

Cold Room Application

free Evolution



PLC application for seasoning cycle cells

vers 1.18

TABLE OF CONTENTS

1	Use of device.....	5
1.1	Conditions of use.....	5
1.2	Responsibility and residual risks.....	5
1.3	Disclaimer.....	5
2	How to use this manual.....	6
3	Introduction.....	7
3.1	Before reading.....	7
3.2	General description.....	7
4	User interface.....	8
4.1	Keys.....	8
4.2	LED.....	8
4.3	Main view.....	9
4.3.1	Application status.....	9
4.3.2	Changing setpoint.....	11
4.4	Main menu.....	11
4.5	Active alarms menu.....	12
4.6	Language selection menu.....	12
4.7	Parameters menu.....	12
5	I/O Configuration.....	13
5.1	Analog Input configuration.....	13
5.2	Digital Input configuration.....	13
5.3	Digital output (relay) configuration.....	14
5.4	Analog output configuration.....	14
5.5	Communication channels configuration.....	15
5.6	Default I/O configuration summary and Wiring Diagram.....	15
6	Compressor.....	17
6.1	Compressor configuration.....	17
6.2	Compressor operating conditions.....	17
6.2.1	Compressor protection in the event of probe failure (duty cycle).....	17
6.2.2	Compressor safety times.....	18
7	Heating / Cooling.....	20
7.1	Heating.....	20
7.2	Cooling.....	20
7.3	Neutral zone.....	21
7.4	Heating/Cooling.....	21
8	Defrost.....	23
8.1	Defrost options.....	23
8.1.1	Start Defrost.....	23
8.1.2	Stop Defrost.....	23
8.1.3	Skip Defrost.....	24
8.2	Defrost overview.....	25
8.3	Defrost conditions and function.....	25
8.3.1	Automatic defrost.....	25
8.3.2	Automatic defrost with Real Time Clock.....	26
8.3.3	Manual defrost.....	26
8.3.4	External or manual defrost.....	26
8.4	Defrost modes.....	27
8.4.1	Defrost with compressor stopped (DEFAULT).....	27
8.4.2	Defrost with electrical heaters.....	27
8.4.3	Hot gas defrost.....	28
8.4.4	Defrost in FREE mode.....	28
8.4.5	Defrost regulator protection and constraints.....	28
9	Evaporator fans.....	29
9.1	Physical configuration.....	29
9.2	Operating conditions.....	29
9.3	Operating modes.....	29

10	Ventilation fans.....	30
10.1	Physical configuration.....	30
10.2	Operating conditions.....	30
10.3	Operating modes.....	30
10.4	Programming.....	30
11	Analog output.....	31
11.1	Physical configuration.....	31
11.2	Operating conditions.....	31
11.3	Operating modes.....	31
11.3.1	Start-up time.....	31
11.3.2	Regulation on compressor request.....	31
11.3.3	Cut-off bypass time.....	31
11.3.4	Pre-ventilation.....	31
11.3.5	Regulation.....	31
11.4	Programming.....	32
12	Pressure switch.....	33
12.1	Operating modes.....	33
12.1.1	Alarm reset.....	33
13	Humidity.....	34
13.1	Operating conditions.....	34
13.2	Humidification.....	34
13.2.1	Physical configuration.....	34
13.2.2	Operating modes.....	34
13.3	Dehumidification.....	34
13.3.1	Dehumidification modes.....	34
13.3.2	Physical configuration.....	35
13.3.3	Operating modes.....	35
13.4	Programming.....	35
14	Thermal profiles.....	36
14.1	Programming.....	36
14.2	Enabling the program.....	36
14.2.1	Shortcuts Enabling /disabling thermal profiles	36
14.3	Program control.....	37
14.3.1	Program START.....	37
14.3.2	Program RUN.....	37
14.3.3	Program STOP.....	37
14.3.4	Program RESET.....	37
14.4	STEP behavior.....	38
14.5	Example.....	38
15	Datalogger.....	40
16	Alarms and diagnostics.....	41
16.1	Probe error.....	41
16.2	Alarms.....	41
16.3	High/Low (temperature / relative humidity) alarms.....	42
16.3.1	High/Low temperature alarms configuration.....	42
16.3.2	High/Low humidity alarms configuration.....	43
17	Parameters.....	45
17.1	Compressor.....	45
17.2	Humidity.....	46
17.3	Defrost.....	46
17.4	Evaporator fans.....	47
17.5	Analog output.....	48
17.6	Ventilation fans.....	49
17.7	Alarms.....	49
17.8	Light and digital inputs.....	50
17.9	Display.....	51
17.10	Configuration.....	51
17.11	Programming reference.....	52

17.11.1	Parameter menu.....	52
17.11.2	Parameter table.....	52
17.11.3	BIOS table.....	66
17.11.4	Modbus table.....	70
17.11.5	Client table (Status Variables).....	81

1 USE OF DEVICE

1.1 Conditions of use

Permitted use

For safety reasons, the device must be installed and used in accordance with the instructions provided. In particular, parts carrying dangerous voltages must not be accessible under normal conditions.

The device must be adequately protected from water and dust with regard to the application, and must only be accessible using tools (with the exception of the front panel).

The device is suitable for use in household and/or similar air conditioning appliances or installations and has been tested for safety aspects in accordance with harmonized European reference standards.

Improper Use

Any use other than that expressly permitted is prohibited.

The relay contacts supplied are of the functional type and are subject to fault (since they are electronically controlled they are prone to short-circuiting or remaining open). Any protection devices specified in product standards or suggested by common sense for obvious safety requirements must be installed externally to the device.

1.2 Responsibility and residual risks

Eliwell is not liable for damage caused by:

- Installation/use other than expressly specified and, in particular, in conflict with the safety prescriptions set down in regulations and/or specified in this document;
- Use on panels that do not provide adequate protection against electric shocks, water or dust in the adopted mounting conditions.
- Use on panels allowing access to dangerous parts without having to use tools.
- Tampering with and/or modification of the product.
- Installation/use on panels that do not comply with statutory laws and regulations.

1.3 Disclaimer

This document is the exclusive property of **Eliwell Controls srl** and may not be reproduced or circulated without the express permission of **Eliwell Controls srl**.

While all possible care has been taken to ensure the accuracy of this document, **Eliwell Controls srl** cannot accept liability for any damage resulting from its use.

The same applies to any person or company involved in preparing and editing this document. **Eliwell Controls srl** reserves the right to make aesthetic or functional changes at any time without notice. been taken in the preparation of this document, Eliwell Controls srl cannot accept any liability deriving from its use.

2 HOW TO USE THIS MANUAL

This manual is designed to permit quick, easy reference with the following features:

References

References column:

A column to the left of the text contains references to subjects discussed in the text to help you locate the information you need quickly and easily.

Cross references

Cross references:

All words written in italics are referenced in the subject index to help you find the page containing details on this subject; supposing you read the following text:

"*compressor, evaporator fans* and *defrost* output are deactivated and alarm manual rearm is required"

The italics mean that you will find a reference to the page on the topic of compressor / evaporator fans / defrost listed under the item compressor / evaporator fans / compressor (respectively).

If you are consulting the manual on-line (using a computer), words which appear in italics are hyperlinks: just click on a word in italics with the mouse to go directly to the part of the manual that discusses this topic.

Icons for emphasis

Some segments of text are marked by icons appearing in the references column with the meanings specified below:



Warning! information which is essential for preventing negative consequences for the system or a hazard to personnel, instruments, data, etc., and which users must read with care.



Take note: information on the topic under discussion which the user ought to keep in mind.



Tip: a recommendation which may help the user to understand and make use of the information supplied on the topic under discussion.

3 INTRODUCTION

3.1 Before reading

For all general information concerning the programmable controller FREE Evolution (cabling hardware, I/O mapping, technical data and programming BIOS, etc.) not included in this document, refer to the manual

9MA10252.xx_mm-yy_FREE_Evolution_Panel_UserGuide

3.2 General description

“Cold Room Application” is an application targeting the FREE Evolution programmable controller family which can control functions in both conventional and ventilated cold rooms, including combined temperature and humidity control.

It is suited to the control of commercial and industrial cold cells and, thanks to the wide number of outputs available, provides control of all associated functions, including lights, alarms, fans, humidification / dehumidification, and heating.

The curing/ageing/storing cycle consists of 1 program with 8 climate profiles; completely configurable by the user, the combined control of temperature and relative humidity as well as defrosting makes “Cold Room Application” on FREE Evolution the best electronic solution for curing and keeping all food and consumable products.

The graphic interface features a backlit LCD display.

Menus are user-friendly and parameters can be easily viewed thanks to the large surface area of the display itself.

Applications:

- butchers;
- sausage and salami production;
- delicatessens;
- cheese production;
- pasta production;
- vegetable production;
- food storage cells (fruit, vegetables, meat);
- abattoirs;
- dryers for wood, skins, paper, marble.

4 USER INTERFACE

The front panel of the device functions as user interface and is used to perform all operations relating to the device.

4.1 Keys

FREE Evolution programmable controller has 5 keys. Each key is associated with:

- a direct action, simply bound to the key press;
- a function associated to a long key press (press and hold for about 3 seconds).

Actions/Functions associated to keys

The action/function associated to a key depends on the currently displayed menu, according to the following table.

Key	Single press	Long key press	Edit mode
UP	Select previous element	from Main Menu access the page to configure the datalogger and settings to export the files in the USB	Decrement value of selected digit
DOWN	Select next element	Password entry menu Log out	Increment value of selected digit
		Other menus no action	
LEFT/ESC	States / Parameters menu Back to previous page	Back to previous page	Select next digit / Exit without saving
	Thermal profiles program control panel Reset thermal profiles program		
	Other menus Select previous element		
RIGHT	States / Parameters menu no action	Main view Open main menu	Select previous digit
	Thermal profiles program control panel Start/Stop thermal profiles program	Other menus no action	
	Other menus Select next element		
ENTER	Enter edit mode / Enter sub-menu / Trigger action associated to a button	-	Exit and save

4.2 LED

LED meaning

The FREE Evolution programmable controller has three LEDs, two of which are use by the application with the meaning shown in the following table.

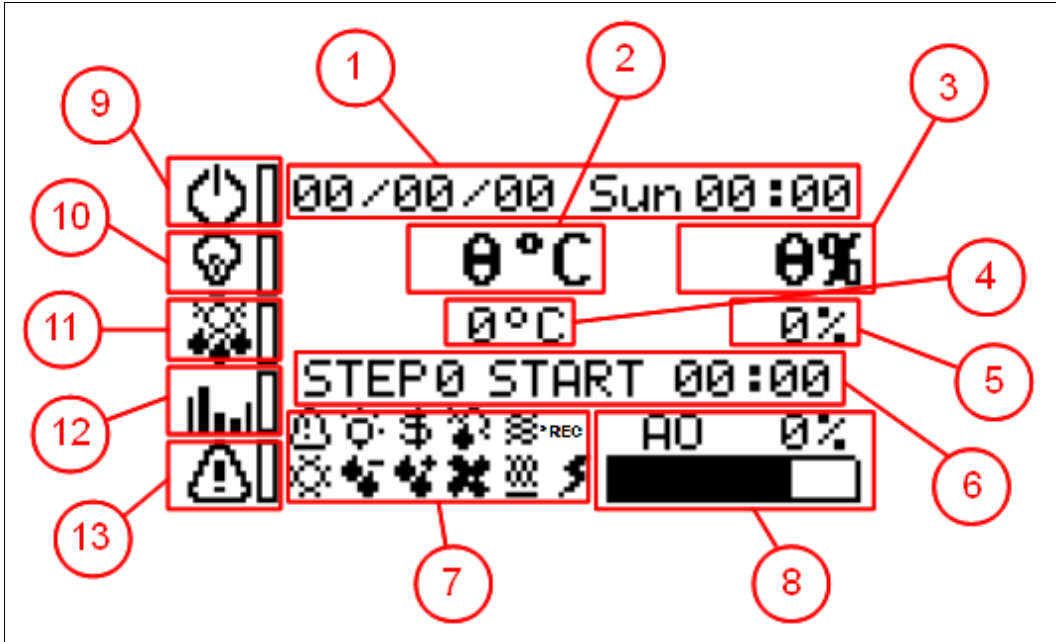
LED	Meaning	Steady ON	Blinking
Red	Global alarm status	At least one alarm is active	No alarm active, but at least one manual rearm alarm is waiting for reset
Yellow	-	-	-
Green	ON/OFF state	Application state is ON	-

Overview of user interface's main view


4.3 Main view

When the device is switched on, it displays the main view, from which you can monitor the application state, issue a few commands, and enter the application menus.

Main view's elements are listed below:



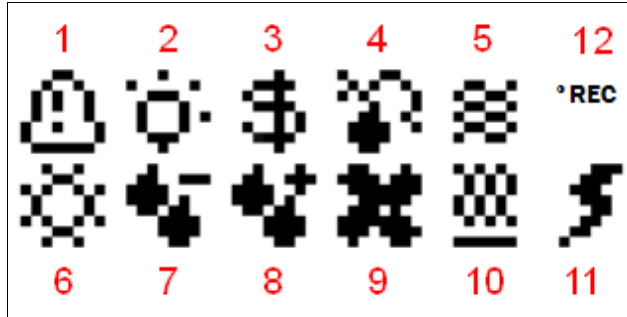
Main view's elements

1. system date and time;
 2. feedback value read by the temperature probe, if available and properly configured;
 3. feedback value read by the humidity probe, if available and properly configured;
 4. temperature setpoint, if thermoregulation is enabled;
 5. humidity setpoint, if relative humidity regulation is enabled;
 6. thermal profiles program status, if enabled;
- Note. If Remote **OFF** from digital following icon appears on display
- 
7. application status (see below, for details);
 8. analog output value, if configured;
 9. button to enter stand-by mode;
 10. button to switch on/off light;
 11. button to access defrost menu options panel
 12. button to open thermal profiles program control panel (Start/Stop/Reset);
 13. button to show the list of all currently active alarms.

4.3.1 Application status

The main view depicts the application status, including the state of the controller output and the activation of some regulation functions, with a set of icons.

State icons overview



State icons meaning

The meaning of each state icon is discussed in the following table.

Ref.	Description	Steady ON	Blinking
1	Global alarm status	At least one alarm is active	No alarm active, but at least one manual rearm alarm is waiting for reset
2	Light relay	Light relay is active (unless power-on exclusion is active, too; see 1014: ODO parameter)	-
3	Economy mode (reduced setpoint)	Economy mode is active	-
4	Defrost state	Defrost is active	Defrost request discarded
5	Ventilation fans relay	Ventilation fans relay is active (unless power-on exclusion is active, too; see 1014: ODO parameter)	-
6	Compressor relay	Compressor relay is active (unless power-on exclusion is active, too; see 1014: ODO parameter)	Compressor activation request pending, but compressor relay is not active, due to a one or more safety times)
7	Dehumidifier relay	Dehumidifier relay is active (unless power-on exclusion is active, too; see 1014: ODO parameter)	-
8	Humidifier relay	Humidifier relay is active (unless power-on exclusion is active, too; see 1014: ODO parameter)	-
9	Evaporator fans relay	Evaporator fans relay is active (unless power-on exclusion is active, too; see 1014: ODO parameter)	-
10	Heater relay	Heater relay is active (unless power-on exclusion is active, too; see 1014: ODO parameter)	-
11	Electric defrost relay	Electric defrost relay is active (unless power-on exclusion is active, too; see 1014: ODO parameter)	-
12	Datalogger	REC icon when logging is active	-

Changing setpoint from the main view

4.3.2 Changing setpoint

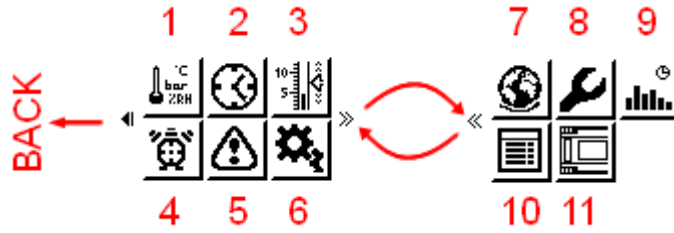
You can change both temperature and humidity setpoint, to be used in regulation, directly from the main view. Just select the right element in the main view and enter edit mode.

4.4 Main menu

To enter the main menu just press and hold the RIGHT key in the main view.

The main menu gives access to many sub-menus and, after successful authentication, to the parameter menus.

Main menu overview



Main menu elements

Main menu elements, giving access to sub-menus, are listed in the following table.

Ref.	Icon	Description	Password
1		Probes menu	No
2		Clock menu	No
3		Setpoint menu	No
4		Automatic defrost time events	No
5		Active alarms menu	No
6		Functions menu	No
7		Language selection menu	No
8		Parameters menu	Either user or installer access rights
9		Thermal profiles program	No
10		States menu	No
11		BIOS parameters menu	Installer access rights

4.5 Active alarms menu

Active alarms menu shows the whole set of currently active alarms and those waiting for manual reset. When more than one alarm is active, you have to scroll the list with UP and DOWN keys.



Alarm reset command

From the active alarms menu you can issue a command to reset alarms, by pressing the reset button.

4.6 Language selection menu

All menus are available in both the English and the Italian language.

Language selection

The user interface language can be changed by selecting the desired language in the language selection menu.



If the selected language differs from the currently active language, the FREE Evolution programmable controller will reboot: after restarting, the selected language would be set.

4.7 Parameters menu

Password entry

To access parameters/BIOS parameters menu, access rights have to be granted by successfully log in - that is, by entering a password when prompted by the user interface: if the password matches the value of either **1122: PA1** or **1123: PA2** parameter, User or Installer access rights are granted to the operator, respectively.

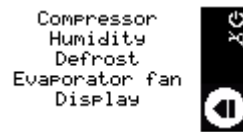


Log out

Access rights remain until either the main menu is closed (back to main view) or an explicit log out command is issued by pressing and holding the DOWN key, in the password menu.

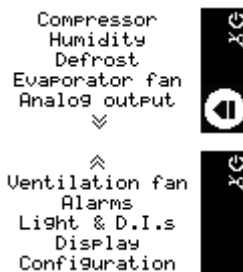
User menu

Parameters menu is displayed differently for different access rights: the user menu



Installer menu

gives access to a sub-set of the elements available in the installer menu.



Sub-menu contents also depends upon access rights.

5 I/O CONFIGURATION



Please refer to FREE Evolution Installation Manual, for important information about electric connections between the FREE Evolution programmable controller and devices connected to its I/O.

Device configuration is determined by the values of I/O configuration parameters available in the configuration menu.

5.1 Analog Input configuration

Probe association to analog input

Probes **Pb1** ... **Pb4** are associated to FREE Evolution controller's analog inputs by means of **1180: H41** ... **1183: H44** parameters.

The same analog input can be assigned to more than one logical probe. For example, it is possible to use the same feedback for both *thermoregulation* (**Pb1**) and the *cut-off regulator* regulating the *analog output* (**Pb4**).

The table below lists default values for parameters **1180: H41** ... **1183: H44**.

Parameter	Meaning	Range
1180: H41	Cell temperature (<i>thermoregulation</i>)	AI1...AI6
1181: H42	Evaporator temperature (<i>defrost</i>)	AI1...AI6
1182: H43	Cell relative humidity (<i>relative humidity regulation</i>)	AI1...AI6
1183: H44	<i>Cut-off regulator</i> feedback	AI1...AI6

You can also disable one or more probes by setting the related parameter to Disabled: in this case, the corresponding regulation function is inhibited.

Analog input physical configuration

Physical characteristics (type - NTC/voltage/current -, start of scale, full scale, calibration) of FREE Evolution programmable controller's analog inputs are set by means of its BIOS parameters, discussed in FREE Evolution Installation Manual and available in the BIOS parameters menu accessed from the main menu.

5.2 Digital Input configuration

Digital input configuration table

The application uses FREE Evolution programmable controller's first two digital inputs with the meaning determined by the parameters **1159: H11** e **1160: H12**.

The table below records the association between parameters and digital input configuration.

Parameter	Description	Range	Meaning	Default value
1159: H11	Digital input 1 (DIL1) configuration	-21...+21	See following tables	+4=NO: Door switch
1160: H12	Digital input 2 (DIL2) configuration	-21...+21	See following tables	+5=NO: External alarm

The meaning of single values of **1159: H11** e **1160: H12** parameters is reported in the following table.

Value	Description	Notes
0	Disabled	
±1	<i>Defrost</i> request	Toggle mode
±2	Economy mode (reduced setpoint)	
±4	Door switch	
±5	External alarm	
±7	Stand-by	
±11	<i>Pressure switch</i>	
±14	Light relay activation	
±15	<i>Ventilation fans</i> relay activation	

Value	Description	Notes
±18	Panic alarm	
±20	<i>Heating/Cooling mode</i> selection	
±21	Start/Stop <i>thermal profiles</i> program	Toggle mode

Digital input polarity

Digital input polarity is configured according to the following rules:

		Value	Description
+	NO	Positive	Active when contact is open (Normally Open)
-	NC	Negative	Active when contact is closed (Normally Closed)

Digital input priority

If both **1159: H11** and **1160: H12** are set to the same value, digital input 1 takes the priority over digital input 2 – that is, digital input 2 is ignored.

5.3 Digital output (relay) configuration



Please refer to FREE Evolution Installation Manual for the available number of relays and their capacity and for the meaning of the symbols found on labels supplied with the device.

Digital output configuration

The following table explains the meaning the application assigns to FREE Evolution programmable controller's digital outputs and the parameters used to configure them.

Description	Meaning	Configuration	Default
Digital output 1 (DO1)	<i>Humidifier</i>	Fixed (not configurable)	<i>Humidifier</i>
Digital output 2 (DO2)	<i>Heater</i>	Fixed (not configurable)	<i>Heater</i>
Digital output 3 (DO3)	<i>Dehumidifier</i> / Electric <i>defrost</i> relay	Configurable (parameter H23)	Dehumidifier
Digital output 4 (DO4)	<i>Compressor</i>	Fixed (not configurable)	<i>Compressor</i>
Digital output 5 (DO5)	<i>Evaporator fans</i>	Fixed (not configurable)	<i>Evaporator fans</i>
Digital output 6 (DO6)	Disabled / Light / Alarm / <i>Ventilation fans</i>	Configurable (parameter 1168: H26)	Light
Digital output 7 (DO7)	Disabled / Light / Alarm / <i>Ventilation fans</i>	Configurable (parameter 1169: H27)	Disabled

5.4 Analog output configuration

Application manages one analog output as the output of a widely-parametric *cut-off regulator*.

Analog output physical configuration

Physical characteristics (type - On-Off/voltage/current -, etc.) of FREE Evolution programmable controller's analog output are set by means of its BIOS parameters, discussed in FREE Evolution Installation Manual and available in the BIOS parameters menu accessed from the main menu.

5.5 Communication channels configuration

BIOS parameters menu, available in the application main menu, gives access also to configuration parameters of the communication channels available on the FREE Evolution programmable controller. See FREE Evolution Installation Manual for details.

5.6 Default I/O configuration summary and Wiring Diagram

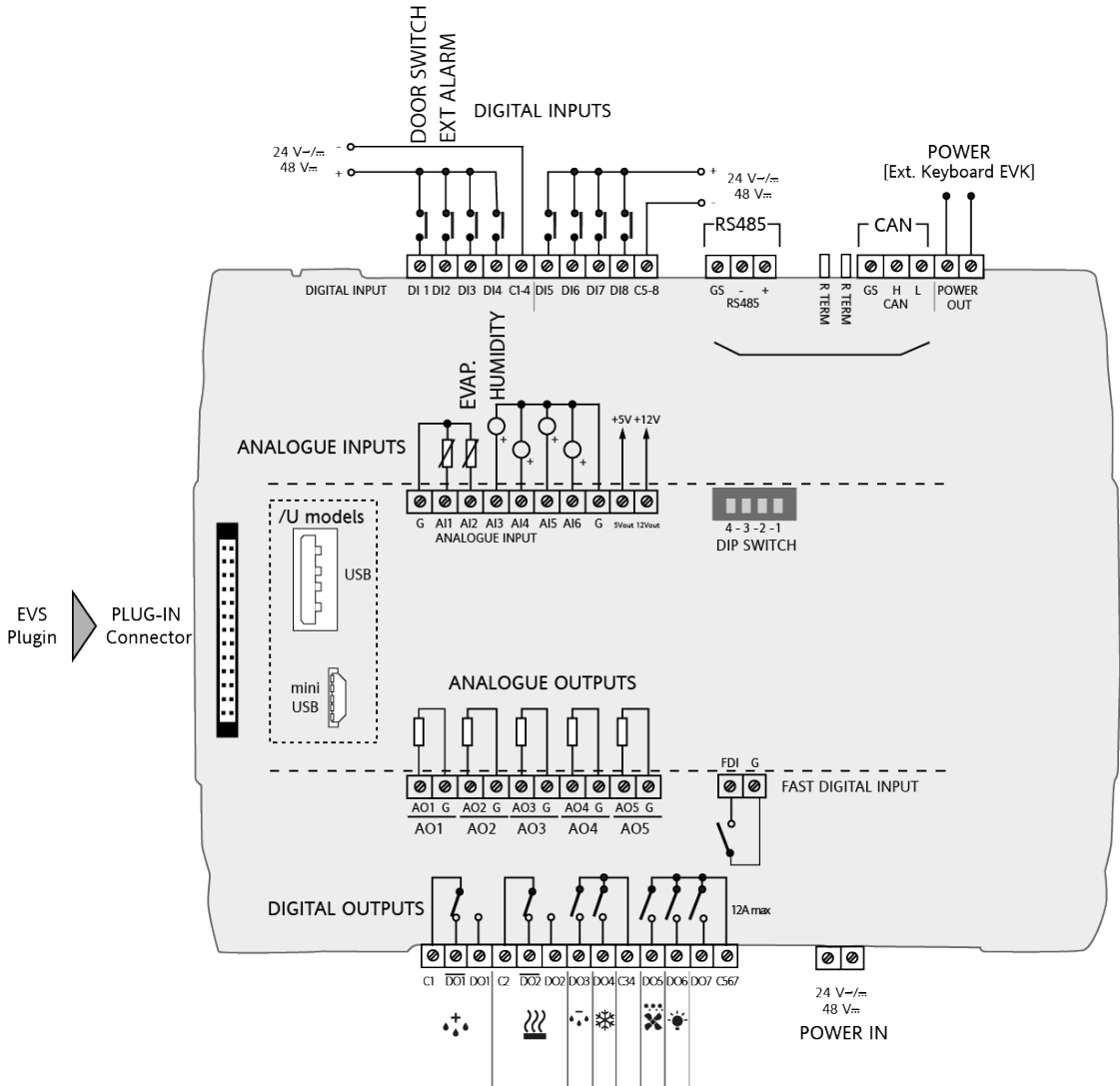
The following table explains the meaning the application assigns to FREE Evolution programmable controller's I/Os and the parameters used to configure them.

I/O
configuration
summary

Description	Meaning	Configuration	Default
Analogue input 1 (Pb1)	Cell temperature (<i>thermoregulation</i>)	Configurable (parameter 1180: H41)	AI1
Analogue input 2 (Pb2)	Evaporator temperature (<i>defrost</i>)	Configurable (parameter 1181: H42)	AI2
Analogue input 3 (Pb3)	Cell relative humidity (<i>relative humidity regulation</i>)	Configurable (parameter 1182: H43)	AI3
Digital input 1 (DIL1)	0: Disabled; ±1 <i>Defrost</i> request; ±2 Economy mode (reduced setpoint); ±4 Door switch; ±5 External alarm; ±7 Stand-by; ±11 <i>Pressure switch</i> ; ±14: Light relay activation;	Configurable (parameter 1159: H11)	Door switch
Digital input 2 (DIL2)	±15: <i>Ventilation fans</i> relay activation; ±18: Panic alarm; ±20: <i>Heating/Cooling mode</i> selection; ±21: Start/Stop <i>thermal profiles</i> program;	Configurable (parameter 1160: H12)	External alarm
Digital output 1 (DO1)	<i>Humidifier</i>	Fixed (not configurable)	<i>Humidifier</i>
Digital output 2 (DO2)	<i>Heater</i>	Fixed (not configurable)	<i>Heater</i>
Digital output 3 (DO3)	<i>Dehumidifier</i> / Electric <i>defrost</i> relay	Configurable (parameter H23)	Dehumidifier
Digital output 4 (DO4)	<i>Compressor</i>	Fixed (not configurable)	<i>Compressor</i>
Digital output 5 (DO5)	<i>Evaporator fans</i>	Fixed (not configurable)	<i>Evaporator fans</i>
Digital output 6 (DO6)	Disabled / Light / Alarm* / <i>Ventilation fans</i>	Configurable (parameter 1168: H26)	Light
Digital output 7 (DO7)	Disabled / Light / Alarm** / <i>Ventilation fans</i>	Configurable (parameter 1169: H27)	Disabled
Analogue output (AO1)	cut-off	Fixed (not configurable)	cut-off

*AlarmDO enabled @ ModBUS address 9090

**AlarmDO enabled @ ModBUS address 9091



6 COMPRESSOR

The compressor is controlled by one of the device's *digital output*. It will be switched on or off depending on:

- the temperature measured by *probe Pb1*;
- *thermoregulation* settings;
- *defrost/dripping* settings.

6.1 Compressor configuration

For information about connecting the compressor to the device, refer to FREE Evolution Installation Manual.

Compressor relay

The compressor is bound to relay **DO4**. Relay polarity is fixed.

6.2 Compressor operating conditions

The regulator is activated provided that:

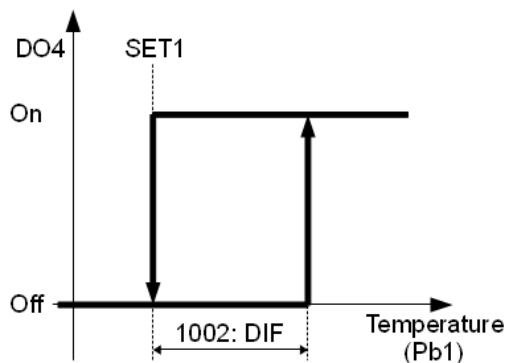
- application state is ON;
- *alarm E1* is not active (cell temperature probe **Pb1** error);
- the time set in parameter **1014: ODO** has elapsed;
- a *defrost* cycle is not active (FREE mode excluded – see parameter **1028: DTY**).

The parameters of this regulator are:

- **SET1** setpoint, which can be chosen in a range defined by a minimum setpoint and a maximum setpoint (parameters **1004: LSE** e **1003: HSE**);
- differential (parameter **1002: DIF**).

Compressor regulation diagram

The diagram below indicates the compressor activation mode for cooling based on the **SET1** and **1002: DIF > 0** parameter.



6.2.1 Compressor protection in the event of probe failure (duty cycle)

1009: ONT e 1010: OFT parameters

If the cold room probe **Pb1** fails (*alarm E1*), the output configured as compressor regulates in accordance with the times set in parameters **1009: ONT** and **1010: OFT**. The first time to consider is **1009: ONT**. If **1009: ONT > 0**, the protection programmed in parameters **1011: DON** / **1012: DOF** / **1013: DBI** must be respected (see *Compressor safety times*).

The table below lists the ways the compressor relay output can be managed:

1009: ONT	1010: OFT	DO4
0	0	Off
0	>0	Off
>0	0	On

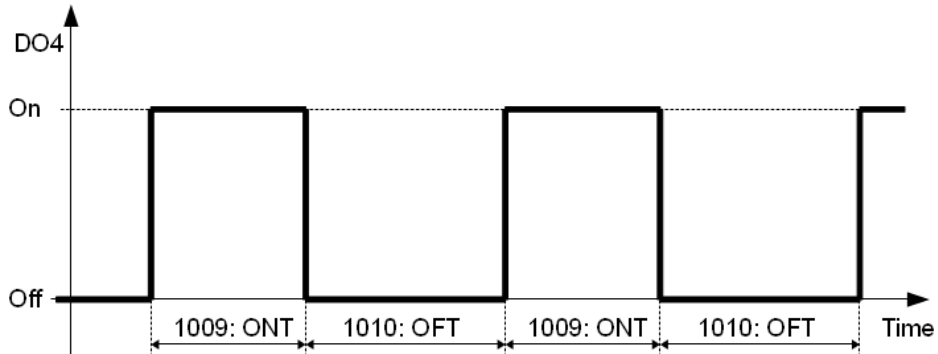
1009: ONT	1010: OFT	DO4
>0	>0	Duty Cycle

Compressor duty cycle

If **1009: ONT** > 0 and **1010: OFT** > 0, the compressor regulator activates in operating cycle mode irrespective of the values read by the probes (cold room probe failure) and of requests from other utilities (duty cycle mode).

If the cold room probe is working properly, the duty cycle mode does not start as it does not have priority over normal compressor regulation settings.

Compressor duty cycle diagram



You are reminded that parameter **1014: ODO** inhibits the activation of all outputs commanding a relay for its entire duration (compressor, defrost, fans, etc.).

6.2.2 Compressor safety times

Compressor on-off operations must respect the safety times that you can set using the special parameters as described below. The compressor **LED** will flash to indicate when an activate compressor request has been received but a safety protection exists.

Off-on timing

A safety time (compressor on-off safety time) regulated by the parameter **1012: DOF** must be respected between a switch-off and switch-on of the same compressor.

This waiting time also occurs when the controller is powered on.

On-on timing

A safety time (compressor on-on safety time) regulated by the parameter **1013: DBI** must be respected between one switch-on and the next.

Delay

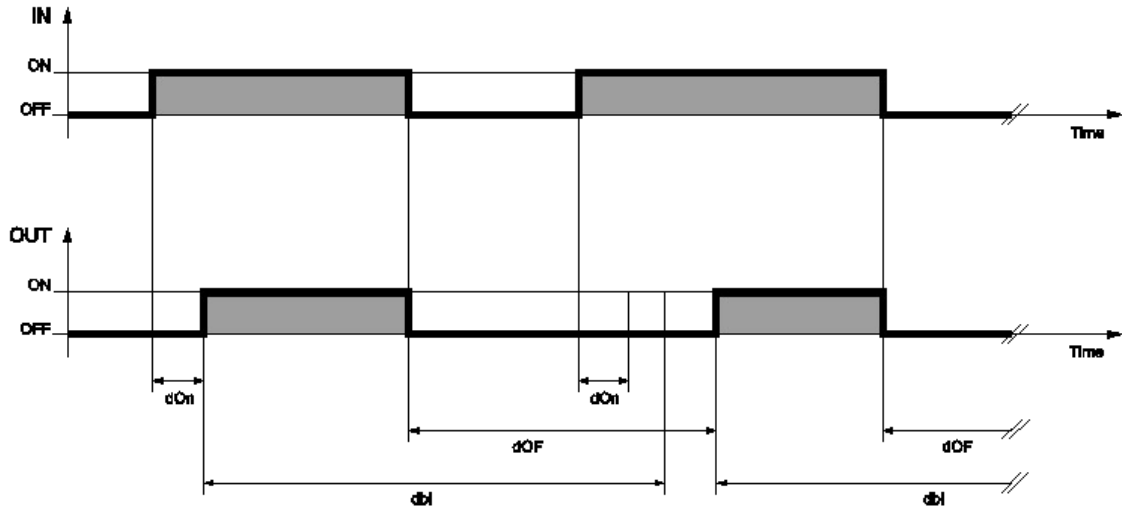
The safety time set in parameter **1011: DON** must elapse between a start-up request and actual start-up.

Times set with parameters **1011: DON** / **1012: DOF** / **1013: DBI**, if active, are not accumulative but parallel.

Diagram of compressor safety times

Compressor protection diagram with parameters **1011: DON** / **1012: DOF** / **1013: DBI** configured.

IN	Input state for compressor regulator
OUT	Output state for compressor regulator



7 HEATING / COOLING

Thermoregulation *parameters* can be viewed and configured in the folders:

- *Compressor* menu (parameter **1002: DIF**);
- *Humidity* menu (parameter **1027: DB**);
- *Configuration* menu (parameter **1156: H07**, **1159: H11** e **1160: H12**).

Parameter **1156: H07** determines thermoregulation type and the set of parameters relevant to that process.

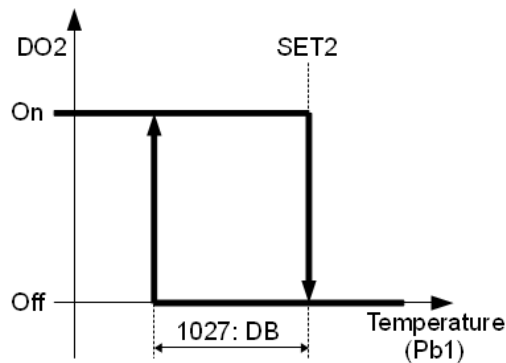
1156: H07	<i>Digital input</i>	Setpoint	<i>Relay</i>
Disabled	-	-	-
Neutral zone	-	SET1	Both DO2 and DO4
Cooling only	-	SET1	DO4
Heating only	-	SET2	DO2
From <i>digital input</i>	Cooling	SET1	DO4
	Heating	SET2	DO2

7.1 Heating

Set thermoregulation type to **1156: H07** = Heating only.

Heating relay		Comments
ON	OFF	
Temperature \leq SET2 - 1027: DB	Temperature $>$ SET2	Differential = 1027: DB always positive

Heating
regulation
diagram

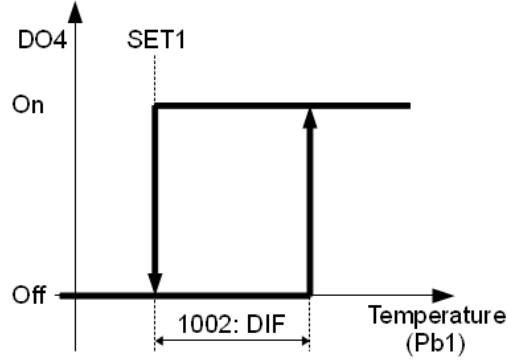


7.2 Cooling

Set thermoregulation type to **1156: H07** = Cooling only.

Compressor relay		Comments
ON	OFF	
Temperature \geq SET1 + 1002: DIF	Temperature $<$ SET1	Differential = 1002: DB always positive

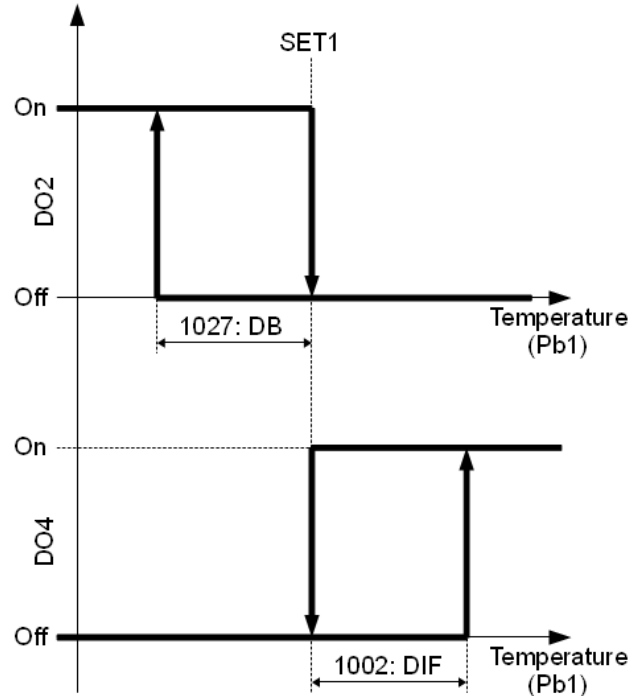
Cooling regulation diagram



7.3 Neutral zone

Set thermoregulation type to 1156: H07 = Neutral zone.

Thermoregulation diagram (in neutral zone)



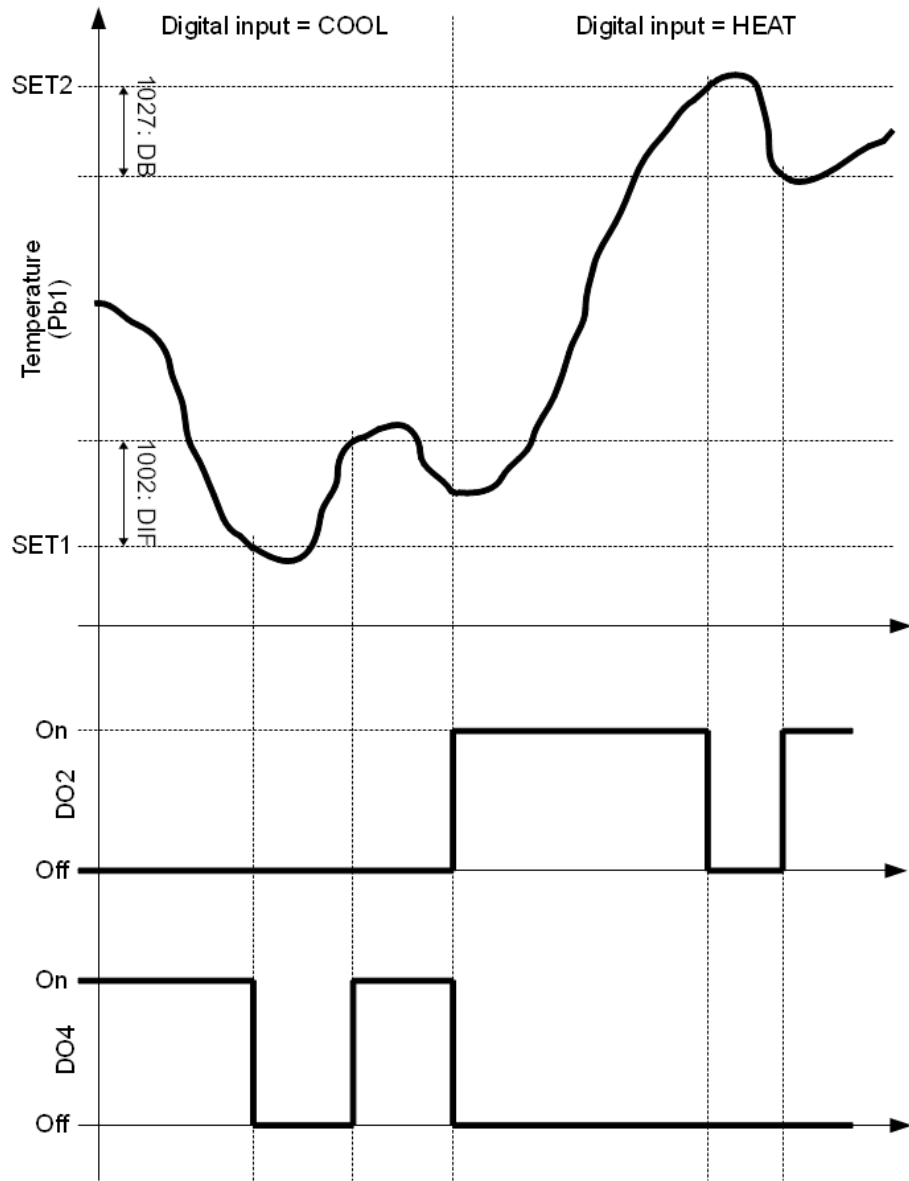
7.4 Heating/Cooling

Set thermoregulation type to 1156: H07 = From digital input. Set a digital input as heating/cooling: 1159: H11 / 1160: H12 = Heat/Cool (beware of polarity NO/NC).



These settings do not allow thermoregulation in neutral zone.

Diagram of thermoregulation with digital input mode selection

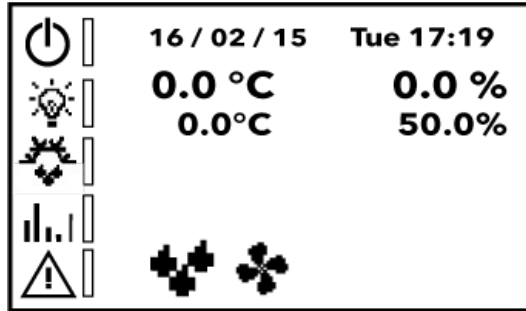


8 DEFROST

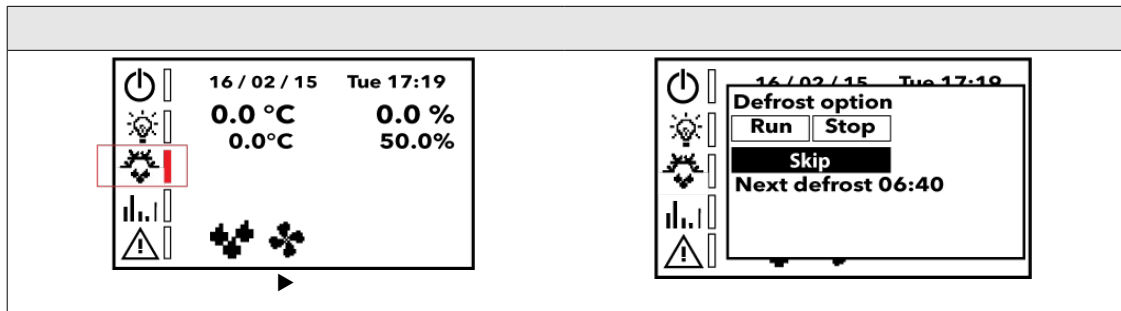
8.1 Defrost options

Defrost Menu

Defrost options are available by selecting the related defrost icon # 11 on main view display described in the User Interface / Main view chapter



A pop-up window to access defrost options will appear selecting defrost icon.



Defrost options are:

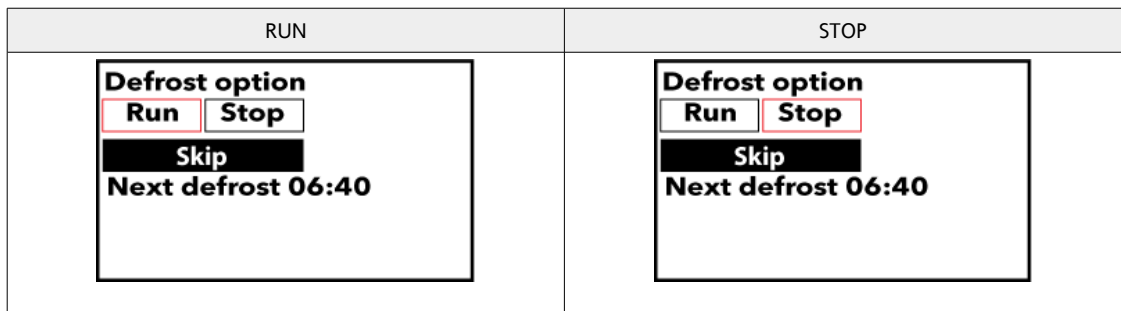
- Start Defrost
- Stop Defrost
- Skip Defrost

8.1.1 Start Defrost

From **Defrost** options menu panel start the defrost by selecting **RUN** key

8.1.2 Stop Defrost

From **Defrost** options menu panel stop the defrost by selecting **Stop** key

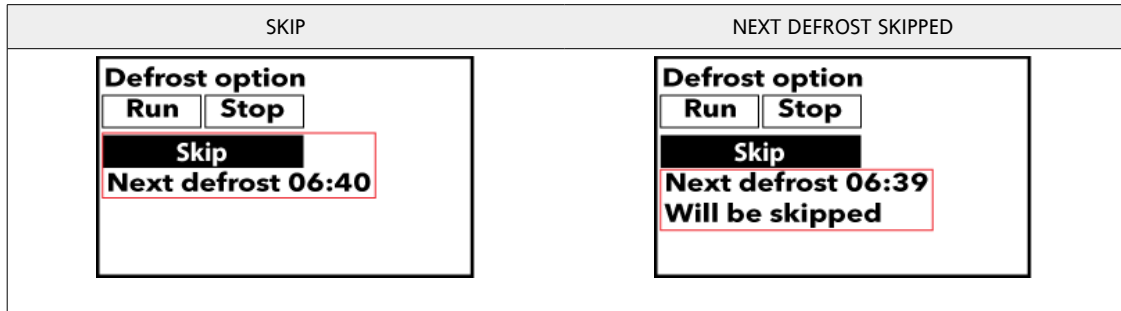


8.1.3 Skip Defrost

From **Defrost** options menu panel you can read the remaining time to next defrost event

By selecting **Skip** key enable or disabled the scheduled event already programmed.

When the application has set to skip the defrost the following message appears on the menu display (left panel)



8.2 Defrost overview

Defrost is used to stop ice from forming on the surface of the internal exchanger.

Defrost takes place basically (see *Defrost modes*) by heating up the internal exchanger using:

- electrical heaters;
- hot gas (hot gas solenoid valve);
- by simply stopping the *compressor* and hence the cooling cycle.

Dripping

On completion of defrost, given that there will be water on the internal exchanger, it is better not to start cooling right away as this would ruin the effect of the defrost by creating ice immediately.

The dripping interval is regulated via parameter **1044: DT**.

8.3 Defrost conditions and function

Defrosting is enabled if:

- the internal exchanger temperature is lower than the end defrost temperature set in parameter **1034: DST**;
- manual defrosting has not already been activated, in which case the request for automatic defrost will be canceled.

Defrost request

Defrost request can be made in the following ways:

Event	Condition
Application switch-on	If parameter 1036: DPO (defrost at switch on) is programmed accordingly
Time interval	If 1029: DIT > 0 each time the defrost time interval set in parameter 1029: DIT has elapsed
Clock (default)	If 1029: DIT = 0 and 1032: DCT = Clock and Clock alarm not active. Defrost is triggered at the times set in Defrost times menu

8.3.1 Automatic defrost

Automatic defrost start request

The defrost cycle is programmed to start at time intervals set in parameter **1029: DIT** > 0. Parameter **1032: DCT** determines how that time interval is counted.

To disable the automatic cycle, set **1029: DIT** = 0.

See automatic defrost with the Real Time Clock to run defrosts at given times.

1032: DCT	Description	Notes
Compressor up-time	Running time in hours of the compressor (DIGIFROST® method)	In this case, the counter runs only if the compressor is on. A new count starts when the defrost interval elapses and a new defrost cycle starts if conditions permit). Please note that compressor running time is counted independently from the internal exchanger temperature. If the internal exchanger probe is missing or faulty, the count continues for the time the compressor is on.
Unit up-time	Running time of the application (in ON state)	The defrost time interval is counted continuously when the application is ON and starts at each power-on. A defrost cycle starts when the defrost interval elapses (indicated by 1029: DIT) if conditions permit and the controller immediately starts counting a new defrost interval.
On compressor stop	On compressor stop	Each time the compressor stops, a defrost cycle is run according to the mode set in parameter 1028: DTY .
Clock	Con RTC (DEFAULT)	At the times set in Defrost times menu

Automatic defrost start conditions

Regardless of how the interval is counted, the following conditions apply:

- if the internal exchanger probe temperature is greater than **1034: DST**, defrost will not be permitted: a new interval will be counted and only at the end of this subsequent count will conditions be tested for the start of a defrost cycle.

8.3.2 Automatic defrost with Real Time Clock

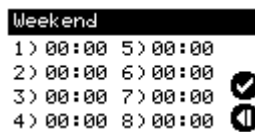
Defrost times menu

Defrost time menu allows the definition of precise times in the day when an automatic defrost request should be considered by the application.

Times for working days are separated from times for the weekend (5+2 schema).



Both in the case of working days and in the case of weekend days, you can set up to 8 times in the day at which the automatic defrost request is issued.



Note that a strict chronological sequence is not mandatory (you may enter the times in any order).



Defrost times exclusion

To not use any of the defrost times you can simply exclude them by increasing the hour value up to 24, which indicates that the parameter is deactivated.

8.3.3 Manual defrost

Manual defrost request

Pressing the manual defrost button will start the defrost cycle, which can also be started from *digital input*, if properly configured.

Procedures for the activation of this defrost cycle are the same as for external defrost.

The defrost interval will now be counted as described for automatic defrost (time **1189: DET** is not cleared, it continues).

Notification of a discarded defrost request

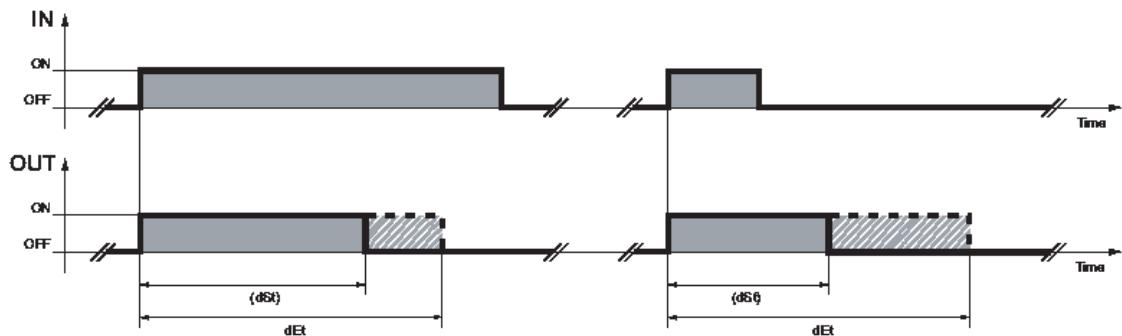
If conditions do not permit (internal exchanger temperature greater than the value set in parameter **1034: DST**), this will be signaled on the display (defrost icon blinks) and defrost will stop.

8.3.4 External or manual defrost

Time graphs for signals in each of the various function modes are presented below.

IN	Defrost request
OUT	Output state for defrost regulator. Note that (1034: DST) indicates defrost end due to temperature setpoint fulfillment.

Defrost request diagrams



Defrost is activated on the rising edge. Hence, you can only activate a defrost, not stop one that is underway. Defrost and dripping currently underway and the defrost or dripping interval count cannot be suspended.

Defrost termination condition

8.4 Defrost modes

Defrost can be activated in four ways, as set in parameter **1028: DTY**.

Whatever the case, defrost is terminated when the following conditions hold:

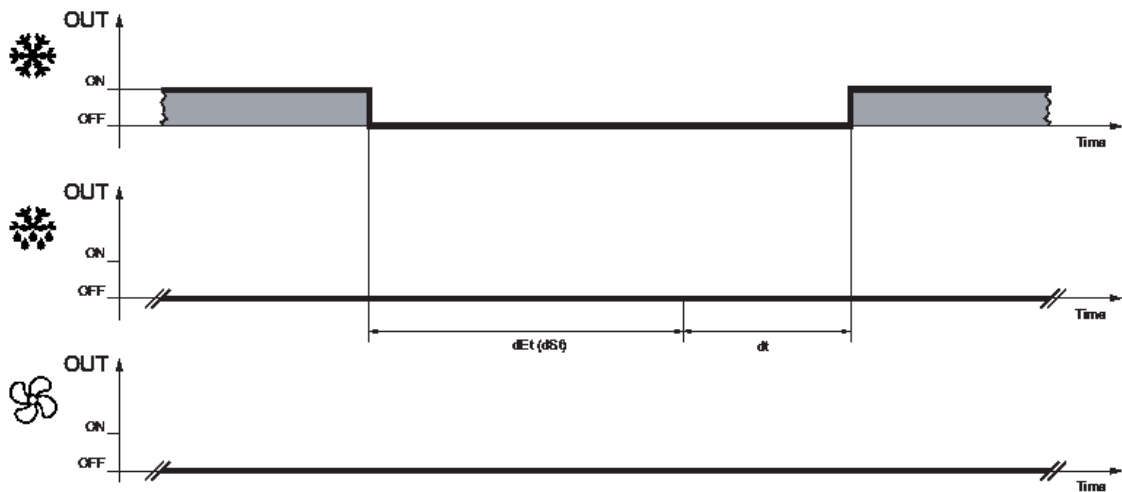
1181: H42	Termination conditions
= Disabled (Evaporator probe not present)	After the timeout set in parameter 1189: DET (defrost timeout) occurred
≠ Disabled (evaporator probe present)	After reaching defrost end temperature set in parameter 1034: DST . If the temperature is not reached before the time set in parameter 1189: DET (defrost timeout) elapses, defrost is terminated.

8.4.1 Defrost with compressor stopped (DEFAULT)

The defrost cycle with the compressor stopped is configured by setting parameter **1028: DTY** = Electric.

Compressor stops for the duration of the defrost, and defrost relay does not exist (parameter **H23** ≠ Electric defrost).

On completion of defrost, the compressor relay stays off during the dripping time set in **1044: DT** if it is not equal to zero.

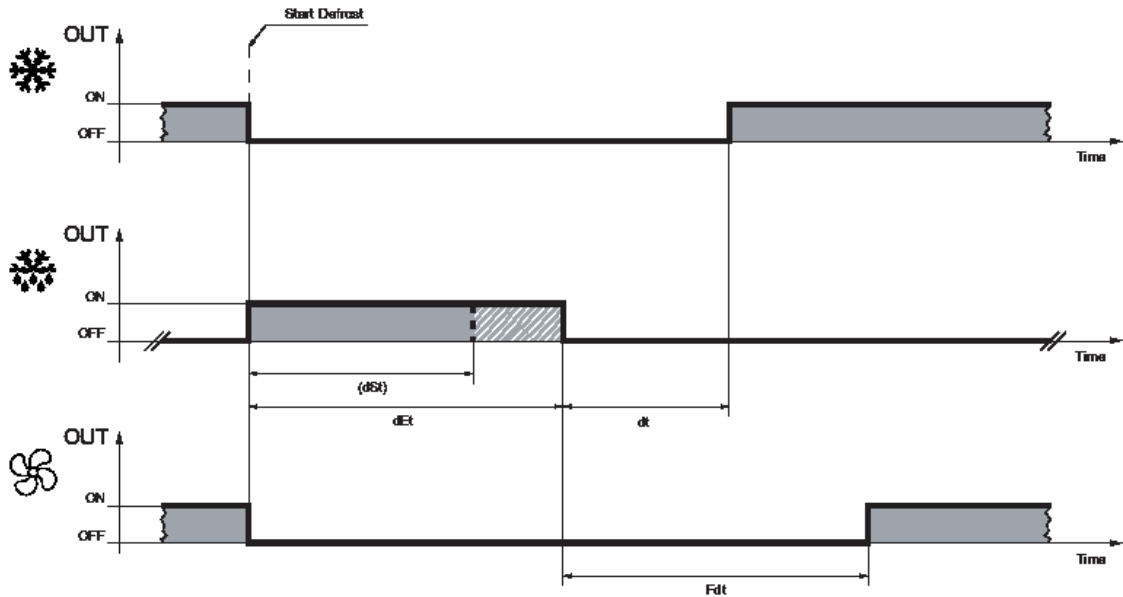


8.4.2 Defrost with electrical heaters

Defrost with electrical heaters is configured by setting **1028: DTY** = Electric and parameter **H23** = Electric defrost.

The *compressor* stops for the duration of the defrost cycle and the relay configured as defrost regulator output and that the electrical heaters are connected to activates.

On completion of defrost, the electrical heaters are switched off and the compressor remains off for the dripping time set in parameter **1044: DT**, if it is not equal to zero.



In the diagram, (1034: DST) marks defrost termination due to reaching of defrost stop temperature. If 1034: DST intervenes before 1189: DET, dripping (1044: DT and 1043: FDT) aligns with 1034: DST. If 1043: FDT < 1044: FDT then will force 1043: FDT = 1044: DT.

During defrost, fans are off if parameter 1045: DFD is set accordingly, otherwise they remain under the control of their own regulator.

8.4.3 Hot gas defrost

Hot gas defrost is configured by setting parameter 1028: DTY = Cycle inversion and parameter H23 = Electric defrost.

The *compressor* stays on for the entire duration of the defrost cycle and the relay configured as defrost regulator output and that the solenoid valve is connected to activates.

On completion of the defrost cycle, the solenoid valve relay is switched off and the dripping set in parameter 1044: DT in enabled if not equal to zero. The compressor relay is once again controlled by the compressor regulator.



Parameters 1011: DON / 1012: DOF / 1013: DBI (see *Compressor safety times*) have priority.

8.4.4 Defrost in FREE mode

Defrost cycle in FREE mode is configured by setting parameter 1028: DTY = Free.

The *compressor* remains under the control of the compressor regulator for the duration of the defrost cycle and the relay configured as defrost and that the defrost heaters are connected to activates.

The heaters are switched off on completion of the defrost cycle. During dripping, the compressor continues to regulate.

8.4.5 Defrost regulator protection and constraints

Defrost timeout

If the defrost cycle does not terminate on reaching the end of defrost temperature set in parameter 1034: DST, a maximum defrost time interval can be set in parameter 1189: DET. If the defrost cycle terminates for timeout, an alarm can be activated by configuring parameter 1095: DAT (see defrost timeout *alarm*).

Moreover, some alarms may be excluded for a certain amount of time after the defrost cycle ends.

In the event of error E1 (cold room probe Pb1 error) defrost cycles will not be run.

9 EVAPORATOR FANS

9.1 Physical configuration

Evaporator fans relay

Evaporator fans are bound to *digital output* (relay) **DO5** (not configurable). Relay polarity is not configurable.

9.2 Operating conditions

Enabling evaporator fans regulation

Evaporator fans regulations is enabled if the following conditions hold:

- application is ON;
- has not been excluded during *defrost* by parameter **1045: DFD**;
- delay after defrost is not active (parameter **1043: FDT**);
- external alarm is not active while parameter **1096: RLO** requires fans are halted in such a condition;
- *pressure switch* alarm (caused by a number of pressure switch events greater than parameter **1115: PEN** in the time interval defined by parameter **1116: PEI**) is not active.

Evaporator fans relay inhibition

Relay bound to evaporator fans is inhibited if:

- door is open and parameter **1047: FOD** = Not active;
- time set in parameter **1014: ODO** has not elapsed yet.

9.3 Operating modes

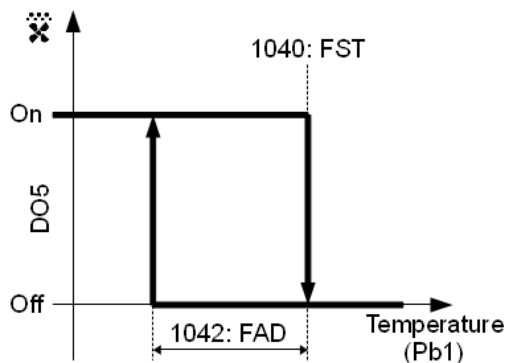
In cooling, evaporator fans work as shown in this diagram.

	<i>Compressor</i> ON	<i>Compressor</i> OFF
Evaporator probe Pb2 not available (1181: H42 = Disabled)	ON	OFF
Evaporator probe Pb2 error	ON	OFF
Evaporator probe available (1181: H42 ≠ Disabled) and 1046: FCO = Not active (fans OFF if compressor OFF)	THERMOSTAT CONTROLLED	OFF
Evaporator probe available (1181: H42 ≠ Disable) e 1046: FCO = Thermostat controlled	THERMOSTAT CONTROLLED	THERMOSTAT CONTROLLED

Thermostat control of evaporator fans

Thermostat control of fans takes place at the values set in parameters **1040: FST** (block fans temperature) and **1042: FAD** (fans differential). Block fans temperature is absolute (real temperature value).

The fan regulator functions as indicated below.



10 VENTILATION FANS

10.1 Physical configuration

Ventilation fans relay

To bind a *digital output* (relay) to ventilation fans either parameter **1168: H26** or **1169: H27**, found in menu Configuration, must be set accordingly.

Default configuration does not bind any relay to ventilation fans.

10.2 Operating conditions

Ventilation fans regulation is enabled if the following conditions hold:

- application is ON;
- ventilation is not switched off from *digital input*, if it has been configured as ventilation request by setting **1159: H11** / **1160: H12** = ± 15 ;
- ventilation fans relay is not disabled in the active *thermal profiles* program step (parameters **nP7** = No, where n is the active step).

10.3 Operating modes

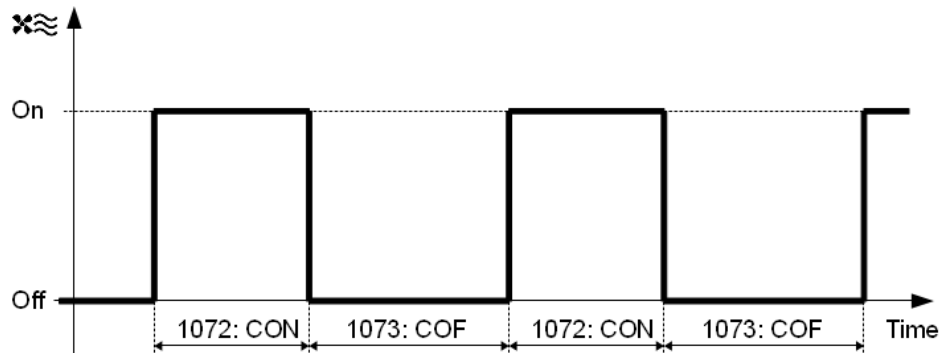
Ventilation fans duty cycle

Ventilation fans are regulated in a duty cycle defined by parameters **1072: CON** and **1073: COF**, according to the rules reported in the following table.

1072: CON	1073: COF	relay
0	0	OFF
0	> 0	OFF
> 0	0	ON
> 0	> 0	Duty cycle

Regulation diagram

Ventilation fans operation is depicted in the following diagram.



10.4 Programming

Parameters related to ventilation fans can be viewed and configured in the folders:

- the Ventilation fan folder in the installer menu (**1072: CON** and **1073: COF**);
- the Configuration folder in the installer menu (**1159: H11** / **1160: H12** and **1168: H26** / **1169: H27**).

11 ANALOG OUTPUT

The application manages one analog output as the output of a widely-parametric cut-off regulator.

As an example, the regulator may be used to regulate the fan unit on the outside of the heat exchanger that normally serves as a condenser. Various types of fan pilot modules can be connected depending on relative availability and the setting of *analog output* BIOS parameter (see FREE Evolution Installation Manual, for details).

11.1 Physical configuration

The cut-off regulator is bound to *analog output AO1* (not configurable).

11.2 Operating conditions

The cut-off regulator associated to analog output is enabled if the following conditions hold:

- application is ON;
- regulator has been enabled by setting parameter **1051: F00** properly and **Pb4** probe is enabled, too (parameter **1183: H44** ≠ Disabled);
- either the cut-off regulator is independent of the *compressor* (**1067: F16** = Not active) or there is a switch on request coming from the *compressor*.

11.3 Operating modes

11.3.1 Start-up time

Start-up time

On each start-up of the cut-off regulator, the *analog output* is forced to its maximum value for the start-up time set in parameter **1054: F03**, after which the *analog output* is set to the value determined by the cut-off regulator.

11.3.2 Regulation on compressor request

Cut-off regulator can be configured to be independent of or dependent on the *compressor* state, by means of parameter **1067: F16**, which determines whether the cut-off regulator can be enabled if *compressor* is off.

11.3.3 Cut-off bypass time

Cut-off bypass time

By means of parameter **1069: F18** a cut-off bypass time can be set; during this period, if the regulator requests the cut-off, the *analog output* is forced to the value set with parameter **1057: F06** (minimum level).

11.3.4 Pre-ventilation

If the fan is activated by a compressor call (see paragraph *Regulation on compressor request*), the compressor ON signal is given only after the regulator has run for the minimum time given in parameter **1070: F19**.

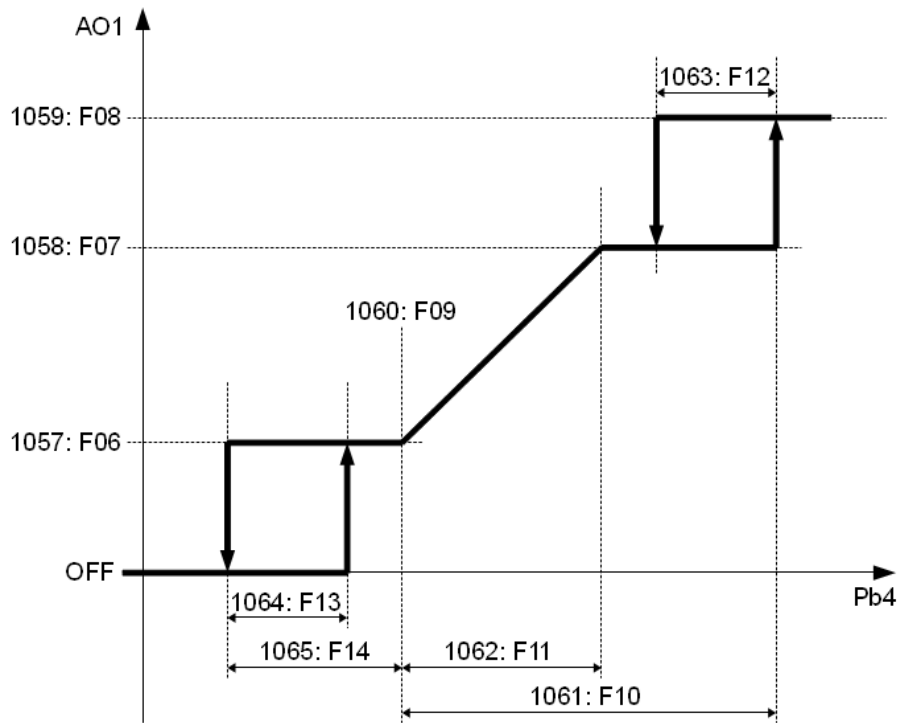
Pre-ventilation is run to prevent the compressor from switching on at excessively high condensation temperatures.

11.3.5 Regulation

The diagrams below plot the *analog output* level as a function of the value read from the regulation probe and the cut-off regulator parameters.

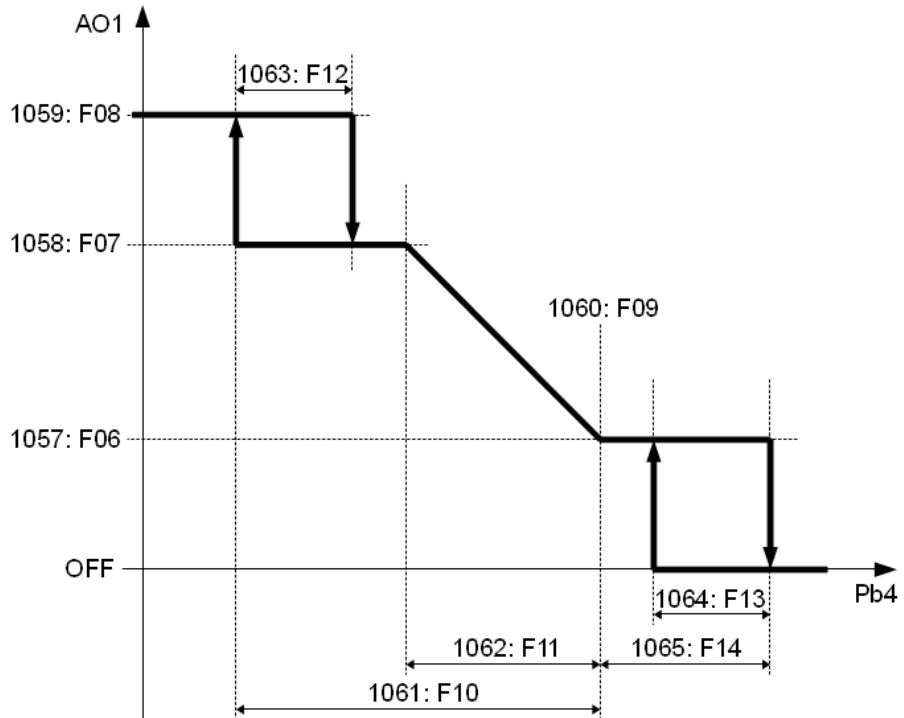
The following diagram refers to cooling mode (**1052: F01** = Cool).

Cut-off regulator diagram in cooling mode



The following diagram refers to heating mode (1052: F01 = Heat).

Cut-off regulator diagram in heating mode



11.4 Programming

Cut-off regulator [parameters](#) can be viewed and configured in:

- the Analog output folder of the installer menu (1051: F00 ... 1071: F20);
- the Configuration folder of the installer menu (parameter 1183: H44).

12 PRESSURE SWITCH

The application performs diagnostic operations over a *digital input* associated via a configuration table. It is activated by setting paramters **1159: H11** / **1160: H12** = ±11.

12.1 Operating modes

Pressure switch event effect

If the pressure switch input is activated, power to the *compressor* is immediately cut off, the relative *alarm LED* lights up to indicate this visually and the alarm folder also displays the proper error message.

Pressure switch event count

Pressure switch diagnostics is configured by means of parameters **1115: PEN** and **1116: PEI**. The time **1116: PEI** is counted down starting at the first pressure switch event.

Pressure switch alarm

An alarm is generated only if the maximum number of events **1115: PEN** is reached before the time set in parameter **1116: PEI** elapsed; in this case, *compressor*, *evaporator fans* and *defrost* output are disabled and manual rearm of the alarm condition is required.

If the number of activations does not exceed the number set in parameter **1115: PEN** in the time interval set in parameter **1116: PEI** alarm condition is automatically rearmed.

If **1115: PEN** = 0 pressure switch diagnostics is inhibited.

12.1.1 Alarm reset

Once the controller is in alarm state, it must be powered off and then powered on again, or a reset request may be issued from either the active alarms menu or the functions menu.

13 HUMIDITY

13.1 Operating conditions

Relative humidity regulation (humidification and dehumidification) is enabled provided that:

- application is ON;
- regulation is enabled by setting **1154: H05** according to the following table and probe **Pb3** is enabled, too (parameter **1182: H43** ≠ Disabled);

1154: H05	Humidification	Dehumidification
Disabled	Disabled	Disabled
Neutral zone	Enabled	Enabled
Humidification	Enabled	Disabled
Dehumidification	Disabled	Enabled

- alarm **E3** is not active (humidity probe **Pb3** error);
- during *defrost*, regulation is not excluded by means of parameter **1024: DEH**.

13.2 Humidification

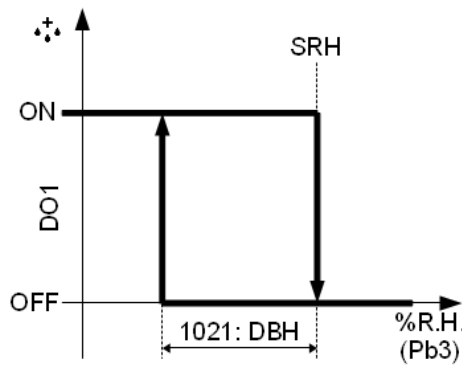
Application accomplishes the humidification task by means of an ON/OFF regulator with differential. The regulator output is bound to a relay, to which a humidifier has to be connected.

13.2.1 Physical configuration

The humidifier is bound to *digital output* (relay) **DO1** (not configurable). Relay polarity is not configurable. For information about connecting the humidifier to the device, refer to FREE Evolution Installation Manual.

13.2.2 Operating modes

The following diagram plots the state of the humidification relay as a function of the cell relative humidity. Differential **1021: DBH** is always positive.



13.3 Dehumidification

Application accomplishes the dehumidification task by means of an ON/OFF regulator with differential. The regulator output is bound to one or more relays, depending on the selected *dehumidification mode*.

13.3.1 Dehumidification modes

Parameter **1158: H09** determines the selected dehumidification mode, according to the following schema.

Configurazione
regolazione
umidità relativa

Humidifier relay

Humidification
diagram

1158: H09	Description
Relay only	Dehumidification with dedicated relay
Relay and compressor	Dehumidification with both dedicated relay and compressor
No relay	Dehumidification with compressor and heating relay

13.3.2 Physical configuration

Dehumidification relay

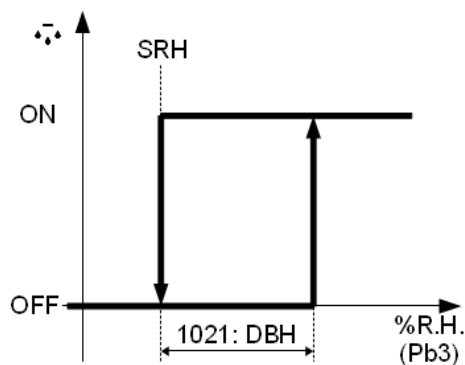
Dehumidifier is bound to *digital output* (relay) **DO3**, if enabled with parameter **H22**. Default configuration enables the dehumidifier relay.

For information about *compressor relay* and *heating relay* configuration see the corresponding sections in this document.

13.3.3 Operating modes

Dehumidification diagram

The following diagram plots the state of dehumidification as a function of the cell relative humidity. Differential **1021: DBH** is always positive.



Dehumidification mode determines which relays are activated if dehumidification is on.

13.4 Programming

Parameters related to relative humidity regulation can be viewed and configured in:

- Humidity folder in the installer menu;
- Configuration folder in the installer menu (**1154: H05 / 1158: H09 / 1182: H43**).

Humidity setpoint can be set either from the *main view* or from a dedicated menu (setpoint menu).

14 THERMAL PROFILES

Application has an 8 step thermal profile. Each step is defined by a set of 10 parameters.

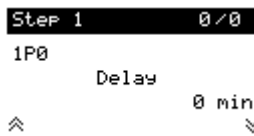
14.1 Programming

Thermal profiles menu

Parameters related to the thermal profiles program can be viewed and configured in the Thermal profiles menu, available in the *main menu*.



Each step has a dedicated sub-menu containing all its parameters.



14.2 Enabling the program

The thermal profiles are enabled from Main View through icon nr 12 described in Main View chapter

12		button to open thermal profiles program control panel (Start/Stop/Reset);	
----	--	---	--

A pop-up window shows up



14.2.1 Shortcuts Enabling /disabling thermal profiles

Shortcuts

Pop-up window is a virtual keyboard to whom shortcuts (i.e. Key functions related to keys) have been associated

See following table. Functions meaning are described in detail in next Program Control paragraph

Key	Single press	Edit mode	Long key press
UP	Select next profile Note. Cycle mode From Profile 8 switch to Profile 0	-	Key not available while running thermal profiles program (cannot select next step)
DOWN	Close pop-up window	Disable thermal profiles program	-
LEFT/ESC	Close pop-up window	Reset thermal profiles program	-
RIGHT	Start/Stop thermal profiles program	-	-
ENTER	Close pop-up window	-	-

Alternatively the thermal profiles program is enabled if automatic mode is switched on in the Functions menu, available in the [main menu](#).

```

Functions      0/0
Economy       Off
Automatic     Off
Reset alarms  Off
^             v
    
```

Thermal profiles program display

Main view display textual information about the state of the thermal profiles program:

```
STEP 1: RUN 02:38
```

where:

- STEP indicates automatic mode is on;
- 1 is the number of the active step;
- START / RUN / STOP HH:MM is the program running state.

14.3 Program control

14.3.1 Program START

In START state, the [main view](#) displays the following text:

```
STEP 1: START 08:30
```

where:

- 08:30 is the program start-up time (--:-- if not specified).

Program can be started:

- from the thermal profiles program control panel, available in the [main view](#);



- a [digital input](#) properly configured by setting parameter **1159: H11** / **1160: H12** = ±21 (toggle START/STOP);
- at the time set directly in the [main view](#):

```
STEP 1: START 01:43
```

14.3.2 Program RUN

In RUN state, the [main view](#) displays the following text:

```
STEP 1: RUN 01:57
```

where:

- 1 is the currently active step;
- 01:57 is the step remaining time.

Step duration can be changed at run-time directly from the [main view](#).

14.3.3 Program STOP

Program can be stopped:

- from the thermal profiles program control panel, available in the [main view](#);
- a [digital input](#) properly configured by setting parameter **1159: H11** / **1160: H12** = ±21 (toggle START/STOP);

14.3.4 Program RESET

Program is reset from the thermal profiles program control panel, available in the [main view](#).

**Thermal profiles
program step
parameters**

14.4 STEP behavior

The following table describes the parameters defining the application behavior when a thermal profiles program step is active.

Parameter	Description	Meaning														
nP0	Step activation delay	Step activation delay, in minutes, after a START event.														
nP1	Step duration	Determines the step duration, in minutes. If nP1 = 0 step stops when the temperature setpoint is reached (does not stop due to a timeout).														
nP2	<i>Relative humidity regulation</i> type	Determines the <i>relative humidity regulation</i> type while the step is active (overwrites parameter 1154: H05).														
nP3	<i>Thermoregulation</i> type	Determines the <i>thermoregulation</i> type while the step is active (overwrites parameter 1156: H07).														
nP4	Humidity setpoint	Determines the <i>relative humidity regulation</i> setpoint while the step is active (overwrites parameter SRH).														
nP5	Temperature setpoint 1	Determines <i>thermoregulation</i> setpoint while the step is active (overwrites SET1).														
nP6	Temperature setpoint 2	Determines <i>thermoregulation</i> setpoint while the step is active (overwrites SET2).														
nP7	Enable/Disable <i>ventilation fans</i> relay	Determines whether <i>ventilation fans</i> relay is enabled/disabled while the step is active. If no relay is configured for this purpose, this parameter has no effect.														
nP8	End step action	Determines the action taken at the end of the step and determines the active setpoint during the delay defined by parameter (n+1)P0 , if $\neq 0$. Available actions are: <table border="1" data-bbox="778 1126 1436 1552"> <thead> <tr> <th>nP8</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>End</td> <td>End of thermal profiles program.</td> </tr> <tr> <td>Next (continue) (*)</td> <td>Go to next step. Keep current setpoint during next step's activation delay.</td> </tr> <tr> <td>Next (wait) (*)</td> <td>Go to next step. Halt regulation, waiting for a new setpoint, during next step's activation delay.</td> </tr> <tr> <td>Loop</td> <td>Go back to the start of the step.</td> </tr> <tr> <td>Go to step</td> <td>Return to step number nP9.</td> </tr> <tr> <td>Everlasting</td> <td>Unlimited duration.</td> </tr> </tbody> </table>	nP8	Description	End	End of thermal profiles program.	Next (continue) (*)	Go to next step. Keep current setpoint during next step's activation delay.	Next (wait) (*)	Go to next step. Halt regulation, waiting for a new setpoint, during next step's activation delay.	Loop	Go back to the start of the step.	Go to step	Return to step number nP9 .	Everlasting	Unlimited duration.
nP8	Description															
End	End of thermal profiles program.															
Next (continue) (*)	Go to next step. Keep current setpoint during next step's activation delay.															
Next (wait) (*)	Go to next step. Halt regulation, waiting for a new setpoint, during next step's activation delay.															
Loop	Go back to the start of the step.															
Go to step	Return to step number nP9 .															
Everlasting	Unlimited duration.															
nP9	Jump back target	Determines the jump back target if nP8 = Go to step.														

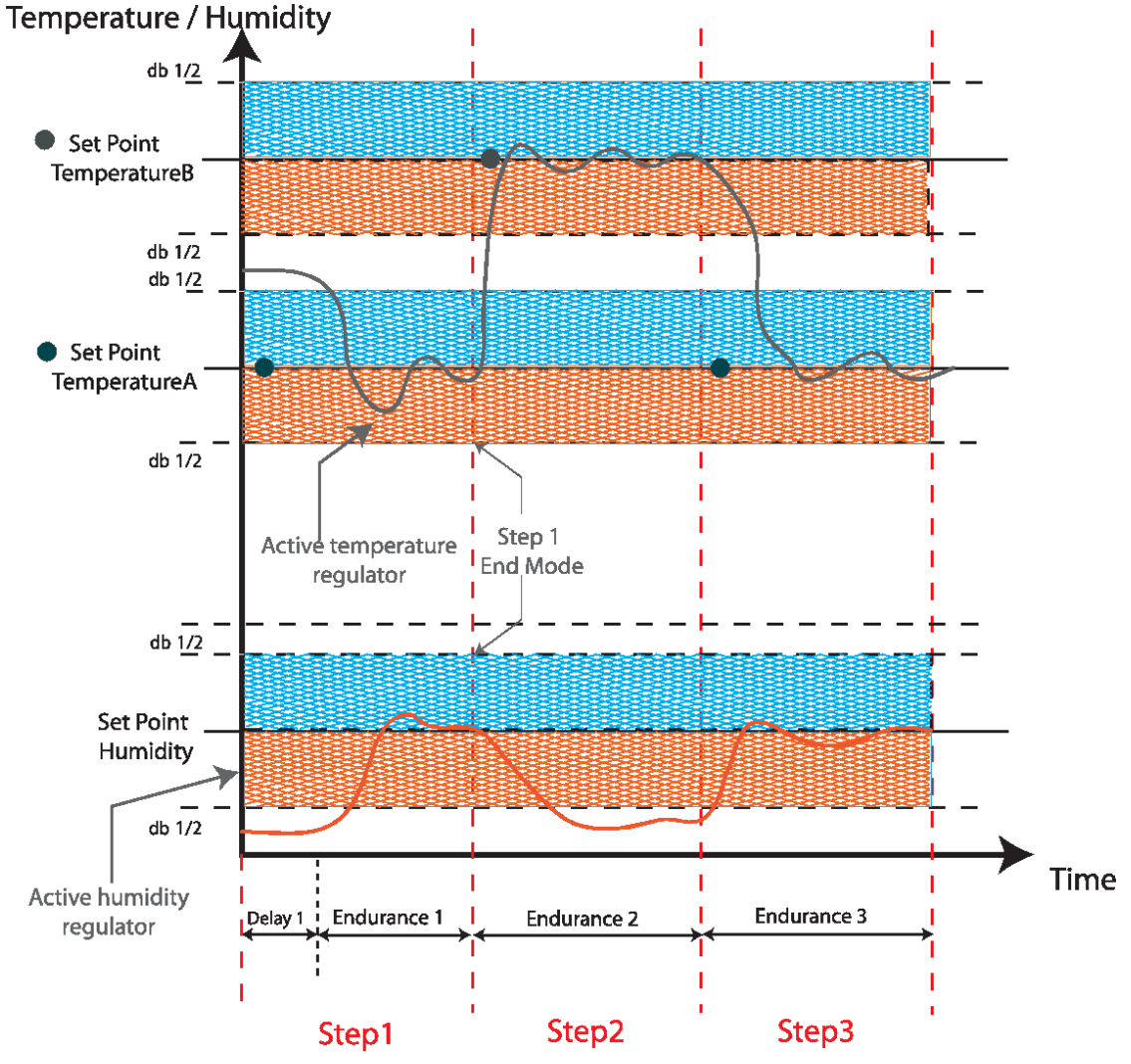
At the end of “End step” the system returns to manual control (i.e. Profiles are disabled)

14.5 Example

The following example discuss a simple 3-step thermal profiles program where both thermoregulation and relative humidity regulation are in neutral zone.

Step	Delay (nP0)	Duration (nP1)	Regulation type (nP2 / nP3)	Humidity setpoint (nP4)	Temperature setpoint (nP5)
Step1	Delay 1	Endurance 1	NZ / NZ	Humidity	Setpoint temperature A

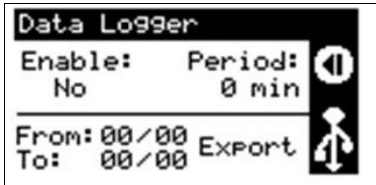
Step	Delay (nP0)	Duration (nP1)	Regulation type (nP2 / nP3)	Humidity setpoint (nP4)	Temperature setpoint (nP5)
Step2	/	Endurance 2	NZ / NZ	Setpoint humidity	Setpoint temperature B
Step3	/	Endurance 3	NZ / NZ	Setpoint humidity	Setpoint temperature A



15 DATALOGGER

From main menu, by long press of UP key , access to **datalogger** and **file export** page.

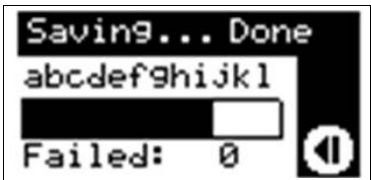
This datalogger saves a file every month including all information about the state of the controller (I/O, state, alarms): Each record is written each <Period> defined by parameter (minimum =5 minutes, maximum = 1440 minutes, 1 minute step), at power on and when an alarm occurs (both when alarm is activated and deactivated).



Label	Description	Notes
Enable	Enable recording (logging)	
Period	Recording period in minutes defined by parameter	minimum = 5 minutes maximum= 1440 minutes step = 1 minute
From	Date (month/year) start exporting records	Ex 06/13
To	Date (month/year) end exporting records	Ex 09/13

Export function

By pressing Export you will see the page informing you about the saving status



Note. 00/00 is the number of the month and year of the file you choose to save. The string "abcdefghijkl" shows the current file name which is currently saving into the USB memory.

16 ALARMS AND DIAGNOSTICS

The application is able to perform complete diagnostics of the system and report any operating trouble with specific alarms.

Alarm condition display

Alarms are always reported by::

- alarm *icon* shown on the display;
- FREE Evolution programmable controller's alarm *LED*.

16.1 Probe error

Probe errors are caused by:

- measured values are outside the nominal range;
- probe faulty / short-circuited / open.

Active probe errors are displayed in the active alarm menu.

The table below lists probe errors.

Error code	Probe error	Effect
E1	Probe Pb1 error (cell temperature)	<ul style="list-style-type: none"> • <i>compressor duty cycle</i> according to parameters 1009: ONT and 1010: OFT • heating regulator disabled • high/low temperature diagnostics is disabled • currently active step of the <i>thermal profiles program</i> is forced to stop, if it is configured with unlimited duration (termination after reaching temperature setpoint)
E2	Probe Pb2 error (evaporator temperature)	<ul style="list-style-type: none"> • <i>defrost</i> termination due to timeout, not because temperature setpoint has been reached • <i>evaporator fans</i> regulation depends upon <i>compressor</i> state
E3	Probe Pb3 error (cell relative humidity)	<ul style="list-style-type: none"> • <i>relative humidity regulation</i> disabled • high/low humidity diagnostics is disabled
E4	Probe Pb4 error (<i>cut-off regulator</i> feedback)	<ul style="list-style-type: none"> • <i>analog output</i> bound to the <i>cut-off regulator</i> is regulator according to parameter 1071: F20 (either off or forced to maximum level)

16.2 Alarms

The following table lists all the application alarms, error probes excluded.

Error code	Alarm	Cause	Effect	Solution
08	High temperature	See <i>High/Low alarms</i>	No effect on regulation (warning only)	Wait for the temperature value read by probe Pb1 (cell temperature) to fall below 1081: HAL
09	Low temperature	See <i>High/Low alarms</i>	No effect on regulation (warning only)	Wait for the temperature value read by probe Pb1 (cell temperature) to rise above

Error code	Alarm	Cause	Effect	Solution
				1082: LAL
19	High humidity	See High/Low alarms	No effect on regulation (warning only)	Wait for the humidity value read by probe Pb3 (cell humidity) to fall below 1089: HHA
20	Low humidity	See High/Low alarms	No effect on regulation (warning only)	Wait for the humidity value read by probe Pb3 (cell humidity) to fall below 1090: LHA
01	External alarm	Due to activation of the digital input configured as alarm (1159: H11 / 1160: H12 = ±5)	Blocks regulators in accordance with parameter 1096: RLO	Regulators resume normal operation upon subsequent deactivation of the digital input
13	Defrost timeout	Interruption of defrost due to timeout instead of reaching defrost end temperature (read from probe Pb2 , evaporator temperature)	No effect on regulation (warning only)	Manual alarm reset required
03	Door open alarm	After the delay 1086: TDO since door opening	No effect on regulation (warning only)	Alarm remains active until the door is closed
02	Panic alarm	Due to activation of the digital input configured as panic alarm (1159: H11 / 1160: H12 = ±18)	No effect on regulation (warning only)	Alarm remains active until subsequent deactivation of the digital input
04	Pressure switch alarm	See Pressure switch		
RTC	Clock error	Real Time Clock error (see FREE Evolution Installation Manual)	Clock-related functions are disabled: automatic defrost on time events; thermal profiles program start-up time	See FREE Evolution Installation Manual

16.3 High/Low (temperature / relative humidity) alarms

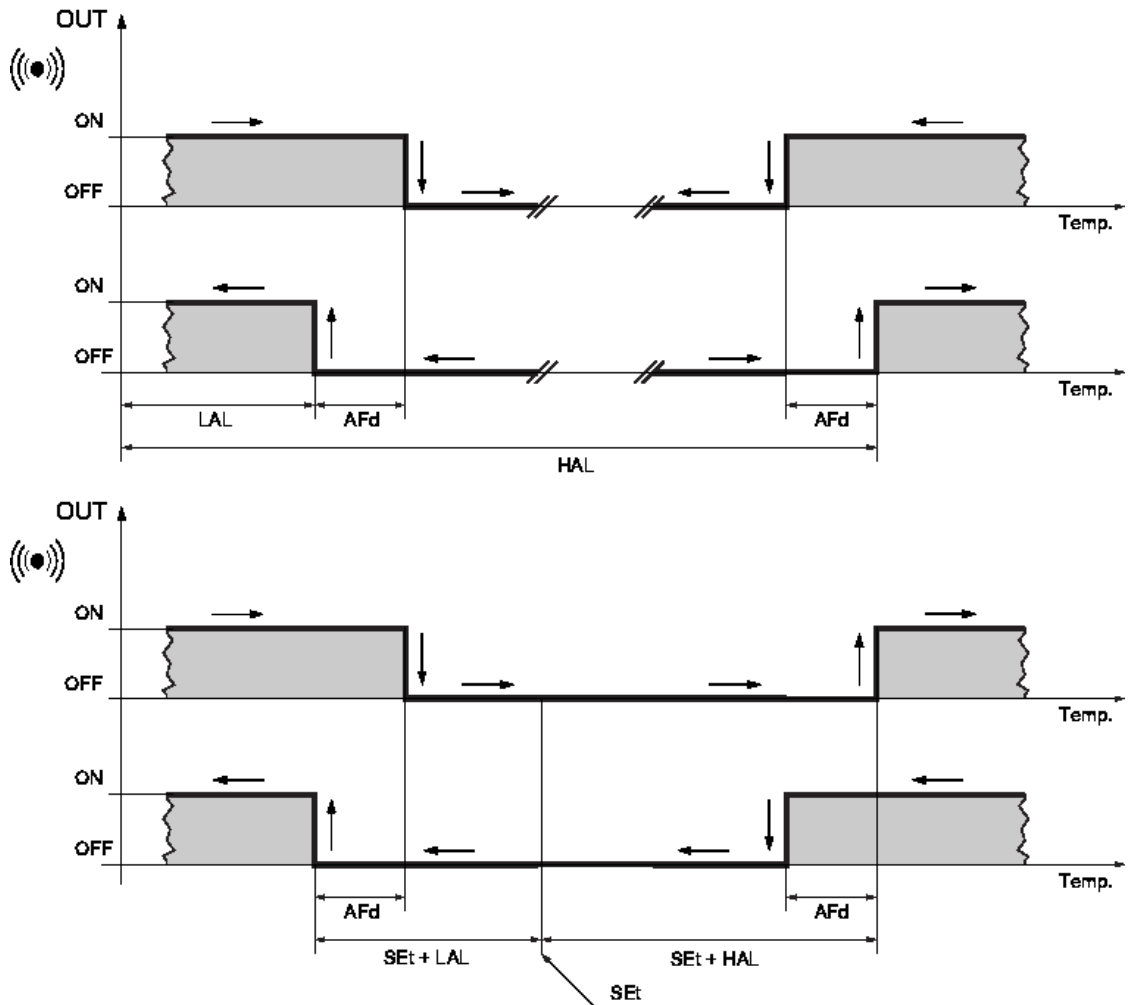
High/Low alarms indicate that user-defined temperature/relative humidity thresholds have been crossed.

16.3.1 High/Low temperature alarms configuration

High/Low temperature alarms refer to values read by probe **Pb1** (cell temperature).

Temperature thresholds are set with parameters **1081: HAL** and **1082: LAL**. Parameter **1079: ATT** determines whether they represent absolute temperature values (**1079: ATT** = Absolute) or values relative to current temperature setpoint (**1079: ATT** = Relative).

High/Low temperature thresholds



To generate an alarm when the value falls below the setpoint when **1079: ATT** = Relative, a negative value must be entered for **1082: LAL**.

Power-on exclusion

Using parameter **1083: PAO** you can set an exclusion time for high/low temperature alarms following the device power-on.

Alarm exclusion after defrost

Using parameter **1084: DAO** you can set an exclusion time for high/low temperature alarms following defrost termination.

Alarm exclusion after door closure

Using parameter **1085: OAO** you can set an exclusion time for high/low temperature alarms following the door closure. During the time intervals defined by parameters 1083: PAO / 1084: DAO / 1085: OAO, the regulator is disabled and any temperature alarms are not signaled.

Alarm signal delay

Using parameter **1087: TAO** you can set a delay for the signaling of the alarm when it occurs.

16.3.2 High/Low humidity alarms configuration

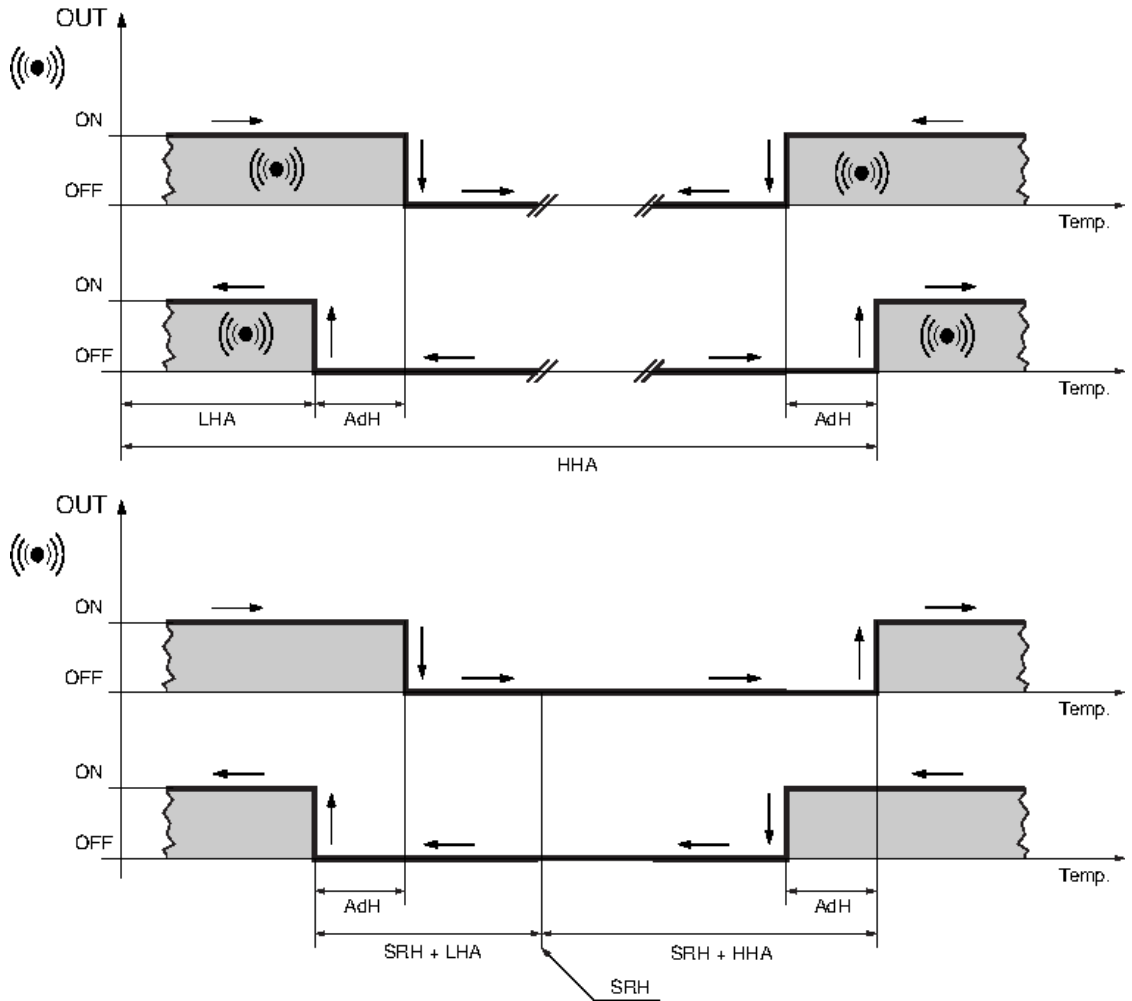
High/Low humidity alarms refer to values read by probe **Pb3** (cell humidity).

High/Low humidity thresholds

Humidity thresholds are set with parameters **1089: HHA** and **1090: LHA**. Parameter **1088: ATH** determines whether they represent absolute humidity values (**1088: ATH** = Absolute) or values relative to current humidity setpoint (**1088: ATH** = Relative).



To generate an alarm when the value falls below the setpoint when **1088: ATH** = Relative, a negative value must be entered for **1090: LHA**.



Power-on exclusion

Using parameter **1093: PAH** you can set an exclusion time for high/low relative humidity alarms following the device power-on.

Alarm exclusion after door closure

Using parameter **1094: OAH** you can set an exclusion time for high/low relative humidity alarms following the door closure.

During the time intervals defined by parameters **1093: PAH** / **1094: OAH**, the regulator is disabled and any relative humidity alarms are not signaled.

Alarm signal delay

Using parameter **1092: AOH** you can set a delay for the signaling of the alarm when it occurs.

17 PARAMETERS

Parameters can be set to fully configure the application.

They can be modified with:

- the application [user interface](#);
- a Personal Computer and the FREE Studio Device software tool.

The following sections analyze each parameter, divided into categories (folders), in detail. The parameters are listed below in tables.

Each parameter is identified on the display as follows:

```
Compressor 0/0
1002: DIF
Differential 0 °C
⌞ ⌋
```

where:

- `Compressor` indicates folder;
- (1/11) 1 indicates the number of the parameter, 11 the total number of parameters displayed in the folder (this number depends on whether the menu is accessed from the User menu or the Installer menu);
- `1002: DIF` is the unique parameter ID;
- `Differential` is the parameter description;
- `0 °C` is the parameter value.

Some parameters are visible only if installer access rights have been granted: please refer to the parameter reference table at the end of the chapter for this information.

17.1 Compressor

1002: DIF	Differential Compressor relay activation differential; the compressor stops on reaching the Setpoint value (as indicated by the adjustment probe) and restarts at a temperature value equal to the Setpoint plus the value of the differential.
1003: HSE	Setpoint MAX Maximum value that can be assigned to the setpoint.
1004: LSE	Setpoint MIN Minimum value that can be assigned to the setpoint. NOTE: The two sets are interdependent: 1003: HSE (maximum setpoint) can not be less than 1004: LSE (minimum setpoint), and viceversa.
1005: OSP	Economy setpoint Temperature value to be added algebraically to the setpoint if reduced set enabled (Economy function). It can be activated with a key stroke, by a function or a digital input configured for this purpose.
1006: HC	Mode Compressor operating mode. If 1006: HC = Heat, compressor integrates the heating regulator and the application can not do cooling anymore (parameter 1156: H07 should be set accordingly).
1009: ONT	Duty cycle time on Actuation time (in minutes) of the compressor due to a probe failure (see compressor duty cycle).
1010: OFT	Duty cycle time off Shutdown time (in minutes) of the compressor due to a probe failure (see compressor duty cycle).

- 1011: DON** **On start delay**
The parameter indicates that a protection is active on the relay actuation of the compressor. The time indicated must elapse between the request and the actual activation of the compressor relay.
- 1012: DOF** **Stop-start delay**
The parameter indicates that a protection is active on the relay actuation of the compressor. The time indicated must elapse between the request and the actual activation of the compressor relay
- 1013: DBI** **Start-start delay**
Delay between activations; the delay time indicated must elapse between two consecutive activations of the compressor.
- 1014: ODO** **Power-on delay**
Delay in activating outputs after the controller is switched on or after a power failure.
If **1014: ODO** = 0, not active.

17.2 Humidity

- 1021: DBH** **Differential**
Relative humidity regulation differential.
- 1022: HSH** **Setpoint MAX**
Maximum value that can be assigned to the humidity setpoint.
- 1023: LSH** **Setpoint MIN**
Minimum value that can be assigned to the humidity setpoint.
- 1024: DEH** **While defrosting**
Relative humidity regulation while defrosting. If **1024: DEH** = Not active, relative humidity regulation is not active during defrost; if **1024: DEH** = Active, relative humidity regulation is active during defrost.
- 1027: DB** **Heating band**
Heating regulation band.
- 1025: OdEH** **Economy Offset Dehumidification**
Value to add with sign for dehumidification in economy mode
- 1026: OHUM** **Economy Offset Umidification**
Value to add with sign for humidification in economy mode

17.3 Defrost

- 1028: DTY** **Type**
Defrost mode.
If **1028: DTY** = Electric, electric defrost (OFF Cycle defrost, that is compressor not running during defrost). NOTE: electrical defrost + air defrost, in the case of fans in parallel with the defrost output relay).
If **1028: DTY** = Cycle inversion, cycle inversion defrost (hot gas, or compressor running during defrost).
If **1028: DTY** = Free, defrost with Free mode (independent of compressor status).
- 1029: DIT** **Time interval**
Time interval between the start of two subsequent defrosting cycles. Times are expressed in hours.
This parameter is used in automatic defrosts at fixed intervals. If **1029: DIT** = 0 there is no automatic defrost: defrost in never executed.
- 1032: DCT** **Counting type**

Selects the count mode for the defrost interval.

If **1032: DCT** = Compressor up-time (DIGIFROST® method), counter is incremented only with the compressor on. Compressor running time is counted separately from the evaporator probe (count active if evaporator probe missing or faulty).

If **1032: DCT** = Unit up-time, defrost count is always active when the application is on.

If **1032: DCT** = On compressor stop, a defrost cycle is run at each compressor stop, depending on the parameter **1028: DTY**.

If **1032: DCT** = Clock, a defrost cycle is run at each time set in the defrost times menu.

1033: DOH **Power-on exclusion**

Defrost exclusion time after switching on application.

1189: DET **Timeout**

Defrost timeout. Determines the maximum duration of defrosting, in minutes.

1034: DST **Stop temperature**

Defrost stop temperature measured by defrost probe.

1036: DPO **At power-on**

Determines if a defrost cycle has to run when the application is switched on.

If **1036: DPO** = Not required, defrost not run at start-up.

If **1036: DPO** = Required, defrost run at start-up.

17.4 Evaporator fans

1040: FST **Stop temperature**

Fan stop temperature; if the evaporator probe reads a higher value than the set value, the fans are stopped. The value can be positive or negative.

Temperatures are expressed in absolute values.

1042: FAD **Differential**

Fan activation differential, relative to stop temperature given in parameter **1040: FST**.

1043: FDT **Delay time**

Fan activation delay after a defrosting cycle.

1044: DT **Drainage time**

After a defrost cycle, the fans and compressor remain off for the time set in this parameter.

1045: DFD **While defrosting**

Allows exclusion of the evaporator fans to be selected or not selected during defrosting.

If **1045: DFD** = Not active, fans are off during defrost.

If **1045: DFD** = Active, evaporator fans regulation is active during defrost.

1046: FCO **If compressor off**

Selects or not fan deactivation at compressor OFF.

If **1045: FCO** = Off, evaporator fans are off if compressor is off.

If **1045: FCO** = Thermostat controlled, evaporator fans are independent of compressor state.

Value **1045: FCO** = Duty cycle is not used.

1047: FOD **If door open**

Selects fan deactivation when the door is opened and fan restart when the door is shut (if they were running).

If **1047: FOD** = Not active, fans are off if door is open.

If **1047: FOD** = Active, evaporator fans regulation is active when the door is open.

1048: FDC Post-ventilation

Fan switch off delay after compressor stop, in minutes. If **1048: FDC** = 0 this function is excluded.

17.5 Analog output

1051: F00 Configuration

Enable/Disable cut-off regulator.

If **1051: F00** = Disabled, cut-off regulator is disabled and all its parameters are ignored by the application.

If **1051: F00** = Enabled, cut-off regulator is enabled and its parameters should be properly configured along with the regulation probe **Pb4**.

1052: F01 Mode

Cut-off regulator operating mode (heat/cool).

1054: F03 Start-up time

Start-up time during which the analog output bound to the cut-off regulator is forced to maximum level.

1057: F06 Minimum level

Minimum level (percentage) of analog output bound to the cut-off regulator.

1058: F07 Medium level

Medium level (percentage) of analog output bound to the cut-off regulator.

1059: F08 Maximum level

Maximum level (percentage) of analog output bound to the cut-off regulator.

1060: F09 Setpoint

Cut-off regulator setpoint. When setpoint is reached, the analog output bound to the cut-off regulator is forced to minimum level given in parameter **1057: F06**.

1061: F10 Maximum level differential

Differential, relative to the setpoint given in parameter **1060: F09**, at which the cut-off regulator forces the analog output to the maximum level.

1062: F11 Proportional band

Cut-off regulator proportional band.

1063: F12 Maximum level hysteresis

Maximum-Medium level (of the analog output bound to the cut-off regulator) hysteresis width.

1064: F13 Cut-off hysteresis

Cut-off hysteresis width.

1065: F14 Cut-off differential

Differential, relative to the setpoint given in parameter **1060: F09**, at which the cut-off regulator forces the analog output to off (cut-off).

1066: F15 While defrosting

Determines whether cut-off regulator is enabled or disabled during defrost.

If **1066: F15** = Not active, cut-off regulator is disabled during defrost.

If **1066: F15** = Active, cut-off regulator is enabled during defrost.

1067: F16 If compressor off

Enable/Disable cut-off regulator when compressor is off.

If **1067: F16** = Not active, cut-off regulator is disabled when compressor is off.

- If **1067: F16** = Active, cut-off regulator is enabled when compressor is off.
- 1068: F17** **After defrost exclusion**
After defrost exclusion time of the cut-off regulator.
- 1069: F18** **Cut-off bypass time**
Cut-off bypass time.
- 1070: F19** **Pre-ventilation**
Pre-ventilation time.
- 1071: F20** **If probe KO**
State of the analog output bound to the cut-off regulator in case of regulation probe error.
If **1071: F20** = Not active, analog output is forced to off (0%).
If **1071: F20** = Active, analog output is forced to maximum level (100%).
- 17.6 Ventilation fans**
- 1072: CON** **Duty cycle time on**
Ventilation fans duty cycle time on.
- 1073: COF** **Duty cycle time off**
Ventilation fans duty cycle time off.
- 17.7 Alarms**
- 1079: ATT** **Temperature alarm value type**
Mode of parameters **1081: HAL** and **1082: LAL**, understood as absolute temperature values or as values relative to the setpoint.
If **1079: ATT** = Absolute, parameters **1081: HAL** and **1082: HAL** give absolute temperature values.
If **1079: ATT** = Relative, parameters **1081: HAL** and **1082: HAL** give values relative to the setpoint.
- 1080: AFD** **Temperature differential**
High/Low temperature alarm differential (with respect to respective thresholds).
- 1081: HAL** **High temperature threshold**
High temperature alarm threshold.
Temperature upper limit (distance from setpoint or absolute value in relation to **1079: ATT**) which, when crossed, triggers an alarm signal.
- 1082: LAL** **Low temperature threshold**
Low temperature alarm threshold.
Temperature lower limit (distance from setpoint or absolute value in relation to **1079: ATT**) which, when crossed, triggers an alarm signal.
- 1083: PAO** **Power-on exclusion**
High/Low temperature alarms exclusion time following a power-on.
- 1084: DAO** **After defrost exclusion**
High/Low temperature alarms exclusion time after defrost.
- 1085: OAO** **After door closure exclusion**
High/Low temperature alarms exclusion time after door closure.
- 1086: TDO** **Door open delay**
Time out after alarm signal following digital input deactivation (door open).

- 1087: TAO** **Temperature alarm delay**
Delay signaling high/low temperature alarms.
- 1088: ATH** **Humidity alarms value type**
Mode of parameters **1089: HHA** and **1090: LHA**, understood as absolute relative humidity values or as values relative to the setpoint.
If **1088: ATH** = Absolute, parameters **1089: HHA** and **1090: LHA** gives absolute relative humidity values.
If **1088: ATH** = Relative, parameters **1089: HHA** and **1090: LHA** gives values relative to the setpoint.
- 1089: HHA** **High humidity threshold**
High humidity alarm threshold.
Humidity upper limit (distance from setpoint or absolute value in relation to **1088: ATH**) which, when crossed, triggers an alarm signal.
- 1090: LHA** **Low humidity threshold**
Low humidity alarm threshold.
Humidity lower limit (distance from setpoint or absolute value in relation to **1088: ATH**) which, when crossed, triggers an alarm signal.
- 1091: ADH** **Relative humidity differential**
High/Low humidity alarm differential (with respect to respective thresholds).
- 1092: AOH** **Relative humidity alarm delay**
Delay signaling high/low alarms.
- 1093: PAH** **Power-on exclusion**
High/Low humidity alarms exclusion time following a power-on.
- 1094: OAH** **After door closure exclusion**
High/Low humidity alarms exclusion time after door closure.
- 1095: DAT** **On defrost timeout**
Alarm signaling end of defrost due to timeout.
If **1095: DAT** = No alarm, no alarm is signaled on defrost timeout.
If **1095: DAT** = Alarm, alarm is signaled on defrost timeout.
- 1096: RLO** **Lock on external alarm**
Regulators locked when external alarm is active:
If **1096: RLO** = None, external alarm does not block any resource.
If **1096: RLO** = Comp/Defrost, external alarm blocks compressor and defrost.
If **1096: RLO** = Comp/Defrost/Fan, external alarm blocks compressor, defrost, and evaporator fans.

17.8 Light and digital inputs

- 1104: DSD** **Light when door open**
Enables light relay from door switch.
If **1104: DSD** = Off, opening the door does not turn on the light.
If **1104: DSD** = On, opening the door turns on the light (when off).
- 1105: DLT** **Light off delay**
Delay switching off relay configured as light after door is closed.
Valid if **1104: DSD** is set to switch on light when door opens.
- 1106: OFL** **Light off from key**

- Disable light relay from key, even if light off delay **1105: DLT** is active.
- 1115: PEN Pressure switch limit**
Number of pressure switch events allowed.
- 1116: PEI Pressure switch time**
Pressure switch event count time interval.
- 17.9 Display**
- 1122: PA1 User password**
Password to access user level parameters (USR level)/the User Menu.
- 1123: PA2 Installer password**
Password to access installer level parameters (INS level)/the Installer Menu.
- 17.10 Configuration**
- 1154: H05 Relative humidity regulation**
If **1154: H05** = Disabled, relative humidity regulation disabled.
If **1154: H05** = Neutral zone, relative humidity regulation enabled in neutral zone (both humidification and dehumidification).
If **1154: H05** = Humidification only, relative humidity regulation enabled in humidification only.
If **1154: H05** = Dehumidification only, relative humidity regulation enabled in dehumidification only.
- 1156: H07 Thermoregulation**
If **1156: H07** = Disabled, thermoregulation disabled.
If **1156: H07** = Neutral zone, thermoregulation enabled in neutral zone (both heating and cooling).
If **1156: H07** = Heating only, thermoregulation enabled in heating only.
If **1156: H07** = Cooling only, thermoregulation enabled in cooling only.
If **1156: H07** = From digital input, thermoregulation enabled with heat/cool mode selection from digital input.
- 1158: H09 Dehumidification type**
If **1158: H09** = Relay only, dehumidification with dedicated relay.
If **1158: H09** = Relay and compressor, dehumidification with dedicated relay and compressor.
If **1158: H09** = No relay, dehumidification with compressor and heating device.
- 1159: H11 Digital input 1**
Digital input 1 configuration.
See digital input configuration table.
- 1160: H12 Digital input 2**
Digital input 2 configuration.
See digital input configuration table.
- H23 Digital output 3**
Digital output 3 configuration.
See digital output configuration table.
- 1168: H26 Digital output 6**
Digital output 6 configuration.
See digital output configuration table.

- 1169: H27 Digital output 7**
 Digital output 7 configuration.
 See digital output configuration table.
- 1180: H41 Probe 1**
 Probe **Pb1** (cell temperature) configuration.
 See analog input configuration table.
- 1181: H42 Probe 2**
 Probe **Pb2** (evaporator temperature) configuration.
 See analog input configuration table.
- 1182: H43 Probe 3**
 Probe **Pb3** (cell humidity) configuration.
 See analog input configuration table.
- 1183: H44 Probe 4**
 Probe **Pb4** (cut-off regulator feedback) configuration.
 See analog input configuration table.

17.11 Programming reference

The following tables report a summary description of the whole set of application parameters discussed in preceding paragraphs, along with information about the range of allowed values, default value, and unit of measurement. Moreover, necessary information to read and write them by means of a fieldbus communication protocol is also recorded.

17.11.1 Parameter menu

The following table indicates the visibility of the application parameters, grouped by folders/menus, depending on access rights granted (user or installer).

Folder	Menu name shown on the display	User menu		Installer menu	
		● = Visible N.A. = Not available	Number of parameters	● = Visible N.A. = Not available	Number of parameters
Compressor	Compressor	●	5/11	●	11/11
Humidity	Humidity	●	2/5	●	5/5
Defrost	Defrost	●	4/7	●	7/7
Evaporator fans	Evaporator fan	●	7/8	●	8/8
Analog output	Analog output	N.A.	0/18	●	18/18
Ventilation fans	Ventilation fan	N.A.	0/2	●	2/2
Alarms	Alarms	N.A.	0/18	●	18/18
Light and digital inputs	Light & D.I.s	N.A.	0/5	●	5/5
Display	Display	●	1/2	●	2/2
Configuration	Configuration	N.A.	0/12	●	12/12

17.11.2 Parameter table

The table below lists all application configuration parameters stored in the device's permanent memory, and their visibilities.

Column meaning:

Column	Meaning								
Menu	Menu containing the parameter								
Access rights	Required access rights to view/edit parameter:								
	<table border="1"> <thead> <tr> <th>Abbreviation</th> <th>Required access rights</th> </tr> </thead> <tbody> <tr> <td>-</td> <td>None: parameter is available in non-protected menus</td> </tr> <tr> <td>USR/INS</td> <td>Parameter is available both in the user menu and in the installer menu</td> </tr> <tr> <td>INS</td> <td>Parameter is only available in the installer menu</td> </tr> </tbody> </table>	Abbreviation	Required access rights	-	None: parameter is available in non-protected menus	USR/INS	Parameter is available both in the user menu and in the installer menu	INS	Parameter is only available in the installer menu
	Abbreviation	Required access rights							
	-	None: parameter is available in non-protected menus							
USR/INS	Parameter is available both in the user menu and in the installer menu								
INS	Parameter is only available in the installer menu								
ID	Parameter unique identifier (ID), as it is displayed in the application menu								
Label	Parameter label, as it is displayed in the application menu								
Address	<p>Only when accessing the parameter through fieldbus communication protocols (with software tools not included in Eliwell FREE Studio).</p> <p>Parameter address for access through communication protocol (either Modbus, CANopen or Modbus TCP).</p> <p>Modbus and Modbus TCP addresses are HOLDING REGISTERS to be access through 3H / 10H commands</p>								
Description	Parameter description.								
Values	<p>Parameter data type: that determines the range of the allowed values for the parameter (to be further refined by the limits shown in Min and Max columns) and the need to apply a conversion, only when accessing the parameter through fieldbus communication protocols (with software tools not included in Eliwell FREE Studio), because the value is signed number. For example, in case you access to a 16-bit integer parameter by means of a communication protocol, you have to apply the following conversion:</p> <ul style="list-style-type: none"> if the value read is between 0 and 32767, the result is equal to the value read (zero and positive values); if the value read is between 32.768 and 65.535, the result is the value read - 65.536 (negative values). 								
Min	Minimum value you can assign to the parameter								
Max	Maximum value you can assign to the parameter								
Default	Default parameter value (set by FREE Studio Device when downloading the application to the FREE Evolution programmable controller).								
U.M.	Unit of measurement.								
EXP	<p>Only when accessing the parameter through fieldbus communication protocols (with software tools not included in Eliwell FREE Studio).</p> <p>If EXP = -1, the value read by means of a fieldbus communication protocol has to be divide by 10 (value/10) in order to convert it to the scale in which Min/Max/Default values are given in the table, according to the U.M. column.</p> <p>Example: parameters HSE = 50.0. Column EXP = -1:</p> <ul style="list-style-type: none"> value shown on the display/read by FREE Studio Device is 50.0; value read by means of a fieldbus communication protocol is 500 → 500/10 = 50.0. 								

Menu	Access rights	ID	Label	Address	Description	Values	Min	Max	Default	U.M.	EXP
Setpoint	-	1001	SET1	16384	Temperature setpoint 1	Signed 16-bit	1004: LSE	1003: HSE	0,0	°C	-1
Setpoint	-		SET2	16385	Temperature setpoint 2	Signed 16-bit	1004: LSE	1003: HSE	0,0	°C	-1
Compressor	USR/INS	1002	DIF	16386	Compressor regulation differential	Signed 16-bit	0,0	30,0	2,0	°C	-1
Compressor	INS	1003	HSE	16387	Temperature setpoint maximum value	Signed 16-bit	1004: LSE	110,0	50,0	°C	-1
Compressor	INS	1004	LSE	16388	Temperature setpoint minimum value	Signed 16-bit	-50,0	1003: HSE	-50,0	°C	-1
Compressor	INS	1005	OSP	16389	Economy setpoint	Signed 16-bit	-30,0	30,0	0,0	°C	-1
Compressor	INS	1006	HC	16390	Compressor operating mode	(0) = Heating; (1) = Cooling			1		
Compressor	INS	1009	ONT	16393	Compressor duty cycle ON time, in case of probe error	Unsigned 16-bit	0	255	10	min	
Compressor	INS	1010	OFT	16394	Compressor duty cycle OFF time, in case of probe error	Unsigned 16-bit	0	255	10	min	
Compressor	USR/INS	1011	DON	16395	Compressor on-start delay	Unsigned 16-bit	0	1000	10	s	
Compressor	USR/INS	1012	DOF	16396	Compressor stop-start safety time	Unsigned 16-bit	0	1000	0	s	
Compressor	USR/INS	1013	DBI	16397	Compressor start-start safety time	Unsigned 16-bit	0	255	2	min	
Compressor	USR/INS	1014	ODO	16398	Power-on delay activation relay	Unsigned 16-bit	0	255	0	min	
Setpoint	-	1019	SRH	16403	Relative humidity setpoint	Signed 16-bit	1023: LSH	1022: HSH	50,0	%R.H.	-1
Humidity	USR/INS	1021	DBH	16405	Relative humidity regulation differential	Signed 16-bit	0,0	50,0	5,0	%R.H.	-1
Humidity	INS	1022	HSH	16406	Relative humidity setpoint maximum value	Signed 16-bit	1023: LSH	100,0	100,0	%R.H.	-1
Humidity	INS	1023	LSH	16407	Relative humidity setpoint minimum value	Signed 16-bit	0,0	1022: HSH	0,0	%R.H.	-1
Humidity	INS	1024	DEH	16408	Relative humidity regulation during defrost	(0) = Not active; (1) = Active			0		
Humidity	USR/INS	1027	DB	16411	Heating regulation differential	Signed 16-bit	0,0	50,0	2,0	°C	-1
Defrost	INS	1028	DTY	16412	Defrost mode	(0) = Electric; (1) = Cycle inversion; (2) = Free			0		
Defrost	USR/INS	1029	DIT	16413	Interval time between two defrost cycles	Signed 16-bit	0	255	6	h	
Defrost	INS	1032	DCT	16416	Interval time counting type	(0) = Compressor up-time; (1) = Unit up-time; (2) = On compressor stop; (3) = Real time clock			3		

Menu	Access rights	ID	Label	Address	Description	Values	Min	Max	Default	U.M.	EXP
Defrost	INS	1033	DOH	16417	Delay after power-on for the beginning of the first defrost cycle	Unsigned 16-bit	0	59	0	min	
Defrost	USR/INS	1034	DST	16418	Defrost stop temperature	Signed 16-bit	-302,0	1472,0	6,0	°C	-1
Defrost	USR/INS	1036	DPO	16420	Determines if a defrost cycle has to run when the application is switched on	(0) = Not required; (1) = Required			0		
Evaporator fan	USR/INS	1040	FST	16424	Fan stop temperature	Signed 16-bit	-302,0	1472,0	6,0	°C	-1
Evaporator fan	USR/INS	1042	FAD	16426	Fan activation differential	Signed 16-bit	1,0	50,0	1,0	°C	-1
Evaporator fan	USR/INS	1043	FDT	16427	Fan activation delay after a defrosting cycle	Unsigned 16-bit	0	255	0	min	
Evaporator fan	USR/INS	1044	DT	16428	Drainage time	Unsigned 16-bit	0	255	0	min	
Evaporator fan	USR/INS	1045	DFD	16429	Allows exclusion of the evaporator fans to be selected or not selected during defrosting	(0) = Not active; (1) = Active			1		
Evaporator fan	USR/INS	1046	FCO	16430	Selects or not fan deactivation at compressor OFF	(0) = Off; (1) = Thermostat controlled; (2) = Duty cycle			1		
Evaporator fan	USR/INS	1047	FOD	16431	Selects fan deactivation when the door is opened and fan restart when the door is shut (if they were running)	(0) = Not active; (1) = Active			1		
Evaporator fan	INS	1048	FDC	16432	Fan switch off delay after compressor stop, in minutes	Unsigned 8-bit	0	99	0	min	
Analog output	INS	1051	F00	16435	Enable/Disable cut-off regulator	(0) = Disable; (1) = Enable			0		
Analog output	INS	1052	F01	16436	Cut-off regulator operating mode (heat/cool)	(0) = Heating; (1) = Cooling			1		
Analog output	INS	1054	F03	16438	Start-up time during which the analog output bound to the cut-off regulator is forced to maximum level	Unsigned 16-bit	0	60	10	s	
Analog output	INS	1057	F06	16441	Minimum level (percentage) of analog output bound to the cut-off regulator	Signed 16-bit	0	100	30	%	
Analog output	INS	1058	F07	16442	Medium level (percentage) of analog	Signed 16-bit	0	100	95	%	

Menu	Access rights	ID	Label	Address	Description	Values	Min	Max	Default	U.M.	EXP
					output bound to the cut-off regulator						
Analog output	INS	1059	F08	16443	Maximum level (percentage) of analog output bound to the cut-off regulator	Signed 16-bit	0	100	100	%	
Analog output	INS	1060	F09	16444	Cut-off regulator setpoint	Signed 16-bit	-50,0	99,9	30,0		-1
Analog output	INS	1061	F10	16445	Maximum level differential	Signed 16-bit	0,0	99,9	10,0		-1
Analog output	INS	1062	F11	16446	Cut-off regulator proportional band	Signed 16-bit	0,0	25,5	7,0		-1
Analog output	INS	1063	F12	16447	Maximum level hysteresis	Signed 16-bit	0,0	25,5	2,0		-1
Analog output	INS	1064	F13	16448	Cut-off hysteresis width	Signed 16-bit	0,0	25,5	2,0		-1
Analog output	INS	1065	F14	16449	Cut-off differential	Signed 16-bit	0,0	25,5	3,0		-1
Analog output	INS	1066	F15	16450	Determines whether cut-off regulator is enabled or disabled during defrost	(0) = Not active; (1) = Active			1		
Analog output	INS	1067	F16	16451	Enable/Disabled cut-off regulator when compressor is off	(0) = Not active; (1) = Active			1		
Analog output	INS	1068	F17	16452	After defrost exclusion time of the cut-off regulator	Unsigned 8-bit	0	59	0	min	
Analog output	INS	1069	F18	16453	Cut-off bypass time	Unsigned 16-bit	0	255	0	s	
Analog output	INS	1070	F19	16454	Pre-ventilation	Unsigned 16-bit	0	255	0	s	
Analog output	INS	1071	F20	16455	State of the analog output bound to the cut-off regulator in case of regulation probe error	(0) = Not active; (1) = Active			1		
Ventilation fan	INS	1072	CON	16456	Ventilation fans duty cycle time on	Unsigned 16-bit	0	255	1	min	
Ventilation fan	INS	1073	COF	16457	Ventilation fans duty cycle time off	Unsigned 16-bit	0	255	0	min	
Alarms	INS	1079	ATT	16463	Temperature alarm value type	(0) = Absolute; (1) = Relative			1		
Alarms	INS	1080	AFD	16464	Temperature differential	Signed 16-bit	1,0	50,0	1,0	°C	-1
Alarms	INS	1081	HAL	16465	High temperature alarm threshold	Signed 16-bit	1082: LAL		50,0	°C	-1
Alarms	INS	1082	LAL	16466	Low temperature alarm threshold	Signed 16-bit		1081: HAL	-50,0	°C	-1

Menu	Access rights	ID	Label	Address	Description	Values	Min	Max	Default	U.M.	EXP
Alarms	INS	1083	PAO	16467	High/Low temperature alarms exclusion time following a power-on	Unsigned 16-bit	0	10	3	h	
Alarms	INS	1084	DAO	16468	High/Low temperature alarms exclusion time after defrost	Unsigned 16-bit	0	999	60	min	
Alarms	INS	1085	OAO	16469	High/Low temperature alarms exclusion time after door closure	Unsigned 16-bit	0	10	1	h	
Alarms	INS	1086	TDO	16470	Time out after alarm signal following digital input deactivation (door open)	Unsigned 16-bit	0	255	10	min	
Alarms	INS	1087	TAO	16471	Delay signaling high/low temperature alarms	Unsigned 16-bit	0	255	0	min	
Alarms	INS	1088	ATH	16472	Relative humidity alarm value type	(0) = Absolute; (1) = Relative			1		
Alarms	INS	1089	HHA	16473	High humidity alarm threshold	Signed 16-bit	_1090_LHA		50,0	%R.H.	-1
Alarms	INS	1090	LHA	16474	Low humidity alarm threshold	Signed 16-bit		_1089_HHA	-50,0	%R.H.	-1
Alarms	INS	1091	ADH	16475	Relative humidity differential	Signed 16-bit	1,0	50,0	2,0	%R.H.	-1
Alarms	INS	1092	AOH	16476	Relative humidity alarm delay	Unsigned 16-bit	0	255	0	min	
Alarms	INS	1093	PAO	16477	High/Low humidity alarms exclusion time following a power-on	Unsigned 16-bit	0	10	3	h	
Alarms	INS	1094	OAH	16478	High/Low humidity alarms exclusion time after door closure	Unsigned 16-bit	0	10	1	h	
Alarms	INS	1095	DAT	16479	Alarm signaling end of defrost due to timeout	(0) = No alarm; (1) = Alarm			0		
Alarms	INS	1096	RLO	16480	Regulators locked when external alarm is active	(0) = None; (1) = Compressor and defrost; (2) = Compressor, defrost, and fans			0		
Light & D.I.s	INS	1104	DSD	16488	Enables light relay from door switch	Boolean			1		
Light & D.I.s	INS	1105	DLT	16489	Delay switching off relay configured as light after door is closed	Unsigned 8-bit	0	31	0	min	
Light & D.I.s	INS	1106	OFL	16490	Disable light relay from key, even if light off delay 1105: DLT is active	Boolean			1		

Menu	Access rights	ID	Label	Address	Description	Values	Min	Max	Default	U.M.	EXP
Light & D.I.s	INS	1115	PEN	16499	Number of pressure switch events allowed	Unsigned 16-bit	0	15	15		
Light & D.I.s	INS	1116	PEI	16500	Pressure switch event count time interval	Unsigned 16-bit	1	99	99	min	
Display	USR/INS	1122	PA1	16506	User password	String			***10		
Display	INS	1123	PA2	16509	Installer password	String			***20		
Configuration	INS	1154	H05	16542	Relative humidity regulation mode	(0) = Disabled; (1) = Neutral zone; (2) = Humidification only; (3) = Dehumidification only			1		
Configuration	INS	1156	H07	16544	Thermoregulation mode	(0) = Disabled; (1) = Neutral zone; (2) = Heating only; (3) = Cooling only; (4) = Heating and cooling from DI			1		
Configuration	INS	1158	H09	16546	Dehumidification mode	(0) = Relay only; (1) = Relay and compressor; (2) = No relay (heating and cooling)			0		
Configuration	INS	1159	H11	16547	Digital input 1 configuration	(0) = Disabled; (1) = NO, Defrost request; (-1) = NC, Defrost request; (2) = NO, Economy; (-2) = NC, Economy; (4) = NO, Door switch; (-4) = NC, Door switch; (5) = NO, External alarm; (-5) = NC, External alarm; (7) = NO, Stand-by; (-7) = NC, Stand-by; (11) = NO, Pressure switch; (-11) = NC, Pressure switch; (14) = NO, Light; (-14) = NC, Light; (15) = NO, Ventilation; (-15) = NC, Ventilation; (18) = NO, Panic; (-18) = NC, Panic; (20) = NO, Heat/Cool; (-20) = NC, Heat/Cool; (21) = NO, AUTO mode request; (-21) = NC, AUTO mode request			4		
Configuration	INS	1160	H12	16548	Digital input 2 configuration	See 1159 H11			5		
Configuration	INS	-	H22	16556	Digital output 2 configuration	(1) = Dehumidifier; (2) = Electric defrost			1		
Configuration	INS	1168	H26	16557	Digital output 6 configuratio	(0) = Disabled; (4) = Alarm; (7) = Light; (11) = Ventilation fan			7		
Configuration	INS	1169	H27	16558	Digital output 7 configuration	(0) = Disabled; (4) = Alarm; (7) = Light; (11) = Ventilation fan			0		
Configuration	INS	1180	H41	16569	Probe 1 configuration	(0) = Disabled;			1		

Menu	Access rights	ID	Label	Address	Description	Values	Min	Max	Default	U.M.	EXP
						(1) = Analog input 1; (2) = Analog input 2; (3) = Analog input 3; (4) = Analog input 4; (5) = Analog input 5; (6) = Analog input 6					
Configuration	INS	1181	H42	16570	Probe 2 configuration	See 1180 H41			2		
Configuration	INS	1182	H43	16571	Probe 3 configuration	See 1180 H41			3		
Configuration	INS	1183	H44	16572	Probe 4 configuration	See 1180 H41			4		
Defrost	USR/INS	1189	DET	16578	Defrost timeout	Unsigned 16-bit	1	255	30	min	
Defrost times > Working days	-	-	DE1	16600	Defrost starting time no. 1 on working days	Signed 16-bit	0	1440	1440		
Defrost times > Working days	-	-	DE2	16601	Defrost starting time no. 2 on working days	Signed 16-bit	0	1440	1440		
Defrost times > Working days	-	-	DE3	16602	Defrost starting time no. 3 on working days	Signed 16-bit	0	1440	1440		
Defrost times > Working days	-	-	DE4	16603	Defrost starting time no. 4 on working days	Signed 16-bit	0	1440	1440		
Defrost times > Working days	-	-	DE5	16604	Defrost starting time no. 5 on working days	Signed 16-bit	0	1440	1440		
Defrost times > Working days	-	-	DE6	16605	Defrost starting time no. 6 on working days	Signed 16-bit	0	1440	1440		
Defrost times > Working days	-	-	DE7	16606	Defrost starting time no. 7 on working days	Signed 16-bit	0	1440	1440		
Defrost times > Working days	-	-	DE8	16607	Defrost starting time no. 8 on working days	Signed 16-bit	0	1440	1440		
Defrost times > Weekend	-	-	F1	16608	Defrost starting time no. 1 during weekend	Signed 16-bit	0	1440	1440		
Defrost times > Weekend	-	-	F2	16609	Defrost starting time no. 2 during weekend	Signed 16-bit	0	1440	1440		
Defrost times >	-	-	F3	16610	Defrost starting time no. 3 during weekend	Signed 16-bit	0	1440	1440		

Menu	Access rights	ID	Label	Address	Description	Values	Min	Max	Default	U.M.	EXP
Weekend											
Defrost times > Weekend	-	-	F4	16611	Defrost starting time no. 4 during weekend	Signed 16-bit	0	1440	1440		
Defrost times > Weekend	-	-	F5	16612	Defrost starting time no. 5 during weekend	Signed 16-bit	0	1440	1440		
Defrost times > Weekend	-	-	F6	16613	Defrost starting time no. 6 during weekend	Signed 16-bit	0	1440	1440		
Defrost times > Weekend	-	-	F7	16614	Defrost starting time no. 7 during weekend	Signed 16-bit	0	1440	1440		
Defrost times > Weekend	-	-	F8	16615	Defrost starting time no. 8 during weekend	Signed 16-bit	0	1440	1440		
Thermal profiles > Step 1	-	-	1P0	16616	Step activation delay (step 1)	Unsigned 16-bit	0	5999	0	min	
Thermal profiles > Step 1	-	-	1P1	16617	Step duration (step 1)	Unsigned 16-bit	0	5999	60	min	
Thermal profiles > Step 1	-	-	1P2	16618	Relative humidity regulation mode (step 1)	(0) = Disabled; (1) = Neutral zone; (2) = Humidification only; (3) = Dehumidification only			1		
Thermal profiles > Step 1	-	-	1P3	16619	Thermoregulation mode (step 1)	(0) = Disabled; (1) = Neutral zone; (2) = Heating only; (3) = Cooling only; (4) = Heating and cooling from DI			1		
Thermal profiles > Step 1	-	-	1P4	16620	Relative humidity setpoint (step 1)	Signed 16-bit	_1023_LSH	_1022_HSH	50,0	%R.H.	-1
Thermal profiles > Step 1	-	-	1P5	16621	Temperature 1 setpoint (step 1)	Signed 16-bit	_1004_LSE	_1003_HSE	0,0	°C	-1
Thermal profiles > Step 1	-	-	1P6	16622	Temperature 2 setpoint (step 1)	Signed 16-bit	_1004_LSE	_1003_HSE	0,0	°C	-1
Thermal profiles > Step 1	-	-	1P7	16623	Enables ventilation fans relay (step 1)	Boolean			0		
Thermal profiles > Step 1	-	-	1P8	16624	End step action (step 1)	(1) = End; (2) = Next (continue); (3) = Next (suspend); (4) = Loop; (5) = Go to step; (6) = Everlasting			1		

Menu	Access rights	ID	Label	Address	Description	Values	Min	Max	Default	U.M.	EXP
Thermal profiles > Step 1	-	-	1P9	16625	Jump back target step (step 1)	(0) = STEP 1; (1) = STEP 2; (2) = STEP 3; (3) = STEP 4; (4) = STEP 5; (5) = STEP 6; (6) = STEP 7; (7) = STEP 8			0		
Thermal profiles > Step 2	-	-	2P0	16626	Step activation delay (step 2)	Unsigned 16-bit	0	5999	0	min	
Thermal profiles > Step 2	-	-	2P1	16627	Step duration (step 2)	Unsigned 16-bit	0	5999	60	min	
Thermal profiles > Step 2	-	-	2P2	16628	Relative humidity regulation mode (step 2)	(0) = Disabled; (1) = Neutral zone; (2) = Humidification only; (3) = Dehumidification only			1		
Thermal profiles > Step 2	-	-	2P3	16629	Thermoregulation mode (step 2)	(0) = Disabled; (1) = Neutral zone; (2) = Heating only; (3) = Cooling only; (4) = Heating and cooling from DI			1		
Thermal profiles > Step 2	-	-	2P4	16630	Relative humidity setpoint (step 2)	Signed 16-bit	_1023_LSH	_1022_HSH	50,0	%R.H.	-1
Thermal profiles > Step 2	-	-	2P5	16631	Temperature 1 setpoint (step 2)	Signed 16-bit	_1004_LSE	_1003_HSE	0,0	°C	-1
Thermal profiles > Step 2	-	-	2P6	16632	Temperature 2 setpoint (step 2)	Signed 16-bit	_1004_LSE	_1003_HSE	0,0	°C	-1
Thermal profiles > Step 2	-	-	2P7	16633	Enables ventilation fans relay (step 2)	Boolean			0		
Thermal profiles > Step 2	-	-	2P8	16634	End step action (step 2)	(1) = End; (2) = Next (continue); (3) = Next (suspend); (4) = Loop; (5) = Go to step; (6) = Everlasting			1		
Thermal profiles > Step 2	-	-	2P9	16635	Jump back target step (step 2)	(0) = STEP 1; (1) = STEP 2; (2) = STEP 3; (3) = STEP 4; (4) = STEP 5; (5) = STEP 6; (6) = STEP 7; (7) = STEP 8			0		
Thermal profiles > Step 3	-	-	3P0	16636	Step activation delay (step 3)	Unsigned 16-bit	0	5999	0	min	
Thermal profiles > Step 3	-	-	3P1	16637	Step duration (step 3)	Unsigned 16-bit	0	5999	60	min	
Thermal profiles > Step 3	-	-	3P2	16638	Relative humidity regulation mode (step 3)	(0) = Disabled; (1) = Neutral zone; (2) = Humidification only; (3) = Dehumidification only			1		
Thermal profiles >	-	-	3P3	16639	Thermoregulation mode (step 3)	(0) = Disabled; (1) = Neutral zone; (2) = Heating only;			1		

Menu	Access rights	ID	Label	Address	Description	Values	Min	Max	Default	U.M.	EXP
Step 3						(3) = Cooling only; (4) = Heating and cooling from DI					
Thermal profiles > Step 3	-	-	3P4	16640	Relative humidity setpoint (step 3)	Signed 16-bit	_1023_LSH	_1022_HSH	50,0	%R.H.	-1
Thermal profiles > Step 3	-	-	3P5	16641	Temperature 1 setpoint (step 3)	Signed 16-bit	_1004_LSE	_1003_HSE	0,0	°C	-1
Thermal profiles > Step 3	-	-	3P6	16642	Temperature 2 setpoint (step 3)	Signed 16-bit	_1004_LSE	_1003_HSE	0,0	°C	-1
Thermal profiles > Step 3	-	-	3P7	16643	Enables ventilation fans relay (step 3)	Boolean			0		
Thermal profiles > Step 3	-	-	3P8	16644	End step action (step 3)	(1) = End; (2) = Next (continue); (3) = Next (suspend); (4) = Loop; (5) = Go to step; (6) = Everlasting			1		
Thermal profiles > Step 3	-	-	3P9	16645	Jump back target step (step 3)	(0) = STEP 1; (1) = STEP 2; (2) = STEP 3; (3) = STEP 4; (4) = STEP 5; (5) = STEP 6; (6) = STEP 7; (7) = STEP 8			0		
Thermal profiles > Step 4	-	-	4P0	16646	Step activation delay (step 4)	Unsigned 16-bit	0	5999	0	min	
Thermal profiles > Step 4	-	-	4P1	16647	Step duration (step 4)	Unsigned 16-bit	0	5999	60	min	
Thermal profiles > Step 4	-	-	4P2	16648	Relative humidity regulation mode (step 4)	(0) = Disabled; (1) = Neutral zone; (2) = Humidification only; (3) = Dehumidification only			1		
Thermal profiles > Step 4	-	-	4P3	16649	Thermoregulation mode (step 4)	(0) = Disabled; (1) = Neutral zone; (2) = Heating only; (3) = Cooling only; (4) = Heating and cooling from DI			1		
Thermal profiles > Step 4	-	-	4P4	16650	Relative humidity setpoint (step 4)	Signed 16-bit	_1023_LSH	_1022_HSH	50,0	%R.H.	-1
Thermal profiles > Step 4	-	-	4P5	16651	Temperature 1 setpoint (step 4)	Signed 16-bit	_1004_LSE	_1003_HSE	0,0	°C	-1
Thermal profiles > Step 4	-	-	4P6	16652	Temperature 2 setpoint (step 4)	Signed 16-bit	_1004_LSE	_1003_HSE	0,0	°C	-1
Thermal profiles > Step 4	-	-	4P7	16653	Enables ventilation fans relay (step 4)	Boolean			0		

Menu	Access rights	ID	Label	Address	Description	Values	Min	Max	Default	U.M.	EXP
Thermal profiles > Step 4	-	-	4P8	16654	End step action (step 4)	(1) = End; (2) = Next (continue); (3) = Next (suspend); (4) = Loop; (5) = Go to step; (6) = Everlasting			1		
Thermal profiles > Step 4	-	-	4P9	16655	Jump back target step (step 4)	(0) = STEP 1; (1) = STEP 2; (2) = STEP 3; (3) = STEP 4; (4) = STEP 5; (5) = STEP 6; (6) = STEP 7; (7) = STEP 8			0		
Thermal profiles > Step 5	-	-	5P0	16656	Step activation delay (step 5)	Unsigned 16-bit	0	5999	0	min	
Thermal profiles > Step 5	-	-	5P1	16657	Step duration (step 5)	Unsigned 16-bit	0	5999	60	min	
Thermal profiles > Step 5	-	-	5P2	16658	Relative humidity regulation mode (step 5)	(0) = Disabled; (1) = Neutral zone; (2) = Humidification only; (3) = Dehumidification only			1		
Thermal profiles > Step 5	-	-	5P3	16659	Thermoregulation mode (step 5)	(0) = Disabled; (1) = Neutral zone; (2) = Heating only; (3) = Cooling only; (4) = Heating and cooling from DI			1		
Thermal profiles > Step 5	-	-	5P4	16660	Relative humidity setpoint (step 5)	Signed 16-bit	_1023_LSH	_1022_HSH	50,0	%R.H.	-1
Thermal profiles > Step 5	-	-	5P5	16661	Temperature 1 setpoint (step 5)	Signed 16-bit	_1004_LSE	_1003_HSE	0,0	°C	-1
Thermal profiles > Step 5	-	-	5P6	16662	Temperature 2 setpoint (step 5)	Signed 16-bit	_1004_LSE	_1003_HSE	0,0	°C	-1
Thermal profiles > Step 5	-	-	5P7	16663	Enables ventilation fans relay (step 5)	Boolean			0		
Thermal profiles > Step 5	-	-	5P8	16664	End step action (step 5)	(1) = End; (2) = Next (continue); (3) = Next (suspend); (4) = Loop; (5) = Go to step; (6) = Everlasting			1		
Thermal profiles > Step 5	-	-	5P9	16665	Jump back target step (step 5)	(0) = STEP 1; (1) = STEP 2; (2) = STEP 3; (3) = STEP 4; (4) = STEP 5; (5) = STEP 6; (6) = STEP 7; (7) = STEP 8			0		
Thermal profiles > Step 6	-	-	6P0	16666	Step activation delay (step 6)	Unsigned 16-bit	0	5999	0	min	
Thermal profiles > Step 6	-	-	6P1	16667	Step duration (step 6)	Unsigned 16-bit	0	5999	60	min	
Thermal profiles >	-	-	6P2	16668	Relative humidity regulation mode (step 6)	(0) = Disabled; (1) = Neutral zone; (2) = Humidification			1		

Menu	Access rights	ID	Label	Address	Description	Values	Min	Max	Default	U.M.	EXP
Step 6						only; (3) = Dehumidification only					
Thermal profiles > Step 6	-	-	6P3	16669	Thermoregulation mode (step 6)	(0) = Disabled; (1) = Neutral zone; (2) = Heating only; (3) = Cooling only; (4) = Heating and cooling from DI			1		
Thermal profiles > Step 6	-	-	6P4	16670	Relative humidity setpoint (step 6)	Signed 16-bit	_1023_LSH	_1022_HSH	50,0	%R.H.	-1
Thermal profiles > Step 6	-	-	6P5	16671	Temperature 1 setpoint (step 6)	Signed 16-bit	_1004_LSE	_1003_HSE	0,0	°C	-1
Thermal profiles > Step 6	-	-	6P6	16672	Temperature 2 setpoint (step 6)	Signed 16-bit	_1004_LSE	_1003_HSE	0,0	°C	-1
Thermal profiles > Step 6	-	-	6P7	16673	Enables ventilation fans relay (step 6)	Boolean			0		
Thermal profiles > Step 6	-	-	6P8	16674	End step action (step 6)	(1) = End; (2) = Next (continue); (3) = Next (suspend); (4) = Loop; (5) = Go to step; (6) = Everlasting			1		
Thermal profiles > Step 6	-	-	6P9	16675	Jump back target step (step 6)	(0) = STEP 1; (1) = STEP 2; (2) = STEP 3; (3) = STEP 4; (4) = STEP 5; (5) = STEP 6; (6) = STEP 7; (7) = STEP 8			0		
Thermal profiles > Step 7	-	-	7P0	16676	Step activation delay (step 7)	Unsigned 16-bit	0	5999	0	min	
Thermal profiles > Step 7	-	-	7P1	16677	Step duration (step 7)	Unsigned 16-bit	0	5999	60	min	
Thermal profiles > Step 7	-	-	7P2	16678	Relative humidity regulation mode (step 7)	(0) = Disabled; (1) = Neutral zone; (2) = Humidification only; (3) = Dehumidification only			1		
Thermal profiles > Step 7	-	-	7P3	16679	Thermoregulation mode (step 7)	(0) = Disabled; (1) = Neutral zone; (2) = Heating only; (3) = Cooling only; (4) = Heating and cooling from DI			1		
Thermal profiles > Step 7	-	-	7P4	16680	Relative humidity setpoint (step 7)	Signed 16-bit	_1023_LSH	_1022_HSH	50,0	%R.H.	-1
Thermal profiles > Step 7	-	-	7P5	16681	Temperature 1 setpoint (step 7)	Signed 16-bit	_1004_LSE	_1003_HSE	0,0	°C	-1
Thermal profiles > Step 7	-	-	7P6	16682	Temperature 2 setpoint (step 7)	Signed 16-bit	_1004_LSE	_1003_HSE	0,0	°C	-1

Menu	Access rights	ID	Label	Address	Description	Values	Min	Max	Default	U.M.	EXP
Thermal profiles > Step 7	-	-	7P7	16683	Enables ventilation fans relay (step 7)	Boolean			0		
Thermal profiles > Step 7	-	-	7P8	16684	End step action (step 7)	(1) = End; (2) = Next (continue); (3) = Next (suspend); (4) = Loop; (5) = Go to step; (6) = Everlasting			1		
Thermal profiles > Step 7	-	-	7P9	16685	Jump back target step (step 7)	(0) = STEP 1; (1) = STEP 2; (2) = STEP 3; (3) = STEP 4; (4) = STEP 5; (5) = STEP 6; (6) = STEP 7; (7) = STEP 8			0		
Thermal profiles > Step 8	-	-	8P0	16686	Step activation delay (step 8)	Unsigned 16-bit	0	5999	0	min	
Thermal profiles > Step 8	-	-	8P1	16687	Step duration (step 8)	Unsigned 16-bit	0	5999	60	min	
Thermal profiles > Step 8	-	-	8P2	16688	Relative humidity regulation mode (step 8)	(0) = Disabled; (1) = Neutral zone; (2) = Humidification only; (3) = Dehumidification only			1		
Thermal profiles > Step 8	-	-	8P3	16689	Thermoregulation mode (step 8)	(0) = Disabled; (1) = Neutral zone; (2) = Heating only; (3) = Cooling only; (4) = Heating and cooling from DI			1		
Thermal profiles > Step 8	-	-	8P4	16690	Relative humidity setpoint (step 8)	Signed 16-bit	_1023_LSH	_1022_HSH	50,0	%R.H.	-1
Thermal profiles > Step 8	-	-	8P5	16691	Temperature 1 setpoint (step 8)	Signed 16-bit	_1004_LSE	_1003_HSE	0,0	°C	-1
Thermal profiles > Step 8	-	-	8P6	16692	Temperature 2 setpoint (step 8)	Signed 16-bit	_1004_LSE	_1003_HSE	0,0	°C	-1
Thermal profiles > Step 8	-	-	8P7	16693	Enables ventilation fans relay (step 8)	Boolean			0		
Thermal profiles > Step 8	-	-	8P8	16694	End step action (step 8)	(1) = End; (2) = Next (continue); (3) = Next (suspend); (4) = Loop; (5) = Go to step; (6) = Everlasting			1		
Thermal profiles > Step 8	-	-	8P9	16695	Jump back target step (step 8)	(0) = STEP 1; (1) = STEP 2; (2) = STEP 3; (3) = STEP 4; (4) = STEP 5; (5) = STEP 6; (6) = STEP 7; (7) = STEP 8			0		

17.11.3 BIOS table

Type	Address	Name	Description	Min	Max	UM	Default Value
BIOS	15780	Addr_CAN_OB	CAN On Board address	1	127	num	125
BIOS	15781	Baud_CAN_OB	CAN On Board baud rate protocol	2	6	num	2
BIOS	15716	Par_TAB	Tab (map code)	0	65535	num	0
BIOS	15717	Par_POLI	Polycarbonate code	0	65535	num	1025
BIOS	15725	Temp_UM	Unit of temperature measurement	0	1	num	0
BIOS	15726	Cfg_AI1	Type of analogue input AI1	0	2	num	2
BIOS	15727	Cfg_AI2	Type of analogue input AI2	0	2	num	2
BIOS	15728	Cfg_AI3	Type of analogue input AI3	0	8	num	3
BIOS	15729	Cfg_AI4	Type of analogue input AI4	0	8	num	3
BIOS	15730	Cfg_AI5	Type of analogue input AI5	0	8	num	3
BIOS	15731	Cfg_AI6	Type of analogue input AI6	0	8	num	3
BIOS	15736	FullScaleMin_AI3	First value analogue input AI3 scale	-9999	9999	digit	0
BIOS	15737	FullScaleMax_AI3	Last value analogue input AI3 scale	-9999	9999	digit	1000
BIOS	15738	FullScaleMin_AI4	First value analogue input AI4 scale	-9999	9999	digit	0
BIOS	15739	FullScaleMax_AI4	Last value analogue input AI4 scale	-9999	9999	digit	1000
BIOS	15740	FullScaleMin_AI5	First value analogue input AI5 scale	-9999	9999	digit	0
BIOS	15741	FullScaleMax_AI5	Last value analogue input AI5 scale	-9999	9999	digit	1000
BIOS	15742	FullScaleMin_AI6	First value analogue input AI6 scale	-9999	9999	digit	0
BIOS	15743	FullScaleMax_AI6	Last value analogue input AI6 scale	-9999	9999	digit	1000
BIOS	15748	Calibration_AI1	Analogue input AI1 differential	-180	180	°C-°F/10	0
BIOS	15749	Calibration_AI2	Analogue input AI2 differential	-180	180	°C-°F/10	0

Type	Address	Name	Description	Min	Max	UM	Default Value
BIOS	15750	Calibration_AI3	Analogue input AI3 differential	-1000	1000	digit	0
BIOS	15751	Calibration_AI4	Analogue input AI4 differential	-1000	1000	digit	0
BIOS	15752	Calibration_AI5	Analogue input AI5 differential	-1000	1000	digit	0
BIOS	15753	Calibration_AI6	Analogue input AI6 differential	-1000	1000	digit	0
BIOS	15758	Cfg_AO1_AO5	Type of analogue output AO1/AO5	0	2	num	0
BIOS	15759	Cfg_AO2	Type of analogue output AO2	0	2	num	0
BIOS	15760	Cfg_AO3	Type of analogue output AO3	0	2	num	0
BIOS	15761	Cfg_AO4	Type of analogue output AO4	0	2	num	0
BIOS	15762	SubCfg_AO5	Subtype of analogue output AO5	0	1	num	0
BIOS	15774	Addr_RS485_OB	RS485 On Board address	0	255	num	1
BIOS	15775	Proto_RS485_OB	Select RS485 On Board protocol	2	3	num	3
BIOS	15776	DataBit_RS485_OB	RS485 On Board Data bit number	8	8	num	8
BIOS	15777	StopBit_RS485_OB	RS485 On Board stop bit number	1	2	num	1
BIOS	15778	Parity_RS485_OB	RS485 On Board parity protocol	0	2	num	2
BIOS	15779	Baud_RS485_OB	RS485 On Board baud rate protocol	0	5	num	2
BIOS	15782	Addr_RS485_PI	RS485 passive Plug-In address	0	255	num	1
BIOS	15783	Proto_RS485_PI	Select RS485 passive Plug-In protocol	2	3	num	3
BIOS	15784	DataBit_RS485_PI	RS485 passive Plug-In Data bit number	8	8	num	8
BIOS	15785	StopBit_RS485_PI	RS485 passive Plug-In stop bit number	1	2	num	1
BIOS	15786	Parity_RS485_PI	RS485 passive Plug-In parity protocol	0	2	num	2
BIOS	15787	Baud_RS485_PI	RS485 passive Plug-In baud rate protocol	0	5	num	2
BIOS	15788	Addr_CAN_PI	CAN passive Plug-In address	1	127	num	1
BIOS	15789	Baud_CAN_PI	CAN Passive Plug-In baud rate protocol	2	6	num	2

Type	Address	Name	Description	Min	Max	UM	Default Value
BIOS	15790	Addr_RS232_PI	RS232 passive Plug-In address	0	255	num	1
BIOS	15791	Proto_RS232_PI	Select RS232 passive Plug-In protocol	2	3	num	3
BIOS	15792	DataBit_RS232_PI	RS232 passive Plug-In Data bit number	7	8	num	8
BIOS	15793	StopBit_RS232_PI	RS232 passive Plug-In stop bit number	1	2	num	1
BIOS	15794	Parity_RS232_PI	RS232 passive Plug-In parity protocol	0	2	num	2
BIOS	15795	Baud_RS232_PI	RS232 passive Plug-In baud rate protocol	0	5	num	2
BIOS	15772	Port_TFTP_IP	TFTP Port number 0 is equal to default port 69	0	65535	num	0
BIOS	15796	Port_HTTP_PI	HTTP Port number 0 is equal to default port 80	0	65535	num	0
BIOS	15797	Port_ETH_PI	TCP/IP Port number	0	65535	num	502
BIOS	15798	Ip_1_ETH_PI	Ethernet passive Plug-In IP address (1 st part)	0	255	num	10
BIOS	15799	Ip_2_ETH_PI	Ethernet passive Plug-In IP address (2 nd part)	0	255	num	0
BIOS	15800	Ip_3_ETH_PI	Ethernet passive Plug-In IP address (3 rd part)	0	255	num	0
BIOS	15801	Ip_4_ETH_PI	Ethernet passive Plug-In IP address (4 th part)	0	255	num	100
BIOS	15802	DefGtwy_1_ETH_PI	Default Gateway (1 st part)	0	255	num	192
BIOS	15803	DefGtwy_2_ETH_PI	Default Gateway (2 nd part)	0	255	num	168
BIOS	15804	DefGtwy_3_ETH_PI	Default Gateway (3 rd part)	0	255	num	0
BIOS	15805	DefGtwy_4_ETH_PI	Default Gateway (4 th part)	0	255	num	1
BIOS	15806	NetMsk_1_ETH_PI	Net mask (1 st part)	0	255	num	255
BIOS	15807	NetMsk_2_ETH_PI	Net mask (2 nd part)	0	255	num	255
BIOS	15808	NetMsk_3_ETH_PI	Net mask (3 rd part)	0	255	num	255
BIOS	15809	NetMsk_4_ETH_PI	Net mask (4 th part)	0	255	num	0
BIOS	15810	PriDNS_1_ETH_PI	Primary DNS server (1 st part)	0	255	num	194
BIOS	15811	PriDNS_2_ETH_PI	Primary DNS server (2 nd part)	0	255	num	25

Type	Address	Name	Description	Min	Max	UM	Default Value
BIOS	15812	PriDNS_3_ETH_PI	Primary DNS server (3 rd part)	0	255	num	2
BIOS	15813	PriDNS_4_ETH_PI	Primary DNS server (4 th part)	0	255	num	129
BIOS	15814	SecDNS_1_ETH_PI	Secondary DNS server (1 st part)	0	255	num	194
BIOS	15815	SecDNS_2_ETH_PI	Secondary DNS server (2 nd part)	0	255	num	25
BIOS	15816	SecDNS_3_ETH_PI	Secondary DNS server (3 rd part)	0	255	num	2
BIOS	15817	SecDNS_4_ETH_PI	Secondary DNS server (4 th part)	0	255	num	130
BIOS	15818	EnableDHCP_ETH_PI	Enable DHCP	0	1	flag	0
BIOS	15820	Modem_RS232_PI	Modem Enable	0	1	flag	0
BIOS	15821	Modem_InitStr1	Init String (1st part)	0	0	0	0
BIOS	15831	Modem_InitStr2	Init String (2nd part)	0	0	0	0

17.11.4 Modbus table

The table below lists all application configuration parameters including Modbus addresses

Format: display format for **Default Value /Min/Max - XXX.Y** display of whole number with decimal point

Device Type type of data displayed on **FREE Studio Device**

Menu	Address	Name	Device type	Default	Min	Max	Unit	Format	Description
Setpoint	16384	_1001_SET1	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Cooling/Neutral zone setpoint
Setpoint	16385	SET2	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Heating setpoint
Comp	16386	_1002_diF	Signed 16-bit	20	0	300	°C	XXX.Y	Differential
Comp	16387	_1003_HSE	Signed 16-bit	500	_1004_LSE	1100	°C	XXX.Y	Maximum setpoint value
Comp	16388	_1004_LSE	Signed 16-bit	-500	-500	_1003_HSE	°C	XXX.Y	Minimum setpoint value
Comp	16389	_1005_OSP	Signed 16-bit	0	-300	300	°C	XXX.Y	Economy setpoint (adds algebraically to P1001_SET)
Comp	16390	_1006_HC	0 = Heating; 1 = Cooling	1					Compressor mode (HEAT/COOL)
Comp	16393	_1009_Ont	Unsigned 16-bit	10	0	255	min		Compressor time on, when probe is broken
Comp	16394	_1010_OFt	Unsigned 16-bit	10	0	255	min		Compressor time off, when probe is broken
Comp	16395	_1011_dOn	Unsigned 16-bit	10	0	1000	s		Switching-on time delay
Comp	16396	_1012_dOF	Unsigned 16-bit	0	0	1000	s		Switching-off time delay
Comp	16397	_1013_dbi	Unsigned 16-bit	2	0	255	min		Time delay between consecutive switching-ons
Comp	16398	_1014_OdO	Unsigned 16-bit	0	0	255	min		Power-on time delay
Setpoint	16403	_1019_SRH	Signed 16-bit	500	_1023_LSH	_1022_HSH	%R.H.	XXX.Y	Relative humidity setpoint
Humidity	16405	_1021_dbH	Signed 16-bit	50	0	500	%R.H.	XXX.Y	Relative humidity differential
Humidity	16406	_1022_HSH	Signed 16-bit	1000	_1023_LSH	1000	%R.H.	XXX.Y	Maximum relative humidity setpoint value
Humidity	16407	_1023_LSH	Signed 16-bit	0	0	_1022_HSH	%R.H.	XXX.Y	Minimum relative humidity setpoint value
Humidity	16408	_1024_dEH	0 = Not active; 1 = Active	0					Relative humidity regulation status when defrosting
Humidity	16411	_1027_db	Signed 16-bit	20	0	500	°C	XXX.Y	Heating band

Menu	Address	Name	Device type	Default	Min	Max	Unit	Format	Description
Defrost	16412	_1028_dtY	0 = Electric; 1 = Cycle inversion; 2 = Free	0					Defrost type
Defrost	16413	_1029_dIt	Signed 16-bit	6	0	255	h		Defrost time interval
Defrost	16416	_1032_dCt	0 = Compressor uptime; 1 = Unit uptime; 2 = On compressor stop; 3 = Real time clock	3					Defrost time interval counting type
Defrost	16417	_1033_dOH	Unsigned 16-bit	0	0	59	min		Power-on exclusion of defrost
Defrost	16418	_1034_dSt	Signed 16-bit	60	-3020	14720	°C	XXX.Y	Defrost stop temperature
Defrost	16420	_1036_dPO	0 = Not required; 1 = Required	0					Defrost at power-on
Evap. Fan	16424	_1040_FSt	Signed 16-bit	60	-3020	14720	°C	XXX.Y	Fan stop temperature
Evap. Fan	16426	_1042_FAd	Signed 16-bit	10	10	500	°C	XXX.Y	Fan differential
Evap. Fan	16427	_1043_Fdt	Unsigned 16-bit	0	0	255	min		Fan delay time
Evap. Fan	16428	_1044_dt	Unsigned 16-bit	0	0	255	min		Drainage time
Evap. Fan	16429	_1045_dFd	0 = Not active; 1 = Active	1					Defrost fan disable
Evap. Fan	16430	_1046_FCO	0 = Off; 1 = Thermostat controlled; 2 = Duty cycle	1					Fan when compressor OFF
Evap. Fan	16431	_1047_Fod	0 = Not active; 1 = Active	1					Fan when door open
Evap. Fan	16432	_1048_FdC	Unsigned 8-bit	0	0	99	min		Fan delay when compressor OFF
Analog. Out	16435	_1051_F00	0 = Disable; 1 = Enable	0					A.O. configuration
Analog. Out	16436	_1052_F01	0 = Heating; 1 = Cooling	1					A.O. mode
Analog. Out	16438	_1054_F03	Unsigned 16-bit	10	0	60	s		A.O. start up time
Analog. Out	16441	_1057_F06	Signed 16-bit	30	0	100	%		A.O. minimum level
Analog. Out	16442	_1058_F07	Signed 16-bit	95	0	100	%		A.O. medium level
Analog. Out	16443	_1059_F08	Signed 16-bit	100	0	100	%		A.O. maximum level

Menu	Address	Name	Device type	Default	Min	Max	Unit	Format	Description
Analog. Out	16444	_1060_F09	Signed 16-bit	300	-500	999		XXX.Y	A.O. setpoint
Analog. Out	16445	_1061_F10	Signed 16-bit	100	0	999		XXX.Y	A.O. maximum level differential
Analog. Out	16446	_1062_F11	Signed 16-bit	70	0	255		XXX.Y	A.O. proportional band
Analog. Out	16447	_1063_F12	Signed 16-bit	20	0	255		XXX.Y	A.O. maximum level hysteresis width
Analog. Out	16448	_1064_F13	Signed 16-bit	20	0	255		XXX.Y	A.O. cut-off hysteresis width
Analog. Out	16449	_1065_F14	Signed 16-bit	30	0	255		XXX.Y	A.O. cut-off differential
Analog. Out	16450	_1066_F15	0 = Not active; 1 = Active	1					A.O. when defrosting
Analog. Out	16451	_1067_F16	0 = Not active; 1 = Active	1					A.O. when compressor OFF
Analog. Out	16452	_1068_F17	Unsigned 8-bit	0	0	59	min		A.O. delay after defrosting
Analog. Out	16453	_1069_F18	Unsigned 16-bit	0	0	255	s		A.O. bypass time
Analog. Out	16454	_1070_F19	Unsigned 16-bit	0	0	255	s		A.O. pre-ventilation
Analog. Out	16455	_1071_F20	0 = Not active; 1 = Active	1					A.O. when probe broken
Vent. Fan	16456	_1072_COn	Unsigned 16-bit	1	0	255	min		Ventilation fan time ON
Vent. Fan	16457	_1073_COF	Unsigned 16-bit	0	0	255	min		Ventilation fan time OFF
Alarms	16463	_1079_Att	0 = Absolute; 1 = Relative	1					Temperature alarm value type (absolute/relative)
Alarms	16464	_1080_AFd	Signed 16-bit	10	10	500	°C	XXX.Y	Temperature alarm differential
Alarms	16465	_1081_HAL	Signed 16-bit	500	_1082_LAL		°C	XXX.Y	High temperature alarm value

Menu	Address	Name	Device type	Default	Min	Max	Unit	Format	Description
Alarms	16466	_1082_LAL	Signed 16-bit	-500		_1081_HAL	°C	XXX.Y	Low temperature alarm value
Alarms	16467	_1083_PAO	Unsigned 16-bit	3	0	10	h		Power-on exclusion of temperature alarm
Alarms	16468	_1084_dAO	Unsigned 16-bit	60	0	999	min		After defrost exclusion of temperature alarm
Alarms	16469	_1085_OAO	Unsigned 16-bit	1	0	10	h		After door closure exclusion of temperature alarm
Alarms	16470	_1086_tdO	Unsigned 16-bit	10	0	255	min		Door open exclusion
Alarms	16471	_1087_tAO	Unsigned 16-bit	0	0	255	min		Temperature alarm delay
Alarms	16472	_1088_Ath	0 = Absolute; 1 = Relative	1					Humidity alarm value type (absolute/relative)
Alarms	16473	_1089_HHA	Signed 16-bit	500	_1090_LHA		%R.H.	XXX.Y	High humidity alarm value
Alarms	16474	_1090_LHA	Signed 16-bit	-500		_1089_HHA	%R.H.	XXX.Y	Low humidity alarm value
Alarms	16475	_1091_AdH	Signed 16-bit	20	10	500	%R.H.	XXX.Y	Humidity alarm differential
Alarms	16476	_1092_AOH	Unsigned 16-bit	0	0	255	min		Humidity alarm delay
Alarms	16477	_1093_PAO	Unsigned 16-bit	3	0	10	h		Power-on exclusion of humidity alarm
Alarms	16478	_1094_OAH	Unsigned 16-bit	1	0	10	h		After door closure exclusion of humidity alarm
Alarms	16479	_1095_dAt	0 = No alarm; 1 = Alarm	0					Alarm on defrost timeout
Alarms	16480	_1096_rLO	0 = None; 1 = Compressor and defrost; 2 = Compressor, defrost, and fans	0					Regulators locked by external alarm
Light & DI	16488	_1104_dSd	Boolean	1					Light ON when door open
Light & DI	16489	_1105_dLt	Unsigned 8-bit	0	0	31	min		Light OFF delay
Light & DI	16490	_1106_OFI	Boolean	1					Light OFF from D.I.
Light & DI	16499	_1115_PEn	Unsigned 16-bit	15	0	15			Number of pressure switch errors allowed
Light & DI	16500	_1116_PeI	Unsigned 16-bit	99	1	99	min		Pressure switch error count interval
Display	16506	_1122_PA1	String	***10					User password
Display	16509	_1123_PA2	String	***20					Installer password
Config.	16542	_1154_H05	0 = Disabled; 1 = Neutral zone; 2 = Humidification only; 3 = Dehumidification only	1					Relative humidity regulation type

Menu	Address	Name	Device type	Default	Min	Max	Unit	Format	Description
Config.	16544	_1156_H07	0 = Disabled; 1 = Neutral zone; 2 = Heating only; 3 = Cooling only; 4 = Heating and cooling from DI	1					Thermoregulation type
Config.	16546	_1158_H09	0 = Relay only; 1 = Relay and compressor; 2 = No relay (heating and cooling)	0					Dehumidification type
Config.	16547	_1159_H11	0 = Disabled; 1 = NO, Defrost request; 255 = NC, Defrost request; 2 = NO, Economy; 254 = NC, Economy; 4 = NO, Door switch; 252 = NC, Door switch; 5 = NO, External alarm; 251 = NC, External alarm; 7 = NO, Stand-by; 249 = NC, Stand-by; 11 = NO, Pressure switch; 245 = NC, Pressure switch; 14 = NO, Light; 242 = NC, Light; 15 = NO, Ventilation; 241 = NC, Ventilation; 18 = NO, Panic; 238 = NC, Panic; 20 = NO, Heat/Cool; 236 = NC, Heat/Cool; 21 = NO, AUTO mode request; 235 = NC, AUTO mode request	4					DIL1 configuration
Config.	16548	_1160_H12	0 = Disabled; 1 = NO, Defrost request; 255 = NC, Defrost request; 2 = NO, Economy; 254 = NC, Economy; 4 = NO, Door switch; 252 = NC, Door switch; 5 = NO, External alarm; 251 = NC, External alarm; 7 = NO, Stand-by; 249 = NC, Stand-by; 11 = NO, Pressure switch; 245 = NC, Pressure switch; 14 = NO, Light; 242 = NC, Light; 15 = NO, Ventilation; 241 = NC, Ventilation; 18 = NO, Panic; 238 = NC, Panic; 20 = NO, Heat/Cool; 236 = NC, Heat/Cool; 21 = NO, AUTO mode request; 235 = NC, AUTO mode request	5					DIL2 configuration
Config.	16556	H22	1 = Dehumidifier; 2 = Electric defrost	1					DOL2 configuration
Config.	16557	_1168_H26	0 = Disabled; 7 = Light; 11 = Ventilation fan	7					DOL6 configuration
Config.	16558	_1169_H27	0 = Disabled; 7 = Light; 11 = Ventilation fan	0					DOL7 configuration
Config.	16569	_1180_H41	0 = Disabled; 1 = Analog input 1; 2 = Analog input 2; 3 = Analog input 3; 4 = Analog input 4; 5 = Analog input 5; 6 = Analog input 6	1					Probe 1 configuration
Config.	16570	_1181_H42	0 = Disabled; 1 = Analog input 1; 2 = Analog input 2; 3 = Analog input 3; 4 = Analog input 4; 5 = Analog input 5; 6 = Analog input 6	2					Probe 2 configuration

Menu	Address	Name	Device type	Default	Min	Max	Unit	Format	Description
Config.	16571	_1182_H43	0 = Disabled; 1 = Analog input 1; 2 = Analog input 2; 3 = Analog input 3; 4 = Analog input 4; 5 = Analog input 5; 6 = Analog input 6	3					Probe 3 configuration
Config.	16572	_1183_H44	0 = Disabled; 1 = Analog input 1; 2 = Analog input 2; 3 = Analog input 3; 4 = Analog input 4; 5 = Analog input 5; 6 = Analog input 6	4					Probe 4 configuration
Defrost	16578	_1189_dEt	Unsigned 16-bit	30	1	255	min		Defrost timeout
Defrost Time	16600	dE1	Signed 16-bit	1440	0	1440		HH:MM	Defrost event #1 on working days
Defrost Time	16601	dE2	Signed 16-bit	1440	0	1440		HH:MM	Defrost event #2 on working days
Defrost Time	16602	dE3	Signed 16-bit	1440	0	1440		HH:MM	Defrost event #3 on working days
Defrost Time	16603	dE4	Signed 16-bit	1440	0	1440		HH:MM	Defrost event #4 on working days
Defrost Time	16604	dE5	Signed 16-bit	1440	0	1440		HH:MM	Defrost event #5 on working days
Defrost Time	16605	dE6	Signed 16-bit	1440	0	1440		HH:MM	Defrost event #6 on working days
Defrost Time	16606	dE7	Signed 16-bit	1440	0	1440		HH:MM	Defrost event #7 on working days
Defrost Time	16607	dE8	Signed 16-bit	1440	0	1440		HH:MM	Defrost event #8 on working days
Defrost Time	16608	F1	Signed 16-bit	1440	0	1440		HH:MM	Defrost event #1 during week-end
Defrost Time	16609	F2	Signed 16-bit	1440	0	1440		HH:MM	Defrost event #2 during week-end
Defrost Time	16610	F3	Signed 16-bit	1440	0	1440		HH:MM	Defrost event #3 during week-end
Defrost	16611	F4	Signed 16-bit	1440	0	1440		HH:MM	Defrost event #4 during week-end

Menu	Address	Name	Device type	Default	Min	Max	Unit	Format	Description
Time									
Defrost Time	16612	F5	Signed 16-bit	1440	0	1440		HH:MM	Defrost event #5 during week-end
Defrost Time	16613	F6	Signed 16-bit	1440	0	1440		HH:MM	Defrost event #6 during week-end
Defrost Time	16614	F7	Signed 16-bit	1440	0	1440		HH:MM	Defrost event #7 during week-end
Defrost Time	16615	F8	Signed 16-bit	1440	0	1440		HH:MM	Defrost event #8 during week-end
Step	16616	STEP1_P0	Unsigned 16-bit	0	0	5999	min		Step 1 activation delay
Step	16617	STEP1_P1	Unsigned 16-bit	60	0	5999	min		Step 1 duration
Step	16618	STEP1_P2	0 = Disabled; 1 = Neutral zone; 2 = Humidification only; 3 = Dehumidification only	1					Step 1 humidity regulation type
Step	16619	STEP1_P3	0 = Disabled; 1 = Neutral zone; 2 = Heating only; 3 = Cooling only; 4 = Heating and cooling from DI	1					Step 1 thermoregulation type
Step	16620	STEP1_P4	Signed 16-bit	500	_1023_LSH	_1022_HSH	%R.H.	XXX.Y	Step 1 humidity setpoint
Step	16621	STEP1_P5	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Step 1 temperature setpoint 1
Step	16622	STEP1_P6	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Step 1 temperature setpoint 2
Step	16623	STEP1_P7	Boolean	0					Step 1 AUX relay activation status
Step	16624	STEP1_P8	1 = End; 2 = Next (continue); 3 = Next (suspend); 4 = Loop; 5 = Go to step; 6 = Everlasting	1					Step 1 end action
Step	16625	STEP1_P9	0 = STEP 1; 1 = STEP 2; 2 = STEP 3; 3 = STEP 4; 4 = STEP 5; 5 = STEP 6; 6 = STEP 7; 7 = STEP 8	0					Step 1 jump back destination
Step	16626	STEP2_P0	Unsigned 16-bit	0	0	5999	min		Step 2 activation delay
Step	16627	STEP2_P1	Unsigned 16-bit	60	0	5999	min		Step 2 duration
Step	16628	STEP2_P2	0 = Disabled; 1 = Neutral zone; 2 = Humidification only; 3 = Dehumidification only	1					Step 2 humidity regulation type
Step	16629	STEP2_P3	0 = Disabled; 1 = Neutral zone; 2 = Heating only; 3 =	1					Step 2 thermoregulation type

Menu	Address	Name	Device type	Default	Min	Max	Unit	Format	Description
			Cooling only; 4 = Heating and cooling from DI						
Step	16630	STEP2_P4	Signed 16-bit	500	_1023_LSH	_1022_HSH	%R.H.	XXX.Y	Step 2 humidity setpoint
Step	16631	STEP2_P5	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Step 2 temperature setpoint 1
Step	16632	STEP2_P6	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Step 2 temperature setpoint 2
Step	16633	STEP2_P7	Boolean	0					Step 2 AUX relay activation status
Step	16634	STEP2_P8	1 = End; 2 = Next (continue); 3 = Next (suspend); 4 = Loop; 5 = Go to step; 6 = Everlasting	1					Step 2 end action
Step	16635	STEP2_P9	0 = STEP 1; 1 = STEP 2; 2 = STEP 3; 3 = STEP 4; 4 = STEP 5; 5 = STEP 6; 6 = STEP 7; 7 = STEP 8	0					Step 2 jump back destination
Step	16636	STEP3_P0	Unsigned 16-bit	0	0	5999	min		Step 3 activation delay
Step	16637	STEP3_P1	Unsigned 16-bit	60	0	5999	min		Step 3 duration
Step	16638	STEP3_P2	0 = Disabled; 1 = Neutral zone; 2 = Humidification only; 3 = Dehumidification only	1					Step 3 humidity regulation type
Step	16639	STEP3_P3	0 = Disabled; 1 = Neutral zone; 2 = Heating only; 3 = Cooling only; 4 = Heating and cooling from DI	1					Step 3 thermoregulation type
Step	16640	STEP3_P4	Signed 16-bit	500	_1023_LSH	_1022_HSH	%R.H.	XXX.Y	Step 3 humidity setpoint
Step	16641	STEP3_P5	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Step 3 temperature setpoint 1
Step	16642	STEP3_P6	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Step 3 temperature setpoint 2
Step	16643	STEP3_P7	Boolean	0					Step 3 AUX relay activation status
Step	16644	STEP3_P8	1 = End; 2 = Next (continue); 3 = Next (suspend); 4 = Loop; 5 = Go to step; 6 = Everlasting	1					Step 3 end action
Step	16645	STEP3_P9	0 = STEP 1; 1 = STEP 2; 2 = STEP 3; 3 = STEP 4; 4 = STEP 5; 5 = STEP 6; 6 = STEP 7; 7 = STEP 8	0					Step 3 jump back destination
Step	16646	STEP4_P0	Unsigned 16-bit	0	0	5999	min		Step 4 activation delay
Step	16647	STEP4_P1	Unsigned 16-bit	60	0	5999	min		Step 4 duration
Step	16648	STEP4_P2	0 = Disabled; 1 = Neutral zone; 2 = Humidification only; 3 = Dehumidification only	1					Step 4 humidity regulation type

Menu	Address	Name	Device type	Default	Min	Max	Unit	Format	Description
Step	16649	STEP4_P3	0 = Disabled; 1 = Neutral zone; 2 = Heating only; 3 = Cooling only; 4 = Heating and cooling from DI	1					Step 4 thermoregulation type
Step	16650	STEP4_P4	Signed 16-bit	500	_1023_LSH	_1022_HSH	%R.H.	XXX.Y	Step 4 humidity setpoint
Step	16651	STEP4_P5	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Step 4 temperature setpoint 1
Step	16652	STEP4_P6	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Step 4 temperature setpoint 2
Step	16653	STEP4_P7	Boolean	0					Step 4 AUX relay activation status
Step	16654	STEP4_P8	1 = End; 2 = Next (continue); 3 = Next (suspend); 4 = Loop; 5 = Go to step; 6 = Everlasting	1					Step 4 end action
Step	16655	STEP4_P9	0 = STEP 1; 1 = STEP 2; 2 = STEP 3; 3 = STEP 4; 4 = STEP 5; 5 = STEP 6; 6 = STEP 7; 7 = STEP 8	0					Step 4 jump back destination
Step	16656	STEP5_P0	Unsigned 16-bit	0	0	5999	min		Step 5 activation delay
Step	16657	STEP5_P1	Unsigned 16-bit	60	0	5999	min		Step 5 duration
Step	16658	STEP5_P2	0 = Disabled; 1 = Neutral zone; 2 = Humidification only; 3 = Dehumidification only	1					Step 5 humidity regulation type
Step	16659	STEP5_P3	0 = Disabled; 1 = Neutral zone; 2 = Heating only; 3 = Cooling only; 4 = Heating and cooling from DI	1					Step 5 thermoregulation type
Step	16660	STEP5_P4	Signed 16-bit	500	_1023_LSH	_1022_HSH	%R.H.	XXX.Y	Step 5 humidity setpoint
Step	16661	STEP5_P5	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Step 5 temperature setpoint 1
Step	16662	STEP5_P6	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Step 5 temperature setpoint 2
Step	16663	STEP5_P7	Boolean	0					Step 5 AUX relay activation status
Step	16664	STEP5_P8	1 = End; 2 = Next (continue); 3 = Next (suspend); 4 = Loop; 5 = Go to step; 6 = Everlasting	1					Step 5 end action
Step	16665	STEP5_P9	0 = STEP 1; 1 = STEP 2; 2 = STEP 3; 3 = STEP 4; 4 = STEP 5; 5 = STEP 6; 6 = STEP 7; 7 = STEP 8	0					Step 5 jump back destination
Step	16666	STEP6_P0	Unsigned 16-bit	0	0	5999	min		Step 6 activation delay
Step	16667	STEP6_P1	Unsigned 16-bit	60	0	5999	min		Step 6 duration
Step	16668	STEP6_P2	0 = Disabled; 1 = Neutral zone; 2 = Humidification	1					Step 6 humidity regulation type

Menu	Address	Name	Device type	Default	Min	Max	Unit	Format	Description
			only; 3 = Dehumidification only						
Step	16669	STEP6_P3	0 = Disabled; 1 = Neutral zone; 2 = Heating only; 3 = Cooling only; 4 = Heating and cooling from DI	1					Step 6 thermoregulation type
Step	16670	STEP6_P4	Signed 16-bit	500	_1023_LSH	_1022_HSH	%R.H.	XXX.Y	Step 6 humidity setpoint
Step	16671	STEP6_P5	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Step 6 temperature setpoint 1
Step	16672	STEP6_P6	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Step 6 temperature setpoint 2
Step	16673	STEP6_P7	Boolean	0					Step 6 AUX relay activation status
Step	16674	STEP6_P8	1 = End; 2 = Next (continue); 3 = Next (suspend); 4 = Loop; 5 = Go to step; 6 = Everlasting	1					Step 6 end action
Step	16675	STEP6_P9	0 = STEP 1; 1 = STEP 2; 2 = STEP 3; 3 = STEP 4; 4 = STEP 5; 5 = STEP 6; 6 = STEP 7; 7 = STEP 8	0					Step 6 jump back destination
Step	16676	STEP7_P0	Unsigned 16-bit	0	0	5999	min		Step 7 activation delay
Step	16677	STEP7_P1	Unsigned 16-bit	60	0	5999	min		Step 7 duration
Step	16678	STEP7_P2	0 = Disabled; 1 = Neutral zone; 2 = Humidification only; 3 = Dehumidification only	1					Step 7 humidity regulation type
Step	16679	STEP7_P3	0 = Disabled; 1 = Neutral zone; 2 = Heating only; 3 = Cooling only; 4 = Heating and cooling from DI	1					Step 7 thermoregulation type
Step	16680	STEP7_P4	Signed 16-bit	500	_1023_LSH	_1022_HSH	%R.H.	XXX.Y	Step 7 humidity setpoint
Step	16681	STEP7_P5	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Step 7 temperature setpoint 1
Step	16682	STEP7_P6	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Step 7 temperature setpoint 2
Step	16683	STEP7_P7	Boolean	0					Step 7 AUX relay activation status
Step	16684	STEP7_P8	1 = End; 2 = Next (continue); 3 = Next (suspend); 4 = Loop; 5 = Go to step; 6 = Everlasting	1					Step 7 end action
Step	16685	STEP7_P9	0 = STEP 1; 1 = STEP 2; 2 = STEP 3; 3 = STEP 4; 4 = STEP 5; 5 = STEP 6; 6 = STEP 7; 7 = STEP 8	0					Step 7 jump back destination
Step	16686	STEP8_P0	Unsigned 16-bit	0	0	5999	min		Step 8 activation delay
Step	16687	STEP8_P1	Unsigned 16-bit	60	0	5999	min		Step 8 duration

Menu	Address	Name	Device type	Default	Min	Max	Unit	Format	Description
Step	16688	STEP8_P2	0 = Disabled; 1 = Neutral zone; 2 = Humidification only; 3 = Dehumidification only	1					Step 8 humidity regulation type
Step	16689	STEP8_P3	0 = Disabled; 1 = Neutral zone; 2 = Heating only; 3 = Cooling only; 4 = Heating and cooling from DI	1					Step 8 thermoregulation type
Step	16690	STEP8_P4	Signed 16-bit	500	_1023_LSH	_1022_HSH	%R.H.	XXX.Y	Step 8 humidity setpoint
Step	16691	STEP8_P5	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Step 8 temperature setpoint 1
Step	16692	STEP8_P6	Signed 16-bit	0	_1004_LSE	_1003_HSE	°C	XXX.Y	Step 8 temperature setpoint 2
Step	16693	STEP8_P7	Boolean	0					Step 8 AUX relay activation status
Step	16694	STEP8_P8	1 = End; 2 = Next (continue); 3 = Next (suspend); 4 = Loop; 5 = Go to step; 6 = Everlasting	1					Step 8 end action
Step	16695	STEP8_P9	0 = STEP 1; 1 = STEP 2; 2 = STEP 3; 3 = STEP 4; 4 = STEP 5; 5 = STEP 6; 6 = STEP 7; 7 = STEP 8	0					Step 8 jump back destination
	16696	LocalState	0 = Off; 1 = On	0					Local state setting (ON/OFF)
Logger	16710	LogEnable	0 = False; 1 = True	1	0	1			Logger Enable
Logger	16711	LogCycle	00:05...24:00	00:10	00:05	24:00	min		Logger Period

17.11.5 Client table (Status Variables)

The table below lists all application configuration status including Modbus addresses

Format: display format for **Default Value /Min/Max - XXX.Y** display of whole number with decimal point

Read only enables/disables editing of Status variables.

Device Type type of data displayed on **FREE Studio Device**

Address	Name	Device type	Unit	Format	ReadOnly	Description
8960	CurrentState	0 = Off; 1 = On			R	Current ON/OFF state
8961	CurrentMode	0 = Heating; 1 = Cooling; 2 = Neutral zone			R	Current HEAT/COOL mode
8962	CurrentTemperatureSetpoint	Signed 16-bit	°C	XXX.Y	R	Current temperature setpoint
8963	TemperatureSetpoint1	Signed 16-bit	°C	XXX.Y	RW	Temperature setpoint 1
8964	TemperatureSetpoint2	Signed 16-bit	°C	XXX.Y	RW	Temperature setpoint 2
8965	HumiditySetpoint	Signed 16-bit	%R.H	XXX.Y	RW	Humidity setpoint
8966	ThermoregulationType	0 = Disabled; 1 = Neutral zone; 2 = Heating only; 3 = Cooling only; 4 = Heating and cooling from DI			R	Thermoregulation type
8967	HumidityRegulationType	0 = Disabled; 1 = Neutral zone; 2 = Humidification only; 3 = Dehumidification only			R	Humidity regulation type
8968	CurrentStep	0 = STEP 1; 1 = STEP 2; 2 = STEP 3; 3 = STEP 4; 4 = STEP 5; 5 = STEP 6; 6 = STEP 7; 7 = STEP 8			R	Current step number, in AUTO mode
8969	CurrentStepState	0 = START; 1 = RUN; 2 = STOP			R	Current step state, in AUTO mode
8970	CurrentStepTime	Unsigned 16-bit	min		RW	Current step time, in AUTO mode
8971	PasswordEntry	String (5 char)			RW	Password entered
8974	PasswordLevel	Unsigned 8-bit			R	Current password level
8975	ResetPassword	Boolean			RW	Reset password request
8976	ResetAlarm	Boolean			RW	Reset alarm request
8977	Pb1Enabled	Boolean			R	Probe 1 enable status (if TRUE, it is enabled)

Address	Name	Device type	Unit	Format	ReadOnly	Description
8978	Pb1	Signed 16-bit	°C	XXX.Y	R	Probe 1 = thermoregulation feedback
8979	Pb1Error	0 = Inactive; 1 = Active; 2 = Resettable			R	Probe 1 error
8980	Pb2Enabled	Boolean			R	Probe 2 enable status (if TRUE, it is enabled)
8981	Pb2	Signed 16-bit	°C	XXX.Y	R	Probe 2 = evaporator temperature
8982	Pb2Error	0 = Inactive; 1 = Active; 2 = Resettable			R	Probe 2 error
8983	Pb3Enabled	Boolean			R	Probe 3 enable status (if TRUE, it is enabled)
8984	Pb3	Signed 16-bit	%R.H.	XXX.Y	R	Probe 3 = humidity
8985	Pb3Error	0 = Inactive; 1 = Active; 2 = Resettable			R	Probe 3 error
8986	Pb4Enabled	Boolean			R	Probe 4 enable status (if TRUE, it is enabled)
8987	Pb4	Signed 16-bit		XXX.Y	R	Probe 4 = A.O. regulation
8988	Pb4Error	0 = Inactive; 1 = Active; 2 = Resettable			R	Probe 4 error
8989	ExternalAlarm	0 = Inactive; 1 = Active; 2 = Resettable			R	External alarm
8990	PanicAlarm	0 = Inactive; 1 = Active; 2 = Resettable			R	Panic alarm
8991	DoorOpenAlarm	0 = Inactive; 1 = Active; 2 = Resettable			R	Door open alarm
8992	PressureAlarm	0 = Inactive; 1 = Active; 2 = Resettable			R	Pressure alarm
8993	HighTemperatureAlarm	0 = Inactive; 1 = Active; 2 = Resettable			R	High temperature alarm
8994	LowTemperatureAlarm	0 = Inactive; 1 = Active; 2 = Resettable			R	Low temperature alarm
8995	DefrostTimeoutAlarm	0 = Inactive; 1 = Active; 2 = Resettable			R	Defrost timeout alarm
8996	HighHumidityAlarm	0 = Inactive; 1 = Active; 2 = Resettable			R	Tanalog
8997	LowHumidityAlarm	0 = Inactive; 1 = Active; 2 = Resettable			R	Low humidity alarm
8998	ClockError	0 = Inactive; 1 = Active; 2 = Resettable			R	System clock error
8999	GlobalAlarmStatus	0 = Inactive; 1 = Active; 2 = Resettable			R	Global alarm status
9000	EconomyDIEnabled	Boolean			R	Economy DI configuration status (if TRUE, it is enabled)
9001	EconomyDI	0 = Inactive; 1 = Active			R	Economy DI

Address	Name	Device type	Unit	Format	ReadOnly	Description
9002	DoorSwitchEnabled	Boolean			R	Door switch configuration status (if TRUE, it is enabled)
9003	DoorSwitch	0 = Inactive; 1 = Active			R	Door switch
9004	AlarmDIEnabled	Boolean			R	Alarm DI configuration status (if TRUE, it is enabled)
9005	AlarmDI	0 = Inactive; 1 = Active			R	Alarm DI
9006	StateDIEnabled	Boolean			R	State (ON/OFF) DI configuration status (if TRUE, it is enabled)
9007	RemoteState	0 = Off; 1 = On			R	Remote ON/OFF state setting (from digital input)
9008	LightDIEnabled	Boolean			R	Light DI configuration status (if TRUE, it is enabled)
9009	LightDI	0 = Inactive; 1 = Active			R	Light DI
9010	VentilationDIEnabled	Boolean			R	Ventilation DI configuration status (if TRUE, it is enabled)
9011	VentilationDI	0 = Inactive; 1 = Active			R	Ventilation DI
9012	PressureSwitchEnabled	Boolean			R	Pressure switch configuration status (if TRUE, it is enabled)
9013	PressureSwitch	0 = Inactive; 1 = Active			R	Pressure switch
9014	PanicDIEnabled	Boolean			R	Panic DI configuration status (if TRUE, it is enabled)
9015	PanicDI	0 = Inactive; 1 = Active			R	Panic DI
9016	ModeDIEnabled	Boolean			R	Mode DI configuration status (if TRUE, it is enabled)
9017	ModeDI	0 = Heating; 1 = Cooling			R	Mode DI
9076	DefrostDIEnabled	Boolean			R	Defrost from DI configuration status (if TRUE, it is enabled)
9077	DefrostDI	0 = Inactive; 1 = Active			R	Defrost from DI
9078	AutoModeDIEnabled	Boolean			R	AUTO mode request from DI configuration status (if TRUE, it is enabled)
9079	AutoModeDI	0 = Inactive; 1 = Active			R	AUTO mode request from DI
9018	CompressorDO	0 = Inactive; 1 = Active			R	Compressor DO

Address	Name	Device type	Unit	Format	ReadOnly	Description
9019	DehumidifierDOEnabled	Boolean			R	Dehumidifier DO configuration status (if TRUE, it is enabled)
9020	DehumidifierDO	0 = Inactive; 1 = Active			R	Dehumidifier DO
9021	DefrostDOEnabled	Boolean			R	Defrost DO configuration status (if TRUE, it is enabled)
9022	DefrostDO	0 = Inactive; 1 = Active			R	Defrost DO
9023	HeaterDO	0 = Inactive; 1 = Active			R	Heater DO
9024	EvaporatorFansDO	0 = Inactive; 1 = Active			R	Evaporator fans DO
9025	HumidifierDO	0 = Inactive; 1 = Active			R	Humidifier DO
9026	LightDOEnabled	Boolean			R	Light DO configuration status (if TRUE, it is enabled)
9027	LightDO	0 = Inactive; 1 = Active			R	Light DO
9028	VentilationFanDOEnabled	Boolean			R	Ventilation fan DO configuration status (if TRUE, it is enabled)
9029	VentilationFanDO	0 = Inactive; 1 = Active			R	Ventilation fan DO
9030	sysClock_seconds_RW	Unsigned 8-bit			RW	Second value to update (0...59 seconds)
9031	sysClock_minutes_RW	Unsigned 8-bit			RW	Minute value to update (0...59 minutes)
9032	sysClock_hours_RW	Unsigned 8-bit			RW	Hour value to update (0...23 hours)
9033	sysClock_dayweek_RW	Unsigned 8-bit			RW	Day of the week value to update (0...6 days of the week)
9034	sysClock_daymonth_RW	Unsigned 8-bit			RW	Day of the month value to update (0...31 days of the month)
9035	sysClock_month_RW	Unsigned 8-bit			RW	Month value to update (0...12 months)
9036	sysClock_year_RW	Unsigned 8-bit			RW	Year value to update (0...99 years)
9037	sysClock_update	Unsigned 8-bit			RW	Confirm update
9038	ThermoregulationEnabled	Boolean			R	Thermoregulation configuration status (if TRUE, it is enabled)

Address	Name	Device type	Unit	Format	ReadOnly	Description
9039	CompressorRequest	Boolean			R	Request to switch on the compressor
9040	HumidificationConfigured	Boolean			R	Humidification configuration status (if TRUE, it is enabled)
9041	DehumidificationConfigured	Boolean			R	Dehumidification configuration status (if TRUE, it is enabled)
9042	DehumidificationRequest	Boolean			R	Active request for dehumidification
9043	CoolingConfigured	Boolean			R	Cooling configuration status (if TRUE, it is enabled)
9044	CoolingRequest	Boolean			R	Active request for cooling
9045	CompressorForDehumidification	Boolean			R	If TRUE, compressor is configured to be used for dehumidification
9046	HeatingConfigured	Boolean			R	Heating configuration status (if TRUE, it is enabled)
9047	HeatingSetpoint	Signed 16-bit	°C	XXX.Y	R	Temperature setpoint for heating
9048	HeaterForDehumidification	Boolean			R	If TRUE, heater is configured to be used for dehumidification
9049	DehumidifierForDehumidification	Boolean			R	If TRUE, dehumidifier is configured to be used for dehumidification
9050	DehumidificationEnabled	Boolean			R	Dehumidification enable status
9051	CoolingEnabled	Boolean			R	Cooling enable status
9052	HeatingEnabled	Boolean			R	Heating enable status
9053	HumidificationEnabled	Boolean			R	Humidification enable status
9054	VentilationEnabled	Boolean			R	Ventilation enable status
9055	CompressorConsensus	Boolean			R	Consensus to switch on the compressor
9056	AOEnabled	Boolean			R	A.O. enable status (if TRUE, it is enabled)
9057	AORequest	Signed 16-bit	%		R	A.O. level
9058	DefrostRequest	Boolean			R	
9059	DefrostEnabled	Boolean			R	

Address	Name	Device type	Unit	Format	ReadOnly	Description
9060	DefrostActive	Boolean			R	
9080	DefrostRequestDiscardedWarning	Boolean			R	Discarded defrost request warning
9061	FunEconomyRequest	Boolean			RW	
9062	FunEconomy	Boolean			R	
9063	FunAutoRequest	Boolean			RW	
9064	FunAuto	Boolean			R	
9065	ToggleLightRequest	Boolean			RW	
9066	DefrostHMIRequest	Boolean			RW	Defrost request from HMI
9067	ResetCountersHMIRequest	Boolean			RW	Reset counters request
9068	CompressorUptimeHours	Signed 16-bit	h		R	Compressor uptime hours
9069	CompressorUptimeFraction	Unsigned 16-bit	s		R	Compressor uptime hour fraction (in seconds)
9070	UnitUptimeHours	Signed 16-bit	h		R	Unit uptime hours
9071	UnitUptimeFraction	Unsigned 16-bit	s		R	Unit uptime hour fraction (in seconds)
9072	PressureAlarmCount	Unsigned 16-bit			R	Pressure alarm count
9073	StartStopAutoRequest	Boolean			RW	AUTO mode START/STOP HMI request
9074	ResetAutoRequest	Boolean			RW	AUTO mode RESET HMI request
9075	DisableAUX	Boolean			R	
9081	StartAutoModeTime	Signed 16-bit		HH:MM	RW	AUTO mode start time (from RTC)
10000	PACKED_Status01	Unsigned 16-bit			R	Packed BOOL status variables (to optimize remote HMI communication) - Part 1
10001	PACKED_Status02	Unsigned 16-bit			R	Packed BOOL status variables (to optimize remote HMI communication) - Part 2
9100	TelevisId	Signed 16-bit			R	
9101	Version1	Unsigned 16-bit			R	
9102	Version2	Unsigned 16-bit			R	

ALPHABETICAL INDEX

A

access rights.....
 log out..... 11
 password..... 11
alarms.....
 alarm condition display..... 37
 high/low..... 38
 menu..... 11
 probe error..... 37
 reset..... 11
analog input..... 12
analog output..... 13
automatic defrost..... 22

C

communication channels..... 14
compressor..... 16
 duty cycle..... 17
 protection in the event of probe failure..... 16
 relay..... 16
 safety times..... 17
cut-off regulator..... 28
 cut-off bypass time..... 28
 pre-ventilation..... 28
 start-up time..... 28

D

defrost..... 22
 defrost times menu..... 23
 FREE mode..... 25
 hot gas..... 25
 termination condition..... 24
 timeout..... 25
 with compressor stopped..... 24
 with electrical heaters..... 24
dehumidification.....
 relay..... 32
digital input..... 12
 polarity..... 13
 priority..... 13
digital output..... 13 e seg.
dripping..... 22

E

evaporator fans..... 26
 relay..... 26
 thermostat control..... 26

H

humidifier.....
 relay..... 31

I

installer menu..... 11

K

keys..... 7
 associated functions..... 7

L

language..... 11
LED..... 7

M

main menu..... 10
main view..... 8
 changing setpoint..... 10

manual defrost..... 23

P

parameters..... 41
 menu..... 11, 48
 table..... 48
parametri.....
 tabella..... 66
pressure switch..... 30
 alarm..... 30
 alarm reset..... 30
 event count..... 30
probes..... 12

R

references..... 5
relative humidity regulation..... 31
 dehumidification..... 31
 humidification..... 31
relay..... 13

S

state icons..... 9

T

thermal profiles..... 33
 menu..... 33
 program reset..... 34
 program run..... 34
 program start..... 34
 program state display..... 34
 program STOP..... 34
 step..... 35
thermoregulation..... 19
 cooling..... 19
 heating..... 19
 mode selection from digital input..... 20
 neutral zone..... 20

U

user menu..... 11

V

ventilation fans..... 27
 duty cycle..... 27
 relay..... 27



Eliwell Controls Srl

Via dell' Industria, 15 Z. I. Paludi

32010 Pieve d' Alpago (BL) - Italy

Telephone +39 (0)437 986 111

Fax +39 (0)437 989 066

Ufficio commerciale:

+39 (0)437 986 100 (Italy)

+39 (0)437 986 200 (other countries)

saleseliwell@schneider-electric.com

Helpline : +39 (0)437 986 250

eliwell.freeway@schneider-electric.com

www.eliwell.com

cod. 9MA10231 rel.05/15

© Copyright Eliwell Controls s.r.l. 2012-2015 All rights reserved
vers . 1.18