

ThermStat 3

The ThermStat 3 is a programmable temperature monitoring security device. This unit is capable of monitoring temperatures near the ThermStat and in three separate locations by using probes. The ThermStat 3 is capable of allowing the device to defrost without triggering an alarm. (A list of recommended and compatible probes and application printed in **Note 1.**) The ThermStat 3 has a C-form relay and three (3) solid state zone outputs. The alarm points are programmed at the factory and can be changed at installation as needed. Hysteresis trip settings are discussed later. The unit can display the temperature in the Celsius or Fahrenheit scale. The memory in the ThermStat 3 is **non-volatile**.

When the factory settings need changed for your particular application, complete the programming worksheet (included) **before** you begin programming the device. A completed worksheet will add peace of mind as you go through the programming fields assigning codes and values.

Installation Procedure:

To open the ThermStat 3, insert a small flat blade screwdriver between the cover and the back plate and twist the screwdriver to open the device. Mount the ThermStat 3 in the required location using the provided screws. Four holes have been pre-drilled on the back mounting plate for your convenience. (There also is a mounting pattern template provided with the printed instructions). Route wires to the device, such as power and probes, as necessary from behind the ThermStat 3. **Remember!!!** It is important to avoid lights, motors, ballast transformers, fans and electromagnetic devices when routing and pulling wires.

Note 1: Temperature Probes. The standard probe part numbers are TP-1, TP-2, TP-3. TP-1 is used for the first probe. TP-2 is for the second probe and TP-3 is the third probe. Because these probes have been digitally addressed, these probes cannot be duplicated at the installation. One cannot use two or more of the same probes. If you have an application of only one remote location to monitor, use a TP-1. If there are two remote locations to monitor, use a TP-1 and a TP-2. The extreme temperature probes, part number HTP, have been designed for higher and lower temperatures as well as a more hostile environment. The probe part numbers are HTP-1, HTP-2, HTP-3. See chart for comparisons.

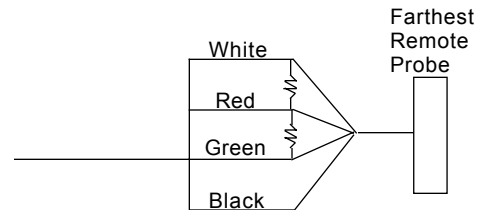
TP Series			HTP Series		
HI	120°F	48°C	HI	250°F	121°C
LO	32°F	0°C	LO	-30°F	-35°C
+/-	4°F	2°C	+/-	4°F	2°C

Only the stainless steel probe can be submersed in a non-reactive liquid. Do not submerge the wire.

Only use the TP Series or HTP Series with the ThermStat 3.

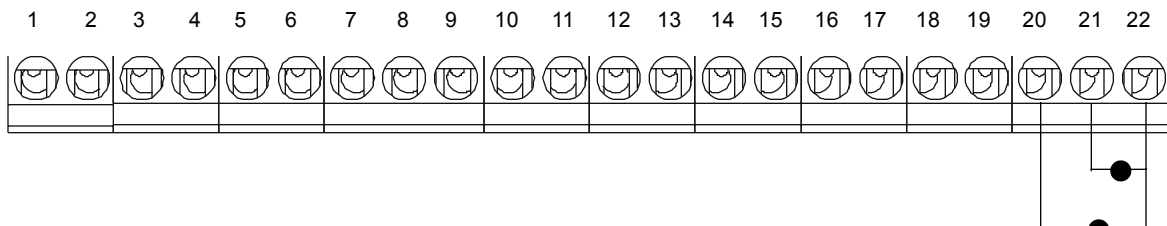
Use the TP 100 or HTP 100 series of probes with the ThermStat 4.

Note 2: A remote temperature probe can be mounted up to 150 feet away from the ThermStat 3 depending on the levels of RF interference. CE dictates a maximum of 3 meters for installations in European countries. Your specific installation may not allow a long run of wiring due to factors of the surrounding environment. Pull up resistors are supplied for long wiring runs. 1/4W, 1KΩ, Red to Green, Red to White.



Note3: There are two (2) blue colored capacitors provided with Probe 1 to attach to the ThermStat 3. These can be attached to help limit/filter noise that could affect the unit.

Note 4: Outputs can be programmed separately. See programming chapter.



ThermStat 3 and Probe Connections

1 -	power in (positive)	See notes regarding compatible power supplies other than those supplied by GRI.	
2 -	power in (negative)		
3 -	Red (probe)		
4 -	not used		
5 -	not used		
6 -	not used		
7 -	Mechanical Relay	N/O	
8 -	Mechanical Relay	N/C	Relay 1
9 -	Mechanical Relay	Common	
10 -	Solid State output	N/O	
11 -	Solid State output	N/O	Relay 2
12 -	Solid State output	N/O	
13 -	Solid State output	N/O	Relay 3
14 -	Solid State output	N/C	
15 -	Solid State output	N/C	Relay 4
16 -	Closed Loop Input 1		
17 -	Closed Loop Input 2		
18 -	Closed Loop Input 3		
19 -	Closed Loop Input 4		
20 -	White (probe)		
21 -	Green (probe)		
22 -	Black (probe)		

Current Draw	
With No Probes	70 mA in idle
For Each Probe	add 20 mA
Backlight on	add 50 mA
In Alarm (sounder)	add 50 mA
Mechanical Relay	add 80 mA
Example	
ThermStat	70 mA
2 Probes	40 mA
Backlight on	50 mA
Total	160 mA in idle
Alarm	add 80 mA
Total	240 mA
Maximum Current Draw is 310 mA.	
Solid State alarm output does not add to current draw.	
One mA equals one thousandth of an amp.	

Connection Description

Connect DC power to terminals 1 (+) and 2 (-). Observe polarity. **WARNING.** If you are using a power supply other than the RTD/12, be certain that the power is **regulated**. The use of unapproved power supplies will void the warranty. GRI's technical support team can provide information. 800-445-5218.

Connect zone wiring.

Terminals 7 and 9 are used for N/O contact when ThermStat 3 is in normal operation.

Terminals 8 and 9 are used for N/C contacts when ThermStat 3 is in normal operation.

Terminals 10 and 11 connect to the appropriate control panel zone for N/O contact when the ThermStat is on normal operation. 10 and 11 close on alarm.

Terminals 12 and 13 connect to the appropriate control panel zone for N/O contact when the ThermStat 3 is in normal operation. 12 and 13 close on alarm.

Terminals 14 and 15 connect to the appropriate control panel zone for N/C contact when the ThermStat 3 is in normal operation. 14 and 15 open on alarm.

Terminals 16, 17, 18 and 19 are closed loop connections within the solid state output function. When these loops are activated their connection is internally pulled high. These connections can be used for switches on doors, windows, water sensors, louvers and such. E.g. connect terminal 16 to one side of the switch and the other side of the switch to ground (-DC). NOTE: Ground should be connected to the ground in the alarm panel (if used).

Remote Temperature Probe Connections

Standard and High Temperature probe wiring connections are the same.

Red wire to	terminal 3	(positive)
White wire to	terminal 20	(clock)
Green wire to	terminal 21	(data)
Black wire to	terminal 22	(negative)

It is very difficult to attach ALL of the probe connections on the terminal strip.

When using one or more probes it is suggested that a single 4-conductor cable be used as a stub line. Attach the one cable to the ThermStat and then all splicing and other related multiple connections can be done on that single lead with the use of wire nuts and other connectors.

Wiring Runs must not exceed 150 feet (combined length). In the event you encounter false readings or no readings at all, install the pull up resistors starting at the farthest remote probe. It may be possible that all of the probes will need pull up resistors. Attach as follows: Place a resistor between the red and green lead and a resistor between the red and white lead. (see drawing). There are two resistors enclosed with each probe. To help keep the total amount of wire used to connect the probes at a minimum it is suggested that a parallel wiring connection be used from one probe to the next instead of pulling a home run from each probe.

Programming the ThermStat 3

After the ThermStat 3 is mounted, wired and power applied, the ThermStat 3 will be operational in the factory default mode and immediately begin monitoring temperatures. The display window will show a series of numbers as it "looks at" the different probes.

For an example only: < 0 > then < 72 > then < 1 > then < 68 > then < 2 > then < 81 > then < 3 > then < 73 > and the sequence begins again. The single digit is the probe; the second number displayed is the temperature reading taken by the probe shown in Celsius or Fahrenheit. Zero (0) is the first temperature location (local, in the ThermStat) and three (3) is the last of the remote probe sequence.

From the factory, the ThermStat 3 will monitor and display temperatures. The ThermStat 3 will not sound or trigger an alarm relay. See the pre-set settings that are loaded at the factory. The High/Low temperatures to be monitored are set by the installer.

When the factory settings need changed for your particular application, complete the programming worksheet (included) **before** you begin programming the device. A completed worksheet will help as you go through the programming fields assigning codes and values.

To enter programming

Push the Function Switch until the display reads _____ : _____

By pushing the button labeled 10 and/or 01 :

You can enter the Program Field number you wish to program

Push Function switch to read the LCD display.

Enter the command.

Push Function to SAVE. The process goes back to the beginning Field for programming.

Enter the next Program Field number to program.

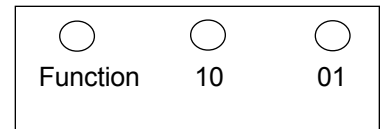
Enter the command.

Push Function to Save.

Repeat the process until completed.

Push and hold FUNCTION switch to exit programming.

See example:



This following example programs the ThermStat 3 to activate the local sensor (on board) high alarm at 85°F, activates the local sensor (on board) low alarm at 44°F. The sounder will be on.

Program	Field Location	X shows factory default
1	Backlight on	
2	Backlight off	X
3	Sounder on	
4	Sounder off	X
5	Celsius scale on	
6	Fahrenheit Scale on	X
7	Local Display on	X
8	Local Display off	
9	Probe 1 Display on	
10	Probe 1 Display off	
11	Probe 2 Display on	X
12	Probe 2 Display off	
13	Probe 3 Display on	X
14	Probe 3 Display off	
15	High Alarm Local on	
16	High Alarm Local off	X
17	High Alarm Probe 1 on	
18	High Alarm Probe 1 off	X
19	High Alarm Probe 2 on	
20	High Alarm Probe 2 off	X
21	High Alarm Probe 3 on	
22	High Alarm Probe 3 off	X
23	Low Alarm Local on	
24	Low Alarm Local off	X
25	Low Alarm Probe 1 on	
26	Low Alarm Probe 1 off	X
27	Low Alarm Probe 2 on	
28	Low Alarm Probe 2 off	X
29	Low Alarm Probe 3 on	
30	Low Alarm Probe 3 off	X
31	Hystersis L setting	1
32	Local Low Limit Setting	(-5)
33	Probe 1 Low Limit Setting	(-5)
34	Probe 2 Low Limit Setting	(-5)
35	Probe 3 Low Limit Setting	(-5)
36	Local High Limit Setting	(35)
37	Probe 1 High Limit Setting	(35)
38	Probe 2 High Limit Setting	(35)
39	Probe 3 High Limit Setting	(35)
40	Low Local Output	(1)

(Factory Default Settings)

41	Low Probe 1 Output	(1)				
42	Low Probe 2 Output	(1)				
43	Low Probe 3 Output	(1)				
44	High Local Relay Output	(1)		1	Mechanical Relay	C Form
45	High Probe 1 Output	(1)	(Output Assignments)	2	Solid State	N/O To BACP Board
46	High Probe 2 Output	(1)		3	Solid State	N/O To BACP Board
47	High Probe 3 Output	(1)		4	Solid State	N/C To BACP Board
48	Closed Loop 1 on					
49	Closed Loop 1 off	X				
50	Closed Loop 2 on					
51	Closed Loop 2 off	X				
52	Closed Loop 3 on					
53	Closed Loop 3 off	X				
54	Closed Loop 4 on					
55	Closed Loop 4 off	X				
56	Closed Loop R1 Setting	(1)				
57	Closed Loop R2 Setting	(1)		1	Mechanical Relay	C Form
58	Closed Loop R3 Setting	(1)	(Output Assignments)	2	Solid State	N/O
59	Closed Loop R4 Setting	(1)		3	Solid State	N/O
60	Defrost Local on			4	Solid State	N/C
61	Defrost Local off	X				
62	Defrost Probe 1 on					
63	Defrost Probe 1 off	X				
64	Defrost Probe 2 on					
65	Defrost Probe 2 off	X				
66	Defrost Probe 3 on					
67	Defrost Probe 3 off	X				
68	Defrost Time Setting minutes		120 Minutes Max			
73	Master Reset					

To set the local (on board) alarm:

Enter programming by pushing FUNCTION

Go to Field 3 and Save then

Go to Field 15 and Save;

Go to Field 23 and Save;

Go to Field 32 Save and then enter the temperature desired for low alarm (44) and Save;

Go to Field 36 and Save then enter the temperature desired for high alarm (85) and Save;

To exit push Function for approx. 2 sec.

End of Example

