EVZ000 (user interface) / EVG003 (power module) Split digital controller for static refrigeration units

GB ENGLISH

1 PREPARATIONS

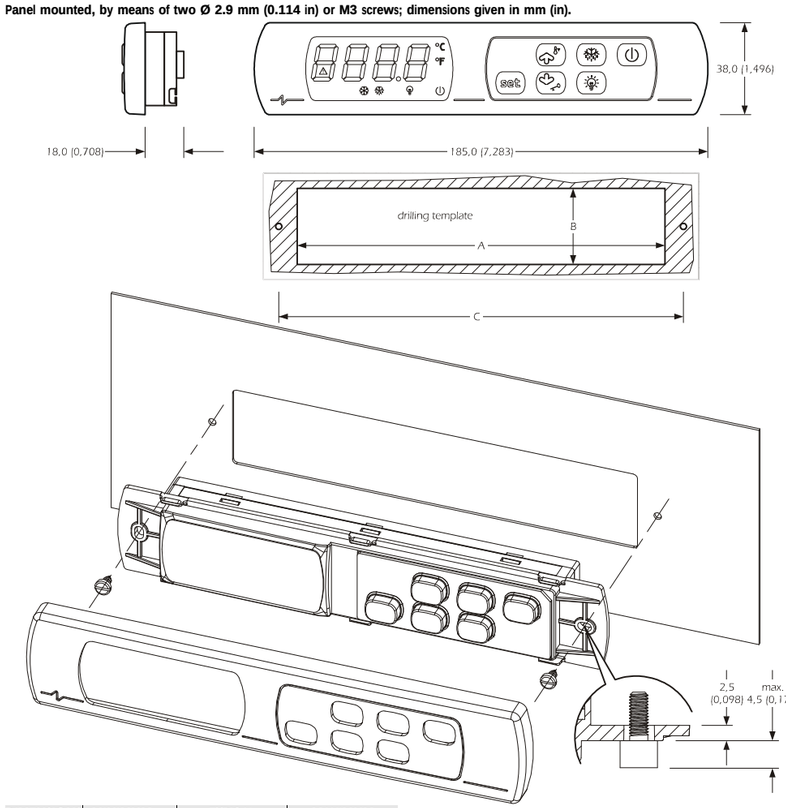
1.1 Important

Please read these instructions carefully prior to installation and use, and follow all the precautions for installation and electrical connections; keep these instructions with the device for future consultation.

2 INSTALLATION

2.1 EVZ000 (user interface) installation

Panel mounted, by means of two Ø 2.9 mm (0.114 in) or M3 screws; dimensions given in mm (in).

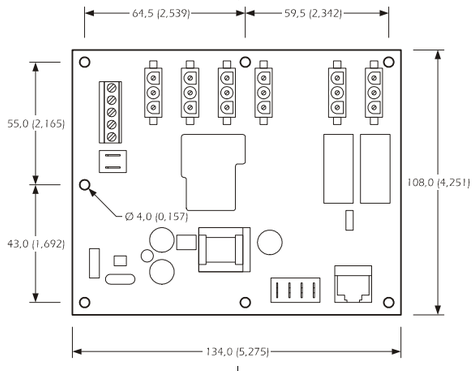


DIMENSIONS	MINIMUM	TYPICAL	MAXIMUM
A	150,0 (5,905)	150,0 (5,905)	150,5 (5,925)
B	31,0 (1,220)	31,0 (1,220)	31,5 (1,240)
C	164,0 (6,456)	165,0 (6,496)	166,0 (6,535)

2.2 EVG003 (power module) installation

On a flat surface, using isolating spacers of length greater than or equal to 10 mm (0.393 in).

For further information, consult the electrical safety standards.

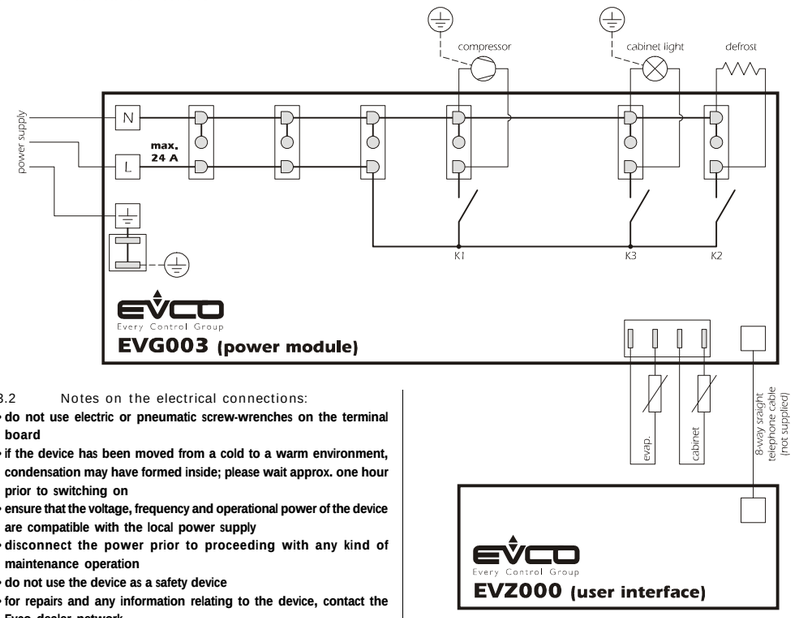


2.3 Notes on installation

- **tighten the screws with moderate torque to avoid damaging the case of the user interface**
- **ensure that the operating conditions (operating temperature, humidity, etc.) are within the limits indicated in the technical data sheets**
- **do not install the device near to any sources of heat (heating elements, hot air conduits, etc.), equipment containing powerful magnets (large diffusers, etc.), areas affected by direct sunlight, rain, humidity, excessive dust, mechanical vibration or shock**
- **in compliance with safety regulations, the device must be installed correctly, and in such a way as to protect against any contact with electrical parts; all safety devices must be fixed so that they cannot be removed without the use of tools.**

3 ELECTRICAL CONNECTIONS

3.1 Electrical connections



3.2 Notes on the electrical connections:

- **do not use electric or pneumatic screw-wrenches on the terminal board**
- **if the device has been moved from a cold to a warm environment, condensation may have formed inside; please wait approx. one hour prior to switching on**
- **ensure that the voltage, frequency and operational power of the device are compatible with the local power supply**
- **disconnect the power prior to proceeding with any kind of maintenance operation**
- **do not use the device as a safety device**
- **for repairs and any information relating to the device, contact the Evco dealer network.**

4 USER INTERFACE

4.1 Introductory information

The device has the following operational states:

- **"on" (power is connected and the device is on: the regulators may be switched on)**
- **"stand-by" (power is connected but software sets the device to off: the regulators are switched off; the option to switch the cabinet light on/off is dependent on parameter u2).**

The term "switching on" is understood to mean switching from the stand-by state to on; the term "switching off" is understood to mean switching from the on state to the stand-by state.

When the device is switched on, the status it was in when the power was interrupted is restored.

4.2 Switching the device on/off

- **ensure the keyboard is not blocked and that no procedures are running**
- **press (⏻) for 2 s.**

4.3 The display

If the device is switched on, then during normal operation the display will show the quantity assigned by parameter P5:

- **if P5 = 0, the display will show the cabinet temperature**
- **if P5 = 1, the display will show the operational setpoint**
- **if P5 = 2, the display will show the evaporator temperature**
- **if P5 = 3, the display will show "cabinet temperature - evaporator temperature".**

While in stand-by mode the display is switched off.

4.4 Displaying the cabinet temperature

- **ensure the keyboard is not blocked and that no procedures are running**
- **press (SET) for 2 s: the display will show the first available label**
- **press (▲) or (▼) to select "Pb1"**
- **press (SET)**

To exit the procedure:

- **press (SET) or leave for 60 s**
- **press (▲) or (▼) until the display shows the quantity assigned by parameter P5 or do not operate the keypad for 60 s.**

Alternatively:

- **press (⏻)**

4.5 Displaying the evaporator temperature

- **ensure the keyboard is not blocked and that no procedures are running**
- **press (SET) for 2 s: the display will show the first available label**
- **press (▲) or (▼) to select "Pb2"**
- **press (SET)**

To exit the procedure:

- **press (SET) or leave for 60 s**
- **press (▲) or (▼) until the display shows the quantity assigned by parameter P5 or do not operate the keypad for 60 s.**

Alternatively:

- **press (⏻)**

If there is no evaporator probe (parameter P3 = 0), label "Pb2" will not be displayed.

4.6 Manual activation of defrosting

- **ensure the keyboard is not blocked and that no procedures are running**
- **press (❄) for 4 s.**

If defrosting is activated while the evaporator temperature is above the value set by parameter d2, defrosting will not be activated.

4.7 Switching the cabinet light on/off

- **ensure no procedures are running**
- **press (💡)**

See also parameter u2.

4.8 Blocking/unblocking the keyboard

To block the keyboard:

- **ensure no procedures are running**
- **press (SET) and (▼) for 2 s: the display will show "Loc" for 1 s**

If the keyboard is blocked, it will not be possible to:

- **switch the device off/on**
- **display the cabinet temperature (using the procedure indicated in paragraph 4.4)**
- **display the evaporator temperature (using the procedure indicated in paragraph 4.5)**
- **manually activate defrosting**
- **change the operational setpoint using the procedure indicated in paragraph 6.1 (the operational setpoint may also be set by means of parameter SP).**

These operations will cause the label "Loc" to be displayed for 1 s.

To unblock the keyboard:

- **press (SET) and (▼) for 2 s: the display will show "UnL" for 1 s.**

4.9 Buzzer mute

- **ensure no procedures are running**
- **press any key (the first key press does not trigger the associated effect).**

5 SUPPLEMENTARY INFORMATION

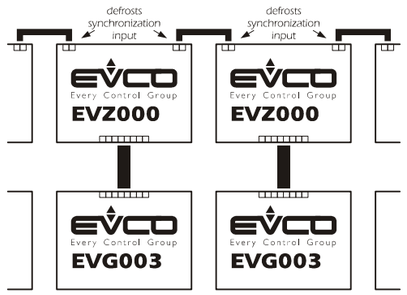
5.1 Defrost synchronisation

The contact of the digital input for synchronising defrosting is closed during defrosting operations; it is possible to synchronise defrosting operations by connecting the inputs of several devices together.

In this case, drip draining duration counting starts when defrosting of the last device is concluded.

The inputs are connected together by means of a two-core cable wired directly into 2.5 mm (0.098 in) pitch, 2-way female JST connectors; the cable is not provided with the device.

The length of the cable used to connect the inputs together must not exceed 5 m (16.404 feet).



6 SETTINGS

6.1 Setting the operational setpoint

- **ensure the keyboard is not blocked and that no procedures are running**
- **press (SET) the LED (❄) will flash**
- **press (▲) or (▼) within 15 s; also see parameters r1, r2 and r3**
- **press (SET) or leave for 15 s.**

It is also possible to set the operational setpoint by means of parameter SP.

6.2 Setting the configuration parameters

To access the procedure:

- **ensure no procedures are running**
- **press (▲) and (▼) for 4 s: the display will show "PA"**
- **press (SET)**
- **press (▲) or (▼) within 15 s s to set "-19"**
- **press (SET) or leave for 15 s**
- **press (▲) and (▼) for 4 s: the display will show "SP".**

To select a parameter:

- **press (▲) or (▼)**

To modify a parameter:

- **press (SET)**
- **press (▲) or (▼) within 15 s**
- **press (SET) or leave for 15 s.**

To exit the procedure:

- **press (▲) and (▼) for 4 s or leave for 60 s.**

Interrupt the device power supply after altering the parameters

6.3 Resetting configuration parameter default values

- **ensure no procedures are running**
- **press (▲) and (▼) for 4 s: the display will show "PA"**
- **press (SET)**
- **press (▲) or (▼) within 15 s to set "743"**
- **press (SET) or leave for 15 s**
- **press (▲) and (▼) for 4 s: ithe display will show "dEF"**
- **press (SET)**
- **press (▲) or (▼) within 15 s to set "149"**
- **press (SET) or leave for 15 s: the display will flash "dEF" for 4 s, after which the device will exit the procedure**
- **Disconnect the power to the device.**

Ensure that the parameter default values are appropriate, in particular, that the probes are PTC type.

7 SIGNALS

7.1 Messages

LED	MEANING
❄	**Compressor LED** **if on then the compressor is on** **if flashing:** **• the operational setpoint is being changed** **• compressor protection is ongoing (parameters C0, C1 and C2)**
❄	**defrosting LED** **if on, defrosting ongoing** **if flashing:** **• defrosting has been requested, but compressor protection is ongoing (parameters C0, C1 and C2)** **• defrost synchronisation is ongoing** **• drip-draining is ongoing (parameter d7)** **• refrigerant fluid heating is ongoing (parameter dA)**
💡	**Cabinet light LED** **If on, then the cabinet light is on**
⚠	**alarm LED** **if on, an alarm state or an error is ongoing**
⏻	**On/stand-by LED** **if on, the device is in stand-by mode**
°C	**degree Celsius LED** **if on, the unit of measurement for temperature will be degrees Celsius (parameter P2)**
°F	**degree Fahrenheit LED** **if on, the unit of measurement for temperature will be degrees Fahrenheit (parameter P2)**

CODE	MEANING
Loc	**the keypad ad/or the operational setpoint are blocked (parameter r3); see section 4.8**
- - - -	**the value to be displayed is not available (e.g. because the probe is missing)**

8 ALARMS

8.1 Alarms

CODE	MEANING
AL	**Minimum temperature alarm** **Remedies:** **• check the temperature associated with the alarm** **• see parameters A0, A1 and A2** **Main consequences:** **• the device will continue to operate normally**
AH	**Maximum temperature alarm** **Remedies:** **• check the cabinet temperature** **• see parameters A4 and A5** **Main consequences:** **• the device will continue to operate normally**

When the cause that triggered the alarm has been resolved, the device restores normal operation.

9 INTERNAL DIAGNOSTICS

9.1 Internal diagnostics

CODE	MEANING
Pr1	**Cabinet probe error** **Remedies:** **• see parameter P0** **• check probe integrity** **• check probe-device connection** **• check the cabinet temperature** **Main consequences:** **• the activity of the compressor will depend on parameters C4 and C5** **• defrosting will never be activated**
Pr2	**Evaporator probe error** **Remedies:** **• the same as for the previous case, but in relation to the evaporator probe** **Main consequences:** **• if parameter P3 is set to 1, defrosting will last for the duration established by parameter d3** **• if parameter P3 is set to 1 and parameter d8 is set to 2, the device will operate as though parameter d8 was set to 0**

When the cause that triggered the alarm has been resolved, the device restores normal operation.

10 TECHNICAL INFORMATION

10.1 Technical information

EVZ000 (user interface) case: **grey self-extinguishing.**

EVG003 (power module) case: **open card.**

EVZ000 (user interface) front panel protection classification **IP 65.**

EVG003 (power module) front panel protection classification: **IP00.**

EVZ000 (user interface) connections: **8 way female telephony connector (to the power module), 2.5 mm (0.098 in, digital inputs) pitch 2-way male JST connectors.**

The user interface is connected to the power module by means of an 8-core telephony cable wired straight on 8-way telephony connectors; the cable is not supplied with the device.

Digital inputs for synchronising defrosting between several devices are connected together by means of a two-core cable wired directly into 2.5 mm (0.098 in) pitch, 2-way female JST connectors; the cable is not provided with the device.

EVG003 (power module) connections: **8-way telephony connector (to the user interface), screw terminal blocks (power supply), 6.3 mm faston (ground), 2.8 mm faston (sensor inputs), 3-way male Mate-N-Lok connectors (outputs).**

Operating temperature: **from 0 to 55 °C (from 32 to 54.44 °C, 10 ... 90% relative humidity, without condensation).**

EVZ000 (user interface) power supply: **powered by the EVG003 (power module).**

EVG003 (power module) power supply: **115 V AC (-15%) ... 230 V AC (+10%), 50/60 Hz, 6.3 VA.**

Alarm buzzer: **available on request.**

Sensor inputs: **2 (chamber probe and evaporator probe) for PTC/NTC probes.**

Digital inputs: **2 (synchronised defrosting) in parallel (clean contact, 5 V 1 mA).**

Sensor range: **from -50.0 to 150.0 °C (from -50 to 300 °F) for PTC probes, from -40.0 to 105.0 °C (from -40 to 220 °F) for NTC probes.**

Sensitivity: **0,1 °C/1 °C/1 °F.**

Digital outputs: **3 relays:**

- **compressor relay: 30 A res. @ 250 VAC (NA contacts)**
- **defrost relay:16 A res. @ 250 VAC (NA contacts)**
- **cabinet light relay: 16 A res. @ 250 VAC (NA contacts).**

The maximum permitted current on loads is 24 A.

11 OPERATIONAL SETPOINT AND CONFIGURATION PARAMETERS

11.1 Operational setpoint

	MIN.	MAX.	U.o.M.	DEF.	OPERATIONAL SETPOINT
	r1	r2	°C/°F (1)	2,0	operational setpoint

11.2 Configuration parameters

PARAM.	MIN.	MAX.	U.o.M.	DEF.	OPERATIONAL SETPOINT
SP	r1	r2	°C/°F (1)	2,0	operational setpoint
PARAM.	**MIN.**	**MAX.**	**U.o.M.**	**DEF.**	**SENSOR INPUTS**
CA1	-25,0	25,0	°C/°F (1)	1,0	cabinet probe offset
CA2	-25,0	25,0	°C/°F (1)	0,0	evaporator probe offset
P0	0	1	- - - -	1	probe type 0 = PTC 1 = NTC
P1	0	1	- - - -	0	degree Celsius decimal point (for the quantity displayed during normal operation) 1 = YES
P2	0	1	- - - -	0	unit of temperature measurement (2) 0 = °C 1 = °F
P3	0	1	- - - -	1	evaporator probe enabling 1 = YES
P5	0	3	- - - -	0	quantity displayed during normal operation 0 = cabinet temperature 1 = operational setpoint 2 = evaporator temperature 3 = "cabinet temperature - evaporator temperature"
PARAM.	**MIN.**	**MAX.**	**U.o.M.**	**DEF.**	**MAIN CONTROLLER**
r0	0,1	15,0	°C/°F (1)	2,0	operational setpoint differential
r1	-99,0	r2	°C/°F (1)	-1,0	minimum operational setpoint
r2	r1	99,0	°C/°F (1)	8,0	maximum operational setpoint
r3	0	1	- - - -	0	block operational setpoint change (with the procedure indicated in paragraph 6.1) 1 = YES
PARAM.	**MIN.**	**MAX.**	**U.o.M.**	**DEF.**	**COMPRESSOR PROTECTIONS**
C0	0	240	min	0	compressor delay from device power on(3)
C1	0	240	min	0	minimum elapsed time period between two consecutive compressor start-up operations; also compressor delay on resolution of cabinet probe error (4) (5)
C2	0	240	min	0	minimum compressor shut-down time (4)
C3	0	240	s	0	minimum compressor start-up time
C4	0	240	min	3	duration of compressor shut-down during cabinet probe error; see also C5
C5	0	240	min	5	compressor start-up duration during cabinet probe error; see also C4
PARAM.	**MIN.**	**MAX.**	**U.o.M.**	**DEF.**	**DEFROSTING**
d0	0	99	h	6	defrost interval; see also d8 (6) 0 = regular periodic defrosting will never be activated
d1	0	1	- - - -	0	type of defrosting 0 = electric 1= hot gas (7)
d2	-99,0	99,0	°C/°F (1)	8,0	defrost end temperature (only if P3 = 1)
d3	0	99	min	30	defrost duration if P3 = 0; maximum defrost duration if P3 = 1 0 = defrosting will never be activated
d4	0	1	- - - -	0	defrosting at device power on(3) 1 = YES
d5	0	99	min	0	defrost delay from device power on (only if d4 = 1) (3)
d6	0	1	- - - -	0	temperature displayed during defrosting (only if P5 = 0) 0 = cabinet temperature 1 = if, on activation of defrosting the cabinet temperature is below the "operational setpoint + r0", at most"operational setpoint + r0"; if on activation of defrosting the cabinet temperature is above the "operational setpoint + r0", at most the cabinet temperature at activation of defrosting (8)
d7	0	15	min	0	drip-drain duration
d8	0	2	- - - -	0	type of drip-drain interval 0 = defrosting will be activated when the device has remained on for the time set by d0 1 = defrosting will be activated when the compressor has remained on for the time set by d0 2 = defrosting will be activated when the evaporator temperature has remained below the temperature set by d9 for the period of time set by d0 (9)
d9	-99,0	99,0	°C/°F (1)	10,0	the evaporator temperature above which the defrost interval count is suspended (only if d8 = 2)
dA	0	99	min	0	minimum compressor on duration on activation of defrosting so that they may be activated (only if d1 = 1) (10)
dC	0	999	min	30	maximum contact close duration of the digital inputs for synchronising defrosting 0 = no function
PARAM.	**MIN.**	**MAX.**	**U.o.M.**	**DEF.**	**TEMPERATURE ALARMS**
A0	0	1	- - - -	0	temperature associated with the minimum temperature alarm 0 = cabinet temperature 1 = evaporator temperature (11)
A1	-99,0	99,0	°C/°F (1)	-5,0	the temperature below which the minimum temperature alarm is activated; see also A0 and A2 (12)
A2	0	2	- - - -	1	minimum temperature alarm type 0 = no alarm 1 = in relation to the operational setpoint (i.e. "operational setpoint - A1"; consider A1 to be without sign) 2 = absolute (i.e. A1)
A4	-99,0	99,0	°C/°F (1)	10,0	the temperature above which the maximum temperature alarm is activated; see also A5 (12)
A5	0	2	- - - -	1	maximum temperature alarm type 0 = no alarm 1 = in relation to the operational setpoint (i.e. "operational setpoint + A4"; consider A4 to be without sign) 2 = absolute (i.e. A4)
A6	0	240	min	60	device power-on maximum temperature alarm delay (3)
A7	0	240	min	40	temperature alarm delay
A8	0	240	min	40	drip-drain end maximum temperature alarm delay (13)
PARAM.	**MIN.**	**MAX.**	**U.o.M.**	**DEF.**	**DIGITAL OUTPUTS**
u2	0	1	- - - -	1	enable cabinet light switching on/off while in stand-by mode (14) 1 = YES
PARAM.	**MIN.**	**MAX.**	**U.o.M.**	**DEF.**	**RESERVED**
LA	- - - -	- - - -	- - - -	- - - -	reserved
Lb	- - - -	- - - -	- - - -	- - - -	reserved
LP	- - - -	- - - -	- - - -	- - - -	reserved

(1) the unit of measurement depends on parameter P2
(2) Set the parameters relating to the controllers appropriately after altering parameter P2
(3) the parameter is even effective after power supply interruption, such as when the device is switched on
(4) the time period established by parameter C1 is counted even while in stand-by mode
(5) if parameter C1 is set to 0, the cabinet probe error resolution delay will, in any case, be 2 minutes
(6) The device stores the defrost interval count every 30 minutes; altering parameter d0 has effect of concluding the previous defrost interval or manual defrost activation
(7) if parameter d1 is set to 1 and parameters C0, C1 and C2 are set to 0, the compressor will be shut down 1 s after completion of defrosting
(8) the display will restore normal function when, on completion of drip draining, the cabinet temperature drops below the value that blocked the display (or if a temperature alarm occurs)
(9) if parameter P3 is set to 0, the device will operate as though parameter d8 was set to 0
(10) if, on defrost activation, the compressor on duration is less than the time established by parameter dA, the compressor will remain on for the fraction of time required to complete it
(11) if parameter P3 is set to 0, the device will operate as though parameter A0 was set to 0
(12) the parameter differential is 2.0 °C/4 °F
(13) there are no temperature alarms during defrosting and drip draining, if they occur following defrost activation
(14) if parameter u2 is set to 0, switching off the device may cause switching off of the cabinet light (the service will remain off on subsequent switching on of the device); if parameter u2 is set to 1, switching off the device does not cause switching off of the cabinet light (the service remains on on subsequent switching on of the device).

The device must be disposed of in accordance with local regulations pertaining to the collection of electrical and electronic appliances.

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