Management controller

Premium/Prostore
&
Standard

Standard Model

Model for Ecostore Premium& Prostore

CONTENTS

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Description of buttons

PREMIUM

PREMIUM
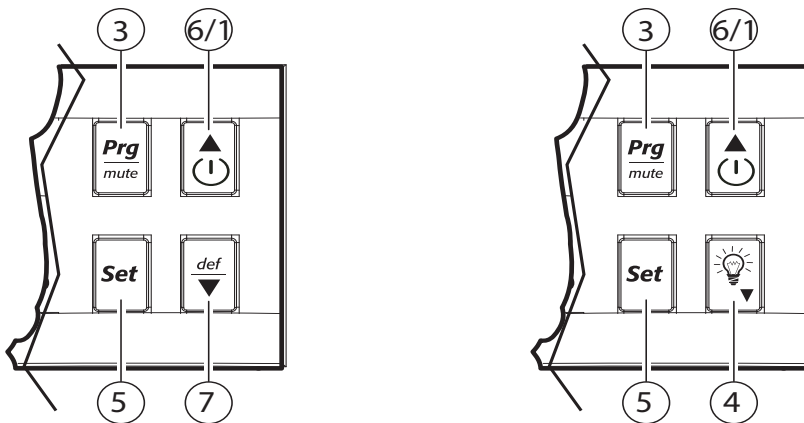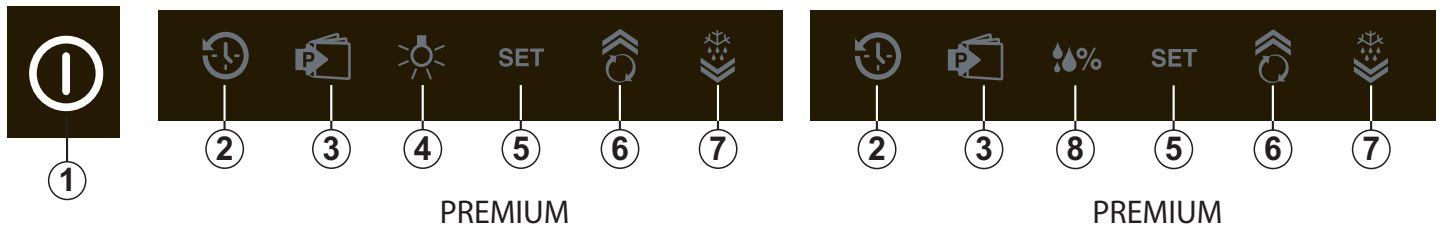
Standard Control

Description

1. ON/OFF
2. History button
3. Programming confirmation button
4. Light button
5. Temperatura/Programming button
6. Temperature decrease /Turbo cooling button
7. Temperature increase/Manual defrost button
8. Umidity button

Description of Icons

Premium

Standard Control

ICON	FUNCTION	DESCRIPTION	NORMAL FUNCTIONING		
			ON	**OFF**	**BLINK**
⊘	**COMPRESSOR**	ON when the compressor starts. Flashes when the activation of the compressor is delayed by safety times.	Compressor on	Compressor off	Awaiting activation
✳	**FAN**	ON when the fan starts.Flashes when the activation of the fan is prevented due to external disabling or procedures in progress.	Fan on	Fan off	Awaiting activation
❄	**DEFROST**	ON when the defrost is activated. Flashes when the activation of the defrost is prevented due to external disabling or procedures in progress.	Defrost in progress	Defrost not in progress	Awaiting activation
AUX	**AUX**	Si accende all'attivazione dell'uscita ausiliaria selezionata come AUX (LUCE)ON when the auxiliary output selected as AUX (or LIGHT) is activated.	AUX auxiliary output active	AUX auxiliary output not active	
⚠	**ALARM**	ON following pre-activation of the delayed external digital input alarm. Flashes in the event of alarms during normal operation (e.g. high/low temperature) or in the event of alarms from an immediate or delayed external digital input.	Delayed external alarm (before the time 'A7' elapses)	No alarm present	Alarms in norm. operation (e.g. High/low temperature) or immediate or delayed alarm from external digital input
🕐	**CLOCK**	On in case of consultation history temperature .	History temperature	History temperature not consulting	
▱	**DOOR**	Blinking in case of door open/On in case of alarm door open	Auxiliary exit Light ON	Auxiliary exit Light ON Door closed	Door open
🔧	**Service**	Flashes in the event of malfunctions, for example E2PROM errors or probe faults	Programming , set temperature	No malfunction	Malfunction (e.g. E2PROM error or probe fault). Contact service
HACCP	**HACCP**	ON if the HACCP function is enabled.Flashes when there are new HACCP alarms stored (HA and/or HF alarm shown on the display)	HACCP function enabled	HACCP function not enabled	HACCP alarm saved (HA and/or HF)
🌡↑	**TEMPERATURE**	ON in case of high Temperature	Alarm High temperature	No alarm	Actual alarm (high temperature)
🌡↓	**DISPLAY**	ON in case Low temperature	Alarm low temperatutre in history	No alarm	Actual alarm (low temperature)

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INSTRUMENT PROGRAMMING

Operation parameters, completely modifiable from front keypad. Access to these is protected by a password that prevents random changes or modifications by unauthorised persons.

Accessing parameters (configuration):

1. **press the PRG and SET buttons together** for more than 5 seconds and the display will show "00", password required;
2. use the buttons ▲ or ▼ to scroll the numbers until displaying "**11**" (Password for accessing parameters);
3. confirming with **SET**, the first modifiable parameter will appear on the display.

Modifying parameters

After displaying the parameter, proceed as follows:

1. use the buttons ▲ or ▼ to scroll the parameters to the one to be modified. Scrolling is accompanied by lighting up of an icon on the display, representing the parameter category. Alternatively, press the **PRG** button to display a menu of the categories or parameters for quickly accessing the family of parameters to be changed;

2. scroll the menu with the buttons ▲ and ▼ and the codes of the various parameter categories (see "Summary of operation parameters") are displayed, together with lighting up of the corresponding icon (if present);

3. on accessing the category, press **SET** to go straight to the first parameter of the selected category (if no parameter is visible, pressing the **SET** button will have no effect);

4. it is possible to continue consulting the parameters or return to the categories menu with the **PRG** button;

5. press **SET** to display the value associated with the parameter;

6. increase or decrease the value respectively with the buttons ▲ and ▼;

7. press **SET** to temporarily save the new value and return to the display of the parameter. Repeat the procedure from step 1 or step 2;

8. if the parameter has subparameters, press **SET** to display the first subparameter;

9. press the buttons ▲ or ▼ to view all the subparameters;

10. press **SET** to display the associated value;

11. increase or decrease the value respectively with the buttons ▲ or ▼;

12. press **SET** to temporarily save the new value and return to the display of the subparameter code;

13. press **PRG** to return to the display of the parent parameter.

Saving new values assigned to parameters

To permanently save the values of the modified parameters, press the **PRG** button for more than **5 seconds**, thus exiting the parameter modification procedure. It is possible to cancel all the parameter modifications, temporarily stored in RAM, and return to "normal operation" by not pressing any button for 60 seconds, thus allowing the parameter modification session to expire for TIMEOUT.

Attention: If the modification session expires for timeout, the parameters will not be not restored.

If the power to the instrument is switched off before pressing the *PRG* button, all changes made to the parameters and temporarily saved will be lost.

Classification of parameters

As well as being divided according to TYPE, the parameters are grouped into logical CATEGORIES identified by the initial symbols or letters.
Given below are the existing categories with respective letters.

Parameters	Category	Text	Icon
r	Temperature probe management parameters	Pro	⚒
r	Temperature control parameters	CtL	⚒
c	Compressor safety time and activation parameters	CMP	⊖
d	Defrost management parameters	dEF	❄
A	Alarm management parameters	ALM	⚒
F	Fan management parameters	Fan	✜
H	General configuration parameters (addresses, enabling, etc.…)	CnF	AUX

Default parameters

	Parameter	Descrizione	Description	Range	Unit of
		PARAMETERS RELEVANT TO TEMPERATURE PROBE MANAGEMENT			
1	r2	Stabilità misura	Measurement stability	4...15	
2	r3	Rallentamento visualizzazione sonda	Probe display response	0...15	
3	r5	Selezione °C o°F	Selection °C or °F	0/1	Flag
4	r6	Punto decimale	Decimal point	0/1	Flag
5	rti	Visualizzazione su terminale interno	Display on terminal	1…7	
6	rA2	Configurazione sonda 2	Configuration probe 2	0…4	
7	rA3	Configurazione sonda 3	Configuration probe 3	0…4	
8	rc1	Calibrazione sonda CELLA	Calibration probe 1	-20.0..20.0	C/ F (/10)
9	rc2	Calibrazione sonda 2	Calibration probe 2	-20.0..20.0	C/ F (/10)
10	rc3	Calibrazione sonda 3	Calibration probe 3	-20.0..20.0	C/ F (/10)
		PARAMETRI RELATIVI ALLA REGOLAZIONE DELLA TEMPERATURA\PARAMETERS RELEVANT TO TEMPERATURE CONTROL MANAGEMENT			
11	St	**Set point**	**Set point**	r1…r2	**C/ F**
12	rd	Delta Regolatore	Control delta	0.1…20	C/ F
13	r1	Set minimo ammesso	Minimum set point allowed	-50...r2	C/ F
14	r2	Set massimo ammesso	Maximum set point allowed	r1…200	C/ F
15	r5	Abilitazione monitoraggio temperatura	Enable temperature monitoring	0...1	C/ F
		PARAMETRI RELATIVI ALLA GESTIONE DEL COMPRESSORE\PARAMETERS RELEVANT TO COMPRESSOR MANAGEMENT			
16	c0	Ritardo start compressore. ,ventole e aux zona neutra all'accensione	Delay Output from power on	0...15	Min
17	c1	Tempo minimo tra accensioni successive	Delay between power on	0…15	Min
18	c2	Tempo minimo di On del compressore	Minimum compressor OFF time	0...15	Min
19	c4	Duty setting	Duty setting	0…100	Min
20	cc	Durata ciclo continuo	Continuous cycle duration	0...15	Hours
21	c6	Esclusione allarme dopo ciclo continuo	Alarm bypass after continuous cycle	0...15	Hours

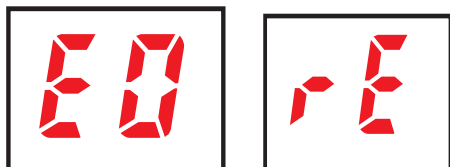|		PARAMETRI RELATIVI ALLA GESTIONE DELLO SBRINAMENTO\PARAMETERS RELEVANT TO DEFROST MANAGEMENT			
22	d0	Tipo di defrost	Type of defrost	0...4	Flag
23	d1	Intervallo tra i defrost	Interval between defrosts	0...250	Hours
24	dt1	Temperatura di fi ne defrost evap.	End defrost temperature, evaporator	-50...200	C/ F
25	dtP	Temperatura di fine sbrinamento a fermata di gruppo	End defrost temperature at unit stop	0...200	C/ F
26	dP1	Durata massima defrost evaporatore	Maximum defrost duration, evaporator	1...250	Min
27	d3	Ritardo inserimento defrost	Defrost start delay	0...250	Min
28	d4	Abilitazione defrost allo start up	Enable defrost on start-up	n/y	Flag
29	d5	Ritardo defrost allo start up	Defrost delay on start-up	0...250	Min
30	d6	Blocco display durante il defrost	Display on hold during defrost	0...2	
31	dd	Tempo di gocciolamento dopo il defrost	Dripping time after defrost	0...15	Min
32	d8	Esclusione allarmi dopo il defrost	Alarm bypass after defrost	0...15	Hours
33	d8d	Esclusione allarmi dopo aperture porta	Delay on door opening alarm	0...250	Hours/Min
34	d9	Priorità defrost su protezioni compressore	Defrost priority over compressor protectors	n/y	Flag
35	dC	Base dei tempi per defrost	Time base defrost (0=h/m;1=m/s)	0/1	Flag
36	dC1	Base dei tempi per allarmi	Time base alarms (0=h/m;1=m/s)	0/1	Flag
37	d10	Running time del compressore	Compressor running time for defrost	0...250	Hours
38	d11	Soglia di temperatura di running time	Running time temperature for defrost	-20.0..20.0	C/ F
39	dF0	Numero di ore del compressore attivo dopo il quale lo sbrinamento deve essere attivato	NUM_COMP_ON number of hours the compressor is on after which defrost must start	0...12	Hours
40	dF1	Numero di aperture porta dopo il quale il parametro DFO deve decrementare	number of door openings after which dF0 must be decreased	0...500	Units
41	dF2	Minuti da sottrarre al parametro DF0 per anticipare lo sbrinamento	minutes to be subtracted to dF0 in order to anticipate defrost	0...240	Min
		PARAMETRI RELATIVI ALLA GESTIONE DEGLI ALLARMI\PARAMETERS RELEVANT TO ALARM MANAGEMENT			
42	A0	Differenziale allarmi e ventole	Alarm (fan) differential	0.1...20.0	C/ F
43	A1	Tipo di soglia AL e AH	Relative or Absolute Alarm	0/1	flag
44	AL	Soglia di allarme di bassa temperatura	Low temperature alarm threshold	-50...200	C/ F
45	AH	Soglia di allarme di alta temperatura	High temperature alarm threshold	-50...200	C/ F
46	Ad	Ritardo segnalazione bassa e alta temperatura	Low and high temperature signal delay	0...250	Min
47	A4	Confi gurazione ingresso digitale 1	Digital input 1 configuration	0...15	flag
48	A5	Confi gurazione ingresso digitale 2	Digital input 2 configuration	0...15	Flag
49	A6	Blocco compressore da allarme esterno	Stop compressor from external alarm	0...100	Min
50	A7	Ritardo rilevazione allarme esterno	External alarm detection delay	0...250	Min
51	A8	Abilitazione allarmi Ed1 ed Ed2	Enable alarms 'Ed1' and 'Ed2'	0(off)-9(0n)	Flag
52	A9	Segnale virtuale 2(usato per connttere la almpada a led)	Virtual input 2 configuration(Used in connection with LED_Lamp)	0...15	Flag
53	Ac	Allarme alta temperatura condensatore	High condenser temperature alarm	0...200	C/ F
54	AE	Differenziale allarme alta temperatura condensatore	High condenser temperature alarm differential	0.1...20	C/ F
55	Acd	Ritardo allarme alta temperatura condensatore	High condenser temperature alarm delay	0...250	Min

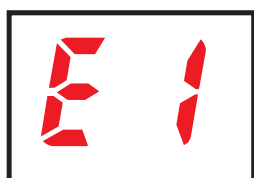| 56	ACS	Soglia di temperature per allarme Clean	Alarm Clean Setpoint	-50....+200	C/ F
57	ACd	Ritardo allarme alta temperatura condensatore	Alarm Clean differential		C/ F
		PARAMETRI RELATIVI ALLA GESTIONE DEL VENTILATORE EVAPORATORE\PARAMETERS RELEVANT TO EVAPORATOR FAN MANAGEMENT			
58	F0	Gestione ventilatori	Fan management	0...3	Flag
59	F1	Temperatura accensione ventilatore	Fan stop temperature	-50...200	C/ F
60	F2	Ventilatore off con compressore off	Fan OFF with compressor OFF	0/1	Flag
61	F3	Ventilatore in sbrinamento	Fans in defrost	0/1	Flag
62	Fd	Ventilatore spento dopo lo sgocciolamento	Fan OFF after dripping	0...15	Min
63	F10	Umidità	Humidity_LVL	0...2	
64	F11	Ventilatore acceso in bassa umidità	Fan ON time in low humidity mode	0..600	sec
65	F12	Ventilatore spento in bassa umidità	Fan OFF time in low humidity mode	0..600	sec
66	F13	Ventilatore acceso in media umidità	Fan ON time in medium humidity mode	0..600	sec
67	F14	Ventilatore spento in media umidità	Fan OFF time in medium humidity mode	0..600	sec
68	F15	Ventilatore acceso in alta umidità	Fan ON time in high humidity mode	0..600	sec
69	F16	Ventilatore spento in alta umidità	Fan OFF time in high humidity mode	0..600	sec
70	F17	Differenziale del compressore in accensione con umidita bassa	temperature differential for compressor ON in low hum.	0,1..20	sec
71	F18	Differenziale del compressore in accensione con umidita media	temperature differential for compressor ON in medium hum.	0,1..20	sec
72	F19	Differenziale del compressore in accensione con umidita alta	temperature differential for compressor ON in high hum.	0,1..20	sec
		PARAMETRI GENERALI DI CONFIGURAZIONE			
73	H0	Indirizzo dispositivo	Device address	0...207	
74	H1	Funzionamento del rele 4 (Flusso elettrovalvola= 14) (Resistenza conice= 15) (Luce porta vetro= 8) (Resistenza di scarico condensa=2)	Function of relay 4 (Flow electrovalve = 14) (Frame resistance = 15) (Glass door light = 8) (Drain pipe resistance = 2)	0...16	Flag
75	H2	Abilita/disabilita tasto ON/OFF (Y=1;N=6)	Enable ON/OFF (Y=1;N=6)	0...6	Flag
76	H4	Disabilita Cicalino	Disable buzzer	0/1	Flag
77	H6	Blocco tastiera	Lock keypad	0...255	
78	H7	Percentuale di umidità (H7=0 , disabilita controllo umidità F0=3)- Attivazione Luce (H7=1) -Tipo di controllo : Versione Mass (H7=2)	keyboard type: HUM% key (H7 = 0, enable humidity management with F0=3) or LIGHT key (H7 = 1). Controller type: Mass version (H7 = 2)	1...3	
79	CCd	Conteggio gioni di pulizia	Clean Counter Days	0.......999	Days
80	Cd	Giorni di pulizia	Clean days	0.......999	Days
81	SAn	Numero allarmi di tipo Service avvenuti	Service Alarms number	0.......255	Flag
82	SAr	Azzeramento del contatore dei Service Alarms	Service Alarms counter reset San	0.......1	Flag
83	CAn	Numero di allarmi Clean avvenuti dall'ultimo reset	Clean Alarm counter	0.......255	Flag
84	CAr	Azzeramento del contatore degli allarmi di Clean	Clean Alarm counter reset	0.......1	Flag
85	4r1	Spazio tra il differnziale corrente e il flusso della temperatura della elettrovalvola	Gap between current differential and flow electro-valve temperature differential	0,1..20	C/ F
86	4r2	Abilita/disabilita la resistenza cornice mobile con la referenza della temperatura impostata	Parameter (temperature) enabling/disabling frame resistance with reference to chosen cell setpoint	-20..20	C/ F
87	4r3	Ritardo per la resistenza di scarico(il tempo deve includere la durata del defrost)	Delay for drain pipe switch-off (the value must include the defrost duration)	0...60	min

SERVICE ALARMS AND SIGNALLING

SERVICE ALARMS

ALL THE SERVICE ALARMS GENERATED FOR APPLIANCE FAULTS ARE SIGNALLED ON THE DISPLAY THROUGH THE ASSISTANCE REQUEST ICON

|	
🔧 **THERMOSTATTING PROBE FAULT ALARM** **E0** **rE**	In case of faulty thermostatting probe, the display shows the message **rE** alternating with **E0** (compartment probe S1). The appliance still works and compressor activation and/or deactivation is time managed (15 min. ON and 15 min. OFF). The alarm condition is automatically reset as soon as compartment probe operation is restored.
🔧 **ROOM PROBE FAULT ALARM** **E1**	In case of faulty room probe, the display shows the message **E1** (room probe S2). The alarm condition is automatically reset as soon as compartment probe operation is restored. The service alarm signalling icon flashes whereas the controller buzzer is deactivated
🔧 **CONDENSER PROBE FAULT ALARM (IF PRESENT)** **E2**	The service alarm signalling icon flashes whereas the controller buzzer is deactivated. In case of faulty condenser probe (if installed on the machine), the display alternately shows the message **SEr/E2.** The alarm condition is automatically reset as soon as compartment probe operation is restored.
🔧 **CLEAN ALARM (ACTIVATABLE IF CONDENSER PROBE IS PRESENT)** **CLn**	Clean alarm: when the condenser is very dirty on the display will appear the label **CLn**; this alarm dosen't stop the cycle but only advises the customer to clean the condenser. The **CLn** alarm appears only after 90 days to work of compressor and when the temperature of the condenser and ambient is over to delta of the parameter **ACS** The alarm disapears when the temperature decrease from parameter **ACd**.(differential) or pressing the button **Prg**.
🔧 **LED LIGHT CE ALARM (in Premium models only)** **0cn**	With the LED lamp disconnected, the display will show the message **ce** in sequence of temperature. This happens when the lamp is disconnected or damaged. In case of no lamp connection, the controller does not diagnose any fault. The alarm disappears when the lamp is reconnected. Parameter to be configured for lamp **A9=9**
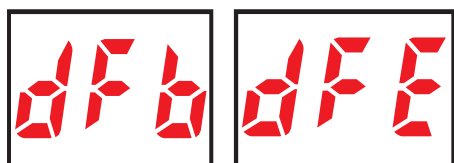
MANUAL DEFROST

To manually activate a defrost cycle it is necessary to keep the temperature decrease button pressed for at least 3 seconds.

The display shows the message **dFb/**defrost **start** for a few seconds and the icon signalling activation of the defrost cycle lights up.

Defrost can be manually stopped by pressing the DEF/decrease temperature button again for at least 3 seconds. The display shows the message **dFE/**defrost **end.**

Defrost in the range models is carried out following the algorithm values: 1) parameter **dF0,** associating the actual hours of compressor operation, 2) parameter **dF1,** number of door openings, where parameter **dF0** must be reduced ,3)parameter **dF2,** minutes to be add to parameter **dF1** from subtracted to parameter **dF0,**to anticipate defrost . Parameter **dI** remains active if these values are not respected.

ACTIVATION OF "TURBO COOLING" CONTINUOUS CYCLE
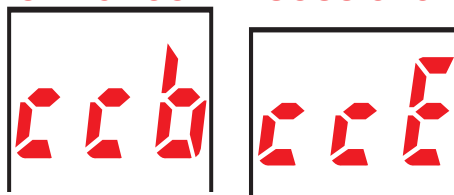
In case of activation of continuous cycle, by pressing the temperature decrease button for more than 5 seconds the display will show the message **ccb,** at the same time as the temperature the message **tc** will appear, meaning that "turbo cooling" has been activated. The cycle will end for time, by parameter **CC**, or for temperature by parameter **AL**, or by pressing the button again.

ACTIVATION OF HUMIDITY CYCLE
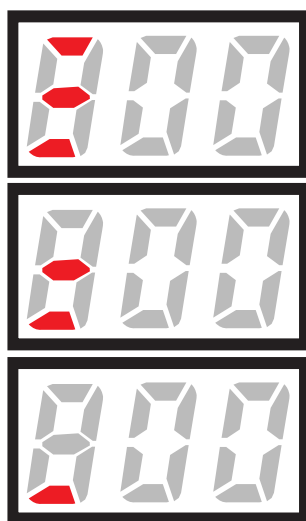
The humidity value is activated by pressing the corresponding button. Three modes can be activated: low, medium, high % .**F0= 3**

The function activates the evaporator fans following the logic of low, medium and high humidity % to be obtained in the compartment.

The parameters functioning in this are:

Selection	Correspondence	Evaporator fans functionality	
		Compressor OFF	Compressor ON
	Low humidity	F11= Fans ON F12= Fans Off	Fans always ON
	Medium humidity	F13= Fans ON F14= Fans Off	Fans always ON
	High humidity	F15= Fans ON F16= Fans Off	Fans always ON

SERVICE ALARMS AND SIGNALLING

TEMPERATURE ALARM

HI **LO**

The icon light up and audible alarm sound when the compartement temperature exceeds the set maximun value. The alarm ceases when the temperature returns to Set point.
A Parameter **AL** and **AH** determine the threshold of alarm of hight or lower temperature.
Another parameter as **Ad** determine the delay of alarm .
When the temperature return to set point, and the icon stay again ON , press the button **PRG** or directly on icon.

TEMPERATURE ALARM "SER"

SEr

When the temperature of condenser is over of delta parameter **AC** with a delay time to **Acd** , the alarm "**SEr**" appears on the display and the compressor if stopped.
The alarm can be resetted pressing togheter the buttons PRG and UP and the delay **Acd** will be re setted. The compressor will be ON only if the temperature reaches the value of AC-AE and the time of value (C1 (compressor delay at power on) will expired. If the alarm "**Ser**" appears again check if the condenser fan works or not.

DOOR OPEN

dor

When the time set on parameter **d8d** is expired, the alarm **dor** appear on the display, following from buzzer signaling and the red light on blinking , (premium model only).
The alarm disappear when the door is closed.
The buzzer is off pressing the icon on display.
If the alarm is On with the door closed, this is due to :
- door not aligned
- control panel not aligned
- sensor broken
The calibration of infrared sensor is of 9 mm: over this distance the sensor not more close the contact and the alarm will be always present.

EPROM ALARM

OEE
OEF

When one of the other alarms apper on the display , check the parameter list.
If the parameters setted are not kept in memory replace the instrument.

Defrost

Defrost management has in principle the same features of the current FW: however, as the evaporator probe is not present, defrost will be managed by counting working hours of the compressor and will end for timeout. A programmed defrost will be done every defined number (parameter dF0) of working hours. In addition, the algorithm will count the number of openings of the door as well. The aim is to anticipate of a number of minutes (dF2) the programmed defrost with reference to the total number of openings of the door.

Every time the programmed defrost is done, the total on-time hours of compressor and the number of door openings will be reset. Proper parameters will be employed in order to manage this algorithm.

In order to do this, consider flux diagram of Figure 3.4. For instance, t_on_cmpr is the variable counting on-time hours of compressor starting from last defrost, whereas n_open_door is the number of openings of the door. t_on_cmpr is reset after each defrost, while n_open_door is reset every time it reaches dF1 value.
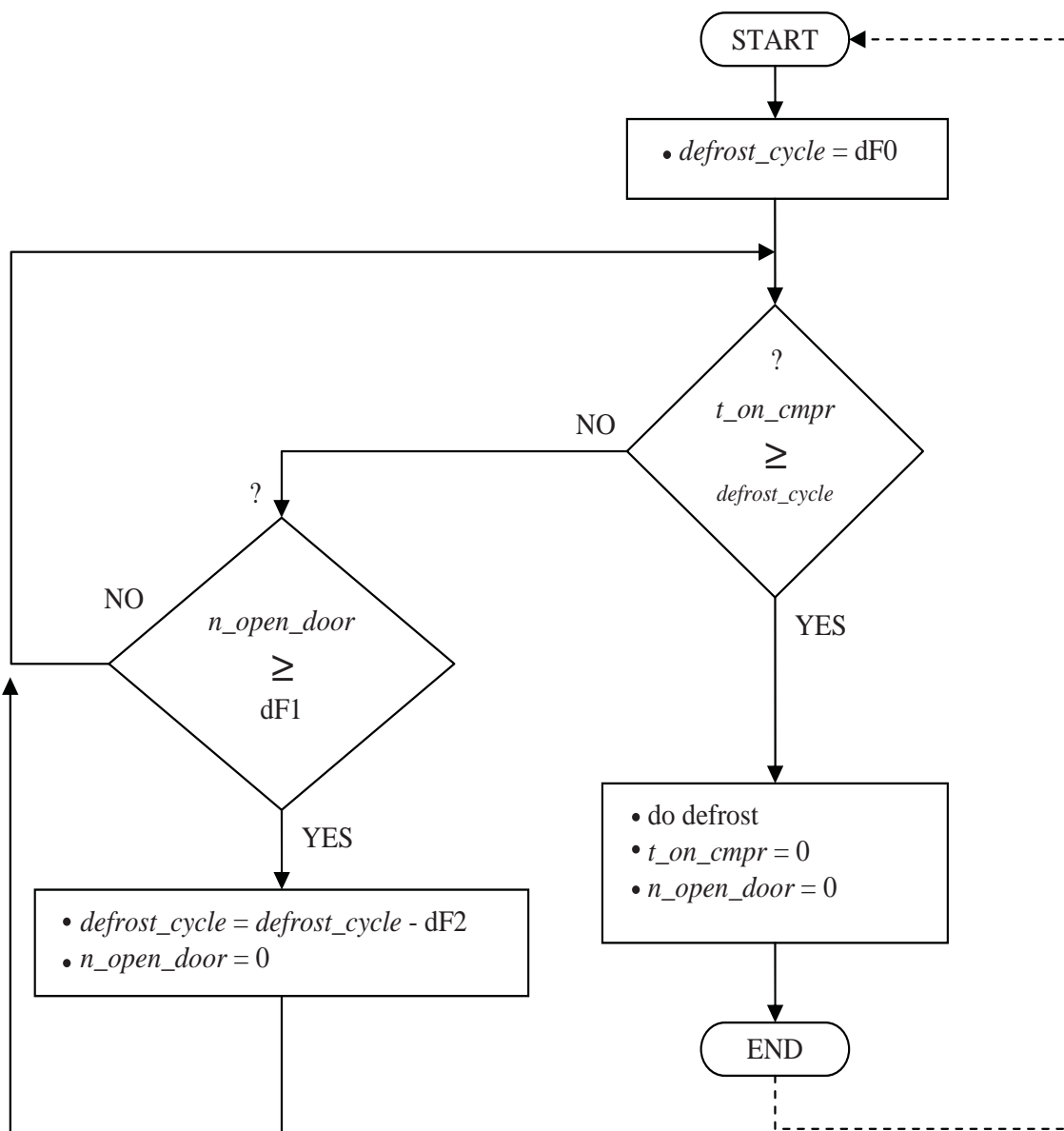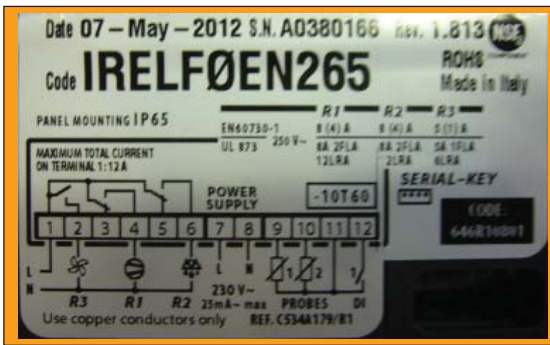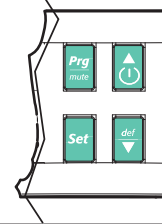

Figure 3.4: flux diagram for defrost algorithm.

Main termoregulator and where used

Date 07 – May – 2012 S.N. A0380166 Rev. 1.813 Code **IRELFØEN265** ROHS Made in Italy	Factory code 646R10802 SPC = 093328 used on Mass and Gab freezer and refrigerated 3 relay (8A -8A-5A)
Date 28 – Feb – 2012 S.N. A0369911 Rev. 1.250 Code **IRELCØHH225** Made in Italy	Factory code 646R11001 SPC = 093329 used on Mass and Gab glass door freezer and refrigerated 4 relay (16A -8A-8A-8A)
Date 05 – Mar – 2012 S.N. A0370610 Rev. 1.215 Code **IRELCØHH235** ROHS Made in Italy	Factory code 646R11101 SPC = 093434 used on Mass dual temp MASTER refrigerated , installed in the **upper compartement** 4 relay (16A-8A -8A-8A)
Date 05 – Mar – 2012 S.N. A0370611 Rev. 1.215 Code **IRELCØHH245** ROHS Made in Italy	Factory code 646R11301 SPC = 093438 used on Mass dual temp SLAVE freezer and refrigerated , installed on **lower compartement** 4 relay (16A-8A -8A-8A)
Date 03 – Apr – 2012 S.N. A0001497 Rev. 1.016 Code **IUEL1Ø1404** model **IXE1C0H1213** ROHS Made in Italy	Factory code 646R10602 SPC = 093437 used on Premium/prostore and as Master on dual temperature (**installed in the upper compartement**) 4 relay (16A-8A -8A-8A)
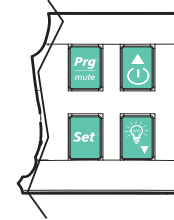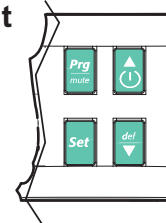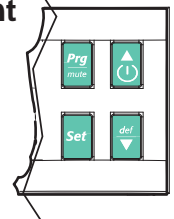
Date 03-Apr-2012 S.N. A0001498 Rev. 0.016
Code **IUEL101407** ROHS
model **IXE1C0H1223** Made in Italy

Comp Reg R3 AUX R4 | N | R1 R2 R3 R4
L EN60730-1 6 (6) A 8 (4) A 8 (4) A 8 (4) A
250 V~

13 14 15 16 17 18
PANEL MOUNTING IP65 SERIAL-KEY
MAX. TOTAL CURRENT -10T60
ON TERMINAL 3: 12 A
1 2 3 4 5 6 7 8 9 10 11 12 tLAN CODE: 646R11400
R1 R2 L N 1 2 1 2
115/230 V~ PROBES DI DI
50mA~ max
Use copper conductors only REF. C716A072/R0
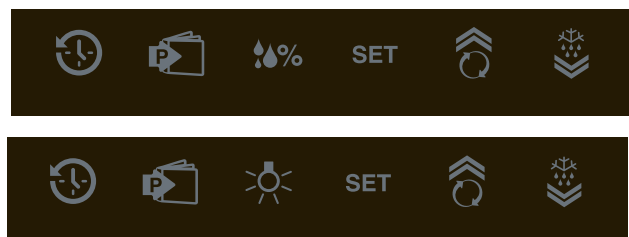
Factory code 646R11401
SPC = 093439
used on Premium as Slave on dual temperature
4 relay (16A-8A -8A-8A) **(installed on lower**
compartement as freezer and refrigerated*)*

ALIMENTAZIONE X1
SENSORE IR OMRON U11
SERIALE RS485 X2
SERIALE RS485 X3
CONNESSION TERMOREGOLATORE J1
CONNESSIONE PREC 10 X4
TRASFORMATORE
LD3 LD4
LD7 LD8
LD1 LD2
LD5 LD6
LED BIANCHI
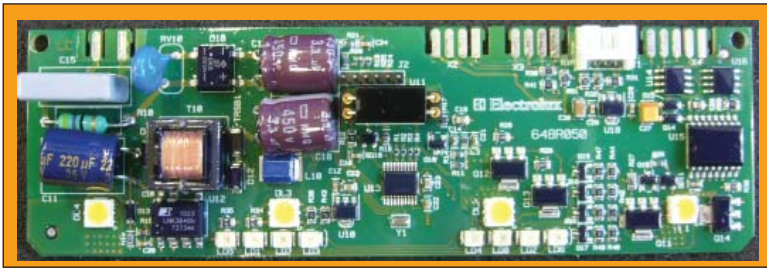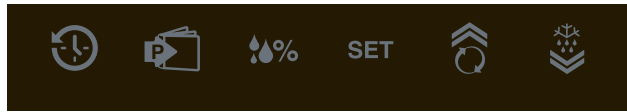
Factory code 648R05000
SPC = 093389
used on Premium dual doors
and Super premium

X1 Power
Termoregulator J1
LD5 LD6
LED BIANCHI
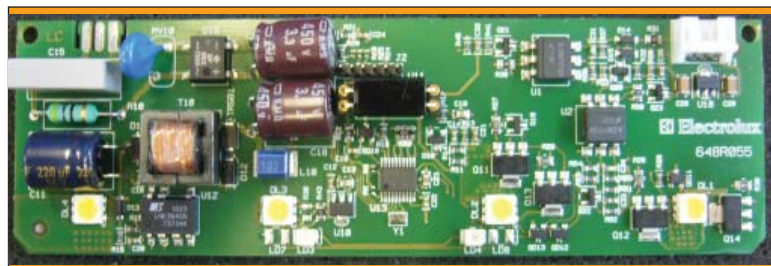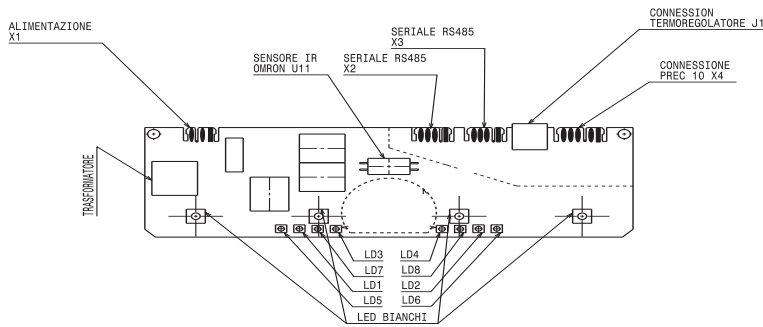
Factory code 648R05500
SPC = 093388
used on Premium/prostore one
doors and half doors
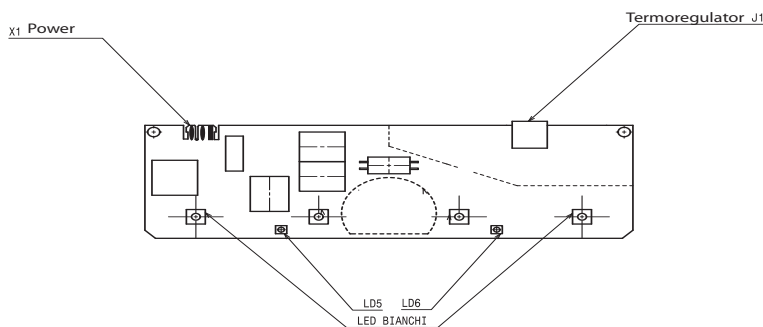
Factory code 646R11500
SPC = 0TH303
used on all Cabinets and couters all
range asia sb line with power supply to
12V

7.1 Temperature probe management parameters

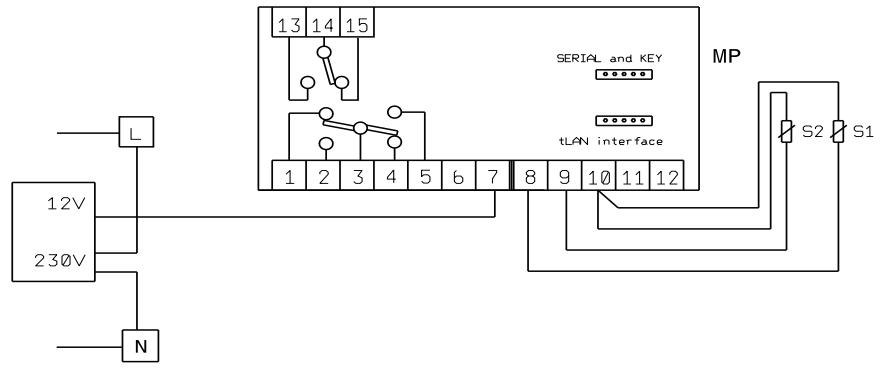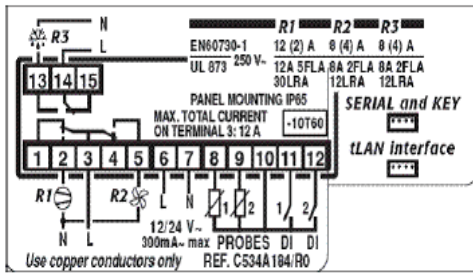| Code	Parameter	Models	UOM	Type	Min	Max	Def.
Pw	Password	MSYF	–	C	0	200	22
/2	Measurement stability	MSYF	–	C	1	15	4
/3	Probe display response	MSYF	–	C	0	15	0
/4	Virtual probe	MSYF	–	C	0	100	0
/5	Select °C or °F	MSYF	flag	C	0	1	0
/6	Decimal point	MSYF	flag	C	0	1	0
/tI	Display on internal terminal	MSYF	–	C	1	7	1
/tE	Display on external terminal	MSYF	–	C	0	6	0
/P	Select type of probe	MSYF	–	C	0	2	0
/A2	Configuration of probe 2 (S2)	YF	–	C	0	4	2
		MS	–	C	0	4	0
/A3	Configuration of probe 3 (S3, DI 1)	MSYF	–	C	0	4	0
/A4	Configuration of probe 4 (S4, DI 2)	MSYF	–	C	0	4	0
/A5	Configuration of probe 5 (S5, DI 3)	MSYF	–	C	0	4	0
/c1	Calibration of probe 1	MSYF	°C/°F	C	-20	20	0.0
/c2	Calibration of probe 2	MSYF	°C/°F	C	-20	20	0.0
/c3	Calibration of probe 3	MSYF	°C/°F	C	-20	20	0.0
/c4	Calibration of probe 4	MSYF	°C/°F	C	-20	20	0.0
/c5	Calibration of probe 5	MSYF	°C/°F	C	-20	20	0.0

Tab. 7.a

Note: par. /A5 and /c5 refer to instruments with 5 relays (ir33DIN, powercompact and MasterCella).

'/2': Measurement stability
Defines the coefficient used to stabilise the temperature reading. Low values assigned to this parameter allow a prompt response of the sensor to temperature variations, but the reading becomes more sensitive to disturbance. High values slow down the response, but guarantee greater immunity to disturbance, that is, a more stable and more precise reading. The parameter acts on the temperature readings, filtering the minimum variations, and at the same time considers the average of the readings. Default: '/2'=4.

/3: Probe display response
This parameter is used to set the update rate for the temperature display. The temperature shown on the display tends to follow rapid deviations away from the set point very slowly, and vice-versa, moves very quickly in the event where the temperature displayed is nearing the set point. If the control temperature exceeds the high or low temperature thresholds (and an AL or AH alarm is activated), or if the maximum number of filtering steps (255) is exceeded (see the Timeout column in Table 7.b), the filtering would immediately be bypassed and the temperature displayed would be the temperature effectively measured, until all the alarms are reset. The parameter only affects the temperature displayed, and not the temperature used for the control functions.

Important:
• the control temperature actually measured differs from the value displayed, and therefore the outputs may not be activated with reference to the latter temperature value.
• if the probe displayed is a product probe, with temperature values higher than the set point, the probe display rate algorithm will be faster for decreases in the temperature and slower for increases;
• if the probe displayed is an evaporator or condenser probe, the display rate algorithm always refers to the set point and thus may have specific effects (fast when the evap. probe reading increases and slow when it decreases; fast when the condenser probe reading decreases and slow when it increases);
• the parameter /3 acts on the temperature displayed by the instrument, if /tE=0 (no probe displayed by the repeater display); if the repeater display is configured (/tE <> 0), the parameter /3 will act on the temperature displayed by the repeater.

Example: in the case of "bottle coolers", typically used in supermarkets, when the doors are opened frequently, due to the greater thermal inertia of the liquids compared to the air (and the fact that the probe is positioned in the air and not directly on the products), the instrument measures a temperature that is higher than effective temperature of the soft drinks, thus displaying a quite "unrealistic" temperature. Setting the parameter /3 to a value other than 0, any abrupt variations in temperature are "filtered" on the display, showing a temperature trend that is "closer" to the actual trend of the product temperature. The following table shows the possible values of '/3' and the corresponding display delayed update values (Tdel).

Value of par. /3	Display delay (Tdel)	Timeout
0	Disabled	0
1	5 s	21 min
2	10 s	42 min
3	15 s	64 min
4	20 s	85 min
5	25 s	106 min
6	30 s	127 min
7	40 s	170 min
8	50 s	212 min
9	60 s	255 min
10	75 s	319 min
11	90 s	382 min
12	105 s	446 min
13	120 s	510 min
14	150 s	637 min
15	180 s	765 min

Tab. 7.b

Default: '/3'=0 => Function disabled.

/4: Probe average (virtual probe)
This parameter is used to choose whether to control the temperature based solely on the room probe reading, or alternatively whether to refer to the "weighted" average of the room probe S1 and probe 2 (S2, see the parameter '/A2'). This parameter is useful in special applications.

Example: if the room probe is in intake mode, and probe 2 in outlet mode, control can be performed based on the weighted average of the 2 values read.

The formula used is: probe average (Virtual probe) = [S1 x (100 - P) + (S2 x P)] / 100 where:

S1 = room probe; S2 = probe 2; P = value of the parameter /4.

Virtual probe:

• /4=0 control is performed using the room probe - this is the typical situation;

• /4=100 control is performed in reference to the values read by probe 2;

• /4=50 control refers to a "virtual" probe, calculated based on the average between the room probe and probe 2. With values above 50, probe 2 has a greater weight in the calculation, vice-versa for values below 50.

Important: in the event of faults or if probe 2 is not enabled, the instrument uses the room probe only. If the fault is on the room probe, the "Control probe" error is signalled.

Default: /4=0 => control on room probe.

/5: Select °C or °F

Defines the unit of measure (degrees Centigrade or degrees Fahrenheit) shown on the display.

/5=0 to operate in degrees Centigrade.

/5=1 to operate in degrees Fahrenheit.

Default: /5=0 => operation in degrees centigrade.

/6: Decimal point

Used to enable or disable the display of the temperature with resolution to the tenth of a degree between -20 and + 20.

Note: the exclusion of the decimal point is active only with reference to the display of the reading on the main and remote displays, while the parameters are always set to the tenth of a degree.

'/6'=0 the readings are displayed to the tenth of a degree, between -20 and +20 °C;

'/6'=1 all the readings are displayed without the tenths of a degree.

Default: /6 = 0 = > decimal point displayed.

/tl: Probe displayed on instrument

For selecting the probe to be displayed by the instrument.

/tl=1 => virtual probe

/tl=2 => probe 1

/tl=3 => probe 2

/tl=4 => probe 3

/tl=5 => probe 4

/tl=6 => probe 5

/tl=7 => set point

Note:

• control is always based on the virtual control probe;

• if the probe to be displayed has not been enabled, the display will show the message '____'.

Default: /tl=1 => Virtual probe.

/tE: Probe displayed on external terminal

Selects the probe to be displayed on the remote terminal.

/tE=0 => remote terminal not present

/tE=1 => virtual probe;

/tE=2 => probe 1;

/tE=3 => probe 2;

/tE=4 => probe 3;

/tE=5 => probe 4;

/tE=6 => probe 5.

Important:

Control is always based on the virtual control probe;

If the probe to be displayed has not been enabled, the display will show the message '____';

If the probe to be displayed is faulty, the display will show the message '____';

If the terminal is not present, the display will remain completely dark.

Default: /tE=0 => Remote terminal not present.

/P: Select type of probe

Used to select the type of probe used for the measurements.

/P=0 => NTC standard with range -50T90 °C

/P=1 => NTC with extended range -40T150 °C

/P=2 => PTC standard with range -50T150°C

For correct readings from the PTC probes, the hardware must be prepared to accept PTC readings (as well as NTC).

Note: all models in the ir33 range manage NTC probes with extended range (models HT).

Default: '/P'=0 => NTC standard with range -50T90 °C

Available on all models fitted with NTC inputs.

/A2: Configuration of probe 2
Used to configure the operating mode of probe 2.
/A2= 0 => probe 2 absent
/A2= 1 => product probe (used for display only)
/A2= 2 => defrost probe
/A2= 3 => condenser probe
/A2 = 4 => antifreeze probe
In any case, probe 2 is used for calculating the virtual control probe.
Default: /A2= 2 => defrost probe; /A2= 0 on models M and S => probe 2 absent.

/A3: Configuration of probe 3
As above, but relating to probe 3.
Important note: the input is enabled for use with a probe only if the parameter corresponding to digital input A4 is set to 0.
Default: /A3= 0 => Probe 3/Digital input absent.

/C1: Calibration or offset for probe 1
/C2: Calibration or offset for probe 2
/C3: Calibration or offset for probe 3

These parameters are used to correct the temperature measured by the probes, using an offset: the value assigned to these parameters is in fact added to (positive value) or subtracted from (negative value) the temperature measured by the probes. The temperature value is corrected by the offset before checking if the reading is out-of-range.

Example: to decrease the temperature measured by probe 1 by 2.3 degrees, set /C1= -2.3. The calibration or offset can be set from -20 to +20.

Warning: if the probe is disabled, the display shows '____'. If the probe is faulty, the display shows the corresponding error code. When displaying the parameter, pressing SET shows the value of the corresponding probe already corrected with the offset, while pressing SET a second time displays the abbreviated code.
Default: /C1=/C2=/C3=/C4=/C5=0 no offset.

7.2 Temperature control parameters

❄

Code	Parameter	Model	UOM	Type	Min	Max	Def.
St	Temperature set point	MSYF	°C/°F	F	r1	r2	0.0
rd	Control delta	-SYF	°C/°F	F	0.1	20	2.0
rn	Dead band	-SYF	°C/°F	C	0.0	60	4.0
rr	Reverse differential for control with dead band	-SYF	°C/°F	C	0.1	20	2.0
r1	Minimum set point allowed	MSYF	°C/°F	C	-50	r2	-50
r2	Maximum set point allowed	MSYF	°C/°F	C	r1	200	60
r3	Operating mode	-SYF	flag	C	0	2	0
r4	Automatic night-time set point variation	MSYF	°C/°F	C	-20	20	3.0
r5	Enable temperature monitoring	MSYF	flag	C	0	1	0
rt	Temperature monitoring interval	MSYF	hours	F	0	999	-
rH	Maximum temperature read	MSYF	°C/°F	F	-	-	-
rL	Minimum temperature read	MSYF	°C/°F	F	-	-	-

Tab. 7.c

St: set point
Establishes the set point value used by the controller. Default: St=0.0.

rd: Control delta
Establishes the value of the differential, or hysteresis, used for temperature control. Low values guarantee an ambient temperature that deviates only slightly from the set point, but involves frequent starts and stops of the main actuator (normally the compressor). In any case, the compressor can be protected by suitably setting the parameters that limit the number of activations/hour and the minimum OFF time (see the C parameters).
Note: if control with two compressor steps has been selected ('H1, H5'=12, 13), the differential 'rd' is divided between the two steps.
Default: rd =2

rn: Dead band
Establishes the value of the dead band, when the auxiliary output is selected as heating, in control with dead band mode. The differential is in the centre of the dead band.
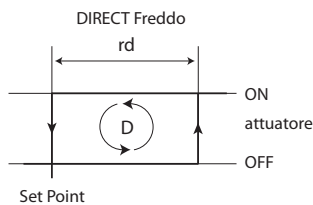
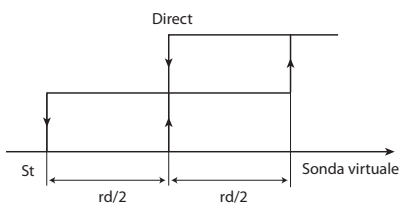DIRECT Freddo

Fig. 7.a

Fig. 7.b

Note:
- the step associated with the aux 1 or 2 output is only associated with the protection timer c0, while the step associated with the compressor (in both direct and reverse operation) is associated with the timers c0, c1, c2, c3. As a result, the steps may be active at the same time due to the protectors associated with the compressor step (minimum on time), as well as the unit defrost status;
- if the curtain switch function is enabled ('A4, A5, A9'=7), the controller modifies the set point when the contact closes, adding or subtracting the value of parameter 'r4'; the new value is used for all functions relating to the set point (e.g. relative high and low temperature alarms, dead band, etc.). When 'r4'=3.0 (preset value) the set point is increased by 3 degrees compared to the value used with the curtain open.

Default: 'rn'=4.

rr: Reverse differential for control with dead band
Establishes the value of the differential used in reverse temperature control, when the auxiliary output is selected as heating, in control with dead band mode. Default: 'rr'=2.

Note: no protection times are featured for the reverse output.

r1: minimum set point allowed
Determines the minimum value that can be set for the set point. Using this parameter prevents the user from setting a set point lower than the value indicated by r1. Default: r1=-50.

r2: maximum set point allowed
Determines the maximum value that can be set for the set point. Using this parameter prevents the user from setting a set point higher than the value indicated by r2. Default: r2 = +60.

r3: operating mode
ir33 can work as a thermostat and defrost controller for static units at normal temperature (r3=0), as a simple thermostat in Direct operation (r3=1), or as simple thermostat in Reverse-cycle operation (r3=2).

r3=0 Direct thermostat with defrost control (cooling);
r3=1 Direct thermostat (cooling);
r3=2 Reverse-cycle thermostat (heating).

Also see the description of parameters A4, A5, A9.

Note: with r3=1 and r3=2, the defrosts are always disabled.

A digital input set for direct/reverse-cycle control with parameter r3 has priority over the operating mode. The figure to the side shows reverse control with two compressor steps.

Default: r3=0=> Direct thermostat operation with defrost control.

r4:Automatic variation of the set point in night-time operation
This parameter is part of the group for control of the curtain switch, together with A4, A5 and A9,
programmable for configuring the digital inputs. When the curtain is closed, and consequently, the digital input connected to the curtain switch is closed, the controller automatically increases the set point by the value assigned to r4 in direct mode (cooling), and automatically decreases the set point by the value assigned to r4, in reverse mode (heating).

Important: if the value of r4 is negative, the controller with the curtain switch closed will decrease the set point, in direct mode (cooling), and increase the set point in reverse mode (heating).

Default: r4=3.0..

r5: Enable minimum and maximum temperature monitoring.
r5=0 disabled
r5=1 enabled
Default: r5=0

rt: Effective interval for monitoring the maximum and minimum temperature.

rH: Maximum temperature measured in the interval rt.

rL: Minimum temperature measured in the interval rt
All these parameters are used by the instruments to record the minimum and maximum temperature measured by the room probe in a period of up to 999 hours (over 41 days). To enable this function, proceed as follows:
- set r5=1; select rt;
- press SET to display for how many hours the minimum and maximum temperature have been recorded (if the function has just been enabled, rt=0);
- to start recording the temperatures again, press q for more than 5 seconds when displaying the hours (the message rES indicates that the value has been reset).

The instrument resets the number of hours and restarts the monitoring process;
- to display the maximum temperature measured by the probe, read the value associated with rH, while to display the minimum temperature measured by the probe, read the value associated with rL..

Important:
- after the maximum time of 999 hours, the monitoring of the minimum and maximum temperature continues, while the time value remains fixed at 999.
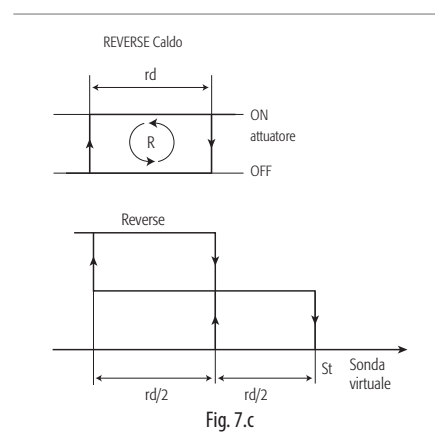

REVERSE Caldo

rd

R

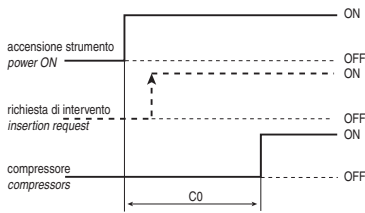ON attuatore

OFF

Reverse

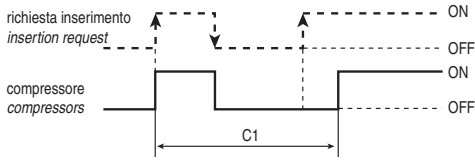St Sonda virtuale

rd/2   rd/2

Fig. 7.c

Fig. 7.d

Fig. 7.e
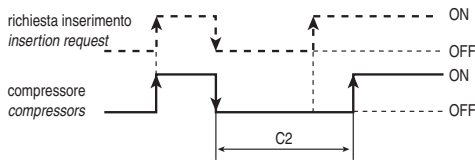
Fig. 7.f
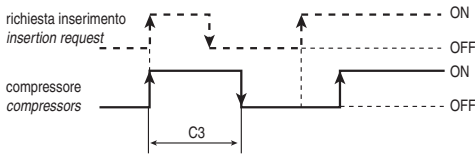

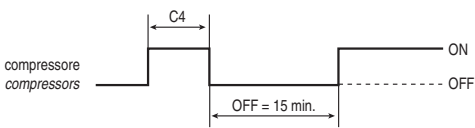Fig. 7.g

Fig. 7.h

7.3 Compressor management parameters

Code	Parametro	Models	U.M.	Type	Min	Max	Def.
c0	Compressor, fan and AUX start delay on power up in dead zone	–SYF	min	C	0	15	0
c1	Minimum time between successive starts	–SYF	min	C	0	15	0
c2	Minimum compressor OFF time	–SYF	min	C	0	15	0
c3	Minimum compressor ON time	–SYF	min	C	0	15	0
c4	Duty setting	–SYF	min	C	0	100	0
cc	Continuous cycle duration	–SYF	hours	C	0	15	0
c6	Alarm bypass after continuous cycle	–SYF	h/min	C	0	250	2
c7	Maximum pump down time	–SYF	s	C	0	900	0
c8	Comp. start delay after open PD valve	–SYF	s	C	0	60	5
c9	Enable autostart function in PD	–SYF	flag	C	0	1	0
c10	Select pump down by time or pressure	–SYF	flag	C	0	1	0
c11	Second compressor delay	–SYF	s	C	0	250	4

Tab. 7.d

c0: Compressor and fan start delay (if 'FAN' relay present) on start-up
When the controller is switched on, the compressor and the evaporator fans and the auxiliary relay in control with dead band (H1 or H5=11) start after a delay (in minutes) equal to the value set for this parameter, in order to protect the compressor against repeated power-ups in the event of frequent power drops. Default: c0=0 => no minimum delay is set.

Example: setting c0=6 forces the compressor to wait 6 minutes before starting from when power returns. In the event of systems with more than one compressor, the parameter c0 can also be used to avoid simultaneous starts of a series of units. Simply set a different value of c0 for each compressor. **Note:** the second compressor step, for the aux 1 or 2 output ('H1 or H5'=12, 13), is associated with the timers 'c0','c1','c2','c3'.

c1: Minimum time between two successive starts of the compressor
Sets the minimum time (in minutes) that must elapse between two starts of the compressor, irrespective of the temperature and the set point. Setting this parameter limits the number of starts per hour.
Default: c'=0 => no minimum time is set between two starts.
Example: if the maximum number of activations/hour allowed is 10, simply set c1=6 to ensure that this limit is respected. Note: the second compressor step, for the aux 1 or 2 output ('H1 or H5'=12, 13), is associated with the timers 'c0','c1','c2','c3'.

c2: Minimum compressor OFF time
SSets the minimum time (in minutes) for the compressor to remain OFF. The compressor is not started again until the minimum time selected (c2) has elapsed from when it last stopped.
Note: this parameter is useful to ensure the balancing of the pressure after the compressor stops for systems with hermetic and capillary compressors. The second compressor step, for the aux 1 or 2 output ('H1 or H5'=12, 13), is associated with the timers 'c0','c1','c2','c3'.

c3: Minimum compressor ON time
Sets the minimum running time for the compressor. The compressor is not stopped until it has been ON for at least the minimum time selected (c3). **Note:** the second compressor step, for the aux 1 or 2 output ('H1 or H5'=12, 13), is associated with the timers 'c0','c1','c2','c3'.
Default: c3=0 => no minimum running time is set.

c4: Duty setting
If the virtual control probe fault alarm occurs (see parameter '/4'), this parameter is used to ensure the operation of the compressor until the fault is resolved.
Default: c4=0 => compressor always Off in the event of a virtual control probe error.
Important: In the event of errors on probe 2, the virtual probe corresponds to the room probe (probe 1) and consequently the Duty Setting is not activated.
In practice, as the compressor is no longer able to operate based according to the temperature (due to the probe fault), it is made to run cyclically with an operating time (ON time) equal to the value assigned to parameter c4 (in minutes) and a fixed OFF time of 15 minutes.
There are two values of c4 that cause special behaviour:
c4=0, in the event of faults involving the virtual control probe, the compressor is always OFF;
c4=100, the compressor is always ON, that is, the 15 minute OFF time is always ignored.

Special situations:
- if the virtual control probe error occurs while the compressor is OFF, it remains OFF for 15 minutes, and is then started (respecting the times set for parameters c1 and c2) and remains ON for a time equal to c4, Duty Setting. This special operation is signalled by the LED that flashes during the compressor OFF period, and remains on steady when the compressor is operating. The fans continue to operate according the set parameters (see F parameters). If the duty setting requires the immediate shutdown of the compressor for a non-specified time (c4= 0), this is done without observing the compressor protection times.
- if the virtual control probe error occurs while the compressor is ON, it remains ON for the time c4, and then is stopped (without observing the minimum ON time, if set for parameter c3) and remains OFF for 15 minutes (the LED flashes in this phase). After this, cyclical operation starts, with an operating time equal to the value of c4.
Warning: If the virtual probe error disappears, the unit returns to normal operation.
Note: if control with two compressor steps is selected (with or without rotation, 'H1 or H5'= 12 or 13), the duty setting acts on both steps.

cc: Continuous cycle duration

This is the time (in hours) during which the compressor operates continuously to lower the temperature, even below the set point. With cc=0 => the continuous cycle is disabled. The controller exits the continuous cycle procedure after the time set for parameter cc has elapsed, or upon reaching the minimum specified temperature (see the minimum temperature alarm, parameter AL). Default: cc=0 (hours).

Note: if control with two compressor steps is selected (with or without rotation, 'H1 or H5'= 12 or 13), the continuous cycle acts on both steps

c6: Alarm bypass after continuous cycle

This is the time (in hours or minutes) for which the temperature alarm is deactivated after a continuous cycle. If the temperature of the refrigeration unit, after the continuous cycle, falls due by inertia below the minimum temperature (set point – AL), the activation of the low temp. alarm is delayed for the time c6.
Default: c6=2 (hours).
Warning: remember that at the minimum specified temperature (see the minimum temperature alarm, parameter AL) the continuous cycle is forced OFF and deactivated.
Parameter 'c6' may be expressed in hours 'dC1' = 0' (default) or minutes 'dC1'=1'.

c7: Maximum pump down time

This parameter determines, depending on the setting of parameter c10, the maximum time in minutes by which the circuit must reach the required low pressure value in pump down operation (c10=0), or the compressor operating time after the closing of the pump down valve in case of pump down operation by time (c10=1). The pump down valve must be connected to the auxiliary output, setting the relevant parameter (H1 or H5).

Pump down by pressure (c10=1):

When reaching the maximum pump down time, the compressor stops and the Pd alarm is activated, which disables the compressor autostart function (see parameter c9) with the pump down valve closed, on the "high pressure" request from the pressure switch. The compressor remains OFF until the controller requires cooling. When reaching the set point, a pump down procedure is run and the alarm is
automatically reset if the low pressure is reached within the time c7.
Low pressure is monitored by connecting the low pressure switch to one of the two digital inputs and setting the parameter A4, A5 or A9.

Pump down by time (c10=1):

When the compressor operating time c7 is reached after the closing of the valve, the compressor is stopped, irrespective of the low pressure reading, and the Pd alarm is deactivated. In any case, the compressor is stopped when reaching the low pressure.
In this case, autostart in pump down is disabled. Default: c7 =0 => pump down disabled.

c8 : Compressor start delay after opening of PD valve

This parameter determines after how many seconds from the opening of the pump down valve the compressor starts. It is useful to avoid activating the LP alarm unnecessarily.
The low pressure alarm (LP), with valve open and compressor ON, is activated by the opening of the pressure switch. This alarm stops the compressor and is reset automatically.
Starting from July 2007 parameter c8 has been set to 0 and is not visible in the controllers distributed. The function relating to c8 can still be used, however it must be stressed that in certain conditions, during the time c8 (alarm from digital input, probe alarm, on/off), the pump down valve may remain open.

c9: Enable autostart function with PD operation (active when C7=6)

If parameter c9 is set to 0, the system will perform a pump down cycle each time the pump down valve closes. If the parameter is set to 1, on the other hand, the system will perform a pump down cycle each time the pump down valve closes and on each successive request from the low pressure switch when there is no cooling requirement (autostart situation). The activation of a compressor autostart cycle in pump down is signalled by the message 'Ats'. This message is reset automatically on the next correct pump down cycle. The autostart function is disabled if Pd alarms are active or if pump down by time is selected.
Note: the autostart function is disabled in the off status and if the controller has been switched on but the compressor has not yet been activated (after the first activation of the compressor, the autostart function, if selected, will be always active).
Default: c9=0 => only one pump down cycle is run whenever the pump down valve is closed.

c10: Select pump down by pressure or by time

This parameter determines if the pump down procedure must end following the activation of the low pressure switch, or after a set time. In this case, after the valve closes, the compressor works for time c7 or until the low pressure value is reached. When this time has elapsed, the compressor is stopped, irrespective of the status of the low pressure input.
The Pd alarm (pump down ended by timeout) and the compressor autostart function in pump down are disabled
Default: c10=0 => pump down by pressure.

c11: Second compressor delay

This parameter determines the delay of the second compressor, compared to the main compressor, during start-up ('H1 or H5'=7). Vice-versa, the two compressors are stopped at the same time.
If two compressor steps have been selected ('H1'=12, 13), the parameter c11 represents the delay for the activation of the second step from the first.
Important: select the auxiliary output as a delayed compressor or second compressor step using parameter 'H1 or H5'. Default: c11=4 => 4 second delay.

7.4 Defrost management parameters

Code	Parameter	Model	UOM	Type	Min	Max	Def.
d0	Type of defrost	-SYF	flag	C	0	4	0
dI	Interval between defrosts	-SYF	hours	F	0	250	8
dt1	End defrost temperature, evaporator	-SYF	°C/°F	F	-50	200	4.0
dt2	End defrost temperature, aux evap.	-SYF	°C/°F	F	-50	200	4.0
dt3	End defrost temperature, evap. probe 3	-SYF	°C/°F	F	-50	200	4.0
dP1	Maximum defrost duration, evaporator	-SYF	min	F	1	250	30
dP2	Maximum defrost duration, aux evap.	-SYF	min	F	1	250	30
d3	Defrost start delay	-SYF	Min	C	0	250	0
d4	Enable defrost on start-up	-SYF	flag	C	0	1	0
d5	Defrost delay on start-up	-SYF	min	C	0	250	0
d6	Display on hold during defrost	-SYF	-	C	0	2	1
dd	Dripping time after defrost	-SYF	min	F	0	15	2
d8	Alarm bypass after defrost	-SYF	hours	F	0	15	1
d8d	Alarm bypass after door open	-SYF	h/min	C	0	250	0
d9	Defrost priority over compressor protectors	-SYF	flag	C	0	1	0
d/1	Display of defrost probe 1	MSYF	°C/°F	F	-	-	-
d/2	Display of defrost probe 2	MSYF	°C/°F	F	-	-	-
dC	Time base for defrost	-SYF	flag	C	0	1	0
dC1	Time base for alarm delay 'c6' and 'd8'	-SYF	flag	C	0	1	0
d10	Compressor running time	-SYF	hours	C	0	250	0
d11	Running time temperature threshold	-SYF	°C/°F	C	-20	20	1.0
d12	Advanced defrost	-SYF	-	C	0	3	0
dn	Nominal defrost duration	-SYF	-	C	1	100	65
dH	Proportional factor, variation in dl	-SYF	-	C	0	100	50

Tab. 7.e

Important warning: afor the set times to become immediately operational, the instrument needs to be turned off and on again. If this operation is not carried out, timing resumes operation the next time it is used.

d0: Type of defrost
For the instruments fitted with defrost relays:
- d0=0 electric heater defrost by temperature;
- d0=1 hot gas defrost by temperature;
- d0=2 electric heater defrost by time, Ed1 and Ed2 not displayed;
- d0=3 hot gas defrost by time, Ed1 and Ed2 not displayed.
- d0=4 eletrical heater temperature defrost by time, Ed1 and Ed2 not displayed.

Defrosts can be performed for all models:
- by temperature, using the defrost probe fitted on the evaporator. In any case, the defrost will be stopped after a maximum set safety time (dP1 and dP2). The warnings Ed1 and Ed2, "end defrost due to maximum duration" (parameter 'A8') can be disabled;
- by time: without the defrost probe;
- by time with temperature control: based on the evaporator temperature, the function is similar to the mode where d0=0. Once the temperatures dt1 and dt2 have been reached, the controller deactivates the defrost output and then reactivates it if the related evaporator probes measure a temperature below dt1 and dt2 -1°C. This occurs for the entire duration of the defrost set using the parameter dP.

Note:
- model S does not have a defrost relay, and consequently the defrost can only be performed by stopping the compressor and selecting end of defrost by time or temperature. If the alarms Ed1 and Ed2 are not disabled, when activated, they can be cancelled by pressing PRG and ▲ together for more than 5 seconds. In any case, the signals Ed1 and Ed2 are reset automatically at the start of the next defrost operation.
- if control with two compressor steps is selected (with or without rotation, H1 or H5= 12 or 13) the defrost is performed acting on both steps.

Default: d0=0 => electric heater defrost by temperature.

dl: Interval between defrosts
The defrosts are performed cyclically at an interval equal to the value of dl in hours (or minutes, see parameter dC), counted from the end of the previous defrost. The duration of the defrost therefore does not therefore affect the interval between defrosts. The interval dl is also maintained when the unit is OFF. If the interval dl expires when the controller is OFF, when it is started again a defrost is performed.

If dl =0 => the defrost is never performed except when forced from the keypad (manual defrost), from the supervisor or from the digital input (see parameter A4, A5, A9), or from the Real Time Clock.

Important: PTo ensure regular defrosts, the interval between defrosts must be greater than the maximum defrost duration, plus the dripping time and post-dripping time.

Note: during the defrost, the temperature alarms are disabled.
Default: dl =8 hours.

dt1: evaporator end defrost temperature set point
This parameter is used to set the end defrost temperature, measured on the evaporator. In any case, the maximum defrost duration is equal to the value, in minutes, set for parameter dP1.
- if when a defrost is requested, the temperature measured by the defrost probe on the evaporator is greater than the value set for the end defrost, the cycle is not performed (including the dripping and post-dripping phases). The same is true for the defrost on start-up, from digital contact, from RTC and from the keypad;
- if the defrost probe on the evaporator is faulty or disabled, the controller performs a timed defrost, with a duration equal to the value set for parameter dP1;
- if the end defrost set point is not reached within the time set for parameter dP1, the defrost is stopped. If enabled (parameter A8), the error signal Ed1 is displayed, which persists until the start of the next defrost cycle.

In the defrost by temperature, the parameter establishes the threshold for activating or deactivating the corresponding defrost relay.
Default: dt1=4°C.

dt2: end defrost temperature set point, auxiliary evaporator
dt2 acts in the same way as parameter dt1 described above, but referring to the auxiliary evaporator.
Note for dt1 and dt2: in the defrost by temperature, the parameter establishes the threshold for activating or deactivating the corresponding defrost relay.
Default: dt2 =4°C.

dP1: Maximum evaporator defrost duration
Determines the maximum defrost duration on the evaporator in minutes (or seconds, see parameter dC) if defrost by temperature is selected. If timed defrost has been selected, this is the actual duration of the defrost. Default: dP1=30 minutes.

dP2: Maximum defrost duration, auxiliary evaporator
As for parameter dP1 described above, but refers to the auxiliary evaporator.
Default: dP2=30 minutes.

d3: Defrost start delay
This parameter determines the time that must elapse, when the defrost is activated, between the
stopping of the compressor (electric heater defrost) or the starting of the compressor (hot gas defrost), and the activation of the defrost relays on the main and auxiliary evaporators.
The delay d3 is useful, in the hot gas defrost, to ensure a sufficient quantity of hot gas for the defrost before the activation of the cycle reversing valve, in very special applications (see paragraph "Description of software functions"). Default: d3=0 minutes.

d4: Defrost when the instrument is switched on
Activates a defrost when the instrument is switched on.
Warning: this request has priority over the activation of the compressor and the continuous cycle.
The possible values are:
d4=0, no defrost is performed when the instrument is switched on;
d4=1, a defrost is performed when the instrument is switched on.
Starting a defrost when the instrument is switched on may be useful in special situations.

Example: frequent power drops occur in the system, which cause the internal clock to be reset. This clock calculates the interval between two defrosting operations, restarting from zero. If the frequency of the power failure were, in an extreme case, greater than the defrost frequency (e.g. a power failure every hour, against a defrost every 10 hours) the controller would never perform a defrost. In a situation of this type, it is preferable to enable defrost on start-up, above all if the defrost is controlled by temperature (probe on the evaporator), therefore avoiding unnecessary defrosts or at least reducing the running times. In the case of systems with a large number of units, if selecting defrosts at start-up, after a power failure all the units will start defrosting, thus causing a voltage overload. To overcome this, the parameter d5 can be used. It adds a delay before the defrost, and this delay must obviously be different for each unit.
Default: d4=0 the instrument does not perform a defrost on start-up.
Available on all models except for IR33M.

d5: Defrost delay when the instrument is switched on or from multifunction input
The time that must elapse between start-up of the controller and the start of the defrost.
• if the digital input is used to enable the defrost (see parameter A4, A5, A9=3) or to start a defrost from external contact (see parameter A4, A5, A9=4), the parameter d5 refers to the delay between enabling of the defrost or request to enable, and the effective start.
• the defrost digital input (see parameter A4, A5, A9) can be usefully employed to perform defrosts in real time, connecting a timer to the input. The defrost will be activated when the timer contact closes.
• If several units are connected to the same timer, parameter d5 should be used to delay the various defrosts, thus avoiding power overloads.
  In addition, to avoid unwanted defrosts started by the clock inside the instrument, set parameter dI=0 (manual defrosts only, started from the keypad, by the RTC, by the calculation of the compressor running time or by the multifunction contact).
Important warning: when connecting a series of units to the same timer, the best solution is to insulate all the contacts galvanically, fitting intermediate relays for each contact.
Default: d5=0 => no delayed defrost when switching the instrument on or following the activation of the multifunction input.

d6: Display during defrost

Specified values:
- d6=0 => during the defrost the instrument displays the text dEF alternating with the value read by the probe selected using parameter /tl. This is to signal that any high temperature values are due to the defrost procedure in progress.
- d6=1 => during the defrost the last temperature shown before the start of the cycle remains on the display. The display returns to normal when the control temperature reaches the set point, the temperature to be displayed is less than the value locked on the display or, in any case, after the time set for the "alarm bypass after defrosting" (d8).
- d6=2 => during the defrost the instrument displays the text dEF steady on the display.

Note: in OFF and REVERSE modes, the display is unlocked after the defrost.

Default: d6=1 => during the defrost the last temperature read before the start of the cycle remains on the display, both on the built-in terminal and on the remote terminal.

dd: Dripping time

This parameter is used to stop (in minutes) the compressor and the evaporator fans after a defrost to facilitate evaporator dripping. If dd=0 => there is no dripping time, therefore, at the end of the defrost the control functions start immediately. Default: dd=2 minutes.

Note: if control with two compressor steps is selected (with or without rotation, H1 or H5= 12 or 13) the dripping acts on both steps.

d8: Alarm bypass time after defrost and/or door open

Indicates the time (in hours or minutes) that the high temperature alarm signal is ignored from after the end of a defrost cycle or from when the door to the cold room is opened, if the Multifunction input is connected to the "door switch" (see parameters A4, A5 and A9).

Important: parameter 'd8' can be expressed in hours 'dC1'=0 (default) or minutes 'dC1'=1.

Parameter dC1 is masked and consequently not visible.

Default: d8 =1 hour bypass.

d8d: Open door alarm delay.

This indicates the delay to signal that the door is open, if the multifunction input is connected to the "door switch" (see parameter 'A4', 'A5' or 'A9'). If 'd8d'= 0, parameter 'd8d' is disabled and the open door alarm delay returns to 'd8'. Default: 'd8d'=0 disabled.

d9: Defrost priority over compressor protective devices

Ignores the compressor protection times at the start of the defrost. Compressor protection times:
- c1: minimum time between 2 successive starts;
- c2: minimum OFF time;
- c3: minimum operating time.

d9 = 0 the protection times are respected

d9 = 1 the protection times are not respected. Therefore, defrost has higher priority and the compressor times are ignored.

In the hot gas defrost, this is useful to avoid delaying the start of the defrost if the compressor has just stopped and there is a minimum time between two starts of the compressor. Remember, however, that in this event the maximum number of compressor starts per hour may not necessarily be respected.

⚠️ **Warning:** if the defrost requires the activation of the compressor (hot gas defrost) and parameter d9=1, the compressor may risk being damaged due to an excessive number of close starts.

Default: d9=0 => the defrost respects the compressor times (however by default these are set to zero).

d/1: Defrost probe 1 reading

This parameter is used to display the value measured by defrost probe 1 (on the instruments where this is fitted), by pressing SET. If defrost probe 1 is disabled, three horizontal dashes '_ _ _' will be displayed.

d/2: Defrost probe 2 reading

As for parameter d/1 described above, but refers to defrost probe 2.

dC: Time base

Used to modify the measurement unit used to count the times set for parameters dI (defrost interval), dP1 and dP2 (defrost duration).

dC=0 =>dI expressed in hours, dP1 and dP2 in minutes.

dC=1 =>dI expressed in minutes, dP1 and dP2 in seconds.

The parameter dC=1 can be used to test defrost operation at shorter times. In addition, it is useful for using the instrument to manage air driers. The defrost cycle then becomes the condensate discharge cycle, which must be performed at close intervals (minutes) and for short durations (seconds).

Default: dC=0 =>dI expressed in hours, dP1 and dP2 in minutes.

d10: Compressor running time

This parameter indicates the compressor operating time in hours, with the temperature below the threshold indicated by the parameter d11, after which a defrost request is generated. Setting d10=0 disables the function.

Note: if control with two compressor steps is selected (with or without rotation, H1 or H5= 12 or 13) the compressor running time is only calculated on the first step.

Default: d10=0 => Function disabled.

d11: Running time temperature threshold

This parameter indicates the evaporation temperature below which the compressor must continue to operate for the time d10 in order to generate a defrost request. Default: d11 =1 => 1°C.

d12: Advanced auto-adapting defrosts

This parameter is used to enable and disable the advanced defrost function, as per the following table:

d12	Skip defrost	Automatic variation of dl
0	Disabled	Disabled
1	Disabled	Enabled
2	Enabled	Disabled
3	Enabled	Enabled

Tab. 7.f

Default: d12 =0 => Both the functions are disabled.

dn: Nominal defrost duration

This indicates the average duration of the defrost in normal operating conditions. It is expressed as a percentage, with reference to parameters dP1 and dP2, according to the following formulae:

$$dn1 = \frac{dn}{100} dP1 \quad \text{and} \quad dn2 = \frac{dn}{100} dP2$$

Example: with dn=65, dP1=90 min. and dP2=120 min.
Nominal defrost duration on main evaporator: 59 min.
Nominal defrost duration on auxiliary evaporator: 78 min.
Default: dn=65 => 65% of dP1 or dP2

dH: Proportional factor in the variation of the defrost interval

This parameter is used to increase or decrease the influence of the effective duration of the defrost, in relation to the nominal duration, in the algorithm that manages the automatic variation of the defrost interval. By setting dH=0, the effective duration has no influence on the duration of the defrost interval. Vice versa, dH = 100 achieves maximum efficiency. Default: dH=50

7.5 Alarm management parameters

⚠️

Code	Parameter	Model	UOM	Type	Min	Max	Def.
A0	Alarm and fan differential	MSYF	°C/°F	C	0.1	20	2.0
A1	Type of threshold AL and AH	MSYF	flag	C	0	1	0
AL	Low temperature alarm threshold	MSYF	°C/°F	F	-50	200	0.0
AH	High temperature alarm threshold	MSYF	°C/°F	F	-50	200	0.0
Ad	Low and high temperature signal delay	MSYF	min	F	0	250	120
A4	Digital input 1 configuration (DI1)	-SYF	-	C	0	14	0
		M---	-	C	0	14	3
A5	Digital input 2 configuration (DI2)	MSYF	-	C	0	14	0
A6	Stop compressor from external alarm	-SYF	min	C	0	100	0
A7	External alarm detection delay	-SYF	min	C	0	250	0
A8	Enable alarms Ed1 and Ed2	-SYF	flag	C	0	1	0
A9	Digital input 3 configuration (DI3)		-	C	0	14	0
Ado	Light management mode with door switch	MSYF	flag	C	0	1	0
Ac	High condenser temperature alarm	-SYF	°C/°F	C	0.0	200	70.0
AE	High condenser temperature alarm differential	-SYF	°C/°F	C	0.1	20	5.0
Acd	High condenser temperature alarm delay	-SYF	min	C	0	250	0
AF	Light sensor OFF time	-SYF	sec	C	0	250	0
ALF	Antifreeze alarm threshold	MSYF	°C/°F	C	-50	200	-5.0
AdF	Antifreeze alarm delay	MSYF	min	C	0	15	1

Tab. 7.g

Note: par. A9 refers to the instruments with 3 digital inputs (ir33DIN, powercompact and MasterCella).

Important warning: for the set times to become immediately operational, the instrument needs to be turned off and on again. If this operation is not carried out, timing resumes operation the next time it is used.

A0: Alarm and fan differential

This is the differential used for disabling high and low temperature alarms (AL and AH - see Figure 7.i) and for managing the fans (see the F parameters). In the event of an alarm, as can be seen from the figure, the value of A0 in part determines the effective activation points of the temperature alarms. Default: A0=2.0 degrees.

A1: Type of threshold AL and AH

Used to select whether the values of parameters AL and AH are considered absolute thresholds or relative to the value of the set point.
A1 = 0 => AL and AH are considered as relative thresholds.
A1 = 1 => AL and AH are considered absolute thresholds.
Default: A1 = 0 => AL and AH are considered relative thresholds.

AL : Minimum temperature alarm

This is used to determine the activation threshold for the low temperature alarm.
Relative threshold for low temperature alarm = (set point) - (value of AL)
AL=0 => Alarm disabled;
Absolute threshold for low temperature alarm = value of AL.
AL=-50 => Alarm disabled.
Important: If the threshold AL is selected as relative, the value for disabling the alarm is 0, while if selected as absolute, the alarm disabling value is -50.

Warnings for the relative threshold:

The value of AL does not indicate the actual alarm temperature, but the maximum permissible deviation from the set point; changing the set point automatically changes the low temperature alarm, while the maximum deviation allowed (=AL) remains fixed.
Note: the low temperature alarm features automatic reset (this means that if the temperature returns above the minimum value set, the alarm signal is cancelled automatically).
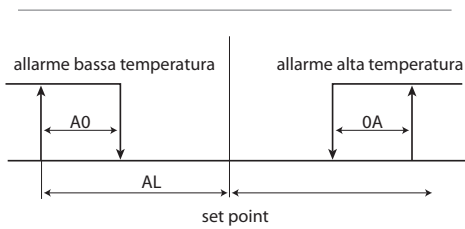
allarme bassa temperatura   allarme alta temperatura

A0

0A

AL

set point

Fig. 7.i

Warnings for using the continuous cycle
The low temperature alarm is also used in the continuous cycle (see the description of parameter cc'.
In fact, if the temperature falls to the alarm level, the continuous cycle is stopped automatically, even if the selected time has not yet elapsed. This deactivation, however, does not involve an alarm signal.
Default: AL =0 => low temperature alarm disabled.
Note: for the control probe alarm, the low temperature alarm is reset and monitoring reinitialised.

AH: High temperature alarm
This is used to determine the activation threshold for the high temperature alarm.
Relative threshold for high temperature alarm = (set point) + (value of AH)
AH=0 => Alarm disabled;
Absolute threshold for high temperature alarm = value of AH.
AH=200 => Alarm disabled.
Important: if the threshold AH is selected as relative, the value for disabling the alarm is 0, while if selected as absolute, the alarm disabling value is 200.
Warnings for the relative threshold:
• the value of AH does not indicate the alarm temperature, but the maximum permissible deviation from the set point; consequently, changing the set point automatically changes the high temperature alarm, while the maximum deviation allowed (=AH) remains fixed.
Warnings:
• the high temperature alarm has automatic reset: this means that if the temperature returns above/below the minimum value envisaged, the alarm signal is cancelled automatically
• in the event of a control probe alarm, the high temperature alarm is reset and monitoring reinitialised.
Default: AH=0 => high temperature alarm disabled.

Ad: Temperature alarm delay
Indicates after how many minutes the temperature alarm is signalled when the temperature threshold is exceeded.
Warnings:
• Setting a delay for signalling the temperature alarm may help eliminate false alarms due to interference on the probe signal or brief situations (for example, the door to the cold room opened for a short period);
• no temperature alarms are generated during the defrost and continuous cycle procedures;
• the temperature alarm is delayed by the time d8 after the defrost and by the time c6 after the continuous cycle. At the end of these two times, the temperature alarm, if detected, is signalled without waiting for the time set for Ad. If d8 and c6 are set to zero, the temperature alarm is signalled after the time Ad;
• as already indicated by the default value for parameters AL and AH, the instruments are programmed in the factory with the relevant thresholds, and the high and low temperature alarms are disabled. The alarms, when enabled, activate the buzzer, if enabled, and show a code on the display: HI for the high temperature and LO for the low temperature alarm.
The following conditions generate the temperature alarms:
• high temperature alarm: the temperature measured by the virtual control probe is above the threshold set for parameter AH;
• low temperature alarm: the temperature measured by the virtual control probe is below the threshold set for parameter AL.
Default: Ad=120 => 120 minute delay for the temperature alarms.

A4: Multifunction digital input configuration
In the ir33 series, this parameter and the model of controller used define the meaning of the multifunction digital input.
The possibilities are described below:
A4=0 Input not active: the multifunction digital input is not used and is the factory-specified configuration for all versions.
A4=1 Immediate external alarm: the digital input can be connected to an external alarm that requires immediate activation (for example, high pressure alarm or compressor thermal overload). Specifically, the alarm is detected when the contact opens (normal operation with contact closed). The activation of the alarm:
• shows the message on the display (IA);
• activates the buzzer, if enabled;
• activates the alarm relay, if selected;
• involves the following actions on the actuators:
  - compressor: operates depending on the values assigned to parameter A6 (stop compressor from external alarm).
  - fans: continue to operate according to the fan parameters (F).
When stopping the compressor, the minimum ON time (c3) is ignored. When the alarm stops, the defrost and continuous cycle can be performed again, and the compressor returns to normal operation.

Important warning: remember that in order to ensure the safety of the unit in the event of serious alarms, all the electromechanical safety devices required to guarantee correct operation must be fitted on the unit.

Note:
• if more than one digital input is configured as the immediate alarm, the alarm will be generated when at least one of the inputs is open.
• if control with two compressor steps is selected (with or without rotation, H1, H5 = 12 or 13) the immediate external alarm acts on both steps.

A4=2 Delayed external alarm
The delayed external alarm is equivalent to the immediate external alarm (A4=1), except that this alarm is signalled after the time A7 from when it is detected ('dA' signal). This configuration is especially useful for managing the low pressure alarm. In fact, when starting for the first time, the unit often detects a low pressure alarm due to the environmental conditions rather than the malfunctioning of the unit.
Setting a delay for the alarm will avoid false signals. In fact, by suitably calculating the delay, if the low pressure is due to environmental conditions (low temperature), the alarm will be automatically reset before the delay has elapsed.
Note:
• if 'A7'=0, the activation of the alarm does not cause the compressor to operate according to the values assigned to the parameter 'A6' (stop compressor from external alarm); on the other hand, the 'dA' signal is displayed, the icon flashes, the buzzer and the alarm relay (if selected) are activated;

the delayed external alarm is thus signal-only.

- both the immediate and delayed external alarm have automatic reset;
- if more than one digital input is configured as the delayed alarm, the alarm will be generated when at least one of the inputs is open;
- if control with two compressor steps is selected (with or without rotation, H1, H5 = 12 or 13) the delayed external alarm acts on both steps.

A4 =3 The meaning varies according to the model used
Version ir33M = probe selection
This is used to exploit the digital input in order to show, on the display, the probe selected by parameter /tl or the first enabled probe (see parameters /A2, /A3, /A4, /A5). In practice, if the contact is open, the probe selected by parameter /tl is shown, whereas, if the contact is closed, the first enabled probe is shown.

For all other models = Defrost enabling
An external contact can be connected to the multifunction input to enable or inhibit the defrost.
- Contact open: the defrost is inhibited. Contact closed: the defrost is enabled.
- Contact closed without request from the controller: the defrost is not performed.
- Contact closed and defrost in progress: when the digital input is opened, the defrost is immediately stopped and the unit restarts normal operation (without performing the dripping or post-dripping phases). The LED starts flashing to indicate that the defrost request is pending, awaiting the next enabling signal (closing of the contact), when the defrost will be performed completely.
Suggestion: this function is useful in the following situations, for example:
- multiplexed showcases with hot gas defrost. In these systems, defrosts must be performed by "islands", and therefore, at any one time, some islands are enabled to be defrosted, while others are disabled;
- to prevent defrosts on the units accessible by the public during opening times. Any defrost request arriving when the contact is open will remain pending until the contact closes.

A4 = 4 Start defrost from external contact
This function used to start the defrost from an external contact.
If dI=0 and no defrost enabling signal related to the clock is set, the defrost can only be performed on start-up, from the digital input, by the supervisor and from the keypad. This function is useful to run real time defrosts. To perform the defrosts, connect a cyclical, mechanical or electronic timer to the digital input: When the contact on the timer closes, the defrost request is sent. As seen in the description of parameter d5, a series of units can be connected to the same timer.
Important warning for versions operating on 12Vac and 12-24Vac
When connecting a series of units to the same timer, the best solution is to insulate all the contacts galvanically, inserting an intermediate relay for each contact. Setting a different value for d5 on each unit will avoid simultaneous defrosts.
Note: if more than one digital input is configured to enable the defrost, the defrost will be disabled when at least one of the inputs is closed.

A4 = 5 Door switch with compressor and fan stop
Setting A4=5 manages the cold room door switch. The behaviour of the door switch depends on whether the door is opened with the light OFF or light ON. The need to differentiate the two operating modes is mainly designed for controlling display cases and cold rooms.
Case 1 - door opened with light OFF:
If the door is opened with the light OFF:
- the compressor and evaporator fans are switched off (to stop the fans only, set parameter A4=9);
- in the models fitted with an auxiliary relay programmed as the light output, the light is switched on;
- the reading displayed and the icon flash;
- the temperature alarms are disabled.
If the door remains open for longer than time d8, the controller restarts normal operation:
- compressor and fan ON, if requested;
- light ON (the auxiliary relay is selected as the light);
- the buzzer and the alarm relay are activated;
- the temperature alarms are enabled;
- the reading flashes.
To stop the reading from flashing, close the door. When the door is closed, the controller returns to normal operation, switching off the light and enabling the temperature alarm after the delay time d8. The compressor is re-started observing any protection times selected (see the C parameters).

Case 2: door opened with light ON:
SAssuming the user enters the cold room, turning on the light before entering, closing the door behind him, and then exits the room, closing the door a second time. When the door is opened:
- the compressor the evaporator fans are switched off (to stop the fans only, set parameter A4=9);
- the light stays on (only in the models fitted with an auxiliary relay programmed as the light output);
- the reading displayed and the icon flash;
- the temperature alarms are disabled
When the door is closed the first time, the controller maintains the previous situation. When the door is closed the second time, the controller returns to normal operation, switching off the light and enabling the temperature alarm after the delay time d8. The compressor is re-started, observing any protection times selected (see the C parameters).
If the door remains open for a time longer than d8, the controller returns to normal operation:
- compressor and fan ON, if requested;
- light OFF;
- the reading flashes;
- the buzzer and the alarm relay are activated;
- the temperature alarms are enabled;
- when the door closes the temperature alarm delay d8 is not set.
If, after being closed for the first time, the door remains closed for longer than time d8, or if the light is switched off manually, the controller restarts normal operation:
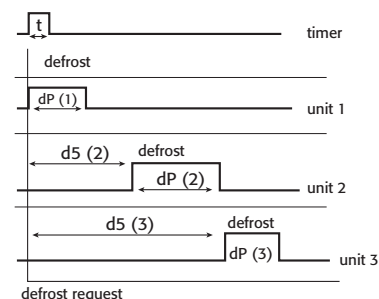- compressor and fan ON, if requested;

Fig. 7.l

Key:
t=   impulse from the timer to start the defrost: the minimum duration must be 0.5 s.
dP (1)=   maximum defrost duration on unit 1.
dP(2)=   defrost delay from external contact for unit 2, higher than dP(1) to prevent overlapping defrosts. Same for d5(3) and dP(3).

- light OFF;
- the temperature alarms are enabled;
- the temperature alarm delay d8 is set.

If after the door is first closed the light is switched off manually, the controller resumes normal operation.

Note:

1. if the light was previously switched on manually, when the door is closed for the second time, it is automatically switched off;
2. if more than one digital input is configured as the door switch, the door open status will be considered when at least one of the inputs is open;
3. if control with two compressor steps is selected (with or without rotation, H1, H5 = 12 or 13), opening the door deactivates both steps.

Warning: even when the fan is managed by the fan controller (see the F parameters), the fans are forced to stop when the door is open. This algorithm resolves any problems relating to faults or malfunctions of the "door switch".

A4 =6 Remote ON/OFF

The digital input can also be programmed as a remote ON/OFF switch. When the contact is closed, the controller is ON.

When the controller is OFF:

- the temperature is displayed alternating with the message OFF;
- the internal timer for parameter dl is updated. If dl expires when the unit is OFF, a defrost is performed when the unit is switched on again;
- the auxiliary relay set as AUX or LIGHT remains active;
- the buzzer and the alarm relay are de-activated;
- the controller does not perform the control functions, defrosts, continuous cycle, signal the temperature alarms and all other functions;
- the compressor protection times are observed;
- when the instrument is switched back on, all the functions are re-activated, with the exception of defrost on start-up, compressor and fan delay on start-up.

Contact closed => ON.

The ON/OFF from external digital input has priority over the keypad and the supervisor.

If A4, A5, A9=6, the controller is ON with all the contacts closed

Note:

- if more than one digital input is configured as the remote ON/OFF, the OFF status occurs when at least one of the inputs is open;
- if control with two compressor steps is selected (with or without rotation, H1, H5 = 12 or 13), the OFF status deactivates both steps.

A4 =7 Curtain switch

If the input is selected as a curtain switch, the controller modifies the set point when the contact closes, adding the value of parameter r4; the new value is then used for all the functions relating to the set point (e.g. relative high and low temperature alarms, control with dead band, control with two compressor steps, etc.).

When r4=3.0 (default value), the set point is increased by 3 degrees from the value used when the curtain is open.

Contact closed => curtain lowered.

If one of the auxiliary outputs is used to manage the light, lowering the curtain automatically switches the light off, while raising it switches the light on.

Note: if more than one digital input is configured as a curtain switch, the curtain open status occurs when at least one of the inputs is open.

A4 = 8 Low pressure switch input for pump down

The low pressure alarm LP is signalled when the pressure switch signals a low pressure situation with the pump down valve open and the compressor on, if the pump down function is active, or when the compressor is on. The low pressure alarm signal is nonetheless delayed by the time in minutes set for parameter A7.

The low pressure alarm 'LP' door stops the compressor. This parameter, together with parameters c7, c8, c9, H1 and H5, allows management of the pump down algorithm.

Note: if control with two compressor steps is selected (with or without rotation, H1, H5 = 12 or 13), the low pressure alarm deactivates both steps.

Contact open => low pressure.

Important: If c7=0 (pump down disabled), the low pressure situation can still be detected. If more than one digital input is configured as the low pressure switch input, the low pressure alarm is activated when at least one of the inputs is open.

A4 =9 Door switch with fan stop only

Same as for option A4=5, with the difference being that when opening the door, only the fans are stopped, rather than the compressor and the fans.

Note: if more than one digital input is configured as the door switch, the door open status occurs when at least one of the inputs is open.

A4=10 Direct/Reverse operation

The digital input is used to select direct operation (cooling), contact open, or reverse operation (for heating), contact closed. For example, a switch can be connected t select heating or cooling operation.

Depending on the value of parameter r3, the following configurations are possible:

when r3=0   Contact open = direct operation with defrost control;

Contact closed = reverse operation.

When r3 =1 or r3 =2;   Contact open = direct operation;

Contact closed = reverse operation.

WARNING: if A4=10, the status of the digital input has priority over the parameter r3, that is, the value assigned to parameter r3 is ignored and only the status (open or closed) of the digital input is considered.

Note:

1. if more than one digital input is configured as direct/reverse, the direct status occurs when at least one of the inputs is open;
2. the status of digital input selected as direct and reverse has priority over the operating mode set using parameter 'r3';
3. if control with two compressor steps is selected (with or without rotation, H1, H5 = 12 or 13), the DIRECT or REVERSE status alarm acts on both steps.

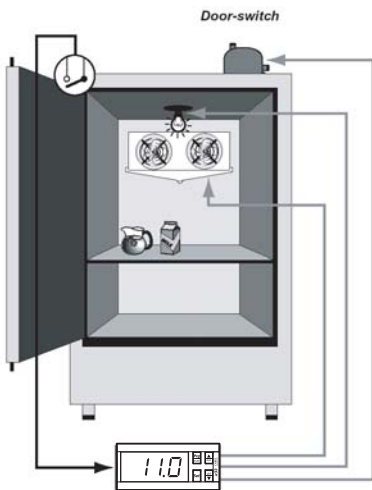### A4 =11 Light sensor

Door-switch

Fig. 7.m

The digital input is used to read a light sensor (actually an analogue input, from which a digital signal is taken using the parameter or threshold of the light sensor). The light sensor may be located:
• in the door stop,
• inside the cold room or cabinet.

In the first case, , the sensor signals the opening and the closing of the door, because, with the door open, light is signalled, and with the door closed, darkness is signalled (the sensor is located in the door stop and thus will be shadowed when the door is closed). The inside light will be automatically switched on when the door is open and switched off when the door is closed. The light stays OFF for a minimum time of 5 seconds, to avoid rapid, successive impulses of the light relay.
To select this operating mode, set AF=0.

In the second case, the light sensor signals the opening of the door of the cold room or the cabinet due to the outside light that the sensor detects, thus activating the inside light. The closing of the door is measured by time, as the light inside the cold room or cabinet will illuminate the sensor. After time AF (greater than 0), the inside light is switched off for 5 seconds. If the light sensor signals darkness, the door must be closed and the light will therefore remain OFF. Otherwise, the door is still considered open and the light is switched on again. To select this operating mode, set AF>0.

A4 =12 Activation of the AUX output

The digital input is used to activate/deactivate the AUX output, if configured with parameter H1 or H5, with the following logic:

Digital input	AUX output
open	deactivation
close	activation

Tab. 7.h

The output is activated/deactivated on closing/opening the contact, to make this operating mode compatible with the presence of the AUX button and the control signal from the supervisor.
Note: if more than one digital input is configured as AUX, the open status occurs when at least one of the inputs switches to open status.

A4 =13 Door switch with compressor and fans off and light not managed.

Same as for A4=5, with the difference that the light output is not modified.
Note:
1. the door management algorithm depends on the parameter 'Ado'.
2. if more than one digital input is configured as the door switch, the door open status will be considered when at least one of the inputs is open.

A4 =14 Door switch with fans only off and light not managed.

Same as for A4=9, with the difference that the light output is not modified.
Note: for A4/5= 13 or 14: the Ado door management algorithm is used in both cases.
Default: A4=0 => Digital input not active (for all other models).
The table below summarises the functions of the digital input corresponding to the value assigned to the variable A4.

Value of A4	Function	Function active	LED on
0	input not active		
1	immediate external alarm	open = alarm	open
2	delayed external alarm	open = alarm	open
3	for model M, select probes	open = probe selected by parameter /tl closed = first probe enabled	
3	other models, enable defrost	closed= enabled	
4	start defrost	closing = defrost request	
5	door switch with compressor and fans OFF	open = door open	
6	remote ON/OFF	open = instrument off	
7	curtain switch	closed = curtain closed	
8	low pressure switch	open = low pressure	
9	door switch with fans OFF only	open = door open	
10	direct / reverse	open = direct	
11	light sensor	above the threshold = off	
12	activation of AUX output	open = deactivation	
13	door switch with compressor and fans off, light not managed	open = door open	
14	door switch with fans only off, light not managed	open = door open	

Tab. 7.h

Note:
• if more than one digital input is configured in the same way, the activation of the associated function will be enabled if at least one of these is open.
• for control with two compressor steps (with or without rotation, H1=12 or 13) the function associated with the digital inputs is activated on both.

A5: Configuration of the second multifunction digital input.

For this parameter the same description relating to parameter A4 is valid, obviously referring to the second digital input. Default:
A5=0 => Digital input not active.

A6: Stop compressor from external alarm (multifunction input)

The meaning of this parameter is similar to that of parameter c4 (duty setting).
If an external alarm occurs (immediate or delayed), the compressor works for a time equal to the value set for parameter A6 (in minutes), while it remains OFF for a fixed period of 15 minutes.

Special cases:
A6=0 the compressor is always OFF;
A6=100 the compressor is always ON.

The fans continue to be managed according to the set parameters (see category F). If duty setting for the probe alarm (parameter c4) is also active, the controller uses the value of A6.

Note: if control with two compressor steps is selected (with or without rotation, H1, H5 = 12 or 13), the stop compressor acts on both steps.

Default: A6=0 => compressor OFF in the event of external alarms.

A7: Delay in detecting the external alarm (multifunction input)

Establishes the delay (in minutes) in detecting an external alarm, if selected as a delayed external alarm (A4, A5=2) or the signal of the low pressure (LP) alarm).

Note: if A7= 0, in the event of delayed alarms from digital input (A4 or A5 or A9= 2), the controller does not act on the control outputs.

A8: Enable signals Ed1 and Ed2

The alarms Ed1 and Ed2 signal the end of the defrost due to maximum duration of the defrost time dP1/dP2 and can be disabled by setting A8=0. The warnings Ed1 and Ed2, if enabled, are cancelled at the start of the following defrost or can be reset manually by pressing the **PRG** ▲ and AUX buttons for more than 5 seconds. Default: A8=0 => warnings Ed1 and Ed2 disabled.

Ac: Condenser high temperature alarm

If a probe is set as the condenser probe, the condenser temperature can be monitored to signal the high temperature alarm, probably due to obstruction or fouling. If the condenser temperature is > Ac+ (AE/2), the pre-alarm is signalled, displaying the alarm message cht. If in the pre-alarm situation, the condenser temperature falls to < Ac, the pre-alarm is reset and the signal cht is cancelled. If the condenser temperature increases to > Ac + AE, the alarm CHt is activated and the compressor is stopped. This alarm is delayed by the time Acd, from when the alarm threshold AC is exceeded. The alarm can only be reset manually. In the event of a condenser probe fault, the alarm and pre-alarm are activated.

Note: if control with two compressor steps is selected (with or without rotation, H1= 12 or 13) the high condenser temperature alarm acts on both steps.

Important:

1. if no condenser probe is selected, the condensing temperature alarm and pre-alarm are disabled.

2. the condenser fans can be controlled in on/off mode; for this function, refer to parameters F4 and F5.

Default: Ac=70.0 degrees.

AE: High condenser temperature alarm differential

This is the differential used for activation of the high condenser temperature alarm and control of the condenser fans.

Default: AE=5.0.

Acd: Condenser high temperature alarm delay

The parameter Acd can be used to set a delay on the activation of the condenser high temperature alarm. When the threshold Ac + AE is exceeded, the alarm delay timer is started. If, when the delay time Acd has elapsed, the temperature is still above the threshold, the alarm CHt is activated.

If the condensing temperature falls below Ac, the timer is reset and the alarm CHt is not displayed.

Default: Acd=0 => 0 minutes, immediate high condenser temperature alarm.

AF: Light sensor OFF time

Used to manage the light sensor, connected to a digital input, as:

AF= 0   sensor in the door stop

AF> 0   sensor inside the cold room or cabinet

When AF=0 the inside light is switched on when the sensor detects light, and is switched off when the sensor detects darkness. The light is switched off for a minimum of 3 seconds, so as to avoid close successive impulses of the light relay.

Note: the sensor must be positioned so as to detect darkness when the door is closed.

When AF>0, the inside light is switched on when the sensor detects light. After a time in seconds equal to AF, the light is switched off for 5 seconds to check if the door has been closed. If darkness is detected, the inside light remains OFF, but if light is detected, the inside light is switched back on (after a

minimum time of 3 seconds) and the same cycle starts again. Default: AF = 0.

ALF: Antifreeze alarm threshold

Defines the temperature value below which the antifreeze alarm is detected, with the message AFr.

The function is active if a probe has been set as an antifreeze probe, /A2, /A3, /A4, /A5= 4 and is delayed by the time set for parameter AdF.

The antifreeze alarm stops the compressor and activates the alarm relay, if H1 or H5=0, 1, and has manual reset.

The antifreeze alarm stops the compressor (stops cooling operation) and activates the alarm relay, if'H1'=0, 1 or'H5'=0, 1.

The alarm is reset manually or from the supervisor.

Note: if control with two compressor steps is selected (with or without rotation, H1 = 12 or 13) the antifreeze alarm acts on both steps.

Default: ALF= -5.0.

AdF: Antifreeze alarm delay.

Sets the delay for detecting the antifreeze alarm.

Default: AdF= 1.

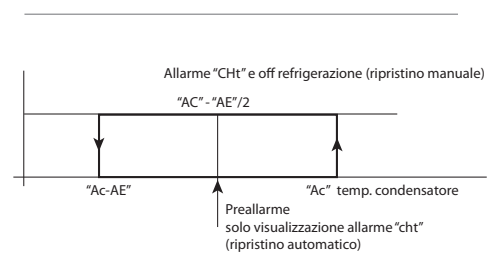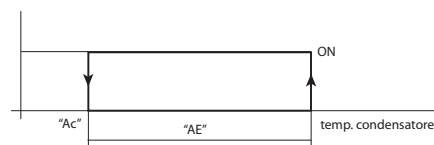Allarme "CHt" e off refrigerazione (ripristino manuale)

"AC" - "AE"/2

"Ac-AE"   "Ac" temp. condensatore

Preallarme
solo visualizzazione allarme "cht"
(ripristino automatico)

Fig. 7.m

ON

"Ac"   "AE"   temp. condensatore

Fig. 7.n

7.6 Fan management parameters

✿

Code	Parameter	Models	UOM	Type	Min	Max	Def.
F0	Fan management	---F	flag	C	0	2	0
F1	Fan start temperature	---F	°C/°F	F	−50	200	5.0
F2	Fan OFF with compressor OFF	---F	flag	C	0	1	1
F3	Fans in defrost	---F	flag	C	0	1	1
Fd	Fan OFF after dripping	---F	min	F	0	15	1
F4	Condenser fan stop temperature	MSYF	°C/°F	C	−50	200	40
F5	Condenser fan start differential	MSYF	°C/°F	C	0.1	20	5.0

Tab. 7.l

The ir33 series controllers manage the evaporator fans in the following modes:
• always ON;
• ON only when the compressor is ON;
• ON according to evaporator and room temperature.

F0: Fan management
The fans can be always on or managed by the "fan controller", which controls them according to the temperature measured by the defrost and virtual control probes.
The evaporator fans can be stopped in the following situations:
• when the compressor is OFF (see parameter F2);
• during defrosts (see parameter F3);
• during the dripping period (see parameter dd);
• and for a further post-dripping period (see parameter Fd);
• in defrost they can be on or off (see parameter F3).
The following values are allowed for this parameter:
F0=0 fans always ON;
F0=1 fans controlled according to the temperature difference between the virtual control probe and the evaporator temperature;
F0=2 fans controlled according to the evaporator temperature.
Warning: remember that if a dripping period is set (dd=0), the fans are stopped irrespective of the value of F0.
Default: F0=0 => fans always ON, not managed by the "fan controller".

F1: Fan start temperature (parameter valid only if F0 =1 or 2)
When F0=1, parameter F1 indicates the minimum difference between room temperature and evaporator temperature for the fans to be started. Therefore, when:
• evaporator temperature < (virtual probe – F1-A0), the fans are ON;
• evaporator temperature > (virtual probe – F1), the fans are OFF.
When stopped, the fans can start again when the difference between the two probes is equal to F1+A0, where A0 is the "fan controller" differential (see Figure 7.o).
When F0=2, parameter F1 indicates the absolute temperature for starting the fans, that is:
• evaporator temperature < (F1-A0), the fans are ON;
• evaporator temperature > (F1), the fans are OFF.
Notes:
• if there are two evaporators and therefore two evaporator probes, control will be performed using the maximum value read by the two probes, to ensure that the fans are started when both evaporators reach the set temperature.
• in the event of errors on the control probes, the fans are always on.
Default: F1=5 =>(if F0=1 or 2), the fans remain ON while the evaporator is 5 degrees colder than the room temperature.

F2: Fans OFF with compressor OFF (according to the value of F0)
Used to decide whether the fans must operate according to the rules set for parameter F0 (with the exception of the defrost cycle, parameters F3, dd and Fd are displayed) or when the compressor is active.
• F2=0 => the fans are always ON (F0=0) or when requested by the fan controller (F0=1,2), even when the compressor is OFF;
• F2=1 => the fans are OFF when the compressor is OFF.
Note: if control with two compressor steps is selected (with or without rotation, H1 or H5= 12 or 13) and parameter F2 =1, the fans are off when both the compressors are off.
Default: F2=1 => fans OFF with compressor OFF.

F3: Fans in defrost
This is used to decide whether the fans should operate or not during the defrosts.
F3=0 => the fans operate during defrosts;
F3=1 => the fans do not operate during defrosts.
Remember that during the dripping time and post-dripping time, if specified, the fans are always OFF. Default: F3=1 => evaporator fans OFF during the defrost.

Fd: Fans OFF for post-dripping
The fans, after defrosting, can be stopped for a further period beyond dd (in minutes), defined by the value of Fd. This is useful to allow the evaporator to return to its operating temperature after defrosting, thus avoiding forcing "hot" air into the refrigerated environment. In the event of management by fan controller, the time Fd does not need to be set, as the controller starts the fans again when the evaporator reaches its operating temperature. If the "fan controller" is active (F0=0), when assigning to Fd a value other than zero, the fans remain OFF for a time equal to the value of Fd, irrespective of the evaporator temperature. Default: Fd=1 => 1 minute stop for post-dripping.

F4: Condenser fan stop temperature
This is used to select the temperature at which the condenser fans should be switched OFF. If setting the auxiliary relay as the condenser fan output (see parameter H1), this will enable adjustments according to the diagram in Figure 7.p:
When the compressor is first started, the fans are switched ON at F4 + 0.2 degrees to compensate for rapid temperature increases that are not easy for the probe to follow.
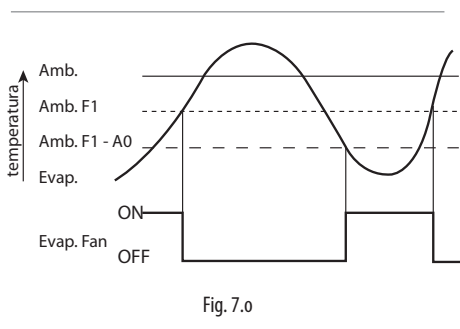After this, control is performed normally, i.e.:
• on: F4 + F5

Amb.
Amb. F1
Amb. F1 - A0
Evap.
ON
Evap. Fan
OFF
temperatura

Fig. 7.o

• off: F4.

In the event of condenser probe errors, the condenser fan output, if selected, is activated.

Important: If no condenser probe is selected, the condenser fan output, if selected, is disabled.

Default: F4=40.0 degrees.

F5: Condenser fan start differential

This is the differential used to control the condenser fans.
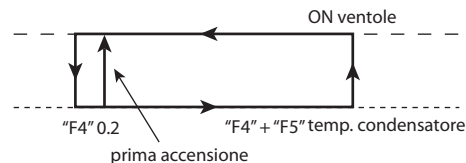
Default: F5=5.0.

ON ventole

"F4" 0.2

prima accensione

"F4" + "F5" temp. condensatore

Fig. 7.p

7.7 General configuration parameters

AUX

Code	Parameter	Models	UOM	Tipo	Min	Max	Def.
H0	Serial address	MSYF	–	C	0	207	1
H1	Function of AUX output	MSYF	flag	C	0	13	1
H2	Disable keypad/IR	MSYF	flag	C	1	6	1
H3	Remote control enabling code	MSYF	–	C	0	255	0
H4	Disable buzzer	MSYF	flag	C	0	1	0
H5	Function of relay 5		–	C	0	10	3
H6	Lock keypad	MSYF	–	C	0	255	0
H7	Select keypad	MSYF	flag	C	0	1	0
H8	Select activation of output with time band	MSYF	flag	C	0	1	0
H9	Enable set point variation with time band	MSYF	flag	C	0	1	0
HPr	Print profile	MSYF	–	C	0	15	0
Hdn	Number of default parameter sets available	MSYF	–	C	0	6	0
Hrl	Enable the remote signalling of the status of the master light relay	MSYF	flag	C	0	1	0
HrA	Enable the remote signalling of the status of the master auxiliary relay	MSYF	flag	C	0	1	0
HSA	Enable alarms from other devices in local network	MSYF	flag	C	0	1	0
In	Establishes if the unit is normal, master or slave	MSYF	–	C	0	6	0
Hdh	Anti-sweat heater offset	MSYF	°C/°F	C	-50	200	0.0

Tab. 7.m

Note:

- par. H5 refers to the instruments with 5 relays (ir33DIN, powercompact and MasterCella);
- parameters H7, HPr, Hdn, HrL, HrA, HsA and In are masked and consequently only visible using the programming kit (IROPZPRG00).

H0: Serial address

This is used to assign to the instrument an address it responds to when connected to a supervisory or telemaintenance system.

Default: H0=1.

H1: Operating mode: logic of output AUX1

Establishes whether the fourth relay is used as an auxiliary output.

The following functions can be associated:

H1=0 - alarm output normally energised. The relay is de-energised when an alarm occurs. The AUX output in "alarm" mode can be set to operate either with the relay energised or de-energised. The latter mode ensures maximum safety, because the alarm is also activated in the event of power failures or disconnection of the cables.

H1=1 - alarm output normally de-energised: the relay is energised when an alarm occurs.

H1=2 - auxiliary output: the actuator connected can be switched ON/OFF using the AUX button. Switching the actuator ON/OFF is signalled by the icon on the display.

H1=3 - light output: the light on the unit can be switched on/off when the door is opened, pressing the LIGHT button, enabling the digital input switch door or the curtain switch digital input (see parameter A4, A, A6) if the door switch is enabled (see parameter A4). In this case, the light is switched off when the door is closed, unless previously switched off from the keypad. Switching the light on/off is signalled by the icon on the display.

H1=4 - auxiliary evaporator defrost output: a heater or reversing valve can be controlled to perform an electric heater defrost or hot gas defrost on the auxiliary evaporator.

H1=5 - pump down valve output: the activation and deactivation of the pump down valve can be controlled.

H1=6 - condenser fan output: if the high condenser temperature alarm is activated, the output can be used to control the condenser fans (see parameter Ac and F4).

H1=7 - delayed compressor output: the output is activated a few seconds after the compressor starts (the delay is established by parameter c11, deactivation of the compressor output corresponds to immediate deactivation of the delayed compressor. If this operating mode is set, it is also active during the compressor pump down and autostart phases, if selected with the appropriate parameters.

H1=8 - auxiliary output with deactivation when OFF: in the off status, the auxiliary output cannot be activated. When starting again, the auxiliary output returns to the previous status.

H1=9 - light output with deactivation when OFF: in the off status, the light cannot be activated. When starting again, the light returns to the previous status.

H1=10 - no function associated with the output. In this case, the logical output AUX1 is not used for any function. If logical outputs AUX1 and AUX2 are associated with the same relay, this setting means the relay in question will only be associated with AUX2. Vice-versa, using this setting for AUX2, the relay will only be associated with AUX1. This possibility is useful when there is just one auxiliary relay, and it needs to be used alternatively as a light relay, associated with the light button and icon, or as an AUX relay, associated with the AUX button and icon.

H1=11- reverse output in control with dead band: used to activate control with dead band ('St"rd"rn"rr'), using the auxiliary output aux1 for the reverse function.

H1=12 - second compressor step output.

H1=13 - second compressor step output with rotation .

Important: mode 'H1'=0 is also useful for signalling power failures.

Default: H1=1 => relay energised with alarm active. Available on all models with aux output.

H2: Disable keypad and/or remote control

Parameter 'H2' can be used to inhibit some functions relating to the use of the keypad, for example, the modification of the parameters and the set point if the unit is accessible to the public.

The following options are available:

Parameter "H2"	0	1	2	3	4	5	6
HACCP							
PRG/MUTE (mute)							
UP/aux					•	•	•
DOWN/DEF (defrost)					•	•	•
set (modification of type F parameters)	•		•		•	•	
Modification of the set point	•		•		•	•	
Modification from the remote control			•	•			
ON/OFF					•	•	

Tab. 7.n

When the set point modification and parameter modification functions are inhibited, neither the set point nor the type F parameters can be changed, while their values can still be displayed. The type C parameters, however, being password protected, can also be modified from the keypad, following the procedure described previously. With the remote control disabled, only the values of the parameters can be displayed, but they cannot be modified; in addition, the mute, defrost, continuous cycle, aux (auxiliary 1), light (auxiliary 2) and on/off functions are disabled. **Warnings:** If H2=2 or H2=3 is set on the remote control, this is immediately disabled. To re-enable the remote control, set H2=0 or H2=1 on the keypad.
Default: H2=1=> all enabled

H3: Enabling code for programming from the remote control

Parameter H3 assigns an access code to the remote control. As already described, this allows the remote control to be used when there is more than one controller present on the same panel, without the risk of interference. For further details, see the paragraph on the use of the remote control.
Default: H3=00 => programming from the remote control without code.

H4: Disable buzzer

This parameter can have two values:
H4=0 buzzer enabled;
H4=1 buzzer disabled
Default: H4=0=> buzzer enabled. Available on all models.

H6: Lock keypad

Using the corresponding bits, the functions relating to the individual buttons on the keypad can be enabled/disabled, according to the following relationships:
Total (value of parameter H6): to calculate the value to be assigned to parameter H6, simply sum the values assigned to the functions that should be disabled.
For ir33, ir33power and ir33DIN see Table 7.q, for powercompact, powercompact small and mastercella see Table 7.q.

Important: the functions disabled using parameter H6 are added to those disabled using parameter H2.
Example: disable the "SET button", "AUX button":
ir33, ir33power and ir33DIN: 1+4 = 5 = value or parameter H6;
powercompact, powercompact small and mastercella: 1+32 = 33 = value of parameter H6.

Bit	Value	Button	Functions that can be enabled/disabled
0	1	set	Report printing procedure
1	2	▼	Defrost
2	4	▲	Continuous cycle
3	8	Prg mute	Mute
4	16	HACCP	Enter HACCP
5	32	aux	Enable/disable auxiliary output 1
6	64	(I)	On/Off
7	128	☼	Enable/disable auxiliary output 2

Tab. 7.o

Default: H6=0 => all buttons disabled.

H8: Select light or AUX output to activate with time band.

This parameter can be used to select the output that is activated or deactivate according to the time band (see parameters tON and tOF).
H8=0=> Time band linked to output configured as the light.
H8=1=> Time band linked to output configured as AUX.
Note: the output being controlled (light or AUX) must be available and selected with parameter H1.
Default: H8=0 => Time band linked to the light.

H9: Enable set point variation with time band.

This parameter can be used to enable the variation of the set point according to the time band (see parameters ton and toF). The controller modifies the set point by adding the value of parameter r4 (to the time toF), the new value is used for all the functions relating to the set point (e.g. relative high and low temperature alarms, control with dead band, control with two compressor steps etc.).

---

ir33, ir33power and ir33DIN:
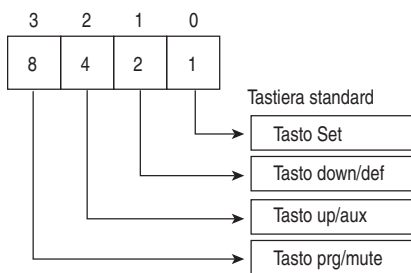
Fig. 7.q

	Value	
Function	Disabled	+
set button	1	
down/def button	2	
up/aux button	4	
prg/mute button	8	

Tab. 7.p

powercompact, powercompact small and MasterCella keypad
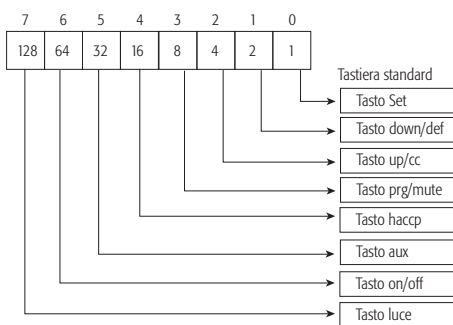
Fig. 7.r

Bit	Mask	Button	Functions that can be enabled/disabled
0	1	Set	Enter HACCP;Report printing procedure
1	2	def ▼	Defrost;Continuous cycle;Enter HACCP
2	4	▲ aux	Enable/disable auxiliary output 1; Continuous cycle
3	8	Prg mute	Mute

Tab. 7.q

H9=0 => Set point variation with time band disabled.

H9=1 => Set point variation with time band enabled.

Note: When r4=3.0 (preset value) the set point is increased by 3 degrees from the value used before toF, at ton the value of the set point will be the value set for parameter St.

As the time band set by ton and toF is related to the output auxiliary selected using parameter H8, the corresponding output will switch on at ton, and will switch off at toF.

Therefore, when H9=1, the following will be true:

- ton : normal set point and selected output on.

- toF : set point + r4 and selected output off.

Default: H9=0 => Function disabled.

rs only.

Hdh: Anti-sweat heater offset

This represents the offset from the set point for the anti-sweat heater function. If Hdh = 0, the anti-sweat heater function is disabled. The anti-sweat heater function is used to maintain the aux 1 or 2 output, configured as the light or aux (H1 or H5= 2, 3, 8, 9) deactivated while the control temperature (virtual probe) is less than 'St' + 'Hdh' when the instrument is first powered up, the 'HI" IA"dA 'CHt"EE"EF"rE' alarms are reset.

During the aforementioned alarms, the aux 1 or 2 output, configured as above, is deactivated.

The function is active, if the light or aux functions are set to be deactivated when off ,'H1' or 'H5'=8, 9, even when switching the controller on.

Default: Hdh =0.0 => function disabled (C°)

                Hdh =32 => function disabled (°F).

In: select normal, master or slave unit (masked parameter).

The parameter In establishes whether the unit is normal, master or slave. The maximum number of slaves in a sub-network is 5.

• Normal: stand-alone unit

• Master: Master unit. Allows the synchronisation of the defrosts, remote signalling of the light and aux relays and the alarms, and the downloading of the parameters.

• Slave: Slave unit. Unit part of a local network serving the master.

The following table shows the values of the parameter:

In: 0 = No Master-Slave (normal)

1 = Master

2 = Slave 1

3 = Slave 2

4 = Slave 3

5 = Slave 4

6 = Slave 5

Note: the synchronisation of the multiplexed defrost is activated only on Master and Slave controllers.

Default: In=0 => normal.

8.1 Summary table of alarms and signals: display, buzzer and relay

The following table describes the alarms and signals on the controller, with their description, the status of the buzzer, the alarm relay and the reset mode.

Code	Icon on the display	Alarm relay	Buzzer	Reset	Description
rE	🔧 flashing	on	on	automatic	virtual control probe fault
E0	🔧 flashing	off	off	automatic	room probe S1 fault
E1	🔧 flashing	off	off	automatic	defrost probe S2 fault
E2	🔧 flashing	off	off	automatic	probe S3 fault
E3	🔧 flashing	off	off	automatic	probe S4 fault
E4	🔧 flashing	off	off	automatic	probe S5 fault
'___'	No	off	off	automatic	probe not enabled
L0	⚠ flashing	on	on	automatic	low temperature alarm
HI	⚠ flashing	on	on	automatic	high temperature alarm
AFr	⚠ flashing	on	on	manual	antifreeze alarm
IA	⚠ flashing	on	on	automatic	immediate alarm from external contact
dA	⚠ flashing	on	on	automatic	delayed alarm from external contact
dEF	❄ on	off	off	automatic	defrost running
Ed1	No	off	off	automatic/manual	defrost on evaporator 1 ended by timeout
Ed2	No	off	off	automatic/manual	defrost on evaporator 2 ended by timeout
Pd	🔧 flashing	on	on	automatic/manual	maximum pump down time alarm
LP	🔧 flashing	on	on	automatic/manual	low pressure alarm
AtS	🔧 flashing	on	on	automatic/manual	autostart in pump down
cht	No	off	off	automatic/manual	high condenser temperature pre-alarm
CHT	🔧 flashing	on	on	manual	high condenser temperature alarm
dor	⚠ flashing	on	on	automatic	door open too long alarm
Etc	🕐 flashing	off	off	automatic/manual	real time clock fault
EE	🔧 flashing	off	off	automatic	E^{2}prom error, unit parameters
EF	🔧 flashing	off	off	automatic	E^{2}prom error, operating parameters
HA	HACCP flashing	off	off	manual	HACCP alarm, HA
HF	HACCP flashing	off	off	manual	HACCP alarm, HF
rCt	Signal	off	off	automatic	instrument enabled for programming from the remote control
Add	Signal	off	off	automatic	automatic address assignment procedure in progress
Prt	Signal	off	off	automatic	printing report
LrH	Signal	off	off	automatic	activation of low relative humidity procedure
HrH	Signal	off	off	automatic	activation of high relative humidity procedure
ccb	Signal				start continuous cycle request
ccE	Signal				end continuous cycle request
dFb	Signal				start defrost call
dFE	Signal				end defrost call
On	Signal				switch ON
off	Signal				switch OFF
rES	Signal				reset alarms with manual reset reset HACCP alarms reset temperature monitoring
n1 - n6	⚠ flashing	on	on	automatic	indicates an alarm on unit 1-6 in the network.
dnL	Signal				download in progress
d1 - d6	⚠ flashing	off	off		download with errors on unit 1-6.

Tab. 8.a

The buzzer sounds if enabled by parameter H4.
The alarm relay is activated if auxiliary output 1 (H1) has been assigned the alarm relay function.
Note: the buzzer is not affected by the CAREL supervisory system.

8.2 Table of alarms and signals: functions enabled/disabled

The following table highlights the functions that are enabled and disabled in the various alarm situations.

Code	PD valve	Compressor	Defrost	Evap. fans	Cond. fans	Continuous cycle
rE	Duty setting (c4)	Duty setting (c4)	unchanged	unchanged	unchanged	unchanged
E0	Duty setting (c4)	Duty setting (c4)	unchanged	unchanged	unchanged	unchanged
E1	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
E2	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
E3	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
E4	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
'___'	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
L0	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
HI	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
AFr	off	off	unchanged	unchanged	unchanged	unchanged
IA	Duty Setting (A6)	Duty setting (A6)	unchanged	unchanged	unchanged	unchanged
dA	Duty setting (A6) if A7<>0	Duty setting (A6) if A7<>0	unchanged	unchanged	unchanged	unchanged
dEF	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
Ed1	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
Ed2	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
Pd	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
LP	off	off	unchanged	unchanged	unchanged	unchanged
Ats	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
cht	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
CHt	unchanged	off	off	unchanged	unchanged	unchanged
dor	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
Etc	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
EE	off	off	not performed	off	off	not performed
EF	off	off	not performed	off	off	not performed
HA	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
HF	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
n1–n6	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
dnL	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged
d1 – d6	unchanged	unchanged	unchanged	unchanged	unchanged	unchanged

Tab. 8.b

Code	AUX dead zone	AUX light anti-sweat	AUX auxiliary anti sweat	AUX second step
rE	off	off	off	Duty setting (C4)
E0	off	off	off	Duty setting (C4)
E1	unchanged	unchanged	unchanged	unchanged
E2	unchanged	unchanged	unchanged	unchanged
E3	unchanged	unchanged	unchanged	unchanged
E4	unchanged	unchanged	unchanged	unchanged
'___'	unchanged	unchanged	unchanged	unchanged
L0	unchanged	unchanged	unchanged	unchanged
HI	unchanged	off	off	unchanged
AFr	unchanged	unchanged	unchanged	off
IA	off	off	off	Duty setting (A6)
dA	off if A7<>0	off if A7<>0	off if A7<>0	Duty setting (A6) if A7<>0
dEF	unchanged	unchanged	unchanged	unchanged
Ed1	unchanged	unchanged	unchanged	unchanged
Ed2	unchanged	unchanged	unchanged	unchanged
Pd	unchanged	unchanged	unchanged	unchanged
LP	unchanged	unchanged	unchanged	off
Ats	unchanged	unchanged	unchanged	unchanged
cht	unchanged	unchanged	unchanged	unchanged
CHt	unchanged	off	off	off
dor	unchanged	unchanged	unchanged	unchanged
	unchanged	unchanged	unchanged	unchanged
EE	off	off	off	off
EF	off	off	off	off
HA	unchanged	unchanged	unchanged	unchanged
HF	unchanged	unchanged	unchanged	unchanged
n1 – n6	unchanged	unchanged	unchanged	unchanged
dnL	unchanged	unchanged	unchanged	unchanged
d1 – d6	unchanged	unchanged	unchanged	unchanged

tab. 8.c

NOTE:

NOTE:

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