



PSK214

Digital Thermostats for Low Temperature Refrigerating Units

INSTALLATION AND OPERATING INSTRUCTIONS



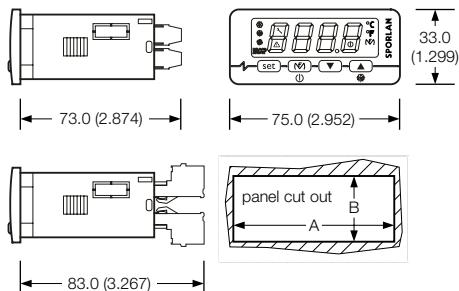
1 GETTING STARTED

1.1 Important

Read these instructions carefully before installing and operating this controller and follow all additional information for installation and electrical connection. Keep this guide for future reference.

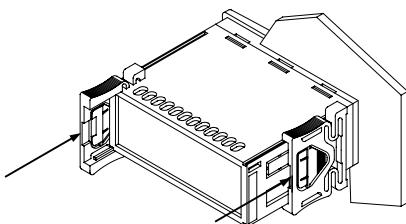
1.2 Installing the controller

Size - mm (inches)



Dimension	Minimum		Typical		Maximum	
	mm	inches	mm	inches	mm	inches
A	71.0	2.79	71.0	2.79	71.8	2.82
B	29.0	1.14	29.0	1.14	29.8	1.17

Installation - Panel mounting, with click brackets (supplied by the builder).



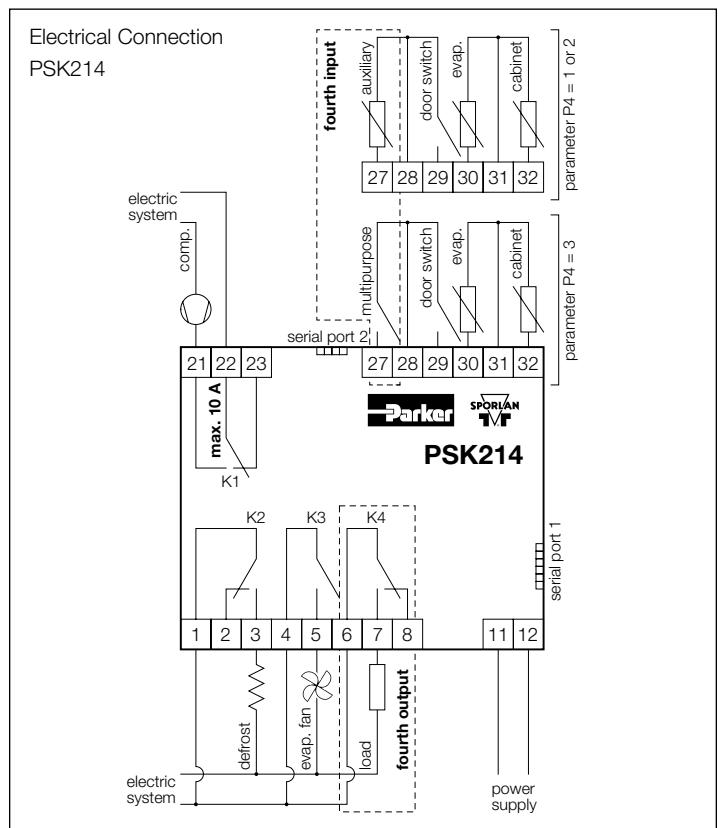
Additional information for installation:

- 83.0 mm (3.267 inches) is the maximum depth with extractable terminal blocks
- the panel thickness must not be greater than 8.0 mm (0.314 inches)
- working conditions (working temperature, humidity, etc.) must be between the limits indicated in the technical data
- do not install the controller close to heat sources (heaters, hot air ducts, etc.), devices containing large magnets, locations subject to direct sunlight, moisture, humidity, dust, mechanical vibrations or shocks
- according to safety regulations, protection against access to electrical parts must be ensured by a correct installation of the controller;

the parts that ensure this protection must be installed so that they can not be removed without the use of a tool.

1.3 Wiring diagram

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
- serial port 1 is 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**

Additional information for electrical connection:

- do not operate on the terminal blocks with electrical screwdrivers/wrenches
- if the controller has been moved from a cold location to a warm one, condensation may occur on the inside of the unit; wait at least one hour before attempting to power up and use the controller
- make sure that the supply voltage and frequency are correct for the power supply of the controller
- always disconnect power from the unit before servicing it

- this controller is not intended to be used as a safety control device
- please contact your Parker Sporlan Sales Engineer prior to any servicing of this controller.

2 USER INTERFACE

2.1 Introductory comments

The device has the following operational states:

- “on” (power is connected and the controller is on: the regulators may be switched on)
- “stand-by” (power is connected but software sets the controller 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 “turning on” is understood to mean switching from the stand-by state to on; the term “turning off” is understood to mean switching from the on state to the stand-by state.

When the controller is turned on, it restores the state it was in when power was interrupted.

2.2 Manual switching on/off of the controller

- make sure the keyboard is not locked and no procedure is running
- press and hold  for 4 seconds.

It is also possible to turn the controller on/off using the multifunction input.

2.3 The display

If the controller is turned on, during normal operation the display will show the quantity you have set with parameter P5:

- if P5 = 0, the display will show the temperature of the cabinet
- if P5 = 1, the display will show the working 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 read by the auxiliary probe (only if parameter P4 has value 1 or 2).

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

2.4 Showing the cabinet temperature

- make sure the keyboard is not locked and no procedure is running
- press and hold  for 2 seconds: the display will show the first available label
- press  or  to select “Pb1”
- press 

To quit the procedure:

- press  or do not press any other buttons for 60 seconds
- press  or  as long as the display shows the quantity you have set with parameter P5 or do not press any other buttons for 60 seconds.

Alternatively:

- press 

2.5 Showing the evaporator temperature

- make sure the keyboard is not locked and no procedure is running
- press and hold  for 2 seconds: the display will show the first available label
- press  or  to select “Pb2”
- press 

To quit the procedure:

- press  or do not press any other buttons for 60 seconds
- press  or  as long as the display shows the quantity you have set with parameter P5 or do not press any other buttons for 60 seconds.

Alternatively:

- press 

If there is no evaporator probe (parameter P3 = 0), label “Pb2” will not be shown.

2.6 Showing the temperature read by the auxiliary probe (only if parameter P4 has value 1 or 2)

- make sure the keyboard is not locked and no procedure is running
- press and hold  for 2 seconds: the display will show the first available label
- press  or  to select “Pb3”
- press 

To quit the procedure:

- press  or do not press any other buttons for 60 seconds
- press  or  as long as the display shows the quantity you have set with parameter P5 or do not press any other buttons for 60 seconds.

Alternatively:

- press 

If the function of the fourth input is not for an auxiliary probe (parameter P4 = 0 or 3), then label “Pb3” will not be shown.

2.7 Manually activating defrost

- make sure the keyboard is not locked and no procedure is running
- press and hold  for 4 seconds.

If the function of the evaporator probe is set for a defrost probe (parameter P3 = 1) and the evaporator temperature is above that established by parameter d2, then defrost will not be activated.

2.8 Manually turning on/off the cabinet light (only if parameter u1 is set to 0)

- make sure no procedures are running
- press 

It is also possible to turn the cabinet light on/off remotely using the micropot and multifunction inputs; see also parameter u2.

2.9 Manually turning on the anti-sweat heater (only if parameter u1 is set to 1)

- make sure the controller is turned on and no procedures are running
- press  for 2 seconds: the anti-sweat heater will be switched on for the period of time established by parameter u6.

Manually turning off of the anti-sweat heater is not permitted.

2.10 Manually turning on/off the auxiliary output (only if parameter u1 is set to 2)

- make sure the keyboard is not locked and no procedure is running
- press 

It is also possible to turn the auxiliary output on/off using the multifunction input.

The auxiliary output can be turned off manually by the same process in section 2.8, only if it was turned on manually (the same applies for remotely turning on the auxiliary output); see also parameter u2.

2.11 Locking/unlocking the keyboard

To lock the keyboard:

- make sure no procedures are running
- press and hold **[set]** and **[▼]** for 2 seconds: the display will show “**Loc**” for 1 second.

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

- manually turn the device on/off
- show the cabinet temperature (using the procedure indicated in paragraph 2.4)
- show the evaporator temperature (using the procedure indicated in paragraph 2.5)
- show the temperature read by the auxiliary probe (using the procedure indicated in paragraph 2.6)
- manually activate defrost
- manually turn the auxiliary output on/off
- view information pertaining to the HACCP alarms
- delete the HACCP alarm list
- change the operational setpoint using the procedure indicated in paragraph 3.1 (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 second.

To unlock the keyboard:

- press and hold **[set]** and **[▼]** for 2 seconds: the display will show “**UnL**” for 1 second.

2.12 Silencing the alarm

- make sure no procedures are running
- press any button (the first button pressed does not trigger the associated effect).

If the fourth output is set as an alarm output (parameter u1 = 4) and parameter u4 is set to 1, then silencing the alarm buzzer will also deactivate the alarm output.

3 SETTINGS

3.1 Setting the date and time (clock)

- make sure the keyboard is not locked and no procedure is running
- press and hold **[▼]** for 2 seconds: the display will show the first available label
- press **[▲]** or **[▼]** to select “**rtc**”.

To modify the year:

- press **[set]** within 60 seconds: the display will show “**yy**” followed by the last two digits of the year
- press **[▲]** or **[▼]** within 15 seconds.

To modify the month:

- press **[set]** within 15 seconds: the display will show “**nn**” followed by the two digits for the month
- press **[▲]** or **[▼]** within 15 seconds.

To modify the day of the month:

- press **[set]** within 15 seconds: the display will show “**dd**” followed by the two digits for the day
- press **[▲]** or **[▼]** within 15 seconds.

To modify the hours:

- press **[set]** within 15 seconds: the display will show “**hh**” followed by the two digits for the hour

- press **[▲]** or **[▼]** within 15 seconds.

To modify the minutes:

- press **[set]** within 15 seconds: the display will show “**nn**” followed by the two digits for the minutes
- press **[▲]** or **[▼]** within 15 seconds
- press **[set]** or do not press any other buttons for 15 seconds.

To exit the procedure:

- press **[▲]** or **[▼]** until display shows the quantity you have set with parameter P5 or do not press any other buttons for 60 seconds.

Alternatively:

- press **[▼]**

3.2 Setting the working setpoint

- make sure the keyboard is not locked and no procedure is running
- press **[set]**: LED  will flash
- press **[▲]** or **[▼]** within 15 seconds; also see parameters r1, r2 and r3
- press **[set]** or do not press any other button for 15 seconds.

You also can modify the working setpoint through parameter SP.

3.3 Setting the configuration parameters

To gain access to the procedure:

- make sure no procedures are running
- press and hold **[▲]** and **[▼]** for 4 seconds: the display will show “**PA**”
- press **[set]**
- press **[▲]** or **[▼]** within 15 seconds to set the display to “**-19**”
- press **[set]** or do not press any other button for 15 seconds
- press and hold **[▲]** and **[▼]** for 4 seconds: the display will show “**SP**”.

To select a parameter:

- press **[▲]** or **[▼]**

To modify a parameter:

- press **[set]**
- press **[▲]** or **[▼]** within 15 seconds
- press **[set]** or do not press any other buttons for 15 seconds.

To quit the procedure:

- press and hold **[▲]** and **[▼]** for 4 seconds or do not press any other buttons for 60 seconds.

Turn off/on the power supply of the controller after the modification of the parameters.

3.4 Restoring the default value of configuration parameters

- make sure no procedure is running
- press and hold **[▲]** and **[▼]** for 4 seconds: the display will show “**PA**”
- press **[set]**
- press **[▲]** or **[▼]** within 15 seconds to set the display to “**743**”
- press **[set]** or do not press any other buttons for 15 seconds
- press and hold **[▲]** and **[▼]** for 4 seconds: the display will show “**DEF**”
- press **[set]**
- press **[▲]** or **[▼]** within 15 seconds to set the display to “**149**”
- press **[set]** or do not press any other buttons for 15 seconds: the display will flash “**DEF**” for 4 seconds, after which the controller will quit the procedure
- turn the controller off then back on after these procedures then confirm that the default values have been reset.

Make sure the default value of the parameters is correct, in particular note if the probes are PTC probes.

4 HACCP

4.1 Introductory comments

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

The controller can store and recall the following information:

- the critical value
- the date and time at which the alarm occurred
- the alarm duration (from 1 minute to 99 hours and 59 minutes)

CODE ALARM TYPE (AND CRITICAL VALUE)

AL	Low temperature alarm (the minimum temperature of the cabinet or the minimum temperature detected by the auxiliary probe during an any alarm state of this type)
AH	High temperature alarm (the maximum temperature of the cabinet or the maximum temperature detected by the auxiliary probe during an any alarm state of this type)
id	Micropoint input alarm (the maximum temperature of the cabinet during an any alarm state of this type); 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 low temperature alarms and high 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 power supply to the controller 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 by pressing any key.

The HACCP LED indicates the status of the HACCP alarm memory; please refer to paragraph 6.1 for details.

4.2 Viewing HACCP alarm information

To access the procedure:

- make sure the keyboard is not locked and no procedure is running
- press and hold **▼** for 2 seconds: the display will show the first available label
- press **▲** or **▼** to select “LS”
- press **set**: 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**: HACCP LED will stop flashing and remain on and the display will show the following information in succession (for example):

INFO EXPLANATION

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 second.

To quit the information series:

- press **(M)**: display will show the selected alarm.

To quit the procedure:

- quit the information series

- press **▲** or **▼** as long as the display shows the quantity you have set with parameter P5 or do not press any other buttons for 60 seconds.

Alternatively:

- quit the information series

- press **(M)**

If the instrument has stored no alarm, the label “LS” will not be shown.

4.3 Deleting the HACCP alarm list

- make sure the keyboard is not locked and no procedure is running
- press and hold **▼** for 2 seconds: the display will show the first available label
- press **▲** or **▼** to select “rLS”
- press **set**
- press **▲** or **▼** within 15 seconds to set the display to “149”
- press **set** or do not press any other buttons for 15 seconds: the display will flash “---” for 4 seconds and the HACCP LED will be turned off, after which the controller will quit the procedure.

If the instrument has no alarm stored, 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

- make sure the keyboard is not locked and no procedure is running
- press and hold **▼** for 2 seconds: the display will show the first available label
- press **▲** or **▼** to select “CH”
- press **set**

To quit the procedure:

- press **set** or do not press any other buttons for 60 seconds
- press **▲** or **▼** as long as the display shows the quantity you have set with parameter P5 or do not press any other buttons for 60 seconds.

Alternatively:

- press **(M)**

5.3 Resetting the compressor operation time

- make sure the keyboard is not locked and no procedure is running
- press and hold **▼** for 2 seconds: the display will show the first available label

- press or to select “rCH”
- press
- press or within 15 seconds to set the display to “149”
- press or do not press any other buttons for 15 seconds: the display will flash “----” for 4 seconds, after which the controller will quit the procedure.

6 INDICATORS

6.1 Indicators

LED	EXPLANATION
	LED compressor if lit, the compressor is turned on if flashing: <ul style="list-style-type: none">the modification of the working setpoint will be runninga compressor protection will be running (parameters C0, C1, C2 and i7)
	LED defrost if lit, defrost is running if flashing: <ul style="list-style-type: none">defrosting has been requested, but compressor protection is ongoing (parameters C0, C1 and C2)the device is waiting for the drip delay to complete (parameter d7)refrigerant fluid heating is ongoing (parameter dA)
	LED evaporator fan if lit, the evaporator fan is turned on if flashing, the device is waiting for the evaporator fan delay to complete (parameter F3)
HACCP	LED HACCP if lit, some HACCP alarm information has been viewed if flashing, the instrument has stored at least one new HACCP alarm if off, all HACCP alarm information has been viewed
	LED maintenance if lit, compressor maintenance is required (parameter C10)
	LED alarm if lit, an alarm is active
	LED on/stand-by if lit, the device is in stand-by mode
°C	LED Celsius degree if lit, the unit of measure of temperatures is degrees Celsius (parameter P2) if flashing, the Energy Saving function is active (parameters r4, i5, HE1 and HE2)
°F	LED Fahrenheit degree if lit, the unit of measure of temperatures is degrees Fahrenheit (parameter P2) if flashing, the Energy Saving function is active (parameters r4, i5, HE1 and HE2)
	LED Multifunction parameter u1 is set to 0 (i.e. the service controlled by the fourth output is the cabinet light) if lit, 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 lit, 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 lit, 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 lit, compressor 2 is on
if flashing, compressor 2 delay is ongoing (parameter C9)

CODE	EXPLANATION
Loc	the keyboard and/or the working setpoint are locked (parameter r3); also look at paragraph 2.11
----	no data available (for example because the probe is not enabled)

7 ALARMS

7.1 Alarms

CODE	EXPLANATION
AL	Low temperature alarm (HACCP alarm) (parameters A0, A1 and A2)
AH	High temperature alarm (HACCP alarm) (parameters A3, A4 and A5)
id	Micropoint input alarm (HACCP alarm) (parameters i0, i1 and i4)
PF	Power failure alarm (HACCP alarm)
iA	Multipurpose input alarm (only if parameter P4 is set to 3) (parameters i5 and i6)
iSd	Controller locked alarm (only if parameter P4 is set to 3) (parameters i5, i6, i7, i8 and i9)
COH	Overheated condenser alarm (only if parameter P4 is set to 3 (parameter C6))
Csd	Compressor locked alarm (only if parameter P4 is set to 3 (parameter C7))

When the cause of the alarm disappears, the controller restores to normal operation, except for the power failure alarm (code “PF”), controller locked alarm (code “iSd”) and the compressor locked alarm (code “Csd”). These alarms can only be reset by switching the power supply to the controller off/on.

8 INTERNAL DIAGNOSTICS

8.1 Internal diagnostics

CODE	EXPLANATION
Pr1	Cabinet probe error (parameter P0)
Pr2	Evaporator probe error (parameter P0)
Pr3	Auxiliary probe error (only if parameter P4 is set to 1 or 2)
rtc	Clock error

When the cause that initiated the error is corrected, the controller returns to normal operation, except for clock errors (code “rtc”) which require the date and time to be reset.

9 TECHNICAL DATA

9.1 Technical data

Frontal bezel protection: IP 65.

Connections (use copper conductors only): spring extractable terminal blocks (power supply, inputs and outputs) by request, 6 pin connector (serial port).

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

Power supply: 115/230 VAC, 50/60 Hz, 5 VA (approximate).

If the instrument is supplied at 115 ... 230 VAC, protect the power supply with a fuse rated 250 V, 1.25 A, 6.7 I2t.

Insulation class: 2.**Maintenance of clock data in absence of power supply:** 24 hours (if battery starts with full charge).**Battery charge time:** 2 minutes without interruptions (the battery is charged by the device power supply).**Alarm buzzer****Measure inputs:** 2 (cabinet probe and evaporator probe) for PTC/NTC probes.**Digital inputs:** 1 (microport) for NO/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, 5V, 1 mA).**Working range:** from -50 to 150°C (-50 to 300°F) for PTC probe, from -40 to 105°C (-40 to 220°F) for NTC probe.**Resolution:** 0.1°C/1°C/1°F.**Digital outputs - 4 relays:**

- compressor relay: 16 A res. @ 250 VAC, 5 FLA, 30 LRA (exchange contacts)
- defrost relay: 8 A res. @ 250 VAC, 2 FLA, 12 LRA (exchange contacts)
- evaporator fan relay: 8 A res. @ 250 VAC, 2 FLA, 12 LRA (NO contact)
- fourth output: 8 A res. @ 250 VAC, 2 FLA, 12 LRA (exchange contacts).

The maximum current allowed on the load is 10 A.**Serial port:** port for communication with a management system (through a serial interface, via TTL, with Modbus communication protocol) or with the programming key.**10 WORKING SET POINT and CONFIGURATION PARAMETERS****10.1 Configuration parameters**

Parameters	Minimum	Maximum	U.M.	DEF.	Working Setpoint
SP	r1	r2	°C/°F	0	working setpoint
Parameters	Minimum	Maximum	U.M.	DEF.	Temperature Inputs
CA1	-25	25	°C/°F	0	cabinet probe offset
CA2	-25	25	°C/°F	0	evaporator probe offset
CA3	-25	25	°C/°F	0	auxiliary probe offset (only if P4 = 1 or 2)
P0	0	1	—	1	kind of probe 0 = PTC 1 = NTC
P1	0	1	—	1	display decimal point value during normal operation (Celsius mode only) 1 = YES
P2	0	1	—	0	unit of measure, temperature 0 = °C 1 = °F
P3	0	2	—	1	evaporator probe function 0 = probe not enabled 1 = defrost probe and thermostat probe for the evaporator fan 2 = thermostat probe for the evaporator fan
P4	0	3	—	3	fourth input function 0 = input not enabled 1 = measure input (display probe) 2 = measure input (condenser probe) 3 = digital input (multipurpose/door switch input)
P5	0	4	—	0	quantity to show during the normal operation 0 = cabinet temperature 1 = working setpoint 2 = evaporator temperature 3 = cabinet temperature - evaporator temperature 4 = temperature read by the auxiliary probe (only if P4 = 1 or 2)
P6	0	4	—	0	quantity to show by the remote indicator 0 = cabinet temperature 1 = working setpoint 2 = evaporator temperature 3 = cabinet temperature - evaporator temperature 4 = temperature read by the auxiliary probe (only if P4 = 1 or 2)
Parameters	Minimum	Maximum	U.M.	DEF.	Setpoints
r0	0.1	15	°C/°F	2	working setpoint differential
r1	-99	r2	°C/°F	-50	minimum working setpoint
r2	r1	99	°C/°F	50	maximum working setpoint
r3	0	1	—	0	lock the working setpoint (with the procedure related in paragraph 3.2) 1 = YES
r4	0	99	°C/°F	0	temperature increase during Energy Saving function (only if P4 = 3 and i5 = 2 or 3); refer also to HE1 and HE2
Parameters	Minimum	Maximum	U.M.	DEF.	Compressor Protections
C0	0	240	min	0	compressor delay after turning on the controller
C1	0	240	min	5	minimum time between two activations in succession of the compressor; also compressor delay from the end of the cabinet probe error
C2	0	240	min	3	minimum time the compressor remains turned off
C3	0	240	s	0	minimum time the compressor remains turned on

Parameters	Minimum	Maximum	U.M.	DEF.	Compressor Protections (continued)
C4	0	240	min	10	time the compressor remains turned off during the cabinet probe error; also look at C5
C5	0	240	min	10	time the compressor remains turned on during the cabinet probe error; also look at C4
C6	0	200	°C/°F	80	condenser temperature above which the overheated condenser alarm is activated (only if P4 = 2)
C7	0	200	°C/°F	90	condenser temperature above which the compressor locked alarm is activated (only if P4 = 2)
C8	0	15	min	1	compressor locked alarm delay (only if P4 = 2)
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 the LED maintenance indicator is turned on 0 = no function
Parameters	Minimum	Maximum	U.M.	DEF.	Defrost
d0	0	99	h	8	defrost interval (only if d8 = 0, 1 or 2) 0 = the defrost at intervals will never be activated
d1	0	1	—	0	kind of defrost 0 = electric defrost 1 = hot gas defrost
d2	-99	99	°C/°F	2	defrost termination temperature (only if P3 = 1)
d3	0	99	min	30	defrost duration if P3 = 0 or 2; maximum defrost duration if P3 = 1 0 = the defrost will never be activated
d4	0	1	—	0	defrost when you turn on the controller (only if d8 = 1, 2 or 3) 1 = YES
d5	0	99	min	0	defrost delay when you turn on the controller (only if d4 = 1); also see i5
d6	0	1	—	1	temperature shown during the defrost (only if P5 = 0) 0 = cabinet temperature 1 = if, upon the activation of defrost, the cabinet temperature is below “working setpoint + r0”, at most “working setpoint + r0”; if, upon the activation of defrost, the cabinet temperature is above “working setpoint + r0”, at most the current cabinet temperature
d7	0	15	min	2	drip delay
d8	0	3	—	0	kind of defrost interval 0 = PERIODIC - the defrost will be activated when the controller has remained turned on for time d0 1 = PERIODIC - the defrost will be activated when the compressor has remained turned on for time d0 2 = PERIODIC - the defrost will be activated when the evaporator temperature has remained below temperature d9 for time d0 3 = REAL TIME - defrosting will be activated at the times established by parameters Hd1 ... Hd6
d9	-99.0	99.0	°C/°F	0.0	evaporator temperature above which the count of the defrost interval is suspended (only if d8 = 2)
dA	0	99	min	0	minimum time the compressor must remain turned on before defrost can be activated (only if d1 = 1)
Parameters	Minimum	Maximum	U.M.	DEF.	Temperature Alarms
A0	0	2	—	0	measured input used for the low temperature alarm 0 = cabinet temperature 1 = evaporator temperature 2 = temperature read by the auxiliary probe (only if P4 = 1 or 2)
A1	-99.0	99.0	°C/°F	-10.0	temperature below which the low temperature alarm is activated; also look at A0 and A2
A2	0	2	—	1	kind of lower temperature alarm 0 = alarm not enabled 1 = relative to the working setpoint (or “working setpoint - A1”; consider A1 without sign) 2 = absolute (or A1)
A3	0	1	—	0	measured input used for high temperature alarm 0 = cabinet temperature 1 = temperature read by the auxiliary probe (only if P4 = 1 or 2)
A4	-99.0	99.0	°C/°F	10.0	temperature above which the high temperature alarm is activated; also look at A3 and A5
A5	0	2	—	1	kind of upper temperature alarm 0 = alarm not enabled 1 = relative to the working setpoint (or “working setpoint + A4”; consider A4 without sign) 2 = absolute (or A4)
A6	0	240	min	120	high temperature alarm delay after turning on the controller (only if A3 = 0 if P4 = 1 and A3 = 1)
A7	0	240	min	15	temperature alarm delay

Parameters	Minimum	Maximum	U.M.	DEF.	Temperature Alarms (continued)
A8	0	240	min	15	high temperature alarm delay after the end of the defrost (only if A3 = 0 or if P4 = 1 and A3 = 1)
A9	0	240	min	15	high temperature alarm delay after the deactivation of the microport input (only if A3 = 0 or if P4 = 1 and A3 = 1)
AA	0	240	min	1	delay recording of power failure alarm
Parameters	Minimum	Maximum	U.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 4 = off if the compressor is off, dependent on F1 if the compressor is on
F1	-99	99	°C/°F	-1	evaporator temperature above which the evaporator fan is turned off (only if F0 = 3 or 4)
F2	0	2	—	0	evaporator fan activity during defrost and drip delay 0 = off 1 = on 2 = dependent on F0
F3	0	15	min	2	fan delay after evaporator drip completes
Parameters	Minimum	Maximum	U.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) 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)
i1	0	1	—	0	microport input contact type 0 = NO (the input will be active if you close the contact) 1 = NC (the input will be active if you open the contact)
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 1 = YES
i5	0	7	—	4	effect caused by activation of the multifunction input (only if P4 = 3) 0 = no effect 1 = SYNCHRONIZING DEFROSTS - after time d5, defrost will be activated 2 = ACTIVATING ENERGY SAVING - Energy Saving function will be activated (until the input is deactivated); also look at r4 3 = ACTIVATION OF NIGHT 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 = ACTIVATING THE EXTERNAL ALARM - after time i7, the display will flash the code "iA" and the buzzer will be activated (until the input is deactivated) 5 = ACTIVATING COMPRESSOR LOCKOUT - the compressor will be turned off, the display will flash the code "iA" and the buzzer will be activated (until the input is deactivated); also look at 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 = NO (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)
i8	0	15	—	0	number of multifunction input alarms such as to cause controller locked alarm (only if P4 = 3 and i5 = 5) 0 = alarm not enabled
i9	1	999	min	240	time without multipurpose input alarms such as to provoke the alarm counter to be cleared (only if P4 = 3 and i5 = 5)

Parameters	Minimum	Maximum	U.M.	DEF.	Digital Outputs
u1	0	7	–	0	<p>service controlled by the fourth output 0 = CABINET LIGHT - in this case, the important factors are: the key (M), parameters i0, i5 and u2 1 = ANTI-SWEAT HEATER - in this case, the important factors are: the key (M) and parameter u6 2 = AUXILIARY OUTPUT - in this case, the important factors are: the key (M), 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 = SYNCHRONIZING DEFROSTS - the output works in parallel with the defrost output; in this case the fourth output terminals must be connected to the auxiliary input of one or more PSK devices, with each having parameter i5 = 1.</p>
u2	0	1	–	0	<p>enables manual switching on/off of the cabinet light or auxiliary output while in stand-by mode (only if u1 = 0 or 2) 1 = YES</p>
u3	0	1	–	0	<p>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)</p>
u4	0	1	–	0	<p>deactivate alarm output when alarm buzzer is silenced (only if u1 = 4) 1 = YES</p>
u5	-99	99	°C/°F	-1	cabinet temperature above which the door element is switched off (only if u1 = 5)
u6	1	120	min	5	anti-sweat heater duration (only if u1 = 1)
u7	0	99	°C/°F	2	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)
u8	0	1	–	0	<p>evaporator valve contact type (only if u1 = 6) 0 = NO (valve active with contact closed) 1 = NC (valve active with contact open)</p>
Parameters	Minimum	Maximum	U.M.	DEF.	Real Time Energy Savings
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
Parameters	Minimum	Maximum	U.M.	DEF.	Real Time Defrost
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
Parameters	Minimum	Maximum	U.M.	DEF.	Serial Network
LA	1	247	----	247	controller 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 1 = odd 2 = even
Parameters	Minimum	Maximum	U.M.	DEF.	Reserved
E9	0	1	–	0	reserved

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