VAV Zone Controller for Zoning System

Specification and Installation Instructions

Models

EVCBI4-ZB *(4 TRIACS / pressure independent)*
EVCBI4D-ZB *(4 TRIACS / pressure dependent)*
TRL24 *(Thermostat 2x4)*

Description

The RIM Zoning System provides a simple and efficient demand-based control of pressure independent and pressure dependent VAV zones with roof top units (RTU) in light commercial applications (2 to 20 tons). These products provide a local BACnet MS/TP communication bus to ensure data exchange of all required information between the zones and the RTUs, which permits seamless integration with a third party BMS system.



EVCBI4-ZB or EVCBI4D-ZB / TRL24

Features

- Field configured VAV algorithms, inputs and outputs
- Built-in actuator, 70 lb-in
- On board differential pressure sensor (EVCBI4-ZB only)
- Simple air balancing and commissioning via thermostat
- Automatically sets operation mode to pressure dependent or independent based on the presence of air flow
- Configurable PI (Proportional-Integral) function
- Independent, configurable proportional control band and dead band per ramp
- Selectable internal or external temperature sensor (10KΩ)
- Changeover by contact or external temperature sensor
- Freeze protection

Operational Features

- Backlit LCD with simple icon and text driven menus
- Select thermostat's default display
- Network service port via on-board mini USB connector
- Manual night set back or no occupancy override
- Multi-level lockable access menu and setpoint
- Selectable Fahrenheit or Celsius scale
- 3-wire connection to controller and 4 push buttons

Applications

- Single duct, cooling only
- Single duct cooling and/or heating
- Up to 4 stage reheat and/or cool
- Up to 4 On/Off heat and/or cool
- Up to 4 time proportioned (TPM) heat or reheat
- Up to 2 analog (0-10Vdc) reheat and/or cool
- Up to 2 floating heat and/or cool
- Pressure dependent or pressure independent
- With or without auto changeover
- Supply/exhaust (requires an additional EVC)

Network Communication

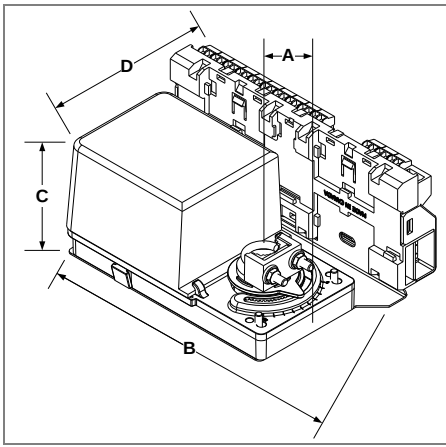
- BACnet MS/TP communication port
- Select MAC address via DIP switch or via network
- Automatic baud rate detection
- Automatic device instance configuration
- Copy & broadcast configuration via thermostat menu or via BACnet to other controllers
- BACnet scheduler
- Firmware upgradeable via BACnet

Controller Specifications

Description	EVCBI4-ZB and EVCB14D-ZB
Torque	70 in.lb. [8 Nm] at rated voltage
Power consumption	10 VA max
Running time through 90º	90 seconds
Power supply	22 to 26 Vac 50/60 Hz
Inputs	2 Universal inputs (Thermistor 10KΩ Type 3, digital 24Vac/dry contact, or 0-10Vdc)
	2 digital inputs
Outputs	2 analog outputs (0-10 Vdc or 2-10Vdc; selectable)
	Up to 4 TRIAC outputs 24 Vac, 500mA max thermal fuse in series with each TRIAC output (on/off, pulse, or 2 floating outputs)
Real Time Clock	Real-time clock (RTC) with super capacitor backup (approximately 3 days)
BACnet	BACnet® MS/TP @ 9600, 19200, 38400 or 76800 bps (B-ASC)
Communication connection	24 AWG twisted-shield cable (Belden 9841 or equivalent). Maximum 50ft (15m) between controller and thermostat
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]

⚠ **The actuator performs an auto-stroke on power up. When changing the actuator adjustment screws, cycle power to initiate the auto-stroke.**

Dimensions

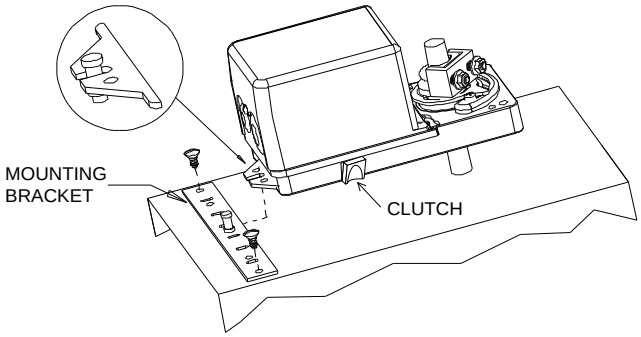


A = 2.85” | 73mm
B = 4.85” | 123mm
C = 1.00” | 24mm
D = 2.36” | 60mm
E = 3.27” | 83mm

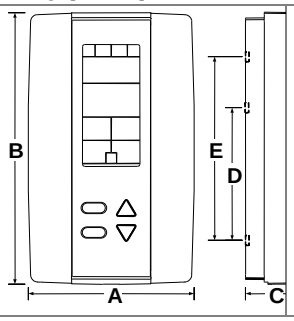
Mechanical Installation

1. Manually close the damper blades and position the actuator to 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. Place the bracket pin at mid distance of the slot.
5. Affix the bracket to the ductwork with #8 self-tapping screws.

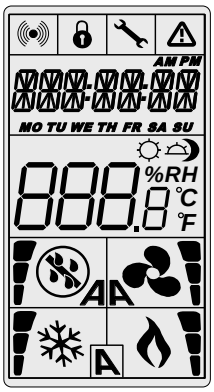
Do not press the clutch when the actuator is powered.



Thermostat Specifications

Description	TRL24
Temperature Sensor	
Setpoint range	10ºC to 40ºC [50ºF to 104ºF]
Control accuracy	Temperature: ±0.4ºC [0.8ºF]
Display resolution	±0.1ºC [0.2ºF]
Network service port	Mini USB connector
Power supply	24Vac or 24Vdc
Power consumption	1VA
Operating temperature	0ºC to 50ºC [32ºF to 122ºF]
Storage temperature	-30ºC to 50ºC [-22ºF to 122ºF]
Relative humidity	5 to 95 % non condensing
Enclosure protection	IP 30 (EN 60529)
Weight	120 g. [0.25 lb]
Dimensions	 A = 2.85” | 73mm B = 4.85” | 123mm C = 1.00” | 24mm D = 2.36” | 60mm E = 3.27” | 83mm

TRL24 Interface

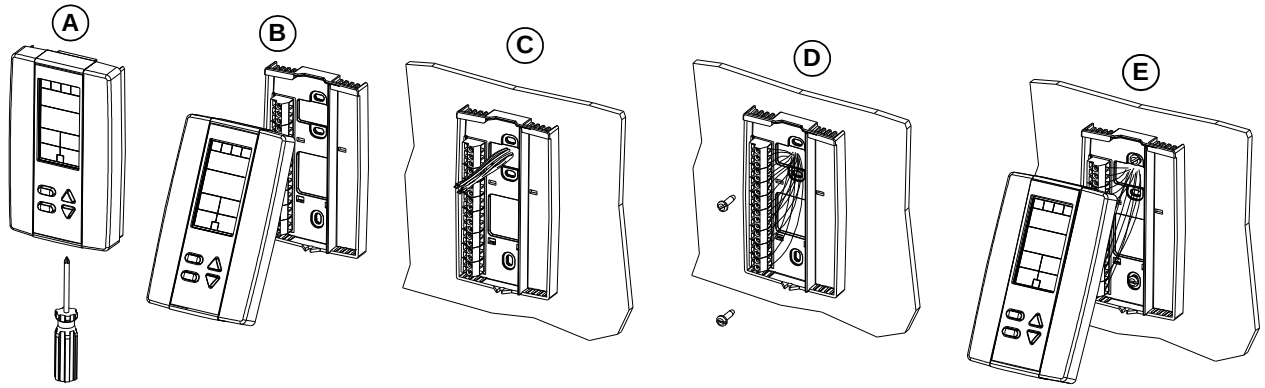


A	Cooling ON A: Automatic		Communication Status		Alarm status
A	Heating ON A: Automatic		Menu Locked		Energy saving mode (NSB or Occupancy)
A	Fan ON A: Automatic		Programming mode (Technician setting)	%RH	Percentage of humidity
				°C or °F	ºC: Celsius scale ºF: Fahrenheit scale

Mounting Instructions

CAUTION: Remove power to avoid a risk of malfunction.

A. Remove the captive screw that's holding the base and the front cover of the unit together.
B. Lift the front cover of the unit to separate it from the base.
C. Pull all wires through the holes in the base.
D. Secure the base to the wall using wall anchors and screws (supplied). Make the appropriate connections.
E. Mount the control module on the base and secure using the screw.



BACnet Address DIP Switch (DS1)

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

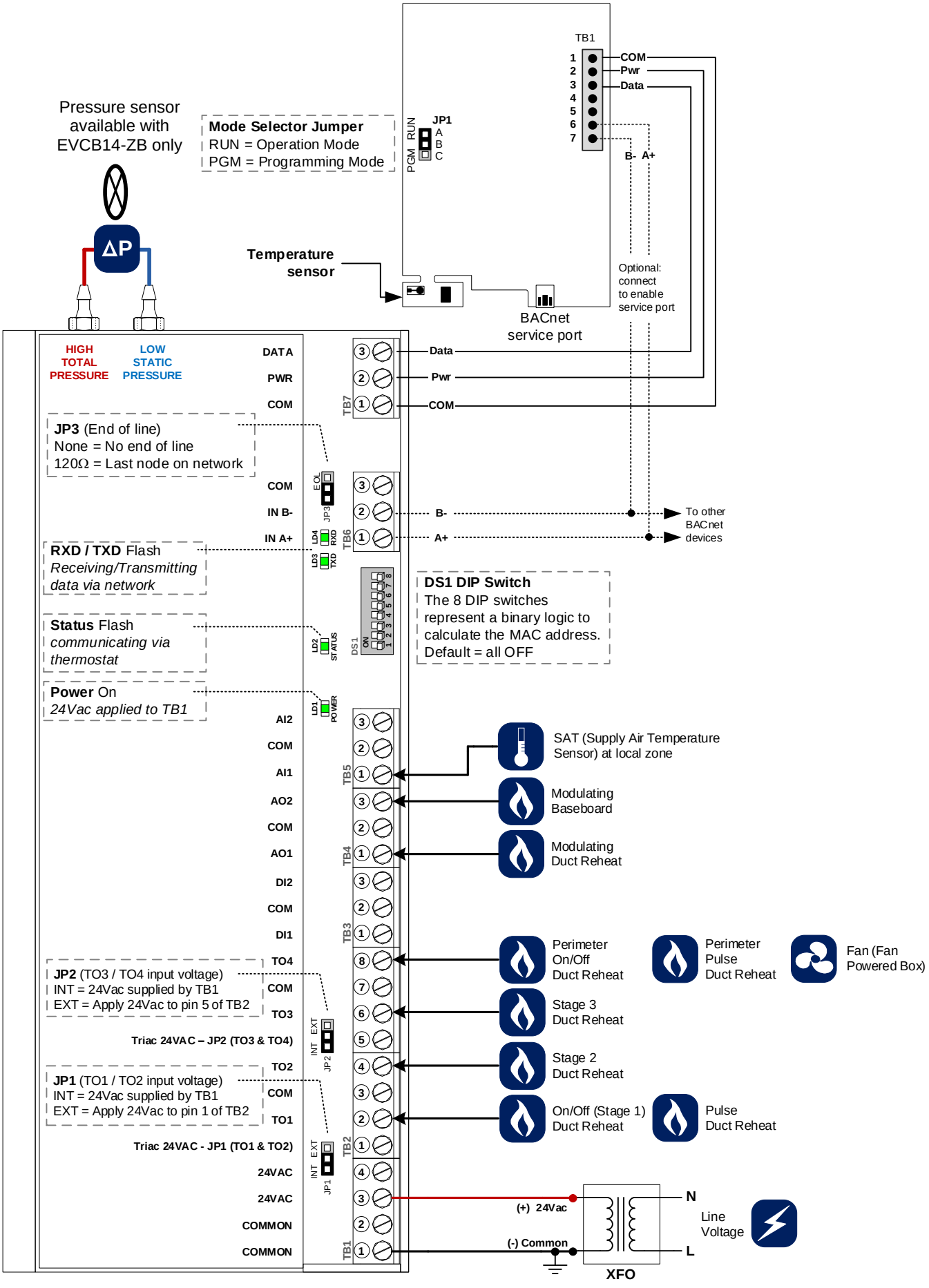
Note: Avoid using addresses above 246 when selecting the MAC address.

MAC Address	DS.1 = 1	DS.2 = 2	DS.3 = 4	DS.4 = 8	DS.5 = 16	DS.6 = 32	DS.7 = 64	DS.8 = 128	Default Device Instance
0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	153000
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	153001
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	153002
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	153003
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	153004
…	…	…	…	…	…	…	…	…	…
126	OFF	ON	ON	ON	ON	ON	ON	OFF	153126
127	ON	ON	ON	ON	ON	ON	ON	OFF	153127

** Slave addresses available by setting DS.8 to ON*

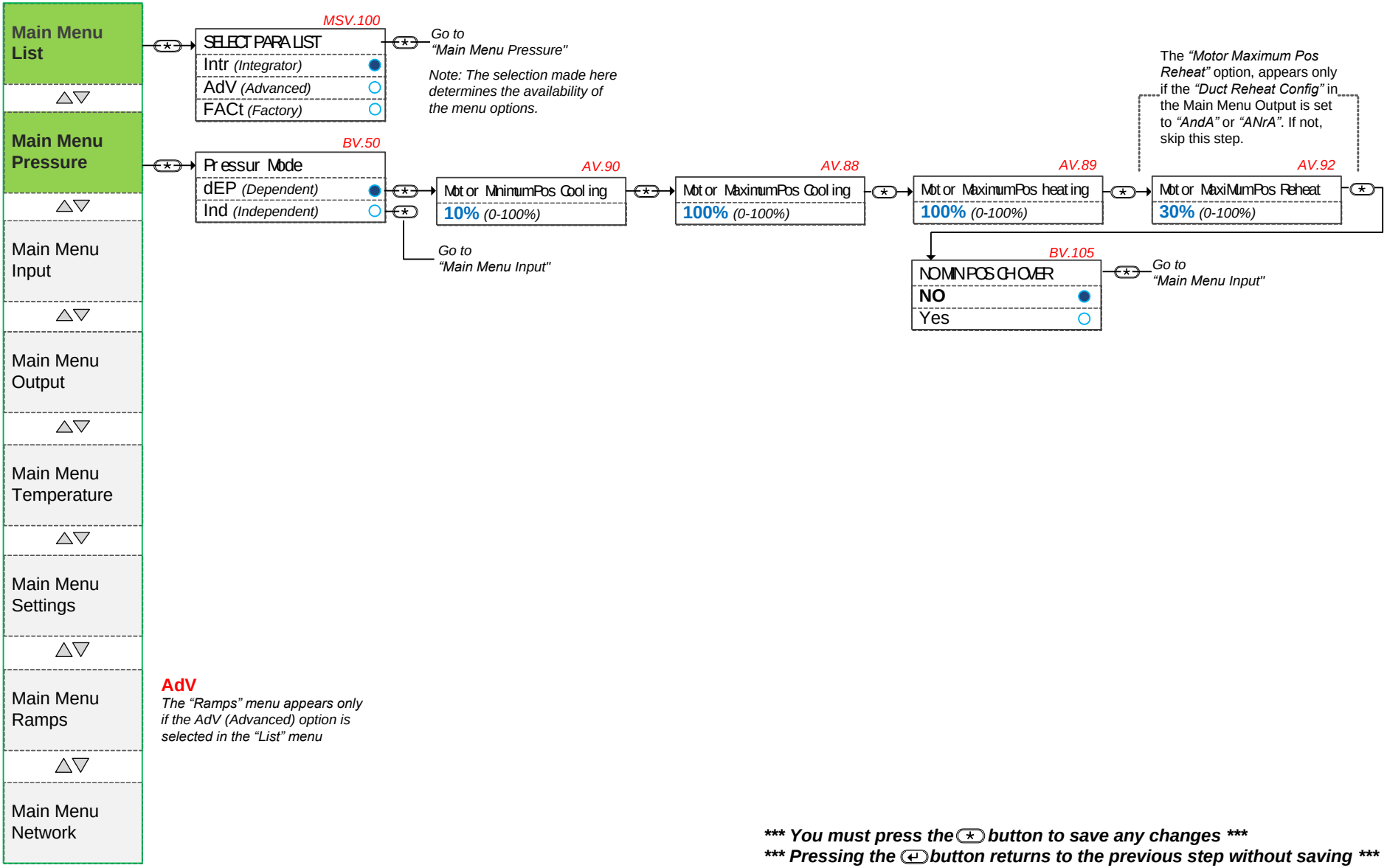
Wiring

We strongly recommend that all Neptronic products be wired to a separate grounded transformer and that transformer shall service only Neptronic products. This precaution will prevent interference with, and/or possible damage to incompatible equipment.



Lists and Pressure – Menu (1 of 4)

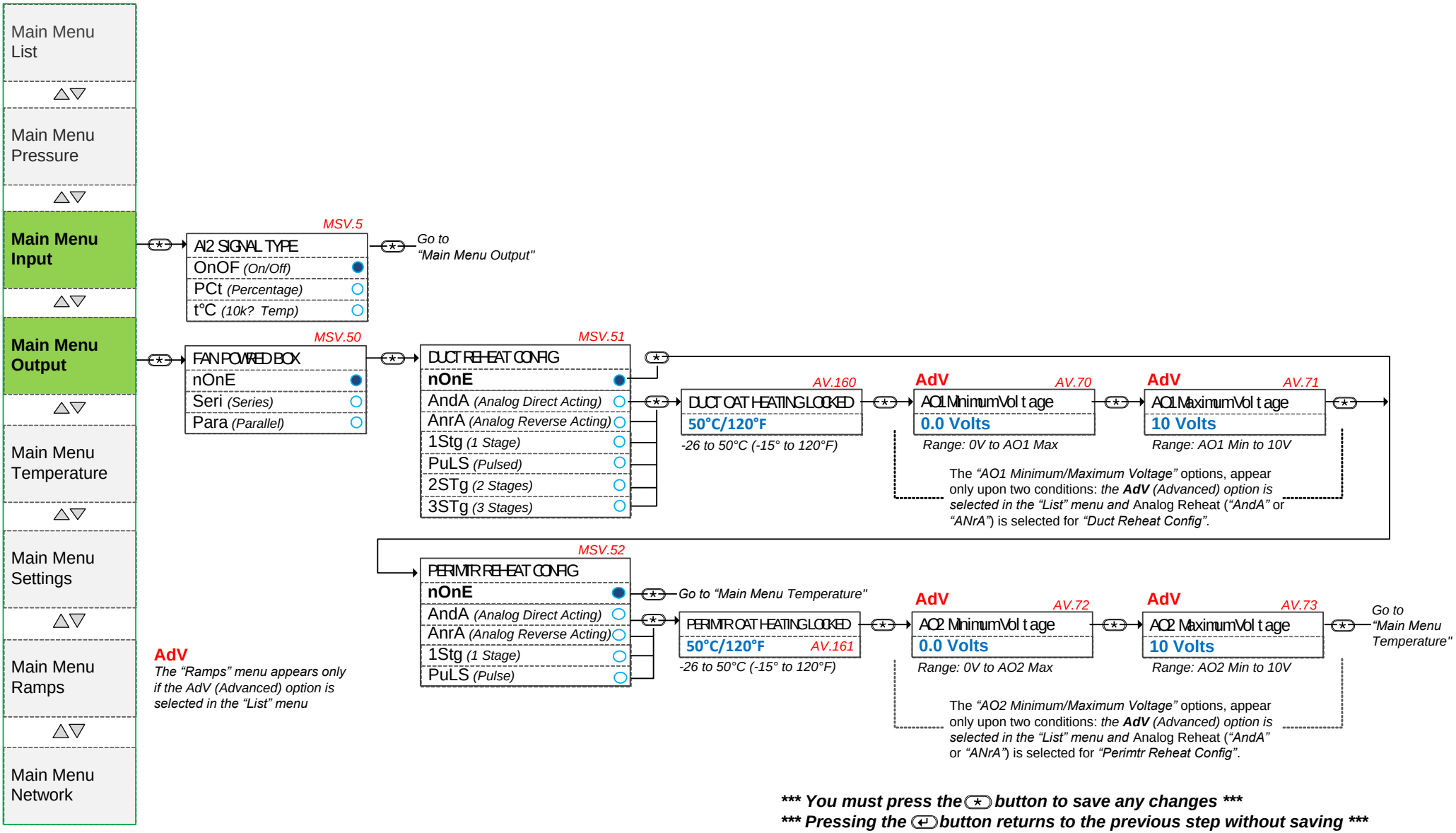
In the “Pressur Mode” menu, the “dEP” menus are used only with pressure dependent models EVCB14D-ZB. Pressure independent models will be set to Ind by default.



AdV
The “Ramps” menu appears only if the AdV (Advanced) option is selected in the “List” menu

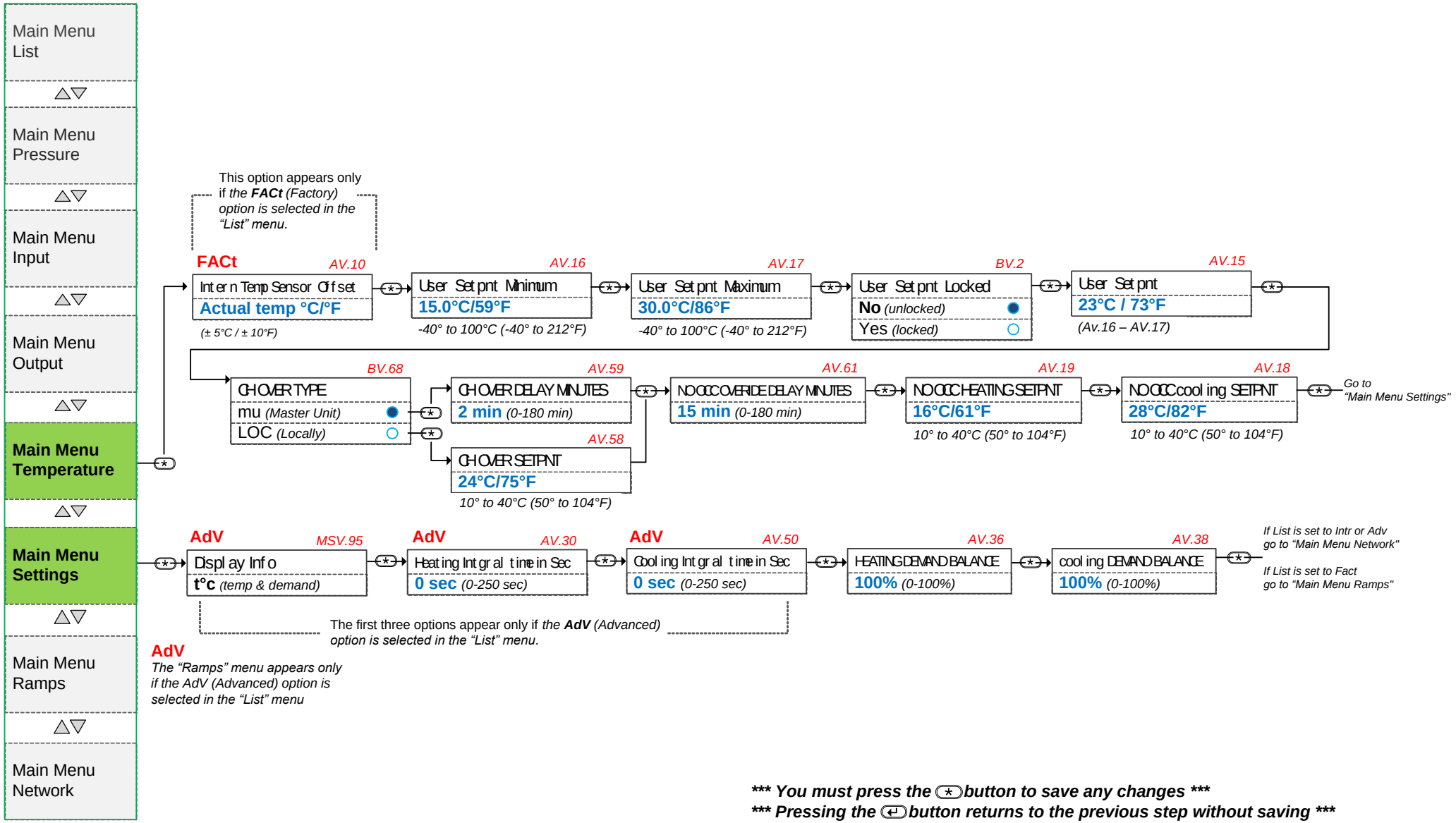
***** You must press the ⊛ button to save any changes *****
***** Pressing the ↵ button returns to the previous step without saving *****

Inputs and Outputs – Menu (2 of 4)



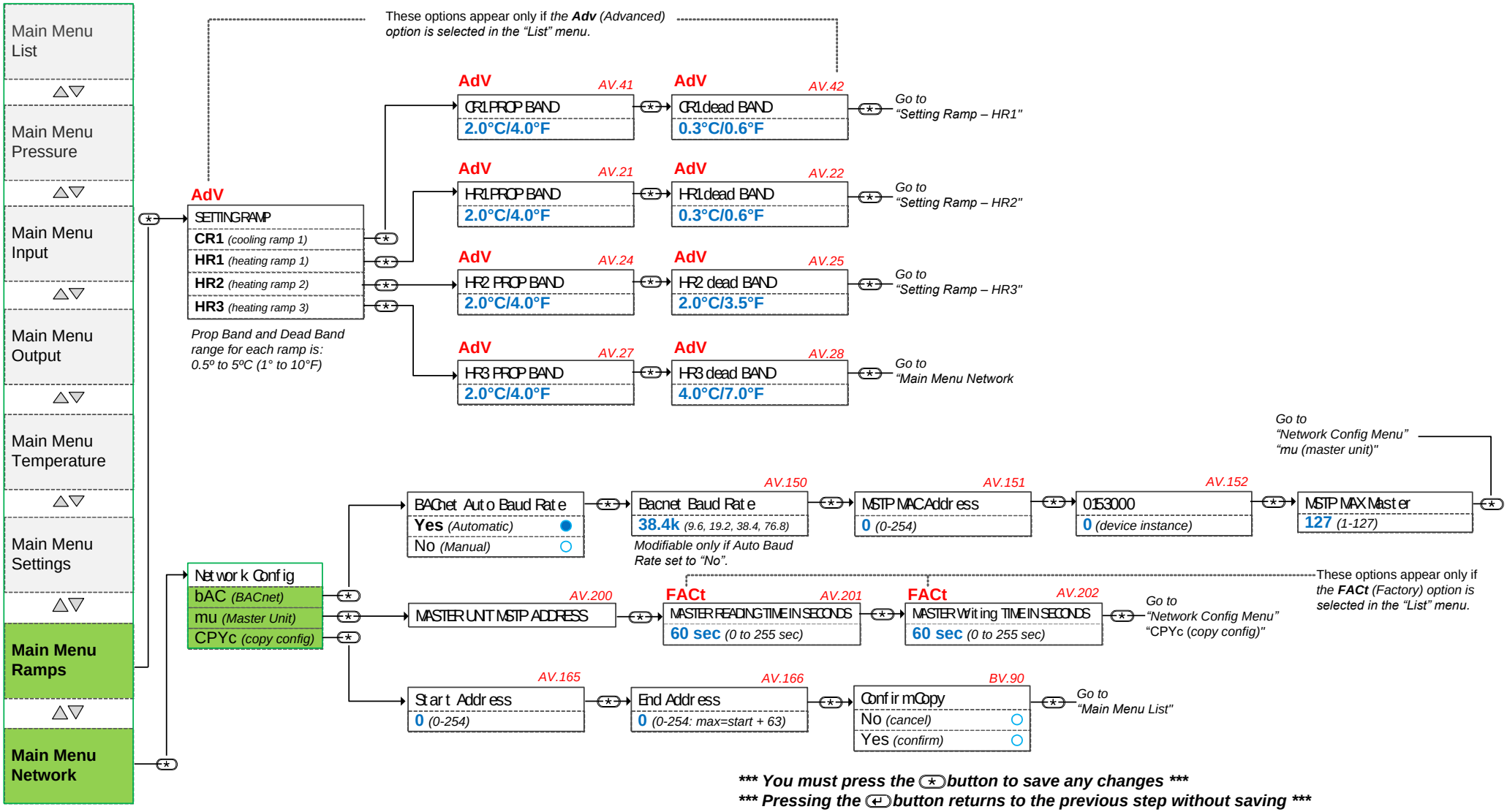
****** You must press the ⊛ button to save any changes ******
****** Pressing the ↵ button returns to the previous step without saving ******

Temperature and Settings – Menu (3 of 4)



****** You must press the ⊛ button to save any changes ******
****** Pressing the ↵ button returns to the previous step without saving ******

Ramps and Network – Menu (4 of 4)



****** You must press the ⊛ button to save any changes ******
****** Pressing the ↵ button returns to the previous step without saving ******

Operation Menus

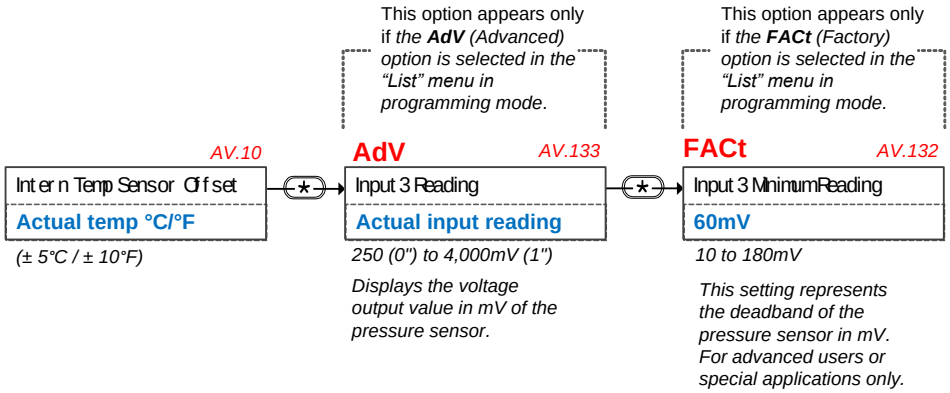
This menu is accessible through normal operation mode. The Mode Selector jumper (JP1) of the thermostat must be set to the "RUN" position (Operation Mode). Refer to Wiring on page 4.

1. Press the **[*]** and **[↵]** buttons simultaneously for 5 seconds. The "Enter Password" screen appears.
2. Enter the password within 1 minute by using the arrow keys to increase or decrease the value and the **[*]** and **[↵]** buttons to toggle between the digits. N:\Instructions Production\PDF-1\Actuators\Neptronic
   a. Password **372** = Temperature Offset Menu
   b. Password **637** = Network Settings Menu
   c. Password **757** = Airflow Balance Mode
3. If you enter the wrong password, the thermostat displays "**Eror**" and returns to Operation Mode. The thermostat will return to normal mode if you navigate through the entire menu and do not make any selection, or if you do not press any key for 5 minutes. The changed values will be saved automatically.

Menu 372 – Temperature Offset

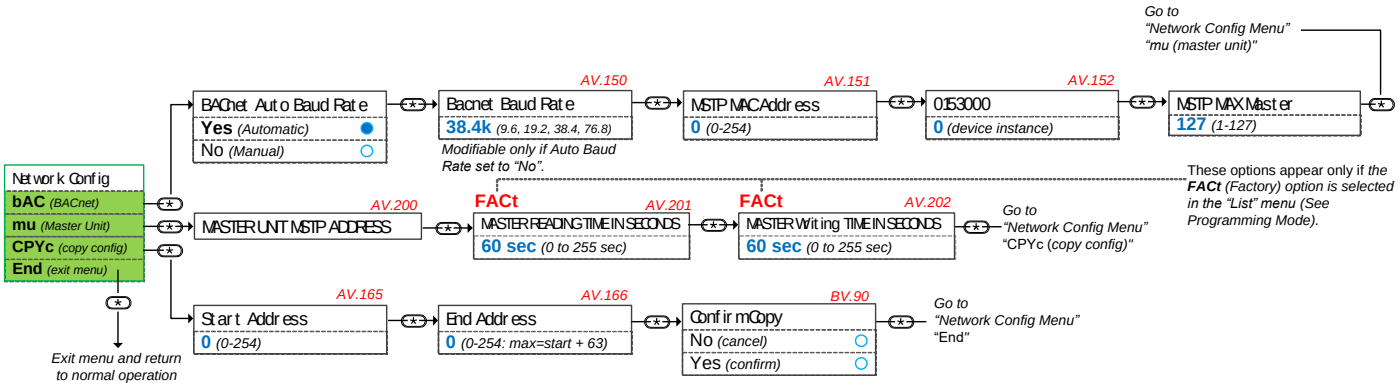
1. Press the **[*]** and **[↵]** buttons simultaneously for 5 seconds.
2. Enter the password **372** within 1.
3. The changed values will be saved automatically.

Compare the displayed temperature reading with a known value from a thermometer. To offset or calibrate the sensor, use the arrows key to set the desired temperature reading. This is useful for thermostats installed in areas where the temperature read is slightly different than the room's actual temperature. For example, a thermostat placed right under the air diffuser. If the thermostat is set to use an external temperature sensor (**EtS**), the thermostat displays "OFF".



Menu 637 – Network Settings

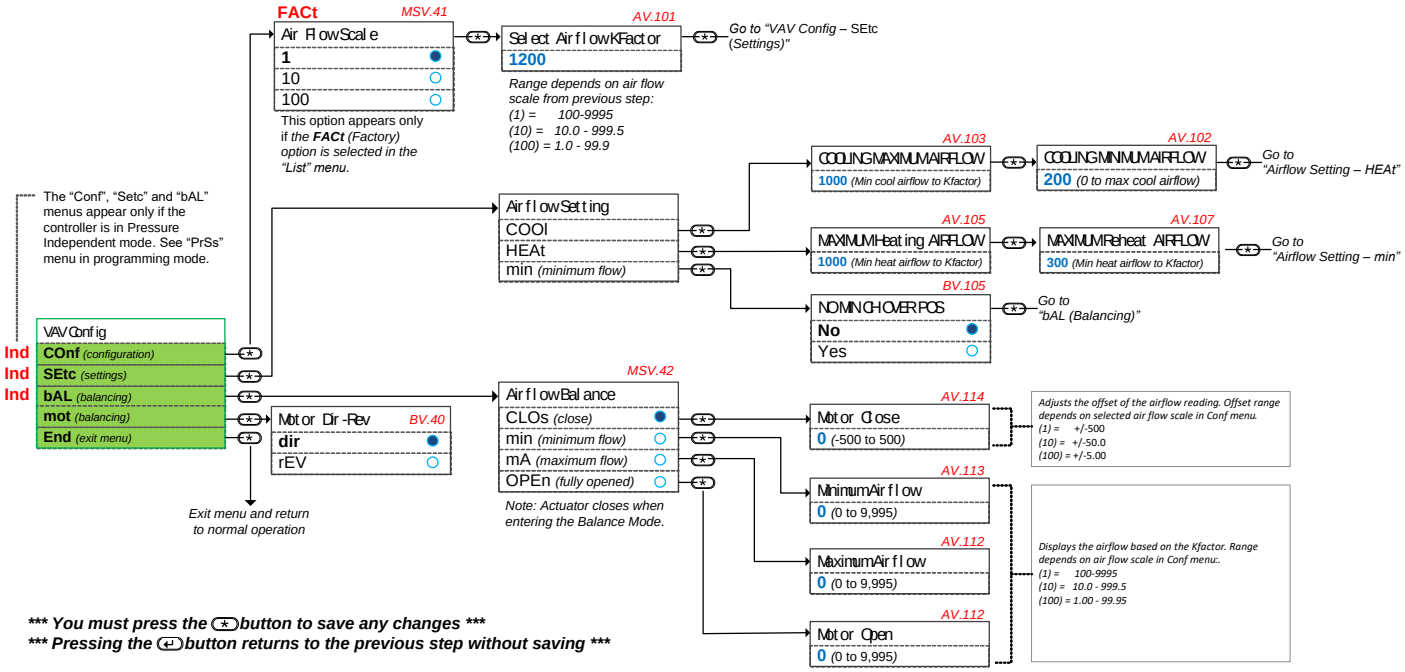
1. Press the **[*]** and **[↵]** buttons simultaneously for 5 seconds.
2. Enter the password **637** within 1 minute.
3. The changed values will be saved automatically.



****** You must press the (*) button to save any changes ******
****** Pressing the (↵) button returns to the previous step without saving ******

Menu 757 – Airflow Balance Mode

1. Press the **[*]** and **[↵]** buttons simultaneously for 5 seconds.
2. Enter the password **757** within 1 minute.
3. The changed values will be saved automatically.



*Note: Refer to **EVCB-Airflow Balance Instructions** on Neptronic website for further information on airflow balancing function.*

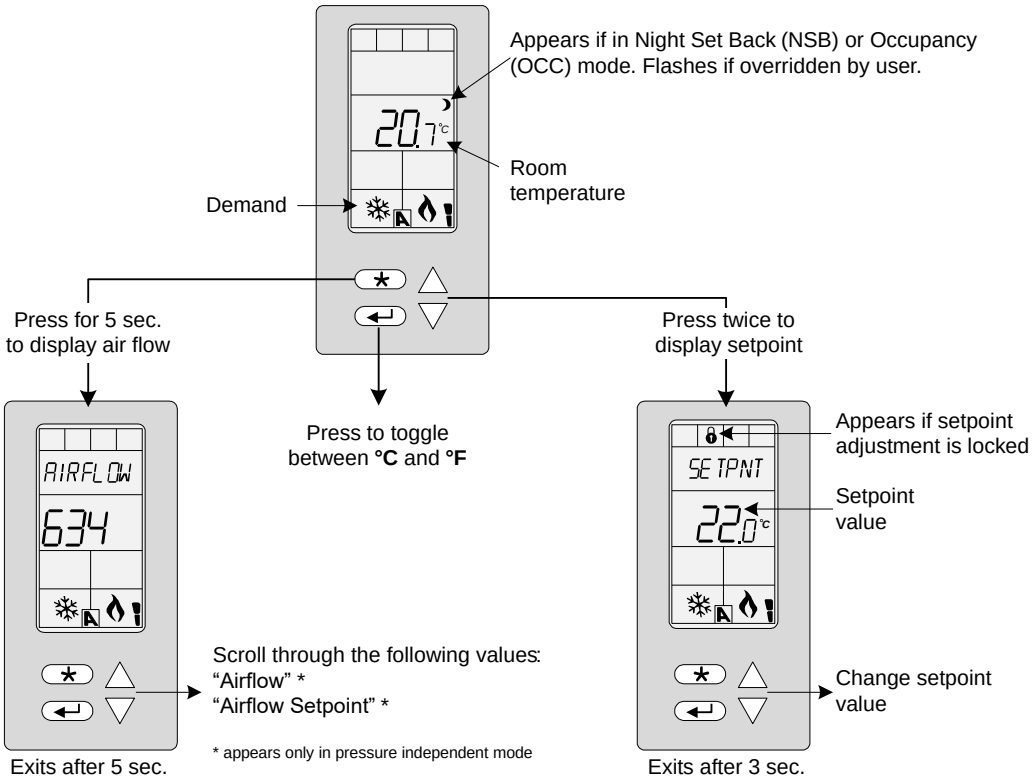
Reset to Factory Default Settings

This will erase all actual configurations and replace them with the factory default settings.

1. The Mode Selector jumper (JP1) of the thermostat must be set to the "RUN" position (Operation Mode). Refer to Wiring on page 4.
2. During the power up sequence of the controller and thermostat (when the firmware versions are displayed), press and hold both the ↵ and ▽ buttons.
3. The "Enter Password" screen appears. Enter **372** within 1 minute by using the arrow keys to increase or decrease the value and the ⊛ and ↵ buttons to toggle between the digits.
4. Use the arrow buttons to select YES and then press ⊛.

Operation Mode

The Mode Selector Jumper (JP1) of the thermostat must be set to the "RUN" position (Operation Mode). Refer to Wiring on page 3.



Power Up

Upon power up, the LCD illuminates and all segments appear for 2 seconds. The thermostat then displays its software version for 2 seconds followed by the controller's software version for 2 seconds. Pressing any key on the thermostat illuminates the LCD for 4 seconds.

Temperature

If enabled in the *"Display Info"* menu (see Temperature and Settings – Menu (3 of 4) on page 7), the thermostat displays the temperature reading. If the sensor is disconnected or short circuited, then the unit displays the sensor's limit. To toggle the temperature scale between ºC and ºF, press the ↵ button.

Temperature Setpoint

To display the setpoint, press the △ or ▽ key twice. The set point appears for 5 seconds. To adjust the setpoint, press the arrow keys while the "Setpnt" temperature is displayed. If the setpoint adjustment has been locked "Setpnt Locked", the lock symbol appears.

Airflow and Air Supply Temperature

Press and hold the ✶ button for 5 seconds and use the arrow keys to view the "airflow", "airflow Setpnt", and "Actual Damper Pos Percent". After 5 seconds without any action, the thermostat returns to operation mode. The airflow values do not appear in pressure dependent mode.

Night Set Back (NSB) or Occupancy Mode

This function is only available if Unit Controller (CMMB-ZB) is set to Occupancy or Night Set Back mode. When the Unit Controller triggers or enters NSB or No Occupancy Mode (the ☽ symbol appears) and uses the NSB or OCC heating and cooling setpoints.

If not locked, you can override the night set back or no occupancy mode for a predetermined period by pressing any of the 4 buttons on the local TRL24 thermostat. During the override period the ☽ symbol will flash. If the ☽ symbol does not flash, the override period is finished or the night set back or no occupancy override has been locked in programming mode.

	Recycling at end of life: please return this product to your Neptronic local distributor for recycling. If you need to find the nearest Neptronic authorized distributor, please consult **www.neptronic.com**.



400 boul. Lebeau, Montreal, Quebec, H4N 1R6

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
Monday to Friday: 8:00am to 5:00pm (Eastern time)