VAV Thermostat

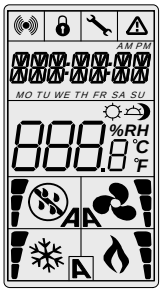
Features: *TRO24T4XYZ1*

- Attractive modern look with large LCD and backlight
- Icon-driven information and 1 line of text information
- Selectable analog and digital outputs
- Precise temperature control with programmable PI function
- Selectable Fahrenheit or Celsius scale
- Manual Night Set Back override
- Multi level lockable access menu
- Lockable set point
- Selectable internal or external temperature sensor (10 KΩ)
- Change over by contact or external temperature sensor
- Pressure sensor input / air flow program
- Selectable proportional control band and dead band
- Anti-freeze protection

Technical Data

	TRO24T4XYZ1
Inputs	3 Universal analog inputs: 0-10Vdc, Thermistor (10k / Type III) or digital input (dry contact) Available for external temperature sensor, change over, night set back or pressure sensor
Outputs	2 Analog outputs: 0-10Vdc or 2-10Vdc selectable (2mA max.)
	4 TRIAC outputs: on/off, pulsed 0 or 24Vac (250mA max.), or 2 Floating outputs
Power supply	22 to 26 Vac 50/60Hz
Power consumption	1VA
Set point range	10ºC to 40ºC [50ºF to 104ºF]
External sensor range	-40ºC to 100ºC [-40ºF to 212ºF]
Control accuracy	Temperature: ±0.4ºC [0.8ºF]
Proportional band	0.5ºC to 5ºC [1ºF to 10ºF] adjustable
Electrical connection	0.8 mm^2 [18 AWG] minimum
Operating temperature	0ºC to 50ºC [32ºF to 122ºF]
Storage & Transport Temperature	-30ºC to 50ºC [-22ºF to 122ºF]
Relative Humidity	5 to 95% non condensing
Degree of protection of housing	IP 30 (EN 60529)
Weight	160 g. [0.36 lb]

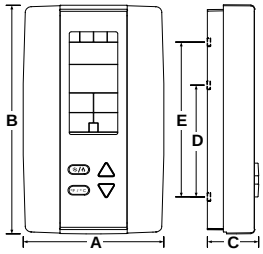
Interface



Symbols on display

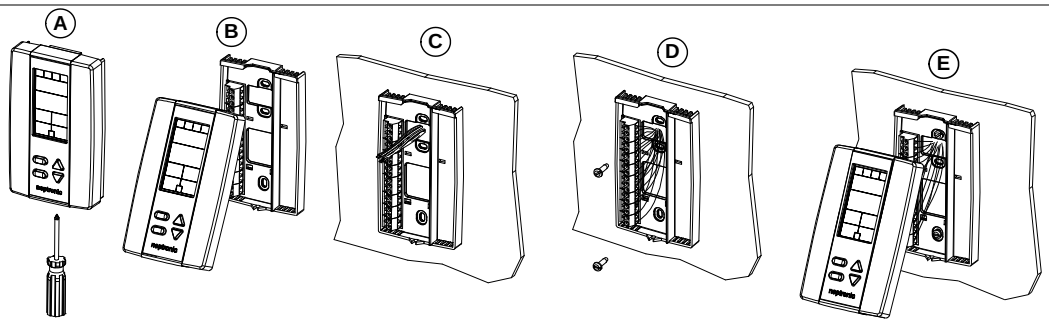
A	*Cooling ON* *33,66,100% output* *A: Automatic*		*Menu set-up Lock*		*Energy saving mode*
A	*Heating ON* *33,66,100% output* *A: Automatic*		*Programming mode* *(Technician setting)*	°C or °F	*ºC: Celsius scale* *ºF: Fahrenheit scale*
	Alarm status				

Dimensions



Dimension	Imperial (in)	Metric (mm)
A	2.85	73
B	4.85	123
C	1.00	24
D	2.36	60
E	3.27	83

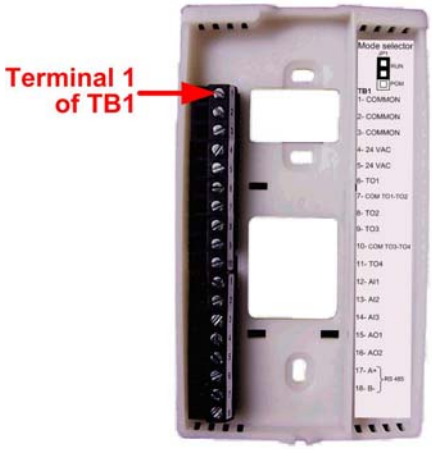
Mounting Instructions



CAUTION: Risk of malfunction. Remove power prior to separate thermostat cover from its base.

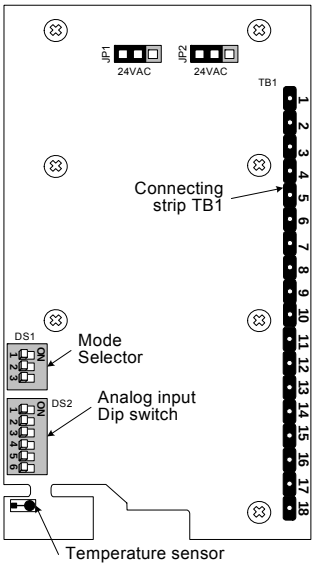
A. Remove the screw (captive) holding the base and the front cover of the thermostat.
B. Lift the front cover of the thermostat to separate it from the base.
C. Pull wire through the base hole.
D. Secure the base to the wall using wall anchors and screws (supplied). Make the appropriate connections.
E. Mount the control module on the base and secure using the screw.

Terminal Description

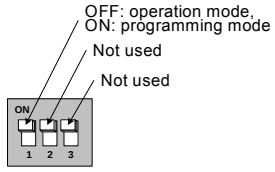


Terminals		Description	If set in floating, terminals 6-8 (floating 1), terminals 9-11 (floating 2) are as follow:		
TB1	1	Common			
	2	Common			
	3	Common			
	4	24Vac			
	5	24Vac			
	6	Triac output 1 (TO1)	TO1 close	1	FLOATING
	7	Triac (24Vac EXT.) (TO1 & TO2) see Settings section			
	8	Triac output 2 (TO2)	TO2 open		
	9	Triac output 3 (TO3)	TO3 close	2	
	10	Triac (24Vac EXT.) (TO3 & TO4) see Settings section			
	11	Triac output 4 (TO4)	TO4 open		
	12	Analog input 1 (AI1)			
	13	Analog input 2 (AI2)			
	14	Analog input 3 (AI3)			
	15	Analog output 1 (AO1)			
	16	Analog output 2 (AO2)			

Settings on PC Board



Mode Selection Dip Switch (DS1)



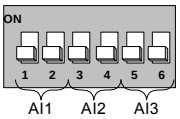
Triac (digital) Output Signal Selection

(**JP1** for **TO3** & **TO4** - **JP2** for **TO1** & **TO2**)

Jumper on left: All triac output signal is linked to internal 24Vac.
(Same 24Vac than thermostat)

Jumper on right: All triac output signal is linked to external 24Vac.
(Different 24Vac than thermostat)

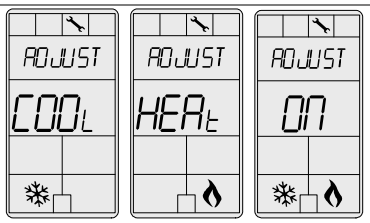
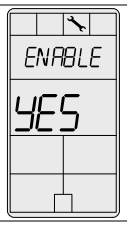
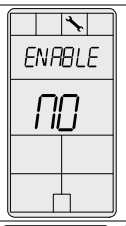
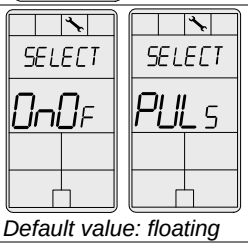
Analog Input Dip Switch (DS2)

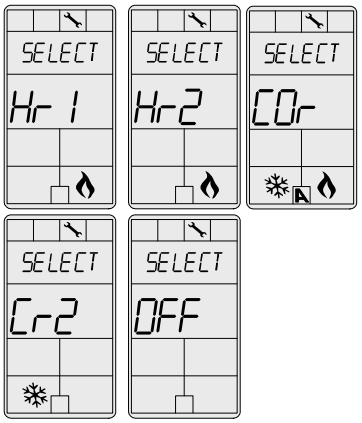
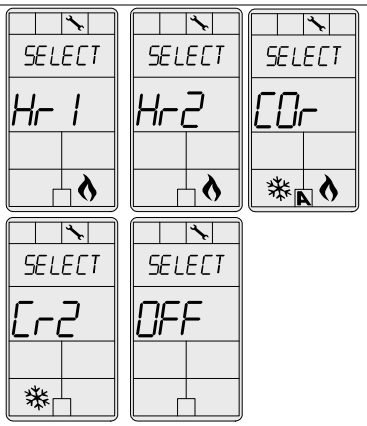


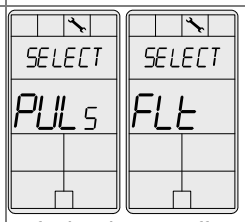
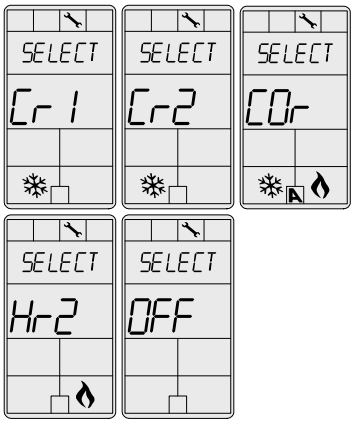
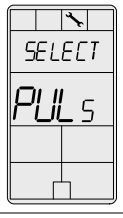
		ON	OFF
AI1	Thermistor 10KΩ	DS2.1	DS2.2
	Dry contact		
	0-10 Vdc	DS2.2	DS2.1
AI2	Thermistor 10KΩ	DS2.3	DS2.4
	Dry contact		
	0-10 Vdc	DS2.4	DS2.3
AI3	Thermistor 10KΩ	DS2.5	DS2.6
	Dry contact		
	0-10 Vdc	DS2.6	DS2.5

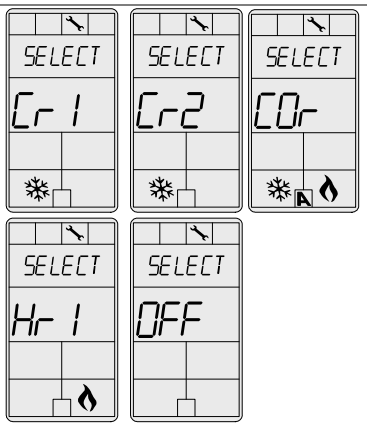
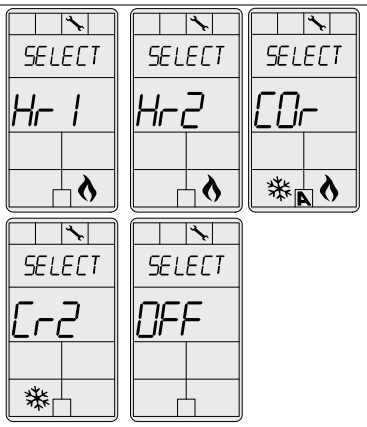
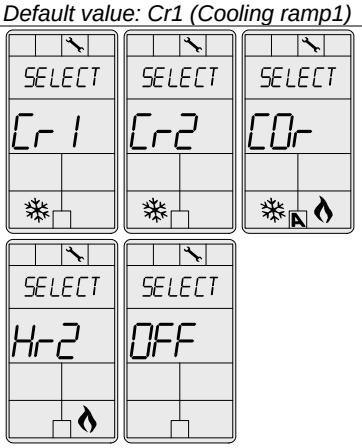
Programming Mode

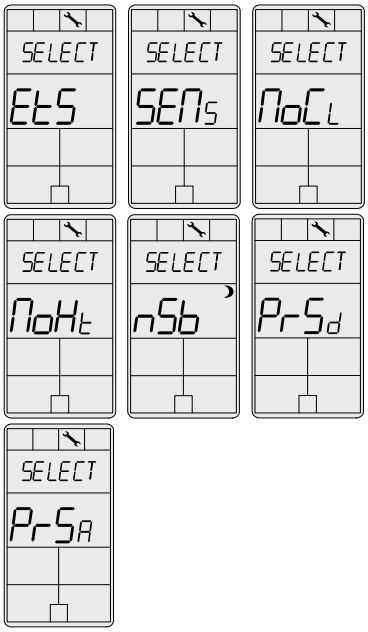
When in this mode this symbol is displayed. Please press on button to advance to the next program function, press on button to return to preceding stage and press on button △ or ▽ to change value. You can leave the programming mode at any time, changed values will be recorded.

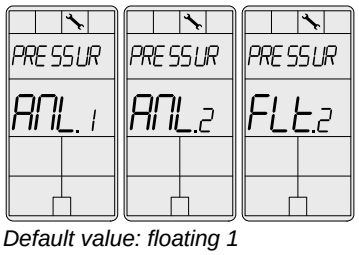
Step	Display	Description	Values
1		**Internal temperature sensor Calibration:** Display shows *"INSIDE TEMPER SENSOR OFFSET"* and temperature read by internal temperature sensor. You can adjust the calibration of the sensor by comparison with a known thermometer. For example if thermostat has been installed in an area where temperature is slightly different than the room typical temperature (thermostat place right under the air diffuser).	Range : 10 to 40ºC [50 to 104ºF] (max. offset ± 5 ºC) Increment: 0.1ºC [0.2ºF]
2		**Minimum set point:** Display shows *"ADJUST MINIMUM USER SETPNT"* and the minimum set point temperature. Please select the desired minimum set point temperature. The minimum value is restricted by the maximum value. (step #3)	Minimum range: 10 to 40ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 15ºC [59ºF]*
3		**Maximum set point:** Display shows *"ADJUST MAXIMUM USER SETPNT"* and the maximum set point temperature. Please select the desired maximum set point temperature. The maximum value is restricted by the minimum value. (step #2)	Maximum range: 10 to 40ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 30ºC [86ºF]*
4		**Locking the set point:** Display shows *"USER SETPNT LOCKED"* and the status of the function. You can lock or unlock the set point adjustment by end user. If locked, *"YES"* and lock symbol will appear.	 *Default value: Unlocked*
5		**Adjust internal set point:** Display shows *"ADJUST INTERN SETPNT"* and the set point temperature. Select the desired set point temperature; this one should be within the temperature range. Lock symbol will appear if the set point was locked at the previous step. Set point value is restricted by the minimum and maximum value. (step #2 & 3)	Set point range: 10 to 40ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 22ºC [72ºF]*
6		**Adjust the control mode:** Display shows *"ADJUST TEMPER CONTROL MODE"*. Cooling and heating symbols are also displayed. Select which control mode you want to authorize: Automatic *cooling and heating*, cooling or heating, heating only or cooling only. If you want to authorize this entire mode, choose Automatic mode.	 *Default value:* *Automatic cooling and heating*
7		**Set On/Off function enable or disable:** Display shows *"ENABLE ON OFF CONTROL MODE"*. You can enable or disable the On/Off function in control mode adjustment by end user.	 *Default value:* *Enable (YES)*
8		**Set TO1 output signal:** Display shows *"SELECT TO1 OUTPUT SIGNAL"*. Select which signal output you want for TO1 output. You can choose on/off, pulse or floating signal output. If you select floating, **TO1** will be set close and **TO2** open.	 *Default value: floating*

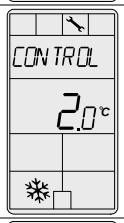
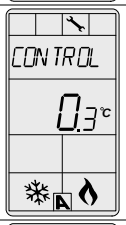
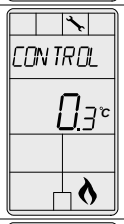
Step	Display	Description	Values
9		**Set TO1 signal ramp:** Display shows *"SELECT TO1 RAMP"*. Select which ramp you want for TO1. You can choose: Changeover ramp, Heating ramp 1, Heating ramp 2, Cooling ramp 1, Cooling ramp 2, OFF Note: If "**FLT**" (floating) has been selected at step #8, the same ramp will be used for TO2. If "**PULs**" has been selected at step #8, you can only choose Heating ramp 1 or Heating ramp 2. **If you selected on/off signal at step #8, go directly to step #12.** **If you selected pulse signal at step #8 or OFF here, go directly to step #13.**	 *Default value: Cr1 (Cooling ramp1)*
10		**Set floating time:** (If "**FLT**" has been selected at step #8) Display shows *"SET FLOATING TIME IN SECONDS"* and the floating time value (in seconds). Please select desired value of the floating time signal.	Range: 15 to 250 sec. Increment: 5 sec. *Default value: 100 sec.*
11		**Set motor direction:** Display shows *"SELECT MOTOR DIRECT REVERSE"*. Select which direction you want for the motor. You can choose: Direct "clockwise" (0 to 90º) or Reverse "counter clockwise" (90 to 0º) **Go to step #16.**	 *Default value: direct (dir)*
12		**Set TO1 on-off close position:** (If "**OnOf**" has been selected at step #8) Display shows *"SELECT TO1 CLOSE PERCENT"* and the value of the close position of the TO1 output. Please select at which percentage you want TO1 to close: at 20%, 40%, 60% or 80% of the demand of the ramp that you selected at step # 9. Contact will automatically open at 0% of the demand.	Range: 20, 40, 60, 80 Increment: 20 % *Default value: 40 (40% of the demand)*
13		**Set TO2 output signal:** Display shows *"SELECT TO2 OUTPUT SIGNAL"*. Select which signal output you want for TO2 output. You can choose on/off or pulse signal output.	 *Default value: on-off*
14		**Set TO2 signal ramp:** Display shows *"SELECT TO2 RAMP"*. Select which ramp you want for TO2. You can choose: Changeover ramp, Heating ramp 1, Heating ramp 2, Cooling ramp 1, Cooling ramp 2, OFF If "**PULs**" has been selected at step #13, you can only choose Heating ramp 1 or Heating ramp 2. **If you selected pulse signal at step #13 or OFF here, go directly to step #16.**	 *Default value: Cr1 (Cooling ramp1)*

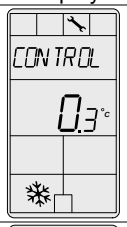
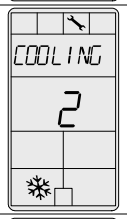
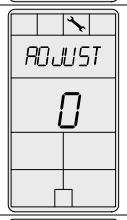
Step	Display	Description	Values
15		**Set TO2 on-off close position:** (If "**OnOf**" has been selected at step #13) Display shows *"SELECT TO2 CLOSE PERCENT"* and the value of the close position of the TO2 output. Please select at which percentage you want TO2 to close: at 20%, 40%, 60% or 80% of the demand of the ramp that you selected at step # 14. Contact will automatically open at 0% of the demand.	Range: 20, 40, 60, 80 Increment: 20 % *Default value: 40 (40% of the demand)*
16		**Set TO3 output signal:** Display shows *"SELECT TO3 OUTPUT SIGNAL"*. Select which signal output you want for TO3 output. You can choose on/off, pulse or floating signal output. If you select floating, **TO3** will be set close and **TO4** open.	 *Default value: on-off*
17		**Set TO3 signal ramp:** Display shows *"SELECT TO3 RAMP"*. Select which ramp you want for TO3. You can choose: Changeover ramp, Heating ramp 1, Heating ramp 2, Cooling ramp 1, Cooling ramp 2, OFF Note: If "**FLT**" (floating) has been selected at step #16, the same ramp will be used for TO4. If "**PULs**" has been selected at step #16, you can only choose Heating ramp 1 or Heating ramp 2. **If you selected on/off signal at step #16, go directly to step #20.** **If you selected pulse signal at step #16 or OFF here, go directly to step #21.**	 *Default value: Hr1 (Heating ramp 1)*
18		**Set floating time:** (If "**FLT**" has been selected at step #16) Display shows *"SET FLOATING TIME IN SECONDS"* and the floating time value (in seconds). Please select desired value of the floating time signal.	Range: 15 to 250 sec. Increment: 5 sec. *Default value: 100 sec.*
19		**Set motor direction:** Display shows *"SELECT MOTOR DIRECT REVERSE"*. Select which direction you want for the motor. You can choose: Direct "clockwise" (0 to 90º) or Reverse "counter clockwise" (90 to 0º) **Go to step #24**	 *Default value: direct (dir)*
20		**Set TO3 on-off close position:** (If "**OnOf**" has been selected at step #16) Display shows *"SELECT TO3 CLOSE PERCENT"* and the value of the close position of the TO3 output. Please select at which percentage you want TO3 to close: at 20%, 40%, 60% or 80% of the demand of the ramp that you selected at step # 17. Contact will automatically open at 0% of the demand.	Range: 20, 40, 60, 80 Increment: 20 % *Default value: 40 (40% of the demand)*
21		**Set TO4 output signal:** Display shows *"SELECT TO4 OUTPUT SIGNAL"*. Select which signal output you want for TO4 output. You can choose on/off or pulse signal output.	 *Default value: on-off*

Step	Display	Description	Values
22		**Set TO4 signal ramp:** Display shows *"SELECT TO4 RAMP"*. Select which ramp you want for TO4. You can choose: Changeover ramp, Heating ramp 1, Heating ramp 2, Cooling ramp 1, Cooling ramp 2, OFF If "**PULs**" has been selected at step #21, you can only choose Heating ramp 1 or Heating ramp 2. **If you selected pulse signal at step #21 or OFF here, go directly to step #24.**	 *Default value: Hr2 (Heating ramp 2)*
23		**Set TO4 on-off close position:** (If "**OnOf**" has been selected at step #21) Display shows *"SELECT TO4 CLOSE PERCENT"* and the value of the close position of the TO4 output. Please select at which percentage you want TO4 to close: at 20%, 40%, 60% or 80% of the demand of the ramp that you selected at step # 22. Contact will automatically open at 0% of the demand.	Range: 20, 40, 60, 80 Increment: 20 % *Default value: 40 (40% of the demand)*
24		**Set AO1 analog signal ramp:** Display shows *"SELECT AO1 ANALOG RAMP"*. Select which ramp you want for analog signal on AO1. You can choose: Changeover ramp, Heating ramp 1, Heating ramp 2, Cooling ramp 1, Cooling ramp 2, OFF	 *Default value: Cr1 (Cooling ramp1)*
25		**Set AO2 analog signal ramp:** Display shows *"SELECT AO2 ANALOG RAMP"*. Select which ramp you want for analog signal on AO2. You can choose: Changeover ramp, Heating ramp 1, Heating ramp 2, Cooling ramp 1, Cooling ramp 2, OFF **If "OFF" was selected for AO1, go to step #29.** **If "OFF" is selected for AO1 & AO2, go to step #32.**	 *Default value: Hr1 (Heating ramp 1)*
26		**Minimum voltage of AO1 output:** (Only if "**OFF**" hasn't been selected at step #24) Display shows *"MIN VOC ANALOG AO1 OUTPUT"* and the value of the minimum voltage of the AO1 output. Please select the desired value of the minimum voltage of AO1 output. (This is the "zero" value) The minimum value is restricted by the maximum value. (step #27)	Range: 0.0 to 10.0 Volt Increment: 0.1 Volt *Default value: 0.0 Volt*

Step	Display	Description	Values
27		**Maximum voltage of AO1 output:** (Only if "**OFF**" hasn't been selected at step #24) Display shows *"MAX VOC ANALOG AO1 OUTPUT"* and the value of the maximum voltage of the AO1 output. Please select the desired value of the maximum voltage of AO1 output. (This is the "span" value) The maximum value is restricted by the minimum value. (step #26)	Range: 0.0 to 10.0 Volt Increment: 0.1 Volt *Default value: 10.0 Volt*
28		**Minimum position of AO1 output:** (Only if "**OFF**" hasn't been selected at step #24) Display shows *"MIN POS AO1 OUTPUT PERCENT"* and the value of the minimum position of the AO1 output. Please select the desired value of the minimum position of AO1 output.	Range: 0 to 100% Increment: 5% *Default value: 0%*
29		**Minimum voltage of AO2 output:** (Only if "**OFF**" hasn't been selected at step #25) Display shows *"MIN VOC ANALOG AO2 OUTPUT"* and the value of the minimum voltage of the AO2 output. Please select the desired value of the minimum voltage of AO2 output. (This is the "zero" value) The minimum value is restricted by the maximum value. (step #30)	Range: 0.0 to 10.0 Volt Increment: 0.1 Volt *Default value: 0.0 Volt*
30		**Maximum voltage of AO2 output:** (Only if "**OFF**" hasn't been selected at step #25) Display shows *"MAX VOC ANALOG AO2 OUTPUT"* and the value of the maximum voltage of the AO2 output. Please select the desired value of the maximum voltage of AO2 output. (This is the "span" value) The maximum value is restricted by the minimum value. (step #29)	Range: 0.0 to 10.0 Volt Increment: 0.1 Volt *Default value: 10.0 Volt*
31		**Minimum position of AO2 output:** (Only if "**OFF**" hasn't been selected at step #25) Display shows *"MIN POS AO2 OUTPUT PERCENT"* and the value of the minimum position of the AO2 output. Please select the desired value of the minimum position of AO2 output.	Range: 0 to 100% Increment: 5% *Default value: 0%*
32		**Set AI1 input signal:** Display shows *"SELECT AI1 INPUT SIGNAL"*. Select which signal you want for AI1 input. You can choose: • OFF (input not used), External temperature function: • EtS (external temperature sensor 10KΩ), Changeover function: • SENs (external change over sensor10KΩ), • NoCl (change over contact normally cool), • NoHt (change over contact normally heat), Night set back function: • nSb (Night set back contact), Pressure function: • PrSd (Differential pressure sensor 0-10vdc, PrSd=10V if P=1), • PrSa (Velocity pressure sensor 0-10vdc, PrSa 10V=Vnom). If changeover is selected: When normally cool "**NoCL**" is selected, if contact is closed heating mode will be activated, if contact is opened cooling mode will be activated. When normally heat "**NoHt**" is selected, if contact is closed cooling mode will be activated, if contact is opened heating mode will be activated. • When change over external sensor "**SENs**" is selected, heating mode will be activated when temperature read by external sensor is above the Change Over Set Point temperature, and cooling mode will be activated when temperature read by external sensor is under, **see step #36.** If pressure sensor is selected: • For pressure independent vav system, you must do calibration by using "Air flow program mode". (page 10)	 *Default value: OFF*

Step	Display	Description	Values
33		**Set AI2 input signal:** Display shows *"SELECT AI2 INPUT SIGNAL"*. Select which signal you want for AI2 input. You can choose: (Same as AI1 see step #32) Note: AI1 input signal has priority to AI2, if you have selected the same function AI2 will not be functional.	*Default value: OFF*
34		**Set AI3 input signal:** Display shows *"SELECT AI3 INPUT SIGNAL"*. Select which signal you want for AI3 input. You can choose: (Same as AI1 see step #32) Note: AI1 & AI2 input signal have priority to AI3, if you have selected the same function AI3 will not be functional.	*Default value: OFF*
35		**External temperature sensor Calibration:** (If "**EtS**" has been selected at step #32, 33 or 34) Display shows *"EXTERN TEMPER SENSOR OFFSET"* and the temperature read by the external temperature sensor (if connected on the selected input). If the sensor is not connected or short circuited, the display shows "**Eror**". You can adjust the calibration of the external sensor by comparison with a known thermometer.	Range: 0 to 50ºC [41 to 122.0ºF] (max. offset ± 5 ºC) Increment: 0.1ºC [0.2ºF]
36		**Change over set point temperature:** (If "**SENs**" has been selected at step #32, 33 or 34) Display shows *"CH OVER SETPNT TEMPER"* and the change over set point temperature. Please select the change over set point temperature. Note: heating mode will be activated when temperature read by external sensor is above the change over set point temperature, and cooling mode will be activated when temperature read by external sensor is under.	Range: 10 to 40ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 24ºC [82ºF]*
37		**Night set back derogation time :**(If "**nSb**" has been selected at step #32, 33 or 34) Display shows *"NSB DELAY OVERRIDE MINUTES"* and the derogation time in minute. NSB ☽ symbol is also displayed. Please select the desired derogation time, if no derogation time is desired select "0".	Range: 0 to 180 min. Increment: 15 min. *Default value: 120 min.*
38		**Heating Set point during Night set back:** (If "**nSb**" has been selected at step #32, 33 or 34) Display shows *"NIGHT SETBACK HEATING SETPNT"* and the value of the heating set point temperature during night set back. NSB ☽ and heating symbols are also displayed. Please select the heating set point temperature during night set back. The maximum value is restricted by the no occupancy cooling set point. (step # 39)	Range: 10.0 to 40.0ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 16.0ºC [61ºF]*
39		**Cooling Set point during Night set back:** (If "**nSb**" has been selected at step #32, 33 or 34) Display shows *"NIGHT SETBACK COOLING SETPNT"* and the value of the cooling set point temperature during night set back. NSB ☽ and cooling symbols are also displayed. Please select the cooling set point temperature during night set back. The minimum value is restricted by the no occupancy heating set point. (step # 38)	Range: 10.0 to 40.0ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 28.0ºC [82ºF]*
40		**Set output signal used for pressure independent:** (If "**PrSd**" or "**PrSa**" has been selected at step #32, 33 or 34) Display shows *"PRESSUR INDEPEN OUTPUT"*. Select which signal output is affected by pressure (connected to actuator). You can choose Floating 1 (TO1 & TO2), Floating 2 (TO3 & TO4), Analog 1 (AO1) or Analog 2 (AO2). *Note: These selections can vary according to the choice made on steps #8 & #16.*	 *Default value: floating 1*

Step	Display	Description	Values
41		**Proportional band of changeover ramp:** Display shows *"CONTROL RAMP CH OVER"* and the value of the changeover ramp proportional band, cooling and heating symbols are also displayed. Please select the desired value of changeover ramp proportional band.	Proportional band range : 0.5 to 5.0ºC [1 to 10ºF] Increment: 0.5ºC [1ºF] *Default value: 2.0ºC [4ºF]*
42		**Proportional band of heating ramp1:** Display shows *"CONTROL RAMP 1 HEATING"* and the value of the heating ramp1 proportional band, heating symbol is also displayed. Please select the desired value of heating ramp1 proportional band.	Proportional band range : 0.5 to 5.0ºC [1 to 10ºF] Increment: 0.5ºC [1ºF] *Default value: 2.0ºC [4ºF]*
43		**Proportional band of heating ramp2:** Display shows *"CONTROL RAMP 2 HEATING"* and the value of the heating ramp2 proportional band, heating symbol is also displayed. Please select the desired value of heating ramp2 proportional band.	Proportional band range : 0.5 to 5.0ºC [1 to 10ºF] Increment: 0.5ºC [1ºF] *Default value: 2.0ºC [4ºF]*
44		**Proportional band of cooling ramp1:** Display shows *"CONTROL RAMP 1 COOLING"* and the value of the cooling ramp1proportional band, cooling symbol is also displayed. Please select the desired value of cooling ramp1proportional band.	Proportional band range : 0.5 to 5.0ºC [1 to 10ºF] Increment: 0.5ºC [1ºF] *Default value: 2.0ºC [4ºF]*
45		**Proportional band of cooling ramp2:** Display shows *"CONTROL RAMP 2 COOLING"* and the value of the cooling ramp2 proportional band, cooling symbol is also displayed. Please select the desired value of cooling ramp2 proportional band.	Proportional band range : 0.5 to 5.0ºC [1 to 10ºF] Increment: 0.5ºC [1ºF] *Default value: 2.0ºC [4ºF]*
46		**Dead band of changeover ramp:** Display shows *"CONTROL DEAD BAND CH OVER"* and the value of the changeover ramp dead band, cooling and heating symbols are also displayed. Please select the desired value of changeover ramp dead band.	Dead band range : 0.0 to 5.0ºC [0.0 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*
47		**Dead band of heating ramp1:** Display shows *"CONTROL DEAD BAND 1 HEATING"* and the value of the heating ramp1 dead band, heating symbol is also displayed. Please select the desired value of heating ramp1 dead band.	Dead band range : 0.0 to 5.0ºC [0.0 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*
48		**Dead band of heating ramp2:** Display shows *"CONTROL DEAD BAND 2 HEATING"* and the value of the heating ramp2 dead band, heating symbol is also displayed. Please select the desired value of heating ramp2 dead band.	Dead band range : 0.0 to 5.0ºC [0.0 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*
49		**Dead band in cooling ramp1:** Display shows *"CONTROL DEAD BAND 1 COOLING"* and the value of the cooling ramp1dead band, cooling symbol is also displayed. Please select the desired value of cooling ramp1 dead band.	Dead band range : 0.0 to 5.0ºC [0.0 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*

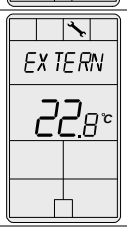
Step	Display	Description	Values
50		**Dead band in cooling ramp2:** Display shows *"CONTROL DEAD BAND 2 COOLING"* and the value of the cooling ramp2 dead band, cooling symbol is also displayed. Please select the desired value of cooling ramp2 dead band.	Dead band range : 0.0 to 5.0ºC [0.0 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*
51		**Anti-cycling delay cooling contact (protection for compressor):** Display shows *"COOLING ANTI CYCLE MINUTES"* and the value (in minutes) of the delay to activate / reactivate cooling contact. Please select the desired value of the delay cooling contact.	Range: 0 to 15 min. Increment: 1 min. *Default value: 2 min.*
52		**Integration time factor setting:** Display shows *"ADJUST INTGRAL TIME IN SECONDS"* and the time in seconds for the integration factor compensation. Please select the desired value of the integration factor compensation.	Range: 0 to 250 seconds Increment: 5 seconds *Default value: 0 seconds*
53		**Enable or disable anti-freeze protection:** Display shows *"ENABLE ANTI FREEZE PROTECT"*. You can enable or disable the Anti-freeze function. When enabled, if temperature drop to 4ºC [39ºF], heat will start even if thermostat is in OFF mode. Heat will stop when temperature reach 5ºC [41ºF].	 *Default value: Disable (NO)*

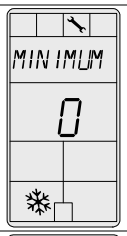
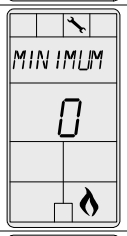
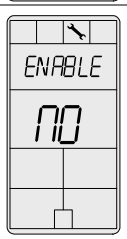
Air Flow Program Mode (Available when in Operation Mode; DS1-1 OFF position)

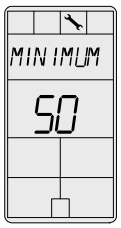
Push on both ❄/🔥 and °F/°C buttons for 5 seconds to access the user air flow program mode. This menu is accessible only If ''**PrSd**'' or ''**PrSA**'' has been selected at step #32, 33 or 34.

Step	Display	Description	Values
F1		**Password:** Display shows *"ENTER PASSWRD"* and *000*. You have 1 minute to enter the password by incrementing or decrementing the blinking digit with △ and ▽ buttons.To modify following digit on right press ❄/🔥, to return to digit on the left press °F/°C. When the password is entered press on ❄/🔥. If you do a mistake, you will see *"***Eror***"* and the thermostat will return in operation mode. You need to redo this step.	Password: **637** (corresponding to NEP)

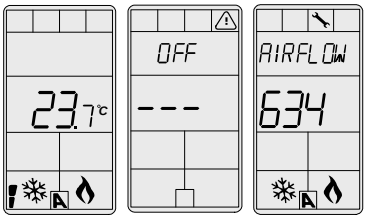
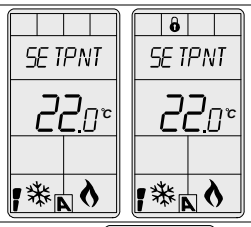
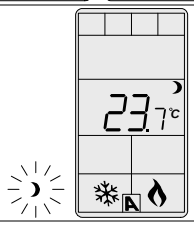
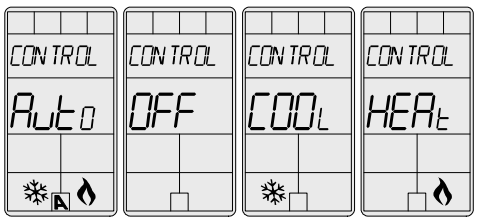
When the password is entered and you are in the balancing mode, this symbol 🔧 is displayed. Press on the ❄/🔥 button to advance to the next program function, press on the °F/°C button to return to previous step and press on the △ or ▽ button to change value. The system will exit the menus and return to normal function if you navigate through the entire menu or if no button is pressed for 5 minutes, changed values will be saved.

Step	Display	Description	Values
F2		**Internal temperature sensor calibration:** Display shows *"INSIDE TEMPER SENSOR OFFSET"* 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 40ºC [50 to 104ºF] (max. offset ± 5 ºC) Increment: 0.1ºC [0.2ºF]
F3		**External temperature sensor calibration:** (If ''**EtS**'' has been selected at step #32, 33 or 34 of programming mode) Display shows *"EXTERN TEMPER SENSOR OFFSET"* and the temperature read by the external temperature sensor (if connected on the selected input). If the sensor is not connected or short circuited, the display shows *"***Eror***"*. You can adjust the calibration of the external sensor by comparison with a known thermometer.	Range: 0 to 50ºC [41 to 122.0ºF] (max. offset ± 5 ºC) Increment: 0.1ºC [0.2ºF]

Step	Display	Description	Values
F4		**Pressure filter setting:** Display shows *"PRESSUR FILTER TIME IN SECONDS"* and the time in seconds for the numeric filter applied to the pressure analog input. Please select the desired value of the numeric filter. This filter stabilize the reading and slowed down the answer of the system	Range: 1 to 10 seconds Increment: 1 seconds *Default value: 2 seconds*
F5		**Integration time factor setting:** Display shows *"AIRFLOW INTGRAL TIME IN SECONDS"* and the time in minutes for the integration factor compensation. Please select the desired value of the integration factor compensation.	Range: 0 to 60 min. Increment: 1 min. *Default value: 0 min.*
F6		**Air flow K factor:** Display shows *"ADJUST AIRFLOW KFACTOR VNOM"* and the value of the k factor or the V nominal according to your pressure sensor selection (''**PrSd**'' or ''**PrSa**'' selected at step #32, 33 or 34) **PrSd** …V = k√ΔP when ΔP=1 (10.00V) **PrSa** … Vnom =10.00V Please select the desired value of k factor or the V nominal.	Range: 100 to 9995 Increment: 5 *Default value: 1200*
F7		**Minimum cooling airflow:** Display shows *"MINIMUM COOLING AIRFLOW"* and the value of the minimum airflow in cooling. Please select the desired value of the minimum airflow in cooling. The minimum value is restricted by the maximum value. (step #F8)	Range: 0 to maximum cooling airflow Increment: 5 *Default value: 100*
F8		**Maximum cooling airflow:** Display shows *"MAXIMUM COOLING AIRFLOW"* and the value of the maximum airflow in cooling. Please select the desired value of the maximum airflow in cooling. The maximum value is restricted by the minimum value. (step #F7)	Range: minimum cooling airflow to k factor or V nominal Increment: 5 *Default value: 1000*
F9		**Minimum heating airflow:** Display shows *"MINIMUM HEATING AIRFLOW"* and the value of the minimum airflow in heating. Please select the desired value of the minimum airflow in heating. The minimum value is restricted by the maximum value. (step #F10)	Range: 0 to maximum heating airflow Increment: 5 *Default value: 100*
F10		**Maximum heating airflow:** Display shows *"MAXIMUM HEATING AIRFLOW"* and the value of the maximum airflow in heating. Please select the desired value of the maximum airflow in heating. The maximum value is restricted by the minimum value. (step #F9)	Range: minimum heating airflow to k factor or V nominal Increment: 5 *Default value: 1000*
F11		**Enable or disable airflow balancing:** Display shows *"ENABLE AIRFLOW BALANCE"*. You can enable or disable the balancing airflow function. If you do not need to balance system, select **No**. You will leave the balancing menu and return to operation mode. If you want to balance system, select **YES**. In this case, you will leave the balancing menu and return to operation mode if no button is pressed for 30 minutes, changed values will be saved.	 *Default value: Disable (No)*

F12		**Minimum airflow calibration:** Display shows *"MINIMUM AIRFLOW"* and the value of the minimum airflow detected by the pressure sensor. The thermostat will send a signal to the actuator close the VAV boxe at minimum airflow. When the value on thermostat is stable, you can adjust the calibration of the sensor by comparison with the reading on a manometer or a balometer. If you can't stabilize the system, you will need to increase the filter value. (step #F4)	Range: 0 to k factor or V nominal (max. offset ± ½ value) Increment: 1
F13		**Maximum airflow calibration:** Display shows *"MAXIMUM AIRFLOW"* and the value of the maximum airflow detected by the pressure sensor. The thermostat will send a signal to the actuator open the VAV boxe at maximum airflow. When the value on thermostat is stable, you can adjust the calibration of the sensor by comparison with the reading on a manometer or a balometer. If you can't stabilize the system, you will need to increase the filter value. (step #F4) **Come back to step #F11**	Range: 0 to k factor or V nominal (max. offset ± ½ value) Increment: 1

Operation Mode

Step	Description	Display
A	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 4 buttons. LCD will light for 4 seconds. **Temperature display** In operation mode, thermostat will automatically display temperature read. If "**OFF**", "**- - -**" and alarm symbol are displayed, the temperature sensor is not connected or short circuited. To change the scale between ºC and ºF, press on °F/°C button. **Air flow display** To display the air flow, press on ❄/🔥 button for 5 seconds. When in this mode *"AIRFLOW"* is displayed. Air flow value will be displayed during 5 seconds.	
B	**Set point display and adjustment** To display the set point, press two times on Δ or ∇. Set point will be displayed during 3 seconds. To adjust set point, press on Δ or ∇ while the temperature set point is displayed. *Note: If set point adjustment has been locked, 🔒 symbol will be displayed.*	
C	**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 4 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.	
D	**Control mode selection :** To verify which control mode is set, press on ❄/🔥 button. Control mode will be displayed during 5 seconds. To change of control mode, press on the ❄/🔥 button while control mode is displayed. You can choose one of the following: ✓ Automatic Cooling or Heating ✓ Cooling and Heating OFF ✓ Cooling only ✓ Heating only *Note: These selections can vary according to the choice made on steps #6 & #7.*	

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**.