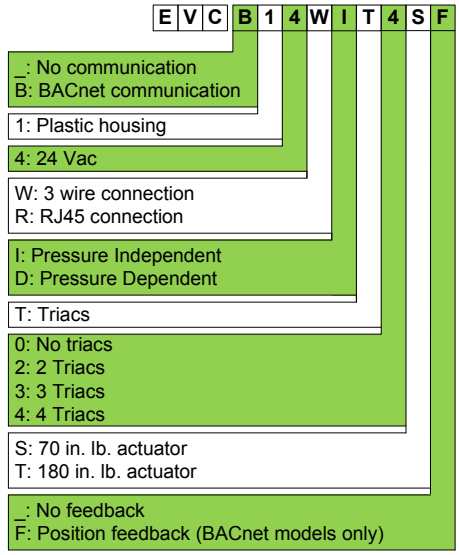
This document includes the manuals for both versions of the thermostats available for this controller. The TFL2X followed by the TFL5X.

Electronic VAV Controller
Specification & Installation Instructions

Features:

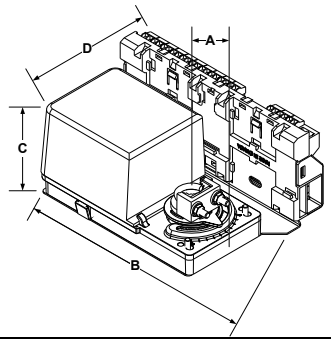
- LED indication of relay status
- Quality “non strip” terminals
- 24 Vac thermal fuse
- Selectable analog and digital output
- Precise temperature control with programmable PI function
- Selectable Fahrenheit or Celsius scale
- Manual night set back or no occupancy override
- Multi level lockable access menu
- Lockable setpoint
- Selectable internal or external temperature sensor (10KΩ)
- Change over by contact or external temperature sensor
- On board differential pressure sensor (depending on models)
- Pressure sensor air flow program available
- Selectable proportional control band and dead band
- Anti-freeze protection
- BACnet® MS/TP @ 9600, 19200, 38400, 76800 bps available
- Selectable device instance via technician menu
- Selectable MAC Address by dip switch on the EVCB



Technical Data	EVC
Torque	70 in.lb. [8 Nm] or 180 in.lb. [20 Nm] at rated voltage
Power consumption	10 VA max
Running time through 90º	95 seconds ±10%
Power supply	22 to 26 Vac 50/60 Hz
Inputs	2 thermistor inputs
	2 digital inputs
	Differential pressure sensor 0-1.0” WC (on pressure independent models)
Outputs	2 analog outputs (0-10 Vdc)
	Up to 4 TRIAC outputs 24 Vac, 500mA max fused / TRIAC
Communication	BACnet® MS/TP @ 9600, 19200, 38400 or 76800 bps (on EVCB models)
Communication connection	24 AWG twisted-shield cable (Belden 9841 or equivalent)
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
Weight	1.8 kg. [4 lb]

Dimensions

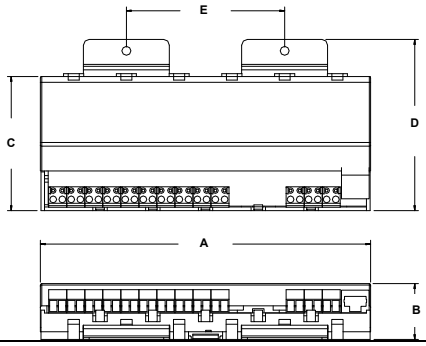
EVC with 70 in. lb. actuator



Dimension	Imperial (in)	Metric (mm)
A	1.50	38
B	7.2	183
C	3.2	82
D	5.1	128
Tubing ID*	1/8	3.175

**On pressure independent models*

EVC for 180 in. lb. actuator

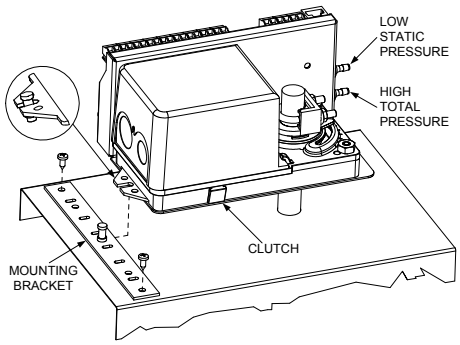


Dimension	Imperial (in)	Metric (mm)
A	7.20	182.9
B	1.22	31.0
C	2.93	74.3
D	3.74	94.9
E	3.45	87.6
Tubing ID*	1/8	3.175

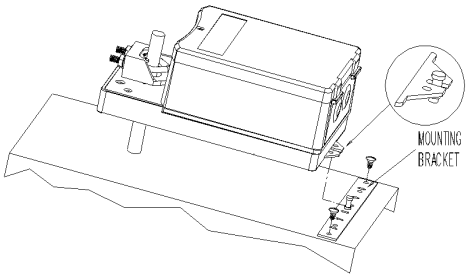
**On pressure independent models*

⚠ **The actuator will do an auto-stroke on power up. When changing the actuator adjustment screws, make sure to cycle power to initiate the auto-stroke. Auto-stroke is not available on EVC pressure independent without feedback (EVC**x**14x**IT**xx).**

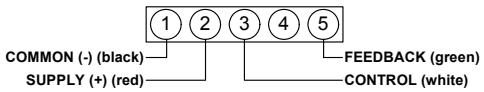
Installation



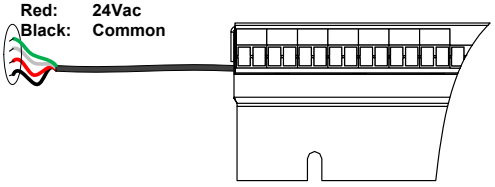
1. Manually close the damper blades and positioned the actuator at 0º or 90º.
2. Slide the actuator onto the shaft.
3. Tighten the nuts on the “U” bolt to the shaft with an 8mm wrench to a torque of 60 in.lb. [6.7 Nm].
4. Slide the mounting bracket under the actuator. Ensure free movement of the slot at the base of the actuator. The bracket pin must be placed in the mid distance of the slot.
5. Fix the bracket to the ductwork with #8 self-tapping screws.



Terminal in the actuator



Green: Feedback
White: Control
Red: 24Vac
Black: Common



1. Manually close the damper blades and positioned the actuator at 0º or 90º.
2. Slide the actuator onto the shaft.
3. Tighten the nuts on the “U” bolt to the shaft with an 8mm wrench to a torque of 150 in.lb. [17 Nm].
4. Slide the mounting bracket under the actuator. Ensure free movement of the slot at the base of the actuator. The bracket pin must be placed in the mid distance of the slot.
5. Fix the bracket to the ductwork with #8 self-tapping screws.
6. Connect the cable from the EVC to the terminal in the actuator as shown here.

Terminal Description

Low Voltage Supply (TB1)

1- Common
2- Common
3- 24 Vac Input
4- 24 Vac Input

Triac Output (TB2)*

1- Triac 24 Vac input for TO1/TO2
2- Triac Output 1 (TO1)
3- Common
4- Triac Output 2 (TO2)
5- Triac 24 Vac input for TO3/TO4
6- Triac Output 3 (TO3)
7- Common
8- Triac Output 4 (TO4)

Digital Input (TB3)

1- Digital Input 1 (DI1)
2- Common (DI1 & DI2)
3- Digital Input 2 (DI2)

Analog Output (TB4)

1- Analog Output 1 (AO1)
2- Common (AO1 & AO2)
3- Analog Output 2 (AO2)

Analog Input (TB5)

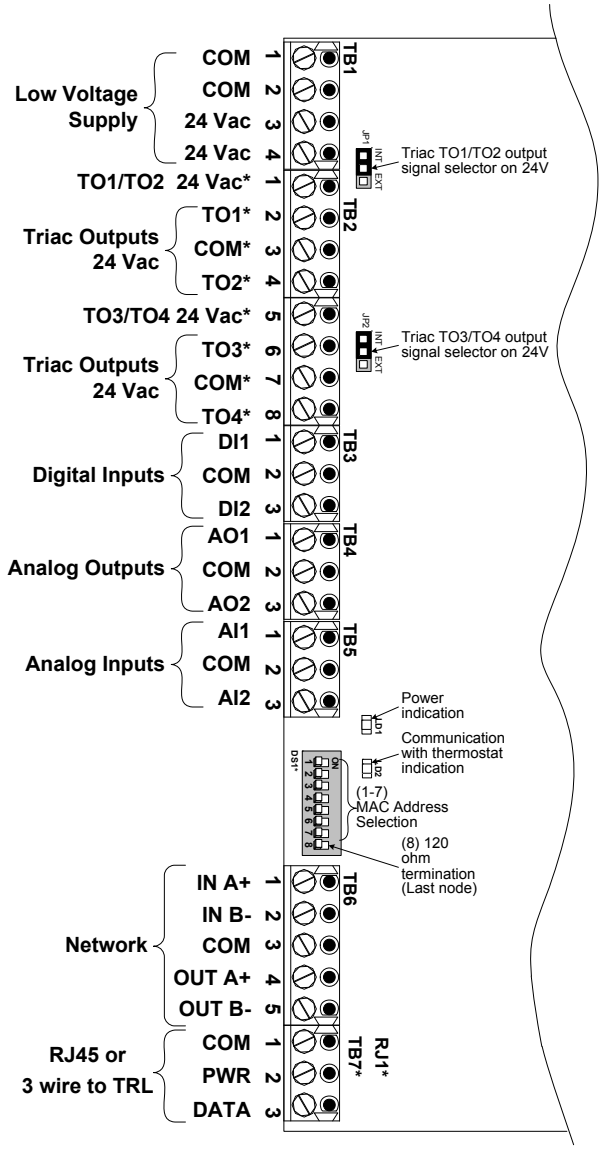
1- Analog Input 1 (AI1)
2- Common (AI1 & AI2)
3- Analog Input 2 (AI2)

Network (TB6)

1- Input (IN A+)
2- Input (IN B+)
3- Common
4- Output (A+)
5- Output (B-)

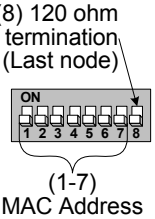
Thermostat Connection (TB7 or RJ1)*

1- Common
2- Power
3- Data
Note: If RJ45, simply connect Ethernet cable to RJ1



* Option

BACnet® MAC address dip switch

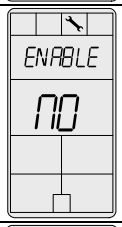


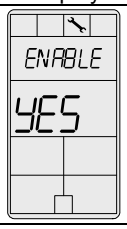
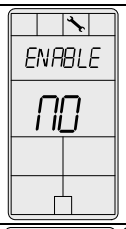
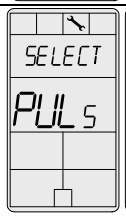
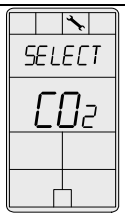
MSTP/MAC address for communication, are selectable in binary logic by dip switch.
If you do not change device instance in programme mode, it will be automatically modified according to the MAC address.

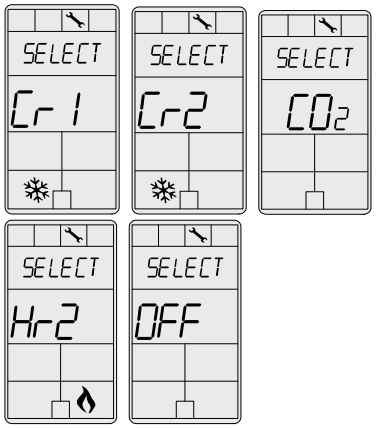
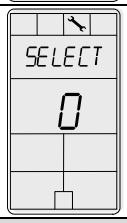
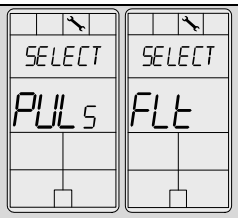
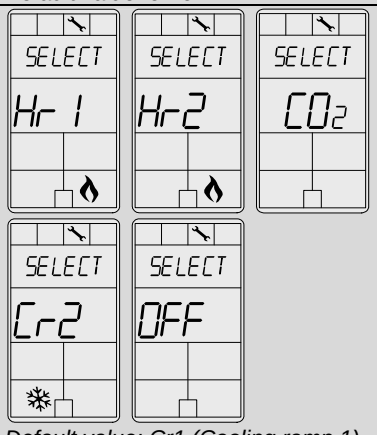
	B0	B1	B2	B3	B4	B5	B6	
MAC Address	DS.1	DS.2	DS.3	DS.4	DS.5	DS.6	S.7	Default Device Instance
0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	153000
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	153001
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	153002
3	ON	ON	OFF	OFF	OFF	OFF	OFF	153003
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	153004
…	…	…	…	…	…	…	…	…
126	OFF	ON	ON	ON	ON	ON	ON	153126
127	ON	ON	ON	ON	ON	ON	ON	153127

Programming Mode

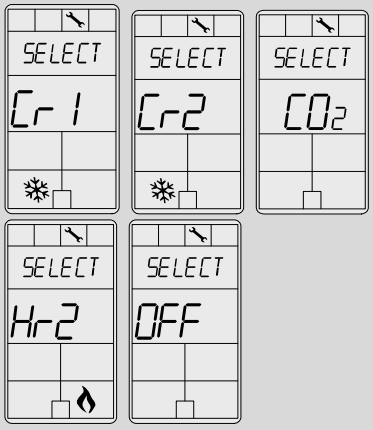
When in this mode the symbol is displayed. Press on button ⊛ to advance to the next program function, press on button ↵ to return to previous function and press on the arrow buttons △ or ▽ to change values. You can exit the programming mode at any time, changed values are automatically recorded.

Step	Display	Description	Values
1		**Internal temperature sensor Calibration:** Display scrolls *"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 typical room temperature (thermostat placed right under the air diffuser).	Range: 10 to 40ºC [50 to 104ºF] (max. offset ± 5ºC) Increment: 0.1ºC [0.2ºF]
2		**Minimum setpoint:** Display scrolls *"ADJUST MINIMUM USER SETPNT"* and the minimum setpoint temperature. Select the desired minimum setpoint 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 setpoint:** Display scrolls *"ADJUST MAXIMUM USER SETPNT"* and the maximum setpoint temperature. Please select the desired maximum setpoint 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 setpoint:** Display scrolls *"USER SETPNT LOCKED"* and the status of the function. You can lock or unlock the setpoint adjustment by end user. If locked, *"YES"* and lock symbol will appear.	 *Default value: Unlocked (NO)*
5		**Adjust internal setpoint:** Display scrolls *"ADJUST INTERN SETPNT"* and the setpoint temperature. Select the desired setpoint temperature; which should be within the listed temperature range. Lock symbol will appear if the setpoint was locked at the previous step. Setpoint value is restricted by the minimum and maximum value (step #2 & 3).	Setpoint range: 10 to 40ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 22ºC [72ºF]*
6		**Adjust the control mode:** Display scrolls *"ADJUST TEMPER CONTROL MODE"*. Cooling and heating symbols are also displayed. Select which control mode to authorize: Automatic, cooling or heating, heating only or cooling only. If you want to authorize all modes, choose Automatic mode. ON mode will the user allow to switch between heat & cool mode. If you want to authorize only Automatic mode, select CLHt mode.	    *Default value:* *Automatic cooling and heating*

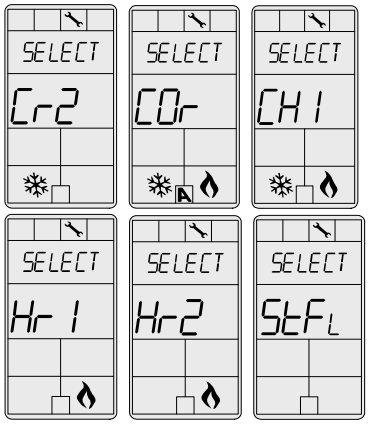
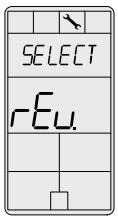
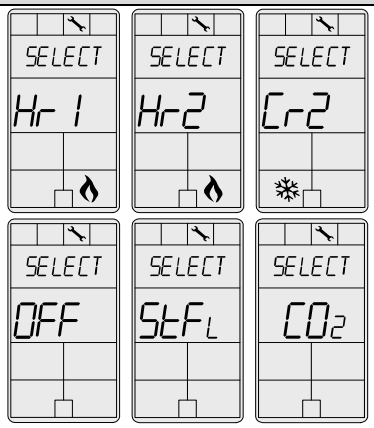
Step	Display	Description	Values
7		**Set On/Off function enable or disable:** Display scrolls *"ENABLE ON OFF CONTROL MODE"*. Select Yes or No to enable or disable user control mode adjustment.	 *Default value: Enable (YES)*
8		**Set TO1 output signal:** Display scrolls *"SELECT TO1 OUTPUT SIGNAL"*. Select the desired signal output for TO1 output, either **OnOF** (On-Off), **PULs** (Pulse) or **FLt** (Floating).	  *Default value: on-off*
9		**Set TO1 signal ramp:** Display scrolls *"SELECT TO1 SIGNAL RAMP"*. Select the desired ramp for TO1 from the options provided: Hr1: Heating ramp 1, Hr2: Heating ramp 2, Cr1: Cooling ramp 1, Cr2: Cooling ramp 2, CO2: CO2 alarm, OFF. If "**PULs**" was selected at step #8, you can only choose Hr1 or Hr2. **If you selected OnOF at step #8, go directly to step #12.** **If you selected PULs at step #8 or OFF here, go directly to step #14.**	     *Default value: Cr1 (Cooling ramp 1)*
10		**Set TO1 floating time:** (If "**FLt**" was selected at step #8) Display scroll *"SET FLOATNG 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 TO1 direction:** (If "**FLt**" was selected at step #8) Display scrolls *"SELECT FLOATNG DIRECT REVERSE"* and the selected rotation direction. Select the desired direction, either: dIr: Direct "clockwise" (0 to 90º) or rEv: Reverse "counter clockwise" (90 to 0º) **Go directly to step #18.**	 *Default value: dIr (direct)*
12		**Set TO1 on-off closing level:** (If "**OnOf**" was selected at step #8) Display scrolls *"SELECT TO1 CLOSE PERCENT"* and the value of the closing level of the TO1 output. Select the percentage at which you want TO1 to close: at x% of the demand of the ramp that you selected at step # 9.	Range: 15 to 80 Increment: 1% *Default value: 40 (40% of the demand)*
13		**Set TO1 on-off opening level:** (If "**OnOf**" was selected at step #8) Display scrolls *"SELECT TO1 OPEN PERCENT"* and the value of the opening level of the TO1 output. Select the percentage at which you want TO1 to open: at x% of the demand of the ramp that you selected at step # 9.	Range: 0 to TO1 closing- 4% Increment: 1% *Default value: 0 (0% of the demand)*

Step	Display	Description	Values
14		**Set TO2 output signal:** Display scrolls *"SELECT TO2 OUTPUT SIGNAL"*. Select the desired signal output for TO2 output from the options provided: OnOf, PULs	 *Default value: on-off*
15		**Set TO2 signal ramp:** Display scrolls *"SELECT TO2 SIGNAL RAMP"*. Select the desired ramp for TO2 from the options provided: Hr1: Heating ramp 1, Hr2: Heating ramp 2, Cr1: Cooling ramp 1, Cr2: Cooling ramp 2, CO2: CO2 alarm, OFF. If "**PULs**" was selected at step #14, you can only choose Hr1 or Hr2. **If you selected pulse signal at step #14, go directly to step #18.** **If you selected OFF, go directly to step #18.**	 *Default value: Hr1 (Heating ramp 1)*
16		**Set TO2 on-off closing level:** (If "**OnOf**" was selected at step #14) Display scrolls *"SELECT TO2 CLOSE PERCENT"* and the value of the closing level of the TO2 output. Please select the percentage at which you want TO2 to close: x% of the demand of the ramp that you selected at step #15.	Range: 15 to 80 Increment: 1% *Default value: 40 (40% of the demand)*
17		**Set TO2 on-off opening level:** (If "**OnOf**" has been selected at step #14) Display scrolls *"SELECT TO2 OPEN PERCENT"* and the value of the opening level of the TO2 output. Select the percentage at which you want TO2 to open: at x% of the demand of the ramp that you selected at step #15.	Range: 0 to TO2 closing- 4% Increment: 1% *Default value: 0 (0% of the demand)*
18*		**Set TO3 output signal:** Display scrolls *"SELECT TO3 OUTPUT SIGNAL"*. Select the desired signal output for TO3 output, either **OnOF** (On-Off), **PULs** (Pulse) or **FLt** (Floating).	 *Default value: on-off*
19*		**Set TO3 signal ramp:** Display scrolls *"SELECT TO3 SIGNAL RAMP"*. Select the desired ramp for TO3 from the options provided: Hr1: Heating ramp 1, Hr2: Heating ramp 2, Cr1: Cooling ramp 1, Cr2: Cooling ramp 2, CO2: CO2 alarm, OFF. If "**PULs**" was selected at step #18, you can only choose Hr1 or Hr2. **If you selected OnOF at step #18, go directly to step #22.** **If you selected PULs at step #18 or OFF here, go directly to step #24.**	 *Default value: Cr1 (Cooling ramp 1)*

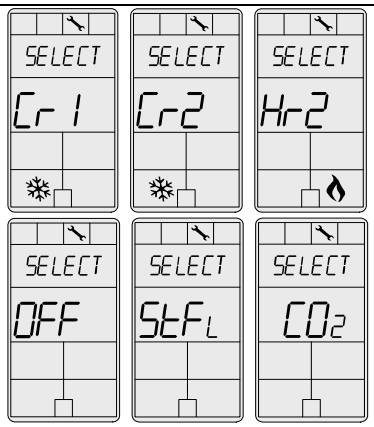
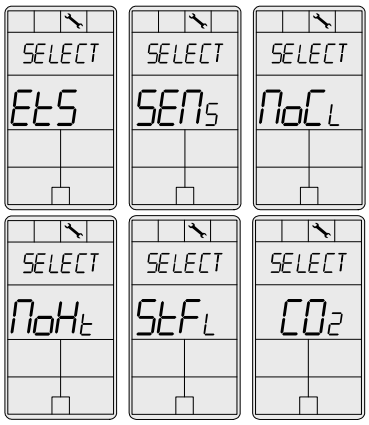
**Only on selected models*

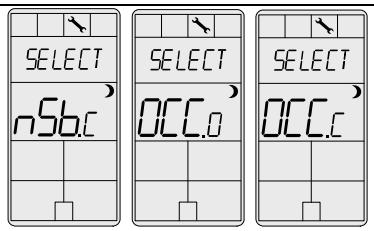
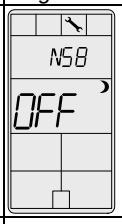
Step	Display	Description	Values
20*		**Set TO3 floating time:** (If "**FLt**" was selected at step #18) Display scroll *"SET FLOATNG TIME IN SECONDS"* and the floating time value (in seconds). Please select desired value of the floating time signal.	Range: 15 to 250 sec. Increment: 5 sec. *Default value: 100 sec.*
21*		**Set TO3 direction:** (If "**FLt**" was selected at step #18) Display scrolls *"SELECT FLOATNG DIRECT REVERSE"* and the selected rotation direction. Select the desired direction, either: dIr: Direct "clockwise" (0 to 90º) or rEv: Reverse "counter clockwise" (90 to 0º) **Go directly to step #28.**	 *Default value: dIr (direct)*
22*		**Set TO3 on-off closing level:** (If "**OnOf**" was selected at step #18) Display scrolls *"SELECT TO3 CLOSE PERCENT"* and the value of the closing level of the TO3 output. Select the percentage at which you want TO3 to close: at x% of the demand of the ramp that you selected at step #19.	Range: 15 to 80 Increment: 1% *Default value: 40 (40% of the demand)*
23*		**Set TO3 on-off opening level:** (If "**OnOf**" was selected at step #18) Display scrolls *"SELECT TO3 OPEN PERCENT"* and the value of the opening level of the TO3 output. Select the percentage at which you want TO3 to open: at x% of the demand of the ramp that you selected at step #19.	Range: 0 to TO3 closing- 4% Increment: 1% *Default value: 0 (0% of the demand)*
24*		**Set TO4 output signal:** Display scrolls *"SELECT TO4 OUTPUT SIGNAL"*. Select the desired signal output for TO4 output from the options provided: OnOf, PULs .	 *Default value: on-off*
25*		**Set TO4 signal ramp:** Display scrolls *"SELECT TO4 SIGNAL RAMP"*. Select the desired ramp for TO4 from the options provided: Hr1: Heating ramp 1, Hr2: Heating ramp 2, Cr1: Cooling ramp 1, Cr2: Cooling ramp 2, CO2: CO2 alarm, OFF. If "**PULs**" was selected at step #24, you can only choose Hr1 or Hr2. **If you selected pulse signal at step #24, go directly to step #28.** **If you selected OFF, go directly to step #28.**	 *Default value: Hr1 (Heating ramp 1)*
26*		**Set TO4 on-off closing level:** (If "**OnOf**" was selected at step #24) Display scrolls *"SELECT TO4 CLOSE PERCENT"* and the value of the closing level of the TO4 output. Please select the percentage at which you want TO4 to close: x% of the demand of the ramp that you selected at step #25.	Range: 15 to 80 Increment: 1% *Default value: 40 (40% of the demand)*

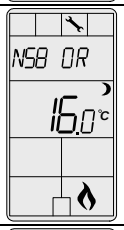
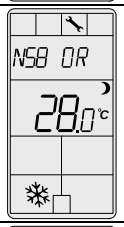
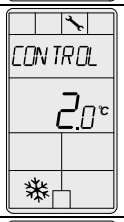
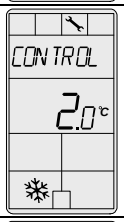
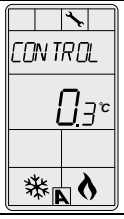
**Only on selected models*

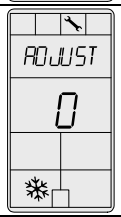
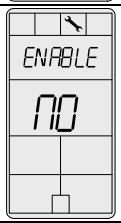
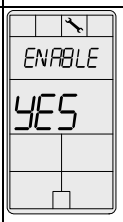
Step	Display	Description	Values
27*		**Set TO4 on-off opening level:** (If "**OnOf**" has been selected at step #24) Display scrolls *"SELECT TO4 OPEN PERCENT"* and the value of the opening level of the TO4 output. Select the percentage at which you want TO4 to open: at x% of the demand of the ramp that you selected at step #25.	Range: 0 to TO4 closing- 4% Increment: 1% *Default value: 0 (0% of the demand)*
28		**Set motor signal ramp:** Display scrolls *"SELECT MOTOR SIGNAL RAMP"*. Select which ramp you want for the motor from the options provided: Hr1: Heating ramp 1, Hr2: Heating ramp 2, Cr1: Cooling ramp 1, Cr2: Cooling ramp 2, COr: Change over ramp, CH1: Cool-Heat ramp 1 *(This option is used only on pressure independent models)* StFL: If this ramp is selected the Motor will be driven by the proportional input coming from the StFL *(This option is used only on pressure independent models)* *CH1 (cool-heat without change over) will make the actuator follow the demand in cooling & heating for ramp 1 (Cr1+Hr1).	 *Default value: Cr1 (Cooling ramp 1)*
29		**Set motor direction:** Display scrolls *"SELECT MOTOR DIRECT REVERSE"*. Select the desired direction you want for the motor, either: dir. "clockwise" (0 to 90º) or rEv. "counter clockwise" (90 to 0º)	 *Default value: direct (dir)*
30*		**Motor minimum position in cooling:** Display scrolls *"MOTOR MIN POS COOLING"* and the selected minimum position. The cool icon is also displayed. *Note: This option is used only on pressure dependant models and if Cr1, Cr2 or CO was selected at step #28.*	Range: 0 to 100% Increment: 5 % *Default value: 10%*
31*		**Motor minimum position in heating:** Display scrolls between *"MOTOR MIN POS HEATING"* and the selected minimum position. The heat icon is also displayed. *Note: This option is used only on pressure dependant models and if Hr1, Hr2 or CO was selected at step #28 and another output is using Hr1.*	Range: 0 to 100% Increment: 5 % *Default value: 10%*
32		**Set AO1 analog signal ramp:** Display scrolls *"SELECT AO1 ANALOG RAMP"*. Select the desired ramp for analog signal on AO1 from the options provided: Hr1: Heating ramp 1, Hr2: Heating ramp 2, Cr1: Cooling ramp 1, Cr2: Cooling ramp 2, CO2: CO2 alarm, StFL: If this ramp is selected the output will be driven by the proportional input coming from the StFL between min/max cooling (0-10Vdc) *(This option is used only on pressure independent models)* OFF.	 *Default value: Cr1 (Cooling ramp 1)*

**Only on selected models*

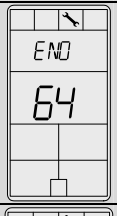
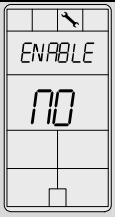
Step	Display	Description	Values
33		**Set AO2 analog signal ramp:** Display scrolls *"SELECT AO2 ANALOG RAMP"*. Select the desired ramp for analog signal on AO2 from the options provided: Hr1: Heating ramp 1, Hr2: Heating ramp 2, Cr1: Cooling ramp 1, Cr2: Cooling ramp 2, CO2: CO2 Ramp, StFL: If this ramp is selected the output will be driven by the proportional input coming from the StFL between min/max cooling (0-10Vdc) *(This option is used only on pressure independent models)* OFF. **If "OFF" was selected for AO1, go to step #36.** **If "OFF" is selected for AO1 & AO2, go to step #38.**	 *Default value: Hr1 (Heating ramp 1)*
34		**Minimum voltage of AO1 output:** (Only if "**OFF**" hasn't been selected at step #32) Display scrolls *"MIN VDC ANALOG AO1 OUTPUT"* and the value of the minimum voltage of the AO1 output. Select the desired value for the minimum voltage of AO1 output. (This is the "zero" value) The minimum value is restricted by the maximum value (step #35).	Range: 0.0 to 10.0 Volt Increment: 0.1 Volt *Default value: 0 Volt*
35		**Maximum voltage of AO1output:** (Only if "**OFF**" hasn't been selected at step #32) Display scrolls *"MAX VDC ANALOG AO1 OUTPUT"* and the value of the maximum voltage of the AO1 output. Select the desired value for the maximum voltage of AO1 output. (This is the "span" value). The maximum value is restricted by the minimum value (step #34).	Range: 0.0 to 10.0 Volt Increment: 0.1 Volt *Default value: 10.0 Volt*
36		**Minimum voltage of AO2 output:** (Only if "**OFF**" hasn't been selected at step #33) Display scrolls *"MIN VDC ANALOG AO2 OUTPUT"* and the value of the minimum voltage for the AO2 output. Select the desired value for the minimum voltage of AO2 output. (This is the "zero" value) The minimum value is restricted by the maximum value (step #37).	Range: 0.0 to 10.0 Volt Increment: 0.1 Volt *Default value: 0 Volt*
37		**Maximum voltage of AO2 output:** (Only if "**OFF**" hasn't been selected at step #33) Display scrolls *"MAX VDC ANALOG AO2 OUTPUT"* and the value of the maximum voltage for the AO2 output. Select the desired value for the maximum voltage of AO2 output. (This is the "span" value) The maximum value is restricted by the minimum value (step #36).	Range: 0.0 to 10.0 Volt Increment: 0.1 Volt *Default value: 10.0 Volt*
38		**Set AI1 input signal:** Display scrolls *"SELECT AI1 INPUT SIGNAL"*. Select the desired signal for AI1 input from the options provided: • 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), CO2 function: • CO2 (Connect an external CO2 sensor input to enable the control of the actuator for IAQ, 0-10 Vdc), Air flow set point function: *(This option is used only on pressure independent models)* • StF (0-10 Vdc), flow Set Point is proportional to 0-10Vdc also affected by cooling demand, 0Vdc=AirFlowCoolMin and 10Vdc =AirFlowCoolMax 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 SetPoint temperature, and cooling mode will be activated when temperature read by external sensor is below, **see step #41.**	 *Default value: OFF*

Step	Display	Description	Values
39		**Set AI2 input signal:** Display scrolls *"SELECT AI2 INPUT SIGNAL"*. Select the desired signal for AI2 input from the options provided (Same as AI1 see step #38) Note: AI1 input signal has priority over AI2, if you selected the same function, AI2 will not be functional.	*Default value: OFF*
40		**External temperature sensor Calibration:** (If "**EtS**" was selected at step #38 or 39) Display scrolls *"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 comparing with a known thermometer.	Range: -30 to 90ºC [-22 to 194.0ºF] (max. offset ± 5ºC) Increment: 0.1ºC [0.2ºF]
41		**Change over set point temperature:** (If "**SENs**" was selected at step #38 or 39) Display scrolls *"CH OVER SETPNT TEMPER"* and the change over setpoint temperature. Select the change over setpoint temperature. Note: heating mode will be activated when temperature read by external sensor is above the change over setpoint temperature, and cooling mode will be activated when temperature read by external sensor is below.	Range: 10 to 40ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 24ºC [75ºF]*
42		**CO2 maximum range:** (If "**CO2**" was selected at step #38 or 39) Display scrolls *"SELECT CO2 MAXIMUM"* and the value of the maximum CO2 reading in ppm.	Range: 100 to 5000 ppm Increment: 50 ppm *Default value: 2000 ppm*
43		**CO2 setpoint:** (If "**CO2**" was selected at step #38 or 39) Display scrolls *"CO2 SETPNT"* and the value of the setpoint of CO2 in ppm. This is the maximum tolerated CO2 value. Beyond this value an alarm will be activated. The motor will fully open and outputs assigned to CO2 alarm will also be activated The setpoint value is restricted by the CO2 maximum range (step # 42).	Range: 100 to 5000 ppm Increment: 10 ppm *Default value: 800 ppm*
44		**Set DI1 input signal:** Display scrolls *"SELECT DI1 CONTACT"*. Moon ☽ symbol is also displayed. Select the desired setting from the options provided: • nSb.o (Night set back, normally open) contact, • nSb.c (Night set back, normally close) contact, • OCC.o (Occupancy, normally open) contact • OCC.c (Occupancy, normally close) contact. **If you selected Occupancy, go directly to step #47.**	 *Default value:* *Night set back Normally open (nSb.o)*
45		**Night set back mode:** Select if you want to enable heating/cooling set point and override when in night set back by choosing "**StP**" or "**OFF**" to have all outputs turned off when in nigh set back. **If you selected Off, go directly to step #50.**	 *Default value: StP (Set point/override enabled)*
46		**Night set back override time :** Display scrolls *"NSB DELAY OVERIDE MINUTES"* and the override time in minute. NSB ☽ symbol is also displayed. Select the desired override time, if none is desired select "0". **Go to step #48.**	Range: 0 to 180 min. Increment: 15 min. *Default value: 120 min.*

Step	Display	Description	Values
47		**No occupancy override time :** (This option is only available if OCC.c or OCC.o was selected at step #44.) Display scrolls *"NO OCC DELAY OVERIDE MINUTES"* and the override time in minute. NSB ☽ symbol is also displayed. Select the desired derogation time; if none is desired select "0".	Range: 0 to 180 min. Increment: 15 min. *Default value: 120 min.*
48		**Heating setpoint during Night set back or No occupancy:** Display scrolls *"NSB OR NO OCC HEATING SETPNT"* and the value of the heating setpoint temperature during night set back or no occupancy. Moon ☽ and heating symbols are also displayed. Please select the heating setpoint temperature during night set back or no occupancy. The maximum value is restricted by the night set back or no occupancy cooling setpoint (step # 49).	Range: 10.0 to 40.0ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 16.0ºC [61ºF]*
49		**Cooling setpoint during Night set back or No occupancy:** Display scrolls *"NSB OR NO OCC COOLING SETPNT"* and the value of the cooling setpoint temperature during night set back or no occupancy. Moon ☽. Cooling symbols are also displayed. Select the cooling setpoint temperature during night set back or no occupancy. The minimum value is restricted by the night set back or no occupancy heating setpoint (step #48).	Range: 10.0 to 40.0ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 28.0ºC [82ºF]*
50		**Proportional band of changeover ramp:** Display scrolls *"CONTROL RAMP CH OVER"* and the value of the changeover ramp proportional band, cooling and heating symbols are also displayed. Select the desired value for changeover ramp proportional band.	Proportional band range: 0.5 to 5.0ºC [1 to 10ºF] Increment: 0.5ºC [1ºF] *Default value: 2.0ºC [4ºF]*
51		**Proportional band of heating ramp1:** Display scrolls *"CONTROL RAMP 1 HEATING"* and the value of the heating ramp1 proportional band, heating symbol is also displayed. Select the desired value for heating ramp1 proportional band.	Proportional band range: 0.5 to 5.0ºC [1 to 10ºF] Increment: 0.5ºC [1ºF] *Default value: 2.0ºC [4ºF]*
52		**Proportional band of heating ramp2:** Display scrolls *"CONTROL RAMP 2 HEATING"* and the value of the heating ramp2 proportional band, heating symbol is also displayed. Select the desired value for heating ramp2 proportional band.	Proportional band range: 0.5 to 5.0ºC [1 to 10ºF] Increment: 0.5ºC [1ºF] *Default value: 2.0ºC [4ºF]*
53		**Proportional band of cooling ramp1:** Display scrolls *"CONTROL RAMP 1 COOLING"* and the value of the cooling ramp1proportional band, cooling symbol is also displayed. Select the desired value for cooling ramp1proportional band.	Proportional band range: 0.5 to 5.0ºC [1 to 10ºF] Increment: 0.5ºC [1ºF] *Default value: 2.0ºC [4ºF]*
54		**Proportional band of cooling ramp2:** Display scrolls *"CONTROL RAMP 2 COOLING"* and the value of the cooling ramp2 proportional band, cooling symbol is also displayed. Select the desired value for cooling ramp2 proportional band.	Proportional band range: 0.5 to 5.0ºC [1 to 10ºF] Increment: 0.5ºC [1ºF] *Default value: 2.0ºC [4ºF]*
55		**Dead band of changeover ramp:** Display scrolls *"CONTROL DEAD BAND CH OVER"* and the value of the changeover ramp dead band, cooling and heating symbols are also displayed. Select the desired value for changeover ramp dead band.	Dead band range: 0 to 5.0ºC [0 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*

Step	Display	Description	Values
56		**Dead band of heating ramp1:** Display scrolls *"CONTROL DEAD BAND 1 HEATING"* and the value of the heating ramp1 dead band, heating symbol is also displayed. Select the desired value for heating ramp1 dead band.	Dead band range: 0 to 5.0ºC [0 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*
57		**Dead band of heating ramp2:** Display scrolls *"CONTROL DEAD BAND 2 HEATING"* and the value of the heating ramp2 dead band, heating symbol is also displayed. Select the desired value for heating ramp2 dead band.	Dead band range: 0 to 5.0ºC [0 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*
58		**Dead band in cooling ramp1:** Display scrolls *"CONTROL DEAD BAND 1 COOLING"* and the value of the cooling ramp1dead band, cooling symbol is also displayed. Select the desired value for cooling ramp1 dead band.	Dead band range: 0 to 5.0ºC [0 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*
59		**Dead band in cooling ramp2:** Display scrolls *"CONTROL DEAD BAND 2 COOLING"* and the value of the cooling ramp2 dead band, cooling symbol is also displayed. Select the desired value for cooling ramp2 dead band.	Dead band range: 0 to 5.0ºC [0 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*
60		**Anti-cycling delay cooling contact (protection for compressor):** Display scrolls *"COOLING ANTI CYCLE MINUTES"* and the value (in minutes) of the delay to activate / reactivate cooling contact. Select the desired value for the delay cooling contact.	Range: 0 to 15 min. Increment: 1 min. *Default value: 2 min.*
61		**Integration time factor setting for heating:** Display scrolls *"HEATING INTGRAL TIME IN SECONDS"* and the time in seconds for the integration factor compensation, heating symbol is also displayed. Select the desired value of the integration factor compensation.	Range: 0 to 250 seconds Increment: 5 seconds *Default value: 0 seconds*
62		**Integration time factor setting for cooling:** Display scrolls *"COOLING INTGRAL TIME IN SECONDS"* and the time in seconds for the integration factor compensation, cooling symbol is also displayed. Select the desired value of the integration factor compensation.	Range: 0 to 250 seconds Increment: 5 seconds *Default value: 0 seconds*
63		**Enable or disable anti-freeze protection:** Display scrolls *"ENABLE ANTI FREEZE PROTECT"*. You can enable or disable the Anti-freeze function. When enabled, if temperature drops to 4ºC [39ºF], heat will start even if thermostat is in OFF mode. Heat will stop when temperature reaches 5ºC [41ºF].	 *Default value: Disable (NO)*
64[1]		**Auto bauds rate:** Display scrolls *"AUTO BAUDS RATE"*. You can enable or disable the Auto bauds rate function. When enabled, the controller automatically detects the baud rate of the system and coordinates it and you cannot change the bauds rate value yourself. If disable, you must select yourself the right bauds rate at step #66.	 *Default value: Enable (YES)*

[1] *Only on BACnet models*

Step	Display	Description	Values
65[1]		**Auto bauds, current baud:** Display scrolls *"AUTO COMPORT BAUDS RATE.* and the detected baud rate. **Go to step #67.**	Range: 9600, 19200, 38400, 76800
66[1]		**Communication bauds rate:** Display scrolls *"ADJUST COMPORT BAUDS RATE"* and the value of the baud rate in kbps. Select the desired communication bauds from the options provided: 9.6. 19.2, 38.4, 76.8.	Range: 9600, 19200, 38400, 76800 Default value: 76.8 kbps
67[1]		**MAC address:** Display scrolls *"ADJUST MSTP MAC ADDRESS"* and the value of the MAC address. If dipswitches 0 to 7of DS1 on the EVC are all in the Off position, then you can change the MAC address by pressing the up and down arrow. Each device must have a unique MAC address on a network.	Range: 0 to 254 *Default value: 0*
68[1]		**Copy config:** Display shows *"COPY CONFIG"*. Select "**YES**" if you want to copy the configuration you did to this device to others on the network.	
69[1]		**Select "start" address:** Display shows *"SELECT BEGIN ADDRESS"*. Select the first address you want to copy to. For example if you select MAC address 1 here and 54 in the next step, all the devices from 1 to 54 will receive the configuration of the current device.	*Range: 0-254* *Default value: 0*
70[1]		**Select "end" address:** Display shows *"SELECT END ADDRESS"*. Select the last address you want to copy to. You cannot copy on more than 64 addresses at once.	*Range: begin address + 63* *Default value: begin address*
71[1]		**Copy config result:** Display shows "*COPY CONFIG SUCCEED*" if everything went ok. If not, you will be able to scroll the addresses and see the error message associated with each address. See the Annex section for the complete list of error messages.	 Error message example: *Program Mode Error for address 7*
72[1]		**Communication device instance:** Display scrolls *"ADJUST DEVICE INSTANC 0153000"*. To change the device, select *"YES"* and go to next step. If the device instance is not changed in programming mode (step #72 & 73), it will be automatically modified according to the MAC address selected by the DIP switch on the EVCB or in programming mode (step #67 or B4). **If you do not want to change the device, go directly to step #1.**	 *Default value: NO*
73[1]		**Communication device instance (cont'd):** Display scrolls the device address value. You can modify the device address by increasing or decreasing the blinking digit with "Δ" or "∇"buttons. To modify the next digit, on right, press ⊛, to return to the previous digit press ↵.	Range: 0 to 4194302 Increment: 1 digit *Default value: 0153000*

[1] *Only on BACnet models*

Air Flow & BACnet Program Mode (Available when in Operation Mode; JP1 set on RUN)

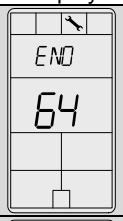
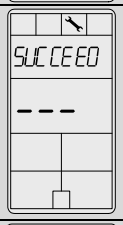
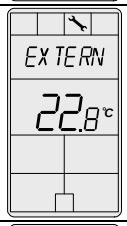
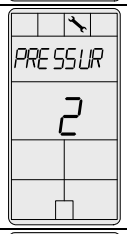
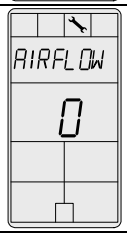
Push on both (*) and (↵) buttons for 5 seconds to access the user air flow program mode.

Step	Display	Description	Values
F1		**Password:** Display scrolls *"ENTER PASSWRD"* and *000*. You have 1 minute to enter the password using the arrow buttons △ and ▽ increase or decrease the value, one digit at a time. Press (*) to move to the next digit and press (↵) to move one digit to the left. . When the password is correct press on (*). If you make a mistake, the screen displays *"**Eror**"* and the thermostat returns to normal operation mode. You will need to repeat this step.	Password: **637**

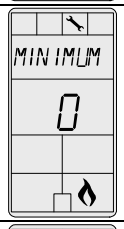
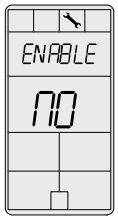
Once the password is entered and you are in the balancing mode, this symbol 🔧 is displayed. Press on the (*) button to advance to the next program function, press on the (↵) button to return to previous step and press on the △ or ▽ button to change value. The system will exit the menus and return to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

Step	Display	Description	Values
B1[1]		**Auto bauds rate:** Display scrolls *"AUTO BAUDS RATE"*. You can enable or disable the Auto bauds rate function. When enabled, the EVC automatically detects the baud rate of the system and coordinates it and you cannot change the bauds rate value yourself. If disable, you must select yourself the right bauds rate at step #B3.	 *Default value: Enable (YES)*
B2[1]		**Auto bauds, current baud:** Display scrolls *"AUTO COMPORT BAUDS RATE*. and the detected baud rate. **Go to step #B4.**	Range: 9600, 19200, 38400, 76800
B3[1]		**Communication bauds rate:** Display scrolls *"ADJUST COMPORT BAUDS RATE"* and the value of the baud rate in kbps. Select the desired communication bauds from the options provided: 9.6, 19.2, 38.4, 76.8.	Range: 9600, 19200, 38400, 76800 Default value: 76.8 kbps
B4[1]		**MAC address:** Display scrolls *"ADJUST MSTP MAC ADDRESS"* and the value of the MAC address. If dipswitches 0 to 7of DS1 on the EVC are all in the Off position, then you can change the MAC address by pressing the up and down arrow. Each device must have a unique MAC address on a network.	Range: 0 to 254 *Default value: 0*
B5[1]		**Copy config:** Display shows *"COPY CONFIG"*. Select "**YES**" if you want to copy the configuration you did to this device to others on the network.	
B6[1]		**Select "start" address:** Display shows *"SELECT BEGIN ADDRESS"*. Select the first address you want to copy to. For example if you select MAC address 1 here and 54 in the next step, all the devices from 1 to 54 will receive the configuration of the current device.	*Range: 0-254* *Default value: 0*

[1] *Only on BACnet models*

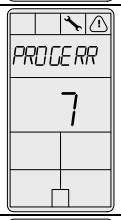
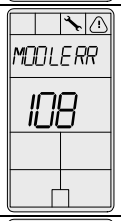
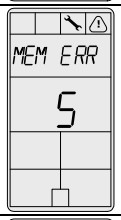
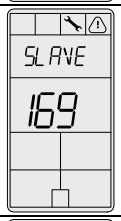
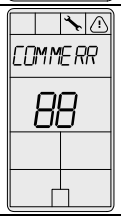
Step	Display	Description	Values
B7[1]		**Select "end" address:** Display shows *"SELECT END ADDRESS"*. Select the last address you want to copy to. You cannot copy on more than 64 addresses at once.	*Range: begin address + 63* *Default value: begin address*
B8[1]		**Copy config result:** Display shows "*COPY CONFIG SUCCEED*" if everything went ok. If not, you will be able to scroll the addresses and see the error message associated with each address. See the Annex section for the complete list of error messages.	 Error message example: *Program Mode Error for address 7*
B9[1]		**Communication device instance:** Display scrolls *"ADJUST DEVICE INSTANC 0153000"*. To change the device, select *"YES"* and go to next step. If the device instance is not changed in programming mode (step #72 & 73 or B9 & B10), it will be automatically modified according to the MAC address selected by the DIP switch on the EVCB or in programming mode (step #67 or B4). **If you do not want to change the device, go directly to step #F2.**	 *Default value: NO*
B10[1]		**Communication device instance (cont'd):** Display scrolls the device address value. You can modify the device address by increasing or decreasing the blinking digit with "Δ" or "∇"buttons. To modify the next digit, on right, press ⊛, to return to the previous digit press ↵.	Range: 0 to 4194302 Increment: 1 digit *Default value: 0153000*
F2		**Internal temperature sensor calibration:** Display scrolls *"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 is installed in an area where temperature is slightly different than the typical room temperature (thermostat placed 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**" was selected at step #38 or 39) Display scrolls *"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. *Note: This is the last menu for pressure dependant EVC.*	Range: -30 to 90ºC [-22 to 194.0ºF] (max. offset ± 5 ºC) Increment: 0.1ºC [0.2ºF]
F4[2]		**Pressure filter setting:** Display scrolls *"PRESSUR FILTER TIME IN SECONDS"* and the time in seconds for the numeric filter applied to the pressure analog input. Select the desired value for the numeric filter. This filter stabilizes the reading and slows the system's response time	Range: 1 to 10 seconds Increment: 1 seconds *Default value: 2 seconds*
F5[2]		**Integration time factor setting:** Display scrolls *"AIRFLOW INTGRAL TIME IN MINUTES"* and the time in minutes for the integration factor compensation. Select the desired value for the integration factor compensation.	Range: 0 to 60 min. Increment: 1 min. *Default value: 0 min.*

[1] *Only on BACnet models*
[2] *Only on pressure independent models*

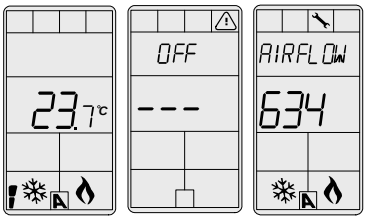
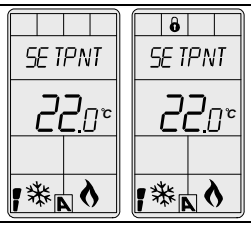
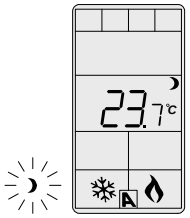
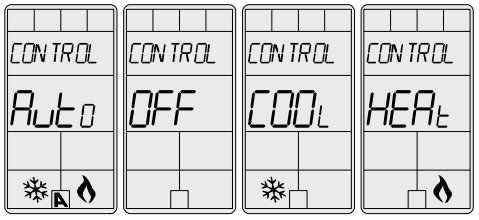
Step	Display	Description	Values
F6[2]		**Air flow K factor:** Display scrolls *"ADJUST AIRFLOW KFACTOR"* and the value of the k factor. V = k√ΔP when ΔP=1 Select the desired value for k factor. This value can be affected by the maximum airflow calibration (step # F13)	Range: 100 to 9995 Increment: 5 *Default value: 1200*
F7[2]		**Minimum cooling airflow:** Display scrolls *"MINIMUM COOLING AIRFLOW"* and the value of the minimum airflow in cooling. Select the desired value for the minimum airflow in cooling. The minimum value is restricted by the maximum value. (step #F8) NOTE: This option is only available if the Motor Signal Ramp is set to either Cr1, Cr2, COr or CH1 (step #28 programming mode).	Range: 0 to maximum cooling airflow - 5 Increment: 5 *Default value: 100*
F8[2]		**Maximum cooling airflow:** Display scrolls *"MAXIMUM COOLING AIRFLOW"* and the value of the maximum airflow in cooling. Select the desired value for the maximum airflow in cooling. The maximum value is restricted by the minimum value. (step #F7) NOTE: This option is only available if the Motor Signal Ramp is set to either Cr1, Cr2, COr or CH1 (step #28 programming mode).	Range: minimum cooling airflow + 5 to k factor Increment: 5 *Default value: 1000*
F9[2]		**Minimum heating airflow:** Display scrolls *"MINIMUM HEATING AIRFLOW"* and the value of the minimum airflow in heating. Select the desired value for the minimum airflow in heating. The minimum value is restricted by the maximum value. (step #F10) NOTE: This option is only available if the Motor Signal Ramp is set to either Hr1, Hr2, COr or CH1 (step #28 programming mode).	Range: 0 to maximum heating airflow - 5 Increment: 5 *Default value: 100*
F10[2]		**Maximum heating airflow:** Display scrolls *"MAXIMUM HEATING AIRFLOW"* and the value of the maximum airflow in heating. Select the desired value for the maximum airflow in heating. The maximum value is restricted by the minimum value. (step #F9) NOTE: This option is only available if the Motor Signal Ramp is set to either Hr1, Hr2, COr or CH1 (step #28 programming mode).	Range: minimum heating airflow + 5 to k factor Increment: 5 *Default value: 1000*
F11[2]		**Enable or disable airflow balancing:** Display scrolls *"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 access the min & max airflow calibration menus and will have 1 hour before returning to operation mode if no buttons are pressed. Changed values will automatically be saved.	 *Default value: Disable (No)*
F12[2]		**Minimum airflow calibration:** Display scrolls *"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 box at minimum airflow. When the value on thermostat is stable, you can adjust the calibration of the sensor by comparing 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 (max. offset ± ½ value) Increment: 1
F13[2]		**Maximum airflow calibration:** Display scrolls *"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 box at maximum airflow. When the value on thermostat is stable, you can adjust the calibration of the sensor by comparing with the reading on a manometer or a balometer. The KFactor (step #F6) will be affected by this adjustment If you can't stabilize the system, you will need to increase the filter value (step #F4). **Go back to step #F11.**	Range: 0 to 9999 (max. offset ± ½ value) Increment: 1

[2] *Only on pressure independent models*

Annex – Error Codes for Copy Config

CC1		**Succeed:** If there are problems with the copy, user will be able to scroll through the range of addresses to find out the error codes for each address. In the event that some worked, they will be labelled as "*COPY CONFIG SUCCEED*" with the address shown underneath.
CC2		**Program mode error:** Display shows "*COPY CONFIG PROGERR*" with the address shown underneath. The target device is in program mode, the copy is not possible.
CC3		**Device type error:** Display shows "*COPY CONFIG TYPEERR*" with the address shown underneath. The target device is not the same type as the source, the copy is not possible. For example trying to copy an EVC configuration to an EFC.
CC4		**Model type error:** Display shows "*COPY CONFIG MODLERR*" with the address shown underneath. The target device is not the same model as the source, the copy is not possible. For example trying to copy an EVCB74WIT2S configuration to an EVCB74WIT4S.
CC5		**Memory error:** Display shows "*COPY CONFIG MEM ERR*" with the address shown underneath. The target device is not the same application version (eeprom) as the source, the copy is not possible.
CC6		**Slave address:** Display shows "*COPY CONFIG SLAVE*" with the address shown underneath. The target device is at a slave address. It cannot respond to the master if the copy went ok or not. User should manually check to make sure copy was done correctly or avoid using slave addresses (128-254).
CC7		**Communication error:** Display shows "*COPY CONFIG COMMERR*" with the address shown underneath. No responses were received from the target device (after 3 tries). Either the address doesn't exist (not used) or there is a problem with wiring/noise.

Operation Mode

Step	Description	Display
A	At powering up, thermostat will light display and activate all LCD segments for 2 seconds. **Illuminating the LCD.** To illuminate the LCD, simply press 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 has short circuited. To change the scale between ºC and ºF, press on ↵ button. **Air flow display*** To display the air flow, press on ✶ button for 5 seconds. The screen displays *"AIRFLOW"* and the value for 5 seconds. *(This option is used only on pressure independent models)*	
B	**Setpoint display and adjustment:** To display the setpoint, press twice on Δ or ∇. Setpoint will be displayed for 3 seconds. To adjust setpoint, press on Δ or ∇ while the temperature setpoint is displayed. *Note: If setpoint adjustment has been locked, 🔒 symbol will be displayed.*	
C	**Night set back (NSB) or no occupancy:** When thermostat is in night set back or no occupancy mode, moon symbol ☽ is displayed, so setpoint for cooling and/or heating are increased as per the setting made in programming mode. If not locked, night set back or no occupancy can be overridden for a predetermined period by pressing any of the 4 buttons. During the override period the ☽ symbol will flash. If ☽ does not flash, the override period is finished or the night set back or no occupancy override 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 for 5 seconds. To change control mode, press on Δ or ∇while control mode is displayed. Select 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.*	

**Only on selected models*

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**.

Notes:

400 Lebeau Blvd, Montreal, Qc, H4N 1R6, CANADA

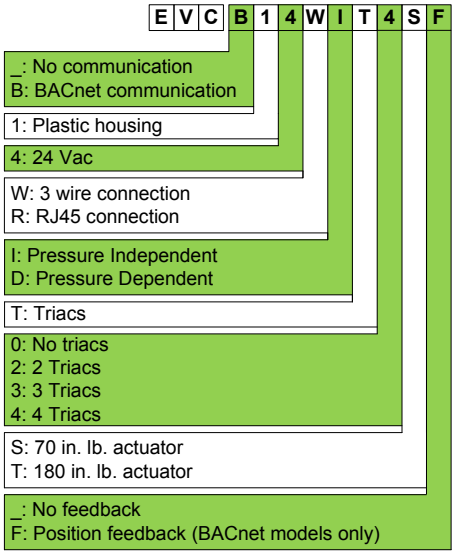
www.neptronic.com

Toll free in *North America*: 1 800 361-2308
Tel.: (514) 333-1433
Fax: (514) 333-3163
Customer service Fax: (514) 333-1091
Business hours: from Monday to Friday, 8:00am to 5:00pm (Eastern time)

Electronic VAV Controller
Specification & Installation Instructions

Features:

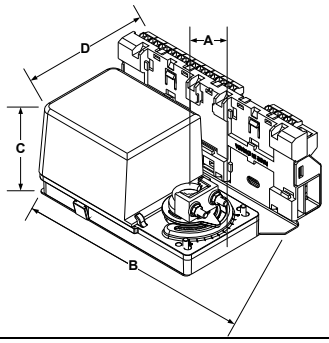
- LED indication of relay status
- Quality “non strip” terminals
- 24 Vac thermal fuse
- Selectable analog and digital output
- Precise temperature control with programmable PI function
- Selectable Fahrenheit or Celsius scale
- Manual night set back or no occupancy override
- Multi level lockable access menu
- Lockable setpoint
- Selectable internal or external temperature sensor (10KΩ)
- Change over by contact or external temperature sensor
- On board differential pressure sensor (depending on models)
- Pressure sensor air flow program available
- Selectable proportional control band and dead band
- Anti-freeze protection
- BACnet® MS/TP @ 9600, 19200, 38400, 76800 bps available
- Selectable device instance via technician menu
- Selectable MAC Address by dip switch on the EVCB



Technical Data	EVC
Torque	70 in.lb. [8 Nm] or 180 in.lb. [20 Nm] at rated voltage
Power consumption	10 VA max
Running time through 90º	95 seconds ±10%
Power supply	22 to 26 Vac 50/60 Hz
Inputs	2 thermistor inputs
	2 digital inputs
	Differential pressure sensor 0-1.0” WC (on pressure independent models)
Outputs	2 analog outputs (0-10 Vdc)
	Up to 4 TRIAC outputs 24 Vac, 500mA max fused / TRIAC
Communication	BACnet® MS/TP @ 9600, 19200, 38400 or 76800 bps (on EVCB models)
Communication connection	24 AWG twisted-shield cable (Belden 9841 or equivalent)
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
Weight	1.8 kg. [4 lb]

Dimensions

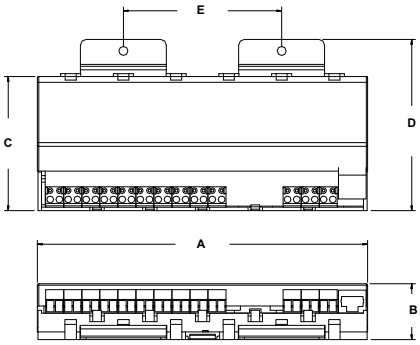
EVC with 70 in. lb. actuator



Dimension	Imperial (in)	Metric (mm)
A	1.50	38
B	7.2	183
C	3.2	82
D	5.1	128
Tubing ID*	1/8	3.175

**On pressure independent models*

EVC for 180 in. lb. actuator

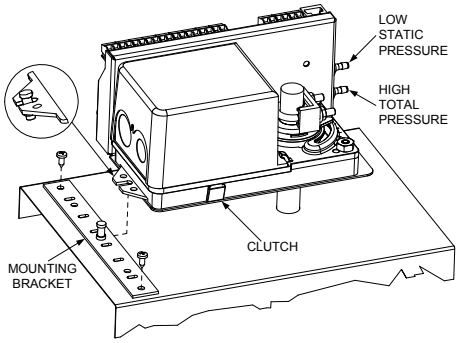


Dimension	Imperial (in)	Metric (mm)
A	7.20	182.9
B	1.22	31.0
C	2.93	74.3
D	3.74	94.9
E	3.45	87.6
Tubing ID*	1/8	3.175

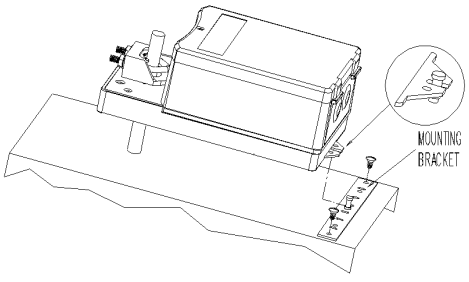
**On pressure independent models*

⚠ **The actuator will do an auto-stroke on power up. When changing the actuator adjustment screws, make sure to cycle power to initiate the auto-stroke. Auto-stroke is not available on EVC pressure independent without feedback (EVC**x**14**x**IT**xx**).**

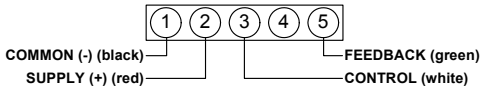
Installation



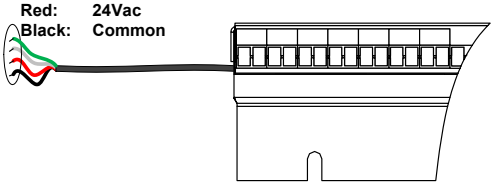
1. Manually close the damper blades and positioned the actuator at 0º or 90º.
2. Slide the actuator onto the shaft.
3. Tighten the nuts on the “U” bolt to the shaft with an 8mm wrench to a torque of 60 in.lb. [6.7 Nm].
4. Slide the mounting bracket under the actuator. Ensure free movement of the slot at the base of the actuator. The bracket pin must be placed in the mid distance of the slot.
5. Fix the bracket to the ductwork with #8 self-tapping screws.



Terminal in the actuator



Green: **Feedback**
White: **Control**
Red: **24Vac**
Black: **Common**



1. Manually close the damper blades and positioned the actuator at 0º or 90º.
2. Slide the actuator onto the shaft.
3. Tighten the nuts on the “U” bolt to the shaft with an 8mm wrench to a torque of 150 in.lb. [17 Nm].
4. Slide the mounting bracket under the actuator. Ensure free movement of the slot at the base of the actuator. The bracket pin must be placed in the mid distance of the slot.
5. Fix the bracket to the ductwork with #8 self-tapping screws.
6. Connect the cable from the EVC to the terminal in the actuator as shown here.

Terminal Descriptions

Low Voltage Supply (TB1)
1- Common
2- Common
3- 24 Vac Input
4- 24 Vac Input

Triac Output (TB2)*
1- Triac 24 Vac input for TO1/TO2
2- Triac Output 1 (TO1)
3- Common
4- Triac Output 2 (TO2)
5- Triac 24 Vac input for TO3/TO4
6- Triac Output 3 (TO3)
7- Common
8- Triac Output 4 (TO4)

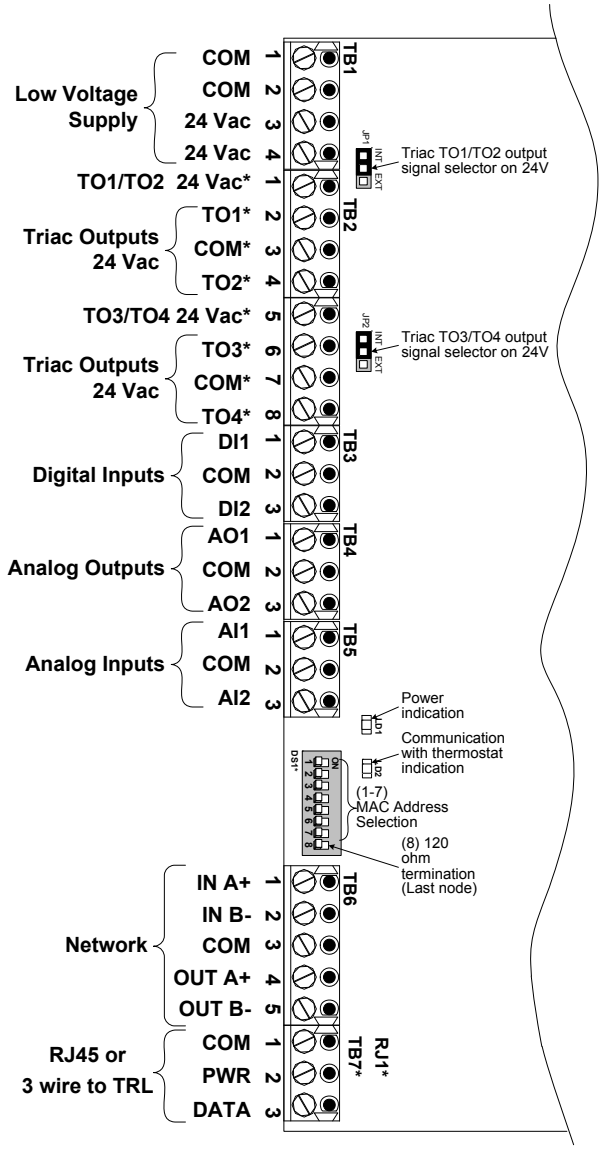
Digital Input (TB3)
1- Digital Input 1 (DI1)
2- Common (DI1 & DI2)
3- Digital Input 2 (DI2)

Analog Output (TB4)
1- Analog Output 1 (AO1)
2- Common (AO1 & AO2)
3- Analog Output 2 (AO2)

Analog Input (TB5)
1- Analog Input 1 (AI1)
2- Common (AI1 & AI2)
3- Analog Input 2 (AI2)

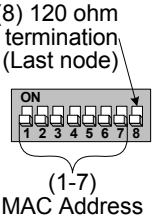
Network (TB6)
1- Input (IN A+)
2- Input (IN B+)
3- Common
4- Output (A+)
5- Output (B-)

Thermostat Connection (TB7 or RJ1)*
1- Common
2- Power
3- Data
Note: If RJ45, simply connect Ethernet cable to RJ1



* Option

BACnet® MAC address dip switch

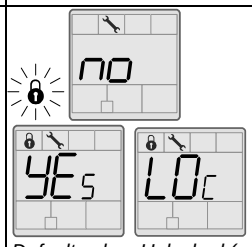
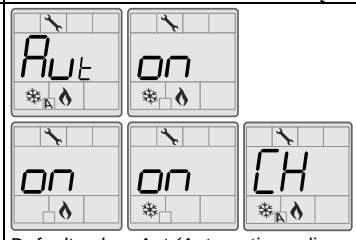
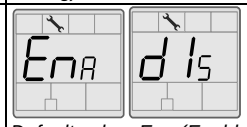
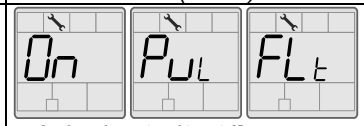
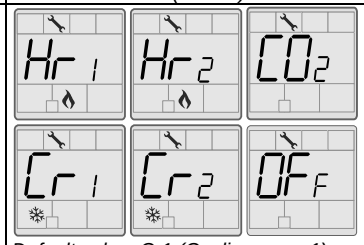
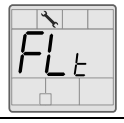
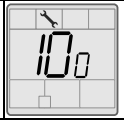


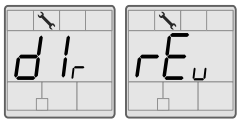
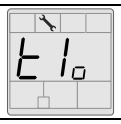
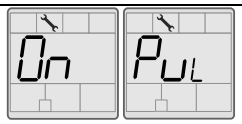
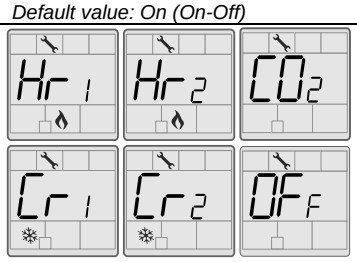
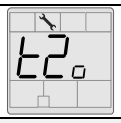
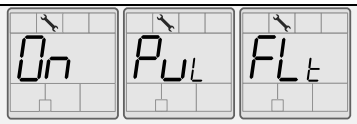
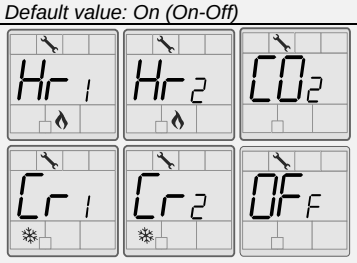
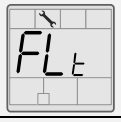
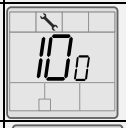
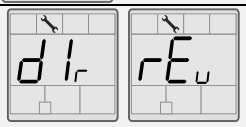
MSTP/MAC address for communication, are selectable in binary logic by dip switch.
If you do not change device instance in programme mode, it will be automatically modified according to the MAC address.

	B0	B1	B2	B3	B4	B5	B6	
MAC Address	**DS.1**	**DS.2**	**DS.3**	**DS.4**	**DS.5**	**DS.6**	**S.7**	**Default Device Instance**
0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	153000
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	153001
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	153002
3	ON	ON	OFF	OFF	OFF	OFF	OFF	153003
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	153004
…	…	…	…	…	…	…	…	…
126	OFF	ON	ON	ON	ON	ON	ON	153126
127	ON	ON	ON	ON	ON	ON	ON	153127

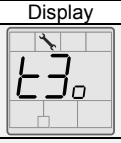
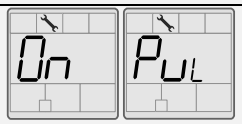
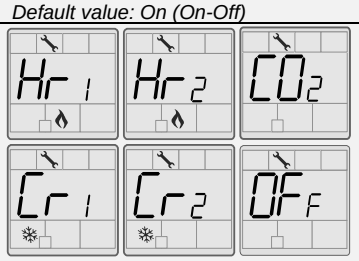
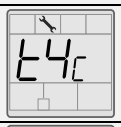
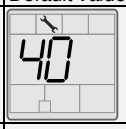
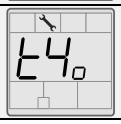
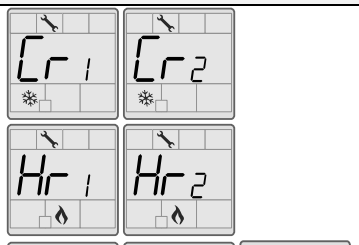
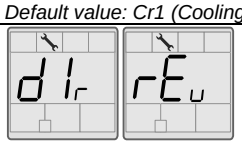
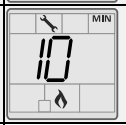
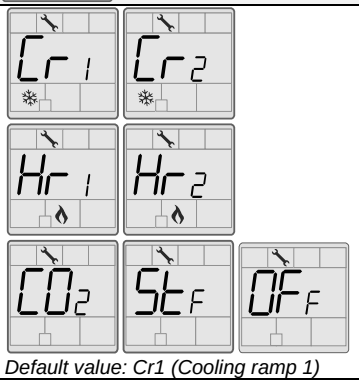
Programming Mode

When in this mode the symbol is displayed. Press on the (*) button to advance to the next program function. Press on the button (↵) to return to the previous function and press on the arrow buttons △ or ▽ to change values. You can exit the programming mode at any time. Changed values will automatically be recorded.

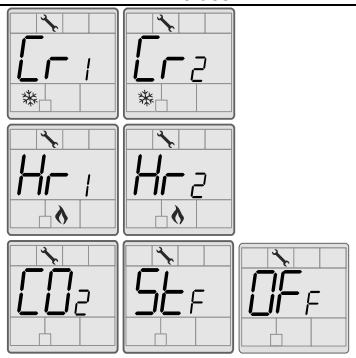
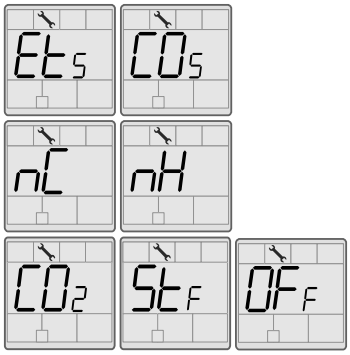
Step	Display	Description	Values
1		**Internal temperature sensor Calibration:** Display scrolls between "**tS1**" and temperature read by internal temperature sensor. You can adjust the calibration of the sensor by comparison with a known thermometer. For example if thermostat was installed in an area where temperature is slightly different than the typical room temperature (thermostat placed right under the air diffuser).	 Range : 10 to 40ºC [50 to 104ºF] Increment: 0.1ºC [0.2ºF] (max. offset ± 5ºC) (Factory calibrated)
2		**Minimum setpoint:** Display scrolls between "**StP**" and the minimum setpoint temperature. **MIN** is also displayed. Select the desired minimum setpoint 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 setpoint** Display scrolls between "**StP**" and the maximum setpoint temperature. **MAX** is also displayed. Select the desired maximum setpoint 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 setpoint :** Display scrolls between "**LOc**" and the selected value. You can lock or unlock the setpoint adjustment by end user. If locked the lock symbol will appear.	 *Default value: Unlocked (no)*
5		**Adjust setpoint:** Display scrolls between "**StP**" and the temperature setpoint. Select the desired setpoint. It should be within the temperature range.	 Setpoint range : 10 to 40ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 22ºC [72ºF]*
6		**Adjust the control mode:** Display scrolls between "**CtL**" and "**Aut**". Select which control mode to authorize: Automatic, cooling or heating, heating only or cooling only (represented by "on" and the symbols in the lower portion of the screen). If you want to authorize all modes, choose Automatic mode. ON mode will the user allow to switch between heat & cool mode. If you want to authorize only Automatic mode, select CH mode.	 *Default value: Aut (Automatic cooling and heating)*
7		**Set On/Off function enable or disable:** Display scrolls between "**OFF**" and "**EnA**". You can enable or disable the Off mode adjustment by end user.	 *Default value: Ena (Enable)*
8		**Set TO1 output signal:** Display scrolls between "**to1**" and "**On**" Select the desired signal output for TO1 output, either **On** (On-Off), **PuL** (Pulse) or **FLt** (Floating).	 *Default value: On (On-Off)*
9		**Set TO1 signal ramp:** Display scrolls between "**to1**" and the selected ramp. Select the desired ramp for TO1 from the options provided: Hr1, Hr2, Cr1, Cr2, CO2 (CO^2 alarm), OFF. If "**PUL**" was selected at step #8, you can only choose Hr1 or Hr2. **If you selected On at step #8, go directly to step #12.** **If you selected PuL at step #8 or OFF here, go directly to step #14.**	 *Default value: Cr1 (Cooling ramp 1)*
10		**Set TO1 floating time:** (If "**FLt**" was selected at step #8) Display scroll "**FLt**" 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.*

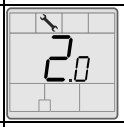
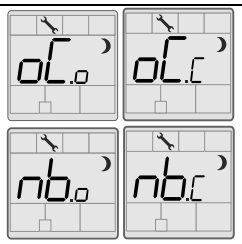
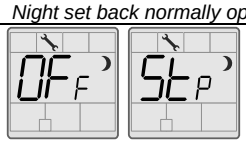
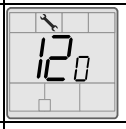
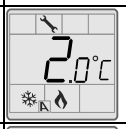
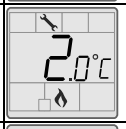
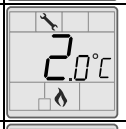
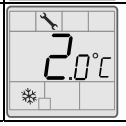
Step	Display	Description	Values
11		**Set TO1 direction:** (If "**FLt**" was selected at step #8) Display scrolls between "**FLt**" and the selected rotation direction. Select the desired direction, either: dIr: Direct "clockwise" (0 to 90º) or rEv: Reverse "counter clockwise" (90 to 0º) **Go directly to step #18.**	 *Default value: dIr (direct)*
12		**Set TO1 on-off closing level:** (If "**On**" was selected at step #8) Display scrolls between "**t1c**" and the value of the close position of the TO1 output. Please select at which percentage you want TO1 to close: x% of demand of the ramp that you selected at step #9.	 Range: 15 to 80 Increment: 1% *Default value: 40 (40% of the demand)*
13		**Set TO1 on-off opening level:** (If "**On**" has been selected at step #8) Display scrolls between "**t1o**" and the value of the opening level of the TO1 output. Select the percentage at which you want TO1 to open: at x% of the demand of the ramp selected at step # 9.	Range: 0 to (T1c - 4%) Increment: 1% *Default value: 0 (0% of the demand)*
14		**Set TO2 output signal:** Display scrolls between "**to2**" and "**On**" Select the desired signal output for TO2 output, either On or PuL.	 *Default value: On (On-Off)*
15		**Set TO2 signal ramp:** Display scrolls between "**to2**" and the selected ramp. Select the desired ramp for TO2 from the options provided: Hr1, Hr2, Cr1, Cr2, CO2 (CO^2 alarm), OFF If "**PUL**" has been selected at step #14, you can only choose Hr1 or Hr2. **If you selected pulse signal at step #14, go directly to step #18.** **If you selected "OFF", go directly to step #18.**	 *Default value: Hr1 (Heating ramp 1)*
16		**Set TO2 on-off closing level:** (If "**On**" was selected at step #14) Display scrolls between "**t2c**" and the value of the close position of the TO2 output. Please select at which percentage you want TO2 to close: x% of demand of the ramp selected at step #15.	 Range: 15 to 80 Increment: 1 % *Default value: 40 (40% of the demand)*
17		**Set TO2 on-off opening level:** (If "**On**" has been selected at step #14) Display scrolls between "**t2o**" and the value of the opening level of the TO2 output. Select the percentage at which you want TO2 to open: at x% of the demand of the ramp that you selected at step #15.	Range: 0 to (T2c - 4%) Increment: 1% Default value: 0 (0% of the demand)
18*		**Set TO3 output signal:** Display scrolls between "**to3**" and "**On**" Select the desired signal output for TO1 output, either **On** (On-Off), **PuL** (Pulse) or **FLt** (Floating).	 *Default value: On (On-Off)*
19*		**Set TO3 signal ramp:** Display scrolls between "**to3**" and the selected ramp. Select the desired ramp for TO3 from the options provided: Hr1, Hr2, Cr1, Cr2, CO2 (CO^2 alarm), OFF. If "**PUL**" was selected at step #18, you can only choose Hr1 or Hr2. **If you selected On at step #18, go directly to step #22.** **If you selected PuL at step #18 or OFF here, go directly to step #24.**	 *Default value: Cr1 (Cooling ramp 1)*
20*		**Set TO3 floating:** (If "**FLt**" was selected at step #18) Display scroll "**FLt**" 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.*
21*		**Set TO3 direction:** (If "**FLt**" was selected at step #18) Display scrolls between "**FLt**" and the selected rotation direction. Select the desired direction, either: dIr: Direct "clockwise" (0 to 90º) or rEv: Reverse "counter clockwise" (90 to 0º) **Go directly to step #28.**	 *Default value: dIr (direct)*
22*		**Set TO3 on-off closing level:** (If "**On**" was selected at step #18) Display scrolls between "**t3c**" and the value of the close position of the TO3 output. Please select at which percentage you want TO3 to close: x% of demand of the ramp that you selected at step #19.	 Range: 15 to 80 Increment: 1% *Default value: 40 (40% of the demand)*

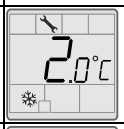
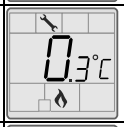
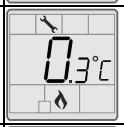
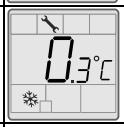
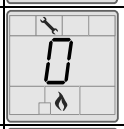
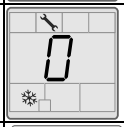
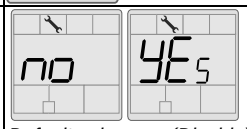
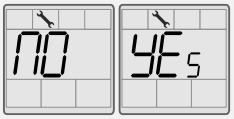
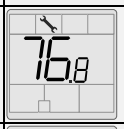
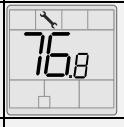
**Only on selected models*

Step	Display	Description	Values
23*		**Set TO3 on-off opening level:** (If "**On**" has been selected at step #18) Display scrolls between "**t3o**" and the value of the opening level of the TO3 output. Select the percentage at which you want TO3 to open: at x% of the demand of the ramp selected at step #19.	Range: 0 to (T3c - 4%) Increment: 1% Default value: 0 (0% of the demand)
24*		**Set TO4 output signal:** Display scrolls between "**to4**" and "**On**" Select the desired signal output for TO4 output, either On or PuL.	 *Default value: On (On-Off)*
25*		**Set TO4 signal ramp:** Display scrolls between "**to4**" and the selected ramp. Select the desired ramp for TO4 from the options provided: Hr1, Hr2, Cr1, Cr2, CO2 (CO^2 alarm), OFF If "**PUL**" has been selected at step #24, you can only choose Hr1 or Hr2. **If you selected pulse signal at step #24, go directly to step #28.** **If you selected "OFF", go directly to step #28.**	 *Default value: Hr1 (Heating ramp 1)*
26*		**Set TO4 on-off closing level:** (If "**On**" was selected at step #24) Display scrolls between "**t4c**" and the value of the close position of the TO4 output. Please select at which percentage you want TO4 to close: x% of demand of the ramp selected at step #25.	 Range: 15 to 80 Increment: 1 % *Default value: 40 (40% of the demand)*
27*		**Set TO4 on-off opening level:** (If "**On**" has been selected at step #24) Display scrolls between "**t4o**" and the value of the opening level of the TO4 output. Select the percentage at which you want TO4 to open: at x% of the demand of the ramp that you selected at step #25.	Range: 0 to (T4c - 4%) Increment: 1% Default value: 0 (0% of the demand)
28		**Set motor signal ramp:** Display scrolls between "**Mr**" and the selected ramp. Select the desired ramp for the motor from the options provided: Cr1: Cooling ramp 1, Cr2: Cooling ramp 2, Hr1: Heating ramp 1, Hr2: Heating ramp 2, CO: Change over ramp, CH1: Cool-Heat ramp 1 without change over will make the actuator follow the demand in cooling & heating for ramp 1 (Cr1+Hr1). Stf: If this ramp is selected the Motor will be driven by the proportional input coming from the Stf *CH1 and Stf options are used only on pressure independent models*	 *Default value: Cr1 (Cooling ramp 1)*
29		**Set motor direction:** Display scrolls between "**Mr**" and the selected rotation direction. Select the desired direction for the motor, either: dIr: Direct "clockwise" (0 to 90º) or rEv: Reverse "counter clockwise" (90 to 0º)	 *Default value: dir (Direct)*
30*		**Motor minimum position in cooling:** Display scrolls between "**Pos**" and the selected minimum position. The cool icon is also displayed. *Note: This option is used only on pressure dependant models and if Cr1, Cr2 or CO was selected at step #28.*	 Range: 0 to 100% Increment: 5 % *Default value: 10%*
31*		**Motor minimum position in heating:** Display scrolls between "**Pos**" and the selected minimum position. The heat icon is also displayed. *Note: This option is used only on pressure dependant models and if Hr1, Hr2 or CO was selected at step #28 and another output is using Hr1.*	 Range: 0 to 100% Increment: 5 % *Default value: 10%*
32		**Set AO1 signal ramp:** Display scrolls between "**Ao1**" and the selected ramp. Select the desired ramp for AO1 from the options provided: Cr1: Cooling ramp 1, Cr2: Cooling ramp 2, Hr1: Heating ramp 1, Hr2: Heating ramp 2, CO2: CO2 alarm, Stf: If this ramp is selected the output will be driven by the proportional input coming from the Stf between min/max cooling (0-10Vdc). *(This option is used only on pressure independent models)* OFF.	 *Default value: Cr1 (Cooling ramp 1)*

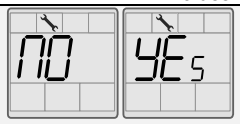
**Only on selected models*

Step	Display	Description	Values
33		**Set AO2 signal ramp:** Display scrolls between "**Ao2**" and the selected ramp. Select the desired ramp for AO2 from the options provided: Cr1: Cooling ramp 1, Cr2: Cooling ramp 2, Hr1: Heating ramp 1, Hr2: Heating ramp 2, CO2: CO2 alarm, Stf: If this ramp is selected the output will be driven by the proportional input coming from the Stf between min/max cooling (0-10Vdc). *(This option is used only on pressure independent models)* OFF. **If "OFF" was selected for Ao1, go to step #36.** **If "OFF" is selected for Ao1 & Ao2, go to step #38.**	 *Default value: Hr1 (Heating ramp 1)*
34		**Minimum voltage of AO1 output:** (Only if "**OFF**" hasn't been selected at step #32) Display scrolls between "**Ao1**" and the value of the minimum voltage of the AO1 ramp. **MIN** symbol is also displayed. Select the desired value for the minimum voltage of the AO1 output. (This is the "zero" value) The minimum value is restricted by the maximum value. (step #35)	 Range: 0.0 to 10.0 Volt Increment: 0.1 Volt *Default value: 0.0 Volt*
35		**Maximum voltage of AO1 output:** (Only if "**OFF**" hasn't been selected at step #32) Display scrolls between "**Ao1**" and the value of the maximum voltage of the AO1 ramp. **MAX** symbol is also displayed. Select the desired value for the maximum voltage of the AO1 output. (This is the "span" value) The maximum value is restricted by the minimum value. (step #34)	 Range: 0.0 to 10.0 Volt Increment: 0.1 Volt *Default value: 10.0 Volt*
36		**Minimum voltage of AO2 output:** (Only if "**OFF**" hasn't been selected at step #33) Display scrolls between "**Ao2**" and the value of the minimum voltage of the AO2 ramp. **MIN** symbol is also displayed. Select the desired value of the minimum voltage for the AO2 output. (This is the "zero" value) The minimum value is restricted by the maximum value. (step #37)	 Range: 0.0 to 10.0 Volt Increment: 0.1 Volt *Default value: 0.0 Volt*
37		**Maximum voltage of AO2 output:** (Only if "**OFF**" hasn't been selected at step #33) Display scrolls between "**Ao2**" and the value of the maximum voltage of the AO2 ramp. **MAX** symbol is also displayed. Select the desired value for the maximum voltage of the AO2 output. (This is the "span" value) The maximum value is restricted by the minimum value. (step #36)	 Range: 0.0 to 10.0 Volt Increment: 0.1 Volt *Default value: 10.0 Volt*
38		**Set AI1 input signal:** Display scrolls between "**AI1**" and the selected input. Select the desired signal for AI1 input from the options provided: • OFF (input not used), • Ets (external temperature sensor 10KΩ), Changeover function: • COs (external change over sensor 10KΩ), Heating mode activated when temperature read by external sensor is above the change over setpoint temperature, and cooling mode activated when temperature read by external sensor is lower, **see step #41.** • nC (change over contact normally cool), Heating mode activated when contact is closed. Cooling mode activated when contact is opened. • nH (change over contact normally heat), Cooling mode activated when contact is closed. Heating mode activated when contact is opened. CO^2 function: • CO2 (Connect an external CO2 sensor input to enable the control of the actuator for IAQ, 0-10 Vdc) Air flow set point function: • StF (0-10 Vdc) Flow Set Point is proportional to 0-10Vdc also affected by cooling demand, 0Vdc=AirFlowCoolMin and 10Vdc =AirFlowCoolMax. *(This option is used only on pressure independent models)*	 *Default value: OFF*
39		**Set AI2 input signal:** Display scrolls between "**AI2**" and the selected input. Select the desired signal for AI2 input from the options provided: (Same as AI1 see step #38) Note: AI1 input signal has priority to AI2, if you have selected the same function AI2 will not be functional.	*Default value: OFF*
40		**External temperature sensor Calibration:** (If ''**Ets**'' was selected at step #38 or 39) Display scrolls between "**Ets**" 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 "**Err**". You can adjust the calibration of the external sensor by comparison with a known thermometer.	 Range: -30 to 90ºC [-22 to 194.0ºF] (max. offset ± 5ºC) Increment: 0.1ºC [0.2ºF]

Step	Display	Description	Values
41		**Change over setpoint temperature:** (If ''**COs**'' was selected at step #38 or 39) Display scrolls between "**tCo**" and the change over setpoint temperature. Select the change over setpoint temperature. Note: heating mode will be activated when temperature read by external sensor is above the change over setpoint 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 [75ºF]*
42		**CO2 maximum range:** (If ''**CO2**'' was selected at step #38 or 39) Display scrolls between "**C0$_2$**" and the value of the maximum CO2 reading in ppm.	 Range: 100 to 5000 ppm Increment: 50 ppm (0-1000) or 100ppm (1000-5000) *Default value: 2000 ppm*
43		**CO2 setpoint:** (If ''**CO2**'' was selected at step #38 or 39) Display scrolls between "**C0$_2$**" and the value of the setpoint of CO2 in ppm. This is the maximum tolerated CO2 value. Beyond this value an alarm will be activated. The motor will fully open and outputs assigned to CO2 alarm will also be activated. The setpoint value is restricted by the CO2 maximum range (step # 42).	 Range: 100 to 5000 ppm Increment: 10 ppm (0-1000) or 100 ppm (1000-5000) *Default value: 800 ppm*
44		**Set DI1 input signal:** Display scrolls between "**dI1**" and the selected value. Moon ☽ symbol is also displayed. You can choose: • nb.o (Night set back, normally open) contact, • nb.c (Night set back, normally close) contact, • oC.o (Occupancy, normally open) contact or • oC.c (Occupancy, normally close) contact. **If you selected Occupancy, go directly to step #47.**	 *Default value:* *Night set back normally open (nb.o)*
45		**Night set back mode:** Select if you want to enable heating/cooling set point and override when in night set back by choosing "**StP**" or "**OFF**" to have all outputs turned off when in nigh set back. **If you selected Off, go directly to step #50.**	 *Default value: StP (Set point/override enabled)*
46		**Night set back override time :** Display scrolls between "**nbt**" and the override time in minute. NSB ☽ symbol is also displayed. Select the desired override time, if no override time is desired select "0". **Go to step #48.**	 Range: 0 to 180 min. Increment: 15 min. *Default value: 120 min.*
47		**No occupancy override time :** (Only available if oC.o or oC.c was selected at step 44.) Display scrolls between "**oCt**" and the override time in minute. NSB ☽ symbol is also displayed. Select the desired override time. If no override time is desired select "0".	 Range: 0 to 180 min. Increment: 15 min. *Default value: 120 min.*
48		**Heating setpoint during Night set back or No occupancy:** Display scrolls between "**StP**" and the value of the heating setpoint temperature during night set back or no occupancy. Moon ☽ and heating symbols are also displayed. Select the heating setpoint temperature during night set back or no occupancy. The maximum value is restricted by the night set back or no occupancy cooling setpoint (step #49).	 Range: 10.0 to 40.0ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 16.0ºC [61ºF]*
49		**Cooling setpoint during Night set back or No occupancy:** Display scrolls between "**StP**" and the value of the cooling setpoint temperature during night set back or no occupancy. Moon ☽ and cooling symbols are also displayed. Select the cooling setpoint temperature during night set back or no occupancy. The minimum value is restricted by the night set back or no occupancy heating setpoint (step # 48).	 Range: 10.0 to 40.0ºC [50 to 104ºF] Increment: 0.5ºC [1ºF] *Default value: 28.0ºC [82ºF]*
50		**Proportional band of changeover ramp:** Display scrolls between "**Pbo**" and the value of the changeover ramp proportional band, cooling and heating symbols are also displayed. 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]*
51		**Proportional band of heating ramp1:** Display scrolls between "**Pb1**" and the value of the heating ramp1 proportional band, heating symbol is also displayed. 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]*
52		**Proportional band of heating ramp2:** Display scrolls between "**Pb2**" and the value of the heating ramp2 proportional band, heating symbol is also displayed. 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]*
53		**Proportional band of cooling ramp1:** Display scrolls between "**Pb1**" and the value of the cooling ramp1 proportional band, cooling symbol is also displayed. 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]*

Step	Display	Description	Values
54		**Proportional band of cooling ramp2:** Display scrolls between "**Pb2**" and the value of the cooling ramp2 proportional band, cooling symbol is also displayed. 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]*
55		**Dead band of changeover ramp:** Display scrolls between "**db.o**" and the value of the changeover ramp dead band, cooling and heating symbols are also displayed. Select the desired value of changeover ramp dead band.	 Dead band range : 0 to 5.0ºC [0.6 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*
56		**Dead band of heating ramp1:** Display scrolls between "**db1**" 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 to 5.0ºC [0.6 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*
57		**Dead band of heating ramp2:** Display scrolls between "**db2**" and the value of the heating ramp2 dead band, heating symbol is also displayed. Select the desired value of heating ramp2 dead band.	 Dead band range : 0 to 5.0ºC [0.6 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*
58		**Dead band in cooling ramp1:** Display scrolls between "**db1**" and the value of the cooling ramp1dead band, cooling symbol is also displayed. Select the desired value of cooling ramp1 dead band.	 Dead band range : 0 to 5.0ºC [0.6 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*
59		**Dead band in cooling ramp2:** Display scrolls between "**db2**" and the value of the cooling ramp2 dead band, cooling symbol is also displayed. Select the desired value of cooling ramp2 dead band.	 Dead band range : 0 to 5.0ºC [0.6 to 10.0ºF] Increment: 0.1ºC [0.2ºF] *Default value: 0.3ºC [0.6ºF]*
60		**Anti-cycling delay cooling contact (protection for compressor):** Display scrolls between "**CYC**" and the value (in minutes) of the delay to activate / reactivate cooling contact. Select the desired value of the delay cooling contact.	 Range: 0 to 15 min. Increment: 1 min. *Default value: 2 min.*
61		**Integration time factor setting for heating:** Display scrolls between "**Int**" and the time in seconds for the integration factor compensation, heating symbol is also displayed. Select the desired value of the integration factor compensation.	 Range: 0 to 250 seconds Increment: 5 seconds *Default value: 0 seconds*
62		**Integration time factor setting for cooling:** Display scrolls between "**Int**" and the time in seconds for the integration factor compensation, cooling symbol is also displayed. Select the desired value of the integration factor compensation.	 Range: 0 to 250 seconds Increment: 5 seconds *Default value: 0 seconds*
63		**Enable or disable anti-freeze protection:** Display scrolls between "**FrE**" and the selected setting. You can enable or disable the Anti-freeze function. When enabled, if temperature drops to 4ºC [39ºF], heat will start even if thermostat is in OFF mode. Heat will stop when temperature reaches 5ºC [41ºF].	 *Default value: no (Disable)*
64[1]		**Auto bauds rate:** Display shows "**Abr**". You can enable or disable the Auto bauds rate function. When enabled, the EVC automatically detects the baud rate of the system and coordinates it and you cannot change the bauds rate value yourself. **If disable, you must select yourself the right bauds rate at step #66.**	 *Default value: Yes*
65[1]		**Auto bauds, current baud:** Display shows "**Abr**" and the detected baud rate. **Go to step #67.**	 Range: 9600, 19200, 38400, 76800
66[1]		**Communication bauds rate:** Display scrolls between "**bAU**" and the value of the baud rate in kBds. Select the desired bauds for communication: 9.6, 19.2, 38.4, 76.8.	 Range: 9600, 19200, 38400, 76800 *Default value: 76.8 kBds*
67[1]		**BACnet MAC address:** Display scrolls between "**Add**" and the value of the MAC address. If dip switches 0 to 7 of DS1 on the EVC are all in the Off position, then you can change the MAC address by using the "Δ" or "∇" buttons. Each device must have a unique MAC address on a network.	Range: 0 to 127 *Default value: 0*

[1]*Only on BACnet models*

Step	Display	Description	Values
68[1]		**Copy config:** Display scrolls between "**CPy**" and "**NO**" Select "**YES**" if you want to copy the configuration you did to this device to others on the network. **If you selected "NO", go back to step #1.**	 *Default value: No*
69[1]		**Select "start" address:** Display scrolls between "**Add**" and "**0**". The "**MIN**" icon is also displayed. Select the first address you want to copy to. For example if you select MAC address 1 here and 54 in the next step, all the devices from 1 to 54 will receive the configuration of the current device.	Range: 0 to 254 *Default Value: 0*
70[1]		**Select "end" address:** Display scrolls between "**Add**". The "**MAX**" icon is also displayed. Select the last address you want to copy to. You cannot copy on more than 64 addresses at once.	Range: begin address + 63 *Default Value: begin address*
71[1]		**Copy config result:** Display shows "**SCd**" if everything went ok. If not, the display will show "**Err**" you will be able to scroll the addresses and see the error message associated with each address. See the Annex section for the complete list of error messages.	
72[1]		**Communication device Instance:** You cannot modify the device instance address through the TRL5x menus. The device instance will automatically be modified according to the MAC address selected by DIP switch on the EVCB or in programming mode (step #67 or B4).	

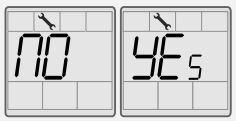
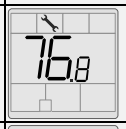
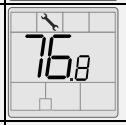
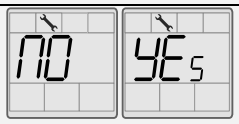
[1] *Only on BACnet models*

Air Flow & BACnet Program Mode (Available when in Operation Mode; JP1 set on RUN)

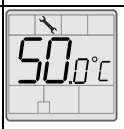
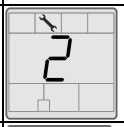
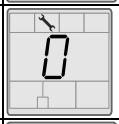
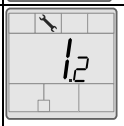
Push on both ⊛ and ↵ buttons for 5 seconds to access the user air flow program mode.

Step	Display	Description	Values
F1		**Password:** Display shows "**PAs**" 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 ↵. When the password is entered press on ⊛. If you do a mistake, you will see "**Err**" and the thermostat will return in operation mode. You need to redo this step.	Password: **637**

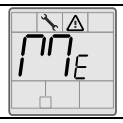
When the password is entered and you are in the balancing mode, this symbol is displayed. Press on the ⊛ button to advance to the next program function, press on the ↵ button to return to previous step and press on the △ or ▽ button to change value. The system will exit the menus and return to normal 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
B1[1]		**Auto bauds rate:** Display shows "**Abr**". You can enable or disable the Auto bauds rate function. When enabled, the EVC automatically detects the baud rate of the system and coordinates it and you cannot change the bauds rate value yourself. **If disable, you must select yourself the right bauds rate at step #B3.**	 *Default value: Yes*
B2[1]		**Auto bauds, current baud:** Display shows "**Abr**" and the detected baud rate. **Go to step #B4.**	 Range: 9600, 19200, 38400, 76800
B3[1]		**Communication bauds rate:** Display scrolls between "**bAU**" and the value of the baud rate in kBds. Select the desired bauds for communication: 9.6, 19.2, 38.4, 76.8.	 Range: 9600, 19200, 38400, 76800 *Default value: 76.8 kBds*
B4[1]		**BACnet MAC address:** Display scrolls between "**Add**" and the value of the MAC address. If dip switches 0 to 7 of DS2 on the RFC are all in the Off position, then you can change the MAC address by using the "Δ" or "∇" buttons. Each device must have a unique MAC address on a network.	Range: 0 to 127 *Default value: 0*
B5[1]		**Copy config:** Display scrolls between "**CPy**" and "**NO**" Select "**YES**" if you want to copy the configuration you did to this device to others on the network. **If you selected "NO", go to step #F2.**	 *Default value: No*
B6[1]		**Select "start" address:** Display scrolls between "**Add**" and "**0**". The "**MIN**" icon is also displayed. Select the first address you want to copy to. For example if you select MAC address 1 here and 54 in the next step, all the devices from 1 to 54 will receive the configuration of the current device.	Range: 0 to 254 *Default Value: 0*
B7[1]		**Select "end" address:** Display scrolls between "**Add**". The "**MAX**" icon is also displayed. Select the last address you want to copy to. You cannot copy on more than 64 addresses at once.	Range: begin address + 63 *Default Value: begin address*
B8[1]		**Copy config result:** Display shows "**SCd**" if everything went ok. If not, the display will show "**Err**" you will be able to scroll the addresses and see the error message associated with each address. See the Annex section for the complete list of error messages.	
B9[1]		**Communication device instance:** You cannot modify the device instance address through the TRL5x menus. The device instance will automatically be modified according to the MAC address selected by DIP switch on the EVCB or in programming mode (step #67 or B4).	
F2		**Internal temperature sensor calibration:** Display scrolls between "**tS1**" and temperature read by internal temperature sensor. You can adjust the calibration of the sensor by comparison with a known thermometer. For example if thermostat has been installed in an area where temperature is slightly different than the room typical temperature (thermostat place right under the air diffuser).	 Range : 10 to 40ºC [50 to 104ºF] Increment: 0.1ºC [0.2ºF] (Factory calibrated)

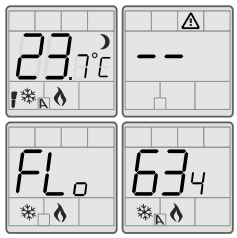
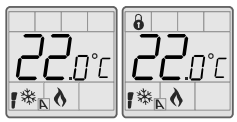
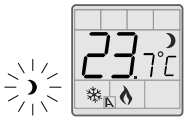
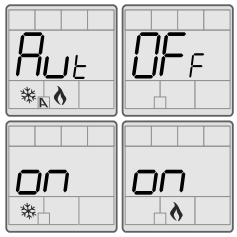
[1] *Only on BACnet models*

Step	Display	Description	Values
F3		**External temperature sensor calibration:** (If "**Ets**" was selected at step #38 or 39) Display scrolls between "**Ets**" 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 "**Err**". You can adjust the calibration of the external sensor by comparison with a known thermometer. *Note: This is the last menu for pressure dependant EVC.*	 Range: -30 to 90ºC [-22 to 194.0ºF] (max. offset ± 5ºC) Increment: 0.1ºC [0.2ºF]
F4		**Pressure filter setting:** Display shows "**FLt**" 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 air time factor setting:** Display shows "**AIr**" 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 "**FAc**" and the value of the k factor. $V = k\sqrt{\Delta P}$ when $\Delta P=1$ Please select the desired value of k factor. *Note: From 100 to 995 full digits are displayed. From 1000 to 9900 only the thousands and hundreds digits are displayed like in the example to the right.*	 Range: 100 to 9900 Increment: 5 (or 100 for value over 1000) *Default value: 1.2 (1200)*
F7		**Minimum cooling airflow:** Display shows "**CL**" and the value of the minimum airflow in cooling. The **MIN** and cooling symbol are also displayed. Please select the desired value of the minimum airflow in cooling. The minimum value is restricted by the maximum value (step F8). *Note: This option is only available if the Motor Signal Ramp is set to either Cr1, Cr2, CO or CH1 (step 28 in programming mode).*	Range: 0 to maximum cooling airflow + 5 Increment: 5 *Default value: 100*
F8		**Maximum cooling airflow:** Display shows "**CL**" and the value of the maximum airflow in cooling. The **MAX** and cooling symbol are also displayed. Please select the desired value of the maximum airflow in cooling. The maximum value is restricted by the minimum value (step F7). *Note: This option is only available if the Motor Signal Ramp is set to either Cr1, Cr2, CO or CH1 (step 28 in programming mode).*	Range: minimum cooling airflow + 5 to k factor Increment: 5 *Default value: 1000*
F9		**Minimum heating airflow:** Display shows "**Ht**" and the value of the minimum airflow in heating. The **MIN** and heating symbol are also displayed. Please select the desired value of the minimum airflow in heating. The minimum value is restricted by the maximum value (step F10). *Note: This option is only available if the Motor Signal Ramp is set to either Hr1, Hr2, CO or CH1 (step 28 in programming mode).*	Range: 0 to maximum heating airflow + 5 Increment: 5 *Default value: 100*
F10		**Maximum heating airflow:** Display shows "**Ht**" and the value of the maximum airflow in heating. The **MAX** and heating symbol are also displayed. Please select the desired value of the maximum airflow in heating. The maximum value is restricted by the minimum value (step F9). *Note: This option is only available if the Motor Signal Ramp is set to Hr1, Hr2, CO or CH1 (step 28 in programming mode).*	Range: minimum heating airflow + 5 to k factor Increment: 5 *Default value: 1000*
F11		**Enable or disable airflow balancing:** Display shows "**FLo**" and the selected setting. 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 access the min & max airflow calibration menus (Steps F12 and F13) and will have 1 hour before returning to operation mode if no buttons are pressed. Changed values will be saved.	 *Default value: Disable (No)*
F12		**Minimum airflow calibration:** Display shows "**FLo**" and the value of the minimum airflow detected by the pressure sensor. The **MIN** icon is also shown. The thermostat will send a signal to the actuator close the VAV box 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 (max. offset ± ½ value) Increment: 1
F13		**Maximum airflow calibration:** Display shows "**FLo**" and the value of the maximum airflow detected by the pressure sensor. The **MAX** icon is also shown. The thermostat will send a signal to the actuator open the VAV box 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). **Go back to step F11.**	Range: 0 to k factor (max. offset ± ½ value) Increment: 1

Annex – Error Codes for Copy Config

CC1		**Succeed:** If there are problems with the copy, user will be able to scroll through the range of addresses to find out the error codes for each address. In the event that some worked, the address will scroll with "**SCd**".
CC2		**Program mode error:** Display scroll "**Prg**" with the address. The target device is in program mode, the copy is not possible.
CC3		**Device type error:** Display scroll "**tYP**" with the address. The target device is not the same type as the source, the copy is not possible. For example trying to copy an EVC configuration to an EFC.
CC4		**Model type error:** Display scroll "**MO**" with the address. The target device is not the same model as the source, the copy is not possible. For example trying to copy an EVCB74WIT2S configuration to an EVCB74WIT4S.
CC5		**Memory error:** Display scroll "**ME**" with the address. The target device is not the same application version (eeprom) as the source, the copy is not possible.
CC6		**Slave address:** Display scroll "**SLA**" with the address. The target device is at a slave address. It cannot respond to the master if the copy went ok or not. User should manually check to make sure copy was done correctly or avoid using slave addresses (128-254).
CC7		**Communication error:** Display scroll "**Err**" with the address. No responses were received from the target device (after 3 tries). Either the address doesn't exist (not used) or there is a problem with wiring/noise.

Operation Mode

Step	Description	Display
A	At powering up, thermostat will light display and activate all LCD segments for 2 seconds. **Illuminating the LCD** To illuminate the LCD, simply push any of the 4 buttons. LCD will light for 4 seconds. **Temperature display** In operation mode, thermostat will automatically display temperature read. If "**- -** " and alarm symbol are displayed, the temperature sensor is not connected or short circuited. To change the scale between ºC and ºF, press on ↵ button. **Air flow display*** To display the air flow, press on ✶ button for 5 seconds. When in this mode, "**FLo**" and its value alternate. Air flow value will be displayed for 5 seconds.	
B	**<u>Setpoint display and adjustment</u>** To display the setpoint, press twice on Δ or ∇. Setpoint will be displayed for 3 seconds. To adjust setpoint, press on Δ or ∇ while the temperature setpoint is displayed. *Note: If setpoint adjustment has been locked, 🔒 symbol will be displayed.*	
C	**<u>Night set back (NSB) or no occupancy:</u>** When thermostat is in night set back or no occupancy mode, moon symbol ☽ is displayed, so setpoint for cooling and/or heating are increased as per the setting made in programming mode. If not locked, night set back or no occupancy can be overridden for a predetermined period by pressing any of the 4 buttons. During the override period the ☽ symbol will flash. If ☽ does not flash, the override period is finished or the night set back or no occupancy override has been locked in programming mode.	
D	**<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 & Heating ✓ Cooling and Heating OFF ✓ Cooling only ✓ Heating only *Note: These selections can vary according to the choice made on steps #6 & #7.*	

**Only on selected models*

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 **<u>www.neptronic.com</u>**.

Notes:

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