

07/2021

Mod: ML20/B5-VV/R2

Production code: PY200PSCND97H

EV3 L series

Controllers for refrigerated cabinets, counters and islands



PLEASE READ CAREFULLY
and save this document
CONSIDER THE ENVIRONMENT

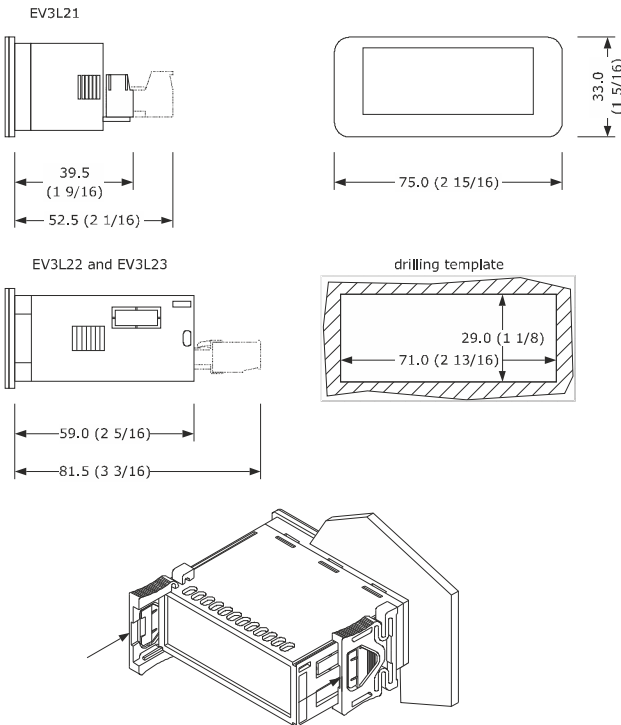
E ENGLISH

- Controllers for normal and low temperature units.
- Power supply 115 or 230 VAC (according to the model).
- Cabinet probe and evaporator probe (NTC).
- Door switch input.
- Compressor relay 16 A res. @ 250 VAC.

Purchasing code	Relays	Probes (NTC)	Power supply
EV3L21N5	1	1	115 VAC
EV3L21N7	1	1	230 VAC
EV3L22N5	2	2	115 VAC
EV3L22N7	2	2	230 VAC
EV3L23N5	3	2	115 VAC
EV3L23N7	3	2	230 VAC

1 MEASUREMENTS AND INSTALLATION

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

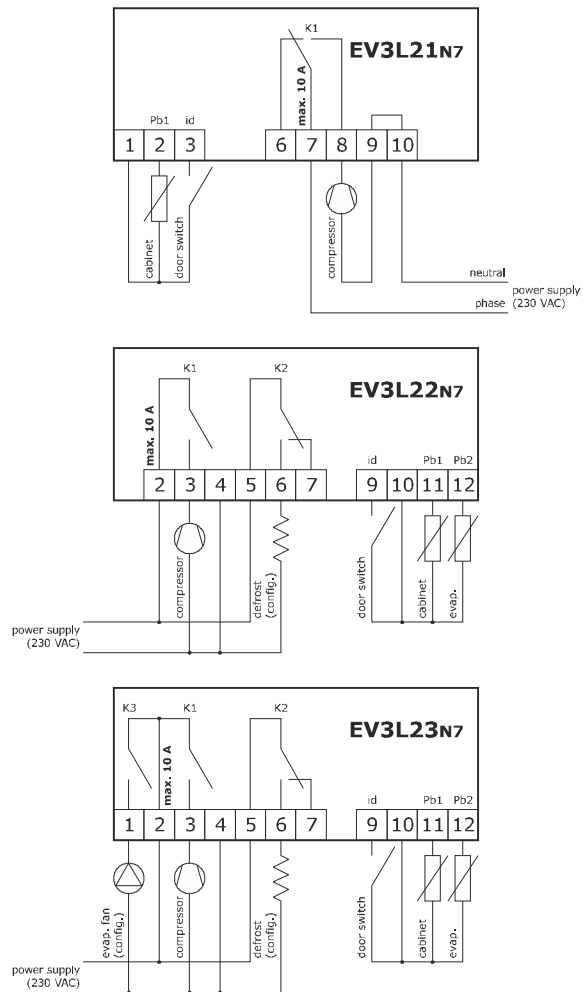


INSTALLATION PRECAUTIONS

- 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.
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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

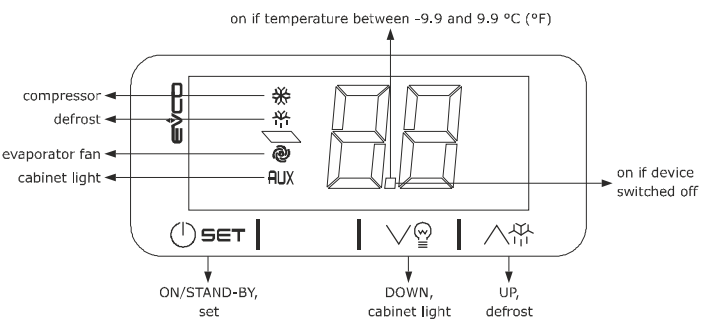
1. Install following the instructions given in the section *MEASUREMENTS AND INSTALLATION*.
2. Power up the device as shown in the section *ELECTRICAL CONNECTION* and an internal test will be run.
The test normally takes a few seconds, when it is finished the display will switch off.
3. Configure the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

PAR.	DEF.	PARAMETER	MIN... MAX.
SP	0	setpoint	r1... r2
P2	0	temperature unit of measurement	0 = °C 1 = °F
d1	0	defrost type	0 = electric 1 = hot gas

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. Touch the ON/STAND-BY key for 3 s.

If the device is switched on, the display will show the cabinet temperature; 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
AUX	cabinet light on	cabinet light off	cabinet light on by digital input

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

4.2 Unlock keypad

Touch a key for 3 s: the display will show the label "Un".

4.3 Set the setpoint

Check that the keypad is not locked.

1. Touch the ON/STAND-BY key.
2. Touch the UP or DOWN key within 30 s to set the value within the limits r1 and r2 (default "-40... 50").
3. Touch the ON/STAND-BY key (or do not operate for 30 s).

4.4 Activate manual defrost

Check that the keypad is not locked.

1. Touch the UP key for 3 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 u1 or u2 = 2)

1. Touch the DOWN key.

5 ADDITIONAL FUNCTIONS

5.1 View the evaporator temperature

Check that the keypad is not locked.

1. Touch the DOWN key for 4 s.
2. Touch the ON/STAND-BY key (or do not operate for 30 s) to exit the procedure.

6 SETTINGS

6.1 Setting configuration parameters

Check that the device is switched on and the keypad is not locked.

1. Touch the ON/STAND-BY key for 6 s: once 3 s have elapsed the display will switch off, once 6 s have elapsed the display will show the label "PA".
2. Touch the ON/STAND-BY key again.
3. Touch the UP or DOWN key within 30 s to set the PS value (default "-19").
4. Touch the ON/STAND-BY key: the display will show the label "SP".
5. Touch the UP or DOWN key to select a parameter.
6. Touch the ON/STAND-BY key.
7. Touch the UP or DOWN key within 30 s to set the value.
8. Touch the ON/STAND-BY key.
9. Touch the ON/STAND-BY key for 3 s (or do not operate for 30 s) to exit the procedure.

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 <i>CONFIGURATION PARAMETERS</i>. - the storing of customized settings overwrites the default.
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Check that the device is switched on and the keypad is not locked.

1. Touch the ON/STAND-BY key for 6 s: once 3 s have elapsed the display will switch off, once 6 s have elapsed the display will show the label "PA".
 2. Touch the ON/STAND-BY key again.
 3. Touch the UP or DOWN key within 30 s to set "49".
 4. Touch the ON/STAND-BY key again: the display will show the label "dF".
 5. Touch the ON/STAND-BY key again.
 6. Touch the UP or DOWN key within 30 s to set the value.
- | VAL. | DESCRIPTION |
|------|---|
| 1 | value to restore the factory settings (default) |
| -2 | value to store customized settings as default |
7. Touch the SET key: the device will exit the procedure.
 8. Touch the SET key 2 s before action 6. (or do not operate for 30 s) to exit the procedure beforehand.

7 CONFIGURATION PARAMETERS

N.	PAR.	DEF.	SETPOINT	MIN... MAX.
1	SP	0	setpoint	r1... r2
ANALOGUE INPUTS				
2	o1	0	cabinet probe offset	-99... 99 °C/°F
3	o2	0	evaporator probe offset	-99... 99 °C/°F
4	P2	0	temperature unit of measurement	0 = °C 1 = °F
5	P4	1	enable evaporator probe	0 = no 1 = yes
6	P8	4	filter for cabinet temperature display	1... 10 1 = quick 4 = normal 7 = slow 10 = very slow
REGULATION				
7	r0	-2	setpoint differential	-99... 0 °C/°F symmetric 0... 99 °C/°F asymmetric
8	r1	-40	minimum setpoint	-99... 99 °C/°F
9	r2	50	maximum setpoint	-99... 99 °C/°F
COMPRESSOR				
10	C0	0	compressor on delay after power-on	0... 99 s x 10
11	C1	5	delay between 2 compressor switch-ons	0... 99 min
12	C2	3	compressor off minimum time	0... 99 min
13	C4	50	percentage compressor on during cabinet probe alarm	referred to the average time compressor on 0... On On = 100 %
DEFROST				
14	d0	8	automatic defrost interval	-99... 1 min (for unit test) 1... 99 h
15	d1	0	defrost type	0 = electric 1 = hot gas
16	d2	2	threshold for defrost end	-99... 99 °C/°F
17	d3	30	defrost duration	0... 99 min
18	d7	2	dripping time	0... 99 min
19	d8	0	defrost relay status during dripping	0 = not active 1 = active
20	d9	0	compressor on consecutive time for hot gas defrost	0... 99 min
ALARMS				
21	A1	-99	threshold for low temperature alarm	-99... 99 °C/°F
22	A4	99	threshold for high temperature alarm	-99... 99 °C/°F
23	A5	-2	high/low temperature alarms reset differential	-99... 0 °C/°F absolute alarms 0... 99 °C/°F alarms relative to setpoint
24	A7	2	high/low temperature alarms delay	0... 99 min x 10 1 h after defrost
FANS				
25	F0	0	evaporator fan mode during normal operation	0 = on 1 = on if compressor on 2 = thermoregulated (with F1)
26	F1	-1	threshold for evaporator fan operation	-99... 99 °C/°F differential = 1 °C/2 °F
27	F2	0	evaporator fan mode during dripping	0 = off 1 = on
28	F3	2	evaporator fan off time	0... 99 min
2	F4	30	evaporator fan off time with compressor off	0... 99 s x 10
30	F5	10	evaporator fan on time with compressor off	0... 99 s x 10
DIGITAL INPUTS				
31	i0	0	door switch input function	0 = cabinet light on 1 = compressor + evaporator fan off, cabinet light on 2 = evaporator fan off, cabinet light on
32	i1	0	door switch input activation	0 = with contact closed 1 = with contact open
33	i2	30	open door alarm delay; also regulation inhibition maximum time with door open	-1... 99 min -1 = disabled
DIGITAL OUTPUTS				
34	u1	1	auxiliary output 1 configuration (relay K2)	0 = evaporator fan 1 = defrost 2 = cabinet light
35	u2	0	auxiliary output 2 configuration (relay K3)	0 = evaporator fan 1 = defrost 2 = cabinet light
SAFETIES				
36	nS	0	compressor start-up number	0... 99 x 10,000
37	PS	-19	password	-99... 99 min 0 = disabilitata
38	MP	1	parameters map identification	0... 9

ALARMS			
COD.	DESCRIPTION	RESET	REMEDIES
P1	cabinet probe alarm	automatic	- check probe integrity - check electrical connection
P2	evaporator 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
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			
With fixed screw terminal blocks: 75.0 x 33.0 x 39.5 mm (2 15/16 x 1 5/16 x 1 9/16 in) for EV3L21, 75.0 x 33.0 x 59.0 mm (2 15/16 x 1 5/16 x 2 5/16 in) otherwise		With removable screw terminal blocks: 75.0 x 33.0 x 52.5 mm (2 15/16 x 1 5/16 x 2 1/16 in) for EV3L21, 75.0 x 33.0 x 81.5 mm (2 15/16 x 1 5/16 x 3 3/16 in) otherwise	
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. 3 VA isolated	
Earthing methods for the control device		None	
Rated impulse-withstand voltage		4 KV	
Over-voltage category		III	
Software class and structure		A	
Analogue inputs		- 1 in EV3L21 (cabinet probe) - 2 in EV3L22 and EV3L23 (cabinet probe and evaporator probe) for NTC probes	
NTC probes	Sensor type	β3435 (10 KΩ @ 25 °C, 77 °F)	
	Measurement field	From -40 to 90 °C (from -40 to 194 °F)	
	Resolution	- 0.1 °C (0.1 °F) between -9.9 and 9.9	
		- 1 °C (1 °F) otherwise	
Digital inputs		1 dry contact (door switch)	
Dry contact	Contact type	5 VDC, 1.5 mA	
	Protection	None	
Digital outputs		- 1 in EV3L21 (K1) - 2 in EV3L22 (K1 and K2) - 3 in EV3L23 (K1, K2 and K3) electro-mechanical relays <u>The maximum current allowed on the loads is 10 A</u>	
Relay K1 (compressor):		SPST, 16 A res. @ 250 VAC	
Relay K2 (auxiliary output 1, default defrost):		SPDT, 8 A res. @ 250 VAC	
Relay K3 (auxiliary output 2, default evaporator fan):		SPST, 5 A res. @ 250 VAC	
Type 1 or Type 2 Actions		Type 1	
Additional features of Type 1 or Type 2 actions		C	
Displays		2 digits custom display 17 mm (11/16 in) high, 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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