EV3X(treme!)41 Small size basic controller for chest freezers

GB ENGLISH

IMPORTANT

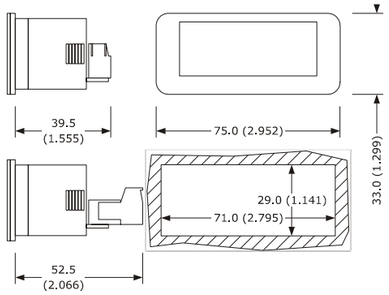
Read this document thoroughly before installation and before use of the device and follow all recommendations; keep this document with the device for future consultation. Only use the device in the way described in this document; do not use the same as a safety device.

The device must be disposed of in compliance with local standards regarding the collection of electric and electronic equipment.

1 DIMENSIONS AND INSTALLATION

1.1 Dimensions

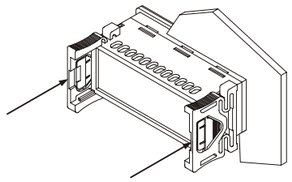
Dimensions are expressed in mm (in).



39.5 (1.555) is the depth with fixed screw connection terminal blocks; 52.5 (2.066) is the depth with removable screw connection terminal blocks.

1.2 Installation

Panel installation with snap-in brackets.

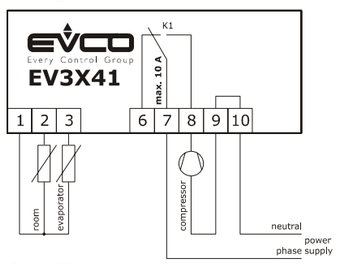


1.3 Installation warnings

- the thickness of the panel on which the devise is to be installed must be between 0.8 and 2.0 mm (0.031 and 0.078 in)
- make sure that the device work conditions (temperature of use, humidity, etc.) lie within the limits indicated; see chapter 8
- do not install the device near to any heat sources (heating elements, hot air ducts etc.), equipment containing powerful magnets (large diffusers, etc.), areas affected by direct sunlight, rain, humidity, excessive dust, mechanical vibrations or shocks
- in compliance with safety standards, the device must be installed correctly and in a way to protect against any contact with electric parts; all parts that ensure protection must be fixed in a way that they cannot be removed without the use of tools.

2 ELECTRIC CONNECTION

2.1 Electric connection



2.2 Warnings for the electric connection

- do not use electric or pneumatic screwdrivers on the device terminal board
- if the device has been taken from a cold to hot place, humidity could condense inside; wait about 1 hour before powering it
- check that the power supply voltage, mains frequency and electric power fall within the set limits; see chapter 8
- disconnect the device power supply before proceeding with any type of maintenance
- position the power cables as far away as possible from the signal cables
- for repairs and information regarding the device, contact the EVCO sales network.

3 USER INTERFACE

3.1 Preliminary notes

Operating statuses:

- "on" status (the device is powered and is on; utilities may be on
- stand-by" status (the device is powered but is switched off via software; utilities are off
- the "off" status: the device is not powered; utilities are off.

Hereafter, if the POF parameter is set to 0, with the word "switch-on" means the passage from "off" status to "on" status; the word "switch-off" means the passage from "on" status to "off" status.

If the POF parameter is set to 1, with the word "switch-on" means the passage from "stand-by" status to "on" status; the word "switch-off" means the passage from "on" status to "stand-by" status.

When the power is switched back on, the device displays the status that it was in at the time it was disconnected.

3.2 Device switch-on/off

If the POF parameter is set to 0:

1. Connect/disconnect the device power supply.

If the POF parameter is set to 1:

2. Make sure that the keyboard is not locked and that no procedure is in progress.
3. Touch the | ⏻ | key for 4 s: the ⏻ LED will flash, after which it will turn off/on.

3.3 The display

If the device is switched on, during normal operation, the display will show the room temperature.

If the device is switched off, the display will be switched off; the ⏻ LED shall be on.

If the device is in "low consumption" mode, the display will be switched off and the LED shall be on.

3.4 Temperature display as detected by the probes

1. Make sure that the keyboard is not locked and that no procedure is in progress.
2. Touch the | ∨ | key for 4 s: the display will show the first label available.
3. Touch the | ∧ | or | ∨ | key to select a label.
4. Touch the | SET | key.

The following table shows the correspondence between the labels and the temperature displayed.

Label	Displayed temperature
Pb1	room temperature
Pb2	evaporator temperature

To exit the procedure:

5. Touch the | SET | key or do not operate for 60 s.
6. Touch the | ⏻ | key.

3.5 Keyboard locking/unlocking

To lock the keyboard proceed as follows:

1. Make sure no procedure is in progress.
2. Do not operate for 30 s: the display will show the message "**Loc**" for 1 s and the keybord shall lock automatically.

To unlock the keyboard:

3. Touch a key for 1 s: the display will show the message "**UnL**" for 1 s.

4 SETTINGS

4.1 Setting the working setpoint

1. Make sure that the keyboard is not locked and that no procedure is in progress.
2. Touch the | SET | key: the LED ✲ will flash.
3. Touch the | ∧ | or | ∨ | key within 15 s; see also r1 and r2 parameters.
4. Touch the | SET | key or do not operate for 15 s: the LED ✲ will switch off after which, the device will exit the procedure.

To exit the procedure before the operation is complete:

5. Touch the | ⏻ | (any changes will not be saved).

The working setpoint can also be set via SP parameter.

4.2 Setting the configuration parameters

To access the procedure:

1. Make sure no procedure is in progress.
2. Touch the | SET | key for 4 s: the display will show "**PA**".
3. Touch the | SET | key.
4. Touch the | ∧ | or | ∨ | key within 15 s to set the value determined with the "**PAS**" parameter (the parameter is set at "**-19**" by default).
5. Touch the | SET | or do not operate for 15 s: the display will show "**SP**".

To select a parameter:

6. Touch the | ∧ | or | ∨ | key.

To set a parameter:

7. Touch the | SET | key.
8. Touch the | ∧ | or | ∨ | key within 15 s.
9. Touch the | SET | key or do not operate for 15 s.

To exit the procedure:

10. Touch the | SET | key for 4 s or do not operate for 60 s (any changes will be saved).

After setting the parameters, suspend power supply flow to the device.

4.3 Manufacturer's settings

To access the procedure:

1. Make sure no procedure is in progress.
2. Touch the | SET | key for 4 s: the display will show "**PA**".
3. Touch the | SET | key.

To restore the manufacturer's settings:

4. Touch the | ∧ | or | ∨ | key within 15 s to set "**149**".
5. Touch the | SET | key or do not operate for 15 s: the display will show "**dEF**".
6. Touch the | SET | key.
7. Touch the | ∧ | or | ∨ | key within 15 s to set "**4**".
8. Touch the | SET | key or do not operate for 15 s: the display will show a flashing "**- - -**" for 4 s, after which the device will exit the procedure.
9. Cut the device power supply off.

Make sure that the manufacturer's settings are appropriate; see chapter 9.

To store customized settings as manufacturer's:

10. Set the configuration parameters (with the procedure described in paragraph 4.2).
11. From step 4. touch the | ∧ | or | ∨ | key within 15 s to set "**161**".
12. Touch the | SET | key or do not operate for 15 s: the display will show "**MAP**".
13. Repeat steps 6. 7. 8. and 9.

To exit the procedure in advance:

14. Touch the | SET | key for 4 s during the procedure (i.e. before setting "**4**": Restore will not be performed).

5 WARNING LIGHTS AND DIRECTIONS

5.1 Signals

LED	Meaning
✲	Compressor LED If the LED is on, the compressor is on If the LED is flashing: - the working setpoint is in the process of being set (via the procedure described in paragraph 4.1) - a compressor protection will be in progress
	Energy saving LED If the LED is on and the display is switched off, the "low consumption" function is in progress; touch a key to restore normal display
°C	Celsius degrees LED If the LED is on, the unit of measurement for temperature is Celsius degrees
°F	Fahrenheit degrees LED If the LED is on, the unit of measurement for temperature is Fahrenheit degrees
⏻	LED on/stand-by If the LED is on, the device is switched off

5.2 Signals

Code	Meaning
Loc	the keyboard is blocked; see paragraph 3.5

6 ALARMS

6.1 Alarms

Code	Meaning
AL	Minimum temperature alarm Solutions: - check the room temperature; see A1 parameter Main consequences: - the device will continue to operate normally
AH	Maximum temperature alarm Solutions: - check the room temperature; see A4 parameter Main consequences: - the device will continue to operate normally

When the cause of the alarm disappears, the device restores normal operation.

7 ERRORS

7.1 Errors

Code	Meaning
Pr1	Room temperature probe error Solutions: - check that the probe is the NTC type - check the device-probe connection - check room temperature Main consequences: - the parameter SPE will never be recalculated
Pr2	Evaporator probe Solutions: - the same as in the previous example, but with regard to the evaporator probe Main consequences: - compressor activity will depend on C4 and C5 parameters

When the cause of the error disappears, the device restores normal operation.

8 TECHNICAL DATA

8.1 Technical data

Purpose of the command device: operating command device.

Construction of the command device: built-in electronic device.

Container: grey self-extinguishing.

Heat and fire protection class: D.

Dimensions: according to model:

- 75.0 x 33.0 x 39.5 mm (2.952 x 1.299 x 1.555 in; L x H x P) with fixed screw connection terminal blocks
- 75.0 x 33.0 x 52.5 mm (2.952 x 1.299 x 2.066 in; L x H x P) with removable screw connection terminal blocks.

Method of mounting the command device: on panel, with snap-in brackets.

Shell protection rating: IP65 (the front one).

Connection method: according to model:

- fixed screw connection terminal blocks for wires up to 4 mm² (0.0062 in²): power supply, analog inputs and digital outputs
- removable screw connection terminal blocks for wires up to 2.5 mm² (0.0038 in²): power supply, analog inputs and digital outputs.

The maximum lengths of the connection cables are:

- power supply: 10 m (32.8 ft)
- analog inputs: 10 m (32.8 ft)
- digital outputs: 10 m (32.8 ft).

Operating temperature: from 0 to 55 °C (from 32 to 131 °F).

Storage temperature: from -25 to 70 °C (from -13 to 158 °F).

Humidity for use: from 10 to 90 % relative humidity without condensate.

Command device pollution situation: 2.

Environmental standards:

- RoHS 2011/65/CE
- WEEE 2012/19/EU
- REACH (CE) regulation n. 1907/2006.

EMC standards:

- EN 60730-1
- IEC 60730-1.

Power supply: 230 VAC (+10 % -15%), 50... 60 Hz (±3 Hz), 2 VA.

Control device grounding method: none.

Rated impulse voltage: 4 KV.

Overvoltage category: III.

Class and structure of software: A.

Analog inputs: 2 inputs (room temperature and evaporator temperature) configurable via configuration parameter for NTC probes.

Analog inputs NTC (10 KΩ @ 25 °C, 77 °F)

Type of sensor:	103-AT.
Measurement field:	from -40 to 105 °C (from -40 to 221 °F).
Resolution:	0,1 °C (1 °F).

Displays: 3 digit custom display, with function icons.

Digital outputs: 1 output (SPDT electromechanical relay with 16 A res. @ 250 VAC) for compressor management.

The maximum allowable current on the load in 10 A.

Classification of the command device according to protection against electric shock: class II, according to the EMC standard EN 60730-1 §2.7.5.

Type 1 or Type 2 actions: type 1.

Complementary features of Type 1 or Type 2 actions: C.

9 CONFIGURATION PARAMETERS

9.1 Configuration parameters

PARAM.	MIN.	MAX.	U.M.	DEF.	WORKING SETPOINT
SP	r1	r2	°C/°F (1)	-18	working setpoint
PARAM.	MIN.	MAX.	U.M.	DEF.	ANALOG INPUTS
CA1	-25	25,0	°C/°F (1)	0,0	room probe offset
CA2	-25	25,0	°C/°F (1)	0,0	evaporator probe offset
P1	0	1	- - -	1	degree Celsius decimal point (during normal operation) 1 = YES
P2	0	1	- - -	0	unit of measurement for temperature (2) 0 = °C (Celsius degree; resolution depends on P1 parameter) 1 = °F (Fahrenheit degree; resolution is 1 °F)
P8	0	250	0,1 s	5	delayed display of temperature changes as detected by the probes
PARAM.	MIN.	MAX.	U.M.	DEF.	MAIN REGULATOR
r0	0,1	15,0	°C/°F (1)	2,0	parameter SPE differential
r1	-99	r2	°C/°F (1)	-40	minimum working setpoint
r2	r1	199	°C/°F (1)	50,0	maximum working setpoint
r3	-99	r4	°C/°F (1)	-45	minimum parameter SPE
r4	r3	99,0	°C/°F (1)	50,0	maximum parameter SPE
r7	0	100	%	12	proportional and integral action gain
PARAM.	MIN.	MAX.	U.M.	DEF.	COMPRESSOR PROTECTION SYSTEM
C0	0	240	min	0	delay in switching on of compressor after the device switches on (3)
C1	0	240	min	5	minimum time between two consecutive times the compressor is switched on
C2	0	240	min	3	minimum compressor switch-off duration (4)
C3	0	240	s	0	minimum duration of compressor switch on time
C4	0	240	min	0	duration of compressor switch off time during an evaporator temperature probe error (code "**Pr2**"); see also C5
C5	0	240	min	10	duration of compressor switch on time during an evaporator temperature probe error (code "**Pr2**"); see also C4
PARAM.	MIN.	MAX.	U.M.	DEF.	COMPENSATIONS
SPE	r3	r4	°C/°F (1)	-27	evaporator temperature for the compensation of the effects introduced by the thermal inactivity of the freeze load and of the operating temperature; see also SP, r0 and r7
PARAM.	MIN.	MAX.	U.M.	DEF.	TEMPERATURE ALARMS
A1	0,0	199	°C/°F (1)	10,0	room temperature below which the minimum temperature alarm is triggered (code "**AL**"; it concerns the working setpoint, that is to say, "working setpoint - A1"); see also A11 0,0 = alarm absent
A4	0,0	199	°C/°F (1)	10,0	room temperature above which the maximum temperature alarm is triggered (code "**AH**"; it concerns the working setpoint, that is to say, "working setpoint + A4"); see also A11 0,0 = alarm absent
A6	0	99	10 min	18	delay in maximum temperature alarm (code "**AH**") after the device is switched on (3)
A7	0	240	min	60	minimum temperature alarm delay (code "**AL**") and maximum temperature alarm delay (code "**AH**")
A11	0,1	15,0	°C/°F (1)	2,0	differential of A1 and A4 parameters
PARAM.	MIN.	MAX.	U.M.	DEF.	ENERGY SAVING
HE3	0	240	min	2	time interval with no key strokes, after which the "low consumption" function is activated 0 = the mode shall never be aactivated
PARAM.	MIN.	MAX.	U.M.	DEF.	VARIOUS
POF	0	1	- - -	1	⏻ key activation 1 = YES
PAS	-99	999	min	-19	access password for the configuration parameters 0 = the password need not be set

Notes:

(1) the unit of measurement depends on P2

(2) properly set the parameters corresponding to the regulators after setting P2 parameter

(3) the parameter has effect even after an interruption in the power supply that occurs while the device is switched on

(4) the time set by paramenter C2 is counted also when the device is off.

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