## **DIMENSIONAL DATA**

## OVERALL DIMENSIONS AND PANEL CUTOUT

The dimensions are expressed in millimetres and inches (third-scale drawing)

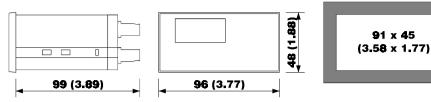
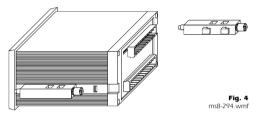


Fig. 3 ds8-294e.wmf

## **INSTALLATION**

## WITH THE FIXING SYSTEM SUGGESTED BY THE BUILDER

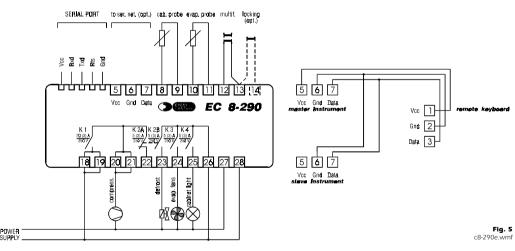
Panel mounting, with the equipped screw brackets (third-scale drawing)



## **ELECTRICAL CONNECTION**

## CONNECTIONS TO DERIVE

Instance of typical application.



## **BUILDER DATA**

## EVERY CONTROL S.r.I.

Via Mezzaterra 6, 32036 Sedico Belluno ITALY

Phone 0039/0437852468 (a.r.) Fax 0039/043783648

Internet addresses

e-mail: every@worknet.it

http://www.everycontrol.it

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# **EC 8-290**

# ON-OFF digital controller for one 1½ HP compressor, evaporator fans, defrost (for temperature-time) and cabinet light output management

Operating instructions

Release 1/00 of April the tenth 2000

Code EC 8-290 DOC E001

# File 8290e.p65

The use of this new instrument is easy; but for safety reasons, it is important read these instructions carefully before the installation or before the use and follow all additional informations.

It is very important keep these instructions with the instrument for future consultations.



## **GENERAL INFORMATIONS**

## WHAT IS THE USE

EC 8-290 is an ON-OFF digital controller studied for refrigerating systems management which basic characteristics are the one 1½ HP compressor, evaporator fans, defrost (for temperature-time) and cabinet light output management; besides, the instrument is provided with one multifunction digital input configurable to interact on the outputs activity (it presents a request of a defrost cycle, it forces the cabinet light output to the status ON, etc.)

In factory the instrument gets preset to accept at the measure inputs PTC/NTC probes used in refrigeration field at the moment.

EC 8-290 is available in the 96 x 48 mm (3.77 x 1.88 in.) case and it is studied for panel mounting with the equipped screw brackets.

## **GETTING STARTED**

## INSTALLATION

EC 8-290 was studied for panel mounting, panel cutout  $91 \times 45$  mm  $(3.58 \times 1.77$  in.), with the equipped screw brackets (the overall dimensions and the panel cutout are related in Fig. 3, the fixing system suggested by the builder is related in Fig. 4).

## ADDITIONAL INFORMATIONS

- the panel thickness must be included from 1 to 5 mm (0.04 to 0.19 in.)
- verify if the using conditions (ambient temperature, humidity, etc.) are within the limits indicated by the builder (see the chapter TECHINICAL DATA)
- install the instrument in a location with a suitable ventilation, to avoid the internal overheating of the instrument
- do not install the instrument near surfaces that can to obstruct the air-grating (carpets, covers, etc.), heating sources (radiators, hot air ducts, etc.), locations subject to direct sunlight, rain, humidity, excessive dust, mechanical vibrations or bumps, devices with strong magnetos (microwave ovens, big speakers, etc.)
- according with the safety norms, the protection against possible contacts with electrical parts and parts protected with functional insulation only must be ensured through a correct installation procedure of the instrument; all parts that ensure the protection must be fixed so that they can not be removed if not with a tool.

## ELECTRICAL CONNECTION

EC 8-290 is provided with two extractable screw terminal blocks for cables up to 2.5 mm² (0.38in², for the connection to the power supply, inputs and outputs) and it is provided with one five poles single line male connector (for the connection to the CLONE configurer/cloner and RICS supervision systems), located on the instrument back panel (the connections to derive are related in Fig. 5 and they are checkable on the polyester label stuck on the instrument case).

## ADDITIONAL INFORMATIONS

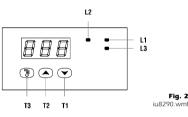
- if the instrument is brought from a cold to a warm location, the humidity may condense inside the instrument; wait about an hour before supply the instrument
- verify if the operating power supply voltage, electrical frequency and power of the instrument correspond to the local power supply (see the chapter TECHNICAL DATA)
- do not supply more instruments with the same transformer
- if the instrument is installed on a vehicle, its power supply must be derived directly from the battery of the vehicle
- give the instrument a protection able to limit the current absorbed in case of failure
- the instrument remains connected to the local power supply as long as the terminals 27 and 28 are derived to the local power supply, even if the instrument is apparently turned off
- if the instrument is supplied from low voltage use low voltage loads
- give the probes a protection able to insulate them against possible contacts with metal parts or use insulated probes
- give the outputs a protection able to protect them against short circuit and overload
- do not try to repair the instrument; for the repairs apply to highly qualified staff

if you have any questions or problems concerning the instrument please consult Every Control (see the chapter BUILDER DATA).

## USE

## PRELIMINARY INFORMATIONS

After derived the connections related in Fig. 5, during the normal functioning the instrument displays the temperature read by the cabinet probe.



If an alarm should be active the instrument displays the alarm code flashing and the buzzer utters an intermittent beep as long as the cause that has given it does not disappear (see the chapter SIGNALS AND ALARMS); pressure on the key T1 during an alarm permits to silence the buzzer.

EC 8-290 is provided with one working setpoint and with some configuration parameters that get stored in a non volatile memory and that permit to set the instrument according with one's requirements (see the chapter CONFIGURABILITY).

The output K 1 is associated to the compressor and to the working setpoint, it remains activated continuously as long as the temperature read by the cabinet probe reaches the working setpoint and when it rises above the working setpoint of the hysteresis value (differential) the output gets reactivated, except during a defrost and a dripping.

Passed the defrost interval from the moment of the instrument start or from the moment in which the instrument presents a request of a defrost cycle, if the conditions permit it (the temperature read by the evaporator probe must be below the defrost stopping setpoint) the instrument automatically presents the following request of a defrost cycle.

A defrost cycle provides three phases (defrost, dripping and evaporator fans stoppage) connected in cascade since the end of one automatically determines the passage to the following

The output K 2B is associated to the defrost and it remains continuously activated during the defrost as long as the temperature read by the evaporator probe reaches the defrost stopping setpoint when the defrost ends and the instrument automatically moves to the dripping; if the instrument was set to manage defrost to resistances (electrical) during a defrost the compressor output gets forced to the status OFF, if the instrument was set to manage hot gas defrost (reversal of cycle) during a defrost the compressor output remains continuously activated.

Passed the dripping length from the moment of the defrost end the instrument automatically moves to the evaporator fans stoppage; during a dripping the compressor output gets forced to the status OFF.

Passed the evaporator fans stoppage length from the moment of the dripping end the defrost cycle ends; during an evaporator fans stoppage the evaporator fans output activation gets discibled.

If the conditions permit it (the temperature read by the evaporator probe must be below the defrost stopping setpoint) keeping pushed the key 12 for four seconds at least the instrument presents a request of a defrost cvcle.

The output K 3 is associated to the evaporator fans and to the output deactivation setpoint, it remains continuously activated as long as the temperature read by the evaporator probe reaches the output deactivation setpoint, when it falls below the output deactivation setpoint of the hysteresis value (differential) the output gets reactivated and during the status OFF of the compressor output the output gets forced to the status OFF, except what established with the parameters of the family F.

The output K 4 is associated to the cabinet light.



Activating the multifunction digital input and the locking digital input (available on request) the instrument interacts on the outputs activity according what established with the param-

## WORKING SETPOINT SETTING (WORKING TEMPERATURE)

To modify the working setpoint value keep pushed the key T3 (the instrument displays the actual value) and at the same time push and release over and over the key T1 or T2 as long as the instrument displays the desired value (keeping pushed the key T1 or T2 the value gets decreased or increased more quickly): after the modification release the key T3 last; during the pressure of the key T3 the LED L1 flashes quickly to indicate that a working setpoint setting procedure is running (to the release of the key T3 the instrument automatically turns out from the working setpoint setting procedure)

## ADDITIONAL INFORMATIONS

- for the whole period of a corrupted memory data alarm the access to the working setnoint setting procedure is refused
- the working setpoint is programmable within the limits established with the parameters r1 and r2
- the working setpoint value gets stored in a non volatile memory even if a lack of power supply happens.

## CONFIGURATION PARAMETERS SETTING

Configuration parameters are arranged on two levels, to protect the most tricky settings against undesirable violations and they are arranged in families that can be recognized through the

To gain access to the first level keep pushed at the same time for four seconds at least the keys T1 and T2 (passed four seconds the instrument displays the label PA).

To select a parameter of the first level push and release over and over the key T1 or T2 as long as the instrument displays the label of the desired parameter

To modify the parameter value keep pushed the key T3 (the instrument displays the actual value) and at the same time push and release over and over the key T1 or T2 as long as the instrument displays the desired value (keeping pushed the key T1 or T2 the value gets decreased or increased more quickly); after the modification release the key T3 last (to the release of the key T3 the instrument displays the label of the parameter again).

To gain access to the second level enter inside the first level and select the label PA.

Keen nushed the key T3 (the instrument displays the actual value) and at the same time nush and release over and over the key T1 or T2 as long as the instrument displays -19 (keeping pushed the key T1 or T2 the value gets decreased or increased more quickly); after the modification release the key T3 last (to the release of the key T3 the instrument displays the label PA again); keep pushed at the same time for four seconds at least the keys T1 and T2 (passed four seconds the instrument displays the first parameter of the second level)

To select a parameter of the second level push and release over and over the key T1 or T2 as long as the instrument displays the label of the desired parameter

To modify the parameter value keep pushed the key T3 (the instrument displays the actual value) and at the same time push and release over and over the key T1 or T2 as long as the instrument displays the desired value (keeping pushed the key T1 or T2 the value gets decreased or increased more quickly); after the modification release the key T3 last (to the release of the key T3 the instrument displays the label of the parameter again)

To turn out from the configuration parameters setting procedure keep pushed at the same time for four seconds at least the keys T1 and T2 or do not operate with the keys for fifty seconds at least (time-out exit)

## ADDITIONAL INFORMATIONS

- for the whole period of a corrupted memory data alarm the access to the configuration parameters setting procedure is refused
- the modification of the parameter /A value has not immediate effect; to obtain this effect, after the modification turn OFF and turn ON again the instrument
- the modification of a parameter value which unit of measure is the hour or the minute or the second has not immediate effect; to obtain this effect it must not be executed during the course of the value
- the modification of the parameters u1, u2, u3, u4 and u5 value has immediate effect; to avoid damages to the connected users, it must be executed with the users
- the configuration parameters values get stored in a non volatile memory even if a lack of power supply happens

## **NETWORK USE**

## PRELIMINARY INFORMATIONS

On request the instrument can be preset to work in a serial network of instruments (slaves) managed from a master instrument in order to implement some resources in the slaves instruments in correspondence with the implementation of the same resources in the master instrument (compressor output status during the normal functioning, presentation of a request of a defrost cycle etc.)

After derived the connections related in Fig. 5, the master instrument reproposes the last settings stored (see the chapter USE), the resources management of the slaves instruments locally happens (see the chapter USE), except what established with the parameters of the

## **USE WITH REMOTE KEYBOARD**

## PRELIMINARY INFORMATIONS

On request the instrument can be preset to work with a remote keyboard in order to manage the resources of the instrument even through the remote keyboard.

After derived the connections related in Fig. 5, the instrument reproposes the last settings stored (see the chapter USE), the remote keyboard repeats the display of the instrument.

## **NETWORK USE WITH REMOTE KEYBOARD**

## PRELIMINARY INFORMATIONS

On request the instrument can be preset to work in a serial network of instruments (slaves) managed from a master instrument in order to implement some resources in the slaves instruments in correspondence with the implementation of the same resources in the master

instrument (compressor output status during the normal functioning, presentation of a request of a defrost cycle, etc.); the resources management of the master instrument can happen even through the remote keyboard.

After derived the connections related in Fig. 5, the master instrument reproposes the last settings stored (see the chapter USE), the resources management of the slaves instruments locally happens (see the chapter USE), except what established with the parameters of the family n: the remote keyboard repeats the display of the master instrument

## CONFIGURABILITY

## WORKING SETPOINT

LABEL MIN.	MAX.	U.M.	ST.	WORKING SETPOINT
r1	r2	(*)	0	working setpoint

It establishes the temperature associated to the compressor output

## CONFIGURATION PARAMETERS

LABE	L MIN.	MAX.	U.M.	ST.	PASSWORD	
PA	-55	99		0	password (§)	
It is the password that permits to gain access to the second level.						

## LARFLMIN MAX ILM ST MEASURE INPUTS /O 1 4 --- 1 kind of probe

It establishes the kind of probe that the instrument must recognize to its measure inputs, as

/1	-55	+99	(*)/8	0	calibration (§)	Ī
3 =	NTC p	orobe		4 =	reserved.	
1 =	PTC probe			2 =	reserved	

It establishes a threshold to add algebraically to the signals coming from the measure inputs (for instance to correct the signals)

## /2 0 6 --- 3 digital filter

It establishes a time constant to apply to the signals coming from the measure inputs, as

0 =	0 sec.	1 =	0.4 sec.
2 =	1.2 sec.	3 =	3.0 sec.
4 =	8.0 sec.	5 =	19.8 sec.
6 =	48.0 sec.		

/8 0 1 --- 1 unit of measure

It establishes the unit of measure with which the temperature gets displayed, as indicated:

- 0 = the unit of measure is the Fahrenheit degree
- 1 = the unit of measure is the Celsius degree

/A 0 1 --- 1 evaporator probe enabling (®)

It establishes if to enable the evaporator probe, as indicated:

- 0 = the evaporator probe is disabled
- 1 = the evaporator probe is enabled.

## LABELMIN, MAX. U.M. ST. ON-OFF TEMPERATURE REGULATOR ASSOCIATED TO THE WORKING SETPOINT AND TO THE COMPRESSOR UIITPIIT

## r0 +1 +15 (\*) +2 hysteresis (differential) (§)

It establishes the hysteresis (differential) relative to the working setpoint.

## r1 -55 +99 (\*) -50 minimum working setpoint programmable

It establishes the minimum working setpoint programmable: the instrument automatically verifies if the value established with the parameter r1 is below the maximum working setpoint programmable established with the parameter r2.

## r2 -55 +99 (\*) +50 maximum working setpoint programmable

It establishes the maximum working setpoint programmable; the instrument automatically verifies if the value established with the parameter r2 is above the minimum working setpoint programmable established with the parameter r1

## LABELMIN. MAX. U.M. ST. COMPRESSOR OUTPUT PROTECTION CO 0 240 (\*\*) 1 disabling time to the output activation from the instrument start

It establishes the time that disables the output activation from the moment of the instrument

## 240 (\*\*) 5 disabling time to the output activation from the previous activation

It establishes the time that disables the output activation from the moment of the previous

## C2 0 240 (\*\*) 3 disabling time to the output activation from the previous deactivation

It establishes the time that disables the output activation from the moment of the previous output deactivation

## C4 0 1 --- O disabling time to the output activation and deactivation It establishes if to disable the output activation and deactivation for a fixed time, as indicated:

1 = the output activation and deactivation get disabled for 3 sec.

## C5 1 240 (\*\*) 10 cycle time for the output activation during a cabinet probe failure alarm

It establishes the cycle time for the output activation due to the contribution of the percentage established with the parameter C6 during a cabinet probe failure alarm.

## 100 % 50 percentage of the cycle time during which the output gets activated during a cabinet probe failure alarm

It establishes the percentage of the cycle time established with the parameter C5 during which the output must remain continuously activated in the course of the cycle time during a cabinet probe failure alarm, except what established with the disabling times to the compressor output

## LABEL MIN. MAX. U.M. ST. DEFROST REGULATOR dO O 99 (\*\*) 8 defrost interval

Ontions:

012 (12 Vac/dc).

custom configuration, presetting to accept at the measure inputs Pt 1000 probes, configuration parameter for the evaporator probe enabling, locking digital input and associated configuration parameters, green LED display, configuration parameters for the user-output configuration, presetting for the connection to a remote keyboard (the maximum distance that can be interfaced is 50 m. 164.04 ft.), presetting for the connection to a serial network of instrument and associated configuration parameters (the maximum distance that can be interfaced is 50 m, 164.04 ft.).

It establishes the time interval that pass from the moment of the instrument start or from the moment in which the instrument presents a request of a defrost cycle to the moment in which the instrument automatically presents the following request of a defrost cycle.

If the parameter d0 has value 0 the instrument never automatically presents a request of a defrost cycle, except what established with the parameter d4.

## d1 0 1 --- 1 kind of defrost

It establishes the kind of defrost that the instrument must manage, as indicated:

0 = to resistances (electrical)

1 = to hot gas (reversal of cycle)

## d2 -55 +99 (\*) +2 defrost stonning setnoint

It is significant exclusively if the parameter /A has value 1, it establishes the temperature to which a defrost gets stopped and it is referred to the evaporator probe.

## d3 1 99 (\*\*) 15 defrost maximum length

It establishes the defrost maximum length

Passed the defrost maximum length from the moment in which the instrument activates a defrost cycle, if the temperature read by the evaporator probe is below the setpoint established with the parameter d2 the defrost ends.

## d4 0 1 --- 0 defrost cycle at the instrument start

It establishes if the instrument automatically must present a request of a defrost cycle at the moment of the instrument start, as indicated:

0 = inactive

1 = the instrument automatically presents a request of a defrost cycle at the moment of the instrument start.

# d5 0 99 (\*\*) 0 delay to a defrost cycle activation from the instrument

It is significant exclusively if the parameter d4 has value 1 or if the parameter i0 has value 1 it establishes the delay with which the instrument automatically presents a request of a defrost cycle from the moment of the instrument start and from the moment of the multifunction digital input activation

A manual presentation of a request of a defrost cycle during the count of the delay established with the parameter d5 clears the delay.

## d6 0 1 --- 1 locking of the displayed temperature from a defrost cycle activation

It establishes if to lock the displayed temperature from the moment in which the instrument activates a defrost cycle, as indicated:

0 - inactive

1 = during a defrost, a dripping and as long as the temperature read by the cabinet probe reaches the working setpoint, the instrument displays the temperature read by the cabinet probe in the moment in which the instrument activates a defrost cycle.

## d7 0 15 (\*\*) 2 dripping length

It establishes the dripping length.

## disabling times to the compressor output activation overd9 0 1 --- 0

It is significant exclusively if the parameter d1 has value 1, it establishes if to clear the disabling times to the compressor output activation in the moment in which the instrument presents a request of a defrost cycle, as indicated:

0 = inactive

1 = in the moment in which the instrument presents a request of a defrost cycle the disabling times to the compressor output activation get cleared.

## dA --- (\*) --- evaporator probe reading (§)

It permits to display the temperature read by the evaporator probe

## db 0 1 --- 0 times base

It establishes the unit of measure of the parameters expressed in time intervals, except for the parameters L3 and n4, as indicated:

0 = the unit of measure of the parameter d0 is the hour and the unit of measure of the parameters C0, C1, C2, C5, d3, d5, d7, A3, A5, A6, A7, F5, i4 and i5 is the minute

the unit of measure of the parameter dO is the minute and the unit of measure of the parameters C0, C1, C2, C5, d3, d5, d7, A3, A5, A6, A7, F5, i4 and i5 is the second.

## LABEL MIN. MAX. U.M. ST. ALARM REGULATOR

## AO +1 +15 (\*) +2 hysteresis (differential)

It establishes the hysteresis (differential) relative to the parameters A1 and A2.

# A1 -55 0 (\*) -10 lower temperature alarm set relative to the working

It establishes a threshold to add algebraically to the working setpoint; the value so obtained establishes the temperature below which the lower temperature alarm gets activated and it is referred to the cabinet probe.

If the parameter A1 has value 0 the lower temperature alarm never gets activated.

## +99 (\*) +10 upper temperature alarm set relative to the working setpoint

It establishes a threshold to add algebraically to the working setpoint; the value so obtained establishes the temperature above which the upper temperature alarm gets activated and it is referred to the cabinet probe.

If the parameter A2 has value 0 the upper temperature alarm never gets activated.

## A3 0 240 (\*\*) 120 disabling time to the temperature alarm activation from the instrument start

It establishes the time that disables the temperature alarm activation from the moment of the instrument start.

## A5 -1 120 (\*\*) 30 disabling time to the buzzer activation for the multifunction digital input alarm indication

It is significant exclusively if the parameter i0 has values different to 0, it establishes the time that disables the buzzer activation for the multifunction digital input alarm indication from the moment in which the multifunction digital input alarm happens

If the parameter A5 has value -1 during a multifunction digital input alarm the buzzer gets not activated.

A6 0 240 (\*\*) 5 disabling time to the temperature alarm activation

It establishes the time that disables the temperature alarm activation from the moment in which the temperature alarm happens.

## A7 0 240 (\*\*) 15 disabling time to the temperature alarm activation from the defrost cycle end

It establishes the time that disables the temperature alarm activation from the moment of the

## defrost cycle end. LABEL MIN. MAX. U.M. ST. EVAPORATOR FANS REGULATOR ASSOCIATED TO THE EVAPORATOR FANS OUTPUT

## F1 -55 +99 (\*) -1 output deactivation setnoint

It is significant exclusively if the parameter /A has value 1 and if the parameter F7 has value 3 or 4, according with the modality established with the parameter F6, it establishes the temperature to which the output gets deactivated and it is referred to the evaporator probe.

## F2 +1 +15 (\*) +2 hysteresis (differential)

It is significant exclusively if the parameter /A has value 1 and if the parameter F7 has value 3 or 4, it establishes the hysteresis (differential) relative to the parameter F1.

## F4 0 2 --- O output functioning during the defrost and the dripping

It establishes the output functioning during a defrost and a dripping, as indicated:

- 0 = during a defrost and a dripping the output gets forced to the status OFF
- 1 = during a defrost and a dripping the output gets forced to the status ON
- 2 = the output functioning during a defrost and a dripping gets established with the

# F5 0 15 (\*\*) 2 evaporator fans stoppage length

It establishes the evaporator fans stoppage length

## F6 0 1 --- 0 kind of output deactivation setnoint

It is significant exclusively if the parameter /A has value 1 and if the parameter F7 has value 3 or 4, it establishes the kind of output deactivation setpoint that the instrument must manage as indicated:

- 0 = absolute (the output deactivation setpoint establishes the temperature to which the
- relative to the temperature read by the cabinet probe (the value obtained subtracting the absolute value of the output deactivation setpoint to the temperature read by the cabinet probe establishes the temperature to which the output gets deactivated).

## F7 0 4 --- 4 output functioning during the normal functioning

It establishes the output functioning during the normal functioning, as indicated: 0 = during the normal functioning the output gets forced to the status OFF

- during the normal functioning the output gets forced to the status ON
- during the normal functioning the output gets forced to the status ON and during the
- status OFF of the compressor output the output gets forced to the status OFF
- during the normal functioning the output is associated to the setpoint established with the parameter F1, it remains continuously activated as long as the temperature read by the evaporator probe reaches the setpoint established with the parameter F1 and when it falls below the setpoint established with the parameter F1 of the hysteresis value (differential) established with the parameter F2 the output gets reactivated
- during the normal functioning the output is associated to the setpoint established with the parameter F1, it remains continuously activated as long as the temperature read by the evaporator probe reaches the setpoint established with the parameter F1, when it falls below the setpoint established with the parameter F1 of the hysteresis value (differential) established with the parameter F2 the output gets reactivated and during the status OFF of the compressor output the output gets forced to the status OFF

## LABEL MIN. MAX. U.M. ST. DIGITAL INPUTS

### action given during the multifunction digital input acti-N 5 --- 4 vation

It establishes the action given during the multifunction digital input activation, as indicated: 0 = inactive

- 1 = if the conditions permit it (the temperature read by the evaporator probe must be below the setpoint established with the parameter d2) activating the multifunction digital input the instrument presents a request of a defrost cycle
- 2 = during the multifunction digital input activation the cabinet light output gets forced to the status ON
- during the multifunction digital input activation the compressor output, except what established with the disabling times to the compressor output activation and the cabinet light output get forced to the status ON
- during the multifunction digital input activation the compressor and evaporator fans outputs get forced to the status OFF and the cabinet light output gets forced to the status ON
- 5 = during the multifunction digital input activation the evaporator fans output gets forced to the status OFF and the cabinet light output gets forced to the status ON.

If the parameter i0 has value 3 or 4 the multifunction digital input alarm activation that happens during a defrost cycle interacts on the compressor output status from the moment of the defrost cycle end.

## --- 0 kind of contact of the multifunction digital input

It establishes the kind of contact of the multifunction digital input, as indicated: 0 = NO contact

1 = NC contact

## i2 0 2 action given during the locking digital input activation

It establishes the action given during the locking digital input activation, as indicated: 0 = inactive

- 1 = during the locking digital input activation the compressor output gets forced to the status OFF
- 2 = during the locking digital input activation the compressor output gets forced to the status OFF, from the moment of the locking digital input deactivation the compressor output activation gets disabled for the time established with the parameter i5, in the
- moment in which the compressor output gets reactivated the instrument increases a locking digital input alarms counter, when the locking digital input alarms counter reaches the number established with the parameter i3 the compressor output gets definitively forced to the status OFF (instrument locking); to obtain the instrument unlocking turn OFF and turn ON again the instrument.

0 15 --- O number of locking digital input alarms enough to give

## the instrument locking (®)

It establishes the number of locking digital input alarms enough to give the instrument lock-

If the parameter i3 has value 0 the instrument locking never happens.

The increasing of the locking digital input alarms counter that gives the instrument locking i4 0 240 (\*\*) 0 time required to clear the locking digital input alarms

# happens in the moment of the locking digital input activation.

It establishes the time that must pass from the moment of the previous locking digital input deactivation in order that the locking digital input alarms counter get cleared.

counter (®)

## i5 0 15 (\*\*) 0 disabling time to the compressor output activation from the previous locking digital input deactivation (®)

It establishes the time that disables the compressor output activation from the moment of the previous locking digital input deactivation.

## LABEL MIN. MAX. U.M. ST. USER-OUTPUT CONFIGURATION

#### u1 0 6 --- 0 user to associate to the output K 1 (®)

It establishes the user to associate to the output K 1, as indicated:

0 = compressor

- 1 = defrost
- 2 = evaporator fans
- 3 = cabinet light 4 = alarm
- 5 = ON-OFF
- 6 = reserved
- u2 0 6 --- 1 user to associate to the output K 2B (®) It has the same significance of the parameter u1.

u3 0 6 --- 2 user to associate to the output K 3 (®)

It has the same significance of the parameter u1.

u4 0 6 --- 3 user to associate to the output K 4

It has the same significance of the parameter u1.

u5 0 6 --- 4 user to associate to the output K 5 (®)

It has the same significance of the parameter u1.

LABEL MIN. MAX. U.M. ST. CONNECTION IN A SERIAL NETWORK WITH EVCOBUS PROTOCOL COMMUNICATION

#### L1 1 15 --- 1 instrument address

It establishes the address to which the instrument (slave) answers when it is connected to a serial network with EVCOBUS protocol communication managed from a master (for instance a

## L2 0 7 --- 0 instrument group

It establishes the group to which the instrument (slave) answers when it is connected to a serial network with EVCOBUS protocol communication managed from a master (for instance a Personal Computer).

## 240 sec 7 time-out link

It establishes for which time interval the instrument must store a connection to a serial network with EVCOBUS protocol communication from the moment in which an interruption of the connection happens.

## L4 0 3 --- 1 baud rate

It establishes the speed with which the data get transmitted in a serial network with EVCOBUS protocol communication, as indicated:

- 0 = 1 200 haud
- 1 = 2 400 haud 2 = 4 800 haud
- 3 = 9 600 haud LABEL MIN. MAX. U.M. ST. CONNECTION IN A SERIAL NETWORK WITH EVCONET

# PROTOCOL COMMUNICATION

# instrument functioning in the network (®)

It establishes the instrument functioning when it is connected to a serial network with EVCONET protocol communication, as indicated:

- 0 = the instrument is not enabled to work in the network
- 1 = the instrument is set as master instrument
- 2 = the instrument is set as slave instrument

## n1 0 8 --- 0 instrument address (®)

It is significant exclusively if the parameter n0 has value 1 or 2, it establishes the instrument address when it is connected to a serial network with EVCONET protocol communication, as indicated:

- 0 = master instrument address
- first slave instrument address
- 2 = second slave instrument address third slave instrument address 3 =
- 4 = fourth slave instrument address
- 5 = fifth slave instrument address
- 6 = sixth slave instrument address
- seventh slave instrument address
- eighth slave instrument address.

## n3 0 1 --- 0 enabling to work as slave instrument (§) (®)

It is significant exclusively if the parameter n0 has value 2 and if the parameter n1 has values different to 0, it establishes if to enable the instrument to work as slave instrument, as indi-

- 0 = the instrument is not enabled to work as slave instrument
- 1 = the instrument is enabled to work as slave instrument.

## n4 0 240 sec. 0 delay to the resources implementation in the slave instrument (®)

It is significant exclusively if the parameter n0 has value 2, if the parameter n1 has values different to 0 and if the parameter n3 has value 1, it establishes a time interval to multiply for the address established with the parameter n1; the value so obtained establishes the delay with which the resources get implemented in the slave instrument from the moment of the

implementation of the same resource in the master instrument, except for the resource turning ON and turning OFF that gets implemented immediately.

## nA 0 15 --- 0 resources to implement in the slave instrument (®)

It is significant exclusively if the parameter n0 has value 2, if the parameter n1 has values different to 0 and if the parameter n3 has value 1, it establishes the resources to implement in the slave instrument in correspondence with the implementation of the same resources in the master instrument, except what established with the disabling times to the compressor output activation of the slave instrument, as indicated:

- 0 = no resources implemented
- 1 = compressor output status during the normal functioning
- 2 = presentation of a request of a defrost cycle
- compressor output status during the normal functioning and presentation of a request of a defrost cycle
- turning ON and turning OFF
- compressor output status during the normal functioning, turning ON and turning OFF
- presentation of a request of a defrost cycle, turning ON and turning OFF 7 = compressor output status during the normal functioning, presentation of a request of a
- defrost cycle, turning ON and turning OFF
- 8 =
- compressor output status during the normal functioning
- presentation of a request of a defrost cycle
- 11 = compressor output status during the normal functioning and presentation of a request of a defrost cycle
- 12 = turning ON and turning OFF
- 13 = compressor output status during the normal functioning, turning ON and turning OFF
- 14 = presentation of a request of a defrost cycle, turning ON and turning OFF
- 15 = compressor output status during the normal functioning, presentation of a request of a defrost cycle, turning ON and turning OFF.

## ADDITIONAL INFORMATIONS

- the symbol (\*) indicates that the unit of measure depends from the parameter /8
- the symbol (8) indicates that the parameter is of the first level
- the symbol (®) indicates that the parameter is available on request only
- the symbol (\*\*) indicates that the unit of measure depends from the parameter db
- a temperature alarm activation that does not disappear at the end of the time established with the parameter A3 gets further disabled for the time established with the parameter A6
- a temperature alarm activation that happens before that the instrument activate a defrost cycle gets disabled for the time established with the parameter A6 but it does not interact on the defrost cycle
- a temperature alarm activation that happens during or at the end of a defrost cycle and that does not disappear at the end of the time established with the parameter A7 gets further disabled for the time established with the parameter A6
- a temperature alarm activation that happens during a multifunction digital input alarm gets disabled for the time established with the parameter A6 from the moment in which the multifunction digital input alarm disappears
- do not set more instruments as master instrument
- if among the resources to implement in the slave instrument there is the compressor output status during the normal functioning, the slave instrument displays the indication "nEf": to display the temperature read by the cabinet probe of the slave instrument keep pushed the key T1
- if among the resources to implement in the slave instrument there is the compressor output status during the normal functioning, in the slave instrument the parameters C5 and C6 has not significance
- if among the resources to implement in the slave instrument there is the presentation of a request of a defrost cycle the parameter d5 establishes a delay to add to the value established with the parameters n1 and n4; the value so obtained establishes the delay with which the resource gets implemented in the slave instrument from the moment of the implementation of the same resource in the master instru-
- if among the resources to implement in the slave instrument there is the presentation of a request of a defrost cycle the slave instrument implements the resource even if the conditions do not permit at the master instrument to activate a defrost
- if among the resources to implement in the slave instrument there is not the turning ON and the turning OFF during the status STAND-BY of the master instrument the resources management of the slave instrument locally happens.

## **SIGNALS AND ALARMS**

If the LED L1 is turned ON it means that the compressor output is activated

If the LED L2 is turned ON it means that the defrost output is activated.

If the LED L3 is turned ON it means that the evaporator fans output is activated.

If the LED L1 flashes it means that a count of a disabling time to the compressor output activation is running (see the parameters CO, C1, C2 and C4) or that the instrument is set as slave instrument, with a proper address, it is enabled to work as slave instrument, among the resources to implement in the slave instrument there is the compressor output status during the normal functioning and that a count of a delay time to the resource implementation is running (see the parameters n1 and n4).

If the LED L2 flashes it means that a count of a delay time to a defrost cycle activation is running (see the parameters CO, C1, C2 and C4), that a dripping is running (see the parameter d7) or that the instrument is set as slave instrument, with a proper address, it is enabled to work as slave instrument, among the resources to implement in the slave instrument there are the compressor output status during the normal functioning and the presentation of a request of a defrost cycle and that a count of a delay time to the resource implementation is running (see the parameters n1 and n4).

If the LED L3 flashes it means that an evaporator fans stoppage is running (see the parameter

If the instrument displays the indication "nEt" it means that the instrument is set as slave

instrument, with a proper address, it is enabled to work as slave instrument and among the resources to implement in the slave instrument there is the compressor output status during the normal functioning (see the parameter nA)

If the instrument displays the temperature read by the cabinet probe and the indication "nEt" flashing every four seconds it means that the instrument is set as slave instrument, with a proper address, it is enabled to work as slave instrument, among the resources to implement in the slave instrument there is the compressor output status during the normal functioning but there is not the turning ON and the turning OFF, the master instrument is during the status STAND-BY and the slave instrument is turned ON (see the parameter nA).

If the instrument displays the indication "E2" flashing and the buzzer utters an intermittent beep (corrupted memory data alarm) it means that there is a corruption of the configuration data in the memory (turn OFF and turn ON again the instrument: if to the turning ON again the alarm does not disappear the instrument must be replaced); during this alarm the access to the working setpoint setting and the configuration parameters setting procedures is refused, all outputs get forced to the status OFF and if the instrument is set as master instrument the resources management of the slave instrument locally happens.

If the instrument displays the indication "F3" flashing and the huzzer utters an intermittent beep (instrument locking) it means that there was a number of locking digital input alarm enough to give the instrument locking (turn OFF and turn ON again the instrument, see the parameters i2, i3, i4 and i5); during this alarm the compressor output gets forced to the status OFF, if a defrost cycle is running the defrost cycle ends and the instrument never activates a

If the instrument displays the indication "E3" flashing alternated to the indication "E0" and the buzzer utters an intermittent beep (locking digital input alarm and cabinet probe failure alarm) it means that the locking digital input is active (deactivate the locking digital input see the parameters i2, i3, i4 and i5) and that; the kind of connected cabinet probe is not proper (see the parameter (0), the cabinet probe is faulty (verify the cabinet probe integrity), there is a mistake in the instrument-cabinet probe connection (verify the instrument-cabinet probe connection integrity), the temperature read by the cabinet probe is outside the limits permitted by the cabinet probe in use (verify that the temperature near the cabinet probe be inside the limits permitted by the cabinet probe); during this alarm the compressor output gets forced to the status OFF, if a defrost cycle is running the defrost cycle ends and the instrument never activates a defrost cycle.

If the instrument displays the indication "E3" flashing alternated to the temperature read by the cabinet probe and the buzzer utters an intermittent been (locking digital input alarm) it means that the locking digital input is active (deactivate the locking digital input, see the parameters i2 i3 i4 and i5); during this alarm the compressor output gets forced to the status OFF if a defrost cycle is running the defrost cycle ends and the instrument never activates a defrost

If the instrument displays the indication "EO" flashing and the buzzer utters an intermittent been (cabinet probe failure alarm) it means that the kind of connected cabinet probe is not proper (see the parameter /0), the cabinet probe is faulty (verify the cabinet probe integrity). there is a mistake in the instrument-cabinet probe connection (verify the instrument-cabinet probe connection integrity), the temperature read by the cabinet probe is outside the limits permitted by the cabinet probe in use (verify that the temperature pear the cabinet probe be inside the limits permitted by the cabinet probe); during this alarm the compressor output functioning gets established with the parameters C5 and C6, if a defrost cycle is running the defrost cycle ends and the instrument never activates a defrost cycle.

If the instrument displays the indication "E1" flashing and the buzzer utters an intermittent been (evanorator probe failure alarm) it means that there is one of the faults saw in the previous case but referred to the evaporator probe: during this alarm, if the parameter F7 has value 3 or 4 the evaporator fans output gets forced to the same status of the compressor output, except what established with the parameter F5 and the defrost ends passed the defrost maximum length

If the instrument displays the temperature read by the cabinet probe and the buzzer utters an intermittent beep (multifunction digital input alarm) it means that the multifunction digital input is active (deactivate the multifunction digital input, see the parameters i0 and i1); during this alarm, if the conditions permit it (the temperature read by the evaporator probe must be below the defrost stopping setpoint) the instrument presents a request of a defrost cycle or the cabinet light output gets forced to the status ON.

If the instrument displays the temperature read by the cabinet probe flashing, the indication "Ain" flashing every four seconds and the buzzer utters an intermittent beep (multifunction digital input alarm and temperature alarm) it means that the multifunction digital input is active (deactivate the multifunction digital input, see the parameters i0 and i1) and that the temperature read by the cabinet probe is outside the limit established with the parameter A1 or A2 (see the parameters A0, A1 and A2); during this alarm gets given the action established with the parameter i0 and if the parameter i0 has value 3 or 4 the instrument never activates a defrost cycle, except if the instrument is set as slave instrument, with a proper address, it is enabled to work as slave instrument and among the resources to implement in the slave instrument there is the presentation of a request of a defrost cycle.

If the instrument displays the temperature read by the cabinet probe, the indication "Ain" flashing every four seconds and the buzzer utters an intermittent beep (multifunction digital input alarm) it means that the multifunction digital input is active (deactivate the multifunction digital input, see the parameters i0 and i1); during this alarm gets given the action established with the parameter i0 and if the parameter i0 has value 3 or 4 the instrument never activates a defrost cycle, except if the instrument is set as slave instrument, with a proper address, it is enabled to work as slave instrument and among the resources to implement in the slave instrument there is the presentation of a request of a defrost cycle.

If the instrument displays the temperature read by the cabinet probe flashing and the buzzer utters an intermittent beep (temperature alarm) it means that the temperature read by the cabinet probe is outside the limit established with the parameter A1 or A2 (see the parameters A0. A1 and A2): inactive

If the instrument displays the indication "nEt" and the buzzer utters an intermittent beep (slave instrument alarm) it means that the instrument is set as slave instrument, with a proper address, it is enabled to work as slave instrument, among the resources to implement in the slave instrument there is the compressor output status during the normal functioning and that there is one of the alarms saw in the previous cases; to display the alarm code flashing of the slave instrument keep pushed the key T1.

If the instrument displays an alarm code flashing and the indication "nFt" flashing every four seconds it means that the instrument is set as slave instrument, with a proper address, it is

enabled to work as slave instrument, among the resources to implement in the slave instrument there is the compressor output status during the normal functioning but there is not the turning ON and the turning OFF, the master instrument is during the status STAND-BY, the slave instrument is turned ON and there is one of the alarms saw in the previous cases.

If the instrument displays the temperature read by the cabinet probe, the indication "nEt" flashing every four seconds and the buzzer utters an intermittent been (serial network alarm) it means that: the instrument is set as slave instrument, with a proper address, it is enabled to work as slave instrument and the master instrument is not enabled to work in the network (see the parameter n0 of the master instrument, during this alarm the resources management of the slave instrument locally happens), the instrument is set as slave instrument, with a proper address, it is enabled to work as slave instrument and the master instrument is set as slave instrument (see the parameter n0 of the master instrument, during this alarm the resources management of the slave instrument locally happens), the instrument is not enabled to work in the network, it is set with a proper address and it is enabled to work as slave instrument (see the parameter n0 of the slave instrument, during this alarm the resources management of the slave instrument locally happens), the instrument is set as master instrument, with a slave instrument address and it is enabled to work as slave instrument (see the parameter n0 of the master instrument, during this alarm the resources management of the slave instrument locally happens), the instrument is set as slave instrument, with a proper address, it is enabled to work as slave instrument and the master instrument has the same address of the slave instrument (see the parameter n1 of the master instrument, during this alarm the resources management of the clave instrument locally hanners), the instrument is set as slave instrument, with a master instrument address and it is enabled to work as slave instrument (see the parameter n1 of the slave instrument, during this alarm the resources management of the slave instrument locally happens), the instrument is set as master instrument, with a proper address and it is enabled to work as slave instrument (see the parameter n3 of the master instrument, inactive), the instrument is set as slave instrument, with a proper address, it is enabled to work as slave instrument and there is a mistake in the connection to the serial network of instruments (verify the integrity of the connection to the serial network of instruments, during this alarm the resources management of the slave instrument locally happens or the instrument is set as slave instrument, with a proper address, it is enabled to work as slave instrument and the master instrument is not connected to the local power supply (verify that the master instrument be connected to the local power supply, during this alarm the resources management of the slave instrument locally happens). ADDITIONAL INFORMATIONS

if the parameter F7 has value 0, 1 or 2 during an evaporator fans stoppage the LED 13 does not flashe

the alarm codes are related in order of precedence

## **TECHNICAL DATA**

TECHNICAL DATA

Case plastic black (PP0), self-extinguishing.

Size: 96 x 48 x 99 mm (3.77 x 1.88 x 3.89 in.), with terminal

Installation panel mounting, panel cutout 91 x 45 mm (3.58 x 1.77 in.)

with the equipped screw brackets.

IP 54. Type of protection:

Connections: extractable screw terminal blocks with pitch 5 mm (0.19

in., power supply, inputs and outputs) for cables up to 2.5 mm2 (0.38 in.2), five poles single line male connector with

pitch 2.5 mm (0.09 in., serial port),

Ambient temperature: from 0 to +60 °C (+32 to +140 °F. 10 ... 90 % of not con-

densing relative humidity) Power supply: 230 Vac or 115 Vac or 24 Vac or 12-24 Vac/dc or

12 Vac/dc, 50/60 Hz, 4 VA,

Insulation class: Ш

Alarm buzzer: incorporated. Measure inputs 2 (cabinet and evaporator probe) configurable for PTC/NTC

Digital inputs: 1 multifunction (5 V, 1 mA) configurable to interact on the

outputs activity and for NO or NC contact.

from -50 a +150 °C (-58 to +302 °F) for PTC probe, from Working range: -40 to +110 °C (-40 to + 230 °F) for NTC probe.

> from -55 to +99 °C (-55 to +99 °F). 1 °F with unit of measure in Fahrenheit, 1 °C with unit of

measure in Celsius. Display: 3-digit display 12.5 mm (0.49 in.) high red LED display

with automatic minus sign, compressor, evaporator fans

and defrost output status indicators. four NO contact relays of which one 20 (3) A @ 250 Vac relay for one 1½ HP @ 250 Vac compressor management

and three 5 (3) A @ 250 Vac relays for evaporator fans defrost system management and for cabinet light control

Kind of defrost managed: to resistances (electrical) and to hot gas (reversal of cycle), automatic, manual and remote

Defrost management: for interval, stopping temperature and maximum length. Serial port: TTL with EVCOBUS protocol communication, for the con-

nection to the CLONE configurer/cloner and RICS supervi-

# **HOW TO ORDER**

CODING SYSTEM Instrument name:

Desired power supply:

Setting range:

Resolution

Outputs:

EC 8-290.

Desired measure input: P (for PTC/NTC probes).

> 220 (230 Vac) 115 (115 Vac)

024 (12-24 Vac/dc)

A24 (24 Vac)