Service Manual

Mod. : R14X-GAEV-TS

Thermo
SCIENTIFIC

Model: R14X-GAEV-TS

R14X-GAEV-TS

Standard Features
- Electronic controller EVK214
- Max 2 probes
- Probe alarm error
- Traditional cooling unit (not monoblock)
- Automatic defrost
- Basin for condensate water
- Gas R404A
- Insulation 50mm
- Exterior made of white plastificated anti-corrosion treated steel
- Interior made of "Sanisteel" with active antibacterial properties
- 2 Door
- Door lock
- Plastificated shelf (530x650mm)
- Small wheels
- EU Plug
- Stability brackets
- Dry contacts for external alarm

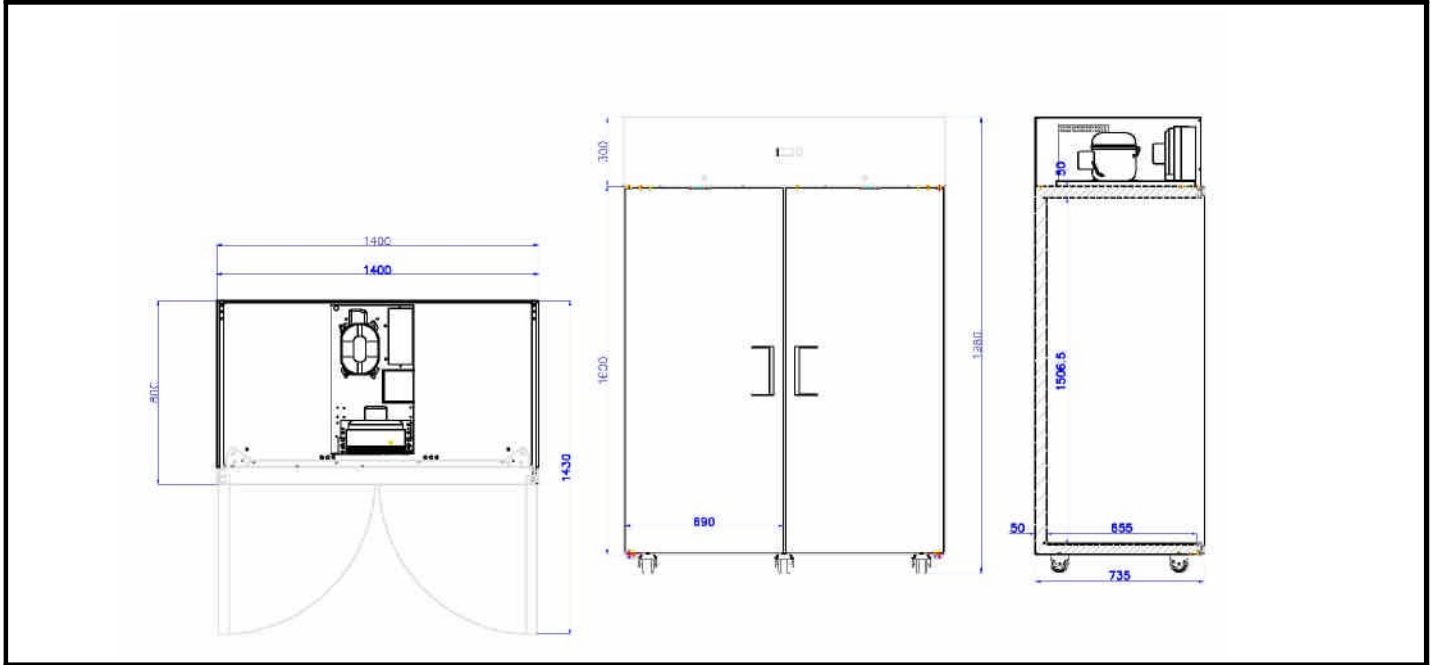**Optionals and Accessories**
 Shelves.

Temperature

	A	B	C	D
° C	-0°/+10°			
° F				

Capacity	Voltage		Abs. Power	Unit Size	Packaging Size	Shelves	Max Ambient	Weight
Lt	Volt/Hz	Amps	Watt	LxDxH cm	LxDxH cm	No.	Temp. ° C	Kg
1400	220-240/50		440	1400x810x1980	1510x860x2160	6	+32	170/190

Model: R14X-GAEV-TS

HCFCs and CFCs Free

ARCHITECT CORNER

STANDARD FEATURES

DESIGN
All models of Thermo Scientific refrigerators and freezers are made in Italy in ISO9001,14001 certified factory. They are constructed for heavy-duty use and have user-friendly design. The choice of best production technologies and materials guarantees their long and trouble-free life.

CABINET CONSTRUCTION
Body insulation is made polyurethane (CFC/HCFC free) with thickness of 50mm. Rounded internal corners to facilitate cleaning and maintenance.

REFRIGERATION SYSTEM
Traditional system (CFC free) - Gas R404a. Thermostatic valve for monoblock and negative temperature versions. Evaporator and condenser are designed to guarantee low-energy consumption and equipped with ventilator and helical fan. Ermetique compressor with thermo-overload protection. Ventilated cooling to maintain stable temperature inside refrigerator even when frequent openings of door. Possibility to adjust temperature from +2°C to +16°C and -10°C to -25°C for freezer versions. Control panel is mounted on top to be easy read and reached for eventual regulation.

DOORS
Ergonomic door handle with possibility to open with one hand only, removable magnetic gaskets.

SHELVING
Plastificated grid shelves.

MODEL FEATURES
Electronic controller

ELECTRICAL
230V/50Hz AC

WARRANTY
12 months warranty on parts and Labor
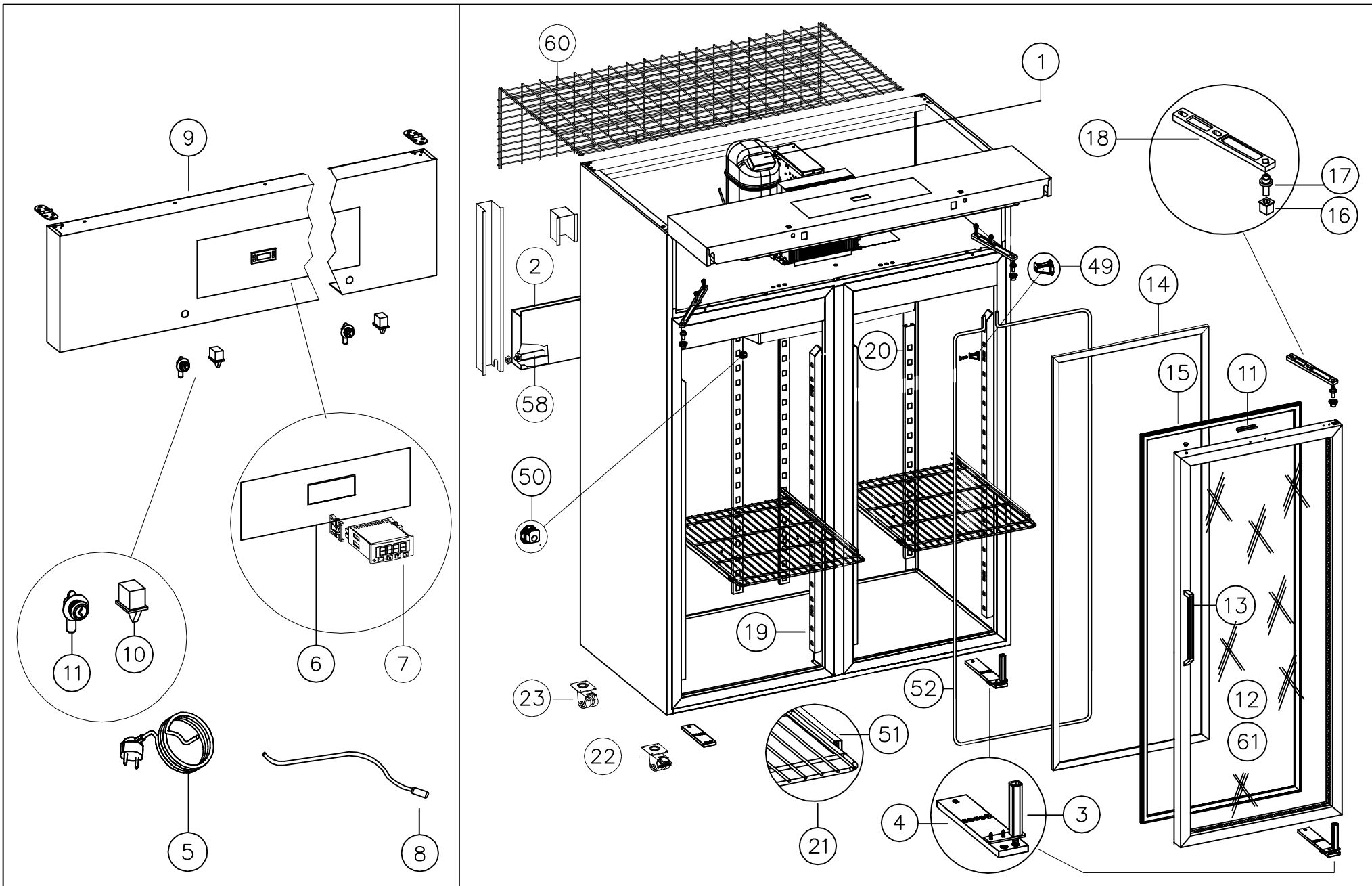
DENOMINAZIONE :

R14X—GAEV—TS

MATERIALE:

DIMENSIONE:

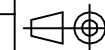TOLLERANZE DI FORMA E POSIZIONE   SECONDO UNI 7226—73 (±0.2)

CODICE DIS.

DISEGNATORE CAD :
DI PAOLO VINCENZO

DATA DI REALIZZAZIONE :
11/11/2011

CONTROLLATO:

SPIGOLI E SMUSSI
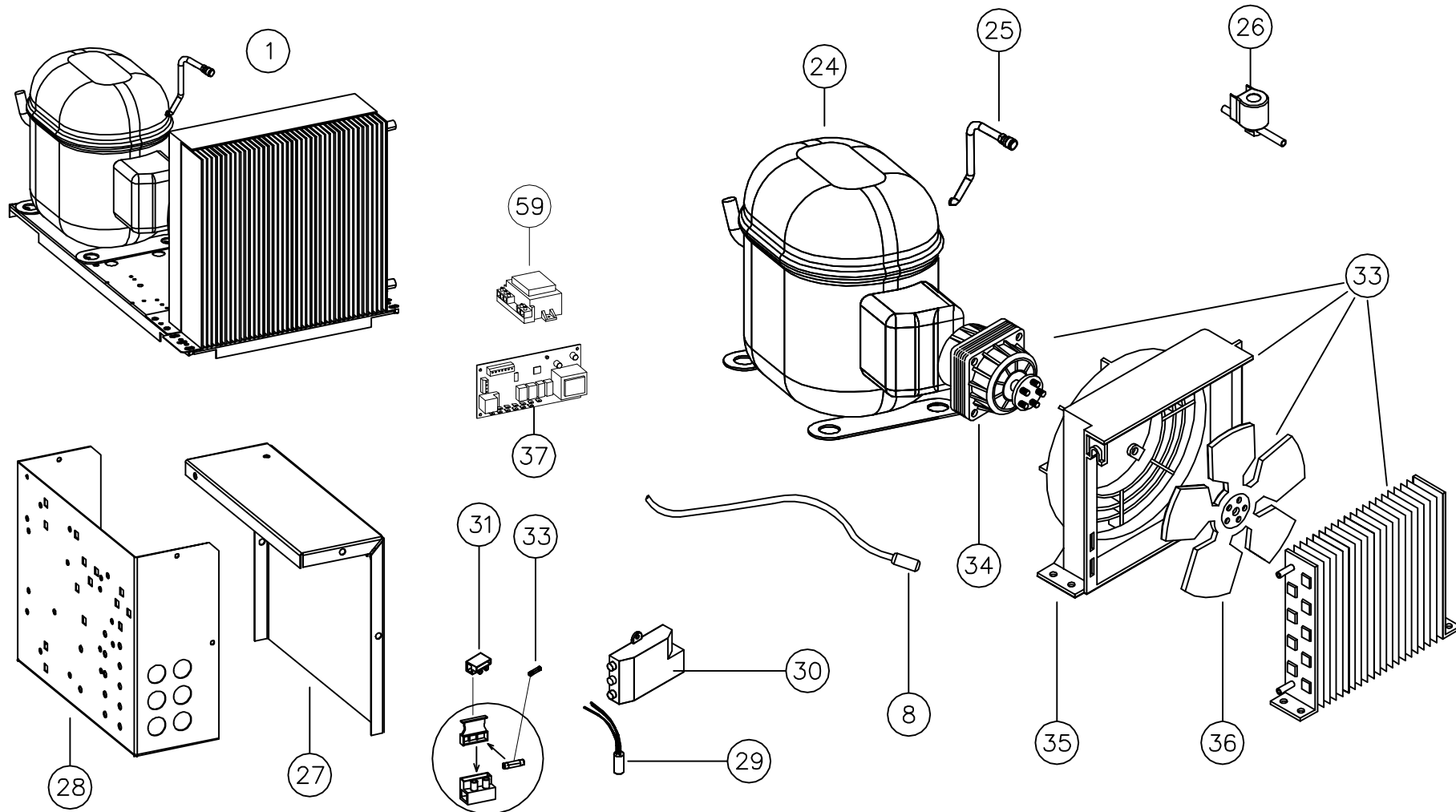NON QUOTATI
SM. 1 X 45°

U.M. SCALA
mm 1:4
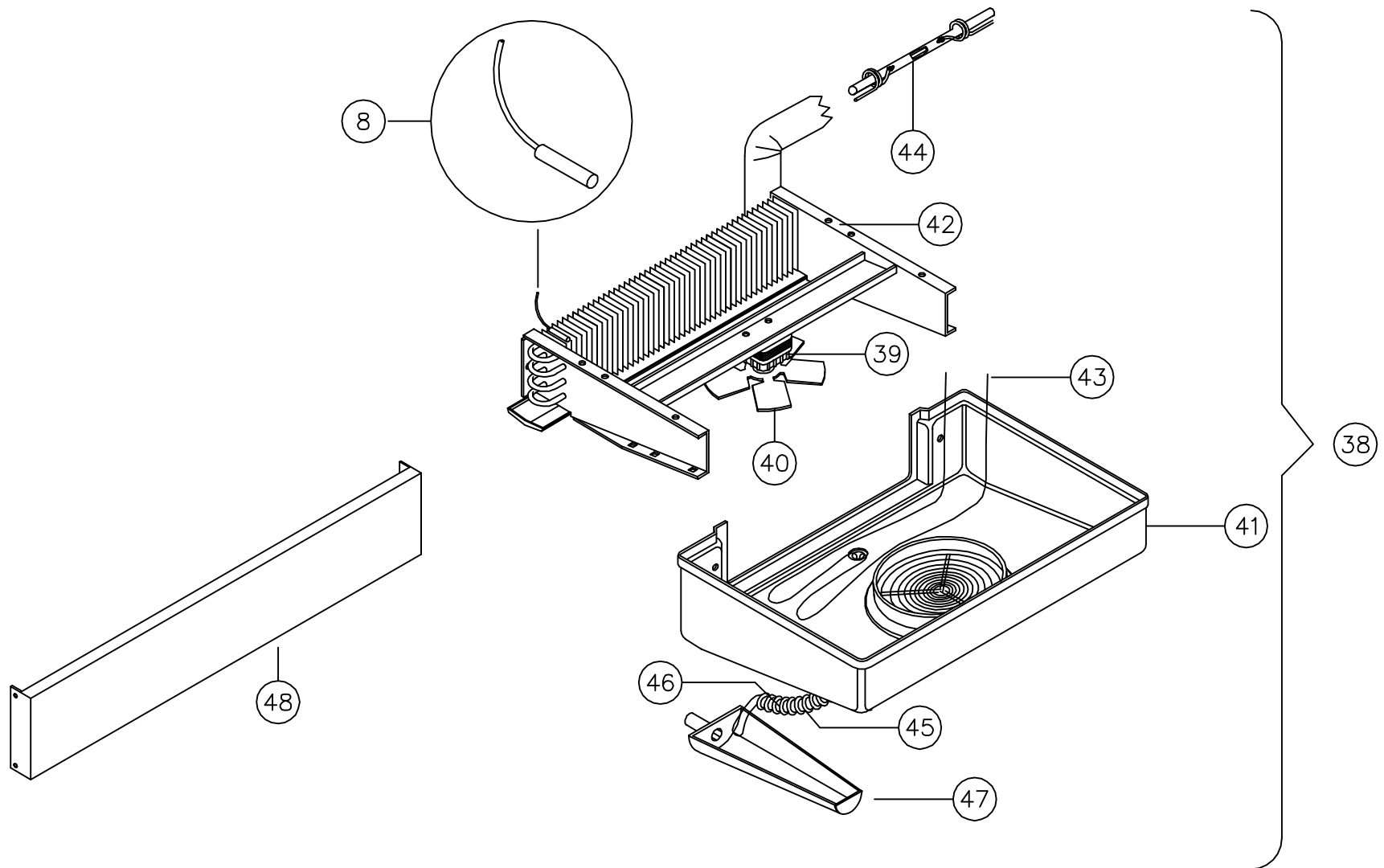
REV.N° :03

DATA: 31/07/2013

Descrizione modifica:

SPARE PARTS LIST

R14X-GAEV-TS	POS.	CRITICAL PARTS	DESCRIZIONE	DESCRIPTION	LIST PRICE	APPROX. DELIVERY TIME
80827072	1		UNITA'COND.400LT TN THERMO-FISHER	CONDENSING UNIT	€	5 DAYS
Q32-0280	2		BACINELLA RACC.COND.VER.VO EP991ND	CONDENSING WATER TRAY	€	5 DAYS
P28-0847	3		CERNIERA A TUFFO C/FERMO CT4000F	HINGE WITH SPRING	€	5 DAYS
P99-0031	4		STAFFA INFER. ALLUM. FRIGO St007C	BOTTOM HINGE SUPPORT	€	5 DAYS
R40-0051	5		CAVO 3x1.5x3500+SCHUKO 10/16A	POWER CABLE	€	5 DAYS
B99-0303	6		ETICHET.POL. THERMO	STICKER	€	5 DAYS
B99-0304	6		ETICHET. GPS SERIES	STICKER GPS SERIES	€	5 DAYS
B99-0004	6		ETICHET. TEMP +4 °C	STICKER +4 °C	€	5 DAYS
R35-0314	7	X	CENTRALINA EVK214 SER NTC12-24VA	ELECTRONIC CONTROLLER	€	3 DAYS
Q32-0578	8	X	SONDA NTC SEMITEC 3MT SN691300	PROBE	€	3 DAYS
4560101	9		FRONTALE ARMADIO	FRONT PANEL	€	5 DAYS
R25-0086	10	X	MICRO SWITCH GRIGIO Mod.60B 8Amp.	MICRO SWITCH	€	3 DAYS
80010310	11		KIT SERRATURA	KIT KEY	€	5 DAYS
M62-0690BSX	12		PORTA A VETRO TN 690X1585 BIANCO SX	DOOR LEFT HAND	€	5 DAYS
XXXXXXX	13		XXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XX	XX
H62-295060	14		PROF.CORN.PORTAMAG.TAV/ARMSP.50/60	PLASTIC PROFILE	€	5 DAYS
H25-0016	15	X	GUARNIZIONE	GASKET	€	3 DAYS
P75-0151	16		BUSSOLA NYLON 6.6 Diam.32 Foro 14.2	BUSH	€	5 DAYS
P99-0040	17		PERNO ALL. ST. PORTA ARM ICE D.14Xm5	PIN ALUMINIUM	€	5 DAYS
P99-0030	18		STAFFA SUPER. ALLUM. FRIGO St009C	TOP HINGE SUPPORT	€	5 DAYS
4080153	19		CREMAGL.ANT.ASPOR.ARM.NEW SUPP.A441	FRONT REMOVABLE RACK	€	5 DAYS
4080163	20		CREMAGL.POST.ASP.ARM.NEW SUPP.A441	REMOVABLE REAR RACK	€	5 DAYS
Q32-0002	21		GRIGLIA PLAST.530X650 Arm.Prof.80	PLASTIC COATED SHELF	€	5 DAYS
P80-0065	22		RUOTA C/FRENO	CASTORS WITH BRAKE	€	5 DAYS
P80-0066	23		RUOTA S/FRENO	CASTORS WITH OUT BRAKE	€	5 DAYS
Q32-0445	24	X	COMPRESSORE MP 14RB R404A 220V 50HZ	COMPRESSOR	€	3 DAYS
P52-0053	25		VALVOLA CARICA 1/4 Mm.300 Vc-500-09	CHARGING VALVE	€	5 DAYS
R30-0032	26	X	ELETTROVALVOLA 230V 50/60HZ BT	ELECTROVALVE	€	3 DAYS
4480064	27		COPERCCHIO x CASSETTA DERIVAZIONE	ELECTRIC BOX COVER	€	5 DAYS
4480054	28		CASSETTA DI DERIVAZIONE ZINC. ARM.	ELECTRIC BOX	€	5 DAYS
S06-0038	29		FILTRO ANTIFREQ. 16A 16SS7D-SBK-Q	ANTIFREQUENZ FILTER	€	5 DAYS
R50-0064	30		MORSETTIERA Pa32/1874 14P. 00311874	TERMINAL Pa32/1874 14P. 00311874	€	5 DAYS
R25-0054	31		PORTA FUSIBILE B4Pa283Wp 1P 00109901 UI	FUSE HOLDER	€	5 DAYS
R35-0257	32	X	FUSIBILI RAPIDI 5X20 1A	FUSE	€	3 DAYS
Q32-0324	33	X	CONDENSATORE Stvf 194 Dx 082055206	CONDENSER	€	3 DAYS
R05-0194	34	X	MOTORE EL. W11/S STVF 124/194	CONDENSER MOTOR	€	3 DAYS
Q32-0111	35		CONVOGLIATORE PL. CF27 X STVF 124	CONDENSER COVER	€	5 DAYS
P36-0028	36		VENTOLA 254-26-5 ASP.STVF 124/194	CONDENSER MOTOR FAN	€	5 DAYS
R35-0028	37	X	RELE' POT. 65.31.82300000 230V 20A	RELAY	€	3 DAYS
8082740	38		UNITA' EVAPOR.ARM.1400 TN PV SILVER	EVAPORATING UNIT	€	5 DAYS
R35-0026	39	X	MOTORINO 10-20 NET4T10ZVN006 CAREN.	EVAPORATOR MOTOR	€	3 DAYS
Q32-0299	40		VENTOLA D.154-34°ASP.HP9 4012310	EVAPORATOR MOTOR FAN	€	5 DAYS
Q32-0416	41		COPRIEVAPORATORE IN PLAST. SHS15	EVAPORATOR COVER	€	5 DAYS
Q32-0350	42	X	AEREOEVAPORATORE SHS 15 040803021A	EVAPORATOR	€	3 DAYS
R35-0002	43		RESISTENZA 44W 220V L4400 ARM+ET139	HEATER	€	5 DAYS
Q32-0126	44		LINEA ASPIR.CU D12030-0 IE70/IE140	SUCTION LINE	€	5 DAYS
H15-0020	45		TUBO GOMMA SILICONE 16x22 FDA	RUBBER TUBE 16x22 FDA	€	5 DAYS
P72-0016	46		MOLLA SPIRALE AISI 302 1x15,2x302	SPRING	€	5 DAYS
H49-0064	47		GOCCIOLATOIO PP COND.EVAP.MM.250	DRIP TRAY	€	5 DAYS
4580081	48		MASCHER.PROT.EVAP.AR.BM7/14PR SANIS	EVAPORATOR MASK	€	5 DAYS
H49-0062	49		SUPPORTO GRANDE CREM.ANT.L34X23 PP	SUPPORT GREAT	€	5 DAYS
H49-0063	50		SUPPORTO PIC. CREM.POST.L26X23 PP	SUPPORT SMAL	€	5 DAYS
4180014	51		GUIDA REGGIG.INOX Arm.Mm630 Prof.80	GUIDE	€	5 DAYS
XXXXXXX	52		XXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XX	XX
XXXXXXX	53		XXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XX	XX
XXXXXXX	54		XXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XX	XX
XXXXXXX	55		XXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XX	XX
XXXXXXX	56		XXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XX	XX
XXXXXXX	57		XXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XX	XX
R35-0146	58		RES.CART.BACIN.EP991 PTC2 230V 230W	HEATING ELEMENT	€	5 DAYS
R15-0001	59		TRASFORMATORE ELIW 230/12V TF411173	TRANSFORMER	€	3 DAYS
Q32-7351371-TF	60		GRIGLIA DI PROTEZIONE	PROTECTION GRID	€	5 DAYS
M62-0690BDX	61		PORTA A VETRO TN 690X1585 BIANCO DX	DOOR RIGHT HAND	€	5 DAYS

Controller EVK214. Parameters for cabinets & counters

Par.	Low Temp el. def	H. Temp hot gas def	H. Temp el. def	H. Temp Stop. def	Low Temp hot gas def	-30°C el. def	-30 hot gas	Par.	Low Temp el. def	H. Temp hot gas def	H. Temp el. def	H. Temp Stop. def	Low Temp hot gas def	-30°C el. def	-30 hot gas
SP	-20	4,5	4,5	4,5	-20	-30	-30	F2	0	0	0	0	0	0	0
CA1	0	0	0	0	0	0	0	F3	2	2	2	2	2	2	2
CA2	0	0	0	0	0	0	0	i0	4	4	4	4	4	4	4
CA3	0	0	0	0	0	0	0	i1	1	1	1	1	1	1	1
P0	1	1	1	1	1	1	1	i2	1	1	1	1	1	1	1
P1	1	1	1	1	1	1	1	i3	2	2	2	2	2	2	2
P2	0	0	0	0	0	0	0	i4	1	1	1	1	1	1	1
P3	1	1	1	0	1	1	1	i5	4	4	4	4	4	4	4
P4	1	1	1	1	1	1	1	i6	0	0	0	0	0	0	0
P5	0	0	0	0	0	0	0	i7	0	0	0	0	0	0	0
P6	0	0	0	0	0	0	0	i8	0	0	0	0	0	0	0
r0	1	1	1	1	1	1	1	i9	240	240	240	240	240	240	240
r1	-25	2	2	2	-25	-32	-32	u1	4	4	4	4	4	4	4
r2	-10	16	16	16	-10	-10	-10	u2	0	0	0	0	0	0	0
r3	0	0	0	0	0	0	0	u3	1	1	1	1	1	1	1
r4	0	0	0	0	0	0	0	u4	0	0	0	0	0	0	0
C0	1	1	1	1	1	1	1	u5	-1	-1	-1	-1	-1	-1	-1
C1	1	1	1	1	1	1	1	u6	5	5	5	5	5	5	5
C2	1	1	1	1	1	1	1	u7	2	0	0	0	2	2	2
C3	0	0	0	0	0	0	0	u8	0	0	0	0	0	0	0
C4	3	3	3	3	3	3	3	HE1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	3	3	3	3	3	3	3	HE2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C6	80	80	80	80	80	80	80	Hd1	--.--	--.--	--.--	--.--	--.--	--.--	--.--
C7	90	90	90	90	90	90	90	Hd2	--.--	--.--	--.--	--.--	--.--	--.--	--.--
C8	1	1	1	1	1	1	1	Hd3	--.--	--.--	--.--	--.--	--.--	--.--	--.--
C9	5	5	5	5	5	5	5	Hd4	--.--	--.--	--.--	--.--	--.--	--.--	--.--
C10	0	0	0	0	0	0	0	Hd5	--.--	--.--	--.--	--.--	--.--	--.--	--.--
d0	6	10	10	10	6	6	6	Hd6	--.--	--.--	--.--	--.--	--.--	--.--	--.--
d1	0	1	0	0	1	0	1	LA	247	247	247	247	247	247	247
d2	8	8	8	8	8	8	8	Lb	2	2	2	2	2	2	2
d3	30	12	12	20	15	30	30	Lp	2	2	2	2	2	2	2
d4	0	0	0	0	0	0	0	E9	1	1	1	1	1	1	1
d5	1	1	1	1	1	1	1								
d6	1	1	1	1	1	1	1								
d7	1	1	1	1	1	1	1								
d8	0	0	0	0	0	0	0								
d9	-40	-10	-10	-10	-30	-30	-30								
dA	0	0	0	0	0	0	0								
A0	0	0	0	0	0	0	0								
A1	-32	2	2	2	-25	-35	-35								
A2	2	2	2	2	2	2	2								
A3	0	0	0	0	0	0	0								
A4	-25	7	7	7	-17	-25	-25								
A5	2	2	2	2	2	2	2								
A6	120	90	90	90	120	120	120								
A7	20	20	20	20	20	20	20								
A8	10	10	10	10	10	10	10								
A9	10	10	10	10	10	10	10								
AA	1	1	1	1	1	1	1								
F0	3	4	4	2	3	3	3								
F1	0	13	13	13	0	0	0								

EVK214 Digital controller for ventilated refrigerating units, with RTC, HACCP and Energy Saving functions
*version 1.04*

GB ENGLISH

## 1 PREPARATIONS

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

1.2 Installazion
For the panel, using the snap-on brackets supplied; the dimensions are given in mm (in).
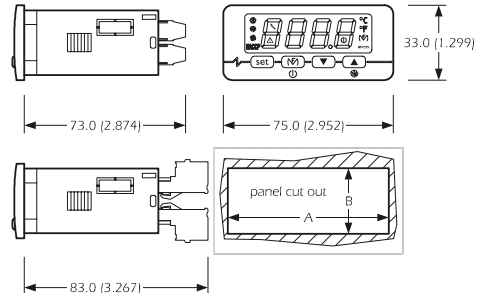
DIMENS.	MIN	TYPICAL	MAX
A	71.0 (2.795)	71.0 (2.795)	71.8 (2.826)
B	29.0 (1.141)	29.0 (1.141)	29.8 (1.173)
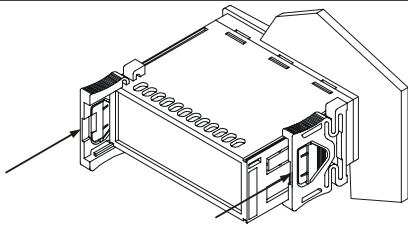
Recommendations for installation:
- the panel thickness must not exceed 8.0 mm (0.314 in)
- ensure that the operating conditions (operating temperature, humidity, etc.) are within the limits indicated in the technical data sheets
- do not install the device near to any sources of heat (heating elements, hot air conduits, etc.), equipment containing powerful magnets (large diffusers, etc.), areas affected by direct sunlight, rain, humidity, excessive dust, mechanical vibration or shock
- in compliance with safety regulations, the device must be installed correctly, and in such a way as to protect against any contact with electrical parts; all safety devices must be fixed so that they cannot be removed without the use of tools.

1.3 Electrical connections
With reference to the electrical circuit diagram:
- the service controlled by the fourth output depends on param. P4
- the service controlled by the fourth output depends on param. u1
- port 1 (by request) is the serial port used for communication with the monitoring system (by means of a serial interface, via TTL, using the MODBUS communication protocol) or with the programming key; the port must not be used for both purposes simultaneously
- port 2 (by request) is the port used for comm. with the remote indicator; the indicator displays the quantity assigned by parameter P6.
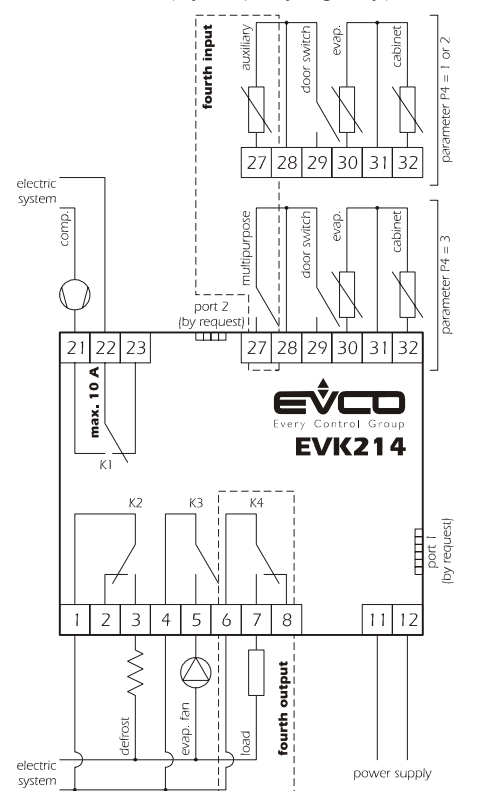
Points to note in relation to electrical connections:
- do not use electric or pneumatic screw-wrenches on the terminal board
- if the device has been moved from a cold to a warm environment, condensation may have formed inside; please wait approx. one hour prior to switching on
- ensure that the voltage, frequency and operational power of the device are compatible with the local power supply
- disconnect the power prior to proceeding with any kind of maintenance operation
- do not use the device as a safety device
- for repairs and any information relating to the device, contact the Evco dealer network.

2 USER INTERFACE

2.1 Introductory comments
The device has the following operational states:
- "on" (power is connected and the device is on: the regulators may be switched on)
- "stand-by" (power is connected but software sets the device to off: the regulators are switched off; the option of manually switching on/off the cabinet light or the auxiliary output depends on parameter u2).

The term "switching on" is understood to mean switching from the stand-by state to on; the term "switching off" is understood to mean switching from the on state to the stand-by state.
When the device is switched on, the status it was in when the power was interrupted is restored.

2.2 Manual switching on/off of the device
- ensure the keyboard is not blocked and that no procedures are running
- press (🔆) for 4 s.
It is also possible to switch the device on/off using the multifunction input.

2.3 The display
If the device is switched on, then during normal operation the display will show the quantity assigned by parameter P5:
- if P5 = 0, the display will show the temperature of the cabinet
- if P5 = 1, the display will show the operational setpoint
- if P5 = 2, the display will show the evaporator temperature
- if P5 = 3, the display will show "cabinet temperature - evaporator temperature"
- if P5 = 4, the display will show the temperature detected by the auxiliary probe (only if parameter P4 is set to 1 or 2).
While in stand-by mode the display is switched off.

2.4 Displaying the cabinet temperature
- ensure the keyboard is not blocked and that no procedures are running
- press (▼) for 2 s: the display will show the first available label
- press (▲) or (▼) to select "**Pb1**"
- press (set)
To exit the procedure:
- press (set) or do not operate the keypad for 60 s
- press (▲) or (▼) until the display shows the quantity assigned by parameter P5 or do not operate the keypad for 60 s.

Alternatively:
- press (🔆)

2.5 Displaying the evaporator temperature
- ensure the keyboard is not blocked and that no procedures are running
- press (▼) for 2 s: the display will show the first available label
- press (▲) or (▼) to select "**Pb2**"
- press (set)
To exit the procedure:
- press (set) or do not operate the keypad for 60 s
- press (▲) or (▼) until the display shows the quantity assigned by parameter P5 or do not operate the keypad for 60 s.

Alternatively:
- press (🔆)
If there is no evaporator probe (parameter P3 = 0), label "**Pb2**" will not be displayed.

2.6 Displaying the temperature detected by the auxiliary probe (only if parameter P4 is set to 1 or 2)
- ensure the keyboard is not blocked and that no procedures are running
- press (▼) for 2 s: the display will show the first available label
- press (▲) or (▼) to select "**Pb3**"
- press (set)
To exit the procedure:
- press (set) or do not operate the keypad for 60 s
- press (▲) or (▼) until the display shows the quantity assigned by parameter P5 or do not operate the keypad for 60 s.

Alternatively:
- press (🔆)
If the function of the fourth input is not that of the auxiliary probe (parameter P4 = 0 or 3), then label "**Pb3**" will not be displayed.

2.7 Manual activation of defrosting
- ensure the keyboard is not blocked and that no procedures are running

- press (❄) for 4 s.
If the function of the evaporator probe is that of the defrosting probe (parameter P3 = 1) and on activation of defrosting the evaporator temperature is above that established by parameter d2, then defrosting will not be activated.

2.8 Manual switching on/off of the cabinet light (only if parameter u1 is set to 0)
- ensure no procedures are running
- press (🔆)
It is also possible to switch the cabinet light on/off remotely using the microport and multifunction inputs; see also parameter u2.

2.9 Switching on the demister (only if parameter u1 is set to 1)
- ensure the device is switched on and no procedures are running
- press (🔆) for 2 s: the demister heater will be switched on for the period of time established by parameter u6.
Manual switching off of the demister is not permitted.

2.10 Manual switching on/off of the auxiliary output (only if parameter u1 is set to 2)
- ensure the keyboard is not blocked and that no procedures are running
- press (🔆)
It is also possible to switch the auxiliary output on/off using the multifunction input.
If the auxiliary output has been switched on manually, then it will be permitted to switch it off the same way (the same principle applies for remote switching on); see also parameter u2.

2.11 Blocking/unblocking the keyboard
To block the keyboard:
- ensure no procedures are running
- press (set) and (▼) for 2 s: the display will show "**Loc**" for 1 s.
If the keyboard is blocked, it will not be possible to:
- manually switch the device on/off
- display the cabinet temperature (using the procedure indicated in paragraph 2.4)
- display the evaporator temperature (using the procedure indicated in paragraph 2.5)
- display the temperature detected by the auxiliary probe (using the procedure indicated in paragraph 2.6)
- manually activate defrosting
- manually switch the auxiliary output on/off
- view information pertaining to the HACCP alarms
- delete the HACCP alarm list
- modify the date and time
- change the operational setpoint using the procedure indicated in paragraph 3.2 (the operational setpoint may also be set by means of parameter SP)
- display the total hours of compressor operation
- delete the total hours of compressor operation.
These operations will cause the label "Loc" to be displayed for 1 s.
To unblock the keyboard:
- press (set) and (▼) for 2 s: the display will show "**UnL**" for 1 s.

2.12 Buzzer mute
- ensure no procedures are running
- press any key (the first key press does not trigger the associated effect).
If parameter u1 is set to 4 (or the service controlled by the fourth output is the alarm output) and parameter u4 is set to 1, then pressing he key will also deactivate the alarm output.

3 SETTINGS

3.1 Setting the date and time (clock)
- ensure the keyboard is not blocked and that no procedures are running
- press (▼) for 2 s: the display will show the first available label
- press (▲) or (▼) to select "**rtc**".
To modify the year:
- press (set) within 60 s: the display will show "**yy**" followed by the last two digits of the year
- press (▲) or (▼) within 15 s.
To modify the month:
- press (set) within 15 s: the display will show "**nn**" followed by the two digits for the month
- press (▲) or (▼) within 15 s.
To modify the day of the month:
- press (set) within 15 s: the display will show "**dd**" followed by the two digits for the day
- press (▲) or (▼) within 15 s.
To modify the hours:
- press (set) within 15 s: the display will show "**hh**" followed by the two digits for the hour
- press (▲) or (▼) within 15 s.
To modify the minutes:
- press (set) within 15 s: the display will show "**nn**" followed by the two digits for the minutes
- press (▲) or (▼) within 15 s
- press (set) or do not operate the keypad for 15 s.
To exit the procedure:
- press (▲) or (▼) until the display shows the quantity assigned by parameter P5 or do not operate the keypad for 60 s.

Alternatively:
- press (🔆)

3.2 Setting the operational setpoint

- ensure the keyboard is not blocked and that no procedures are running
- press [set] the LED ❄ will flash
- press [▲] or [▼] within 15 s; also see parameters r1, r2 and r3
- press [set] or do not operate the keypad for 15 s.

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

3.3 Setting the configuration parameters

To access the procedure:
- ensure no procedures are running
- press [▲] and [▼] for 4 s: the display will show "**PA**"
- press [set]
- press [▲] or [▼] within 15 s to set "**-19**"
- press [set] or do not operate the keypad for 15 s
- press [▲] and [▼] for 4 s: the display will show "**SP**".

To select a parameter:
- press [▲] or [▼]

To select a parameter:
- press [set]
- press [▲] or [▼] within 15 s
- press [set] or do not operate the keypad for 15 s.

To exit the procedure:
- press [▲] and [▼] for 4 s or do not operate the keypad for 60 s.

Interrupt the device power supply after altering the parameters.

3.4 Resetting configuration parameter default values

- ensure no procedures are running
- press [▲] and [▼] for 4 s: the display will show "**PA**"
- press [set]
- press [▲] or [▼] within 15 s to set "**743**"
- press [set] or do not operate the keypad for 15 s
- press [▲] and [▼] for 4 s: the display will show "**dEF**"
- press [set]
- press [▲] or [▼] within 15 s to set "**149**"
- press [set] or do not operate the keypad for 15 s: the display will flash "**dEF**" for 4 s, after which the device will exit the procedure
- interrupt the power to the device.

Ensure that the parameter default values are appropriate, particularly if the probes are PTC type.

4 HACCP

4.1 Introductory comments

The device is capable of storing up to 9 HACCP alarms, after which the most recent alarm will overwrite the oldest.

The device can furnish the following information:
- the critical value
- the data and time at which the alarm occurred
- the alarm duration (from 1 minute to 99 hours and 59 minutes, partial if the alarm is ongoing)

CODE	ALARM TYPE (AND CRITICAL VALUE)
AL	minimum temperature alarm (the minimum temperature of the cabinet or the minimum temperature detected by the auxiliary probe during the alarm state)
AH	maximum temperature alarm (the maximum temperature of the cabinet or the maximum temperature detected by the auxiliary probe during the alarm state)
id	microport input alarm (the maximum temperature of the cabinet during the alarm state); see also parameter i4
PF	power failure alarm (the temperature of the cabinet on restoration of the power supply); see also parameter AA

Warnings:
- **the device records minimum temperature alarms and maximum temperature alarms providing the temperature associated with the alarm is the cabinet temperature (parameters A0 and A3 = 0) or the temperature measured by the auxiliary probe, providing its function is that of display probe (parameter P4 = 1 and parameters A0 = 2 and A3 = 1)**
- **in order to avoid repeatedly recording power failure alarms, disconnect the device power supply while in stand by mode**
- **if the duration of a power failure alarm is such as to cause a clock error, then the device will not provide any information regarding alarm duration**
- **no alarms will be recorded if the device is in stand-by mode.**

When the cause of the alarm is resolved, the display returns to normal, except in the case of a power failure alarm where normal display function must be restored manually.

To restore the normal display manually:
- press any key.

If parameter u1 is set to 4 (or the service controlled by the fourth output is the alarm output), then pressing any key will also deactivate the alarm output.

The HACCP LED provides information relating to the status of the **HACCP** alarm memory; please refer to paragraph 6.1.

4.2 Viewing HACCP alarm information

To access the procedure:
- ensure the keyboard is not blocked and that no procedures are running
- press [▼] for 2 s: the display will show the first available label
- press [▲] or [▼] to select "**LS**"

- press [set] the display will show the most recent alarm code, or one of the codes reported in the table in paragraph 4.1 followed by the number "**1**" (the higher the number following the code, the older the alarm).

To select an alarm:
- press [▲] or [▼] (to select "**AH3**" for example).

To display the information relating to the alarm:
- press [set] the **HACCP** LED will stop flashing and remain on and the display will show the following information in succession (for example):

INFO	MEANING
8,0	the critical value is 8.0 °C/8 °F
StA	the display is about to show the data and time at which the alarm occurred
y07	the alarm occurred in 2007 (continued …)
n03	the alarm occurred in the month of march (continued …)
d26	the alarm occurred on 26 March 2007
h16	the alarm occurred at 16 hours (continued …)
n30	the alarm occurred at 16:30 hours
dur	the display is about to show the alarm duration
h01	the alarm lasted for 1 hour (continued …)
n15	the alarm lasted for 1 hour and 15 minutes
AH3	the selected alarm

The display shows each piece of information for 1 s.

To exit the information series:
- press [❦] the display will show the selected alarm.

To exit the procedure:
- exit the information series
- press [▲] or [▼] until the display shows the quantity assigned by parameter P5 or do not operate the keypad for 60 s.

Alternatively:
- exit the information series
- press [❦]

If the instrument has stored no alarm, the label "**LS**" will not be shown.

4.3 Deleting the HACCP alarm list

- ensure the keyboard is not blocked and that no procedures are running
- press [▼] for 2 s: the display will show the first available label
- press [▲] or [▼] to select "**rLS**"
- press [set]
- press [▲] or [▼] within 15 s to set "**149**"
- press [set] or do not operate the keypad for 15 s: the display will flash "**----**" for 4 s and the **HACCP** LED will be turned off, after which the device will exit the procedure.

If the instrument has stored no alarm, the label "**rLS**" will not be shown.

5 COMPRESSOR OPERATION TIME COUNTER

5.1 Introductory comments

The device is capable of recording up to 9,999 hours of compressor function, after which the number "**9999**" flashes.

5.2 Displaying the compressor operation time

- ensure the keyboard is not blocked and that no procedures are running
- press [▼] for 2 s: the display will show the first available label
- press [▲] or [▼] to select "**CH**"
- press [set]

To exit the procedure:
- press [set] or do not operate the keypad for 60 s
- press [▲] or [▼] until the display shows the quantity assigned by parameter P5 or do not operate the keypad for 60 s.

Alternatively:
- press [❦]

5.3 Resetting the compressor operation time

- ensure the keyboard is not blocked and that no procedures are running
- press [▼] for 2 s: the display will show the first available label
- press [▲] or [▼] to select **rCH**"
- press [set]
- press [▲] or [▼] within 15 s to set "**149**"
- press [set] or do not operate the keypad for 15 s: the display will flash "**----**" for 4 s, after which the device will exit the procedure.

6 INDICATORS

6.1 Indicators

LED	MEANING
❄	compressor LED if on then the compressor is on if flashing: ▪ the operational setpoint is being changed ▪ compressor protection is ongoing (parameters C0, C1, C2 and i7)
❋	defrosting LED if on, defrosting ongoing if flashing: ▪ defrosting has been requested, but compressor protection is ongoing (parameters C0 and C2) ▪ drip-draining is ongoing (parameter d7) ▪ refrigerant fluid heating is ongoing (parameter dA)
⊛	Evaporator fan LED if on then the evaporator fan is on if flashing, then evaporator fan stop is ongoing (parameter F3)

HACCP	HACCP LED if on, you will have not shown all the information on the HACCP alarms if flashing, the instrument will have stored at least one new HACCP alarm if off, you will have shown all the information on the HACCP alarms or you will have cancelled the list of the HACCP alarms
⚒	Maintenance LED if on, compressor maintenance will be required (parameter C10)
⚠	alarm LED if on, an alarm state or an error is ongoing
⏻	on/stand-by LED if on, the device is in stand-by mode
°C	degree Celsius LED if on, the unit of measurement for temperature is degrees Celsius (parameter P2) if flashing, then the Energy Saving function is in operation (parameters r4, i5, HE1 and HE2)
°F	degree Fahrenheit LED if on, the unit of measurement for temperature is degrees Fahrenheit (parameter P2) if flashing, then the Energy Saving function is in operation (parameters r4, i5, HE1 and HE2)
⋈	Multifunction LED **parameter u1 is set to 0 (i.e. the service controlled by the fourth output is the cabinet light)** if on, the cabinet light will have been switched on manually if flashing, the cabinet light will have been turned on remotely (parameter i0) **parameter u1 is set to 1, 4, 5, 6 or 7** if on, the service controlled by the fourth output will be turned on **parameter is set to 2 (i.e. the service controlled by the fourth output is the auxiliary output)** if on, the auxiliary output will have been turned on manually if flashing, the auxiliary output will have been turned on remotely (parameter i5) **parameter u1 is set to 3 (i.e. the service controlled by the fourth output is compressor 2)** if on, compressor 2 is on if flashing, compressor 2 delay is ongoing (parameter C9)

CODE	MEANING
Loc	the key and/or operational setpoint are blocked (parameter r3), refer to paragraph 2.11
----	the quantity for display is not available (e.g. the probe is absent)

7 ALARMS

7.1 Alarms

CODE	MEANING
AL	Minimum temperature alarm (**HACCP alarm**) Remedies: ▪check the alarm temperature ▪ check parameters A0, A1 and A2 Main consequences: ▪ if parameter A0 is set to 0 or if parameter P4 is set to 1 and parameter A0 is set to 2, the device records the alarms ▪ if parameter u1 is set to 4, the alarm output will be activated
AH	Maximum temperature alarm (**HACCP alarm**) Remedies: ▪ check the alarm temperature ▪ check parameters A3, A4 and A5 Main consequences: ▪ if parameter A3 is set to 0 or if parameter P4 is set to 1 and parameter A3 is set to 1, the device records the alarms ▪ if parameter u1 is set to 4, the alarm output will be activated
id	Microport input alarm (**HACCP alarm**) Remedies: ▪ check the causes which activated the input ▪ check parameters i0, i1 and i4 Main consequences: ▪ the outcome set by parameter i0 ▪ if parameter i4 is set to 1, the device records the alarms, providing parameter i2 is not set to -1 ▪ if parameter u1 is set to 4, the alarm output will be activated
PF	Power failure alarm (**HACCP alarm**) Remedies: ▪ check the causes of the power failure ▪ press any key Main consequences: ▪ the device records the alarm; see also parameter AA ▪ if parameter u1 is set to 4, the alarm output will be activated; pressing any key will also deactivate the alarm output
iA	Input malfunction alarm (only if parameter P4 is set to 3) Remedies: ▪ check the causes which activated the input

▪ check parameters i5 and i6

Main consequences:

▪ if parameter i5 is set to 4, the device will continue to operate as normal

▪ if parameter i5 is set to 5, the compressor will be switched off

▪ if parameter u1 is set to 4, the alarm output will be activated

iSd	Device blocked alarm (only if parameter P4 is set to 3) Remedies: ▪ check the causes which activated the input malfunction ▪ switch the device off then on, or disconnect the power supply ▪ check parameters i5, i6, i7, i8 and i9 Main consequences: ▪ the regulators will be switched off ▪ if parameter u1 is set to 4, the alarm output will be activated
COH	Condenser overheating alarm (only if parameter P4 is set to 3) Remedies: ▪ check the condenser temperature ▪ check parameter C6 Main consequences: ▪ if parameter u1 is set to 4, the alarm output will be activated
CSd	Compressor blocked alarm (only if parameter P4 is set to 3) Remedies: ▪ check the condenser temperature ▪ switch the device off and then on again: if on switching back on again the condenser temperature is still above the value established by parameter C7, it will be necessary to disconnect the power supply and clean the condenser ▪ check parameter C7 Main consequences: ▪ the compressor and evaporator fan will be switched off ▪ if parameter u1 is set to 4, the alarm output will be activated

When the cause that triggered the alarm has been resolved, the device will restore normal operation, except for the following alarm states:

▪ the power failure alarm (code "**PF**") requiring that a key be pressed; if parameter u1 is set to 4 (i.e. the service controlled by the fourth output is the alarm output), pressing any key will also deactivate the alarm output

▪ the device blocked alarm (code "**iSd**") which requires the device be switched off or the power supply disconnected

▪ the compressor blocked alarm (code "**CSd**") which requires the device be switched off or the power supply disconnected.

8 INTERNAL DIAGNOSTICS

8.1 Internal Diagnostics

CODE	MEANING
Pr1	Cabinet probe error Remedies: ▪ see parameter P0 ▪ check probe integrity ▪ check probe-device connection ▪ check the cabinet temperature Main consequences: ▪ the activity of the compressor will depend on parameters C4 and C5 ▪ defrosting will never be activated ▪ if parameter u1 is set to 4, the alarm output will be activated ▪ if parameter u1 is set to 5 or 6, the fourth output will be deactivated
Pr2	Evaporator probe error Remedies: ▪ the same as for the previous case, but in relation to the evaporator probe Main consequences: ▪ if parameter P3 is set to 1, defrosting will last for the duration established by parameter d3 ▪ if parameter P3 is set to 1 and parameter d8 is set to 2, the device will operate as though parameter d8 was set to 0 ▪ if parameter F0 is set to 3 or 4, the device will operate as though the parameter was set to 2 ▪ if parameter u1 is set to 4, the alarm output will be activated
Pr3	Auxiliary probe error (only if parameter P4 is set to 1 or 2) Remedies: ▪ the same as for the previous case, but in relation to the auxiliary probe Main consequences: ▪ if parameter u1 is set to 4, the alarm output will be activated
rtc	Clock error Remedies: ▪ reset the date and time Main consequences: ▪ if parameter d8 is set to 3, the device will operate as though the parameter was set to 0

▪ functions relating to date and time will not be available (Energy Saving, HACCP, etc ...)

▪ if parameter u1 is set to 4, the alarm output will be activated

When the cause of the alarm is resolved, the device restores normal operation, except for clock errors (code "**rtc**") which require the date and time to be reset.

9 TECHNICAL DATA

9.1 Technical data

Case: grey self-extinguishing.

Front panel protection classification: IP 65.

Connections: screw terminal blocks (power supply, inputs and outputs), 6 pin connector (serial port; by request), 4 pin connector (to remote indicator; by request); spring extractable terminal blocks (power supply, inputs and outputs) by request.

Operating temperature: from 0 to 55°C (from 32 to 131°F, 10 ... 90% relative humidity, without condensation).

Power supply: 12 VAC/DC (or 12-24 VAC/DC), 50/60 Hz, 3.5 VA (approximate) or 115 ... 230 VAC, 50/60 Hz, 5 VA (approximate).

Maintenance of clock data in absence of power supply: 24 hours will battery fully charged.

Battery charge time: 2 minutes without interruptions (the battery is charged by the device power supply).

Alarm buzzer: available by request.

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

Digital inputs: 1 (microport) for NA/NC contact (clean contact, 5 V, 1 mA); fourth input can be configured as sensor input (display probe or condenser probe, for PTC/NTC probes) or digital input (multifunction, clean contact, 5 V, 1 mA).

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

Sensitivity: 0.1°C/1°C/1°F.

Digital outputs: 4 relays:

- **compressor relay:** 16 A res. @ 250 VAC (exchange contacts)
- **defrost relay:** 8 A res. @ 250 VAC (exchange contacts)
- **evaporator fan relay**: 8 A res. @ 250 VAC (NA contacts)
- **fourth output**: 8 A res. @ 250 VAC (exchange contacts).

The maximum permitted current on loads is 10 A.

Serial port: port for communicating with the monitoring system (by means of a serial interface, via TTL, using the MODBUS communication protocol) or with the programming key; by request.

Other communication ports: port for communicating with the remote indicator; by request.

10 OPERATIONAL SETPOINT AND CONFIGURATION PARAMETERSE

10.1 Operational setpoint

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

10.2 Configuration paramaters

PARAM.	MIN.	MAX.	U.O.M.	DEF.	OPERATIONAL SETPOINT
SP	r1	r2	°C/°F (1)	0,0	operational setpoint
PARAM.	MIN.	MAX.	U.O.M.	DEF.	INGRESSI DI MISURA
CA1	-25,0	25,0	°C/°F (1)	0,0	cabinet probe offset
CA2	-25,0	25,0	°C/°F (1)	0,0	evaporator probe offset
CA3	-25,0	25,0	°C/°F (1)	0,0	auxiliary probe offset (only if P4 = 1 or 2)
P0	0	1	- - - -	1	probe type 0 = PTC 1 = NTC
P1	0	1	- - - -	1	degree Celsius decimal point (for the quantity displayed during normal operation) 1 = YES
P2	0	1	- - - -	0	unit of temperature measurement (2) 0 = °C 1 = °F
P3	0	2	- - - -	1	evaporator probe function 0 = no probe 1 = defrosting probe and evaporator fan thermostat probe 2 = evaporator fan thermostat probe
P4	0	3	- - - -	3	fourth input function 0 = no probe 1 = sensor input (auxiliary probe, display probe) 2 = sensor input (auxiliary probe, condenser probe) 3 = digital input (multifunction input)
P5	0	4	- - - -	0	quantity displayed during normal operation 0 = cabinet temperature 1 = operational setpoint 2 = evaporator temperature 3 = "cabinet temperature - evaporator temperature" 4 = temperature detected by the auxiliary probe (only if P4 = 1 or 2)
P6	0	4	- - - -	0	quantity displayed by the remote indicator 0 = cabinet temperature 1 = operational setpoint 2 = evaporator temperature 3 = "cabinet temperature - evaporator temperature" 4 = temperature detected by the auxiliary probe (only if P4 = 1 or 2)
PARAM.	MIN.	MAX.	U.O.M.	DEF.	MAIN CONTROLLER
r0	0,1	15,0	°C/°F (1)	2,0	operational setpoint differential
r1	-99,0	r2	°C/°F (1)	-50,0	minimum operational setpoint
r2	r1	99,0	°C/°F (1)	50,0	maximum operational setpoint
r3	0	1	- - - -	0	block operational setpoint change (with the procedure indicated in paragraph 3.2) 1 = YES
r4	0,0	99,0	°C/°F (1)	0,0	temperature increase during Energy Saving function (only if P4 = 3 and i5 = 2 or 3); refer also to HE1 and HE2
PARAM.	MIN.	MAX.	U.O.M.	DEF.	COMPRESSOR PROTECTIONS (3)
C0	0	240	min	0	compressor delay from device power on (4)
C1	0	240	min	5	minimum time between two successive compressor operations; also compressor delay on resolution of cabinet probe error (5) (6)
C2	0	240	min	3	minimum compressor shut-down time (5)
C3	0	240	s	0	minimum compressor start-up time
C4	0	240	min	10	duration of compressor shut-down during cabinet probe error; see also C5
C5	0	240	min	10	duration of compressor start-up during cabinet probe error; see also C4
C6	0,0	200,0	°C/°F (1)	80,0	condenser temperature above which the condenser overheating alarm is activated (only if P4 = 2) (7)
C7	0,0	200,0	°C/°F (1)	90,0	condenser temperature above which the compressor block alarm is activated (only if P4 = 2)
C8	0	15	min	1	compressor block alarm delay (only if P4 = 2) (8)
C9	0	120	s	5	compressor 2 delay from power up of compressor 1 (only if u1 = 3)
C10	0	9999	h	1000	number of hours of compressor operation above which maintenance request is indicated 0 = no function
PARAM.	MIN.	MAX.	U.O.M.	DEF.	DEFROSTING
d0	0	99	h	8	defrost interval (only if d8 = 0, 1 or 2) (9) 0 = regular periodic defrosting will never be activated
d1	0	1	- - - -	0	type of defrosting 0 = electric 1= hot gas
d2	-99,0	99,0	°C/°F (1)	2,0	defrost end temperature (only if P3 = 1)
d3	0	99	min	30	defrost duration if P3 = 0 or 2; maximum defrost duration if P3 = 1 0 = defrosting will never be activated
d4	0	1	- - - -	0	defrosting at device power on (only if d8 = 1, 2 or 3) (4) 1 = YES
d5	0	99	min	0	defrost delay from device power on (only if d4 = 1); see also i5 (4)
d6	0	1	- - - -	1	temperature displayed during defrosting (only if P5 = 0) 0 = cabinet temperature 1 = if, on activation of defrosting the cabinet temperature is below the "operational setpoint + r0", at most "operational setpoint + r0"; if on activation of defrosting the cabinet temperature is above the "operational setpoint + r0", at most the cabinet temperature at activation of defrosting (10)
d7	0	15	min	2	drip-drain duration
d8	0	3	- - - -	0	method of activation of defrosting 0 = <u>PERIODIC</u> - defrosting will be activated when the device has been left running for the length of time d0 1 = <u>PERIODIC</u> - defrosting will be activated when the compressor has been running for the length of time d0 2 = <u>PERIODIC</u> - defrosting will be activated when the evaporator temperature remains below the temperature set by d9 for the amount of time et by d0 (11) 3 = <u>REAL TIME</u> - defrosting will be activated at the times established by parameters Hd1 ... Hd6
d9	-99,0	99,0	°C/°F (1)	0,0	the evaporator temperature above which the defrost interval count is suspended (only if d8 = 2)
dA	0	99	min	0	minimum compressor on duration on activation of defrosting so that they may be activated (only if d1 = 1) (12)
PARAM.	MIN.	MAX.	U.O.M.	DEF.	TEMPERATURE ALARMS
A0	0	2	- - - -	0	temperature associated with the minimum temperature alarm 0 = cabinet temperature 1 = evaporator temperature (13) 2 = temperature detected by the auxiliary probe (only if P4 = 1 or 2) (14)
A1	-99,0	99,0	°C/°F (1)	-10,0	the temperature below which the minimum temperature alarm is activated; see also A0 and A2 (7)

PARAM.	MIN.	MAX.	U.O.M.	DEF.	
A2	0	2	- - - -	1	minimum temperature alarm type
					0 = no alarm
					1 = in relation to the operational setpoint (i.e. "operational setpoint - A1"; consider A1 to be without sign)
					2 = absolute (i.e. A1)
A3	0	1	- - - -	0	temperature associated with the maximum temperature alarm
					0 = cabinet temperature
					1 = temperature detected by the auxiliary probe (only if P4 = 1 or 2) (14)
A4	-99,0	99,0	°C/°F (1)	10,0	the temperature above which the maximum temperature alarm is activated; see also A3 and A5 (7)
A5	0	2	- - - -	1	maximum temperature alarm type
					0 = no alarm
					1 = in relation to the operational setpoint (i.e. "operational setpoint + A4"; consider A4 to be without sign)
					2 = absolute (i.e. A4)
A6	0	240	min	120	maximum temperature alarm delay on switching on device (only if A3 = 0 or if P4 = 1 and A3 = 1) (4)
A7	0	240	min	15	temperature alarm delay
A8	0	240	min	15	maximum temperature alarm delay on conclusion of evaporator fan stop (only if A3 = 0 or if P4 = 1 and A3 = 1) (15)
A9	0	240	min	15	maximum temperature alarm delay on microport input deactivation (only if A3 = 0 or if P4 = 1 and A3 = 1) (16)
AA	0	240	min	1	delay recording of power failure alarm
PARAM.	MIN.	MAX.	U.O.M.	DEF.	EVAPORATOR FAN
F0	0	4	- - - -	1	evaporator fan activity during normal operation
					0 = off
					1 = on
					2 = in parallel with compressor
					3 = dependent on F1 (17)
					4 = off if the compressor is off, dependent on F1 if the compressor is on (17)
F1	-99,0	99,0	°C/°F (1)	-1,0	evaporator temperature above which the evaporator fan is switched off (only if F0 = 3 or 4) (7)
F2	0	2	- - - -	0	evaporator fan activity during defrosting and drip-draining
					0 = off
					1 = on (it is recommended that parameter d7 be set to 0)
					2 = dependent on F0
F3	0	15	min	2	evaporator fan stop duration
PARAM.	MIN.	MAX.	U.O.M.	DEF.	DIGITAL INPUTS
i0	0	5	- - - -	1	effect caused by activation of microport input; see also i4
					0 = no effect
					1 = the cabinet light will be switched on (only if u1 = 0, until the input is deactivated)
					2 = the evaporator fan will be switched off (for up to the length of time set by i3 or until the input is deactivated)
					3 = the compressor and evaporator fan will be switched off (for up to the length of time set by i3 or until the input is deactivated) (18)
					4 = the evaporator fan will be switched off (for up to the length of time set by i3 or until the input is deactivated) and the cabinet light will be switched on (only if u1 = 0, until the input is deactivated)
					5 = the compressor and evaporator fan will be switched off (for up to the length of time set by i3 or until the input is deactivated) and the cabinet light will be switched on (only if u1 = 0, until the input is deactivated) (18)
i1	0	1	- - - -	0	microport input contact type
					0 = NA (input active with contact closed)
					1 = NC (input active with contact open)
i2	-1	120	min	30	microport input alarm signal delay
					-1 = the alarm will not be reported
i3	-1	120	min	15	maximum duration of the effect caused by activation of the microport input on the compressor and on the evaporator fan
					-1 = the effect will last until the input will be disabled
i4	0	1	- - - -	0	recording of microport input alarm (19)
					1 = YES
i5	0	7	- - - -	4	effect caused by activation of the multifunction input (only if P4 = 3)
					0 = no effect
					1 = DEFROST SYNCHRONISATION - after the period of time set by d5 defrosting will be activated
					2 = ACTIVATION OF ENERGY SAVING FUNCTION - the Energy Saving function will be activated (until the input is deactivated); see also r4
					3 = CLOSURE OF THE AWNING - the cabinet light will be turned off (only if u1 = 0 and only if switched on manually) and the Energy Saving function will be activated (until the input is deactivated); see also r4
					4 = ALARM ACTIVATION - after the amount of time set by i7 the display will flash the code "iA" and the buzzer will be activated (until the input is deactivated)
					5 = TRIPPING THE PRESSURE SWITCH - the compressor will be switched off, the display will flash the code "iA" and the buzzer will be activated (until the input is deactivated); see also i7, i8 and i9
					6 = TURNING ON THE AUXILIARY OUTPUT - the auxiliary output will be turned on (only if u1 = 2, until the input is deactivated)
					7 = SWITCHING OFF THE DEVICE - the device will switch to stand-by mode (until the input is deactivated)
i6	0	1	- - - -	0	type of multifunction input contact (only if P4 = 3)
					0 = NA (input active with contact closed)
					1 = NC (input active with contact open)
i7	0	120	min	0	if i5 = 4, delayed multifunction input alarm notification (only if P4 = 3)
					if i5 = 5, delayed multifunction input deactivation compressor delay (only if P4 = 3) (20)
i8	0	15	- - - -	0	number of multifunction input alarms such as to cause device block alarm (only if P4 = 3 and i5 = 5)
					0 = no alarm
i9	1	999	min	240	time that must elapse without multifunction input alarms so that the alarm counter is zeroed (only if P4 = 3 and i5 = 5)
PARAM.	MIN.	MAX.	U.O.M.	DEF.	DIGITAL OUTPUTS
u1	0	7	- - - -	0	service controlled by the fourth output (21)
					0 = CABINET LIGHT - in this case, the important factors are: the key [key], parameters i0, i5 and u2
					1 = DEMISTING HEATER - in this case, the important factors are: the key [key] and parameter u6
					2 = AUXILIARY OUTPUT - in this case, the important factors are: the key [key], parameters i5 and u2
					3 = COMPRESSOR 2 - in this case, the important factor is parameter C9
					4 = ALARM OUTPUT - the output is activated during an alarm and during an error; in this case the important factors are parameters u3 and u4
					5 = DOOR ELEMENT - in this case the important factor is parameter u5
					6 = EVAPORATOR VALVE - in this case the important factors are parameters u7 and u8
					7 = DEFROST SYNCHRONISATION - the output works in parallel with the defrost output; in this case the important parameter is factor i5 (22) (23) enabling cabinet light or auxiliary
u2	0	1	- - - -	0	enables manual switching on/off of the cabinet light or auxiliary output while in stand-by mode (only if u1 = 0 or 2) (24)
					1 = YES
u3	0	1	- - - -	1	alarm output polarity (only if u1 = 4)
					0 = disabled during normal operation (the contact between terminals 6 and 7 will be open) and activated during an alarm and during an error (the contact between terminals 6 and 7 will be closed)
					1 = activated during normal operation (the contact between terminals 6 and 7 will be closed) and disabled during an alarm and during an error (the contact between terminals 6 and 7 will be open)
u4	0	1	- - - -	0	enable alarm output deactivation with muting of buzzer (only if u1 = 4)
					1 = YES
u5	-99,0	99,0	°C/°F (1)	-1,0	cabinet temperature above which the door element is switched off (only if u1 = 5) (7)
u6	1	120	min	5	demisting heating duration (only if u1 = 1)
u7	0,0	99,0	°C/°F (1)	2,0	cabinet temperature below which the evaporator valve is deactivated (in relation to the operational setpoint, i.e. the "operational setpoint + u7") (only if u1 = 6) (7)
u8	0	1	- - - -	0	evaporator valve contact type (only if u1 = 6)
					0 = NA (valve active with contact closed)
					1 = NC (valve active with contact open)

PARAM.	MIN.	MAX.	U.O.M.	DEF.	REAL TIME ENERGY SAVING
HE1	00:00	23:59	h:min	00:00	real time Energy Saving function activation time; see also r4 and HE2
HE2	00:00	23:59	h:min	00:00	real time Energy Saving function duration; see also r4 and HE1
					00:00 = the real time Energy Saving function is never activated
PARAM.	MIN.	MAX.	U.O.M.	DEF.	REAL TIME DEFROSTING
Hd1	00:00	23:59	h:min	- - : - -	first real time defrost activation time (only if d8 = 3)
					–:– = first real time defrost never activated
Hd2	00:00	23:59	h:min	- - : - -	second real time defrost activation time (only if d8 = 3)
					–:– = second real time defrost never activated
Hd3	00:00	23:59	h:min	- - : - -	third real time defrost activation time (only if d8 = 3)
					–:– = third real time defrost never activated
Hd4	00:00	23:59	h:min	- - : - -	fourth real time defrost activation time (only if d8 = 3)
					–:– = fourth real time defrost never activated
Hd5	00:00	23:59	h:min	- - : - -	fifth real time defrost activation time (only if d8 = 3)
					–:– = fifth real time defrost never activated
Hd6	00:00	23:59	h:min	- - : - -	sixth real time defrost activation time (only if d8 = 3)
					–:– = sixth real time defrost never activated
PARAM.	MIN.	MAX.	U.O.M.	DEF.	SERIAL NETWORK (MODBUS)
LA	1	247	- - - -	247	device address
Lb	0	3	- - - -	2	baud rate (0 = 2.400 baud, 1 = 4.800 baud, 2 = 9.600 baud, 3 = 19.200 baud)
LP	0	2	- - - -	2	parity
					0 = none (no parity)
					1= odd
					2 = even
PARAM.	MIN.	MAX.	U.O.M.	DEF.	RESERVED
E9	0	1	- - - -	1	reserved

(1)   the unit of measurement depends on parameter P2

(2)   set appropriate regulator parameters after altering parameter P2

(3)   if parameter u1 is set to 3, the service controlled by the fourth output will be compressor 2: compressor 1 and compressor 2 are referred to as "compressor"; compressor 2 operates in parallel with compressor 1, regardless of parameter C9

(4)   the parameter is even effective after power supply interruption, such as when the device is switched on

(5)   the time period established by the parameter is counted even while in stand-by mode

(6)   if parameter C1 is set to 0, the cabinet probe error resolution delay will be 2 minutes in any case

(7)   the parameter differential is 2.0°C/4°F

(8)   if, on device start-up, the condenser temperature is already above that established by parameter C7, parameter C8 will have no effect

(9)   the device stores the defrost interval count every 30 minutes; altering parameter d0 has the effect of concluding the previous defrost interval or manual defrost activation

(10)   the display is restored to normal operation when, the evaporator fan stop is concluded, the cabinet temperature drops below that which blocked the display (or if a temperature alarm occurs)

(11)   if parameter P3 is set to 0 or 2, the device will operate as though parameter d8 was set to 0

(12)   if, on defrost activation, the compressor on duration is less than the time established by parameter dA, the compressor will remain on for the fraction of time required to complete it

(13)   if parameter P3 is set to 0, the device will operate as though parameter A0 was set to 0, but will not record the alarm

(14)   if parameter P4 is set to 0 or 3, the device will operate as though the parameter was set to 0, but will not record the alarm

(15)   during defrosting, drip draining and ventilator fan stop, there are no temperature alarms, if said occur following defrost activation

(16)   there is no maximum temperature alarm while microport input is enabled, if occurring after input activation

(17)   if parameter P3 is set to 0, the device will operate as though parameter F0 was set to 2

(18)   the compressor is switched off 10 s after activation of the input; if the input is activated during defrosting or evaporator fan stop, activation will have no effect on the compressor

(19)   the device records alarms occurring after the time established by parameter i2; if parameter i2 is set to -1, the device does not record the alarms

(20)   ensure that the time established by parameter i7 s less than that established by parameter i9

(21)   in order to avoid damage to the service connected, modify the parameter while in stand-by mode

(22)   if the fourth output terminals are connected to the fourth input terminals of several devices, it will be possible to synchronise defrosting (providing that in each device, parameter P4 is set to 3, that parameter i5 is set to 1 and parameter u1 is set to 7); in this case, drip-drain duration counting starts when defrosting of the last device is concluded

(23)   it is recommended that parameter d7 for each device be set to the same value (different from 0 min); similarly, it is recommended to set parameter F3 for each device to the same value

(24)   if parameter u2 is set to 0, switching off the device may cause switching off of the cabinet light or the auxiliary output (the service will remain off on subsequent switching on of the device); if parameter u2 is set to 1, switching off the device does not cause switching off of the cabinet light or the auxiliary output (the service remains on on subsequent switching on of the device).

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