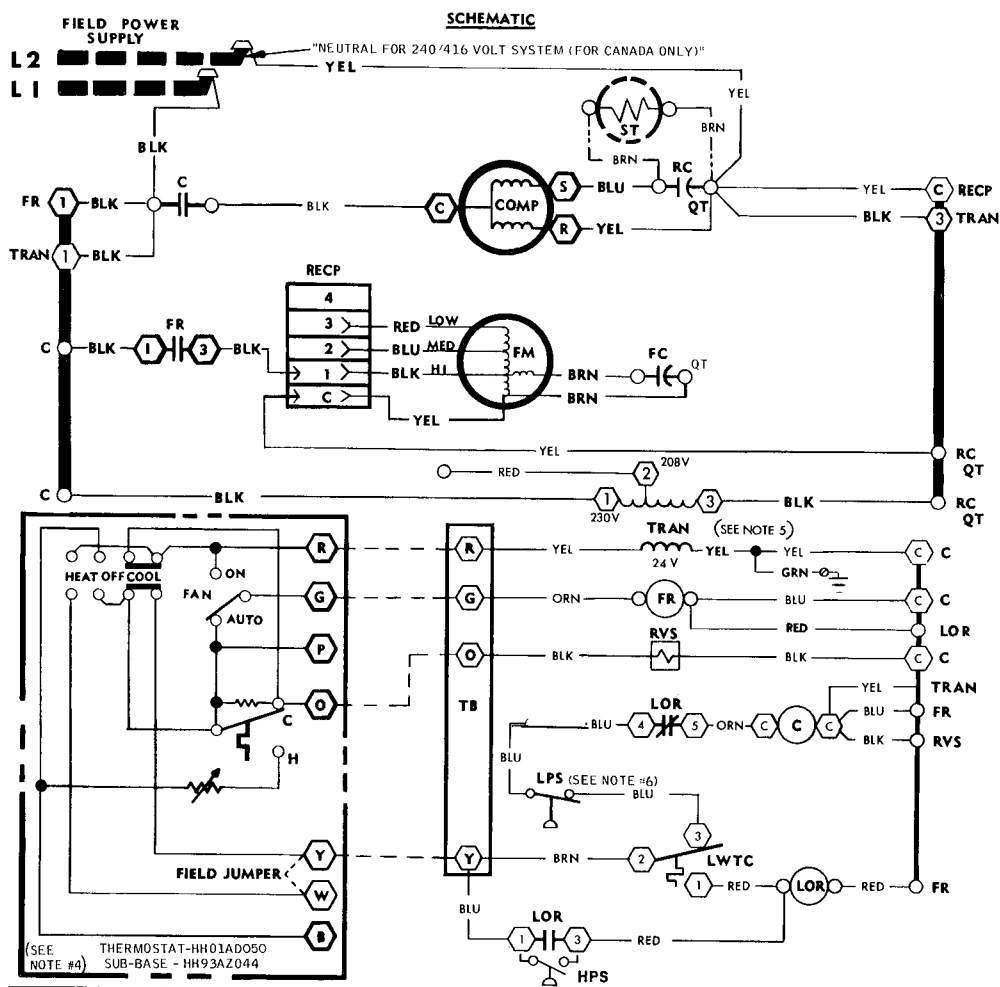
For units controlled by a remote low-voltage wall-mounted thermostat, refer to SEQUENCE OF OPERATION (50HQ,VQ).



NOTES

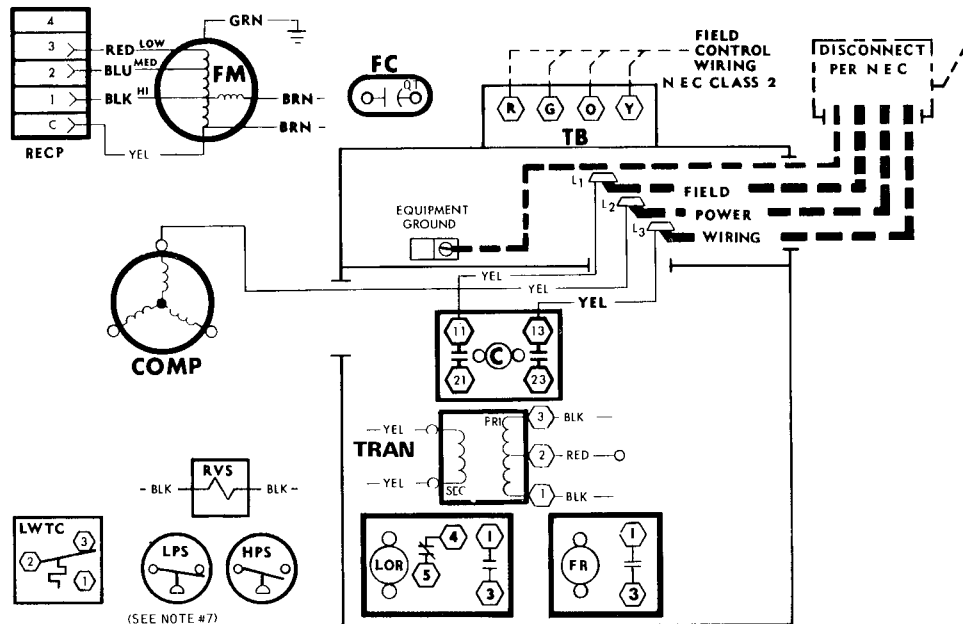
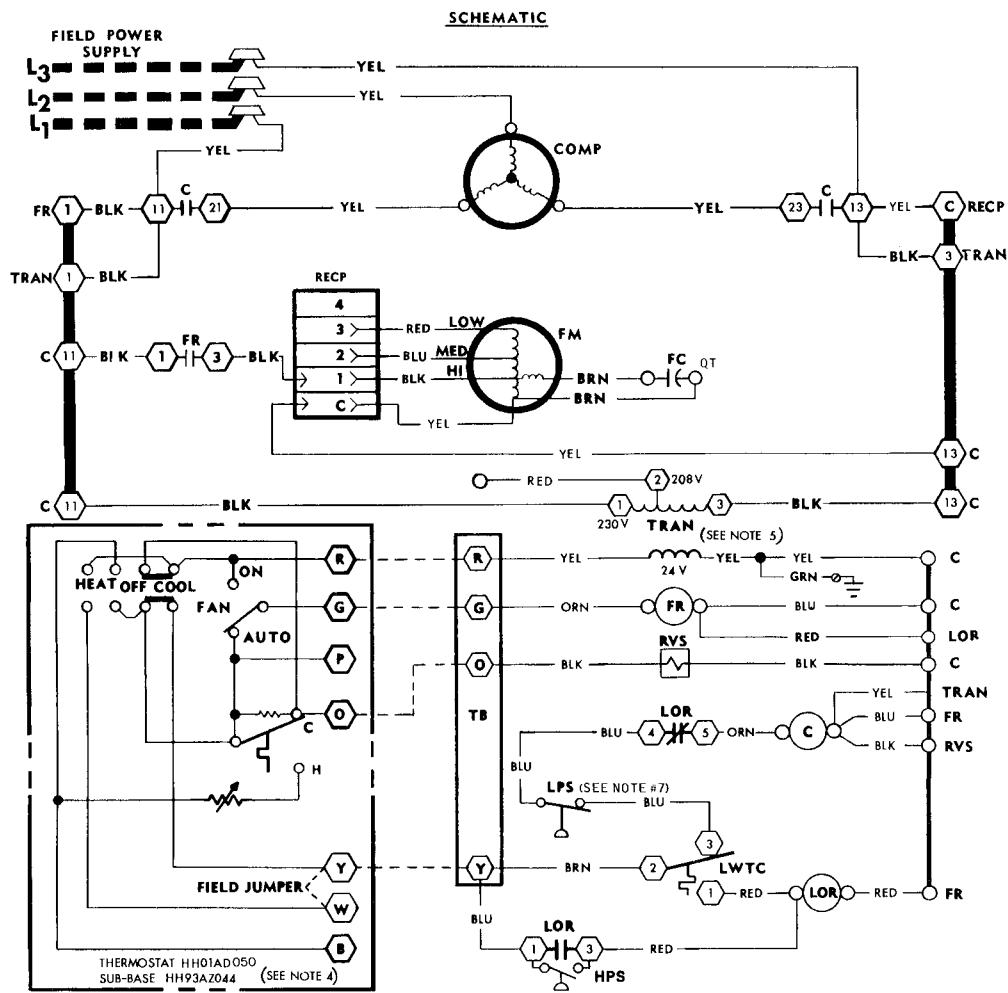
- 1 COMPRESSOR AND FAN MOTOR THERMALLY PROTECTED
- 2 REVERSING VALVE SOLENOID (RVS) IS ENERGIZED IN COOLING MODE
- 3 BLACK WIRE FROM FR-3 TO REC-1 MAY BE DISCONNECTED AND RECONNECTED TO EITHER REC-2 FOR MED SPEED OR REC-3 FOR LOW SPEED
- 4 MUST USE THERMOSTAT AND SUB-BASE AS SPECIFIED
- 5 TRANSFORMER PIGTAILS: BLACK (TERM #1) 240V.; RED (TERM #2) 208V.; BLACK (TERM #3) COMMON INSULATE UNUSED LEAD
- 6 LOW PRESSURE SWITCH IS AN OPTIONAL DEVICE AND MAY NOT BE SUPPLIED ON UNIT
- 7 ANY LETTER APPEARING IN SPACE MARKED * DOES NOT EFFECT SCHEMATIC SHOWN ON THIS DIAGRAM
- 8 USE COPPER OR COPPER-CLAD ALUMINUM CONDUCTORS ONLY

Fig. 2 — Label Diagram; 50HQ,VQ014; 208/230-1-60



- NOTES**
- 1 COMPRESSOR AND FAN MOTOR THERMALLY PROTECTED
 - 2 REVERSING VALVE SOLENOID (RVS) IS ENERGIZED IN COOLING MODE
 - 3 BLACK WIRE FROM FR-3 TO RECP-1 MAY BE DISCONNECTED AND RECONNECTED TO EITHER RECP-2 FOR MFD SPEED OR RECP-3 FOR LOW SPEED
 - 4 MUST USE THERMOSTAT AND SUB-BASE AS SPECIFIED
 - 5 TRANSFORMER PIGTAILS: BLACK (TERM #1) 240V.; RED (TERM #2) 208V.; BLACK (TERM #3) COMMON. INSULATE UNUSED LEAD
 - 6 LOW PRESSURE SWITCH IS AN OPTIONAL DEVICE AND MAY NOT BE SUPPLIED ON UNIT
 - 7 ANY LETTER APPEARING IN SPACE MARKED* DOES NOT EFFECT SCHEMATIC SHOWN ON THIS DIAGRAM
 - 8 USE COPPER OR COPPER-CLAD ALUMINUM CONDUCTORS ONLY

Fig. 3 – Label Diagram; 50HQ, VQ018, 022, 027, 033, 048, 060; 208/230-1-60, 042; 230-1-60



- NOTES**
- 1 COMPRESSOR AND FAN MOTOR THERMALLY PROTECTED.
 - 2 REVERSING VALVE SOLENOID (RVS) IS ENERGIZED IN COOLING MODE
 - 3 BLACK WIRE FROM FR-3 TO RECP-1 MAY BE DISCONNECTED AND RECONNECTED TO EITHER RECP-2 FOR MED SPEED OR RECP-3 FOR LOW SPEED
 - 4 MUST USE THERMOSTAT AND SUB-BASE AS SPECIFIED
 - 5 TRANSFORMER PIGTAILS: BLACK (TERM #1) 240V.; RED (TERM #2) 208V.; BLACK (TERM #3) COMMON INSULATE UNUSED LEAD
 - 6 THREE PHASE MOTOR PROTECTED UNDER PRIMARY SINGLE PHASING CONDITIONS
 - 7 LOW PRESSURE SWITCH IS AN OPTIONAL DEVICE AND MAY NOT BE SUPPLIED ON UNIT
 - 8 ANY LETTER APPEARING IN SPACE MARKED * DOES NOT EFFECT SCHEMATIC SHOWN ON THIS DIAGRAM
 - 9 USE COPPER OR COPPER-CLAD ALUMINUM CONDUCTORS ONLY

Fig. 4 — Label Diagram; 50HQ, VQ033, 042, 048, 060, 080; 208/230-3-60

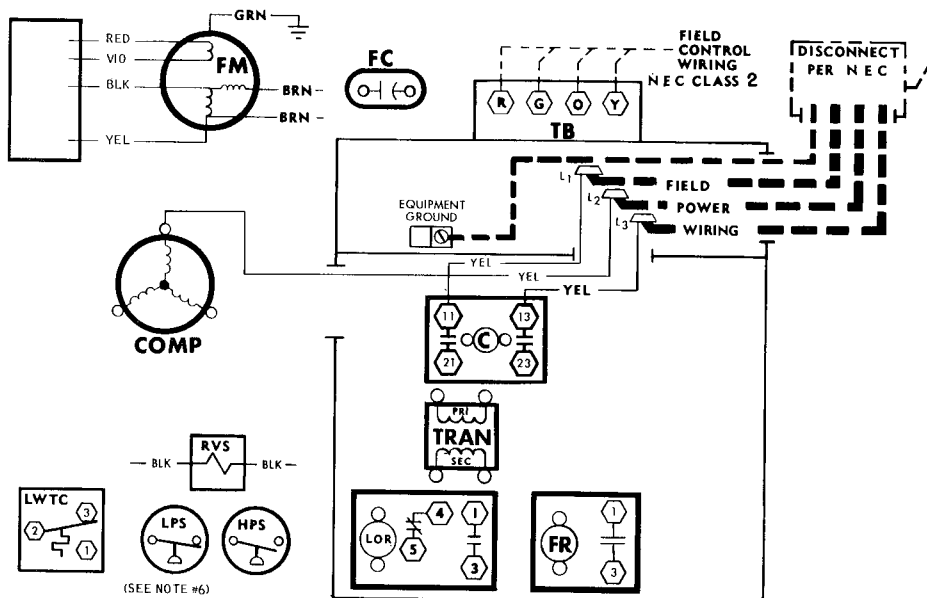
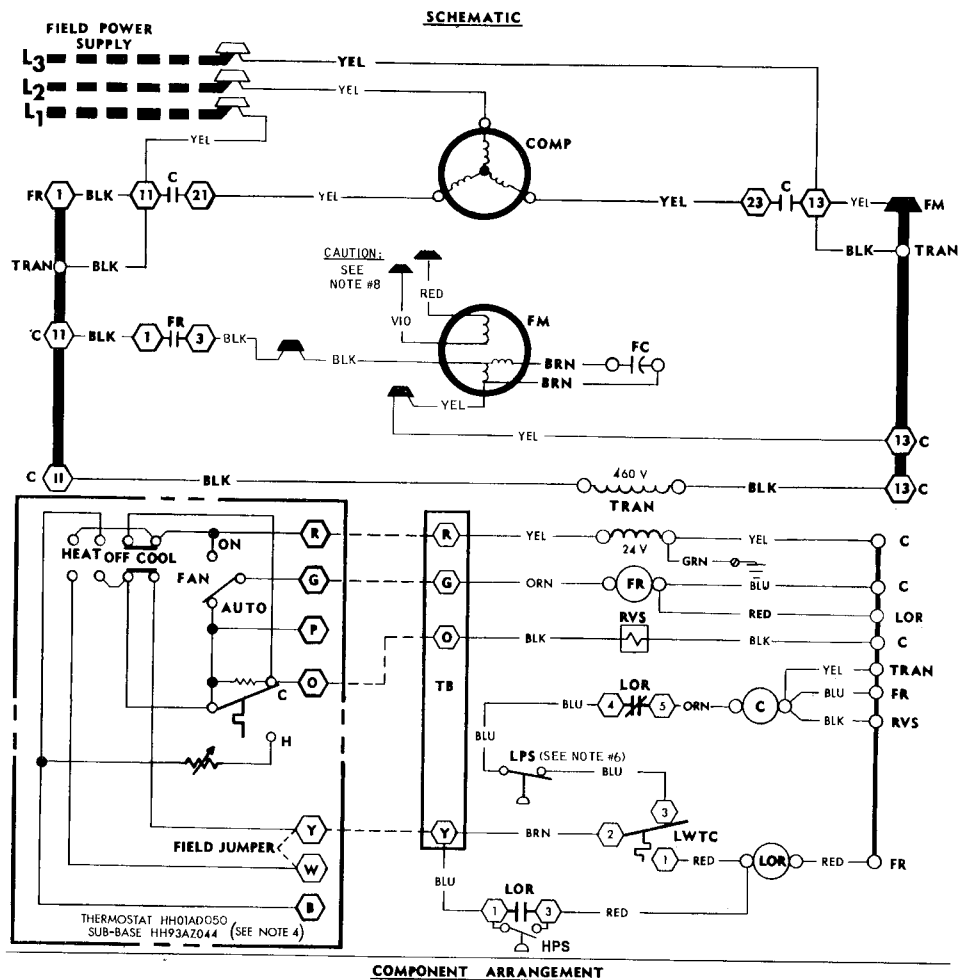


Fig. 5 — Label Diagram; 50HQ, VQ033, 042, 048, 060, 080; 460-3-60

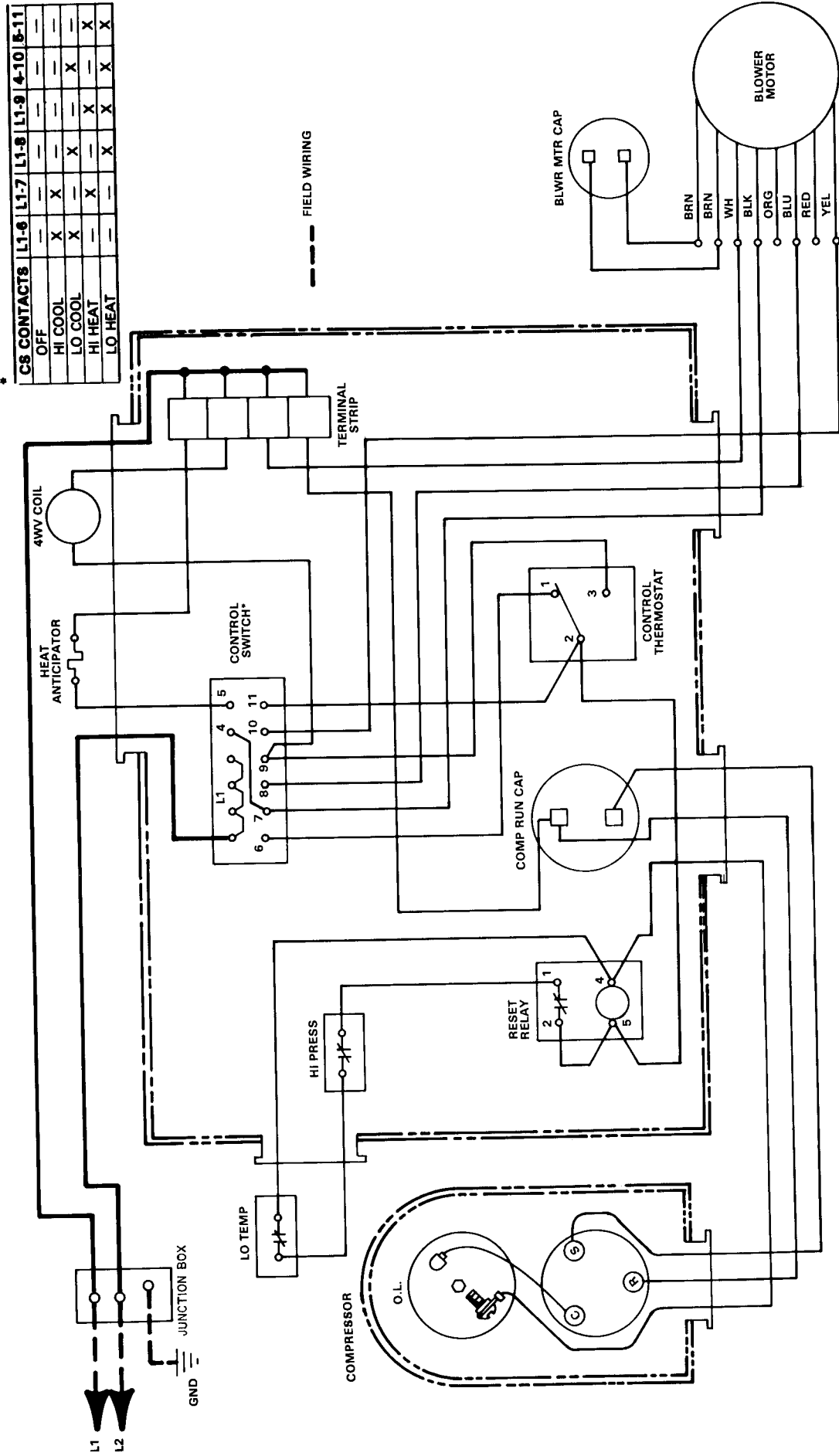


Fig. 6 — Label Diagram; 50BQ007, 009; 208/230-1-60; 277-1-60

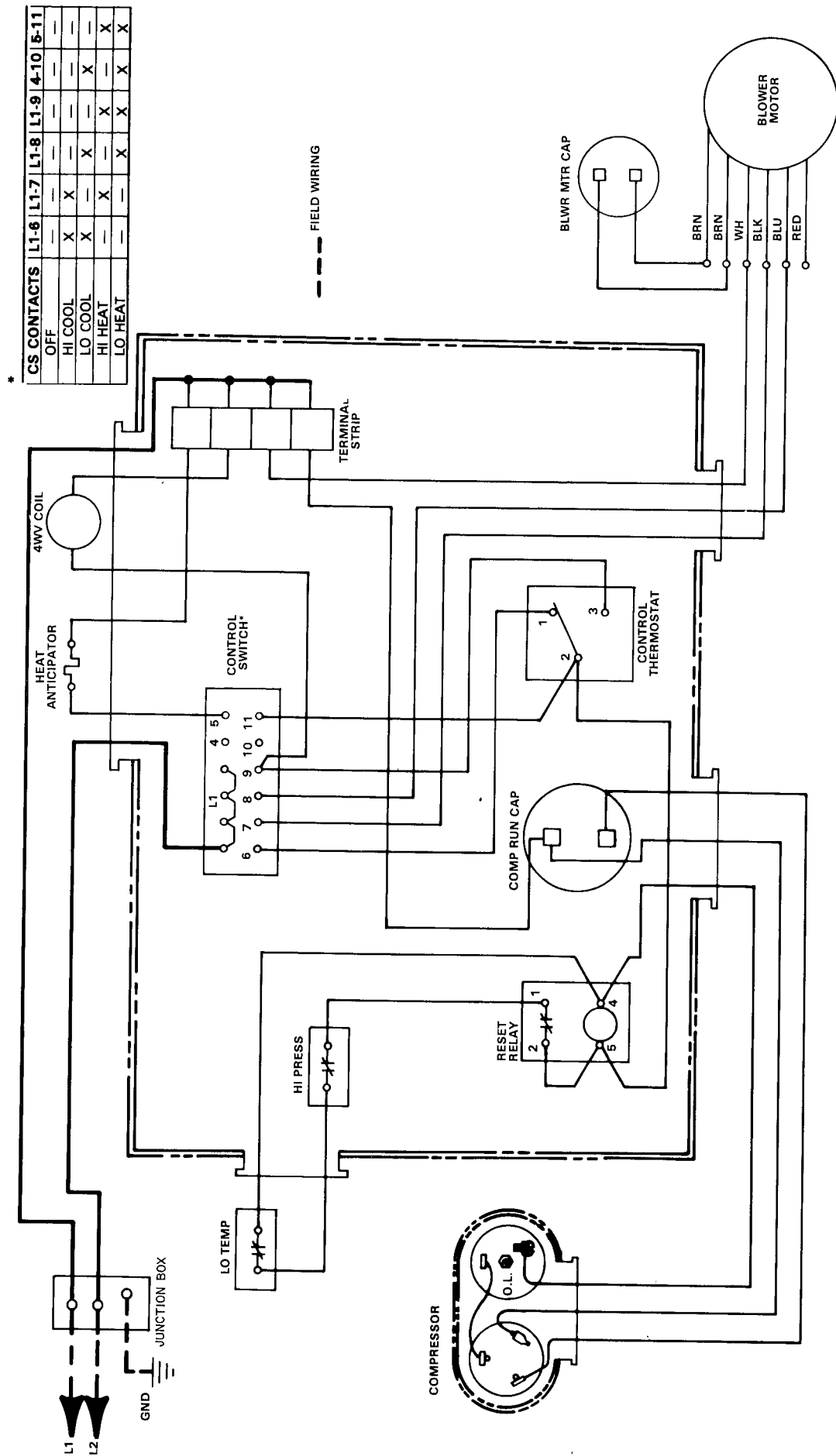


Fig. 7 — Label Diagram; 50BQ012, 016, 019; 208/230-1-60, 277-1-60

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