Digital Programmable Thermostats

Owner's Manual & Installation Instructions

RAK148P2

RAK164P2

LIA308 49-7732 12-13 GE

Important safety information.

⚠ *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.

Electrical rating:
- 24 VAC (18–30 VAC)
- 1 amp maximum per terminal
- DC Power: 3.0 VDC (2 "AAA" batteries included)
- 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:

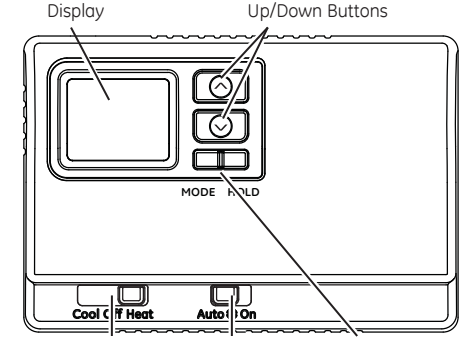
RAK148P2: 2-stage heat (heat pump/resistance heat), 1-stage cool

RAK164P2: 1-stage heat (resistance heat), 1-stage cool

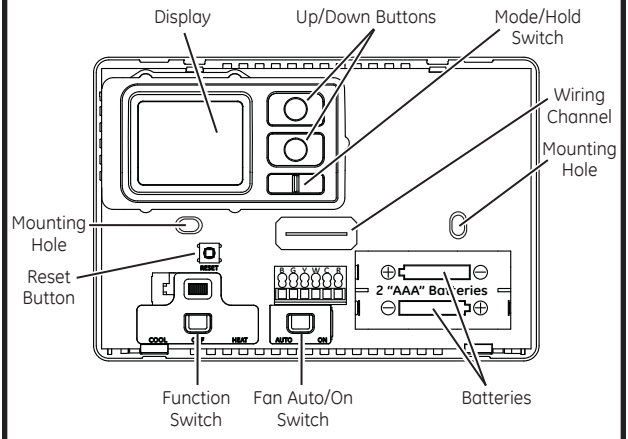
Terminations: R, C, W, Y, G, B (RAK148P2);
R, C, W, Y, G (RAK164P2)

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

THERMOSTAT CONTROL



PARTS DIAGRAM



⚠ *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, 2 "AAA" batteries, 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.

TO INSTALL THERMOSTAT (cont.)

14. Insert two "AAA" batteries into battery holder. Verify that they are oriented as shown on battery holder.

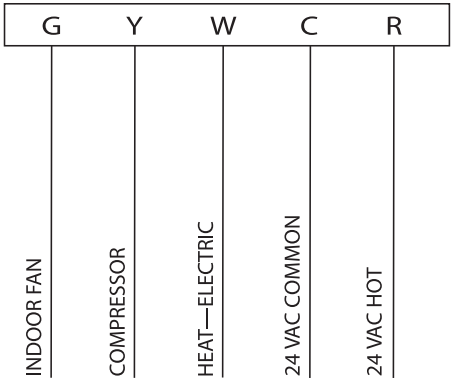
15. Replace cover on thermostat by snapping it in place.

16. Plug the unit in or turn on power to the system at the main service panel.

17. Test thermostat operation as described in the "Testing the Thermostat" section.

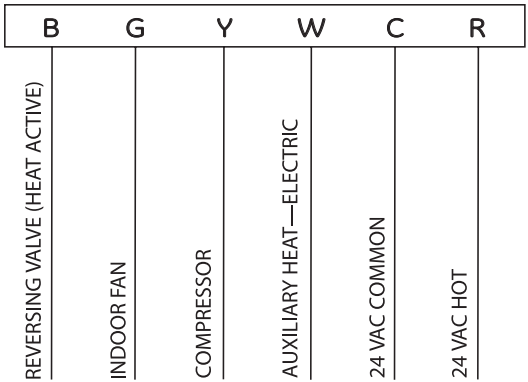
Wiring diagrams.

Table 1: Terminals for five wires 1-stage heat/1-stage cool system (RAK164P2 only)



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 (RAK148P2 only)



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.

The configuration mode is used to set the RAK148P2 and RAK164P2 to match the heating/cooling system. These thermostats function with up to 2-stage heat pump systems (RAK148P2 only).

To configure the RAK148P2 and RAK164P2, perform the following steps:

Note: Operation being set will blink in the display.

1. Slide the ***Function*** switch to the ***OFF*** position.
2. Simultaneously hold the ∨ and ∧ buttons in for 6 seconds while the thermostat is in ***OFF*** mode.
3. Press the ∨ or ∧ button to change settings within each screen.
4. Press the ***Hold*** button to advance to the next screen. ***Note:*** The ***Mode*** button will return you to the previous screen.
5. To save the changes and exit configuration mode, 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 ∨ or ∧ button to select.

   Press the ***Hold*** 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 ∨ or ∧ button to set differential value.

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

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

3. **Temperature Differential—Stage 2—(RAK148P2 only) (1–9°F) (1–5°C)—**Set the number of degrees between when stage 1 turns on and stage 2 turns on.

   Press the ∨ or ∧ button to set differential value.

   Press the ***Hold*** 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 ∨ or ∧ button to select.

   Press the ***Hold*** 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 ∨ or ∧ button to select.

   Press the ***Hold*** 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 ∨ or ∧ button to select.

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

   Note: Move the ***Function*** switch to ***Heat*** or ***Cool*** position to lock the settings into memory.

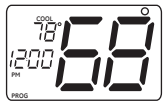
   Note: Default factory setting is 0°F/0°C.

Operating functions.

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 ***Setup*** and ***Program*** modes.

Cool



- In this mode, the thermostat controls the cooling system.
- Press the ***Mode*** button to enter and exit the ***Program Cool*** mode.
- In ***Program Cool*** mode (***PROG*** displays), the thermostat will follow the program schedule that is stored in memory.

Heat

- In this mode, the thermostat controls the heating system.
- Press the ***Mode*** button to enter/exit the ***Program Heat*** mode.
- In ***Program Heat*** mode (***PROG*** displays), the thermostat will follow the program schedule that is stored in memory.

Hold

- When in ***Programmable Cool*** or ***Programmable Heat***, you can lock in the present settings indefinitely by pressing the ***Hold*** button once (***PROG*** flashes). Press ***Hold*** button again to leave ***Hold*** mode (***PROG*** solid). For a temporary ***Hold*** period, raise or lower set temperature to desired set temperature. The thermostat will automatically return to programmed set temperature after 2 hours.

Testing the thermostat.

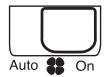
Once the thermostat is installed, it should be thoroughly tested.

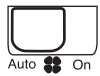
⚠ *CAUTION!* ***Do not use air conditioning when the outdoor temperature is below 50 degrees. This can damage the air conditioning system.***

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.

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. Resistance 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).

Programming.

Factory Programming Settings

The programmable thermostat comes preprogrammed with the following schedule:

MONDAY	**MORN**	6:00 AM	**DAY**	8:00 AM	**EVE**	6:00 PM	**NITE**	10:00 PM
through	**HEAT**	70°F	**HEAT**	62°F	**HEAT**	70°F	**HEAT**	62°F
SUNDAY	**COOL**	78°F	**COOL**	85°F	**COOL**	78°F	**COOL**	82°F

Setting the time and day of the week

The time and day of the week must be set for the program schedule to operate correctly.

1. Slide the ***Function*** switch to the ***Off*** position.

2. Press the ***Hold*** button in for 6 seconds.
3. Press the ∨ or ∧ button to adjust the time in hours. Press the ***Hold*** button once. Now press the ∨ or ∧ button to adjust the time in minutes.

4. Press the ***Hold*** button while the time is displayed. The display shows the day currently set on the thermostat (01 = Monday, 02 = Tuesday, etc.).

5. Press the ∨ or ∧ button to set the current day of the week.
6. Press the ***Hold*** button to go to the programming schedule or slide the ***Function*** switch to ***Cool*** or ***Heat*** positions to lock the values into memory.

Programming.

Program Overview

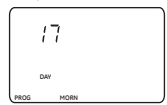
The programmable thermostat has four periods (***MORN, DAY, EVE, NITE***) that are customizable for each day of the week. Each period will have a set time, heat temperature and cool temperature. The thermostat monitors the day and time, while maintaining the specific conditions that you have chosen for each period in the program.

Note: Operation being set will blink in the display.

1. Place the ***Function*** switch in the ***Off*** position.
2. Press the ***Hold*** button in for 6 seconds.
3. Press the ***Hold*** button 3 times.
   - ***DAY*** (01–07) and ***PROG*** is displayed.
4. Press the ∨ or ∧ button to change the day you want to program (01-05 = Monday – Friday individually, 67 = program Saturday and Sunday at the same time, 17 = program every day of the week at the same time, 15 = program Monday – Friday at the same time).

5. Press the ***Hold*** button to advance to the next parameter.
   - Period is displayed (***MORN, DAY, EVE, NITE***).

   Note: You can always press the ***Mode*** button to return to the previous parameter.



6. Press the ∨ or ∧ button to change period of day. The display should blink the period of the day.
7. Press the ***Hold*** button to advance to the next parameter.
   - Set time is displayed.

8. Press the ∨ or ∧ button to adjust hours. Press the ***Hold*** button once, and then press the ∨ or ∧ buttons to adjust minutes.

9. Press the ***Hold*** button to advance to the next screen parameter.
   - Heat temperature is displayed (60°F to 85°F) / (15°C to 29°C).

   Note: Transitions required after 11:59 PM must be programmed in the next days ***MORN*** period.
10. Press the ∨ or ∧ button to adjust heat set temperature.
11. Press the ***Hold*** button to advance to the next screen.
    - Cool temperature is displayed (60°F to 85°F) / (15°C to 29°C).

12. Press the ∨ or ∧ button to adjust cool set temperature.
13. Press the ***Hold*** button to advance to the next screen.

    Repeat steps 1–13 to program each day of the week individually.

    Note: When programming is complete, slide the ***Function*** switch to ***Heat*** or ***Cool*** to exit ***Programming Mode***.

Programming.

Use the following personal program schedule to record your settings:

MONDAY	MORN		DAY		EVE		NITE	
01	HEAT		HEAT		HEAT		HEAT	
	COOL		COOL		COOL		COOL	
TUESDAY	MORN		DAY		EVE		NITE	
02	HEAT		HEAT		HEAT		HEAT	
	COOL		COOL		COOL		COOL	
WEDNESDAY	MORN		DAY		EVE		NITE	
03	HEAT		HEAT		HEAT		HEAT	
	COOL		COOL		COOL		COOL	
THURSDAY	MORN		DAY		EVE		NITE	
04	HEAT		HEAT		HEAT		HEAT	
	COOL		COOL		COOL		COOL	
FRIDAY	MORN		DAY		EVE		NITE	
05	HEAT		HEAT		HEAT		HEAT	
	COOL		COOL		COOL		COOL	
SATURDAY	MORN		DAY		EVE		NITE	
06	HEAT		HEAT		HEAT		HEAT	
	COOL		COOL		COOL		COOL	
SUNDAY	MORN		DAY		EVE		NITE	
07	HEAT		HEAT		HEAT		HEAT	
	COOL		COOL		COOL		COOL	

Low battery indicator.

The programmable thermostats with battery backup have a low battery warning screen.

Low battery warning

The thermostat will display a low battery indication. The low battery warning will be flashing until batteries are replaced.

Power failure Indicator

The programmable thermostats with battery backup also will indicate a main power failure when the 24 VAC power from the room air conditioner is not present.

Power failure

The thermostat will display a power failure indication ("***PF***") on the screen.

Note: If "***PF***" is displayed, it means the 24 VAC power to the thermostat is lost.

Notes.

Troubleshooting tips.

Problem	*Solution*
No display	Check for 24 VAC at thermostat and batteries; display is blank when 24 VAC is not present and batteries are bad.
System fan does not come on properly	Verify that wiring is correct.
All thermostat buttons are inoperative	Verify that 24 VAC is present; unit will not operate when 24 VAC is not present.
Thermostat turns on and off too frequently	Adjust temperature differential (see *Configuration Mode - Setting Temperature Differential, Stage 1* and *Stage 2* sections).
Program schedule activates at the wrong time	Check time (AM/PM) set on thermostat (see *Programming*).
Thermostat does not follow program	Verify that it is in ***Program*** mode; ***PROG*** displays solid; check time (AM/PM); check if in ***Hold*** mode (***PROG*** flashing).
"PROG" flashes (in Hold mode)	Press ***Hold*** button to remove from ***Hold*** mode.
Fan runs continuously	Check ***Fan Auto/On*** switch. If set to ***ON*** position, fan will run continuously.
Room temperature is not correct	Verify that wall hole is plugged with putty or insulation to prevent airflow from the wall cavity. Adjust Temperature Offset (see *Configuration Mode - Room temperature offset* section).
Compressor doesn't run or turn off immediately when changing function or setting	There is a 3 minute time delay and a 3 minute minimum run time for the compressor when it turns on/off.
Fan doesn't run or turn off immediately when changing function or setting	This is normal. On some models, the fan may have a minimum run time/ off time delay.
"▯" displays on screen	Replace batteries with 2 fresh "AAA" alkaline batteries.

Problem	*Solution*
"PF" displays on screen.	Check for 24 VAC at thermostat.
Display reads "12:00 PM"	Set clock/time.
Problem not listed above	Press the ***Reset*** button once. Reset button function: time, day and mode will be changed to the factory settings. Display is refreshed.

Notes.

Notes.

Thermostat Warranty.

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

For The Period Of:	*GE Will Replace:*
One Year *From the date of the original purchase*	***Full Replacement*** of the thermostat which fails due to a defect in materials or workmanship.

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.

Warrantor: General Electric Company. Louisville, KY 40225