



WHITE-RODGERS

1F86-444

Non-Programmable Electronic Digital Thermostat

**INSTALLATION AND
OPERATION INSTRUCTIONS**

Operator: Save these instructions for future use!

**FAILURE TO READ AND FOLLOW ALL INSTRUCTIONS CAREFULLY
BEFORE INSTALLING OR OPERATING THIS CONTROL COULD CAUSE
PERSONAL INJURY AND/OR PROPERTY DAMAGE.**

DESCRIPTION

Your new White-Rodgers Digital Thermostat uses the technology of a solid-state microcomputer to provide precise temperature control.

Features:

- Battery powered (3 "AA" Energizer® alkaline batteries included).
- Simultaneous heat and cool temperature storage
- LCD continuously displays set point and room temperature
- °F/°C convertibility
- Temperature range 45° to 90°F
- Standard five terminals for single or two-transformer systems
- B and O terminals for single stage heat pumps or damper operation

PRECAUTIONS

This thermostat is intended for use with a low voltage system; do not use this thermostat with a line voltage system. If in doubt about whether your wiring is millivolt, line, or low voltage, have it inspected by a qualified heating and air conditioning contractor or electrician.

Do not exceed the specification ratings.

All wiring must conform to local and national electrical codes and ordinances.

This control is a precision instrument, and should be handled carefully. Rough handling or distorting components could cause the control to malfunction.

⚠ CAUTION

To prevent electrical shock and/or equipment damage, disconnect electric power to system, at main fuse or circuit breaker box, until installation is complete.

⚠ WARNING

Do not use on circuits exceeding specified voltage. Higher voltage will damage control and could cause shock or fire hazard.

Do not short out terminals on gas valve or primary control to test. Short or incorrect wiring will damage thermostat and could cause personal injury and/or property damage.

SPECIFICATIONS

ELECTRICAL DATA

Electrical Rating:

- 8 to 30 VAC 50/60 Hz. or D.C.
- 0.05 to 1.5 Amps (Load per terminal)
- 1.5 Amps Maximum Total Load** (All terminals combined)

THERMAL DATA

Setpoint Temperature Range:

45°F to 90°F (7°C to 32°C)

Operating Ambient Temperature Range:

32°F to 105°F

Operating Humidity Range:

0 to 90% RH (non-condensing)

Shipping Temperature Range:

-40°F to 150°F

APPLICATIONS

For use with:

- Standard heat/cool or heat only systems
- Electric heat systems
- Gas or oil fired systems
- Gas systems with intermittent ignition devices (I.I.D.) and/or vent dampers
- Single-stage heat pump systems
- Millivolt systems

DO NOT USE WITH:

- Multi-stage systems
- Systems exceeding 30 VAC and 1.5 amps
- 3-wire zoned hydronic heating systems



WHITE-RODGERS DIVISION
EMERSON ELECTRIC CO.
9797 REAVIS ROAD
ST. LOUIS, MISSOURI 63123-5398

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PART NO. 37-5410C

Replaces 37-5410B
9805

INSTALLATION

REMOVE OLD THERMOSTAT

1. Shut off electricity at the main fuse box until installation is complete. Ensure that electrical power is disconnected.
2. Remove the front cover of the old thermostat. **With wires still attached**, remove wall plate from the wall. If the old thermostat has a wall mounting plate, remove the thermostat and the wall mounting plate as an assembly.
3. **Identify each wire attached to the old thermostat using the labels enclosed with the new thermostat.**
4. Disconnect the wires from old thermostat one at a time. **DO NOT LET WIRES FALL BACK INTO THE WALL.**
5. Install new thermostat using the following procedures.

ELECTRIC HEAT OR SINGLE-STAGE HEAT PUMP SYSTEMS

Read entire paragraph before setting electric heat switch. If you are unsure of your application, contact a qualified serviceperson.

If you have a single-stage heat pump system, OR your system uses central electric heat, where the blower is energized by a **separate circuit** through the fan relay (meaning that the fan turns on immediately on call for heat), then the switch on the back of the thermostat base must be moved to the "ELECTRIC" position (see fig. 1). If the thermostat is energizing electric heat sequencers, the switch **MUST** remain in the "GAS" position.

If you must move the switch to the "ELECTRIC" position (to the left), use a small screwdriver or pencil.

ATTACH THERMOSTAT BASE TO WALL

1. Remove the packing material from the thermostat. Gently pull the cover straight off the base. Forcing or prying on the thermostat will cause damage to the unit. If necessary, move the electric heat switch (see **ELECTRIC HEAT SYSTEMS**, above).
2. Connect wires beneath terminal screws on base using appropriate wiring schematic (see figs. 3 through 10).
3. Place base over hole in wall and mark mounting hole locations on wall using base as a template.
4. Move base out of the way. Drill mounting holes.
5. Fasten base loosely to wall, as shown in fig. 2, using two mounting screws. Place a level against bottom of base, adjust until level, and then tighten screws. (Leveling is for appearance only and will not affect thermostat operation.) If you are using existing mounting holes, or if holes drilled are too large and do not allow you to tighten base snugly, use plastic screw anchors to secure subbase.
6. Push excess wire into wall and plug hole with a fire-resistant material (such as fiberglass insulation) to prevent drafts from affecting thermostat operation.

BATTERY LOCATION

This thermostat requires 3 "AA" alkaline batteries to operate. Batteries are installed in the thermostat at the factory with a battery tag to prevent power drainage. **You must remove the battery tag to engage the batteries** and provide power to the thermostat.

If the word **BATTERY** is displayed, the batteries are low and should be replaced with fresh "AA" Energizer® alkaline batteries. To replace batteries, install the batteries along the top of the base (see fig. 2). The batteries must be installed with the positive (+) ends to the left.

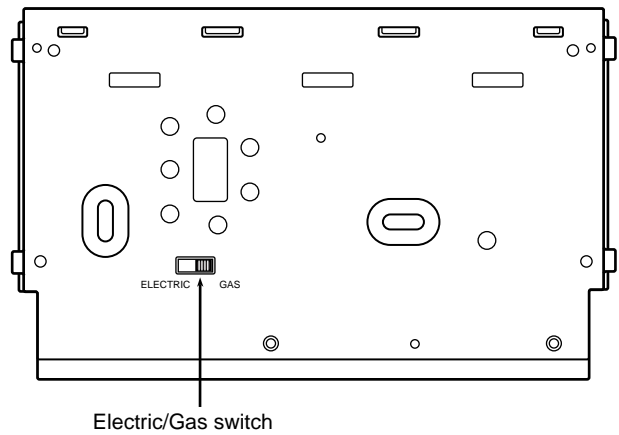


Figure 1. Back of thermostat base

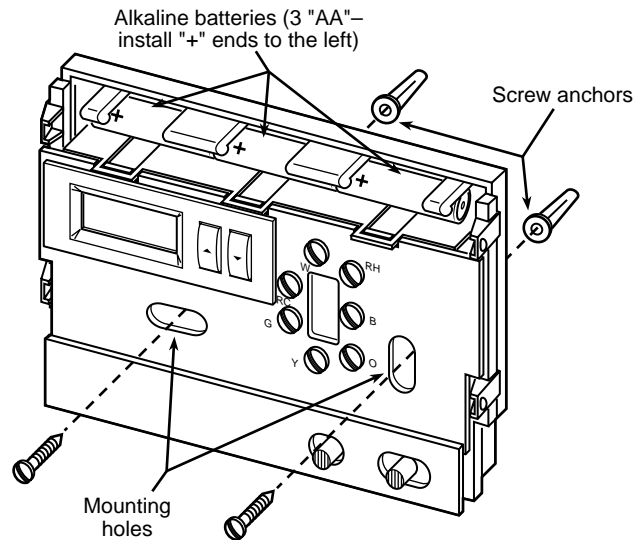


Figure 2. Thermostat base

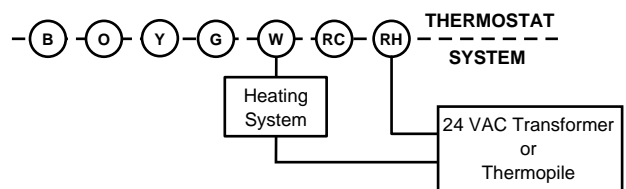


Figure 3. Typical wiring diagram for heating only, 2-wire, single transformer systems or millivolt systems

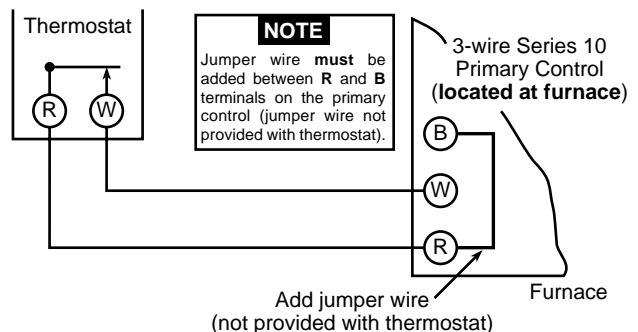


Figure 4. Typical wiring diagram for 3-wire SERIES 10 heating systems

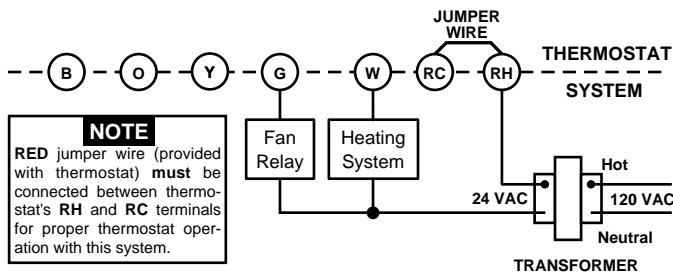


Figure 5. Typical wiring diagram for heat only, 3-wire, single transformer systems

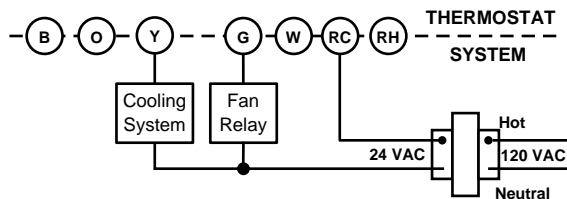


Figure 6. Typical wiring diagram for cool only, 3-wire, single transformer systems

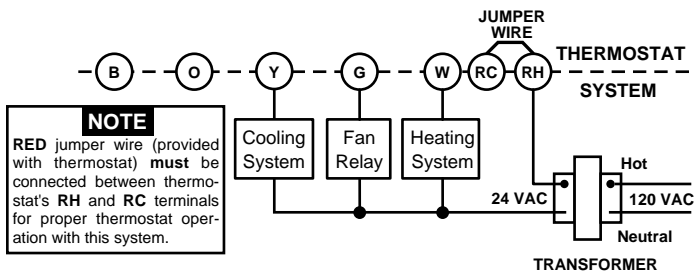


Figure 7. Typical wiring diagram for heat/cool, 4-wire, single transformer systems

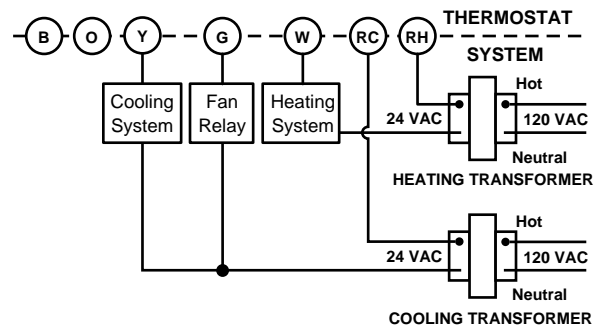


Figure 8. Typical wiring diagram for heat/cool, 5-wire, two-transformer systems

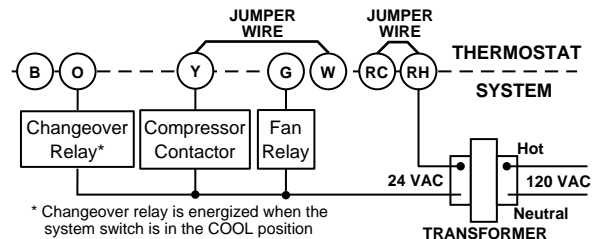


Figure 9. Typical wiring diagram for heat pump with cool active changeover relay

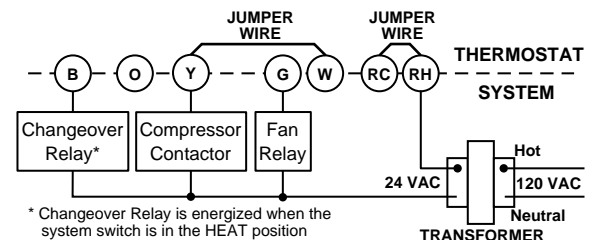


Figure 10. Typical wiring diagram for heat pump with heat active changeover relay

CHECK THERMOSTAT OPERATION



If at any time during testing your system does not operate properly, contact a qualified serviceperson.

Fan Operation

If your system **does not** have a **G** terminal connection, skip to **Heating System**.

1. Turn on power to the system.
2. Move FAN switch to **ON** position. The blower should begin to operate.
3. Move FAN switch to **AUTO** position. The blower should stop immediately.

Heating System



1. Move SYSTEM switch to **HEAT** position. If the heating system has a standing pilot, be sure to light it.
2. Press  to adjust thermostat setting above room temperature. The heating system should begin to operate.
3. Press  to adjust temperature setting below room temperature. The heating system should stop operating.

Cooling System

This thermostat has a built-in short-term (5-minute) time delay. This feature is activated after the compressor shuts down and the setpoint is changed within the 5-minute period. During this 5-minute period, COOL will flash on the display indicating that the thermostat has locked out the compressor to allow head pressure to stabilize. This thermostat does not sense AC power loss and therefore does not activate the short term compressor protection feature when power is restored.

CAUTION

To prevent compressor and/or property damage, if the outdoor temperature is below 50°F, DO NOT operate the cooling system.



1. Move SYSTEM switch to **COOL** position.
2. Press  to adjust thermostat setting below room temperature. The blower should come on immediately on high speed, followed by cold air circulation
3. Press  to adjust temperature setting above room temperature. The cooling system should stop operating.



OPERATION

Before you begin using your thermostat, you should be familiar with its features and with the display and the location and operation of the thermostat buttons. Your thermostat consists of two parts: the **thermostat cover** and the **base**. To remove the cover, gently pull it straight out from the base. To replace the cover, line up the cover with the base and press gently until the cover snaps onto the base.

THE THERMOSTAT BASE

The Thermostat Buttons and Switches

Other than  and , the following buttons and switches are located behind the door on the bottom of the thermostat cover (see fig. 11). Pull the door down to open it.

- ① (Red arrow)  Raises temperature setting.
- ② (Blue arrow)  Lowers temperature setting.
- ③ FAN switch (**ON**, **AUTO**).
- ④ SYSTEM switch (**COOL**, **OFF**, **HEAT**).

The Display

- ⑤ **HEAT** is displayed when the SYSTEM switch is in the **HEAT** position. **COOL** is displayed (non-flashing) when the SYSTEM switch is in the **COOL** position. **COOL** is displayed (flashing) when the compressor is in lockout mode. **OFF** is displayed when the SYSTEM switch is in the OFF position.
- ⑥ Displays current temperature.
- ⑦ **BATTERY** is displayed when the 3 “AA” batteries are low and should be replaced. Nothing else will be displayed.
- ⑧ Displays current setpoint temperature (this is blank when SYSTEM switch is in the OFF position).

OPERATING FEATURES

Now that you are familiar with the thermostat buttons and display, read the following information to learn about the features of the thermostat.

- **SIMULTANEOUS HEATING/COOLING STORAGE**— You can enter both your heating and cooling setpoints at the same time. There is no need to reset the thermostat at the beginning of each season.
- **LOW BATTERY INDICATOR** — If the 3 “AA” alkaline batteries are low and should be replaced, the display will be blank except for the word **BATTERY**. When the batteries are low, pressing any button will cause the display to operate for ten seconds. After ten seconds, the display will be blank except for the word **BATTERY**. When the duration of a low battery condition exceeds four weeks, the setpoint is altered by 10 degrees to signal that the batteries must be replaced.

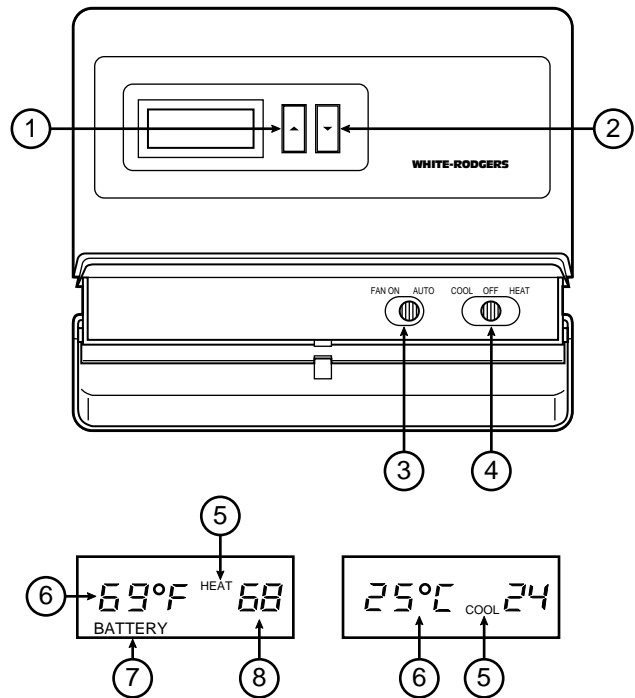










Figure 11. Thermostat display, buttons, and switches

- **°F/°C CONVERTIBILITY**— After ten seconds of no key activity, when the thermostat is in the temperature display adjustment mode, or 30 seconds after power up, pressing  and  at the same time will switch the LCD temperature display between Fahrenheit and Celsius.
- **TEMPERATURE DISPLAY ADJUSTMENT** — Your new thermostat has been accurately set in our factory. However, if you wish, you may adjust your new thermostat temperature display to match your old thermostat. This can be accomplished (within a $\pm 4^\circ$ range) as follows:
 1. Press  and  at the same time within 30 seconds of applying power.
 2. Press  or  to adjust the displayed temperature to your desired setting.
 3. After setting your desired temperature, do not press any buttons for ten seconds. The thermostat will continue operating at the changed temperature setting.

SETTING THE THERMOSTAT

This thermostat is very easy to operate. Set the SYSTEM button to either HEAT or COOL, then press  or  until the temperature you want to maintain is shown on the right side of the display. If you want to turn the system off, just move the SYSTEM switch to **OFF**.

The FAN switch controls the fan operation. When the FAN switch is set to **AUTO**, the fan will cycle with the furnace or air conditioner. When the FAN switch is set to **ON**, the fan will run continuously, regardless of SYSTEM switch position.