



INSTRUCTIONS

Minneapolis-Honeywell Regulator Company

MINNEAPOLIS 8, MINNESOTA • TORONTO 17, ONTARIO

**R8100A-D, J-M
RESIDENTIAL
AIR CONDITIONING
CONTROL CENTER**

APPLICATION

The R8100 Control Center is designed for use with a Honeywell heating-cooling thermostat to provide low-voltage control of a 2-ton or 3-ton air conditioning system.

FEATURES

Models are available with or without a case and cover and include—

1. A transformer for low-voltage control circuit power.
2. Low-voltage terminal strip for thermostat connections.
3. Both quick connect and screw type terminals for line-voltage loads.
4. A fan relay for control of a single-speed or two-speed fan motor.
5. Contactor for across-the-line starting of a single-phase or three-phase compressor motor.
6. N. E. C. class 1 leads for field connecting to an integral or remote mounted dual pressure control.

SPECIFICATIONS

MODELS: Air Conditioning Control Center. Use with T87 and Q405 or T870 and Q412 Thermostat and subbase combinations.

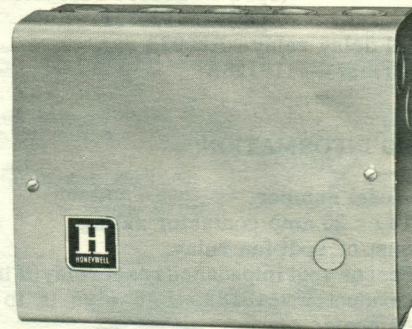
R8100A. Includes transformer, 18 or 25 amp contactor, spst or spdt fan relay, spst impedance reset relay, thermal delay relay, case and cover. Available with or without space for field mounting integral dual pressure control.

R8100B. Includes transformer, 18 or 25 amp contactor, spst or spdt fan relay, spst or spdt impedance reset relay, case and cover. Available with or without a Check-lite* terminal and space for field mounting integral dual pressure control.

R8100C. Includes transformer, 18 or 25 amp contactor, spst or spdt fan relay, thermal delay relay, case and cover. Available with or without space for field mounting dual pressure control.

R8100D. Includes transformer, 18 or 25 amp contactor, spst or spdt fan relay, case and cover. Available with or without space for field mounting integral dual pressure control.

*Trademark
October 28, 1960
Supersedes earlier issue
L. H.



An impedance relay for remote reset of the compressor control circuit is included in the R8100A, -B, -J, and -K models. A thermal delay relay to prevent short cycling the compressor motor is provided in the R8100A, -C, -J, and -L models.

The heating system is controlled by the thermostat and is externally powered.

NOTE:

Two sizes of case and cover are available. One size provides space for field mounting an integral pressure control. The other size provides no space for a pressure control.

- R8100J. Same as R8100A except less case and cover.
- R8100K. Same as R8100B except less case and cover.
- R8100L. Same as R8100C except less case and cover.
- R8100M. Same as R8100D except less case and cover.

ELECTRICAL RATING:

Load rating	120 volt ac		208/240 volt ac	
	normally open contacts	normally closed contacts	normally open contacts	normally closed contacts
Full load	10.0 amp	8.0 amp	5.0 amp	4.0 amp
Locked rotor	60.0 amp	48.0 amp	30.0 amp	24.0 amp

		Contactor		
		LOAD RATING		
18 amp	HERMETIC COMPRESSOR	FULL LOAD	208 volt ac 18.0 amp	
	STANDARD COMPRESSOR	LOCKED ROTOR	240 volt ac 18.0 amp	
	COMPRESSOR	SINGLE-PHASE	108.0 amp	108.0 amp
		THREE-PHASE	3 HP	3 HP
25 amp	HERMETIC COMPRESSOR	FULL LOAD	25.0 amp	
	STANDARD COMPRESSOR	LOCKED ROTOR	25.0 amp	
	COMPRESSOR	SINGLE-PHASE	125.0 amp	125.0 amp
		THREE-PHASE	3 HP	3 HP

Transformer—208/240v, 60 cycle primary.
24v, 60 cycle secondary.

DIMENSIONS: See Fig. 2, 3, and 4.

SIZE OF CONTACTOR SCREW TERMINALS: Standard, for #8 wire. For #6 wire order special connector #115182.

COMPONENT PART NUMBERS:

- Compressor contactor—R850B, Specify 18 or 25 amp rating.
- Fan relay (spst)—R851A
(spdt)—R851E
- Impedance relay (spst)—#112035K for R8100A or-J
(spst)—#112035E for R8100B or-K
(spdt)—#112035F
- Thermal delay relay—R8093A
- Transformer—#116126A.

ORDERING INFORMATION:

Specify—

1. Model number.
2. 18 or 25 amp contactor rating.
3. Spst or spdt fan relay.
4. Spst or spdt impedance reset relay (if included).
5. Connector #115182, if #6 wire is to be used on contactor.
6. Large case and cover for integral pressure control, if required.
7. Dual pressure control as separate item, if required. P432, with special mounting bracket for R8100. See Form 95-2621 for complete information.

Order from—

1. Your usual source, or
2. Minneapolis-Honeywell Regulator Company
1885 Douglas Drive North
Minneapolis 22, Minnesota
(In Canada—Honeywell Controls Limited
Vanderhoof Avenue, Leaside
Toronto 17, Ontario).

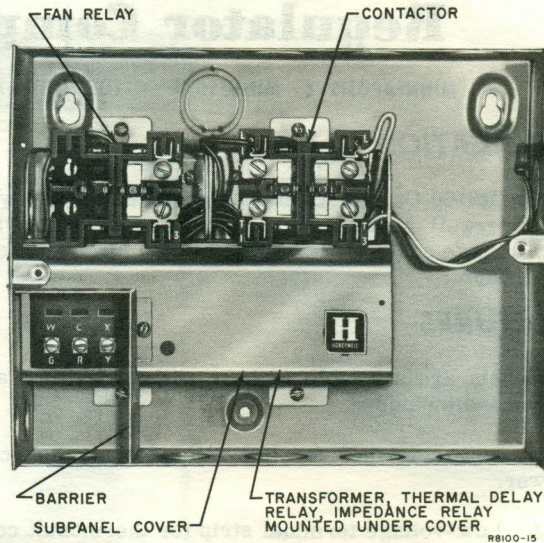


Fig. 1—Internal view of R8100.

INSTALLATION

MOUNTING:

Mount the R8100 Panel or Subpanel on solid, flat

surface. If a pressure control is added, make certain that the capillary will reach the desired location for attaching to the system.

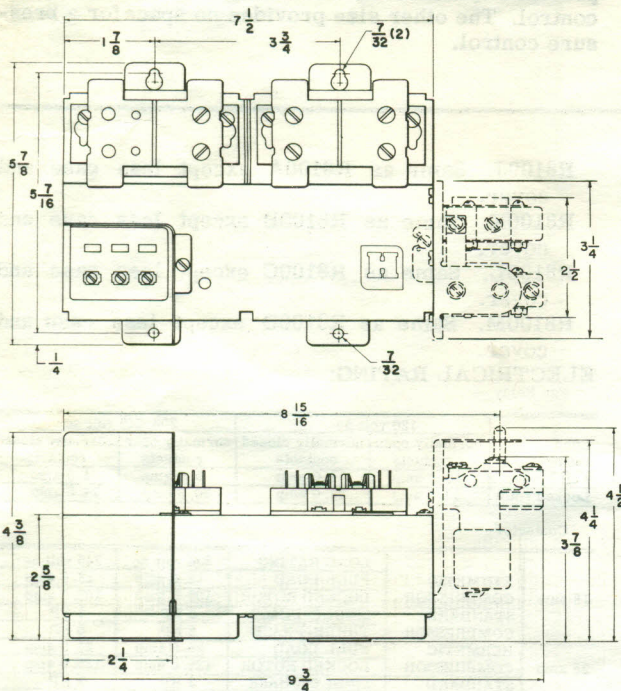


Fig. 2—R8100 Subpanel installation dimensions (in inches).

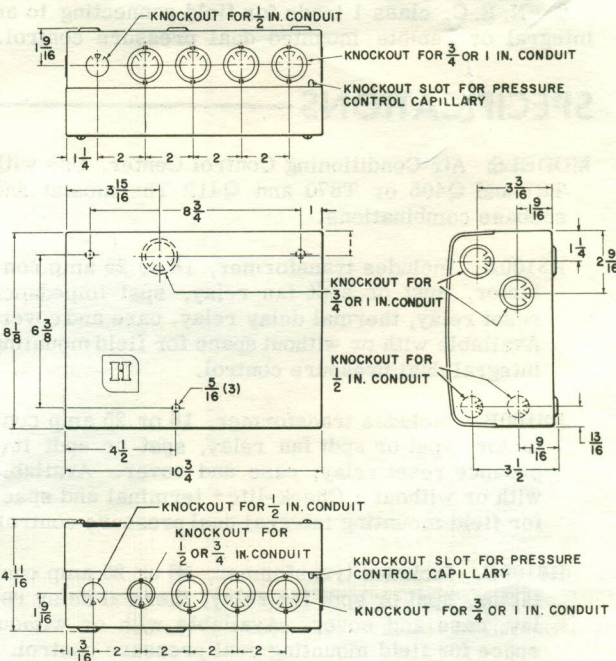


Fig. 3—R8100 case and cover dimensions (in inches) for units providing space for field addition of pressure control.

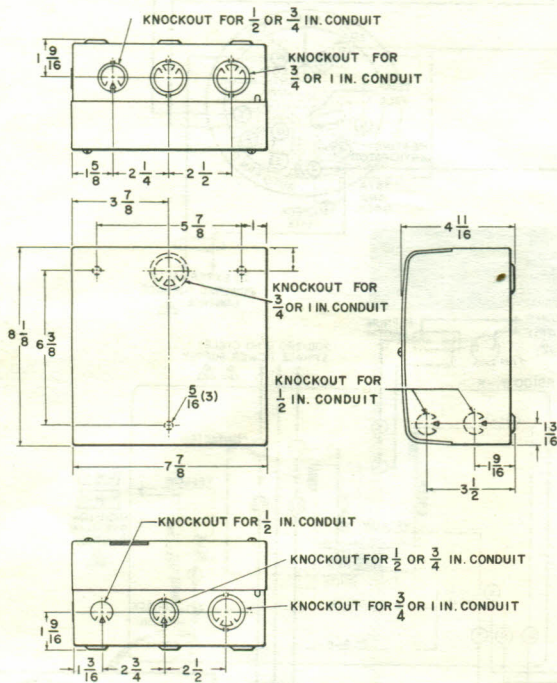
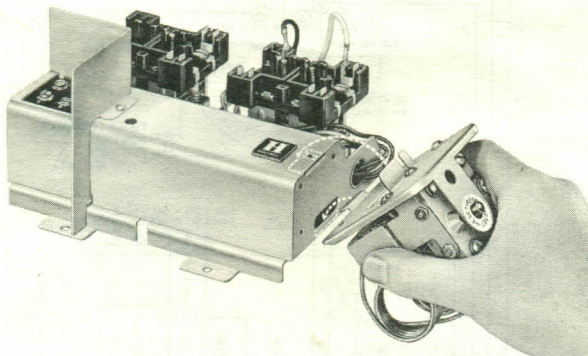


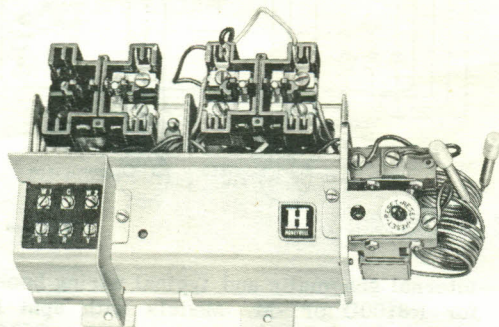
Fig. 4—R8100 case and cover dimensions (In inches) for units without space for addition of pressure control.

TO INSTALL THE DUAL PRESSURE CONTROL (P432 on a special bracket, shipped separately):

1. Insert the tab, located on the bottom of the pressure control bracket, into the oblong slot on the side of the subpanel.



2. Fasten the bracket to the subpanel cover with the screw as shown below.



3. Connect the yellow wire(s) to the exposed terminal of one switch, the blue wire to the exposed terminal of the other.
4. Remove either or both capillary knockout slots (See Fig. 3) as required.
5. Place grommet (two taped to cover) over capillary for protection and insert grommet into knockout slot.
6. Connect the pressure switch capillary to the system. If the reset model is used, push the button.

WIRING:

When connection diagrams are furnished by the system manufacturer, these should be used. If instructions are not furnished, consult the appropriate diagrams that follow.

All wiring must agree with local electrical codes, ordinances and regulations in such matters as wire size, type of insulation, and enclosure.

Two rubber grommets are provided for the wiring knockouts which are used for low-voltage wire. After the knockouts are removed, insert grommets to protect the wire.

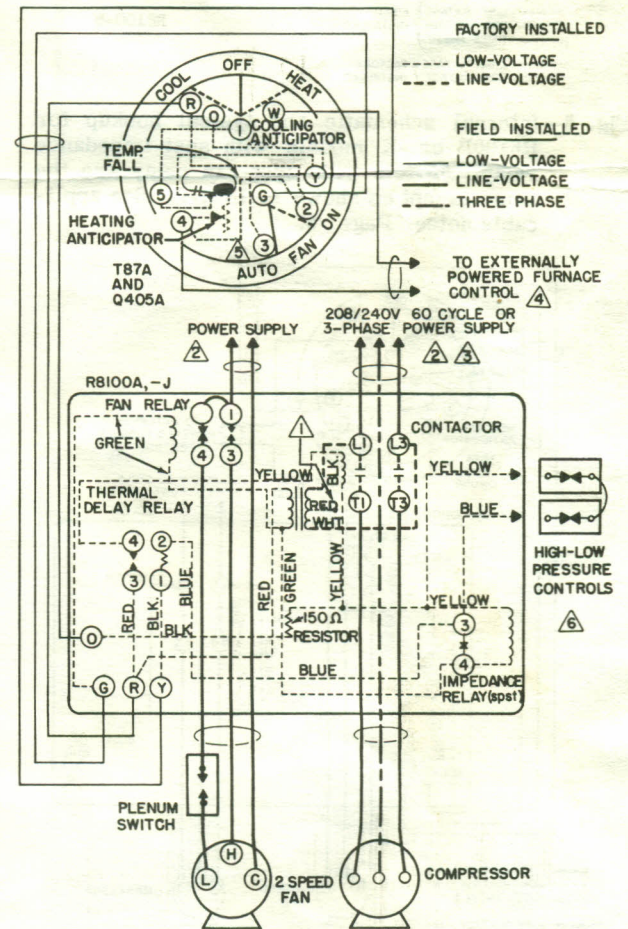


Fig. 5—Internal schematic and typical hookup for R8100A or -J. Models with spst fan relay are the same except as shown in INSET, Figure 6. See applicable notes, Page 5.

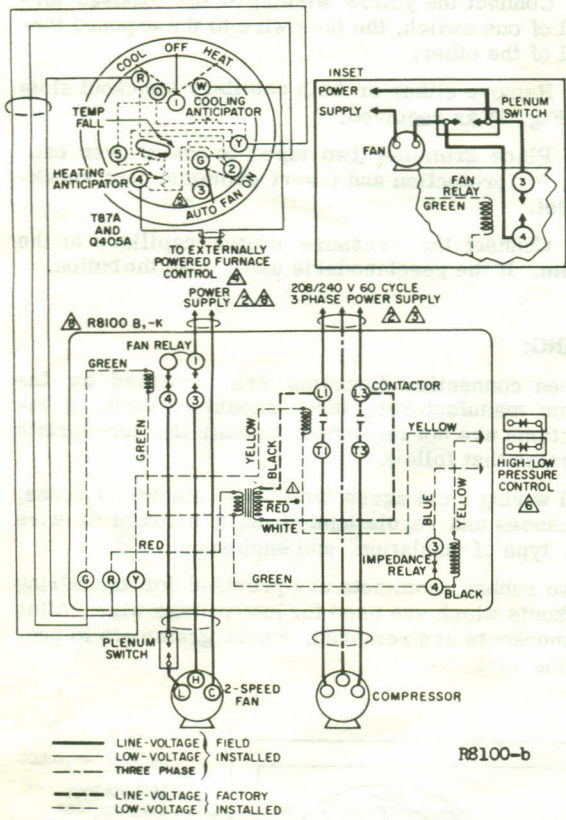


Fig. 6—Internal schematic and typical hookup for R8100B or -K models with spst impedance relay. Models with spst fan relay are the same except as shown in INSET. See applicable notes, Page 5.

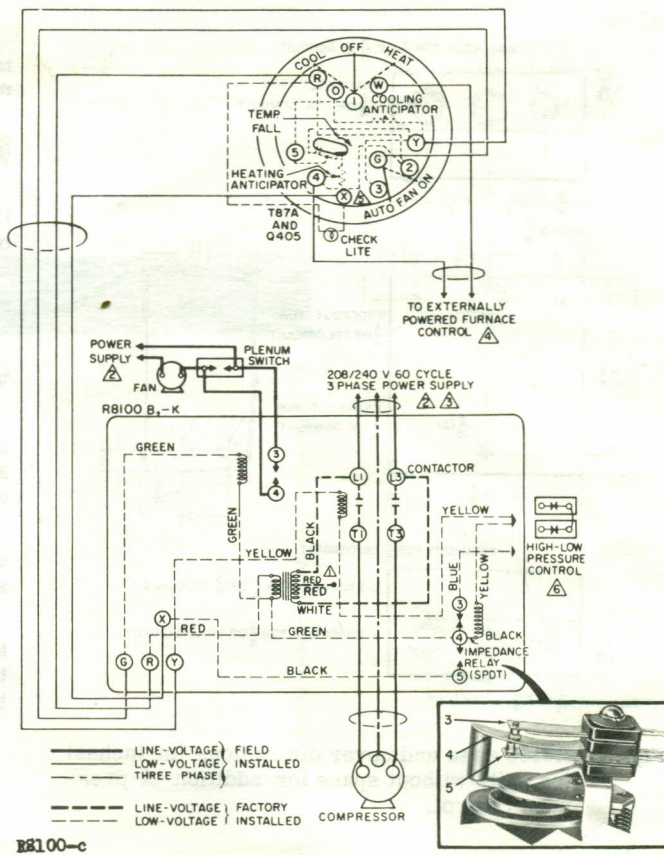


Fig. 7—Internal schematic and typical hookup for R8100B or -K models with spdt impedance relay. See applicable notes, Page 5.

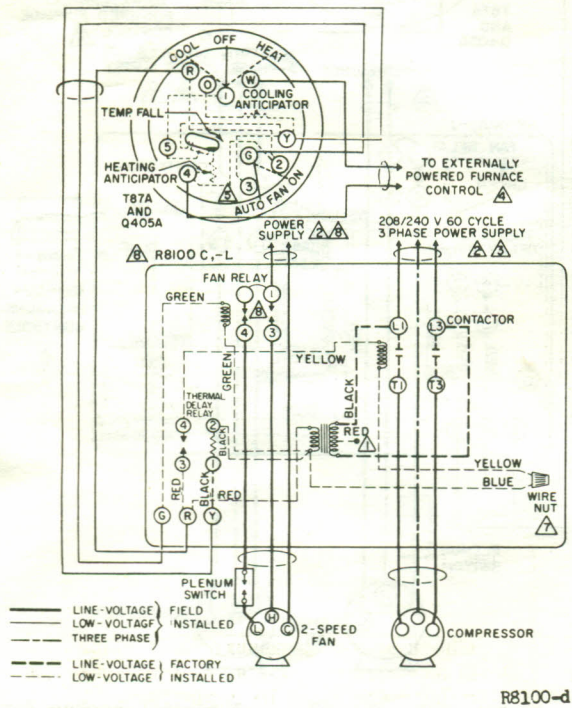


Fig. 8—Internal schematic and typical wiring hookup for R8100C or -L. Models with spst fan relay are the same except as shown in INSET, Figure 6. See applicable notes, Page 5.

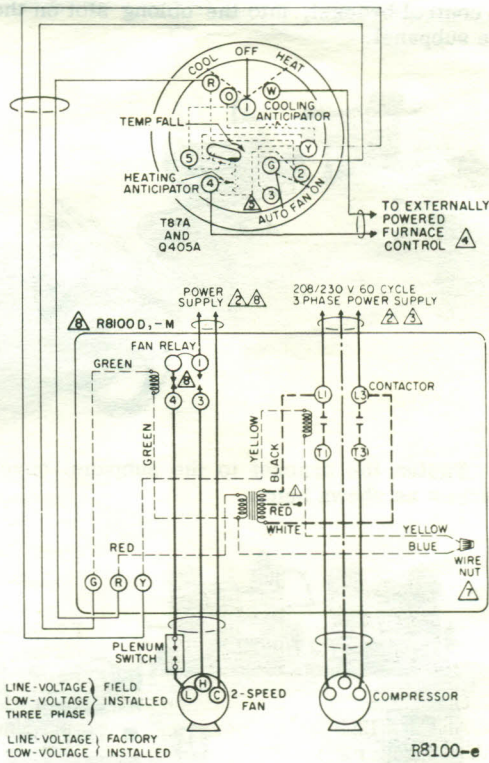


Fig. 9—Internal schematic and typical wiring hookup for R8100D or -M. Models with spst fan relay are the same except as shown in INSET, Figure 6. See applicable notes, Page 5.

NOTES:

- ① For 208 volt operation, remove white lead from L3. Pull plastic insulator from red lead and connect red lead to L3. Place insulator over white lead.
- ② Add disconnecting means and overcurrent protection as required.
- ③ Terminal for 3-phase wire is not provided. Splice wire in box.
- ④ Not suitable for Powerpile* (self generating) application unless switching relay is used.
- ⑤ Remove red jumper between thermostat subbase terminals 2 and 4.

- ⑥ If pressure control is not used, connect yellow lead to blue lead and tape ends. If pressure control is used, connect blue lead to low-pressure switch and yellow lead to high-pressure switch.
- ⑦ If pressure control is used, remove wire nut, connect blue lead to low-pressure switch and yellow lead to high-pressure switch.
- ⑧ For models with spst fan relay, see INSET, Figure 6. Balance of internal schematic and hookup is unchanged.

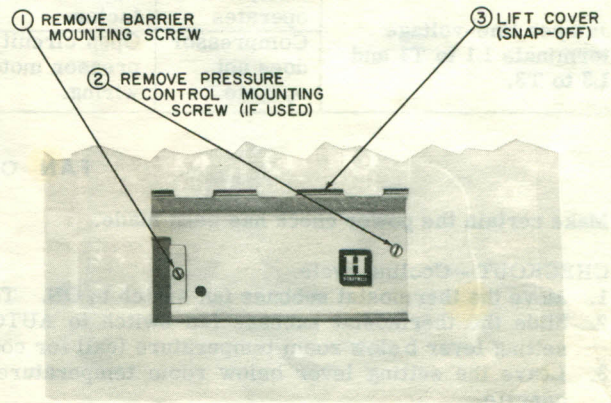
CHECKOUT AND TROUBLE SHOOTING GUIDE

The panel is a central location for checking the system control circuit. The procedures described below should serve as a guide for checkout at the time of installation or when servicing the system. Failure of the equipment to respond in any step indicates trouble in that portion of the circuit.

If the compressor does not start in a normal manner, check the pressure gages (if used) for normal operating pressures. When a pressure control is used, make certain it is reset (manual, automatic, or remote). If the pressures are normal and the system does not operate, proceed as follows—

After removing the panel cover, remove the screws holding the barrier and pressure control (when used). Snap off the cover.

RUN THE FOLLOWING CHECKS IN SEQUENCE. REMOVE JUMPERS BEFORE LEAVING JOB.



Connect a line-voltage test light to terminals L1 and L3. The light glows if power is present. If the light does not glow, check for power at the fuse box. Connect a low-voltage test light to terminals G and

POWER SUPPLY

R. The light glows if power is present. If the light does not glow, check for power at the transformer secondary.

COMPRESSOR OPERATION

Make certain the power check has been made.

CHECKOUT

1. Slide the thermostat subbase system switch to COOL. Move the thermostat setting lever below room temperature (call for cooling). The compressor should operate.
2. Leave setting lever below room temperature and move system switch to AUTO. The compressor should operate.

NOTE: Panels with thermal delay relay (See Figs. 5 and 8) require 10-30 seconds to make the contactor coil circuit and 30-90 seconds to break the circuit.

If Impedance reset relay (Figs. 5, 6 and 7) is used and the compressor does not operate—reset the relay by moving the thermostat subbase system switch to RESET and back or to OFF and back.

If the compressor does not operate in any of the above checks, trouble shoot as follows:

PROCEDURE	RESULT	INDICATES	CORRECTION
Jumper low-voltage terminals R and Y. If thermal delay relay is used, wait 30 to 90 seconds.	Compressor operates	Open circuit in thermostat or wiring.	1. Check for loose connection or broken wire. 2. Check thermostat.
	Compressor does not operate	Open circuit in impedance reset relay, thermal delay relay, pressure switch, contactor, compressor motor, or wiring.	Proceed to next step.
FOR MODELS WITH IMPEDANCE RESET RELAY. Jumper impedance reset relay contacts 3 and 4. Wait 30 to 90 seconds, if thermal delay relay is used.	Compressor operates	Open circuit in impedance reset relay.	1. Check system pressure for overload. 2. If no overload exists, entire impedance reset relay must be replaced.
	Compressor does not operate	Open circuit in thermal delay relay, pressure switch, contactor, compressor motor, or wiring.	Leave jumper on contacts 3 and 4. Proceed to next step.

FOR MODELS WITH THERMAL DELAY RELAY. Jumper terminals 3 and 4 of the thermal delay relay.	Compressor operates	Open circuit in thermal delay relay.	Replace entire thermal delay relay.
	Compressor does not operate	Open circuit in pressure switch, contactor, compressor motor or wiring.	Proceed to next step.
FOR ALL MODELS. Jumper the individual pressure switch terminals.	Compressor operates	Open circuit in pressure switch.	1. Check system pressure for overload cutout. 2. Remove jumper from one switch at a time until contactor drops out. 3. Check switch. Replace, if necessary.
	Compressor does not operate	Open circuit in contactor, compressor motor or wiring.	1. If contactor does not pull in, check pressure switch wiring. If correct, replace entire contactor. 2. If contactor pulls in, proceed to next step.
Jumper line-voltage terminals L1 to T1 and L3 to T3.	Compressor operates	Open circuit in contactor.	Replace entire contactor.
	Compressor does not operate	Open circuit in compressor motor or wiring.	1. Check for loose connection of broken wire. 2. Check compressor motor.

FAN OPERATION

Make certain the power check has been made.

CHECKOUT—Cooling cycle.

1. Move the thermostat subbase fan switch to ON. The fan should operate.
2. Slide the thermostat subbase fan switch to AUTO and the system switch to COOL. Move the thermostat setting lever below room temperature (call for cooling). The fan should operate.
3. Leave the setting lever below room temperature and move the system switch to AUTO. The fan should operate.

If the fan does not operate in any of the above checks, trouble shoot as follows:

PROCEDURE	RESULT	INDICATES	CORRECTION
Jumper low-voltage terminals G and R.	Fan operates	Open circuit in thermostat or wiring.	1. Check for broken wire or loose connection. 2. Check thermostat.
	Fan does not operate	Open circuit in fan relay, wiring, or fan motor.	1. If fan relay does not pull in, replace entire relay. 2. If fan relay does pull in, proceed to next step.
Jumper fan relay terminals 1 and 3 (spdt) or 3 and 4 (spst). Line-voltage.	Fan operates	Open circuit in fan relay.	Replace entire fan relay.
	Fan does not operate	Open circuit in wiring or fan motor.	1. Check for broken wire or loose connection. 2. Check fan motor.

CHECKOUT—Heating cycle

1. Make certain fan operates properly in the cooling cycle checkout.
2. Slide the thermostat subbase system switch to HEAT and the fan switch to AUTO. Move the thermostat setting lever above room temperature (call for heating). The fan should operate when the furnace temperature reaches the plenum switch setpoint.

If the fan does not operate in the above check, trouble shoot as follows:

PROCEDURE	RESULT	INDICATES	CORRECTION
FOR MODELS WITH SPDT FAN RELAY CONTACTS. Jumper fan relay contacts 1 and 4 (line-voltage). Furnace must be hot enough to actuate plenum fan switch.	Fan operates	Open circuit in fan relay.	Replace entire fan relay.
	Fan does not operate	Open circuit in plenum switch, fan motor, or wiring.	Proceed to next step.
FOR ALL MODELS. Jumper plenum switch fan contacts.	Fan operates	Open circuit in plenum switch.	Check temperature setting. If correct, replace plenum switch.
	Fan does not operate	Open circuit in fan motor or wiring.	1. Check for broken wire or loose connection. 2. Check fan motor.