



# Digital Non-Programmable Thermostats

## Owner's Manual & Installation Instructions

RAK148D2

RAK164D2

|                                   |       |
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## *Important safety information.*

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# **WARNING!**

### **FIRE AND SHOCK HAZARD**

- *Always turn off power at the main power supply before installing, cleaning or removing the thermostat.*
- *Do not use on voltages over 30 VAC. Higher voltages will damage the thermostat and could cause shock or fire hazard.*
- *All wiring must conform to local and national electrical and building codes.*
- *Use this thermostat only as described in this manual.*

## **Specifications.**

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**Electrical rating:**

- 24 VAC (18–30 VAC)
- 1 amp maximum per terminal
- 4 amp maximum total load

**Operating temperature range:** 40°F–99°F (4°C–37°C)

**Temperature set range:** 60°F–85°F (15°C–29°C)

**Accuracy:** ± 1°F (± 0.5°C)

### **System configurations:**

RAK148D2: 2-stage heat (heat pump/resistance heat), 1-stage cool

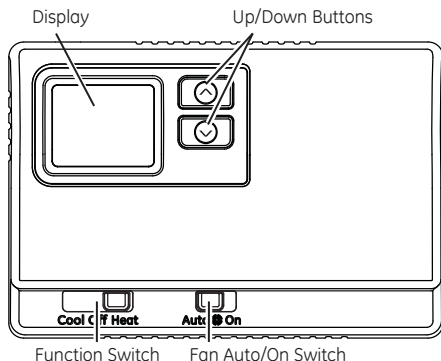
RAK164D2: 1-stage heat (resistance heat), 1-stage cool

**Terminations:** R, C, W, Y, G, B (RAK148D2);  
R, C, W, Y, G (RAK164D2)

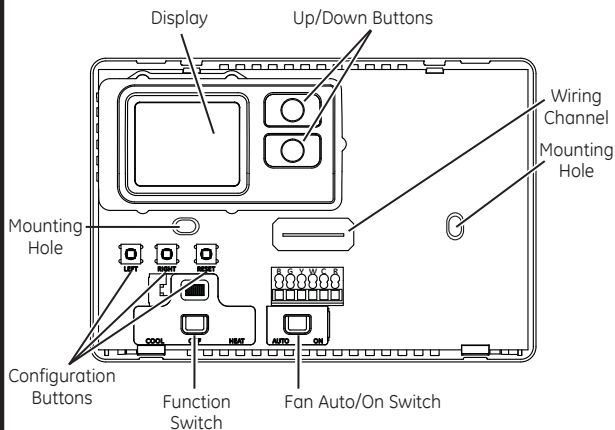
**Wiring:** Maximum wiring length is 66ft (20 meters) for AWG18  
Maximum wiring length is 60ft (18 meters) for AWG20

## INTRODUCTION OVERVIEW

### THERMOSTAT CONTROL



### PARTS DIAGRAM



## INSTALLATION INSTRUCTIONS



### **! WARNING!**

**ELECTRICAL SHOCK HAZARD**—Turn off power by unplugging the unit or by removing the fuse or switching the appropriate circuit breaker to the OFF position before removing the existing thermostat.

### PACKAGE CONTENTS/TOOLS REQUIRED

**Package includes:** Thermostat on base, thermostat cover, wiring labels, screws and wall anchors.

**Tools needed:** Drill with 3/16" bit, hammer, screwdriver and putty.

### TO REMOVE EXISTING THERMOSTAT

1. Turn off power to heating and cooling system by removing the fuse or switching off the appropriate circuit breaker.
2. Remove cover of old thermostat. This should expose the wires.
3. Label the existing wires with the enclosed wire labels before removing wires.
4. After labeling wires, remove wires from wire terminals.
5. Remove existing thermostat base from wall.
6. Refer to the following section for instructions on how to install this thermostat.

### TO INSTALL THERMOSTAT

**IMPORTANT:** *Thermostat installation must conform to local and national building and electrical codes and ordinances.*

**Note:** *Mount the thermostat about five feet above the floor. Do not mount the thermostat on an outside wall, in direct sunlight, behind a door or in an area affected by a vent or duct.*

## TO INSTALL THERMOSTAT (cont.)

1. Turn off power to the heating and cooling system by removing the fuse or switching off the appropriate circuit breaker.
2. Move the **Function** switch on the thermostat to **Off**.
3. Remove the cover by inserting and twisting a coin or screwdriver in the slots on the top of the thermostat.
4. Put thermostat base against the wall where you plan to mount it. Make sure wires will feed through the wire opening in the base of the thermostat.
5. With the base level, mark the placement of the mounting holes.
6. Set thermostat base and cover away from working area.
7. Using a 3/16" drill bit, drill holes in the locations you have marked for mounting.
8. Use a hammer to tap supplied anchors in mounting holes.
9. Align thermostat base with mounting holes and feed the control wires through the wire opening.
10. Seal hole for wires behind thermostat with non-flammable insulation or putty, or use a wall plate obtainable from a local hardware or home building store.
11. Use supplied screws to mount thermostat base to wall.
12. Insert stripped, labeled wires in matching wire terminals by pressing on the corresponding terminal contact. See the "Wiring Diagrams" section of this manual.

 **CAUTION!** *Make sure exposed portion of wires does not touch other wires.*

13. Gently tug wire to be sure of proper connection. Double check that each wire is connected to the proper terminal.

## INSTALLATION INSTRUCTIONS

### TO INSTALL THERMOSTAT (cont.)

14. Replace cover on thermostat by snapping it in place.
15. Plug the unit in or turn on power to the system at the main service panel.
16. Test thermostat operation as described in the "Testing the Thermostat" section.

### Wiring diagrams.

**Table 1: Terminals for five wires 1-stage heat/1-stage cool system (RAK164D2 only)**

| G          | Y          | W             | C             | R          |
|------------|------------|---------------|---------------|------------|
| INDOOR FAN | COMPRESSOR | HEAT—ELECTRIC | 24 VAC COMMON | 24 VAC HOT |

**Note:** Connect G terminal of thermostat to Zoneline GL terminal for low fan speed or terminal GH for high fan speed. Only one can be selected.

**Table 2: Terminals for six wires 2-stage heat/1-stage cool system (RAK148D2 only)**

| B                             | G          | Y          | W                       | C             | R          |
|-------------------------------|------------|------------|-------------------------|---------------|------------|
| REVERSING VALVE (HEAT ACTIVE) | INDOOR FAN | COMPRESSOR | AUXILIARY HEAT—ELECTRIC | 24 VAC COMMON | 24 VAC HOT |

**Note:** Connect G terminal of thermostat to Zoneline GL terminal for low fan speed or terminal GH for high fan speed. Only one can be selected.

## Configuration mode.

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The configuration mode is used to set the RAK148D2 and RAK164D2 to match the heating/cooling system. These thermostats function with up to 2-stage heat pump systems (RAK148D2 only).

To configure the RAK148D2 and RAK164D2, perform the following steps:

**Note:** Operation being set will blink in the display.

1. Slide the **Function** switch to the **OFF** position.
2. Remove the thermostat's front cover.
3. To enter the configuration mode, simultaneously hold the **LEFT** and **RIGHT** buttons in for 6 seconds while the thermostat is in **OFF** mode. (See diagram on page 3.)
4. Once in the configuration mode, press the  $\vee$  or  $\wedge$  button to change settings within each screen.
  - Press the **RIGHT** button to advance to the next screen.
  - Press the **LEFT** button to return to the previous screen.

**NOTE:** To exit configuration mode at any time, slide the **Function** switch to **Heat** or **Cool**.

### Configuration Mode Settings

The setup screens for Configuration Mode are as follows:

1. **Temperature Scale (F or C)**—Choose Fahrenheit or Celsius.

Press the  $\vee$  or  $\wedge$  button to select.



Press the **RIGHT** button to advance to the next screen.

**NOTE:** Default factory setting is Fahrenheit.

2. **Temperature Differential—Stage 1—(1–9°F) (1–5°C)**

Set the number of degrees between the "setpoint" temperature and the "turn on" temperature for first stage.



Press the  $\vee$  or  $\wedge$  button to set differential value.

Press the **RIGHT** button to advance to the next screen.

**Note:** Default factory setting is 2°F/1°C for each stage.



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3. **Temperature Differential—Stage 2**  
(1–9°F/1–5°C) RAK148D2 only

Set the number of degrees between when stage 1 turns on and stage 2 turns on.

Press the  $\vee$  or  $\wedge$  button to set differential value.

Press the **RIGHT** button to advance to the next screen.

**Note:** Default factory setting is 2°F/1°C for each stage.



4. **Minimum Cool Setpoint (60, 64, 66, 68, 70, 72, 74, 76°F) (15, 17, 19, 20, 21, 22, 23, 24°C)**

Adjust to control the minimum Cool set temperature allowed.

Press the  $\vee$  or  $\wedge$  button to select.

Press the **RIGHT** button to advance to the next screen.

**Note:** Default factory setting is 60°F/15°C.



5. **Maximum Heat Setpoint (65, 70, 72, 74, 76, 78, 80, 85°F) (18, 21, 22, 23, 24, 26, 27, 29°C)**

Adjust to control the maximum Heat set temperature allowed.

Press the  $\vee$  or  $\wedge$  button to select.

Press the **RIGHT** button to advance to the next screen.

**Note:** Default factory setting is 85°F/29°C.



6. **Room temperature offset (+9°F to -9°F) (+5°C to -5°C)**

Adjust to calibrate displayed room temperature to match actual room temperature.

Press the  $\vee$  or  $\wedge$  button to select.

Press the **RIGHT** button to advance to the next screen.

**Note:** Default factory setting is 0°F/0°C.



## Operating functions.

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### Off

- In this mode, the thermostat will not turn on the heating or cooling devices (manual fan can operate).
- **Off** is also used to access **Configuration** mode.

### Cool

- In this mode, the thermostat controls the cooling system.
- Press the  $\vee$  or  $\wedge$  button to set the desired temperature.



### Heat

- In this mode, the thermostat controls the heating system.
- Press the  $\vee$  or  $\wedge$  button to set the desired temperature.



## Testing the thermostat.

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Once the thermostat is installed, it should be thoroughly tested.

**! CAUTION!** Do not use air conditioning beyond the simple test when the outdoor temperature is below 50 degrees. This can damage the air conditioning system.

**Note:** Before testing the thermostat, move the **Fan Auto/On** switch to the **Auto** position.

### Fan Test

1. With **Function** switch set to **Off**, slide **Fan Auto/On** switch to **On** position.
2. Indoor fan turns on.
3. Slide **Fan Auto/On** switch to **Auto** position.
4. Indoor fan turns off.



### Cool Test

1. Slide **Function** switch to **Cool** position. **Cool** mode screen is displayed.
2. Adjust set temperature so it is 5 degrees below room temperature.
3. Air conditioning should come on within a few seconds.
4. Adjust the set temperature so it is 2 degrees above the room temperature and the A/C should turn off. **Note:** There is a 3 minute time delay and a 3 minute minimum run time for the compressor when it turns on/off. (On some models, the fan may also have a minimum run time/off time delay).

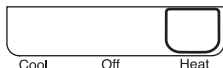


## Testing the thermostat.

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### Heat Test

1. Slide **Function** switch to **Heat** position. **Heat** mode screen is displayed.
2. Adjust set temperature so it is 5 degrees above room temperature.
3. Heat should come on within a few seconds.
4. Adjust the set temperature so it is 2 degrees below the room temperature and the heat should turn off. **Note:** There is a 3 minute time delay and a 3 minute minimum run time for the compressor when it turns on/off. (On some models, the fan may also have a minimum run time/off time delay).



## Troubleshooting tips.

| <b>Problem</b>                                                                          | <b>Solution</b>                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>No display</b>                                                                       | Check for 24 VAC; display is blank when 24 VAC is not present.                                                                                                                                  |
| <b>System fan does not come on properly</b>                                             | Verify that wiring is correct.                                                                                                                                                                  |
| <b>All thermostat buttons are inoperative</b>                                           | Verify that 24 VAC is present; unit will not operate when 24 VAC is not present                                                                                                                 |
| <b>Thermostat turns on and off too frequently</b>                                       | Adjust temperature differential (see <i>Configuration Mode - Setting Temperature Differential, Stage 1 and Stage 2</i> sections).                                                               |
| <b>Fan runs continuously</b>                                                            | Check <b>Fan Auto/On</b> switch. If set to <b>ON</b> position, fan will run continuously.                                                                                                       |
| <b>Room temperature is not correct</b>                                                  | Verify that wall hole is plugged with putty or insulation to prevent airflow from the wall cavity. Adjust Temperature Offset (see <i>Configuration Mode - Room temperature offset</i> section). |
| <b>Compressor doesn't run or turn off immediately when changing function or setting</b> | There is a 3 minute time delay and a 3 minute minimum run time for the compressor when it turns on/off.                                                                                         |
| <b>Fan doesn't run or turn off immediately when changing function or setting</b>        | This is normal. On some models, the fan may have a minimum run time/off time delay.                                                                                                             |
| <b>Problem not listed above</b>                                                         | Press the <b>Reset</b> button once to reset the thermostat and restore all factory settings.                                                                                                    |

*Notes.*

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*Notes.*

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# Thermostat Warranty.

*Staple your receipt here.  
Proof of the original purchase date is  
needed to validate the warranty.*

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## For The Period Of:

### **One Year**

*From the date of the  
original purchase*

## GE Will Replace:

**Full Replacement** of the thermostat which fails  
due to a defect in materials or workmanship.

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## What GE Will Not Cover:

- Service trips to your location.
- Improper installation. If you have an installation problem, contact your installer. You are responsible for providing adequate electrical connections to the product.
- Failure of the product resulting from modifications to the product or due to unreasonable use, including failure to provide reasonable and necessary maintenance.
- In commercial locations, labor necessary to move the unit, after it has been initially installed, to a location where it is accessible for service by an individual technician; or, if the instructions included in this manual have been disregarded.
- Replacement of location fuses or the resetting of circuit breakers.
- Damage to the product caused by improper power supply voltage, accident, fire, floods or acts of God.
- Incidental or consequential damage caused by possible defects with this thermostat.

**EXCLUSION OF IMPLIED WARRANTIES**—Your sole and exclusive remedy is product exchange as provided in this Limited Warranty. Any implied warranties, including the implied warranties of merchantability or fitness for a particular purpose, are limited to one year or the shortest period allowed by law.

*This warranty is extended to the original purchaser and any succeeding owner for products purchased for use within the USA and Canada. In Alaska, the warranty excludes the cost of shipping or service calls to your site.*

*Some states or provinces do not allow the exclusion or limitation of incidental or consequential damages. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state or province to province. To know what your legal rights are, consult your local, state or provincial consumer affairs office or your state's Attorney General.*