

WHITE-RODGERS

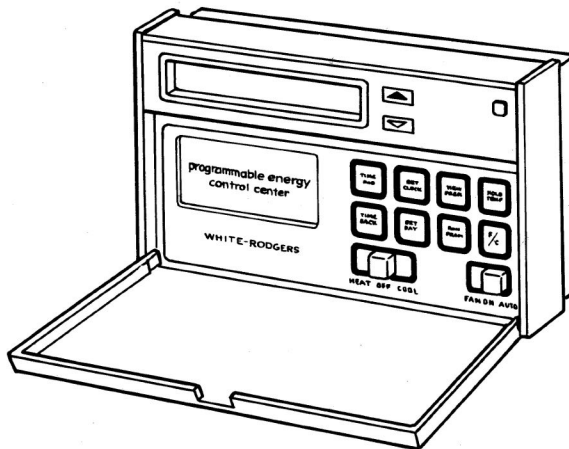
INSTALLATION INSTRUCTIONS

1F90 Low Voltage DIGITAL COMFORT-SET

The 1F90 Digital Comfort-Set utilizes a micro-computer and a solid-state sensor for precise temperature control. You can program the thermostat to provide up to four separate time/temperature settings per 24 hour period. The thermostat will also store two separate sets of time/temperature schedules, one for weekdays, and one for weekends.

Any time/temperature combination can be scheduled for any period, and any five consecutive days of the week can be used for weekdays. An optional 9 volt alkaline battery will maintain the stored program for up to 3 days if incoming power should fail. If power failure is extensive and the program is lost, when power is restored, the thermostat will automatically maintain a heating temperature of 68° F (if in the heating mode), and a cooling temperature of 78° (if in the cooling mode), until a new program can be entered.

The 1F90 will work on most 24 volt heating or cooling systems. This thermostat can only be used on 24 volt A.C. two-wire heating-only systems and 24 volt A.C. four-wire or five-wire heating/cooling systems.



SPECIAL FEATURES

- Separate set-back programming for five day week and two day weekend.
- Four separate time/temperature settings per 24 hour period.
- LCD displays continuous set point, time and room temperature alternately.
- Sensor for (100° F) protection.
- "Hold Temp" feature for manual operation.
- °F/°C button.
- Independently adjustable anticipation for heating and cooling.
- Compressor short cycle protection (3 min.)
- Audio "Beep" when keys are depressed.
- Heating set point resets to 68° F (power loss).
- Cooling set point resets to 78° F (power loss).
- Indicators for "Hold Temp" — "System Cycle" (red LED)
- Sculptured overlay on key pad surface.
- Leatherette inlay on cover.
- Brushed aluminum cover on lens.
- Individual pack
- Nameplate reads "White Rodgers"

SPECIFICATIONS

Electrical Rating: 30 volts MAX. 60 Hz. .15A to 1.5A

Heat Anticipator: Adjustable from front panel.

Cool Anticipator: Adjustable from front panel.

Temperature Range: 40° F to 90° F

Rated Differential: 1/2° to 1-1/2° with adjustable anticipation

Mountings: Wiring wall plate mounts on wall.

Dimensions: 6-3/8"W x 1-3/4"D x 3-1/2"H

FOR NEW INSTALLATIONS

SELECTING LOCATION

For new installation; select a location about 5 feet above the floor on an inside wall with good air circulation at average temperatures. Avoid "HOT SPOT" locations close to radiators, fireplaces, warm air registers, televisions,

concealed hot water or steam pipes, or direct sunlight; also avoid "COLD SPOT" locations due to drafts, chilled water pipes, or an unheated room on the other side of the partition; and avoid "DEAD SPOT" locations due to lack of circulation behind doors and in alcoves or corners.



WHITE-RODGERS DIVISION
EMERSON ELECTRIC CO.
9797 REAVIS ROAD
ST. LOUIS, MISSOURI 63123

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PART No. 37-3654

ROUTING WIRES TO LOCATION

STEP 1. Before drilling hole in wall at selected location, take up quarter round and drill a small guide hole for sighting. From basement, drill 3/4" hole in partition floor next to guide hole. (On basementless houses, drill 1/2" hole through ceiling above partition.)

STEP 2. Probe for obstruction in the partition. Then drill 1/2" hole through wall at selected location.

STEP 3. Through this hole in wall drop a light chain, or 6" chain attached to a strong cord, and snag cord with hooked wire from basement. (On basementless houses, drop cord from ceiling and snag it at the thermostat location.)

STEP 4. Attach thermostat cable to cord and pull cable through hole in wall so that 6" of cable protrudes.

MOUNTING AND WIRING

CAUTION: Disconnect power supply until installation is complete.

All wiring should be done according to local and national electrical codes and ordinances.

STEP 1. Remove the packing material from the thermostat. Holding fingers along the top, between the thermostat and wall plate (Fig. 1), gently unsnap the thermostat from the top portion of wall plate. Thermostat is hinged at the bottom. To disengage thermostat at hinges, rotate top out and lift thermostat upward. Carefully disconnect wiring harness plug from wall plate (Fig. 2).

STEP 2. An optional 9 volt alkaline battery may be installed as shown (Fig. 3). It is not required for proper thermostat operation. The thermostat will display time and temperature (starts at 12:00 pm). Battery should be installed with terminals down (Fig. 3).

STEP 3. Route wires from heating and/or cooling equipment to thermostat location and pull wires through hole in wall so that 6 inches of cable protrudes.

STEP 4. Pull wires through opening near center of wall-plate and connect wires beneath terminal screws. See fig. 2.

STEP 5. Push excess wire into wall and plug up hole with noncombustible material to prevent drafts from affecting thermostat operation.

STEP 6. Fasten wall plate loosely to wall in position shown in Fig. 4, using two mounting screws provided. Place level on top of wall plate, adjust until level, and then tighten screws to secure wall plate.

STEP 7. NOTE: Move system switch on thermostat to the "OFF" position, and fan switch to "AUTO". (Fig. 7) Carefully plug wiring harness from thermostat into mating connector on wall plate. (Fig. 5) **NOTE:** If battery is not fully inserted, thermostat will not snap closed.

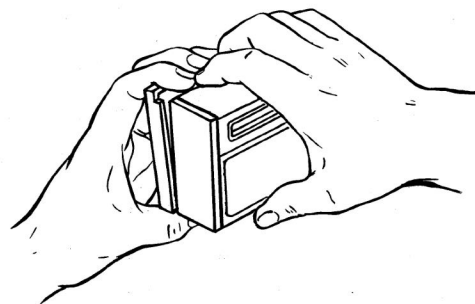


Fig. 1

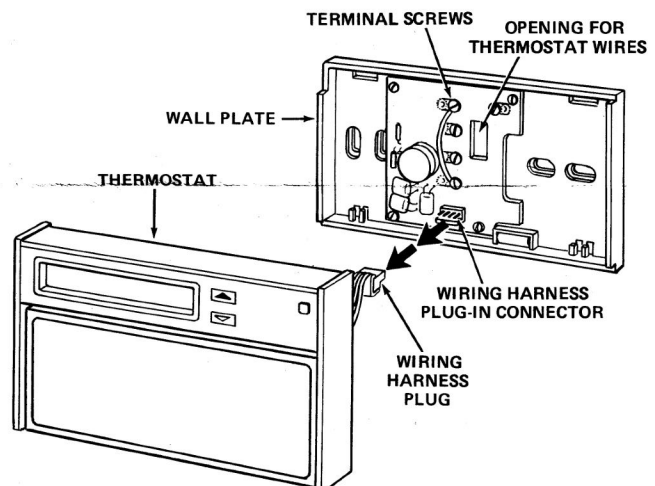


Fig. 2

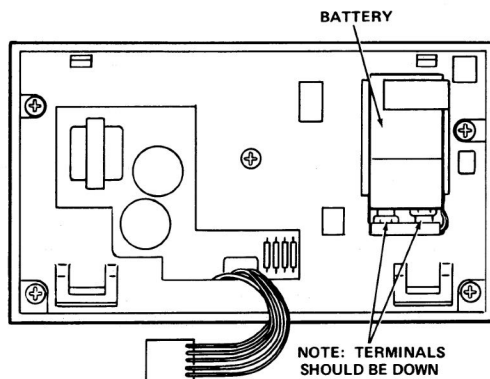


Fig. 3

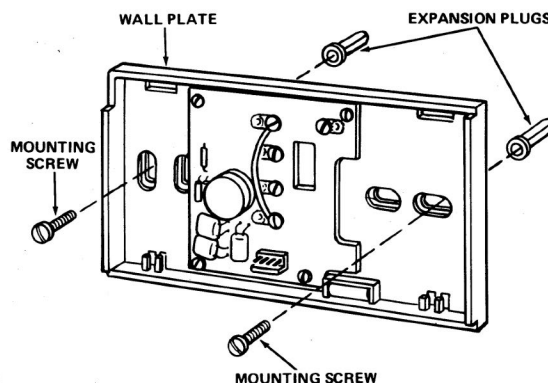


Fig. 4

STEP 8. Align slots on back of thermostat with tabs at bottom of wall plate (Fig. 6). Insert thermostat slots into tabs and rotate thermostat upward. Press firmly on upper corners and thermostat will snap into place on wall plate.

STEP 9. For the following types of systems refer to these corresponding figure numbers for terminal identification and hook-up:

For 2-wire heating only refer to figure 14. For 3-wire Series 10 heating refer to figure 15. For 5-wire Heating/Cooling refer to figures 14 and 17. For 4-wire Heating/Cooling refer to figure 16.

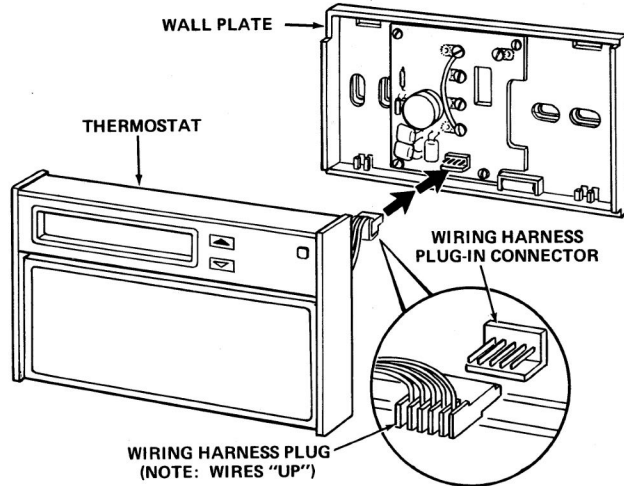


Fig. 5

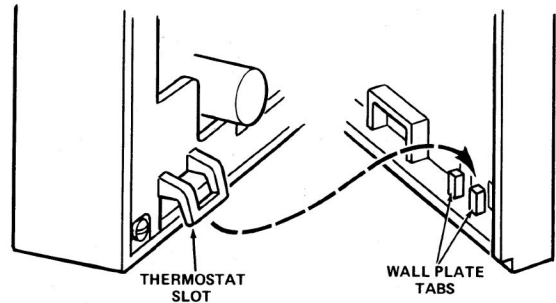


Fig. 6

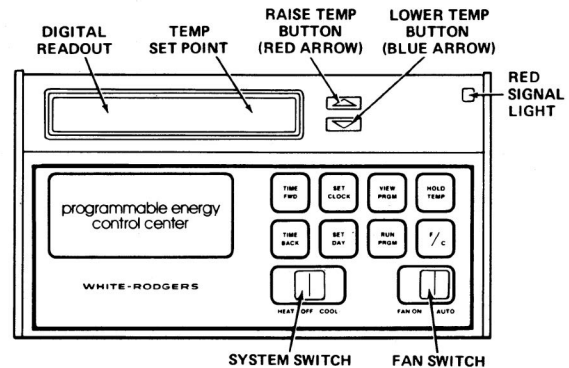


Fig. 7

CHECKING THERMOSTAT OPERATION

HEATING

1. Turn on electrical power to furnace.
2. Move selector switch to "HEAT".
NOTE: If the thermostat is wired for Heating Only, without Air Conditioning, **DO NOT** leave selector switch set in "Cool" position as the battery will discharge. When wired for Heating Only, and you decide to turn off the furnace pilot for the summer, remove the battery. When you relight pilot, replace battery and reprogram thermostat.
3. Move Fan Switch to "Fan On" position. Blower motor on furnace should start on Heating/Cooling applications.
4. Move Fan switch to "Auto" position (blower should stop running).
5. Move System to "Heat" position.
6. Press **RAISE TEMP** button (Fig. 7) to adjust thermostat to call for heat. Red signal light on upper corner of thermostat (Fig. 7) should illuminate. Heating system should begin operating.
7. Press **LOWER TEMP** button to adjust thermostat below actual room temperature. Heating system should go off. Blower may remain operating until temperature within furnace has dropped.

COOLING

CAUTION: If the power to the outdoor condensing unit of your air conditioner has been off for more than 12 hours, and the outdoor temperature is below 65° F, do not operate the air

conditioner. Leave the System switch on the thermostat in the "Off" or "Heat" positions, and turn on power to the outdoor unit. (Most air conditioners are equipped with crankcase heaters inside the compressor to prevent oil or refrigerant from "slugging" the compressor and causing premature compressor failure. If power to the outdoor unit has been interrupted and the outdoor temperature is below 65° F, you should wait at least six hours before operating the system. This will allow the crankcase heater to warm the compressor oil, and eliminate the possibility of damage to the compressor.) The thermostat is also equipped with a delay timer that prevents the cooling system from being short-cycled. Once the thermostat turns off the cooling system, the delay timer will prevent the cooling system from operating for 3 or 4 minutes.



TO CHECK OPERATION:

1. Turn on power to Air Conditioner.
2. Press the **RAISE TEMP** button to adjust the thermostat well above room temperature.
3. Move the System switch to the "Cool" position. The indoor blower and condensing unit should remain off.
4. Press the **LOWER TEMP** button to adjust the setpoint temperature below the room temperature displayed on the thermostat. The red indicator light should illuminate, and the indoor blower and condensing unit should begin operating after 3 to 4 minutes.

Allow the system to operate. (If the air conditioning system does not come on, re-check power switches, and wiring.)



HEATING AND COOLING ANTICIPATION

If your heating/cooling system is turning on and off too often (short cycles); or seems to be running infrequently (long cycles), causing wide temperature changes, the following procedure should be used to correct the problem.

HEATING: Press both  and  at the same time. The number "5" should appear, this is a factory preset value and corresponds to a cycle time of approximately 12 minutes. (Six minutes on and six minutes off.) This is the right setting for a majority of home installations. Anticipator setting resets to "5" in heating and "11" in cooling after an extensive power failure (3 days). If you hold both keys pressed, the number will increase to a maximum of "15", then it will start over at a minimum value of "3". Each higher number adds about two minutes to the time cycles.

Short Cycles: Try a small change, "6" or "7" at first, and see how the system runs.

Long Cycles: Decrease the number to "4" and then "3" if necessary.

COOLING: Press both  and  at the same time. The number "11" should appear.

Short Cycles: Try a change to "12" or "13".

Long Cycles: Decrease the number to "10" and then "9" if necessary.

The number "9" is the minimum value for cooling.

FOR REPLACEMENT INSTALLATION

NOTE: The 1F90 Digital Comfort-Set will replace most two-wire heating, 4-wire, 5-wire heating-cooling thermostats. It cannot be used on the following types of systems.

- Millivolt systems (self generating systems that do not have a transformer or relay).
- Hot water heating systems with three wire zone valves.
- Two stage heat or cool systems.
- Electric heating systems where fan is energized by a fan relay on both heating and cooling operation of the thermostat.
- For systems that have terminals marked "B, O, and X" inside of old thermostat. If B and/or O are used this thermostat cannot be used.

When used on applications with SPARK IGNITION SYSTEM, an isolation relay may be needed. When this thermostat is used with an electrically operated vent damper, you may need an isolation relay. Without relay, the vent damper may open and close rapidly or ignition system may "lock out" for no apparent reason. In either case, install an isolation relay. See Fig. 18.

REMOVING OLD THERMOSTAT

1. Shut off electricity to furnace and air conditioner. Leave it off until installation has been completed.
2. Remove front cover of old thermostat (it will be a "snap-on" type or one that is held in place with screws.) (Fig. 8 & 9)
3. If your old thermostat has a wall mounting plate, remove the thermostat by unscrewing it. (Fig. 10) If the wiring is direct to the thermostat, go to the next step.
4. **FOR HEATING-ONLY THERMOSTATS:** Disconnect two wires and remove old thermostat. Install the new wall plate (Fig. 13) by following the directions under "For Heating Only — Installing New Wall Plate."

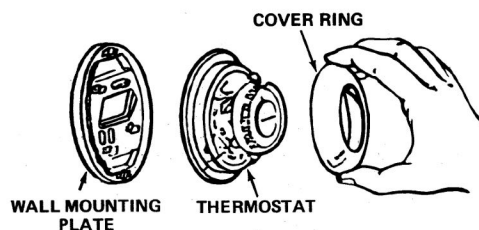


Fig. 8

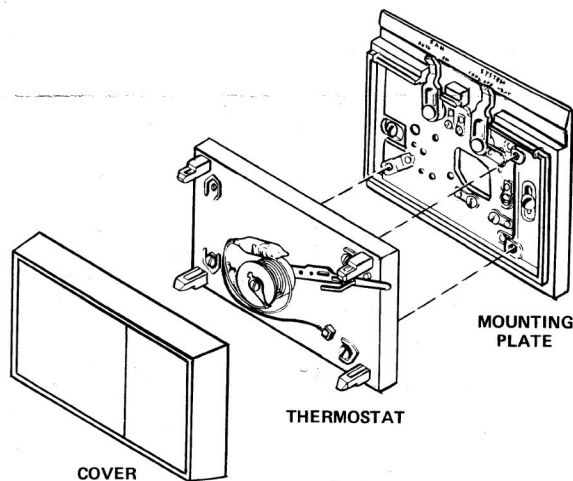


Fig. 9

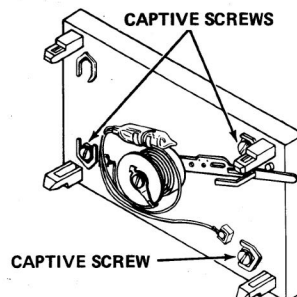


Fig. 10

5. FOR HEATING/COOLING SYSTEMS: Identify wire terminal markings on old thermostat as installed. Using the chart in Figure 11 find these markings. Reading across to the right, you will find the correct "type" of thermostat you have. For example: your thermostat has terminals R₅, 4 Y₆, and G. Read across to the right and you'll see you have a #4 thermostat.

6. After finding the type of thermostat you are replacing, it is necessary that you properly identify each wire to the thermostat. To assist in the identification, self-adhesive labels have been provided. (Fig. 12) You will use only the labels that correspond to your type thermostat. The others can be discarded.

7. Disconnect the wires one at a time. Attach to each wire, the label that matches that wire's terminal marking. Do this before you disconnect the next wire. Notice that the label has both the old terminal marking and the new thermostat marking. Leave labels attached to the wires.

8. Remove old mounting plate from wall.

OLD THERMOSTAT TERMINAL IDENTIFICATION					OLD THERMOSTAT TYPE
4	W	RC	Y	G	TYPE 1
RH	W	RC	Y	G	TYPE 2
M	H	V	C	F	TYPE 3
R5	4		Y6	G	TYPE 4
R	W		Y	G	TYPE 5

Fig. 11

TYPE 1	NEW OLD RH 4	NEW OLD W W	NEW OLD RC RC	NEW OLD Y Y	NEW OLD G G
TYPE 2	NEW OLD RH RH	NEW OLD W W	NEW OLD RC RC	NEW OLD Y Y	NEW OLD G G
TYPE 3	NEW OLD RH M	NEW OLD W H	NEW OLD RC V	NEW OLD Y C	NEW OLD G F
TYPE 4	NEW OLD RH R5	NEW OLD W 4		NEW OLD Y Y6	NEW OLD G G
TYPE 5	NEW OLD RH R	NEW OLD W W		NEW OLD Y Y	NEW OLD G G

Fig. 12

INSTALLING NEW WALL PLATE

1. Pull wires through back of opening near the center of Wall Plate.
2. Place Wall Plate (Fig. 13) against wall where old thermostat was located.
3. Fasten Wall Plate to wall with the two mounting screws provided. If holes in wall are too large and the Wall Plate cannot be tightened firmly, drill two new 3/16" holes and use the two plastic expansion plugs provided (Fig. 13).
4. After installing Wall Plate push excess wire into wall (or electric box).
5. Plug the hole with a fire-proof material to prevent drafts from affecting thermostat operation.

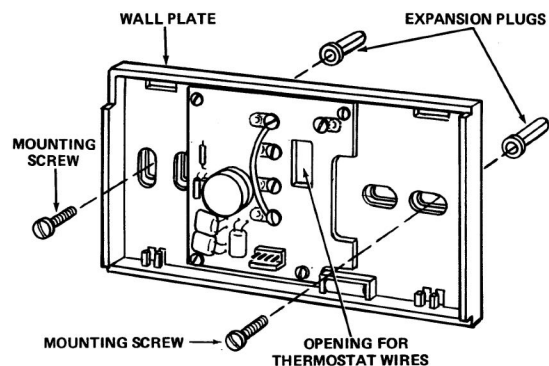


Fig. 13

FOR HEAT ONLY

WIRING THE WALL PLATE

CAUTION: All wiring must comply with local and national electrical codes and ordinances.

1. Attach the two wires that were connected to the thermostat you removed to terminals "W" and "RH" on the Wall Plate (Fig. 14).
2. Refer to page 3 for direction to mount thermostat on Wall Plate.

FOR USE WITH 3 WIRE SERIES 10 HEATING SYSTEMS

To use new thermostat as replacement thermostat for Series 10 three wire heating system, add jumper between R and B on primary control and wire as per Fig 15.

FOR HEATING/COOLING

WIRING WALL PLATE

Use either A or B as it applies to your system.

A FIVE-WIRE SYSTEM where separate transformers are used on heating system and cooling system.

1. Remove and discard the red jumper wire that connects terminals "RH" and "RC" (Fig. 14) on Wall Plate.
2. Pull wires through back opening near center of Wall Plate and connect labeled wires to corresponding terminal screws (Fig. 17).

B FOUR-WIRE SYSTEMS

1. Pull wires through back opening near center of Wall

Plate and connect labeled wires to corresponding terminal screws (Fig. 16).

2. Notice that the jumper between "RC" and "RH" is still connected. Do not remove the jumper

For mounting the new thermostat follow the instructions under "Mounting and Wiring" page 2.

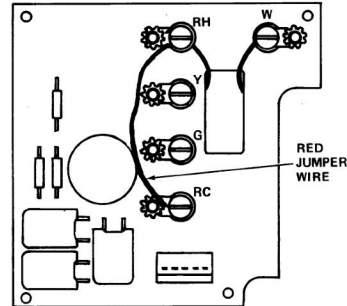


Fig. 14

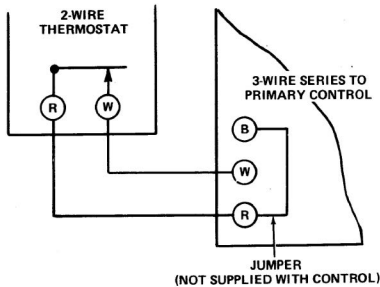


Fig. 15

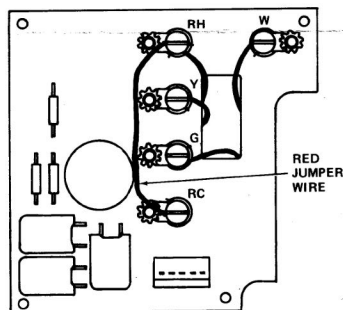


Fig. 16

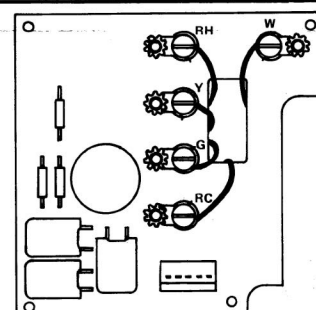


Fig. 17

WIRING USING ISOLATION RELAY

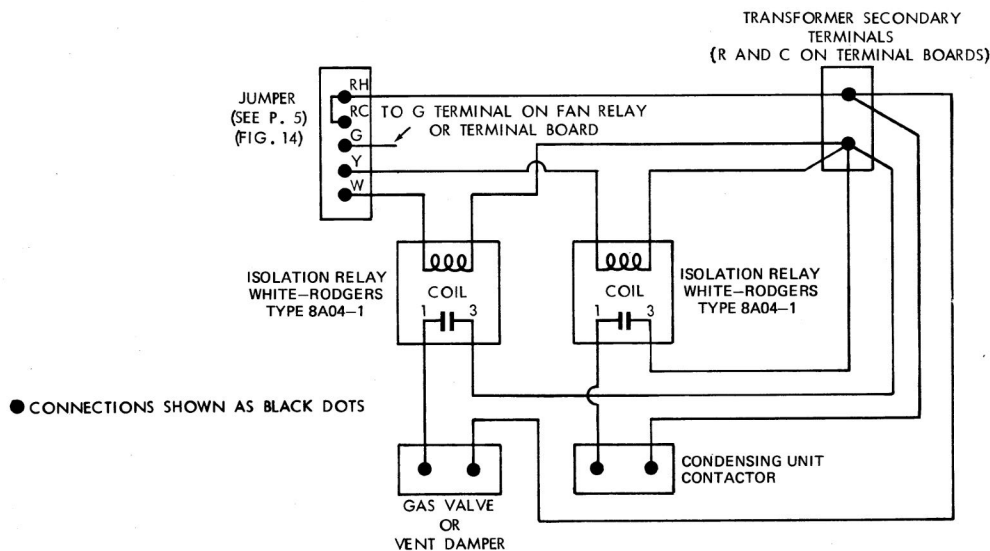


Fig. 18