EV3B43

Basic controller for bottle coolers, with weekly learning algorithm

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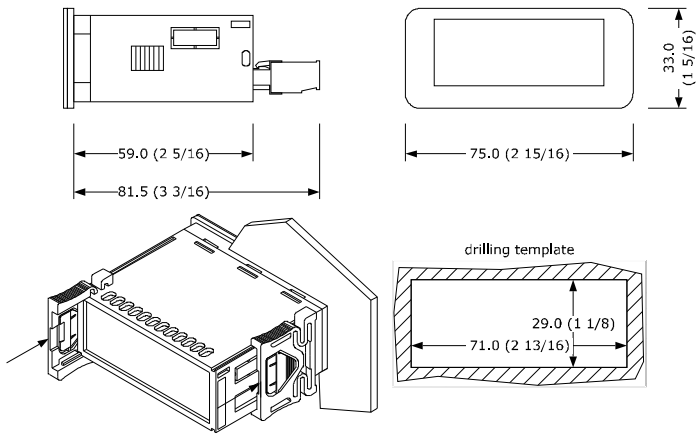
CONSIDER THE ENVIRONMENT

E ENGLISH

- power supply 230 VAC
- cabinet probe and evaporator probe (PTC/NTC)
- door switch input
- compressor relay 16 A res. @ 250 VAC
- cooling or heating operation
- operation with programming key.

1 MEASUREMENTS AND INSTALLATION

Measurements in mm (inches). To be fitted to a panel, snap-in brackets provided.

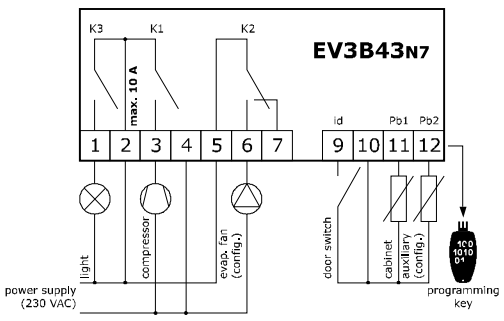


INSTALLATION PRECAUTIONS

- The thickness of the panel must be between 0.8 and 2.0 mm (1/32 and 1/16 in)
- Ensure that the working conditions are within the limits stated in the *TECHNICAL SPECIFICATIONS* section.
- Do not install the device close to heat sources, equipment with a strong magnetic field, in places subject to direct sunlight, rain, damp, excessive dust, mechanical vibrations or shocks.
- In compliance with safety regulations, the device must be installed properly to ensure adequate protection from contact with electrical parts. All protective parts must be fixed in such a way as to need the aid of a tool to remove them.

2 ELECTRICAL CONNECTION

N.B.
- Use cables of an adequate section for the current running through them.
- To reduce any electromagnetic interference connect the power cables as far away as possible from the signal cables.



PRECAUTIONS FOR ELECTRICAL CONNECTION

- If using an electrical or pneumatic screwdriver, adjust the tightening torque.
- If the device has been moved from a cold to a warm place, the humidity may have caused condensation to form inside. Wait about an hour before switching on the power.
- Make sure that the supply voltage, electrical frequency and power are within the set limits. See the section *TECHNICAL SPECIFICATIONS*.
- Disconnect the power supply before doing any type of maintenance.
- Do not use the device as safety device.
- For repairs and for further information, contact the EVCO sales network.

3 FIRST-TIME

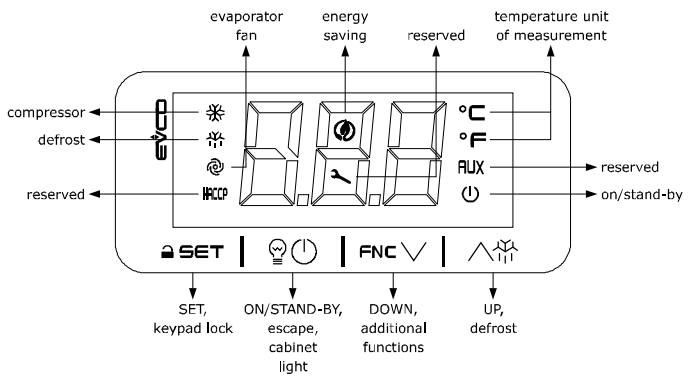
1. Install following the instructions given in the section *MEASUREMENTS AND INSTALLATION*.
2. Power up the device as shown in the section *ELECTRICAL CONNECTION* and an internal test will be run.
   The test normally takes a few seconds, when it is finished the display will switch off.
3. Configure the device as shown in the section *Setting configuration parameters*.
   Recommended configuration parameters for first-time use.

PAR.	DEF.	PARAMETER	MIN... MAX.
SP	**0.0**	setpoint	r1... r2
P0	**1**	probe type	0 = PTC 1 = NTC
P2	**0**	temperature unit of measurement	0 = °C 1 = °F
d1	**0**	defrost type	0 = electric 1 = hot gas 2 = compressor stopped

Then check that the remaining settings are appropriate; see the section *CONFIGURATION PARAMETERS*.

4. Disconnect the device from the mains.
5. Make the electrical connection as shown in the section *ELECTRICAL CONNECTION* without powering up the device.
6. Power up the device.

4 USER INTERFACE AND MAIN FUNCTIONS



4.1 Switching the device on/off

1.	ON/STAND-BY	If POF = 1, touch the ON/STAND-BY key for 2 s.

If the device is switched on, the display will show the P5 value ("cabinet temperature" default); if the display shows an alarm code, see the section *ALARMS*.

LED	ON	OFF	FLASHING
❄	compressor on	compressor off	- compressor protection active - setpoint setting active
	defrost active	-	- defrost delay active - dripping active
	evaporator fan on	evaporator fan off	evaporator fan stop active
	- energy saving active - low consumption active	-	-
°C/°F	view temperature	-	overcooling or overheating active
⏻	device off	device on	device on/off active

If 30 s have elapsed without the keys being pressed, the display will show the "**Loc**" label and the keypad will lock automatically.

4.2 Unlock keypad

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

4.3 Set the setpoint

Check that the keypad is not locked.

1.	SET	Touch the SET key.
2.	FNC	Touch the UP or DOWN key within 15 s to set the value within the limits r1 and r2 (default "-40... 50")
3.	SET	Touch the SET key (or do not operate for 15 s).

4.4 Activate manual defrost (if r5 = 0, default)

Check that the keypad is not locked and that overcooling is not active.

1.		Touch the UP key for 4 s.

If P4 = 1 (default), defrost is activated provided that the evaporator temperature is lower than the d2 threshold.

4.5 Cabinet light on/off (if P13 = 0)

1.		Touch the ON/STAND-BY key.

5 ADDITIONAL FUNCTIONS

5.1 Activate/deactivate overcooling, overheating and manual energy saving

Check that the keypad is not locked.

1.	FNC	Touch the DOWN key.

FUNCTION	CONDITION	CONSEQUENCE
overcooling	r5 = 0, r8 = 1 and defrost not active	the setpoint becomes "setpoint - r6", for the r7 duration
overheating	r5 and r8 = 1	the setpoint becomes "setpoint + r6", for the r7 duration
energy saving	r5 = 0 and r8 = 2	the setpoint becomes "setpoint + r4", at maximum for HE2 duration

5.2 View the temperature detected by the probes

Check that the keypad is not locked.

1.	FNC	Touch the DOWN key for 4 s.
2.	FNC	Touch the UP or DOWN key within 15 s to select a label.

LAB.	DESCRIPTION
Pb1	cabinet temperature
Pb2	auxiliary temperature

3.	SET	Touch the SET key.
4.		Touch the ON/STAND-BY key (or do not operate for 60 s) to exit the procedure.

6 SETTINGS

6.1 Setting configuration parameters

1.	SET	Touch the SET key for 4 s: the display will show the label "**PA**".
2.	SET	Touch the SET key.
3.	FNC	Touch the UP or DOWN key within 15 s to set the PAS value (default "**-19**").
4.	SET	Touch the SET key (or do not operate for 15 s): the display will show the label "**SP**".
5.	FNC	Touch the UP or DOWN key to select a parameter.
6.	SET	Touch the SET key.
7.	FNC	Touch the UP or DOWN key within 15s to set the value.
8.	SET	Touch the SET key (or do not operate for 15 s).
9.	SET	Touch the SET key for 4 s (or do not operate for 60 s) to exit the procedure.
9.		Touch the ON/STAND-BY key to exit the procedure beforehand.

6.2 Restore the factory settings (default) and store customized settings as default

N.B.
- Check that the factory settings are appropriate; see the section *CONFIGURATION PARAMETERS*.
- the storing of customized settings overwrites the default.

1.	SET	Touch the SET key for 4 s: the display will show the label "**PA**".
2.	SET	Touch the SET key.
3.	FNC	Touch the UP or DOWN key within 15 s to set the value.

VAL.	DESCRIPTION
149	value to restore the factory settings (default)
161	value to store customized settings as default

4.	SET	Touch the SET key (or do not operate for 15 s): the display will show the label "**dEF**" (when value "**149**" is set) or the label "**MAP**" (when value "**161**" is set).
5.	SET	Touch the SET key.
6.	FNC	Touch the UP or DOWN key within 15 s to set "**4**".
7.	SET	Touch the SET key (or do not operate for 15 s): the display will show for 4 s "**- - -**" flashing, then the device will exit the procedure.
8.	Interrupt the power supply to the device.	
9.	SET	Touch the SET key 2 s before action 6. to exit the procedure beforehand.

7 CONFIGURATION PARAMETERS

N.	PAR.	DEF.	SETPOINT	MIN... MAX.
1	SP	**5.0**	setpoint	r1... r2

N.	PAR.	DEF.	ANALOGUE INPUTS	MIN... MAX.
2	CA1	**0.0**	cabinet probe offset	-25... 25 °C/°F
3	CA2	**0.0**	auxiliary probe offset	-25... 25 °C/°F
4	P0	**1**	probe type	0 = PTC 1 = NTC
5	P1	**1**	enable °C decimal point	0 = no 1 = yes
6	P2	**0**	temperature unit of measurement	0 = °C 1 = °F
7	P4	**1**	auxiliary probe function	0 = disabled 1 = evaporator probe 2 = condenser probe
8	P5	**0**	value displayed	0 = cabinet temperature 1 = setpoint 2 = auxiliary temperature
9	P8	**5**	display refresh time	0... 250 s : 10
10	P9	**2**	symmetric differential (relative to previous day) for business activity search	0... 6 h 0 = disabled
11	P10	**- - -**	reserved	reserved
12	P11	**- - -**	reserved	reserved
13	P12	**0**	number of door openings each 30 min for business activity	0... 100
14	P13	**0**	hours of business activity previous day (±12 h) for working day	0... 24 h 0 = learning algorithm disabled (also set P12 = 0)
15	P14	**3**	door closed consecutive time for last day of vacations	1... 7 d (days)

N.	PAR.	DEF.	REGULATION	MIN... MAX.
16	r0	**2.0**	setpoint differential	1... 15 °C/°F
17	r1	**-40**	minimum setpoint	-99 °C/°F... r2
18	r2	**50.0**	maximum setpoint	r1... 199 °C/°F
19	r4	**5.0**	setpoint offset in energy saving	0... 99 °C/°F
20	r5	**0**	cooling or heating operation	0 = cooling 1 = heating
21	r6	**0.0**	setpoint offset in overcooling/overheating	0... 99 °C/°F
22	r7	**30**	overcooling/overheating duration	0... 240 min
23	r8	**0**	DOWN key additional function	0 = disabled 1 = overcooling/overheating 2 = energy saving
24	r12	**0**	position of the r0 differential	0 = asymmetric 1 = symmetric

N.	PAR.	DEF.	COMPRESSOR	MIN... MAX.
25	C0	**0**	compressor on delay after power-on	0... 240 min
26	C2	**3**	compressor off minimum time	0... 240 min
27	C3	**0**	compressor on minimum time	0... 240 s
28	C4	**0**	compressor off time during cabinet probe alarm	0... 240 min
29	C5	**10**	compressor on time during cabinet probe alarm	0... 240 min
30	C6	**80.0**	threshold for high condensation warning	0... 199 °C/°F differential = 2 °C/4 °F
31	C7	**90.0**	threshold for high condensation alarm	0... 199 °C/°F
32	C8	**1**	high condensation alarm delay	0... 15 min

N.	PAR.	DEF.	DEFROST (if r5 = 0)	MIN... MAX.
33	d0	**8**	automatic defrost interval	0... 99 h 0 = only manual if d8 = 3, maximum interval
34	d1	**0**	defrost type	0 = electric 1 = hot gas 2 = compressor stopped
35	d2	**2.0**	threshold for defrost end	-99... 99 °C/°F
36	d3	**30**	defrost duration	0... 99 min se P3 = 1, maximum duration
37	d4	**0**	enable defrost at power-on	0 = no 1 = yes
38	d5	**0**	defrost dealy after power-on	0... 99 min
39	d6	**1**	value displayed during defrost	0 = cabinet temperature 1 = display locked 2 = dEF label
40	d7	**2**	dripping time	0... 15 min
41	d8	**0**	defrost interval counting mode	0 = device on hours 1 = compressor on hours 2 = hours evaporator temperature < d9 3 = adaptive 4 = real time
42	d9	**0.0**	evaporation threshold for automatic defrost interval counting	-99... 99 °C/°F
43	d11	**0**	enable defrost timeout alarm	0 = no 1 = yes
44	d15	**0**	compressor on consecutive time for hot gas defrost	0... 99 min
45	d18	**40**	adaptive defrost interval	0... 999 min if compressor on + evaporator temperature < d22 0 = only manual
46	d19	**3.0**	threshold for adaptive defrost (relative to optimal evaporation temperature)	0... 40 °C/°F optimal evaporation temperature - d19
47	d20	**180**	compressor on consecutive time for defrost	0... 999 min 0 = disabled
48	d22	**2.0**	evaporation threshold for adaptive defrost interval counting (relative to optimal evaporation temperature)	-10... 10 °C/°F optimal evaporation temperature + d22

N.	PAR.	DEF.	ALARMS	MIN... MAX.
49	A1	**10.0**	threshold for low temperature alarm (relative to setpoint)	0... 99 °C/°F 0 = disabled
50	A4	**10.0**	threshold for high temperature alarm (relative to setpoint)	0... 99 °C/°F 0 = disabled
51	A6	**12**	high temperature alarm delay after power-on	0... 99 min x 10
52	A7	**15**	high/low temperature alarms delay	0... 240 min
53	A8	**15**	high temperature alarm delay after defrost	0... 240 min
54	A9	**15**	high temperature alarm delay after door closing	0... 240 min
55	A11	**2.0**	high/low temperature alarms reset differential	1... 15 °C/°F

N.	PAR.	DEF.	FANS	MIN... MAX.
56	F0	**3**	evaporator fan mode during normal operation	0 = off 1 = on 2 = according to F15 and F16 if compressor off, on if compressor on 3 = according to F1 4 = off if compressor off, according to F1 if compressor on
57	F1	**-1.0**	threshold for evaporator fan operation	-99... 99 °C/°F differential = 1 °C/2 °F
58	F2	**0**	evaporator fan mode during defrost and dripping	0 = off 1 = on 2 = according to F0

59	F3	**2**	evaporator fan off maximum time	0... 15 min
60	F4	**0**	evaporator fan off time during energy saving	0... 240 s x 10
61	F5	**10**	evaporator fan on time during energy saving	0... 240 s x 10
62	F15	**0**	evaporator fan off time with compressor off	0... 240 s if F0 = 2
63	F16	**1**	evaporator fan on time with compressor off	0... 240 s if F0 = 2
N.	PAR.	DEF.	DIGITAL INPUTS	MIN... MAX.
64	i0	**1**	door switch input function	0 = disabled 1 = compressor + evaporator fan off 2 = evaporator fan off 3 = reserved 4 = reserved 5 = reserved
65	i1	**0**	door switch input activation	0 = with contact closed 1 = with contact open
66	i2	**30**	open door alarm delay	-1... 120 min -1 = disabled
67	i3	**15**	regulation inhibition maximum time with door open	-1... 120 min -1 = until the closing
68	i10	**0**	door closed consecutive time for energy saving	0... 999 min after regulation temperature < SP 0 = disabled
69	i13	**180**	number of door openings for defrost	0... 240 0 = disabled
70	i14	**32**	door open consecutive time for defrost	0... 240 min 0 = disabled
N.	PAR.	DEF.	DIGITAL OUTPUTS	MIN... MAX.
71	u0	**1**	auxiliary relay function	0 = defrost 1 = evaporator fan
N.	PAR.	DEF.	ENERGY SAVING (if r5 = 0)	MIN... MAX.
72	HE2	**0**	energy saving maximum duration	0... 999 min -1 = until the door opening
73	HE3	**0**	consecutive time without operating on keys for low consumption	0... 240 min
N.	PAR.	DEF.	SAFETIES	MIN... MAX.
74	POF	**1**	enable ON/STAND-BY key	0 = no 1 = yes
75	PAS	**-19**	password	-99... 999

8 ALARMS

COD.	DESCRIPTION	RESET	REMEDIES
Pr1	cabinet probe alarm	automatic	- check P0 - check probe integrity - check electrical connection
Pr2	auxiliary probe alarm	automatic	
AL	low temperature alarm	automatic	check A1
AH	high temperature alarm	automatic	check A4
id	open door alarm	automatic	check i0 e i1
COH	high condensation warning	automatic	check C6
CSd	high condensation alarm	manual	- switch the device off and on - check C7
dFd	defrost timeout alarm	manual	- touch a key - check d2, d3 and d11

9 TECHNICAL SPECIFICATIONS

Purpose of the control device		Function controller
Construction of the control device		Built-in electronic device
Container		Black, self-extinguishing
Category of heat and fire resistance		D
Measurements		
75.0 x 33.0 x 59.0 mm (2 15/16 x 1 5/16 x 2 5/16 in) with fixed screw terminal blocks		75.0 x 33.0 x 81.5 mm (2 15/16 x 1 5/16 x 3 3/16 in) with removable screw terminal blocks
Mounting methods for the control device		To be fitted to a panel, snap-in brackets provided
Degree of protection provided by the covering		IP65 (front)
Connection method		
Fixed screw terminal blocks for wires up to 2,5 mm²		Removable screw terminal blocks for wires up to 2,5 mm²; by request
Maximum permitted length for connection cables		
Power supply: 10 m (32.8 ft)		Analogue inputs: 10 m (32.8 ft)
Digital 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)
Operating humidity		Relative humidity without condensate from 10 to 90%
Pollution status of the control device		2
Conformity		
RoHS 2011/65/CE	WEEE 2012/19/EU	REACH (EC) Regulation 1907/2006
EMC 2014/30/UE		LVD 2014/35/UE
Power supply		230 VAC (+10% -15%), 50/60 Hz (±3 Hz), max. 2 VA insulated
Earthing methods for the control device		None
Rated impulse-withstand voltage		2.5 KV
Over-voltage category		II
Software class and structure		A
Analogue inputs		2 for PTC or NTC probes (cabinet probe and auxiliary probe)
PTC probes	Sensor type	KTY 81-121 (990 Ω @ 25 °C, 77 °F)
	Measurement field	from -50 to 150 °C (from -58 to 302 °F)
	Resolution	0.1 °C (1 °F)
NTC probes	Sensor type	ß3435 (10 K□Ω @ 25 °C, 77 °F)
	Measurement field	from -40 to 105 °C (from -40 to 221 °F)
	Resolution	0.1 °C (1 °F)
Digital inputs		1 dry contact (door switch)
Dry contact	Contact type	5 VDC, 1.5 mA
	Power supply	None
	Protection	None
Digital outputs	3 electro-mechanical relays (compressor, auxiliary relay and cabinet light)	
Compressor relay (K1)		SPST, 16 A res. @ 250 VAC
Auxiliary relay (K2)		SPDT, 8 A res. @ 250 VAC
Cabinet light relay (K2)		SPST, 5 A res. @ 250 VAC
The device guarantees double insulation between each digital output connector and the rest of the components of the device		
Type 1 or Type 2 Actions		Type 1
Additional features of Type 1 or Type 2 actions		C
Displays		3 digits custom display, with function icons

N.B.
The device must be disposed of according to local regulations governing the collection of electrical and electronic waste.

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