EVC80P16N7DSM00 (module) / EVC99T00X0XXX01 (User interface)

Digital controller for controlling blast chillers

version 1.00

GB ENGLISH

1 PREPARATIONS

1.1 Important

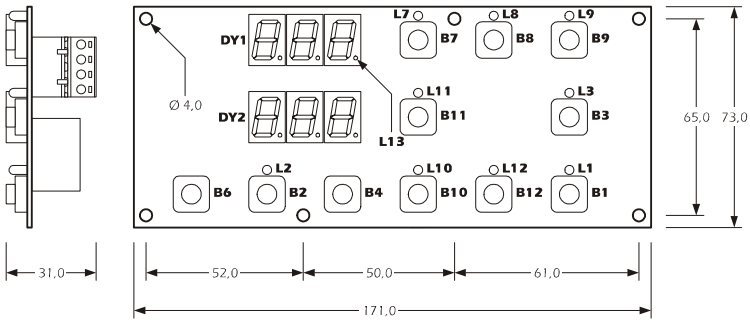
Please read these instructions carefully prior to installation and use, and follow all the precautions for installation and electrical connections; keep these instructions with the device for future consultation.

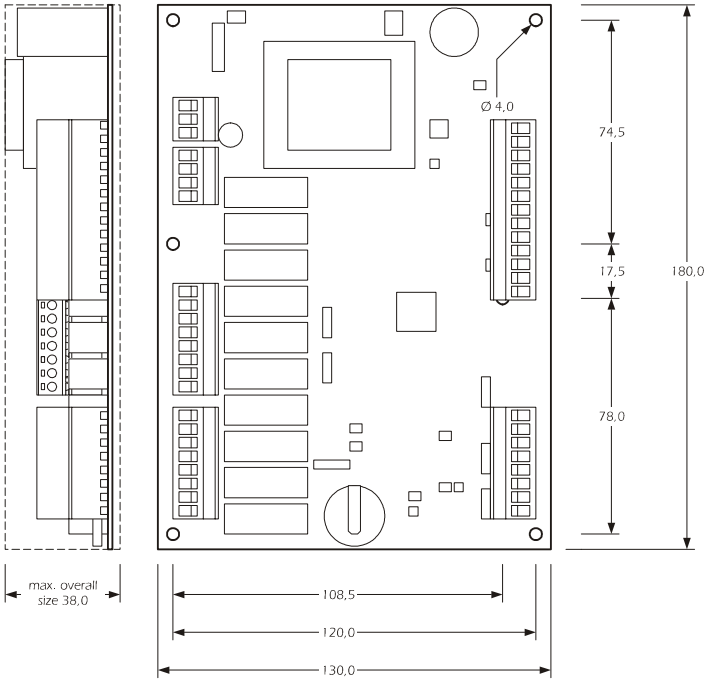
The device must be disposed of in accordance with local regulations pertaining to the collection of electrical and electronic appliances.

1.2 Installation

On a flat surface, with spacers (not provided); dimensions are in mm.

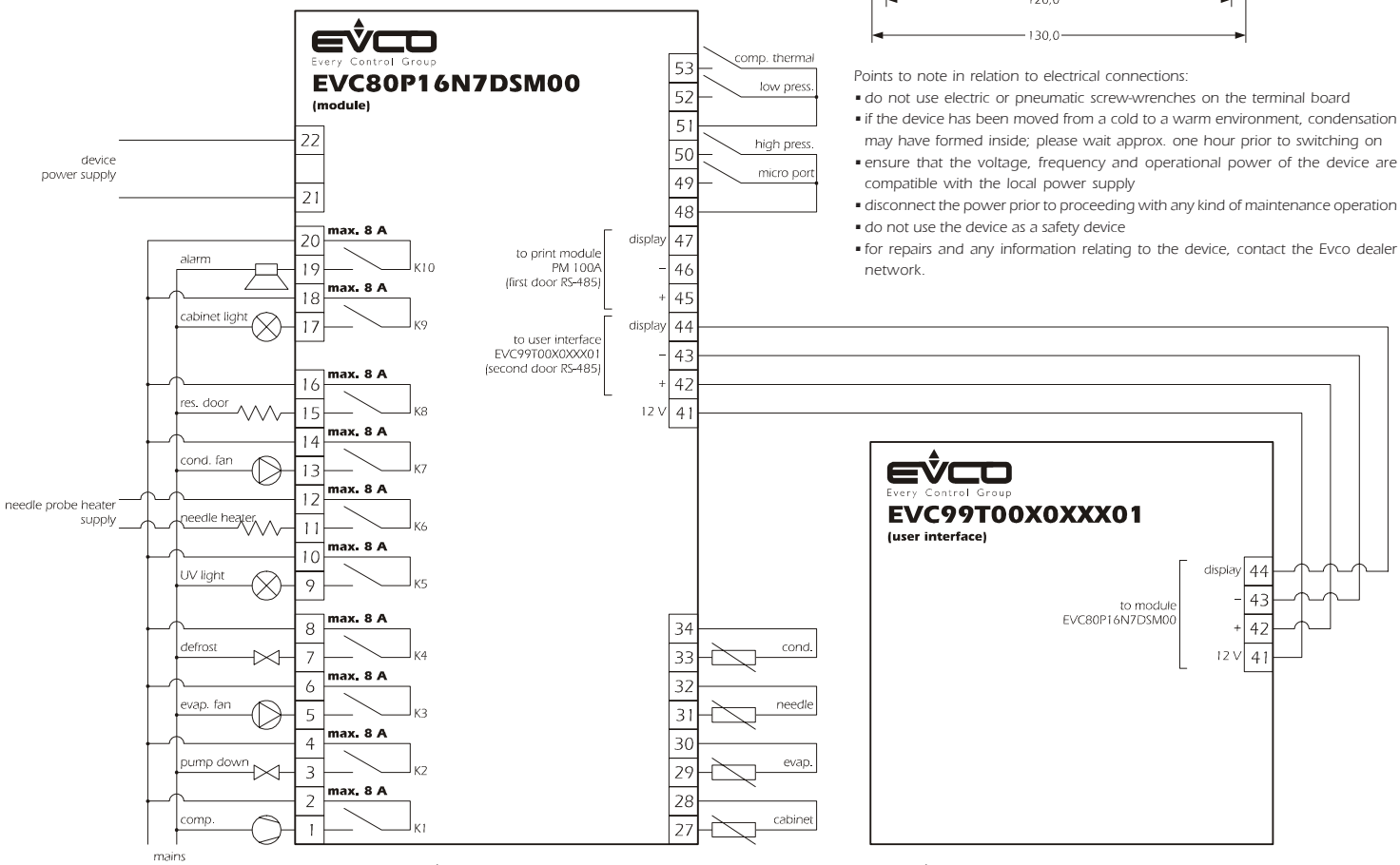
Recommendations for installation:





- the figure on the left refers to the user interface, the figure on he right the module
- 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
- possible metal parts (or possible low voltage circuits) close to the boards must be 13 mm away at least; metal parts must be put to earth
- 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.

1.3 Electrical connections



Points to note in relation to 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.

2 USER INTERFACE

2.1 Introductory information

The device has the following operational states:

- "on" (the device is switched on and an operating cycle is running)
- "stand-by" (the device is switched on and no operating cycle is running, but it is possible to select one)
- "off" (the device is switched on and no operating cycle is running, and it is not possible to select any).

If power is interrupted while in the "on" mode, when power is restored the device will be in the same state and the operational cycle will be restarted from the point reached when the power interr. occurred .

If power is interrupted while in "stand-by" or "off" mode, when power is restored the device will be in the same state.

2.2 Switching the device on/off ("off"/"stand-by")

- ensure no procedures are running
- press **B1** for 5 s

The regulators are switched off while in "off" mod.

2.3 Starting/stopping an operational cycle ("on"/ "stand-by")

- ensure no procedures are running
- press **B1**

The regulators are switched off while in "stand-by" mode.

2.4 The display

In the "on" state, during normal operation, display **DY1** shows:

- the temperature measured by the needle probe if a set-temperature chilling or freezing operation is ongoing
- the temperature of the cabinet if a set-temperature chilling, or timed freezing or a storage operation is ongoing.

Display **DY2** shows:

- the amount of time for a blast chill or freezing operation, if these are ongoing
- "**- - -**" if a storage operation is ongoing.

While in "stand-by" mode, display **DY1** shows the cabinet temperature and display **DY2** shows "- - -".
While in "off" mode, display **DY1** shows "**OFF**" and display **DY2** is off.

2.5 Displaying the temperatures detected by the probes

- ensure the device is in "off" mode and no procedures are running
- press **B2** and **B4** for 5 s: display **DY1** will show the message "**Pr1**" and display **DY2** will show the cabinet temperature
- press **B4** or **B6** to select one of the labels shown in the table below.

CODE	MEANING
Pr1	cabinet probe
Pr2	needle probe
Pr3	evaporator probe
Pr4	condenser probe

To exit the procedure:
- press **B1**

If there is no condenser probe (parameter P3 = 0), label "**Pr4**" will not be displayed.

2.6 Starting/stopping manual defrosting

To start defrosting in manual mode:
- ensure the device is in "off" mode and no procedures are running
- press **B11** : display DY1 will show "**dEF**".

If the evaporator temperature is above the value set by parameter P23, defrosting will not be activated.
To stop defrosting in manual mode:
- press **B11**

2.7 Switching on the UV light (cabinet sterilisation)

- ensure that the device is in "stand-by" mode, that no procedures are running and that the micro port input is not active
- press **B10**

The UV light is turned on for the period of time established by parameter P46 or until **B10** is pressed once more.

2.8 Heating the needle probe

- ensure that the device is in "stand-by" mode, that no procedures are running and that the micro port input is not active
- press **B2** for 5 s: the needle probe will be heated until it reaches the temperature set by parameter P47 or at most for the period of time set by parameter P48.

If the temperature detected by the needle probe is above the value set by parameter P47, heating will not be started.
The micro-port input will not be reported during needle probe heating.

2.9 Buzzer mute

- ensure no procedures are running
- press **B4**

After the period of time established by parameter P56 has elapsed, the buzzer is automatically muted.

3 OPERATIONAL CYCLES

3.1 Introductory information

The device has the following operational cycles:
- hard set-temperature chilling and storage
- normal set-temperature chilling and storage
- set-temperature freezing and storage
- hard timed chilling and storage
- timed normal chilling and storage
- timed freezing and storage.

Set-temperature cycles are preceded by a test to check correct needle probe insertion (see parameters P14 and P15); if the result of the test is negative, cycles will be started in timed mode.

3.2 Hard set-temperature chilling and storage cycle

To select the cycle:
- ensure the device is in "off" mode and no procedures are running
- press **B7** : display **DY1** will show the operational setpoint and L7 will switch on.

To alter the first step operational setpoint:
- press **B4** or **B6**

To alter the second step operational setpoint:
- press **B7** for 5 s: LED **L7** will flash
- press **B4** or **B6**

These settings remain active until another cycle is selected.
Also, it is possible to set the first step operational setpoint by means of parameter P6 and the second step operational setpoint by means of parameter P4; the hard chill process progresses from the first step to the second when the temperature detected by the needle probe reaches the value set by parameter P12.
To start the cycle:
- press **B1**

When the temperature detected by the needle probe reaches the value set by parameter P10, the buzzer is activated for the length of time set by parameter P55 and the device switches to storage mode.
To interrupt the cycle:
- press **B1**

3.3 Normal set-temperature chilling and storage cycle

To select the cycle:
- ensure the device is in "off" mode and no procedures are running
- press **B8** : display **DY1** will show the operational setpoint and LED **L8** will switch on.

To alter the operational setpoint:
- press **B4** or **B6**

These settings remain active until another cycle is selected.
It is also possible to set the operational setpoint by means of parameter P4.
To start the cycle:
- press **B1**

When the temperature detected by the needle probe reaches the value set by parameter P10, the buzzer is activated for the length of time set by parameter P55 and the device switches to storage mode.
To interrupt the cycle:
- press **B1**

3.4 Set-temperature freezing and storage cycle

To select the cycle:
- ensure the device is in "off" mode and no procedures are running
- press **B9** : display **DY1** will show the operational setpoint and LED **L9** will switch on.

To alter the operational setpoint:
- press **B4** or **B6**

These settings remain active until another cycle is selected.
It is also possible to set the operational setpoint by means of parameter P5.
To start the cycle:
- press **B1**

When the temperature detected by the needle probe reaches the value set by parameter P11, the buzzer is activated for the length of time set by parameter P55 and the device switches to storage mode.
To interrupt the cycle:
- press **B1**

3.5 Hard timed blast chilling and storage cycle

To select the cycle:
- ensure the device is in "off" mode and no procedures are running
- press **B7** : display **DY1** will show the operational setpoint and LED **L7** will switch on.

To alter the first step operational setpoint:
- press **B4** or **B6**

To alter the second step operational setpoint:
- press **B7** per 5 s: LED **L7** will flash
- press **B4** or **B6**

It is also possible to set the first step operational setpoint by means of parameter P6 and the second step operational setpoint by means of parameter P4.
- press **B3** : display **DY2** will show the duration of the chilling step and LED **L3** will be switched on.

To alter the duration of the chilling step:
- press **B4** or **B6**

It is also possible to set the chill duration time by means of parameter P16.
These settings remain active until another cycle is selected.
The hard chill process switches from the first step to the second step once the period of time established by parameter P18 has elapsed.
To start the cycle:
- press **B1**

When the chill duration time has elapsed, the buzzer is activated for the length of time set by parameter P55 and the device switches to storage mode.
To interrupt the cycle:
- press **B1**

3.6 Normal timed chilling and storage cycle

To select the cycle:
- ensure the device is in "off" mode and no procedures are running
- press **B8** : display **DY1** will show the operational setpoint and LED **L8** will switch on.

To alter the operational setpoint:
- press **B4** or **B6**

It is also possible to set the operational setpoint by means of parameter P4.
- press **B3** : display **DY2** will show the duration of the chilling step and LED **L3** will be switched on.

To alter the duration of the chilling step:
- press **B4** or **B6**

It is also possible to set the chill duration time by means of parameter P16.
These settings remain active until another cycle is selected.
To start the cycle:
- press **B1**

When the chill duration time has elapsed, the buzzer is activated for the length of time set by parameter P55 and the device switches to storage mode.
To interrupt the cycle:
- press **B1**

3.7 Timed freezing and storage cycle

To select the cycle:
- ensure the device is in "off" mode and no procedures are running
- press **B9** : display **DY1** will show the operational setpoint and LED **L9** will switch on.

To alter the operational setpoint:
- press **B4** or **B6**

It is also possible to set the operational setpoint by means of parameter P5.
- press **B3** : display **DY2** will show the duration of the freezing step and LED **L3** will be switched on.

To alter the duration of the freezing step:
- press **B4** or **B6**

It is also possible to set the freeze duration time by means of parameter P17.
These settings remain active until another cycle is selected.
To start the cycle:
- press **B1**

When the freezing step duration time has elapsed, the buzzer is activated for the length of time set by parameter P55 and the device switches to storage mode.
To interrupt the cycle:
- press **B1**

3.8 Storage, selection and starting a program

The device allows storage of operation cycle settings in programs; up to 99 programs can be stored.
To store a program:
- proceed as described in paragraphs 3.5, 3.6 or 3.7 without starting the cycle
- press **B12** for 5 s: display **DY1** will show the label of the first unused program
- press **B4** or **B6** to select another label
- press **B12** for 5 s: the device will store the program and exit from the procedure (any programs with the same label will be overwritten).

To select and start a stored program:
- ensure the device is in "stand-by" mode and no procedures are running
- press **B12** : display **DY1** will show the label of the first program
- press **B4** or **B6** to select a program
- press **B1**

To display the label of the current program:
- press **B12**

3.9 Additional functions accessible during operational cycles

To display the cabinet temperature during a set-temperature chilling step or during a set-temperature freezing step:
- press the key relating to the current cycle: display **DY1** displays the cabinet temperature for 5 s.

To display the temperature detected by the needle probe during a timed chilling step, timed freezing step or during storage:
- press **B2** : display **DY1** shows the temperature measured by the needle probe for 5 s.

To display the time elapsed since starting a chilling or freezing step:
- press **B4** : display **DY2** shows the elapsed time for 5 s.

If the key is pressed during the storage phase, display DY2 will show the effective duration of the chilling or freezing process

4 SETTINGS

4.1 Setting the date and time

To access the procedure:
- ensure the device is in "off" mode and no procedures are running

To alter the date and time:
- press **B3** for 5 s: display **DY1** will show "**YY**" and display **DY2** will show the last two digits corresponding to the year
- press **B4** or **B6** to change the year
- press **B3** : display **DY1** will show "**NN**" and display **DY2** will show the digits corresponding to the month (the month is displayed in 12 month format)
- press **B4** or **B6** to change the month
- press **B3** : display **DY1** will show "**dd**" and display **DY2** will show the digits corresponding to the day (days are displayed in 31 day format)
- press **B4** or **B6** to change the day
- press **B3** : display **DY1** will show "**hh**" and display **DY2** will show the digits corresponding to the hour (hours are displayed in 24 hour format)
- press **B4** or **B6** to change the hour
- press **B3** : ildisplay **DY1** will show "**nn**" and display **DY2** will show the digits corresponding to the minutes
- press **B4** or **B6** to change the minutes
- press **B3** : the device will exit the procedure.

4.2 Setting the configuration parameters

To access the procedure:
- ensure the device is in "off" mode and no procedures are running
- press **B4** and **B6** for 5 s: display **DY1** will show "**PA**" and display **DY2** will show the corresponding value.

To select a parameter:
- press **B4** or **B6**

To modify a parameter:
- press **B3** : LED **L3** will be switched on
- press **B4** or **B6** within 60 s
- press **B3**

To exit the procedure:
- press **B4** and **B6** for5 s.

5 HACCP

5.1 Introductory information

The device is capable of storing up to 10 HACCP alarms, after which the most recent alarm will overwrite the oldest.
The device can furnish the following information:
- the critical value
- the date and time at which the alarm occurred
- the alarm duration (from 1 minute to 999 minutes, " - - -" if the alarm is ongoing).

CODE	ALARM TYPE (AND CRITICAL VALUE)
Er0	cabinet probe error (the temperature of the cabinet when the alarm condition occurred)
Er1	evaporator probe alarm (the maximum cabinet temperature during the alarm condition)
Er3	needle probe alarm (the maximum cabinet temperature during the alarm condition)
Er4	condenser probe alarm (the maximum cabinet temperature during the alarm condition)
AL	(minimum) cabinet temperature alarm (the minimum cabinet temperature during the alarm condition)
AH	(maximum) cabinet temperature alarm (the maximum cabinet temperature during the alarm condition)
Ht	condenser temperature alarm (the maximum cabinet temperature during the alarm condition)
d - r	micro port input alarm (the maximum cabinet temperature during the alarm condition)
HP	high pressure input alarm (the maximum cabinet temperature during the alarm condition)
LP	low pressure input alarm (the maximum cabinet temperature during the alarm condition)
HA	compressor thermal protection input alarm (the maximum cabinet temperature during the alarm condition)
PF	power failure alarm (the cabinet temperature on restoration of power)

5.2 Viewing HACCP alarm information

Viewing HACCP alarm information:
- ensure the device is in "off" mode and no procedures are running
- press **B12** for 5 s: display **DY1** will show "**Prt**".

To select an alarm:
- press **B4** or **B6** display **DY1** will show the number of the alarm (for example "n03") and display **DY2** will show the relevant code (for example "**AH**", or one of the codes reported in the table in section 5.1; the lower the number, the older the alarm itself).

To display the information relating to the alarm:
- press **B3** repeatedly: the display will show the following information in sequence (for example):

INFO	MEANING
St	on display **DY1**
y07	on display **DY2**
	The alarm occurred in 2007 (continued ...)
M03	on display **DY1**
d26	on display **DY2**
	The alarm occurred on 26 March 2007
h16	on display **DY1**
d30	on display **DY2**
	The alarm occurred at 4:30pm
t	on display **DY1**
8	on display **DY2**
	The critical value is 8 °C/8 °F
dur	on display **DY1**
75	on display **DY2**
	The alarm has lasted for 75 minutes
n03	on display **DY1**
AH	on display **DY2**
	The selected alarm

LED **L13** provides information relating to the status of the HACCP alarm memory; please refer to section 7.1.

To exit the information series:
- press **B4** or **B6** display **DY1** will show the number of another alarm and display **DY2** will show the corresponding code.

To exit the procedure:
- press **B12** for 5 s.

5.3 Deleting the HACCP alarm list

- set parameter P73 to 1.

6 DATA PRINTING

6.1 Introductory information

The device has a serial port for communicating with the PM 100A X9S001 print module.

6.2 Connecting the PM 100A X9S001 print module

Connecting the PM 100A X9S001 print module:
- ensure that parameter P71 is set to 1
- ensure that the print module baud rate is set to 9,600 baud
- ensure that the module parity is set to odd.

6.3 Printing operational cycle information

Printing operational cycle information:
- operational cycle start date
- operational cycle or program type (or one of the codes listed in the table below)

CODE	MEANING
T>>>*	hard set-temperature chilling and storage
T*	normal set-temperature chilling and storage
T***	set-temperature freezing and storage
t>>>*	hard timed chilling and storage
t*	timed normal chilling and storage
t***	timed freezing and storage
P01...99	program 01 ... 99

- printing time
- cabinet temperature (Pr1)
- temperature measured by the needle probe (Pr2, only if the operational cycle is a set-temperature cycle)
- time of switchover to storage mode
- ora di un'eventuale interruzione del ciclo di funzionamento
- time of any operational cycle interruption.

Printing of the temperature occurs at operational cycle start, and at intervals (see parameter P72).

6.4 Printing HACCP alarm information

The module prints the information reported in the table in section 5.2.

To print the information relating to the alarms:
- ensure the device is in "off" mode and no procedures are running
- press **B12** for 5 s: display **DY1** will show "**Prt**"
- press **B12**

To exit the procedure:
- press **B12** for 5 s.

7 MESSAGES AND INDICATIONS

7.1 Messages

LED	MEANING
L1	"on"/"stand-by" LED if on, a chilling or freezing operation is ongoing if flashing, a storage operation is ongoing
L2	needle probe LED if on, the temperature measured by the needle probe is being displayed if flashing, then the result of the test to verify correct needle probe insertion was negative; the cycle will be started in timed mode and the buzzer will emit 5 beeps every 10 s
L3	timed operation cycle LED if on, a timed operation cycle will have been selected (or is ongoing

L7	hard chill LED
	if on:
	▪ a hard chill operation will have been selected
	▪ the first step of a hard chill operation is ongoing
	▪ modification of the hard chill first step operational setpoint is underway
	if flashing:
	▪ modification of the hard chill second step operational setpoint is underway
	▪ the second step of a hard chill operation is in progress

L8	normal chilling LED if on, a normal chill operation has been selected (or is ongoing
L9	freezing LED if on, a freezing operation has been selected (or is ongoing)
L10	UV light (cabinet sterilisation) LED if on, the UV light is on (a cabinet sterilisation operation is ongoing)
L11	defrosting LED if on, defrosting is ongoing
L12	program LED if on, program storing, selection or execution is ongoing
L13	HACCP LED if on, program storing, selection or execution is ongoing

7.2 Indications

CODE	MEANING
dEF	if on, defrosting is ongoing if flashing, drip-draining is ongoing

8 ALARMS

8.1 Alarms

CODE	MEANING
AL	Minimum cabinet temperature alarm Remedies: ▪ check the cabinet temperature ▪ see parameters P64 and P66 Consequences: ▪ the alarm output will be activated
AH	Maximum cabinet temperature alarm Remedies: ▪ check the cabinet temperature ▪ see parameters P65 and P67 Consequences: ▪ the alarm output will be activated
Ht	Condenser temperature alarm Remedies: ▪ check the condenser temperature ▪ see parameter P62 Consequences: ▪ the operational cycle will be interrupted ▪ it will not be possible to start any operational cycles ▪ the condenser fan will be switched on ▪ the alarm output will be activated
d - r	Micro-port input alarm Remedies: ▪ check the causes of the input activation ▪ see parameter P38 Consequences if the alarm occurs while in "on" mode: ▪ the compressor will be shut down ▪ if parameter P37 is set to 1, the evaporator fan will be switched off ▪ if parameter P59 is set to 0, the cabinet light will be switched on ▪ the condenser fan will be switched off ▪ if the UV light is on (i.e. if cabinet sterilisation is ongoing), the UV light will be switched off ▪ the alarm output will be activated Consequences if the alarm occurs while in "stand-by" mode: ▪ if parameter P59 is set to 0, the cabinet light will be switched on
HP	High pressure input alarm Remedies: ▪ check the causes of the input activation ▪ see parameter P40 Consequences: ▪ the operational cycle will be interrupted ▪ the loads will be switched off ▪ it will not be possible to start any operational cycles ▪ the alarm output will be activated
LP	Low pressure input alarm Remedies: ▪ check the causes of the input activation ▪ see parameter P42 Consequences: ▪ the operational cycle will be interrupted ▪ the loads will be switched off ▪ it will not be possible to start any operational cycles ▪ the alarm output will be activated
HA	Compressor thermal protection input alarm Remedies: ▪ check the causes of the input activation ▪ see parameter P44 Consequences: ▪ the operational cycle will be interrupted ▪ the loads will be switched off ▪ it will not be possible to start any operational cycles ▪ the alarm output will be activated
rES	Power failure during an operational cycle Remedies: ▪ check the causes of the input activation Consequences: ▪ the operational cycle will be restored from the point where the power failure occurred

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

9 INTERNAL DIAGNOSTICS

9.1 Internal diagnostics

CODE	MEANING
Er0	Cabinet probe error Remedies: ▪ see parameter P60 ▪ check probe integrity ▪ check probe-device connection ▪ check the cabinet temperature Consequences: ▪ the operational cycle will be interrupted ▪ the loads will be switched off ▪ it will not be possible to start any operational cycles ▪ the alarm output will be activated
Er1	Evaporator probe error Remedies: ▪ the same as for the previous case, but in relation to the evaporator probe Consequences: ▪ defrosting will last for the length of time set by parameter P24 ▪ the evaporator fan will be switched off during storage ▪ the alarm output will be activated
Er3	Needle probe error Remedies: ▪ the same as for the previous case, but in relation to the needle probe Consequences: ▪ if a set-temperature chilling or freezing operation is ongoing, the operational cycle will be interrupted ▪ it will not be possible to start any set-temperature operational cycles ▪ the alarm output will be activated
Er4	Condenser probe error Remedies: ▪ the same as for the previous case, but in relation to the condenser probe Consequences: ▪ the condenser fan will operate in parallel with the compressor, except when set by parameter P54 ▪ the alarm output will be activated
Err	User interface-module communication error Remedies: ▪ check the user interface-module connection Consequences: ▪ if an operational cycle is ongoing, the device will continue to function normally ▪ it will not be possible to start any operational cycles

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

10 TECHNICAL INFORMATION

10.1 Technical information

Case: open case.

Front panel protection classification: IP 00.

EVC99T00X0XXX01 (user interface) connections: plug-in terminal board (to the module); the user interface is connected to the module by means of a 4-core cable (the cable is not included with the device).

EVC80P16N7DSM00 (module) connections: plug-in terminal board (power supply, inputs, outputs and communication ports).

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

EVC99T00X0XXX01 (user interface) power supply: The user interface is powered from the module.

EVC80P16N7DSM00 (module) power supply: 230 VAC, 50/60 Hz, 10 VA (nominal).

Maintaining the time and date in the absence of power: 2 years.

Alarm buzzer: present.

Sensor inputs: 4 (cabinet probe, evaporator probe, needle probe and condenser probe) for PTC/NTC probes.

Digital inputs: 4 (micro port, high pressure, low pressure and compressor thermal protection) for NA/NC (clean contact) contacts.

Sensor range: from -50 to 99°C (from -50 to 210°F) for PTC probes, from -40 to 99°C (from -40 to 210°F) for NTC probes.

Sensitivity: 1°C/1°F.

Digital outputs: 10 relays:

- **compressor realy:** 8 A res. @ 250 VAC (NA contacts)
- **down pump electrovalve relay**: 8 A res. @ 250 VAC (NA contacts)
- **evaporator fan relay**: 8 A res. @ 250 VAC (NA contacts)
- **defrost relay**: 8 A res. @ 250 VAC (NA contacts)
- **UV light relay**: 8 A res. @ 250 VAC (NA contacts)
- **needle probe heater relay**: 8 A res. @ 250 VAC (NA contacts)
- **condenser fan relay**: 8 A res. @ 250 VAC (NA contacts)
- **door element relay**: 8 A res. @ 250 VAC (NA contacts)
- **cabinet light relay**: 8 A res. @ 250 VAC (NA contacts)
- **alarm relay**: 8 A res. @ 250 VAC (NA contacts).

The maximum current allowed on the loads is 8 A.

Communication ports: two RS-485 ports (on the module), for:

- the communication with the user interface
- the communication with the printing module PM 100A X9S001.

The maximum length of the connecting cables is 50 m.

PT ▪ 03/08

11 CONFIGURATION PARAMETERS

11.1 Configuration parameters

PARAM.	MIN.	MAX.	U.o.M.	DEF.	SENSOR INPUTS
P0	0	1	---	1	unit of temperature measurement (1) 0 = °F 1 = °C
P1	-10	10	°C/°F (2)	0	cabinet probe offset
P2	-10	10	°C/°F (2)	0	evaporator probe offset
P3	-10	10	°C/°F (2)	0	needle probe offset
PARAM.	MIN.	MAX.	U.o.M.	DEF.	MAIN CONTROLLER
P4	-40	99	°C/°F (2)	-2	operational setpoint during the second hard chill step; also, operational setpoint during normal chilling (with reference to the cabinet probe)
P5	-40	99	°C/°F (2)	-40	operational setpoint during freezing (with reference to the cabinet probe)
P6	-40	P4	°C/°F (2)	-20	operational setpoint during the first hard chill step (with reference to the cabinet probe)
P7	-40	99	°C/°F (2)	3	operational setpoint during post-chill storage (with reference to the cabinet probe)
P8	-40	99	°C/°F (2)	-20	operational setpoint during post-freeze storage (with reference to the cabinet probe)
P9	1	15	°C/°F (2)	2	P4, P5, P6, P7 and P8 differential
P10	-40	99	°C/°F (2)	3	set temperature chill end temperature (with reference to the needle probe)
P11	-40	99	°C/°F (2)	-18	set temperature freeze end temperature (with reference to the needle probe)
P12	-40	P10	°C/°F (2)	15	temperature at which the hard chill switches from the first step to the second (with reference to the needle probe)
P13	-40	99	°C/°F (2)	65	temperature above which it is not possible to start a set-temperature operational cycle (with reference to the needle probe)
P14	0	99	°C/°F (2)	0	needle probe and the cabinet temperature for verification of correct needle probe insertion (3) 0 = the test will not be performed
P15	1	99	s	60	duration of the second test to check correct needle probe insertion; see also P14 (4)
P16	1	400	min	90	maximum set temperature chill duration; also timed chill duration
P17	1	400	min	240	maximum set temperature freeze duration; also timed freeze duration
P18	1	P16	min	20	first hard timed chill step duration
PARAM.	MIN.	MAX.	U.o.M.	DEF.	COMPRESSOR PROTECTIONS
P19	0	99	min	0	compressor delay from device power on (from restoration of power)
P20	0	99	min	0	minimum elapsed time period between two consecutive compressor start-up operations
P21	0	99	min	0	minimum compressor shut-down time
PARAM.	MIN.	MAX.	U.o.M.	DEF.	DEFROSTING
P22	0	2	---	1	defrost type (5) 0 = electric (defrost on relay) 1 = hot gas (defrost compressor and relay on) 2 = air (evaporator fan on)
P23	-40	99	°C/°F (2)	8	defrost end temperature (with reference to the evaporator probe)
P24	1	99	min/s (6)	20	maximum defrost duration
P25	0	99	h/min (6)	8	defrost interval during storage; see also P26 0 = intermittent defrosting will never be activated (only the first will be activated)
P26	0	99	min/s (6)	1	first defrost delay from start of storage; see also P25
P27	0	1	---	0	defrosting at start of chilling and freezing 1 = YES
P28	0	99	min/s (6)	2	drip-drain duration
P29	0	1	---	0	resetting of compressor protections at start of defrosting (only if P22 = 1) 1 = YES
P30	0	400	s	30	elapsed time between the defrost request and switching on the compressor (only if P22 = 1 and providing that the compressor is off when the defrost is requested); see also P31 (7) (8)

P31	0	400	s	60	elapsed time between the defrost request and activation of the solenoid valve (only if P22 = 1 and on condition that the compressor is off when defrosting is requested); see also P30 (7) (8)
PARAM.	MIN.	MAX.	U.o.M.	DEF.	EVAPORATOR FAN
P32	-40	99	°C/°F (2)	-1	temperature above which the evaporator fan is switched off during storage (with reference to the evaporator probe)
P33	-15	15	°C/°F (2)	1	P32 differential
P34	0	1	---	1	evaporator fan activity during defrosting (only if P22 = 0 or 1) 0 = on 1 = off
P35	0	15	min/s (6)	3	evaporator fan activity during defrosting (only if P22 = 0 or 1
P36	-40	99	°C/°F (2)	90	temperature above which the evaporator fan is switched off (with reference to the cabinet probe)
P37	0	1	---	1	effect caused by activation of microport input on evaporator fan 0 = no effect 1 = the evaporator fan will be switched off
PARAM.	MIN.	MAX.	U.o.M.	DEF.	DIGITAL INPUTS
P38	0	1	---	1	microport input contact type 0 = NA (input active with contact closed) 1 = NC (input active with contact open)
P39	0	200	min	30	micro port input alarm delay (9)
P40	0	1	---	1	high pressure input alarm delay 0 = NA (input active with contact closed) 1 = NC (input active with contact open)
P41	0	200	s	120	high pressure input alarm delay
P42	0	1	---	0	low pressure input contact type 0 = NA (input active with contact closed) 1 = NC (input active with contact open)
P43	0	200	s	0	low pressure input alarm delay
P44	0	1	---	0	compressor thermal protection input contact type 0 = NA (input active with contact closed) 1 = NC (input active with contact open)
P45	0	200	s	0	compressor thermal protection input alarm delay
PARAM.	MIN.	MAX.	U.o.M.	DEF.	CABINET STERILISATION
P46	0	99	min	5	UV light on duration (duration of cabinet sterilisation)
PARAM.	MIN.	MAX.	U.o.M.	DEF.	NEEDLE PROBE HEATING
P47	-40	99	°C/°F (2)	45	needle probe heating end temperature (with reference to the needle probe)
P48	0	99	s	15	maximum duration of needle probe heating
PARAM.	MIN.	MAX.	U.o.M.	DEF.	DOOR ELEMENTS
P49	-20	20	°C/°F (2)	5	the temperature, below which the door elements are switched on (with reference to the cabinet probe)
P50	-10	10	°C/°F (2)	2	P49 differential
PARAM.	MIN.	MAX.	U.o.M.	DEF.	CONDENSER FAN
P51	0	1	---	1	condenser fan activity in the absence of the condenser probe (P61 = 0) 0 = in parallel with compressor 1 = on
P52	-45	100	°C/°F (2)	20	the temperature below which the condenser fan is switched off in the presence of the condenser probe (P61 = 1) and on condition that the compressor is on (with reference to the condenser probe); see also P54
P53	-10	10	°C/°F (2)	5	P52 differential
P54	0	300	s	30	condenser fan switch off delay on switching off the compressor in the presence of the condenser probe (P61 = 1); see also P52
PARAM.	MIN.	MAX.	U.o.M.	DEF.	MISCELLANEOUS
P55	0	99	s	3	chill and freeze cycle completion buzzer duration
P56	1	400	s	15	maximum buzzer duration during an alarm state
P57	0	999	s	10	elapsed time between switching on the compressor and down pump valve activation (down pump in power up); also elapsed time between deactivation of the down pump valve and switching off the compressor (down pump in power down)
P58	0	1	---	0	defrost parameter units of measurement 0 = P25 h, P24, P26, P28 and P35 min 1 = P25 min, P24, P26, P28 and P35 s
P59	---	---	---	---	reserved
P60	0	1	---	0	probe type 0 = NTC 1 = PTC
P61	0	1	---	0	condenser probe enabling 1 = YES
PARAM.	MIN.	MAX.	U.o.M.	DEF.	CONDENSER TEMPERATURE ALARMS
P62	0	99	°C/°F (2)	70	the temperature above which the condenser temperature alarm is activated (with reference to the condenser probe)
P63	0	30	°C/°F (2)	10	P62 differential
PARAM.	MIN.	MAX.	U.M.	DEF.	CABINET TEMPERATURE ALARMS
P64	-99	0	°C/°F (2)	0	temperature below which the minimum temperature alarm is activated during post-chill storage, with relation to P7, i.e. "P7 + P64" (with reference to the cabinet probe) 0 = no alarm
P65	0	99	°C/°F (2)	0	temperature above which the maximum temperature alarm is activated during post-chill storage, with relation to P7, i.e. "P7 + P65" (with reference to the cabinet probe) 0 = no alarm
P66	-99	0	°C/°F (2)	0	temperature below which the minimum temperature alarm is activated during post-freezing storage, with relation to P8, i.e. "P8 + P66" (with reference to the cabinet probe) 0 = no alarm
P67	0	99	°C/°F (2)	0	temperature above which the maximum temperature alarm is activated during post-freezing storage, with relation to P8, i.e. "P8 + P67" (with reference to the cabinet probe) 0 = no alarm
P68	1	15	°C/°F (2)	2	P64, P65, P66 and P67 differential
P69	0	255	min	0	storage operation start-up temperature alarm delay
P70	0	255	min	0	temperature alarm delay
PARAM.	MIN.	MAX.	U.o.M.	DEF.	DATA PRINTING
P71	0	1	---	0	enable printing 1 = YES
P72	0	60	min	5	print interval
P73	0	1	---	0	HACCP alarm list deletion 1 = YES (10)
P74	---	---	---	---	reserved
P75	---	---	---	---	reserved
P76	---	---	---	---	reserved

(1) **Altering parameter P0 effects all parameters where the unit of measurement is degrees Celsius or degrees Fahrenheit**

(2) the unit of measurement depends on parameter P0

(3) (3)the test result is positive if the difference between the temperature measured by the needle probe and the cabinet temperature is greater than the value set by parameter P14 at least 3 times out of 5 (checking is every 10 s); if the test result is negative a second test is initiated (se parameter P15)

(4) the result of the second test is positive if the difference between the temperature measured by the needle probe and the cabinet temperature increases by at least 1°C/1°F with respect to the previous check at least 6 times out of 8 (checking occurs every P15/8 s); if parameter P15 is set to a value of less than 5 s, the second test will not be executed

(5) if parameter P22 is set to 2, micro port input activation will not be signalled

(6) the unit of measurement depends on parameter P58

(7) defrosting will be activated on conclusion of the time which is greatest between those set by parameters P30 and P31

(8) if defrosting is requested when the compressor is on and the time set by parameter P30 is less than the value set by parameter P31, the compressor will remain on and the solenoid valve and defrosting will be activated after the time "P31 - P30" has elapsed since the defrost request; vice versa, if defrosting is requested when the compressor is on and the time set by parameter P30 is greater than that set by parameter P31, when defrosting is requested the compressor will be switched off for the greater of the times between those set by parameters P19, P20 and P21 after which the compressor and defrosting will be activated (the solenoid valve will be activated "P30 - P31" s prior to activation of defrosting)

(9) parameter P39 has no effect during UV light switch on (cabinet sterilisation)

(10) altering parameter P73 is effective on exiting the configuration parameter setting procedure; as soon as you will quit the configuration parameters setting procedure, parameter P73 will automatically get value 0.

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