neptronic®

7 Days Programmable Room Thermostat
Specification & Installation Instructions

VAV Thermostat

TRO24T4XYZ3

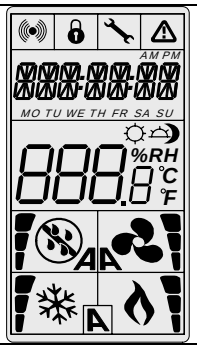
Features:

- Attractive modern look with large LCD and backlight
- Icons driven information and 1 line of text information
- Selectable analog and digital output
- Precise achieve temperature control with programmable PI function
- Selectable Fahrenheit or Celsius scale
- 7 days programming logic
- 2 or 4 daily independent time schedule and temperature
- AM-PM or 24 hours time display
- 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

	TRO24T4XYZ3
Inputs	3 Analog input universal (0-10Vdc or thermistor 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 output (on/off, pulse 0 or 24Vac, 250 mA max.), or 2 Floating output
Power supply	22 to 26Vac 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 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]

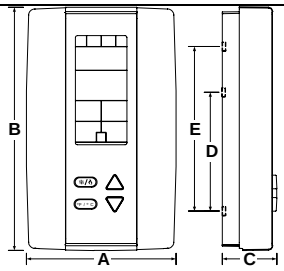
Interface



Symbols on display

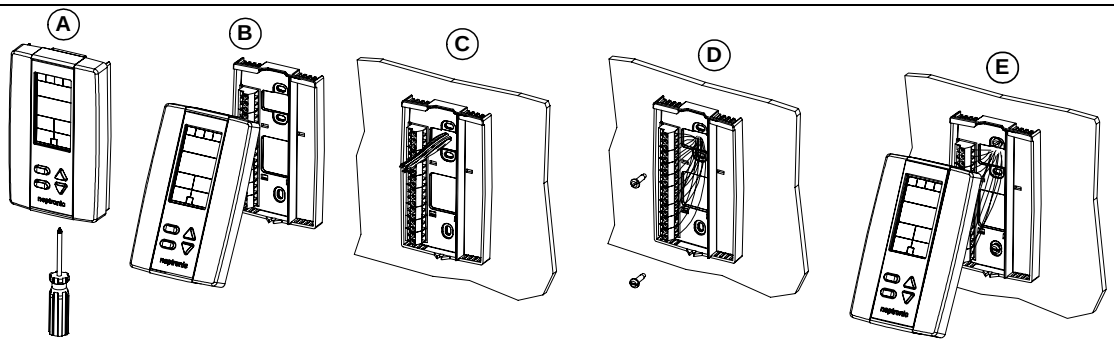
A	***Cooling ON 33,66,100% output A: Automatic***		***Menu set-up Lock***		***Morning***
A	***Heating ON 33,66,100% output A: Automatic***		***Programming mode (Technician setting)***		***Day***
	Alarm status	°C or °F	***ºC: Celsius scale ºF: Fahrenheit scale***		***Evening***
MO TU WE TH FR SA SU	***Day of the week***	***AM PM***	***Morning Afternoon***		***Night***

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

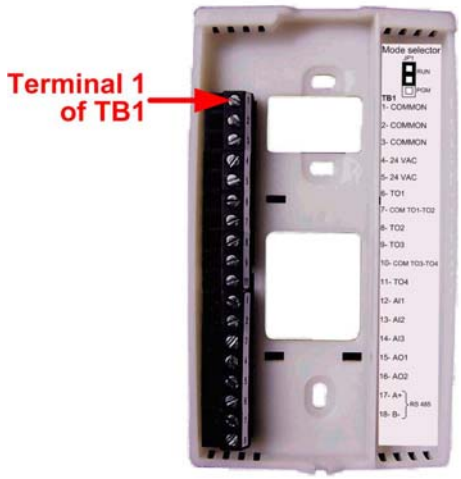
Mounting Instructions



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

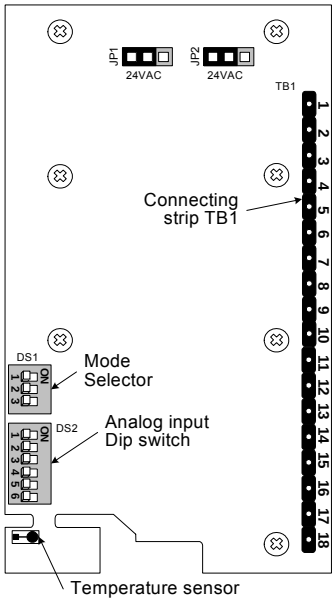
A. Remove the screw (captive) holding the base and the front cover of the thermostat.
B. Lift the front cover of the thermostat to separate it from the base.
C. Pull wire through the base hole.
D. Secure the base to the wall using wall anchors and screws (supplied). Make the appropriate connections.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

Terminal Description

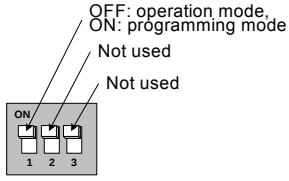


Terminals		Description	If set in floating, terminals 6-8 (floating 1), terminals 9-11 (floating 2) are as follow:		
TB1	1	Common			
	2	Common			
	3	Common			
	4	24Vac			
	5	24Vac			
	6	Triac output 1 (TO1)	TO1 close	1	FLOATING
	7	Triac output Common (TO1 & TO2)			
	8	Triac output 2 (TO2)	TO2 open		
	9	Triac output 3 (TO3)	TO3 close	2	
	10	Triac output Common (TO3 & TO4)			
	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)



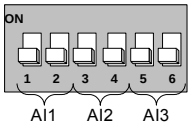
Triac (digital) Output Signal Selection

(**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)

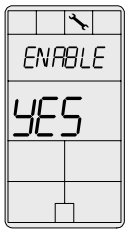
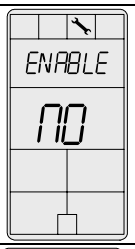
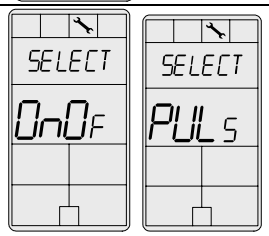
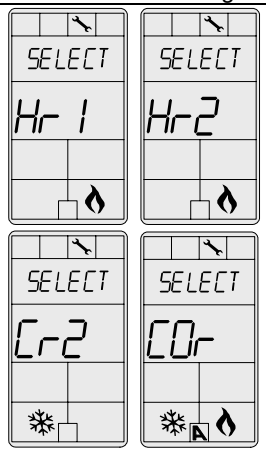
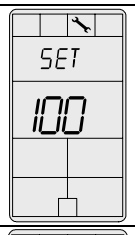
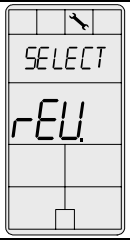
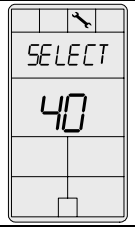
Analog Input Dip Switch (DS2)

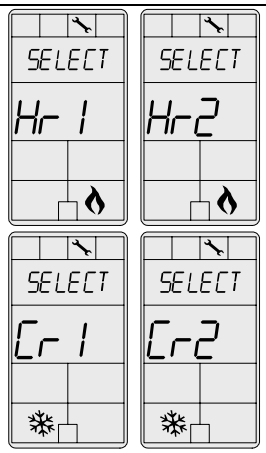
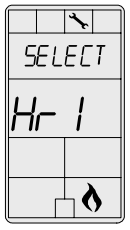
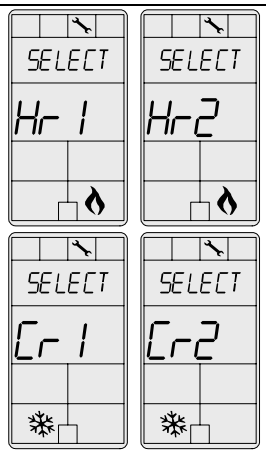
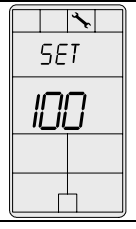


		ON	OFF
AI1	Thermistor 10KΩ	DS2.1	DS2.2
	Dry contact		
	0-10 Vdc	DS2.2	DS2.1
AI2	Thermistor 10KΩ	DS2.3	DS2.4
	Dry contact		
	0-10 Vdc	DS2.4	DS2.3
AI3	Thermistor 10KΩ	DS2.5	DS2.6
	Dry contact		
	0-10 Vdc	DS2.6	DS2.5

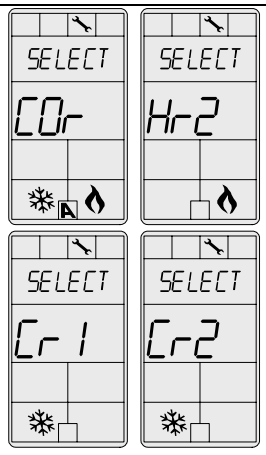
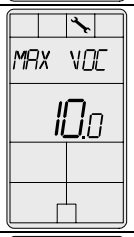
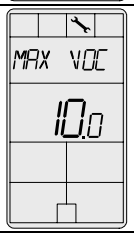
Programming Mode

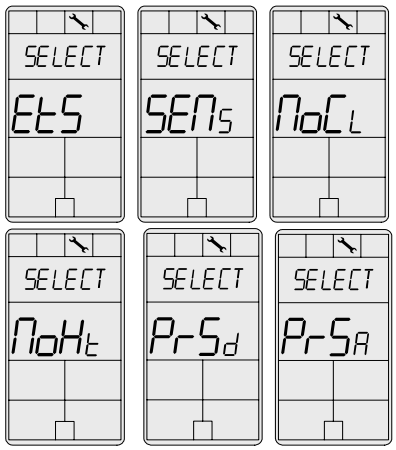
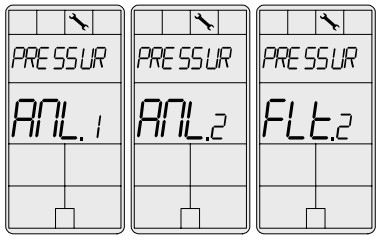
When in this mode this symbol is displayed. Please press on button to advance to the next program function, press on button to return to preceding stage and press on button △ or ▽ to change value. You can leave the programming mode at any time, changed values will be recorded.

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		**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)*
3		**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*
4		**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 or Cooling ramp 2. Note: If "**FLT**" (floating) has been selected at step #3, the same ramp will be used for TO2. If "**PULs**" has been selected at step #3, you can only choose Heating ramp 1 or Heating ramp 2. **If you have selected on/off signal, go directly to step #7.** **If you have selected pulse signal, go directly to step #8.**	 *Default value: Cr1 (Cooling ramp1)*
5		**Set floating time:** (If "**FLT**" has been selected at step #3) 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.*
6		**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 #11.**	 *Default value: direct (dir)*
7		**Set TO1 on-off close position:** (If "**OnOf**" has been selected at step #3) 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 #4. Contact will automatically open at 0% of the demand.	Range: 20, 40, 60, 80 Increment: 20 % *Default value: 40 (40% of the demand)*

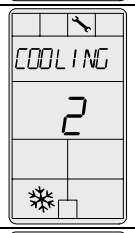
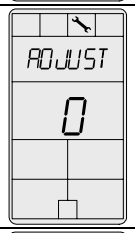
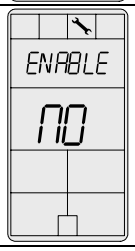
Step	Display	Description	Values
8		**Set TO2 output signal:** Display shows *"SELECT TO2 OUTPUT SIGNAL"*. Select which signal output you want for TO2 output. You can choose on/off or pulse signal output.	 *Default value: on-off*
9		**Set TO2 signal ramp:** Display shows *"SELECT TO2 RAMP"*. Select which ramp you want for TO2. You can choose: Changeover ramp, Heating ramp 1, Heating ramp 2, Cooling ramp 1 or Cooling ramp 2. If "**PULs**" has been selected at step #8, you can only choose Heating ramp 1 or Heating ramp 2. **If you have selected pulse signal, go directly to step #11.**	 *Default value: Cr1 (Cooling ramp1)*
10		**Set TO2 on-off close position:** (If "**OnOf**" has been selected at step #8) 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 #9. Contact will automatically open at 0% of the demand.	Range: 20, 40, 60, 80 Increment: 20 % *Default value: 40 (40% of the demand)*
11		**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*
12		**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 or Cooling ramp 2. Note: If "**FLT**" (floating) has been selected at step #11, the same ramp will be used for TO4. If "**PULs**" has been selected at step #11, you can only choose Heating ramp 1 or Heating ramp 2. **If you have selected on/off signal, go directly to step #15.** **If you have selected pulse signal, go directly to step #16.**	 *Default value: Hr1 (Heating ramp 1)*
13		**Set floating time:** (If "**FLT**" has been selected at step #11) 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.*

Step	Display	Description	Values
14		**Set motor direction:** Display shows *"SELECT MOTOR DIRECT REVERSE"*. Select which direction you want for the motor. You can choose: Direct "clockwise" (0 to 90°) or Reverse "counter clockwise" (90 to 0°) **Go to step #19**	 *Default value: direct (dir)*
15		**Set TO3 on-off close position:** (If "**OnOf**" has been selected at step #11) 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 #12. 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 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*
17		**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 or Cooling ramp 2. If "**PULs**" has been selected at step #16, you can only choose Heating ramp 1 or Heating ramp 2. **If you have selected pulse signal, go directly to step #19.**	    *Default value: Hr2 (Heating ramp 2)*
18		**Set TO4 on-off close position:** (If "**OnOf**" has been selected at step #16) 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 #17. Contact will automatically open at 0% of the demand.	Range: 20, 40, 60, 80 Increment: 20 % *Default value: 40 (40% of the demand)*
19		**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 or Cooling ramp 2.	    *Default value: Cr1 (Cooling ramp1)*

Step	Display	Description	Values
20		**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 or Cooling ramp 2.	 *Default value: Hr1 (Heating ramp 1)*
21		**Minimum voltage of AO1 output:** 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 #22)	Range: 0.0 to 10.0 Volt Increment: 0.1 Volt *Default value: 0.0 Volt*
22		**Maximum voltage of AO1output:** 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 #21)	Range: 0.0 to 10.0 Volt Increment: 0.1 Volt *Default value: 10.0 Volt*
23		**Minimum position of AO1 output:** 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%*
24		**Minimum voltage of AO2 output:** 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 #25)	Range: 0.0 to 10.0 Volt Increment: 0.1 Volt *Default value: 0.0 Volt*
25		**Maximum voltage of AO2 output:** 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 #24)	Range: 0.0 to 10.0 Volt Increment: 0.1 Volt *Default value: 10.0 Volt*
26		**Minimum position of AO2 output:** 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%*

Step	Display	Description	Values
27		**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), 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 #31.** 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*
28		**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 #27) Note: AI1 input signal has priority to AI2, if you have selected the same function AI2 will not be functional.	*Default value: OFF*
29		**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 #27) Note: AI1 & AI2 input signal have priority to AI3, if you have selected the same function AI3 will not be functional.	*Default value: OFF*
30		**External temperature sensor Calibration:** (If ''**EtS**'' has been selected at step #27, 28 or 29) 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]
31		**Change over set point temperature:** (If ''**SENs**'' has been selected at step #27, 28 or 29) 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]*
32		**Set output signal used for pressure independent:** (If ''**PrSd**'' or ''**PrSa**'' has been selected at step #27, 28 or 29) 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 #4 & #12.*	 *Default value: floating 1*

Step	Display	Description	Values
33		**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]*
34		**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]*
35		**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]*
36		**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]*
37		**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]*
38		**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 : 0.3 to 5.0ºC [0.6 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*
39		**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 : 0.3 to 5.0ºC [0.6 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*
40		**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 : 0.3 to 5.0ºC [0.6 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*
41		**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 : 0.3 to 5.0ºC [0.6 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*

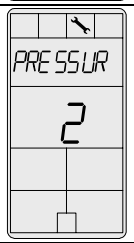
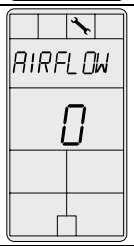
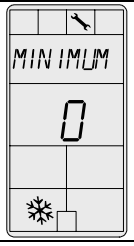
Step	Display	Description	Values
42		**Dead band in cooling ramp2:** Display shows *"CONTROL DEAD BAND 2 COOLING"* and the value of the cooling ramp2 dead band, cooling symbol is also displayed. Please select the desired value of cooling ramp2 dead band.	Dead band range : 0.3 to 5.0ºC [0.6 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*
43		**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.*
44		**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*
45		**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)*

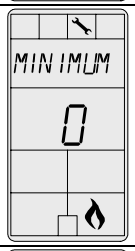
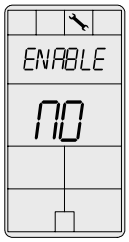
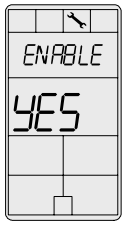
Air Flow Program Mode (Available when in Operation Mode; DS1.1 to OFF)

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)

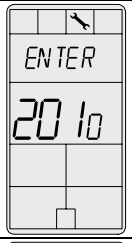
When the password is entered and you are in the balancing mode, this symbol 🔧 is displayed. Press on the (✻/🔥) button to advance to the next program function, press on the (°F/°C) button to return to previous step and press on the △ or ▽ button to change value. The system will exit the menus and return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

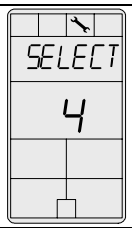
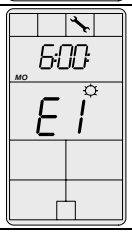
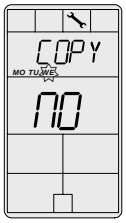
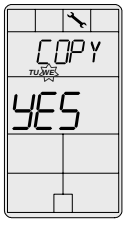
Step	Display	Description	Values
F2		**Internal temperature sensor calibration:** Display shows *"INSIDE TEMPER SENSOR OFFSET"* and temperature read by internal temperature sensor. You can adjust the calibration of the sensor by comparison with a known thermometer. For example if thermostat has been installed 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 #27, 28 or 29 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]
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: 0*

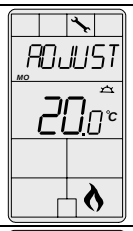
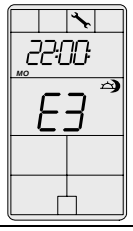
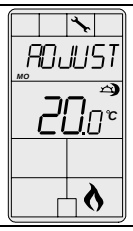
Step	Display	Description	Values
F8		**Maximum cooling airflow:** Display shows *"MAXIMUM COOLING AIRFLOW"* and the value of the maximum airflow in cooling. Please select the desired value of the maximum airflow in cooling. The maximum value is restricted by the minimum value. (step #F7)	Range: minimum cooling airflow to k factor or V nominal Increment: 5 *Default value: 100*
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: 0*
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: 100*
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

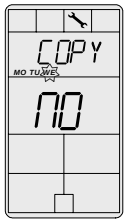
Scheduling Mode (Available when in Operation Mode; DS1.1 to OFF)

Push the °F/°C button for 5 seconds to access the user schedule menu. When in this 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
1		**Time display format:** Display shows *"SET TIME DISPLAY FORMAT"* and the format; 12 or 24 hour. If 12 hour format is selected **AM** or **PM** symbols are also displayed.	 *Default value: 24*
2A		**Actual time setting:** Display shows *"SET HOURS"* and the value of the actual hour. Use the arrows to set the actual time (hour).	Range: 00 to 23 hour Increment: 1 hour
2B		**Actual time setting (cont'd):** Display shows *"SET MINUTES"* and the value of the actual minute. Use the arrows to set the actual time (minute).	Range: 00 to 59 min. Increment: 1 min.
2C		**Actual day setting:** Display shows *"ENTER YEAR"*. Please select the actual date (year).	Range: 2010 to 2099 year Increment: 1 year *Default value: 2010 year*
2D		**Actual day setting (cont'd):** Display shows *"ENTER MONTH"*. Use the arrows to set the actual date (month).	Range: 01 to 12 month Increment: 1 month
2E		**Actual day setting (cont'd):** Display shows *"ENTER DAY"*. Use the arrows to set the actual date (day)	Range: 01 to 31 day Increment: 1 day
3		**Used scheduling:** Display shows *"USED TIME SCHEDUL"* and the status of the function. If you do not need a schedule, select **No** and go to the next step. If you want to set a schedule, select **YES** and **go directly to step #5.**	 *Default value: Yes*
4		**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. **Go directly to step #10.**	Set point range: 10 to 40ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 22ºC [72ºF]*

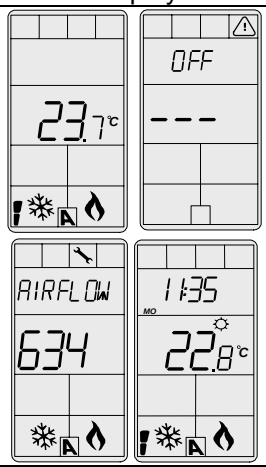
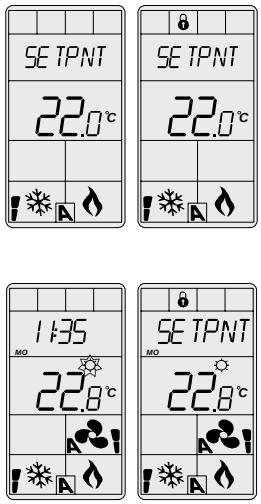
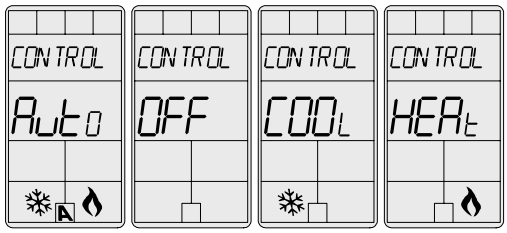
Step	Display	Description	Values
5		**Number of events/day:** Display shows *"SELECT 2 OR 4 EVENTS PER DAY"*. You can select 2 events , or 4 events , , , per day. Your selection will be applied for each day of the week. **If you selected 4 events, go directly to step #8.**	 *Default value: 2 events*
6A		**Monday schedule programming Event 1:** Display shows *"6:00:"* and **E1**. **MO** and sun symbols are also displayed. Note: Monday Event 1 temperature setting will be effective between the time set at this step until the time set for Monday Event 2. Set the Monday Event 1 start time.	Range: 00:00 to Monday Event 2 start time -15 minutes Increment: 15 minutes *Default value: 6:00*
6B		**Monday schedule programming Event 1 cooling setpoint:** Display shows *"ADJUST EVENT 1 COOLING SETPNT"* and the value of the cooling set point temperature during this period. **MO**, sun and cooling symbols are also displayed. Select the desired cooling temperature set point for the Event 1 period. The minimum value is restricted by the Event 1 heating set point. (step # 6C) If Off is selected, the thermostat will be in off mode during this period. (If Off is selected, skip to Step #6D)	Set point range: 10 to 40ºC [50 to 104ºF] or Off Increment: 0.5ºC [1ºF] *Default value: 22ºC [72ºF]*
6C		**Monday schedule programming Event 1 heating set point:** Display shows *"ADJUST EVENT 1 HEATING SETPNT"* and the value of the heating set point temperature during this period. **MO**, sun and heating symbols are also displayed. Select the desired heating set point temperature for the Event 1 period. The maximum value is restricted by the Event 1 cooling set point. (step # 6B)	Set point range: 10 to 40ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 20ºC [68ºF]*
6D		**Monday schedule programming Event 2:** Display shows *"20:00:"* and **E2**. **MO** and moon symbols are also displayed. Note: Event 2 temperature setting will be effective between the time set at this step until the time set for Tuesday Event 1. Select the time you wish Event 2 to begin for Monday.	Range: Monday Event 1 +15 minutes to Monday 23:45 Increment: 15 minutes *Default value: 20:00*
6E		**Monday schedule programming Event 2 cooling set point:** Display shows *"ADJUST EVENT 2 COOLING SETPNT"* and the value of the cooling set point temperature during this period. **MO**, moon and cooling symbols are also displayed. Select the desired cooling temperature set point for the Event 2 period. The minimum value is restricted by the Event 2 heating set point. (step # 6F) If Off is selected, the thermostat will be in off mode during this period. (If Off is selected, skip to Step #7)	Set point range: 10 to 40ºC [50 to 104ºF] or Off Increment: 0.5ºC [1ºF] *Default value: 28ºC [72ºF]*
6F		**Monday schedule programming Event 2 heating set point:** Display shows *"ADJUST EVENT 2 HEATING SETPNT"* and the value of the heating set point temperature during this period. **MO**, moon and heating symbols are also displayed. Please select the desired heating set point temperature for the Event 2 period. The maximum value is restricted by the Event 2 cooling set point. (step # 6E)	Set point range: 10 to 40ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 16ºC [68ºF]*
7		**Copy schedule:** Display shows *"COPY SCHEDUL"*. You can copy the schedule from a previously programmed day to another day. Day programmed will appear and day to copy to will flash. If many days have been programmed, you can select the day you want to copy. If you want to copy, select *"YES"*, If you don't want to copy, select *"NO"*. Ex.: for Wednesday scheduling, you can press on the △ or ▽ button to choose between **MO** *"YES"*, **TU** *"YES"*, **MO TU** *"NO"* If you have selected *"NO"* repeat step #6 with the new day. Repeat this step with all the day. If you go back in the menu, you can see the entire scheduling step #6 even if you copied before. This operation enables you to revise your value or to modify some parameters. When every day has a schedule established, **Go directly to step #10.**	Ex.: for Wednesday    *Default value: NO*

Step	Display	Description	Values
8A		**Monday schedule programming Event 1:** (If "**4**" events was selected at step #4) Display shows *"06:00:"* and **E1**. **MO** and half sun symbols are also displayed. Note: Monday Event 1 temperature setting will be effective between the time set at this step until the time set for Monday Event 2. Set the Monday Event 1 start time.	Range: 00:00 to Monday Event 2 start time -15 minutes Increment: 15 minutes *Default value: 06:00*
8B		**Monday schedule programming Event 1 cooling set point:** Display shows *"ADJUST EVENT 1 COOLING SETPNT"* and the value of the cooling set point temperature for this period. **MO**, half sun and cooling symbols are also displayed. Select the desired cooling set point temperature for the Event 1 period. The minimum value is restricted by the Event 1 heating set point. (step # 8C) If Off is selected, the thermostat will be in off mode during this period. (If Off is selected, skip to Step #8D)	Set point range: 10 to 40ºC [50 to 104ºF] or Off Increment: 0.5ºC [1ºF] *Default value: 22ºC [72ºF]*
8C		**Monday schedule programming Event 1 heating set point:** Display shows *"ADJUST EVENT 1 HEATING SETPNT"* and the value of the heating set point temperature for this period. **MO**, half sun and heating symbols are also displayed. Select the desired heating set point temperature for the Event 1 period. The maximum value is restricted by the Event 1 cooling set point. (step # 8B)	Set point range: 10 to 40ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 20ºC [68ºF]*
8D		**Monday schedule programming Event 2:** Display shows *"20:00:"* and **E2**. **MO** and sun symbols are also displayed. Note: Event 2 temperature setting will be effective between the time set at this step until the time set for Monday Event 3. Select the time you wish Event 2 to begin for Monday.	Range: Monday Event 1 start time +15 minutes to Event 3 start time -15 minutes Increment: 15 minutes *Default value: 20:00*
8E		**Monday schedule programming Event 2 cooling set point:** Display shows *"ADJUST EVENT 2 COOLING SETPNT"* and the value of the cooling set point temperature during this period. **MO**, sun and cooling symbols are also displayed. Select the desired cooling temperature set point for the Event 2 period. The minimum value is restricted by the Event 2 heating set point. (step # 8F) If Off is selected, the thermostat will be in off mode during this period. (If Off is selected, skip to Step #8G)	Set point range: 10 to 40ºC [50 to 104ºF] or Off Increment: 0.5ºC [1ºF] *Default value: 28ºC [72ºF]*
8F		**Monday schedule programming Event 2 heating set point:** Display shows *"ADJUST EVENT 2 HEATING SETPNT"* and the value of the heating set point temperature during this period. **MO**, sun and heating symbols are also displayed. Please select the desired heating set point temperature for the Event 2 period. The maximum value is restricted by the Event 2 cooling set point. (step # 8E)	Set point range: 10 to 40ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 16ºC [68ºF]*
8G		**Monday schedule programming Event 3:** Display shows *"22:00:"* and **E3**. **MO**, half sun and moon symbols are also displayed. Note: Event 3 temperature setting will be effective between the time set at this step until the time set for Monday Event 4. Select the time you wish Event 3 to begin for Monday.	Range: Monday Event 2 start time +15 minutes to Event 4 start time -15 minutes Increment: 15 minutes *Default value: 22:00*
8H		**Monday schedule programming Event 3 cooling set point:** Display shows *"ADJUST EVENT 3 COOLING SETPNT"* and the value of the cooling set point temperature during this period. **MO**, half sun, moon and cooling symbols are also displayed. Select the desired cooling temperature set point for the Event 3 period. The minimum value is restricted by the Event 3 heating set point. (step # 8I) If Off is selected, the thermostat will be in off mode during this period. (If Off is selected, skip to Step #8J)	Set point range: 10 to 40ºC [50 to 104ºF] or Off Increment: 0.5ºC [1ºF] *Default value: 22ºC [72ºF]*
8I		**Monday schedule programming Event 3 heating set point:** Display shows *"ADJUST EVENT 3 HEATING SETPNT"* and the value of the heating set point temperature during this period. **MO**, half sun, moon and heating symbols are also displayed. Select the desired heating set point temperature for the Event 3 period. The maximum value is restricted by the Event 3 cooling set point. (step # 8H)	Set point range: 10 to 40ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 20ºC [68ºF]*

Step	Display	Description	Values
8J		**Monday schedule programming Event 4:** Display shows *"23:45:"* and **E4**. **MO** and moon symbols are also displayed. Note: Event 4 temperature setting will be effective between the time set at this step until the time set for Tuesday Event 1. Please select the time you wish Event 4 to begin for Monday.	Range: Monday Event 3 +15 minutes to Monday 23:45 Increment: 15 minutes *Default value: 23:45*
8K		**Monday schedule programming Event 4 cooling set point:** Display shows *"ADJUST EVENT 4 COOLING SETPNT"* and the value of the cooling set point temperature during this period. **MO**, moon and cooling symbols are also displayed. Select the desired cooling temperature set point for the Event 4 period. The minimum value is restricted by the Event 4 heating set point. (step # 8L) If Off is selected, the thermostat will be in off mode during this period. (If Off is selected, skip to Step #9)	Set point range: 10 to 40ºC [50 to 104ºF] or Off Increment: 0.5ºC [1ºF] *Default value: 28ºC [72ºF]*
8L		**Monday schedule programming Event 4 heating set point:** Display shows *"ADJUST EVENT 4 HEATING SETPNT"* and the value of the heating set point temperature during this period. **MO**, moon and heating symbols are also displayed. Please select the desired heating set point temperature for the Event 4 period. The maximum value is restricted by the Event 4 cooling set point. (step # 8K)	Set point range: 10 to 40ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 16ºC [68ºF]*
9		**Copy schedule:** Display shows *"COPY SCHEDUL"*. You can copy the schedule from a previously programmed day to another day. Day programmed will appear and day to copy to will flash. If many days have been programmed, you can select the day you want to copy. If you want to copy, select *"YES"*, If you don't want to copy, select *"NO"*. Ex.: for Wednesday scheduling, you can press on the △ or ▽ button to choose between **MO** *"YES"*, **TU** *"YES"*, **MO TU** *"NO"* If you have selected *"NO"* repeat step #8 with the new day. Repeat this step with all the day. If you go back in the menu, you can see the entire scheduling step #8 even if you copied before. This operation enables you to revise your value or to modify some parameters When every day has a schedule established, **Go to step #10.**	Ex.: for Wednesday    *Default value: NO*
10		**Locking the set point derogation:** Display shows *"USER SETPNT OVERIDE LOCKED"* and the status of the function. You can lock or unlock the set point derogation by end user. If locked, *"YES"* and lock symbol will appear and user can't derogate the set point.	 *Default value: Unlocked (NO)*
11		**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*

Step	Display	Description	Values
12		**<u>Locking the control mode:</u>** Display shows *"USER CONTROL MODE LOCKED"* and the status of the function. You can lock or unlock the control mode by end user. If locked, *"YES"* and lock symbol will appear and user can't derogate the control mode.	 *Default value: Unlocked (NO)*
13		**<u>Quit scheduling mode</u>** Display shows *"QUIT"* and the status of the function. If you want to revise your schedule, select **No** and **go directly to step #1 of scheduling menu.** If you want to quit the, select **YES** and you will leave the scheduling menu and will return to operation mode.	 *Default value: Yes*

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	**<u>Set point display and adjustment</u>** 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.* **<u>Scheduling setpoint derogation</u>** If you have set a schedule, the set point will be modified until the next event comes on. When thermostat is in operation mode, event symbol is displayed, so set point for cooling and/or heating match to the setting made in scheduling mode. If not locked, set point can be derogated for an event period by pressing onto Δ or ∇ buttons. During period of derogation the event symbol will flash. If event symbol does not flash, the derogation period is finished or the set point has been locked in scheduling mode. If locked, *"SETPNT LOCKED"* and lock symbol will appear.	
C	**<u>Control mode selection :</u>** 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 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 *Note: These selections can vary according to the choice made on steps #2 of programming mode & #11 of scheduling mode.*	

Notes:

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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**.