

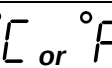

Feature:
TRO5404

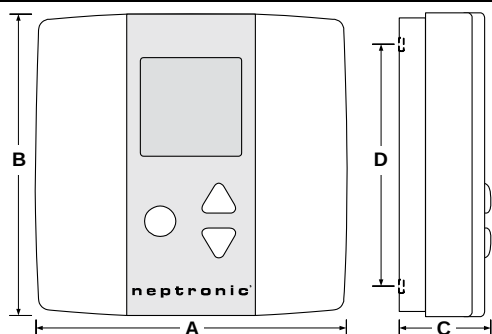
- Selectable analog output
- Selectable Fahrenheit or Celsius scale
- Manual Night Set Back override
- Multi level lockable access menu
- Lockable Set point
- Selectable internal or external temperature sensor
 - ✓ Selectable external temperature sensor type (3.3 KΩ or 10 KΩ | Type 3 or Type G)
- Selectable proportional control band

Technical Data	TRO5404
Outputs	2 Analog Cooling outputs (0-10VDC)
	2 Analog Heating outputs (0-10VDC)
	0 or 22 VDC, TPM, (Time proportional modulation) 250 mA max.
Power supply	22 to 26 VAC 50/60Hz
Power consumption	2 VA
Set point range	10°C to +35°C [50°F to 95°F]
Internal/External temperature sensor	Range: 0°C to +50°C [32°F to +122°F]
Control accuracy	Temperature: +/-0.2°C [0.4°F]
Proportional band	0.5 °C to 4°C [1 °C to 8°F] adjustable
Electrical connection	0.8 mm ² [18 AWG] minimum
Operating temperature	0°C to +50°C [32°F to +122°F]
Storage temperature	-30°C to +50°C [-22°F to +122°F]
Relative Humidity	5 to 95 % non condensing
Degree of protection of housing	IP 30 to EN 60529
Weight	85 g. [0.2 lb]

Presentation

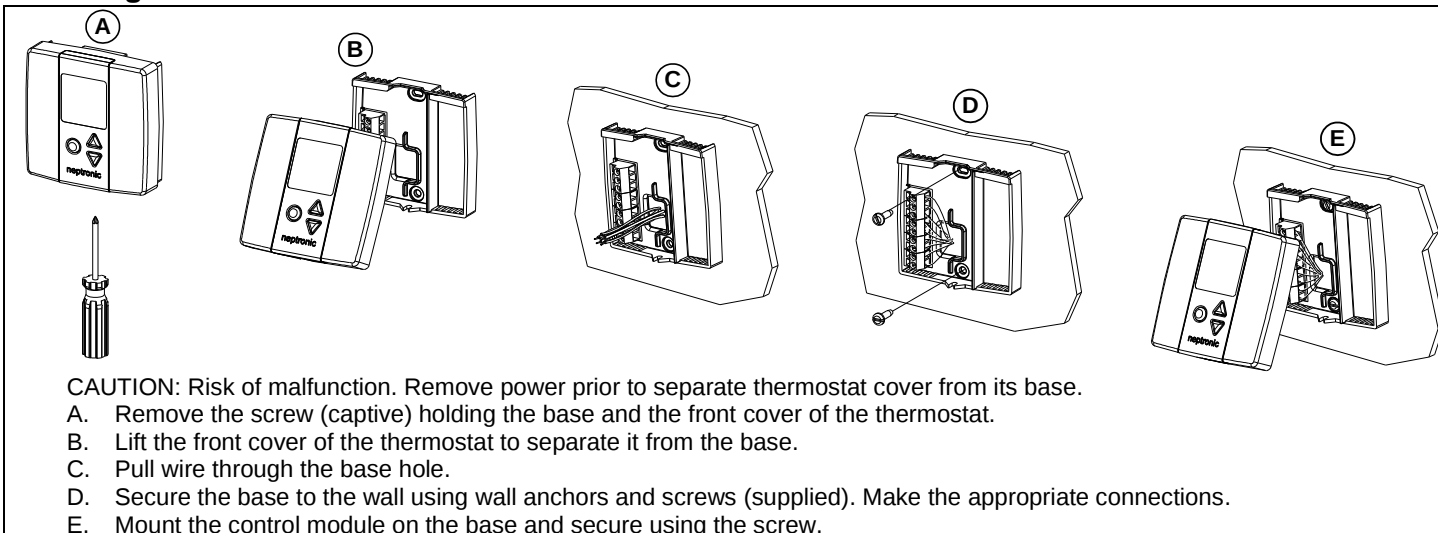
Symbols on display

	Cooling ON A: Automatic		Menu set-up Lock ON
	Heating ON A: Automatic		Programming mode
	Energy saving mode ON	MIN MAX	Minimum/Maximum set points
	°C: Celsius scale °F: Fahrenheit scale		

Dimensions


Dimension	Inches	Metric (mm)
A	3.00	78
B	3.00	78
C	1.00	24
D	2.36	60

Mounting Instructions



Terminal description

	Terminals	TRO5404
	1	Common
	2	24 VAC
	3	Exterior temperature sensor
	4	Night set back input*
	5	Heating ramp
	6	Heating ramp high demand
	7	Cooling ramp
	8	Cooling ramp high demand
	9	TPM (time proportional modulation)

*For a replacement in an existing night set back (NSB) loop with thermostat PTA, the NSB input, terminal #4, of the TRO should be isolated for a good performance.

Settings on PC Board

	Mode Selection 	Jumper (JP1) on RUN: Thermostat is in operation mode . Thermostat must be set in this mode to operate properly. If not locked, set point and control mode (Heating & Cooling ON, Cooling only ON or Heating only ON) may be modified by end user.
		Jumper (JP1) on PGM: Thermostat is set in Programming mode . Refer to following section about all settings description

Programming mode

When in this mode this symbol is displayed. Please press on to advance to the next program function and press on to change value. You can leave the programming mode at any time, changed values will be recorded.

Step	Display	Description	Values
1		Internal temperature sensor Calibration: Display switches between "tS1" and temperature read by internal temperature sensor. You can adjust the calibration of the sensor by comparison with a known thermometer. For example if thermostat has been installed in an area where temperature is slightly different than the room typical temperature (thermostat place right under the air diffuser).	 Range : 10 to 35°C [50 to 95°F] Increment: 1°C [1°F] NOTE: This thermostat has been calibrated at factory
2A		Locking the set point : Display switches between "LOc" and "Stp". You can lock or unlock the set point adjustment by end user. If locked the lock symbol will appear. If you do not want to lock set point adjustment by end user, go directly to step #3.	 Default value: Unlocked

Step	Display	Description	Values																														
2B		Locking the set point (cont'd): Select the desired locked set point temperature; this one should be within the temperature range. Once locked set point temperature is selected, please go directly to step #5	Set point range : 10 to 35°C [50 to 95°F] Increment: 1°C [1°F] Default value: 22°C [72°F]																														
3		Minimum set point: Display switches between "Stp" and the minimum set point temperature. MIN symbol is also displayed. Please select the desired minimum set point temperature.	 Range for Minimum 10 to 34°C [50 to 94°F] Increment: 1°C [1°F] Default value: 15°C [59°F]																														
4		Maximum set point Display switches between "Stp" and the maximum set point temperature. MAX symbol is also displayed. Please select the desired maximum set point temperature.	 Range for Maximum 11 to 35°C [51 to 95°F] Increment: 1°C [1°F] Default value: 30°C [86°F]																														
5A		Locking the control mode: Display switches between "LOc" and "Ctl". You can lock or unlock selection of control mode by end user. If locked the lock symbol will appear. If you do not want to lock selection of control mode by end user, go directly to step #6.	 Default value: Unlocked																														
5B		Locking the control mode (cont'd): Display switches between "Ctl" and "Aut". Select which control mode you want to authorize: Automatic cooling and heating, OFF cooling and heating, heating only or cooling only.	 Default value: Automatic cooling and heating																														
6		Proportional band: Display switches between "Pbd" and the value of the proportional band. Please select the desired value of proportional band.	 Proportional band range : 0.5 to 4.0°C [1.0 to 8.0°F] Increment: 0.5°C [1.0°F] Default value: 2.0°C [4.0°F]																														
7		Minimum position of 1st cooling ramp: Display switches between "CL" and the value of the minimum position of the 1st cooling ramp. MIN and cooling symbols are also displayed. Please select the desired value of the minimum position of the 1st cooling ramp.	 Range: 0.0 to 5.0 Volt. Increment: 0.2 Volt. Default value: 0.0 Volt																														
8		Minimum position of 1st heating ramp: Display switches between "ht" and the value of the minimum position of the 1st heating ramp. MIN and heating symbols are also displayed. Please select the desired value of the minimum position of the 1st heating ramp.	 Range: 0.0 to 5.0 Volt. Increment: 0.2 Volt. Default value: 0.0 Volt																														
9A		Internal/external temperature sensor selection: Display switches between "ts" and "in" or "out". Please select internal or external sensor. If you select internal temperature sensor, go directly to step #10.	 Default value: Internal temperature sensor																														
9B		External temperature sensor value: If you select external temperature sensor, display will switch between "ts2" and the type of the external temperature sensor. Select the external sensor type. <table><tr><th>Temp.</th><th>3.3</th><th>10.1</th></tr><tr><td>5 °C [41°F]</td><td>8.380</td><td>23.460</td></tr><tr><td>10 °C [50°F]</td><td>6.570</td><td>18.790</td></tr><tr><td>15 °C [59°F]</td><td>5.186</td><td>15.130</td></tr><tr><td>20 °C [68°F]</td><td>4.123</td><td>12.260</td></tr><tr><td>25 °C [77°F]</td><td>3.300</td><td>10.000</td></tr><tr><td>30 °C [86°F]</td><td>2.658</td><td>8.194</td></tr><tr><td>35 °C [95°F]</td><td>2.155</td><td>6.752</td></tr><tr><td>40 °C [104°F]</td><td>1.757</td><td>5.592</td></tr><tr><td>45 °C [113°F]</td><td>1.441</td><td>4.655</td></tr></table> Temperature Vs Type of sensor / value (KΩ)	Temp.	3.3	10.1	5 °C [41°F]	8.380	23.460	10 °C [50°F]	6.570	18.790	15 °C [59°F]	5.186	15.130	20 °C [68°F]	4.123	12.260	25 °C [77°F]	3.300	10.000	30 °C [86°F]	2.658	8.194	35 °C [95°F]	2.155	6.752	40 °C [104°F]	1.757	5.592	45 °C [113°F]	1.441	4.655	 Default value: 3.3 (sensor 3.3 KΩ) (With DS100 or WS100, set "ts2" to 3.3)
Temp.	3.3	10.1																															
5 °C [41°F]	8.380	23.460																															
10 °C [50°F]	6.570	18.790																															
15 °C [59°F]	5.186	15.130																															
20 °C [68°F]	4.123	12.260																															
25 °C [77°F]	3.300	10.000																															
30 °C [86°F]	2.658	8.194																															
35 °C [95°F]	2.155	6.752																															
40 °C [104°F]	1.757	5.592																															
45 °C [113°F]	1.441	4.655																															
9C		External temperature sensor Calibration: Display switches between "ts2" and the temperature read by the external temperature sensor (if connected). You can adjust the calibration of the external sensor by comparison with a known thermometer.	 Range: 5 to 45°C [41 to 99.9°F] Increment: 1°C [1°F] 5.0°C [41.0°F], resistance will be infinite. 45.0°C [99.9°F], resistance will be short circuited.																														
10		Night set back derogation time : Display switches between "nSb" and the derogation time in minute. MIN and NSB symbol is also displayed. Please select the desired derogation time, if no derogation time is desired select "OFF".	 Range: OFF or 30 to 180min. Increment: 15min. Default value: 120 min.																														
11		Cooling Set point during Night set back: Display switches between "Stp" and the value of the cooling set point temperature during night set back. NSB symbol and cooling symbols are also displayed. Please select the cooling set point temperature during night set back.	 Range: 22 to 35°C [72 to 95°F] Increment: 1°C [1°F] Default value: 28°C [83°F]																														
12		Heating Set point during Night set back: Display switches between "Stp" and the value of the heating set point temperature during night set back. NSB symbol and heating symbols are also displayed. Please select the heating set point temperature during night set back.	 Range: 10 to 22°C [50 to 72°F] Increment: 1°C [1°F] Default value: 16°C [61°F]																														

Operation mode

Step	Description	Display
1	At powering up, thermostat will light display and activate all LCD segments during 2 seconds. Illuminating the LCD. To illuminate the LCD, you just have to push onto any of the 3 buttons. LCD will light for 8 seconds. Temperature display In operation mode, thermostat will automatically display temperature read. To change the scale between °C and °F, press on both Δ and ∇ for 3 seconds.	
2	Set point display and adjustment To display the set point, press twice on the Δ or ∇ button. Set point is displayed for 5 seconds. To adjust set point, press on Δ or ∇ while the temperature set point is displayed. <i>Note: If set point adjustment has been locked, symbol will be displayed.</i>	
3	Night set back (NSB) : When thermostat is in night set back mode, NSB symbol is displayed, so set point for cooling and/or heating are increased as per the setting made in programming mode. If not locked, night set back can be derogated for a predetermined period by pressing onto any of the 3 buttons. During period of NSB derogation the symbol will flash. If NSB does not flash, the derogation period is finished or the Night set back derogation has been locked in programming mode.	
4	Control mode selection : To verify which control mode is set, press once onto the ○ button. Control mode will be displayed during 5 seconds. To change of control mode, press on Δ or ∇ while control mode is displayed. You can choose one of the following: ✓ Automatic Cooling or Heating ✓ Cooling and Heating OFF ✓ Cooling only ✓ Heating only <i>Note: If control mode selection has been locked, symbol will be displayed.</i>	

Typical Applications

Wiring	Schematic
Central Cooling and Heating terminal (0-10 VDC modulating electric heater and pulsed baseboard)	
Terminals TRO5404	
Central Cooling and Heating and heating terminal with Night set back (pulsed electric heater)	
Terminals TRO5404	

Recycling at end of life

	At end of life, please return the thermostat to your Neptronic® local distributor for recycling. If you need to find the nearest Neptronic® authorized distributor, please consult www.neptronic.com .
--	---