Made in USA

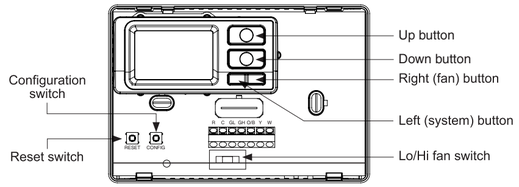
RT6P
Electronic Thermostat

- **7 Day Programmable**
- **Auto Changeover**
- **1-Stage Heat/1-Stage Cool Systems**
- **Configurable to: 2-stage heat pump**
- **Large Display With Backlight**
- **Selectable Fahrenheit or Celsius**

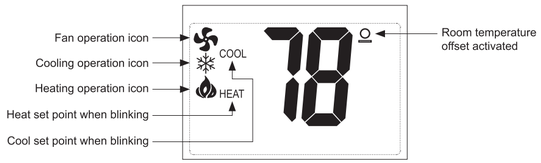
Installation, Operation & Application Guide

FRIEDRICH

Parts Diagram



Icon Descriptions



Specifications

Electrical rating:
- 24 VAC (18-30 VAC)
- 1 amp maximum per terminal
- 3 amp maximum total load

Temperature control range: 45°F to 90°F (7°C to 32°C) **Accuracy:** ± 1°F (± 0.5°C)

System configurations: 2-stage heat, 1-stage cool, heat pump, electric

Timing: Anti-short Cycle: 4 minutes (bypass anti-short cycle delay by returning to OFF mode for 5 seconds)

Backlight Operation: 10 seconds

Terminations: R, C, GL, GH, O/B, Y, W

Important Safety Information

WARNING!:
- This thermostat is for 24 VAC applications only; do not use on voltages over 30 VAC
- All wiring must conform to local and national electrical and building codes
- Do not use air conditioning when the outdoor temperature is below 50 degrees; this can damage your A/C system and cause personal injuries
- Use this thermostat only as described in this manual

Package Contents/Tools Required

Package includes: **RT6P** thermostat on base, thermostat cover, wiring labels, screws and wall anchors, Installation, Operation and Application Guide

Tools required for installation: Drill with 3/16" bit, hammer, screwdriver

Mode of Operation

RT6P is a 1-stage cool/2-stage heat thermostat. It functions with air conditioning, heat pumps, or electric heat systems. It is programmable for 7 days a week and has auto changeover capability.

The thermostat activates the heating appliance when the room temperature is below the set heat temperature (by the differential temperature). The **RT6P** will stop outputting when the call for heat has been satisfied. With heat pumps, the thermostat will not let the compressor come on for 4 minutes after it turns off to protect your compressor.

When the room temperature is greater than the set cool temperature (by the differential temperature), the cooling device is activated. The **RT6P** will stop outputting when the call for cooling is satisfied. The thermostat will not let the compressor come on for 4 minutes after it turns off to protect your compressor.

The **RT6P** has four possible operating modes: **OFF**, **Heat**, **Cool** and **Heat/Cool** mode. In off mode, the thermostat will not turn on heating or cooling devices. In heat mode, the thermostat controls the heating system. In the cool mode, the thermostat controls the cooling system. In the Heat/Cool mode, the thermostat controls the heating and cooling system

The manual fan can be turned on in all operating modes using the **fan** button.

In program mode, the thermostat will automatically be controlled by the set program. Program mode can function with heat mode, cool mode, or heat & cool mode. The clock display alternates with the set temperature display for heat & cool mode.

The program schedule can be overridden by changing the set temperature (up or down button). This puts the RT6P thermostat into a 2-hour temporary hold. After 2 hours, it will automatically return to the program schedule.

Button Functions

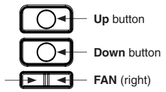
UP – Used to increase the set temperatures and to adjust configuration settings

DOWN – Used to decrease the set temperatures and to adjust configuration settings

SYS (left) – Used to change from OFF, HEAT, COOL and HEAT/COOL modes

FAN (right) – Used to turn on and off the indoor fan

SYS (left) and FAN **(right)** – Used to enter and exit program operation



To Remove Existing Thermostat

ELECTRICAL SHOCK HAZARD – ***Turn off power at the main service panel by removing the fuse or switching the appropriate circuit breaker to the OFF position before removing the existing thermostat.***

1. Turn off power to the heating and cooling system by removing the fuse or switching the appropriate circuit breaker off.
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

ELECTRICAL SHOCK HAZARD – ***Turn off power at the main service panel by removing the fuse or switching the appropriate circuit breaker to the OFF position before removing the existing thermostat.***

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

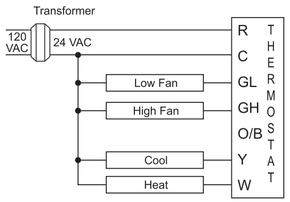
⁂ **Note:** *Mount the thermostat about five feet above the floor. Do not mount the thermostat on an outside wall, in direct sunlight, behind a door, or in an area affected by a vent or duct.*

1. Turn off power to the heating and cooling system by removing the fuse or switching the appropriate circuit breaker off.
2. To remove cover, pull gently at the seam at the top.
3. Put thermostat base against the wall where you plan to mount it (Be sure wires will feed through the wire opening in the base of the thermostat).
4. Mark the placement of the mounting holes.
5. Set thermostat base and cover away from working area.
6. Using a 3/16" drill bit, drill holes in the places you have marked for mounting.
7. Use a hammer to tap supplied anchors in mounting holes.
8. Align thermostat base with mounting holes and feed the control wires through slit in thermal intrusion barrier and into wire opening.
9. Use supplied screws to mount thermostat base to wall.
10. Insert stripped, labeled wires in matching wire terminals.

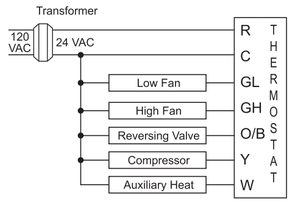
    CAUTION!: *Be sure exposed portion of wires does not touch other wires.*
11. Gently tug wire to be sure of proper connection. Double check that each wire is connected to the proper terminal.
12. Turn on power to the system at the main service panel.
13. Configure thermostat to match the type of system you have.
14. Replace cover on thermostat by snapping it in place.
15. Test thermostat operation as described in "Testing the Thermostat".

Wiring Diagrams

Heat/Cool Systems



Heat pump with electric backup



Terminal Designator Descriptions

R – 24 VAC hot
C – 24 VAC common
O/B – Configurable
  O – Cool active reversing valve
  B – Heat active reversing valve
Y – 1st stage cool, 1st stage heat for heat pumps
W – 1st stage heat for non-heat pump systems, auxiliary heat for HP systems
GL – Low fan
GH – High fan

RT6P Output Chart

Configuration	1ST Cool	1ST Heat	2ND Heat
ELC	Y, G	W, G, B	N/A
HP 'O' config	Y, G, O	Y, G	Y, W, G
HP 'B' config	Y, G	Y, G, B	Y, G, B, W

The **RT6P** thermostat is configurable for different systems. The configuration directly affects the outputs. Use the output chart to correctly configure and wire the thermostat to your system.

Configuration Mode

The configuration mode is used to set the **RT6P** to match your heating/cooling system. The **RT6P** functions with heat pump, air conditioning, or electric heat systems.

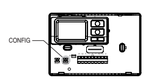
⁂ **Note:** *Thermostat comes configured for 1-stage heat / 1-stage cooling for use with all heat/cool and single-stage heat pump models. For Friedrich PTHP models follow the instructions below to configure the thermostat for two-stage heat pump operation using the 'O' terminal.*

To configure the **RT6P**, perform the following steps:

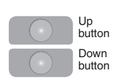
1. Verify the **RT6P** is in the **OFF** mode.
   Press the **SYS** (left) button until off mode displays.

2. Remove the cover of the thermostat by gently pulling near one of the corners at the top of the thermostat.

3. Press the **CONFIG** button for 1 second while the **RT6P** is in **OFF** mode.



Press the **up** or **down** button to change settings within each screen.



Press the button to advance to the next screen.

⁂ *Pressing the **left** button will return you to the previous screen.*

To exit configuration mode, press the **CONFIG** switch for 1 second.

Configuration Mode Settings

The setup screens for Configuration Mode are as follows:

1. **System** – Set for heat pump, non-heat pump, reversing valve operation

System	Setting	Reversing Valve Setting
Heat Pump	HP 'O'	O - Energized in Cooling
Heat Pump	HP 'B'	B - Energized in Heating
Heat/Cool and Single-Stage Heat Pump Only	ELC	N/A

Press the **up** or **down** button to select.
Press the **right** button to advance to the next screen.

2. **Temperature Scale** (F or C)
   Choose Fahrenheit or Celsius.
   Press the **up** or **down** button to select.
   Press the **right** button to advance to the next screen.

3. **1st Stage Temperature Differential** (1°F to 5°F) (0.5°C to 2.5°C)
   Set the number of degrees between your "setpoint" temperature and your "turn on" temperature.
   Press the **up** or **down** button to set differential value.
   Press the **right** button to advance to the next screen.

4. **2nd Stage Temperature Differential** (1°F to 5°F) (0.5°C to 2.5°C) ***(For HP 0 and HP B only)***
   Set the number of degrees between when stage 1 turns on and when stage 2 turns on.
   Press the **up** or **down** button to set differential value.
   Press the **right** button to advance to the next screen.

5. **Staged Off Outputs** (**For HP 0 and HP B only**)
   Select whether the outputs for heating and cooling are staged off independently or are satisfied simultaneously.
   1 = outputs staged off independently
   0 = outputs off simultaneously
   Press the **up** or **down** button to set.
   Press the **right** button to advance to the next screen.

6. **Deadband** (1°F to 9°F) (1°C to 5°C)
   Select the minimum difference between heat set point and cool set point when in auto changeover mode.
   Press the **up** or **down** button to set.
   Press the **right** button to advance to the next screen.

7. **Auxiliary Delay ON** – (0-30 minutes) (**For HP 0 and HP B only**)
   Set the delay time in minutes for auxiliary heat to be locked out after a call for second stage. This extra savings feature is used to temporarily lock out auxiliary heat devices, allowing just heat pump to try to satisfy heat call.
   Press the **up** or **down** button to set.
   Press the **right** button to advance to the next screen.

8. **Maximum Heat Setpoint** (45°F to 90°F) (7°C to 32°C)
   Adjust to control the maximum heat set temperature allowed.
   Press the **up** or **down** button to select.
   Press the **right** button to advance to the next screen.

9. **Minimum Cool Setpoint** (45°F to 90°F) (7°C to 32°C)
   Adjust to control the minimum cool set temperature allowed.
   Press the **up** or **down** button to select.
   Press the **right** button to advance to the next screen.

10. **Room Temperature Offset** (+9°F to -9°F) (+4.5°C to -4.5°C)
    Adjust to calibrate displayed room temperature to match actual room temperature.
    ⁂ **Note:** *When not set to 0, ♀ will display.*
    Press the **up** or **down** button to select.
    Press the **right** button to advance to the next screen.

Setting the Time and Day of the Week

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

1. Press the **SYS** (left) button until you are in the OFF mode.
2. Press and hold the **PROG** button (**SYS** (left) and **FAN** (right) buttons pressed simultaneously) in for 6 seconds.

3. Time displays (hour flashing).
   Press the **up** or **down** button to adjust the hour.
4. Press the **FAN** (right) button once to select minutes (minutes flashing).
   Press the **up** or **down** button to adjust the minutes.

5. Press the **FAN** (right) button once to select day of the week (TODAY flashing).
   Press the **up** or **down** button to select current day of the week.

⁂ **Note:** At any time, press the **SYS** (left) button to return to the previous screen or press the **FAN** (right) button to advance to the next screen.

Press the **PROG** button in for 2 seconds to lock values into memory and return to the OFF mode or press the **FAN** (right) button once to enter programming.

Programming

Program Overview

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

Setting the program schedule:

1. Press the **SYS** (left) button until you are in **OFF** mode.
2. Press and hold the **PROG** button (**SYS** and **FAN** buttons pressed simultaneously) for 6 seconds.

3. Press the **FAN** (right) button 3 times.
4. SUN thru SAT are blinking.

From this screen you have 2 options:

1. Press the **FAN** (right) button to begin programming all 7 days at one time, or
2. Press the up button to see the other programming options.

⁂ **Note:** The days of the week shown on the display will be programmed simultaneously.

The screens are listed below.

Screen 1	SUN	MON	TUE	WED	THU	FRI	SAT
Screen 2		MON	TUE	WED	THU	FRI	
Screen 3		MON					
Screen 4			TUE				
Screen 5				WED			
Screen 6					THU		
Screen 7						FRI	
Screen 8	SUN						SAT
Screen 9							SAT
Screen 10	SUN						

Programming (continued)

From any of the screens above, you can press the **FAN** (right) button to begin entering your program schedule. The days shown on the display will all be programmed simultaneously.

Once the **FAN** (right) button is pressed, **MORN** blinks.

Use the **up** or **down** button to select a different period (**MORN**, **DAY**, **EVE**, **NITE**).

Press **FAN** (right) button to advance to the next screen. Transition time **hour** blinks.

Use the **up** or **down** button to select a different hour.

Press **FAN** (right) button to advance to the next screen. Transition time **minutes** blink.

Use the **up** or **down** button to select different minutes.

Press **FAN** (right) button to advance to the next screen. **Heat set temperature** displays.

Use the **up** or **down** button to adjust the heat set temperature.

Press **FAN** (right) button to advance to the next screen. **Cool set temperature** displays.

Use the **up** or **down** button to adjust the cool set temperature.

Press **FAN** (right) button to advance to the next screen. **Programmable fan** screen displays.

Use the **up** or **down** button to select:

Choose: **Off** – Programmable fan disabled >OR< **On** – Indoor fan on continuously

⁂ **Note:** Programmable fan operates in Program mode only.

Repeat above steps to program the four periods per day.

When the program schedule is complete, press and hold the **PROG** button (**SYS** and **FAN** buttons pressed simultaneously) in for 2 seconds to return to the **OFF** mode.

Factory Preprogramming

The thermostat comes pre programmed with the following schedule:

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

Personal Program Schedule

Use the following personal program schedule to record your settings:

MONDAY *1*	MORN	DAY	EVE	NITE
	HEAT	HEAT	HEAT	HEAT
	COOL	COOL	COOL	COOL
	FAN	FAN	FAN	FAN
TUESDAY *2*	MORN	DAY	EVE	NITE
	HEAT	HEAT	HEAT	HEAT
	COOL	COOL	COOL	COOL
	FAN	FAN	FAN	FAN
WEDNESDAY *3*	MORN	DAY	EVE	NITE
	HEAT	HEAT	HEAT	HEAT
	COOL	COOL	COOL	COOL
	FAN	FAN	FAN	FAN
THURSDAY *4*	MORN	DAY	EVE	NITE
	HEAT	HEAT	HEAT	HEAT
	COOL	COOL	COOL	COOL
	FAN	FAN	FAN	FAN
FRIDAY *5*	MORN	DAY	EVE	NITE
	HEAT	HEAT	HEAT	HEAT
	COOL	COOL	COOL	COOL
	FAN	FAN	FAN	FAN
SATURDAY *6*	MORN	DAY	EVE	NITE
	HEAT	HEAT	HEAT	HEAT
	COOL	COOL	COOL	COOL
	FAN	FAN	FAN	FAN
SUNDAY *7*	MORN	DAY	EVE	NITE
	HEAT	HEAT	HEAT	HEAT
	COOL	COOL	COOL	COOL
	FAN	FAN	FAN	FAN

Operating Modes

There are four possible operating modes for the **RT6P**. **Off**, **Heat**, **Cool** and **Heat/Cool** modes are accessed by pressing the **SYS** (left) button. The **RT6P** also lets you operate in any mode as a programmable thermostat.

OFF Mode

- In this mode, the thermostat will not turn on the heating or cooling devices

⁂ **Note:** *The indoor fan can be turned on manually in every operating mode by pressing the **FAN** (right) button. The word **FAN** shows on the display and the fan icon appears when the fan operates.*

Heat Mode

- In this mode, the thermostat controls the heating system. When the heat outputs, the flame icon ♨ appears on the display.

⁂ **Note:** *For heat pumps, there is a four minute delay for your compressor to restart after it has turned off. To bypass the compressor time delay, go to OFF mode for 5 seconds.*

Cool Mode

- In this mode, the thermostat controls the cooling system. When the cooling outputs, the snowflake icon ❄ appears on the display.

⁂ **Note:** *There is a four minute delay for your compressor to restart after it has turned off. To bypass the compressor time delay, go to OFF mode for 5 seconds.*

Cool and Heat Mode (Auto Changeover)

- In this mode, the thermostat controls the cooling and heating systems, automatically changing over from one to the other as needed.
- The timing display alternates with the set temperature every 10 seconds in the cool and heat mode.

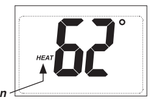
Program Mode

- In this mode, the program function is on (**PROG** displays), and the thermostat will automatically be controlled by the set program schedule. Program mode can function with heat mode, cool mode, or heat & cool mode. The program schedule can be overridden by changing the set temperature (up or down button). After 2 hours, the program schedule will automatically be resumed. To manually return to the program schedule, press the **PROG** button twice.

Set Point Adjustment

Heat Set Point

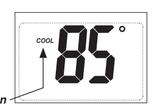
- Use the SYS button to select Heat Mode. Press the up or down button to view the current heat set point larger on the display. When the large set point is displayed, the HEAT icon will blink. The up or down buttons can be used to adjust the set point. After 5 seconds of inactivity the screen will display the room temperature and the HEAT icon will not blink.



HEAT icon will blink.

Cool Set Point

- Use the SYS button to select Cool Mode. Press the up or down button to view the current cool set point larger on the display. When the large set point is displayed, the COOL icon will blink. The up or down buttons can be used to adjust the set point. After 5 seconds of inactivity the screen will display the room temperature and the COOL icon will not blink.



COOL icon will blink.

Heat & Cool Set Points

- Use the SYS button to select Heat/Cool Mode. Press the up or down button to adjust the current set points. When the set points are displayed for adjustment, the ROOM temperature leaves the screen. The up or down buttons can be used to adjust the set points. After 5 seconds of inactivity, the screen will display the Heat and Cool set points and the room temperature.

Testing the Thermostat

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

CAUTION!: *Do not energize the air conditioning system when the outdoor temperature is below 50 degrees. It can result in equipment damage or personal injury.*

Heat Test

1. Press **SYS** (left) button until heat mode is displayed.
2. Adjust the set temperature so it is 5 degrees above the room temperature.
3. Heat should come on within a few seconds.
4. Adjust the set temperature 2 degrees below the room temperature and the heat should turn off. There may be a fan delay on your system.

⁂ **Note:** *For heat pumps, there is a four-minute delay to protect your compressor after it turns off. To bypass the compressor time delay, go to OFF mode for 5 seconds.*

Cool Test

1. Press **SYS** (left) button until cool mode is displayed.
2. Adjust set temperature so it is 5 degrees below room temperature.
3. A/C should come on within a few seconds.
4. Adjust the set temperature 2 degrees above the room temperature and the A/C should turn off. There may be a fan delay on your system.

⁂ **Note:** *There is a four-minute time delay to protect the compressor after it turns off. To bypass the compressor time delay, go to OFF mode for 5 seconds.*

Fan Test

1. Press **FAN** (right) button. Fan displays. Indoor fan turns ON.
2. Press **FAN** (right) button. Indoor fan turns OFF.

Troubleshooting

Symptom	Remedy
No display	Check for 24 VAC at thermostat; display is blank when 24 VAC is not present.
All thermostat buttons are inoperative	Verify 24 VAC is present; unit locks out when 24 VAC is not present
No response with first button press	First button press activates backlight only
Thermostat turns on and off too frequently	Adjust temperature differential (see Configuration Mode Settings 3 & 4)
Fan runs continuously	Press FAN (right) button to turn fan off
Room temperature is not correct	Calibrate thermostat (see Configuration Mode Setting 10)
Heat or Cool not coming on	Verify wiring is correct, gently pull on each wire to verify there is a good connection at terminal block
HEAT blinking	In heat set point screen, this is normal operation
COOL blinking	In cool set point screen, this is normal operation
Not following program schedule	Verify time is correct, check am/pm, verify it is in program mode (PROG displays)
“PROG” on display	Press both SYS (left) and Fan (right) to enter or exit the program mode
Problem not listed above	Press Reset button once*

*** Reset Button Function**: *Display is refreshed, configuration settings are unchanged.*

FRIEDRICH

Friedrich Air Conditioning Co.
10001 Reunion Place, Suite 500, San Antonio, TX 78216
P (210) 546-0500
http://www.friedrich.com