

IDEPlus -HC

Electronic controllers compatible
with flammable refrigerant gases

User Manual

12/20



The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor Eliwell nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Eliwell software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

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Important information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a "Danger" or "Warning" safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazard. Obey all the safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric and Eliwell for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

Qualification of Personnel

Only appropriately trained persons who are familiar with and understand the contents of this manual and all other pertinent product documentation are authorized to work on and with this product. The qualified person must be able to detect possible hazards that may arise from parameterization, modifying parameter values and generally from mechanical, electrical, or electronic equipment.

The qualified person must be familiar with the standards, provisions, and regulations for the prevention of industrial accidents, which they must observe when designing and implementing the system.

Permitted use

This product is used to control refrigerated cabinets, display units and refrigerated units.

The controller must be installed and used in accordance with the provided instructions and in particular, in normal conditions, dangerous energized parts must not be accessible.

The controller should be suitably protected from water and dust. Access to the various product parts from the front should involve the use of a keyed or tooled locking mechanism.

The controller is suitable for integration into equipment for controlling refrigerated cabinets, display units and refrigerated units, and has been checked on the basis of the harmonized European standards of reference.

Only use the product with the specified cables and accessories. Only use genuine accessories and spare parts.

Prohibited use

Any use other than that indicated in the above paragraph "Permitted use" is strictly prohibited.

The relay contacts supplied are electromechanical and are subject to wear. The functional safety protection devices, specified by international or local laws, must be installed outside this device.

Liability and residual risks

The liability of Schneider Electric and Eliwell is limited to the correct and professional use of the product according to the directives referred to herein and in the other supporting documents, and does not cover any damage (including but not limited to) the following causes:

- unspecified installation/use and, in particular, in contravention of the safety requirements of the legislation in force in the country of installation and/or specified in this document;
- use on equipment which does not provide adequate protection against electrocution, water and dust in the actual installation conditions;
- use on equipment which allow access to dangerous parts without the aid of tools and/or which do not have a keyed locking mechanism;
- product tampering and/or alteration;
- installation/use on equipment that does not comply with the regulations in force in the country of installation.

Disposal



The equipment (or product) must be subjected to separate waste collection in compliance with local legislation regarding waste disposal.

About the book

Aim of the document

This document describes the **IDEPlus -HC** controllers and corresponding accessories, including information regarding installation and wiring.

Note: read this document and all related documents carefully before installing, operating or servicing the controller.

Validity note

The characteristics that are presented in the present document should be the same as those characteristics that appear online. In line with our policy of constant improvement, we may revise content over time to improve clarity and accuracy. If you see a difference between the document and online information, use the online information as your reference.

Related documents

Publication title	Reference document code
Instruction Sheet IDEPlus -HC	9IS54789 (EN)

You can download technical publications and other technical information from our website at: www.eliwell.com

Product related information

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, FIRE OR ARC FLASH

- Disconnect all power from all equipment including connected devices prior to removing any covers or doors, or installing or removing any accessories, hardware, cables or wires.
- Always use a properly rated voltage sensing device to confirm the power is off where and when indicated.
- Before restoring the power supply, replace and secure all covers, hardware components and cables.
- Use only the specified voltage when operating this device and any associated products.
- Use appropriate safety interlocks where personnel and/or equipment hazards exist.
- Install and use this equipment in an enclosure appropriately rated for its intended environment.
- Do not use this equipment for safety-critical functions.
- Do not disassemble, repair, or modify this equipment.

Failure to follow these instructions will result in death or serious injury.

DANGER

HAZARD OF ELECTRIC SHOCK AND/OR FIRE

- Do not expose the equipment to liquids.
- Do not exceed the temperature and humidity ranges specified in the technical data and keep the area surrounding the cooling slits aerated.
- Do not apply dangerous voltages to the SELV connection terminals (see "Connections" chapter).
- Only connect compatible accessories - as specified in the section "Accessories" - to the device.
- Only use cables with a suitable cross-section (see "Best wiring practices").

Failure to follow these instructions will result in death or serious injury.

DANGER

LOOSE WIRING CAN RESULT IN ELECTRIC SHOCK AND/OR FIRE

Tighten the connections in compliance with the technical specifications for torque values and make sure the wiring is correct.

Failure to follow these instructions will result in death or serious injury.

WARNING

HAZARD OF OVERHEATING AND/OR FIRE

- Do not use with loads other than those indicated in the technical data.
- Do not exceed the maximum permitted current; in the case of higher loads, use a contactor with suitable power.
- Verify that your application has not been designed with device outputs connected directly to devices generating a frequently operated capacitive load ⁽¹⁾.
- Power lines and output connections must be suitably wired and protected by means of fuses when required by national and local regulations.
- Connect the relay output, including the shared hub, using cables with a cross-section of 2.5 mm² (14 AWG) and a length of at least 200 mm (7.87 in.).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⁽¹⁾ Even if the application does not connect a frequently activated capacitive load to the relays, capacitive loads decrease the life of every electromechanical relay and the installation of a contactor or external relay, sized and maintained in accordance with the size and features of the capacitive load, helps to minimize the effects of relay degradation.

When handling the equipment, take care to avoid damage caused by electrostatic discharge. In particular, the unshielded connectors are extremely vulnerable to electrostatic discharge.

WARNING

UNINTENDED EQUIPMENT OPERATION DUE TO ELECTROSTATIC DISCHARGE

Before handling the equipment, always discharge the static electricity from the body by touching an earthed surface or type-approved antistatic mat.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTICE

INOPERABLE DEVICE

The SELV wiring must be kept separate from all the other wiring (see "Connections" chapter).

Failure to follow these instructions can result in equipment damage.

The temperature (NTC/PTC) probes have no specified connection polarity; the connections can be extended using a normal bipolar cable. Extending the probe wiring influences the electromagnetic compatibility (EMC) of the controller.

NOTICE

INOPERABLE DEVICE

- For the connection of probes and the digital input, use cables no longer than 10 m (32.80 ft).
- For TTL serial line connection, use cables no longer than 3 m (9.84 ft).

Failure to follow these instructions can result in equipment damage.

Flammable refrigerant gases

The use of flammable gas refrigerants is dependent on many factors, including local, regional and/or national regulations.

The devices and corresponding accessories described in the documentation accompanying the product use components and, more specifically, electromechanical relays tested in accordance with IEC standard 60079-15 and classed as nC components (non-sparking 'n' electrical apparatus).

This condition complies to Annex BB of EN/IEC 60335-2-89.

Conformance to Annex BB EN/IEC 60335-2-89 is considered sufficient, and thereby suitable, for commercial refrigeration and HVAC applications applying flammable gas refrigerants, such as R290. However, other limitations, equipment, locations and/or type of machine (refrigerators, vending machines and dispensers, bottle coolers, ice machines, Reach-Ins, etc.) may also be implicated, restricted and/or required in so doing.

The use and application of the information contained herein require expertise in the design and parameterizing/programming of HVAC and refrigeration control systems. Only you—the original equipment manufacturer, installer or user—can be aware of all the conditions and factors present, and the regulations applicable, during the design, installation and setup, operation, and maintenance of the machine or related processes. Therefore, only you can determine the suitability of automation and associated equipment, and the related safeties and interlocks, which can be effectively and properly used in the locations for which the equipment is to be put into service. When selecting automation and control equipment, and any other related equipment or software for an application, you must also consider any applicable local, regional or national standards and/or regulations.

You must verify, while incorporating this controller and related equipment, the final compliance of the machine to regulations and standards when using flammable gas refrigerants. Although all statements and information contained herein are believed to be accurate and reliable, they are presented without warranty of any kind. Information provided herein does not relieve you from the responsibility of carrying out your own tests and validations of conformance to any applicable regulations.

WARNING

REGULATORY INCOMPATIBILITY

Be sure that all equipment applied and systems designed comply with all applicable local, regional and national regulations and standards.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Introduction

Contents

This section includes the following topics:

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Introduction

General Description

IDEPlus -HC is a family of electronic controllers for managing refrigerated cabinets, display units and refrigerated units.

Main regulators

The main regulators for the controller are as follows:

- compressor
- evaporator fans
- Standard defrost
- door switch
- AUX output (Auxiliary)

In this manual, the photographs and diagrams are provided to illustrate the controller (and other Eliwell devices) and are purely illustrative. The corresponding dimensions and proportions may not correspond to actual dimensions in terms of life-size or scale. Furthermore, all the wiring or electrical diagrams should be considered as simplified representations which may not accurately represent the reality.

Models

Prodotto	Descrizione
IDEPlus 902 -HC	IDEPlus 902 NTC 10A 230Vac -HC
IDEPlus 961 -HC	IDEPlus 961 NTC 2Hp 230Vac -HC
IDEPlus 974 -HC	IDEPlus 974 NTC 2Hp/8/5 230Vac BUZ -HC

Abbreviations

- **BUZ (/B)** = controller with Buzzer

Accessories


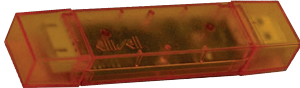
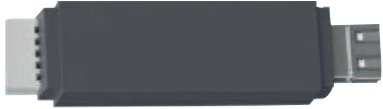

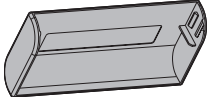
DANGER

HAZARD OF ELECTRIC SHOCK, FIRE OR ARC FLASH

Only connect compatible accessories to the instrument.

Failure to follow these instructions will result in death or serious injury.

Contact a Eliwell representative for further information regarding the accessories that can be used.

Accessory	Description
	Copy Card: Programming key
	UNICARD: Programming key
	DMI: Programming interface
	Probes: NTC/PTC
	Protection: Dripping protection for connections

Preliminary configurations

Contents

This section includes the following topics:

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- IDEPlus 974 -HC (230 Vac)18

Introduction

Overview

IDEPlus -HC is a family of electronic controllers for managing refrigerated cabinets, display units and refrigerated units.

Switching on for the first time

Once the electrical connections have been completed, simply power up the device for it to start working.

At the first startup:

1. Verify and, if necessary, adjust the value of the main controller parameters to adapt the selected application to your system.
2. Verify there are no active alarms.

Note: if there are active alarms, verify the wiring connections.

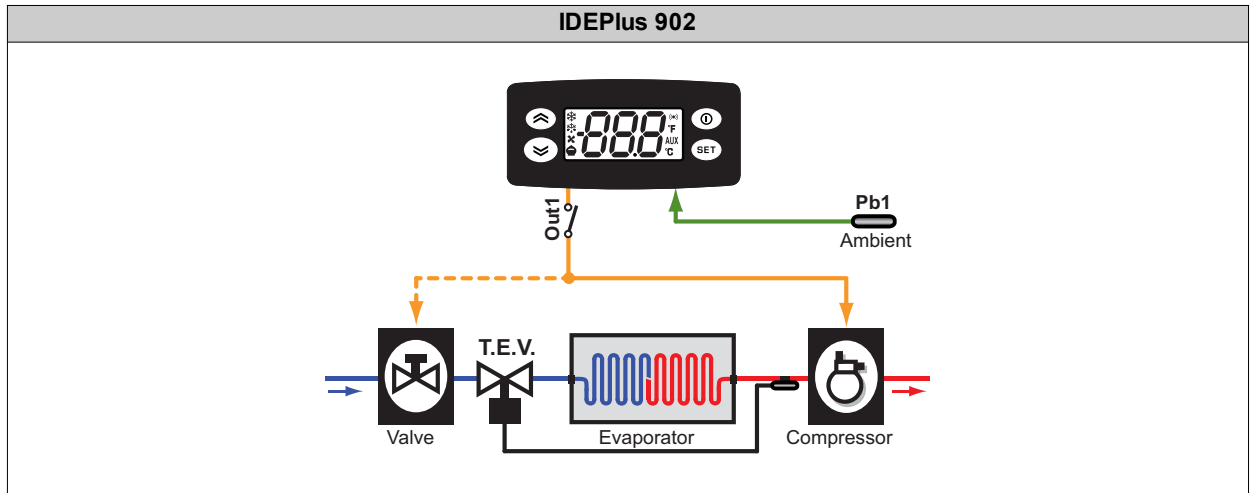
View controller applications

Click on the controller model purchased to access the corresponding application:

- **IDEPlus 902 -HC**
- **IDEPlus 961 -HC**
- **IDEPlus 974 -HC**




IDEPlus 902 -HC (230 Vac)

Application overview



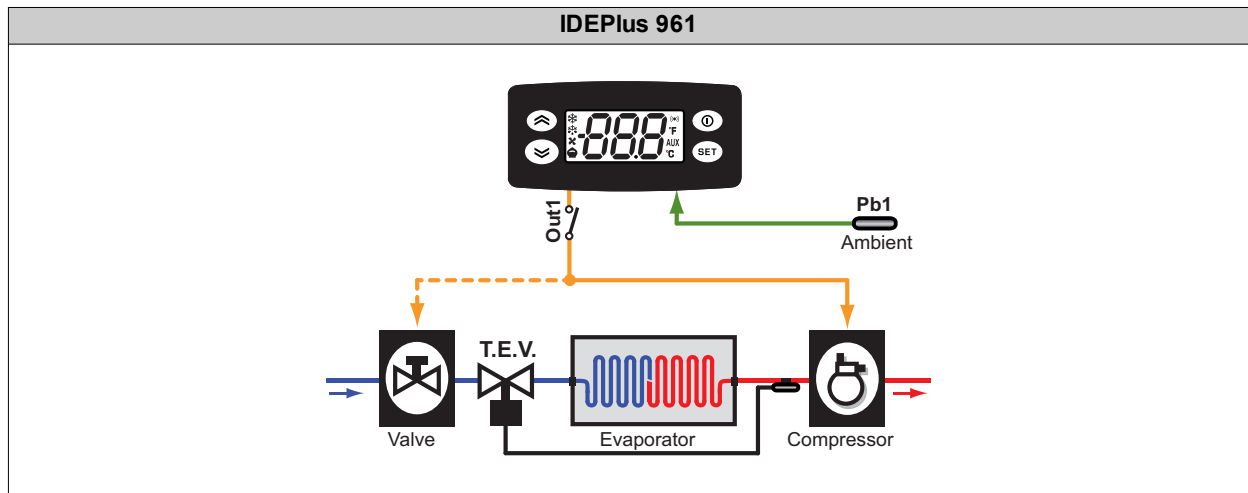
Legend: Ambient = Ambient; Valve = Valve; T.E.V. = Thermostatic expansion valve; Evaporator = Evaporator; Compressor = Compressor.

Application details

Setpoint	0.0 °C (32.0 °F)
Analog inputs	1 NTC input (Pb1)
Digital inputs	1 digital input DI not set (H11 =0)
Digital outputs	Out1 relay (default: Compressor - H21 =1)
Buzzer	NO
Type of defrost	Defrost due to compressor stop
End of defrost	Due to compressor stop
Active alarms	Pb1 maximum / minimum temperature (HAL and LAL)
Key configuration	<ul style="list-style-type: none"> : manual defrost (H31 = 1) : not set (H32 = 0) : stand-by




IDEPlus 961 -HC (230 Vac)

Application overview



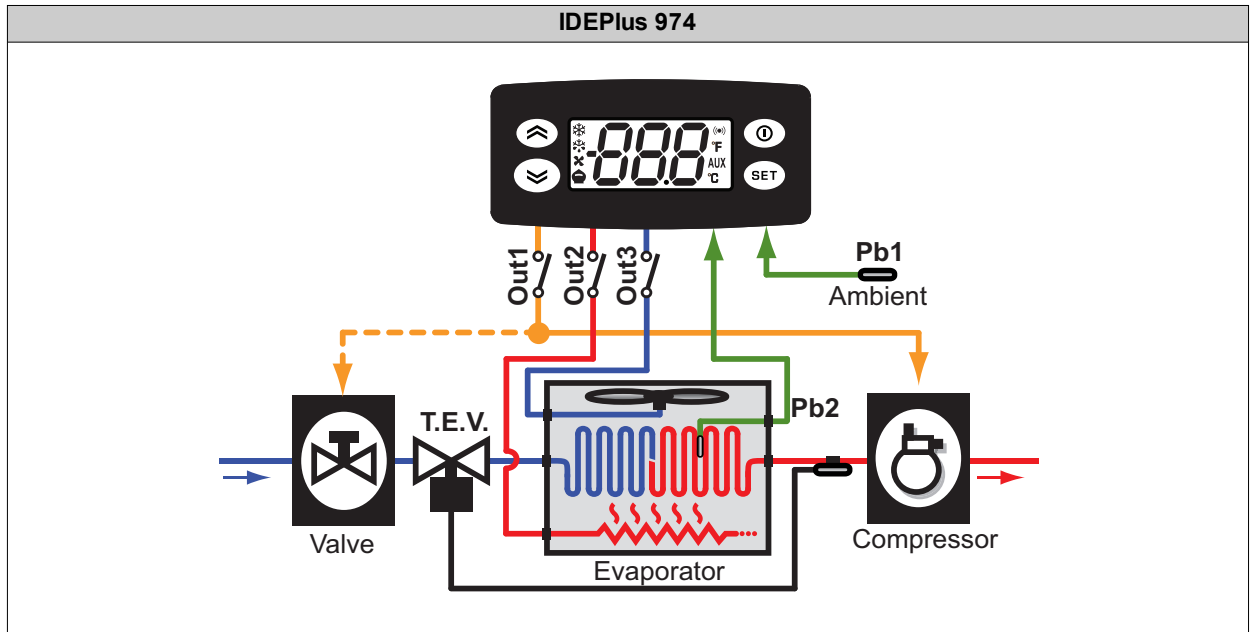
Legend: Ambient = Ambient; Valve = Valve; T.E.V. = Thermostatic expansion valve; Evaporator = Evaporator; Compressor = Compressor.

Application details

Setpoint	0.0 °C (32.0 °F)
Analog inputs	1 NTC input (Pb1)
Digital inputs	1 digital input DI not set (H11=0)
Digital outputs	Out1 relay (default: Compressor - H22=1)
Buzzer	NO
Type of defrost	Defrost due to compressor stop
End of defrost	Due to compressor stop
Active alarms	Pb1 maximum / minimum temperature (HAL and LAL)
Key configuration	<ul style="list-style-type: none"> : manual defrost (H31 = 1) : not set (H32 = 0) : stand-by

IDEPlus 974 -HC (230 Vac)

Application overview



Legend: Ambient = Ambient; Valve = Valve; T.E.V. = Thermostatic expansion valve; Evaporator = Evaporator; Compressor = Compressor.

Application details

Setpoint	0.0 °C (32.0 °F)
Analog inputs	2 NTC inputs (Pb1, Pb2)
Digital inputs	1 digital input DI not set (H11=0)
Digital outputs	Out1 relay (default: Compressor - H21=1) Out2 relay (default: Defrost - H22=2) Out3 relay (default: Evaporator fans - H23=3)
Buzzer	YES
Type of defrost	Electric heater defrost
End of defrost	Due to temperature dSt = 8.0 °C (46.4 °F)
Active alarms	Pb1 maximum/minimum temperature (HAL and LAL)
Key configuration	☞: manual defrost (H31 = 1) ☞: not set (H32 = 0) ⓪: stand-by

Mechanical installation

Contents

This section includes the following topics:

Before starting	20
Power supply disconnection	20
Operating environment	21
Installation Considerations	22
Installation	23

Before starting

Read this manual carefully before installing the controller and its accessories.

In particular, ensure conformity with all safety indications, electrical requirements and current legislation for the machine or the process used with this equipment.

The use and application of information contained herein requires experience in the design and programming of automated control systems. Only the machine user, integrator or manufacturer will be aware of all the conditions and factors affecting installation, configuration, operation and maintenance of the machine or process and can therefore identify the associated equipment and corresponding safety interlocks and systems that can be used appropriately and efficiently. When selecting automation and control equipment, other equipment and connected software for a particular application, all local, regional and national standards and/or legislation must be taken into account.

WARNING

REGULATORY INCOMPATIBILITY

Be sure that all equipment applied and systems designed comply with all applicable local, regional and national regulations and standards.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Power supply disconnection

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, FIRE OR ARC FLASH

- Disconnect all power from all equipment including connected devices prior to removing any covers or doors, or installing or removing any accessories, hardware, cables or wires.
- Always use a properly rated voltage sensing device to confirm the power is off where and when indicated.
- Before restoring the power supply, replace and secure all covers, hardware components and cables.
- Use only the specified voltage when operating this device and any associated products.
- Use appropriate safety interlocks where personnel and/or equipment hazards exist.
- Install and use this equipment in an enclosure appropriately rated for its intended environment.
- Do not use this equipment for safety-critical functions.
- Do not disassemble, repair, or modify this equipment.

Failure to follow these instructions will result in death or serious injury.

Operating environment

The use of flammable gas refrigerants is dependent on many factors, including local, regional and/or national regulations.

The devices and corresponding accessories described in the documentation accompanying the product use components and, more specifically, electromechanical relays tested in accordance with IEC standard 60079-15 and classed as nC components (non-sparking 'n' electrical apparatus).

This condition complies to Annex BB of EN/IEC 60335-2-89.

Conformance to Annex BB EN/IEC 60335-2-89 is considered sufficient, and thereby suitable, for commercial refrigeration and HVAC applications applying flammable gas refrigerants, such as R290. However, other limitations, equipment, locations and/or type of machine (refrigerators, vending machines and dispensers, bottle coolers, ice machines, Reach-Ins, etc.) may also be implicated, restricted and/or required in so doing.

The use and application of the information contained herein require expertise in the design and parameterizing/programming of HVAC and refrigeration control systems. Only you—the original equipment manufacturer, installer or user—can be aware of all the conditions and factors present, and the regulations applicable, during the design, installation and setup, operation, and maintenance of the machine or related processes. Therefore, only you can determine the suitability of automation and associated equipment, and the related safeties and interlocks, which can be effectively and properly used in the locations for which the equipment is to be put into service. When selecting automation and control equipment, and any other related equipment or software for an application, you must also consider any applicable local, regional or national standards and/or regulations.

You must verify, while incorporating this controller and related equipment, the final compliance of the machine to regulations and standards when using flammable gas refrigerants. Although all statements and information contained herein are believed to be accurate and reliable, they are presented without warranty of any kind. Information provided herein does not relieve you from the responsibility of carrying out your own tests and validations of conformance to any applicable regulations.

WARNING

REGULATORY INCOMPATIBILITY

Be sure that all equipment applied and systems designed comply with all applicable local, regional and national regulations and standards.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Installation Considerations

Important information

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, FIRE OR ARC FLASH

- Disconnect all power from all equipment including connected devices prior to removing any covers or doors, or installing or removing any accessories, hardware, cables or wires.
- Always use a properly rated voltage sensing device to confirm the power is off where and when indicated.
- Before restoring the power supply, replace and secure all covers, hardware components and cables.
- Use only the specified voltage when operating this device and any associated products.
- Use appropriate safety interlocks where personnel and/or equipment hazards exist.
- Install and use this equipment in an enclosure appropriately rated for its intended environment.
- Do not use this equipment for safety-critical functions.
- Do not disassemble, repair, or modify this equipment.

Failure to follow these instructions will result in death or serious injury.

When handling the equipment, take care to avoid damage caused by electrostatic discharge. In particular, the unshielded connectors are extremely vulnerable to electrostatic discharge.

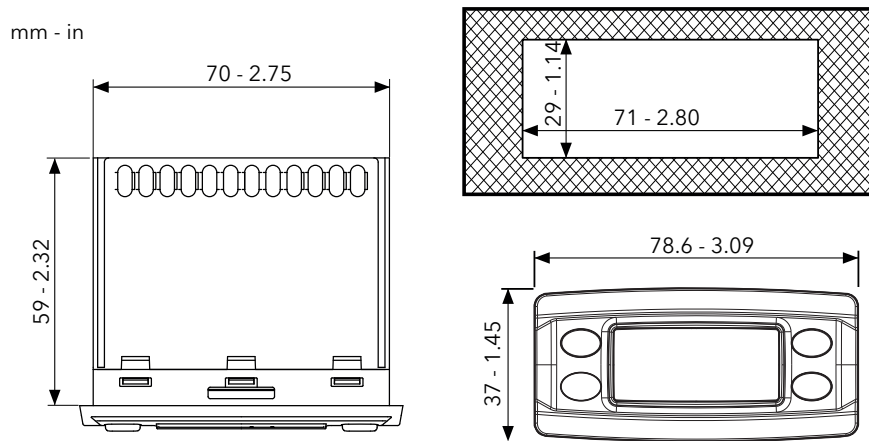
WARNING

UNINTENDED EQUIPMENT OPERATION DUE TO ELECTROSTATIC DISCHARGE

Before handling the equipment, always discharge the static electricity from the body by touching an earthed surface or type-approved antistatic mat.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Mechanical dimensions



Installation

Installing/uninstalling the controller

Mount the controller horizontally.

To install, proceed as follows:

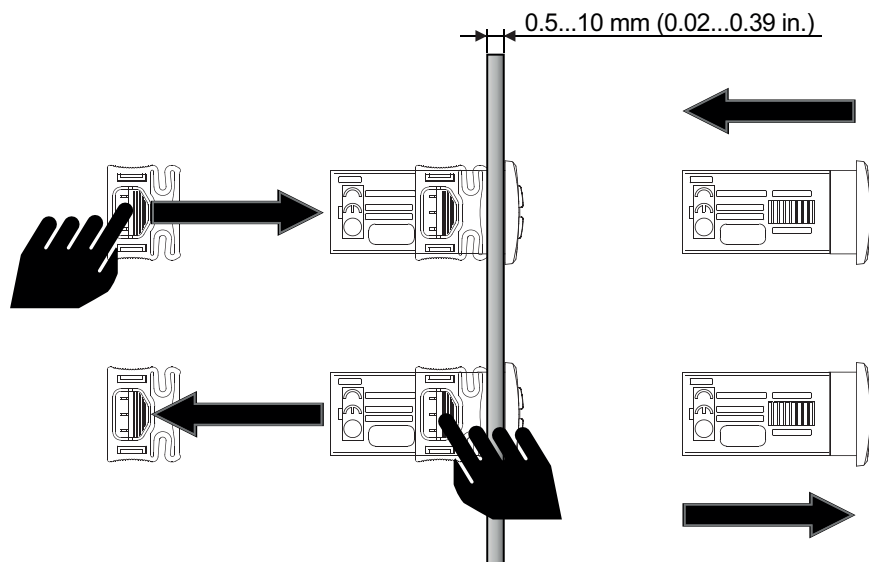
1. Make a hole measuring 71 x 29 mm (2.80 x 1.14 in.)
2. Introducing the controller
3. Secure it by inserting the brackets in the relevant rails at the 2 sides of the controller, until it clicks into place

To uninstall it, proceed as follows:

1. Press the brackets on the 2 sides of the device until you hear a click and take them out
2. Removing the controller

Note: Leave the area around the slits clear to allow air to circulate, keeping the controller cool.

Note: The panel thickness must be between 0.5 mm (0.02 in.) and 7.5 mm (0.3 in.) inclusive.



Electrical connections

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This section includes the following topics:

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Best wiring practices

Warnings

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, FIRE OR ARC FLASH

- Disconnect all power from all equipment including connected devices prior to removing any covers or doors, or installing or removing any accessories, hardware, cables or wires.
- Always use a properly rated voltage sensing device to confirm the power is off where and when indicated.
- Before restoring the power supply, replace and secure all covers, hardware components and cables.
- Use only the specified voltage when operating this device and any associated products.
- Use appropriate safety interlocks where personnel and/or equipment hazards exist.
- Install and use this equipment in an enclosure appropriately rated for its intended environment.
- Do not use this equipment for safety-critical functions.
- Do not disassemble, repair, or modify this equipment.

Failure to follow these instructions will result in death or serious injury.

DANGER

HAZARD OF ELECTRIC SHOCK AND/OR FIRE

- Do not expose the equipment to liquids.
- Do not exceed the temperature and humidity ranges specified in the technical data and keep the area surrounding the cooling slits aerated.
- Do not apply dangerous voltages to the SELV connection terminals (see "Connections" chapter).
- Only connect compatible accessories - as specified in the section "Accessories" - to the device.
- Only use cables with a suitable cross-section (see "Best wiring practices").

Failure to follow these instructions will result in death or serious injury.

WARNING

HAZARD OF OVERHEATING AND/OR FIRE

- Do not use with loads other than those indicated in the technical data.
- Do not exceed the maximum permitted current; in the case of higher loads, use a contactor with suitable power.
- Verify that your application has not been designed with device outputs connected directly to devices generating a frequently operated capacitive load ⁽¹⁾.
- Power lines and output connections must be suitably wired and protected by means of fuses when required by national and local regulations.
- Connect the relay output, including the shared hub, using cables with a cross-section of 2.5 mm² (14 AWG) and a length of at least 200 mm (7.87 in.).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

(1) Even if the application does not connect a frequently activated capacitive load to the relays, capacitive loads decrease the life of every electromechanical relay and the installation of a contactor or external relay, sized and maintained in accordance with the size and features of the capacitive load, helps to minimize the effects of relay degradation.

WARNING

REGULATORY INCOMPATIBILITY

Be sure that all equipment applied and systems designed comply with all applicable local, regional and national regulations and standards.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Wiring guidelines

DANGER

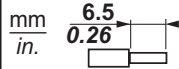











LOOSE WIRING CAN RESULT IN ELECTRIC SHOCK AND/OR FIRE

Tighten the connections in compliance with the technical specifications for torque values and make sure the wiring is correct.

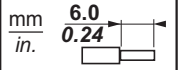






Failure to follow these instructions will result in death or serious injury.

Use copper wires (obligatory).

The table below shows the type and size of permitted cables for screw terminals of power supply and loads.

									
mm in.	0.2...2.5	0.2...2.5	0.25...2.5	0.25...2.5	2 x 0.2...0.75	2 x 0.2...0.75	2 x 0.25...0.75	2 x 0.25...0.75	2 x 0.5...1.5
mm ²	24...14	24...14	24...14	24...14	2 x 24...18	2 x 24...18	2 x 24...18	2 x 24...18	2 x 20...16
AWG	24...14	24...14	24...14	24...14	2 x 24...18	2 x 24...18	2 x 24...18	2 x 24...18	2 x 20...16
 Ø 3.5 mm (0.14 in.)		N•m		0.5...0.6	lb-in		4.42...5.31		

The table below shows the type and size of permitted cables for screw terminals of probes and digital inputs.

					 Ø 3.5 mm (0.14 in.)		N•m	0.5...0.6
mm in.	0.05...2.5	0.05...1.5	0.05...2.5	0.05...1.5	lb-in		4.42...5.31	
mm ²	30...14	30...16	30...14	30...16				
AWG	30...14	30...16	30...14	30...16				

NOTICE

INOPERABLE DEVICE

The SELV wiring must be kept separate from all the other wiring (see "Connections" chapter).

Failure to follow these instructions can result in equipment damage.

NOTICE

INOPERABLE DEVICE

- For the connection of probes and the digital input, use cables no longer than 10 m (32.80 ft).
- For TTL serial line connection, use cables no longer than 3 m (9.84 ft).

Failure to follow these instructions can result in equipment damage.

The temperature (NTC/PTC) probes have no specified connection polarity; the connections can be extended using a normal bipolar cable. Extending the probe wiring influences the electromagnetic compatibility (EMC) of the controller.

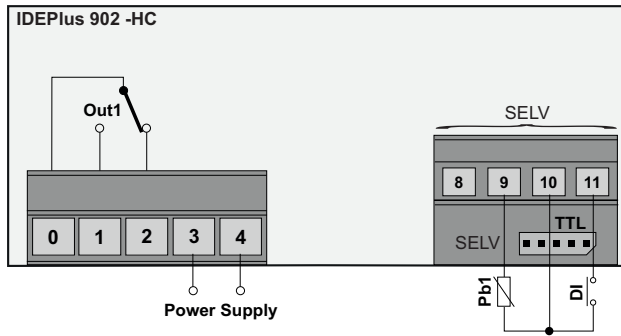
Connections

Wiring diagrams

Click on the controller model to access the corresponding wiring diagram:

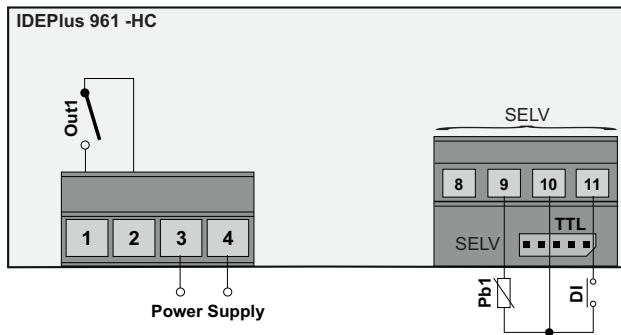
- **IDEPlus 902 -HC**
- **IDEPlus 961 -HC**
- **IDEPlus 974 -HC**

IDEPlus 902 -HC (230 Vac)



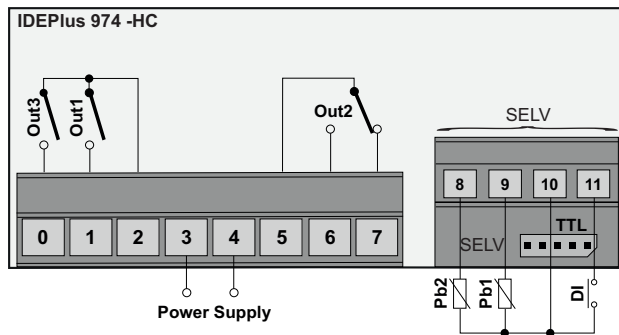
Terminals	Description
0-1-2	Compressor relay (Out1)
3-4	Power supply input 230 Vac
9-10	Probe Pb1
11-10	Digital input DI
SELV	SELV terminals
TTL	TTL serial port

IDEPlus 961 -HC (230 Vac)



Terminals	Description
1-2	Compressor relay (Out1)
3-4	Power supply input 230 Vac
9-10	Probe Pb1
11-10	Digital input DI
SELV	SELV terminals
TTL	TTL serial port

IDEPlus 974 -HC (230 Vac)



Terminals	Description
0-2	Evaporator fans relay (Out3)
1-2	Compressor relay (Out1)
3-4	Power supply input 230 Vac
5-6-7	Defrost relay (Out2)
8-10	Probe Pb2
9-10	Probe Pb1
11-10	Digital input DI
SELV	SELV terminals
TTL	TTL serial port

Technical characteristics

Contents

This section includes the following topics:

- Technical data 31
- Output characteristics31
- Input characteristics31
- Further Information32

Technical data

The product conforms to the following harmonized standards	EN 60730-1 and EN 60730-2-9
Device construction	Electronic automatic incorporated Control
Device purpose	Operating control (non-safety related) device
Type of action	1.B
Pollution class	2
Overvoltage category	II
Nominal pulse voltage	2500 V
Power supply	230 Vac ($\pm 10\%$) 50/60 Hz
Consumption	4.5 VA
Environmental operating conditions	Temperature: -5...55 °C (23...131 °F) Humidity: 10...90% RH (non-condensing)
Transportation and storage conditions	Temperature: -30...85 °C (-22...185 °F) Humidity: 10...90% RH (non-condensing)
Software class	A

Note: check the power supply specified on the controller label.

Note: consult the Sales Office for availability of the relay and power supply capacities.

Output characteristics

230 Vac models	Output	EU (230 Vac)	USA (230 Vac)
IDEPlus 902 -HC	Out1	NO 10(6) A - NC 9(5) A - CO 9 A resistive	NO 10 A - NC 9 A - CO 9 A resistive / NO 5FLA 30LRA
IDEPlus 961 -HC	Out1	12(8) A	12FLA 72LRA
IDEPlus 974 -HC	Out1	12(8) A	12FLA 72LRA
	Out2	NO 8(4) A - NC 6(3) A - CO 6 A resistive	NO 8 A - NC 6 A - CO 6 A resistive / NO 4.9FLA 29.4LRA
	Out3	5(2) A	5 A resistive / 2FLA 12LRA

Input characteristics

Analog inputs	<ul style="list-style-type: none"> • IDEPlus 902 -HC: 1 NTC/PTC input (Pb1) • IDEPlus 961 -HC: 1 NTC/PTC input (Pb1) • IDEPlus 974 -HC: 2 NTC/PTC inputs (Pb1 and Pb2)
Digital inputs	<ul style="list-style-type: none"> • IDEPlus 902 -HC: 1 voltage free digital input (DI). • IDEPlus 961 -HC: 1 voltage free digital input (DI). • IDEPlus 974 -HC: 1 voltage free digital input (DI).

Further Information

Probe values

Display ranges	-99.9...99.9 or -999...999
Measuring range	NTC: -50...110 °C (-58...230 °F) PTC: -55...140 °C (-67...284 °F) (on display with 3 digits + sign)
Accuracy	NTC: -50...-30 °C (-58...-22 °F): Better than 1.5% of the fullscale* + 1 digit. -30...110 °C (-22...230 °F): Better than 1% of the fullscale* + 1 digit. (* fullscale = overall interval breadth -50...110 °C (-58...230 °F) PTC: Better than 1% of the fullscale** + 1 digit. (**) fullscale = overall interval breadth -55...140 °C (-67...284 °F)
Resolution	1 °C/°F or 0.1 °C/°F

Mechanical characteristics

Connectors	TTL serial port for connection of compatible accessories
Dimensions	Front panel 78.6 x 37 mm (3.09 x 1.45 in.), depth 59 mm (2.32 in.)
Mounting panel thickness	0.5...10.0 mm (0.02...0.39 in.)
Terminals	Screw terminal blocks

Note: the technical characteristics provided in this document concerning measurement (range, accuracy, resolution, etc.) refer to the instrument itself only and not to any accessories supplied, such as the probes.

User interface and operation

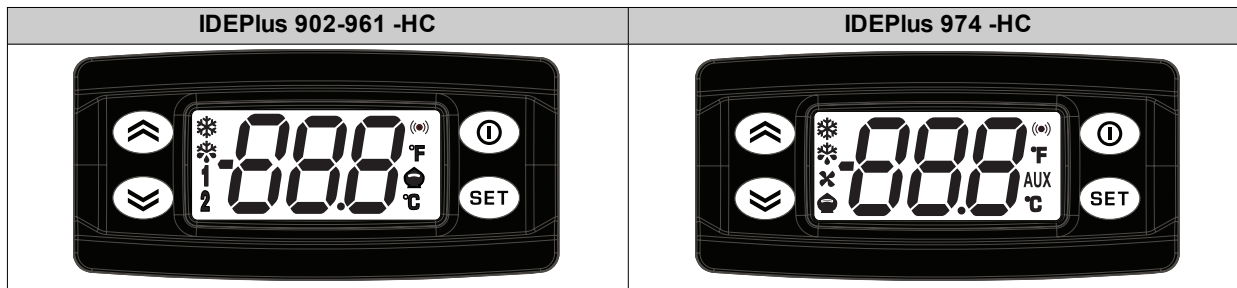
Contents

This section includes the following topics:

User interface	34
Using the controller	35
Setting the probes	37
Setting the displayed values	38

User interface

Interface



Keys

Keys	press and release	press for at least 5 seconds
	<ul style="list-style-type: none"> Scroll through the menu options. Increase the values. 	From outside the menus only. Can be configured by the user (parameter H31) Default: Activates manual defrost.
	<ul style="list-style-type: none"> Scroll through the menu options. Decrease the values. 	From outside the menus only. Can be configured by the user (parameter H32)
	<ul style="list-style-type: none"> Go back up one level in the menu. Confirm the parameter value. 	From outside the menus only. Default: Activates stand-by.
	<ul style="list-style-type: none"> Access the "Machine Status" menu. Display alarms (if present) 	<ul style="list-style-type: none"> Access the "Programming" menu. Confirm commands.

Icons

Icon	Function	Description
	Compressor	Permanently on: compressor active Flashing: delay, protection or activation inhibited Off: compressor off
	Defrost	Permanently on: defrost active Flashing: defrost activated manually or via digital input Off: defrost inactive
	Evaporator fans (IDEPlus 974 only)	Permanently on: fans active Off: fans off
AUX	AUX (IDEPlus 974 only)	Permanently on: AUX output active (depending on model) Off: AUX output not active
	Alarm	Permanently on: alarm present Flashing: alarm silenced Off: no alarm active
°F	Temperature	Permanently on: values displayed in °F (dro = 1) Off: otherwise
	Reduced set	Flashing: reduced set active Fast flashing: access to Installer parameters
°C	Temperature	Permanently on: values displayed in °C (dro = 0) Off: otherwise
1	Heat mode (IDEPlus 902/961 only)	Permanently on: compressor in HEAT mode Off: otherwise
2	AUX (IDEPlus 902/961 only)	Permanently on: AUX output active (depending on model) Off: AUX output not active

Using the controller

Switching on for the first time

Once the electrical connections have been completed, simply power up the device for it to start working.

At the first startup:

1. Verify and, if necessary, adjust the value of the main controller parameters to adapt the selected application to your system.
2. Verify there are no active alarms.















Note: if there are active alarms, verify the wiring connections.

Password

The passwords **PA1** and **PA2** are required to access the device parameters:

- **PA1:** access the User parameters (default: **PA1** = 0 - disabled)
- **PA2:** access the Installer parameters (default: **PA2** = 15 - enabled)

To change the password value:







1. Press and hold for at least 5 seconds 
2. Scroll through the parameters with  and  until you find the label "PA2"
3. Press and release 
4. Set the value "15" using the keys  and 
5. Confirm the value by pressing  (the first folder will be displayed)
6. Scroll through the folders with  and  until you find the label "diS"
7. Press and release 
8. Scroll through the parameters with  and  until you find the label "PS1" or "PS2", depending on whether you want to change access password **PA1** or **PA2**
9. To confirm the value press  or , or let a timeout occur (15 seconds).

Note: If **PA1**=0, the User parameters will be not protected and displayed before **PA2** label.

Note: If the value entered is incorrect, the label **PA1/PA2** will be shown again. Repeat the procedure.

Machine Status Menu

To enter the Machine Status menu:

1. Press and release 
2. Scroll through the folders with keys  and  until you find the label for the desired folder
3. Press and release 
4. View the value reading
5. To exit press  or , or let a timeout occur (15 seconds).


List of folders:

The folders shown are as follows:

- **SEt:** setpoint setting folder
- **AL:** alarms folder (only visible if there are active alarms)
- **Pb1:** Pb1 probe value folder
- **Pb2:** Pb2 probe value folder

Note: some folders may not be present, depending on the model








Progammig Menu

To enter the Programming menu, press and hold  for at least 5 seconds

If required, an access PASSWORD **PA1** will be requested for User parameters and **PA2** for Installer parameters (see **Password** section).











User parameters (User):

Upon access the first parameter (**SEt**) will be shown.

1. Scroll through the parameters with keys  and  until you find the label for the parameter you want to change
2. Press and release 
3. Set the desired value using the keys  and 
4. To confirm the value press  or , or let a timeout occur (15 seconds).

Installer parameters (Inst):

Upon access the first folder (CP) will be shown.









1. Scroll through the folders with keys  and  until you find the label for the desired folder
2. Press and release 
3. Scroll through the parameters with keys  and  until you find the label for the parameter you want to change
4. Press and release 
5. Set the desired value using the keys  and 
6. To confirm the value press  or , or let a timeout occur (15 seconds).

Note: Switch the device off and on again every time you change the parameter configuration.





Locking/unlocking the keypad

To lock/unlock the keypad, press  and  in the 'Machine Status' menu. The keypad can be locked automatically by setting the "LOC" parameter.

Setting the setpoint

1. Press and release  to access the "Machine status" menu
2. Scroll through the folders with  and  until you find the folder **SEt**
3. Press  to view the current setpoint value.
4. Change the setpoint value using  and  within 15 seconds.
5. To confirm the value press  or , or let a timeout occur (15 seconds).

Display the probe values



1. Press and release  to access the "Machine status" menu
2. Scroll through the folders with  and  until you find the folder **Pb1** or **Pb2**
3. Press  to view the value measured by the corresponding probe.

- Notes:**
- the displayed value cannot be changed.
 - folder **Pb2** can only be viewed on models that manage probe Pb2.

Setting frequently used functions

Some frequently used functions may be paired with the keys by suitably configuring the corresponding parameters; they can then be activated by pressing and holding the paired key.

Note: Some keys may not be present or settable, depending on the model.

Key	Parameter
	H31
	H32

Value H31/H32	IDEPlus 902-961 -HC	IDEPlus 974 -HC
0	Disabled	Disabled
1	Defrost	Defrost
2	Reserved	AUX
3	Reduced set	Reduced set
4	Stand-by	Stand-by

Setting the main parameters

See "User" menu in the parameters table for the various models.

Setting the probes

Introduction

Only connect probes of the same type to the device (all NTC or PTC).

Probe inputs

Depending on the model, the controller has the following inputs:

- one or two analog inputs (**Pb1** / **Pb2**)
- one digital input (**DI**)

Setting the probe type

To configure the probe type, you need to set parameter **H00** in folder **CnF**, within the "Installer" menu:

H00 value	Probe type
0	PTC
1 (default)	NTC

Probe calibration

The **diS** folder, within the "Installer" menu, contains the parameters:

- **CA1** (probe Pb1)
- **CA2** (probe Pb2)

to force an additional value (with sign) on reading the corresponding probe (if managed by the specific model).

Setting the displayed values

Introduction

The following settings refer to the parameters in folder **diS**.

Display with decimal point

You need to set parameter **ndt**:

ndt value	Description
y	Display with decimal point and resolution to tenths of a degree
n	Display with no decimal point

Note: this setting only influences the displaying of data, not the resolution of the measurement or the accuracy of the controller's calculations.

Default display

You need to set parameter **ddd**:

ddd value	Description
0	Display setpoint
1	Display the value read by Pb1
2	Display the value read by Pb2

Note: If the selected probe is not present, the displayed value cannot be considered reliable.

Display during defrost

You need to set parameter **ddl**:

ddl value	Description
0	Display the values read by Pb1
1	Display the value read by Pb1 at the start of defrost
2	Display the label dEF

Set the unit of measure for the temperatures

You need to set parameter **dro**:

dro value	Description
0	Display the temperature in °C
1	Display the temperature in °F

Note: this setting only influences how the temperatures read by the probes are displayed. After changing the unit of measure from °C to °F, the value of parameters **SEt**, **diF**, etc, remains the same and they will take on a different meaning, since they are expressed in a new unit of measure (**SEt** = 10 °C becomes **SEt** = 10 °F).

Defrost

Contents

This section includes the following topics:

Introduction	40
Display and alarm operation	41
Automatic defrost	42
Manual defrost	43

Introduction

Defrosting removes ice from the surface of the evaporator.

If **dt** ≠ 0, once defrost is complete, a dripping cycle takes place to prevent the water left on the evaporator from freezing again.

Defrost mode

To select the defrost mode, set parameter **dt** (defrost type).

Defrost takes place due to the evaporator heating up, in one of the following ways:

dt value	Defrost mode
0	Electric heater defrost* (Low temperature applications)
	Defrost due to compressor stoppage (Normal temperature applications)
1	Cycle inversion (hot gas) defrost* (Low temperature applications)
2	Free defrost*

(*): only models that manage probe Pb2.

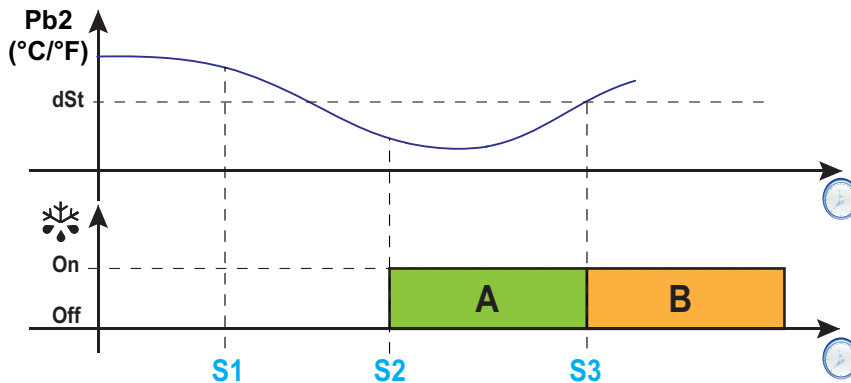
Functioning conditions

Defrost is triggered automatically if:

- the defrost activation timer has elapsed and the temperature of the first evaporator is lower than the defrost end setpoint **dSt**.

Defrost is NOT triggered automatically if:

- a manual defrost is already underway.
- the defrost activation timer has elapsed and the temperature of the first evaporator is higher than the defrost end setpoint **dSt**, in which case a new timer count will begin.



Legend: **A** = Defrost; **B** = Dripping; **S1** = Defrost not performed; **S2** = Defrost start; **S3** = End of defrost and start of dripping cycle.

Setting the dripping interval

To activate dripping at the end of the defrost cycle, set parameter **dt** ≠ 0. During dripping, the evaporator fans are switched off even if **Fdt** < **dt**.

Note: parameter **dt** is only present in models that manage probe Pb2 and that can control the evaporator fans.

Parameters

Parameter	Description
dt	Type of defrost.
dSt	Temperature value set for the end of defrost on evaporator 1.
Fdt	Fan activation delay after a defrost.
dt	Dripping duration.

Display and alarm operation

Alarm operation during defrost

You can activate an alarm for defrost ending due to timeout, by setting parameter **dAt** = y (see alarm **Ad2** in the section "Alarms and indications" on page 66).

Note: this function can only be activated on models that manage probe Pb2.

Note: during defrost the temperature alarm are excluded.

Displayed values

By setting parameter **ddL**, you can choose the values displayed during the defrost phase until the end of dripping time.

The value shown on the display may be configured in one of the following ways:

- **ddL** = 0: display the temperature read by the regulation probe (Pb1)
- **ddL** = 1: display the temperature read by the regulation probe (Pb1) at the start of defrost
- **ddL** = 2: display (permanently) the label **dEF** (defrost)

Restore standard displaying

The standard displaying is restored on the display:

- on reaching the setpoint and after dripping
- on reaching the time-out value defined by parameter **Ldd**

Parameters

Parameter	Description
dAt	Defrost ended due to timeout alarm indication.
ddL	Display mode during defrosting.
Ldd	Display unlock timeout value - label dEF .

Automatic defrost

Introduction

The automatic defrost function is programmed to start at intervals.

If **dit**>0, the defrost cycles runs at fixed intervals indicated by the **dit** parameter.

Functioning conditions

The interval of the automatic defrost is calculated from the value of the **dCt** parameter.

dCt value	Mode	Description
0	Compressor working time (DIGIFROST® method)	The count runs only if the compressor is on. At the end of the defrost interval if the conditions for doing so are met, a new count and a defrost cycle start. Note: the compressor run time is counted regardless of the evaporator temperature. If the evaporator probe is missing or inoperable, the count continues for the time the compressor is on.
1	Controller working time	The defrost interval is counted continuously when the controller is on and starts at each power-on. When the defrost interval ends (indicated by dit), a defrost cycle begins, if the conditions are met, and a new defrost interval count begins.
2	Compressor stop	Each time the compressor stops, a defrost cycle is run according to the mode set in the dtY parameter. Note: the dtY parameter is only displayed and can be set on IDEPlus 974 -HC model. In IDEPlus 902 -HC and IDEPlus 961 -HC models, each time the compressor stops, a defrost cycle is run.

Defrost is triggered automatically if:

- the defrost activation timer has elapsed and the temperature of the first evaporator is lower than the defrost end setpoint **dSt***

If the **OdO** count is in progress or the evaporator temperature is greater than the value of parameter **dSt***, the defrost will not be activated and the display will flash three times.

(*): only models that manage probe Pb2.

Parameters

Parameter	Description
dit	Time interval between one defrost and the next.
dCt	Selection of the defrost interval count mode.
OdO	Output activation delay time from switching on the controller or after a power failure.
dSt	Evaporator 1 defrost end temperature.

Manual defrost

Introduction

The Manual Defrost function can be activated in one of the following ways:

- press and hold a key (configured with **H3x** = 1)
- via digital input (configured with **H11** = ±1)

Note: if the **OdO** count is in progress, the defrost cycle does not begin, the request is not carried out and the display will flash three times to indicate that defrosting is not possible.

Functioning conditions

If manual defrost is activated, the defrost interval count (**dit** time) is not reset.

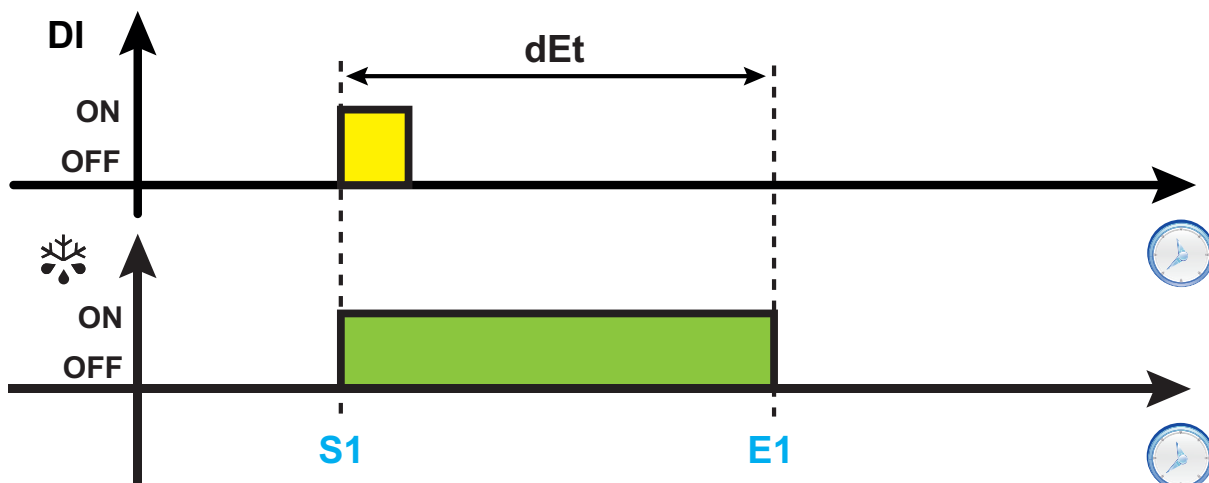
If the **OdO** count is in progress or the evaporator temperature is greater than the value of parameter **dSt***, the defrost will not be activated and the display will flash three times.

(*): only models that manage probe Pb2.

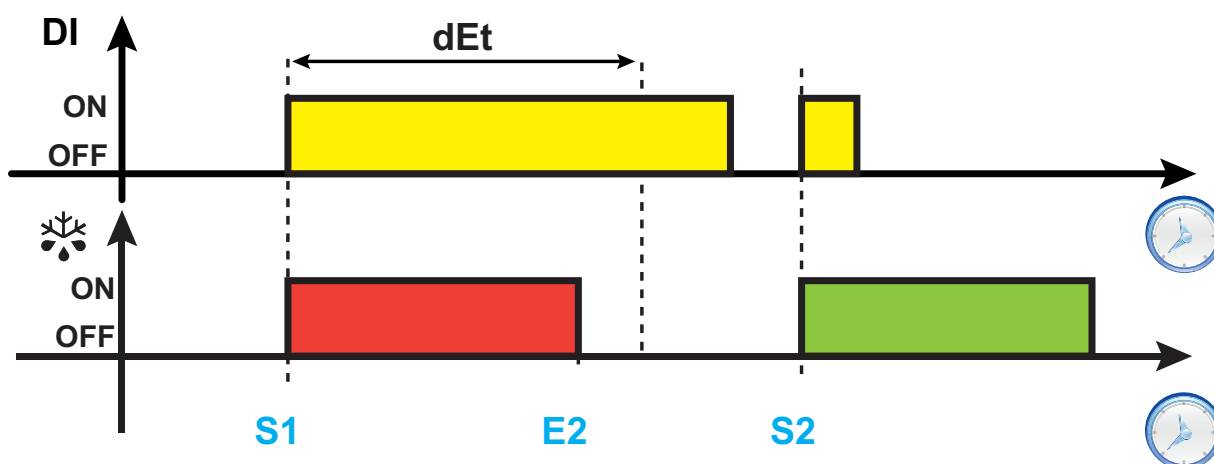
Note: defrost activation takes place upon closure (**H11**=1) or opening (**H11**=-1) of the digital input DI (if activated). You can only activate a defrost, not end an active one. Any defrost or dripping cycle in progress and the defrost or dripping time cannot be suspended.

Regulation examples

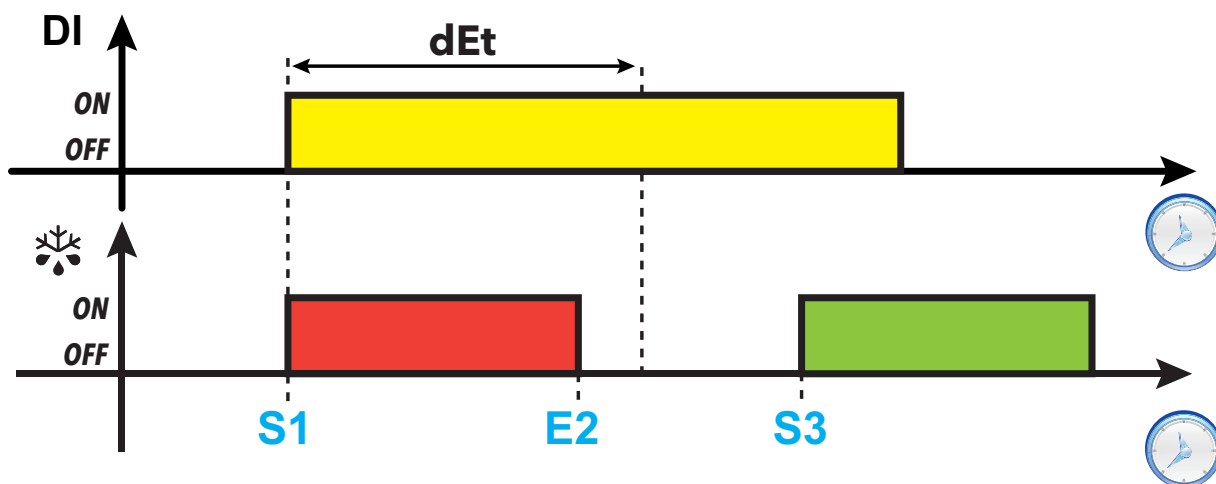
Example 1 (H11 = 1):



Example 2 (H11 = 1):



Example 3 (H11 = 1):



Legend: S1 = Defrost 1 start; S2 = Defrost 2 start; S3 = Regular defrost start with fixed expiration; E1 = End of defrost due to timeout; E2 = End of defrost due to temperature.

Parameters

Parameter	Description
dit	Time interval between one defrost and the next.
OdO	Output activation delay time from switching on the controller or after a power failure.
dEt	Defrost timeout. Determines the maximum duration of the defrost.
dSt	Evaporator 1 defrost end temperature.
H11	DI digital input/polarity configuration.
H31	☞ key configuration.
H32	☞ key configuration.

Electric heater defrost

When defrost is activated ($dt = 0$):

- The compressor stops
- the relay to which the electric heaters are connected, configured as defrost regulator output, is activated

At the end of defrost, if $dt \neq 0$ the controller will move on to the dripping phase and the compressor, fans and heaters will remain inactive. At the end of the dripping cycle, regulation begins again as normal.

End of defrost

Defrost ends in the following conditions:

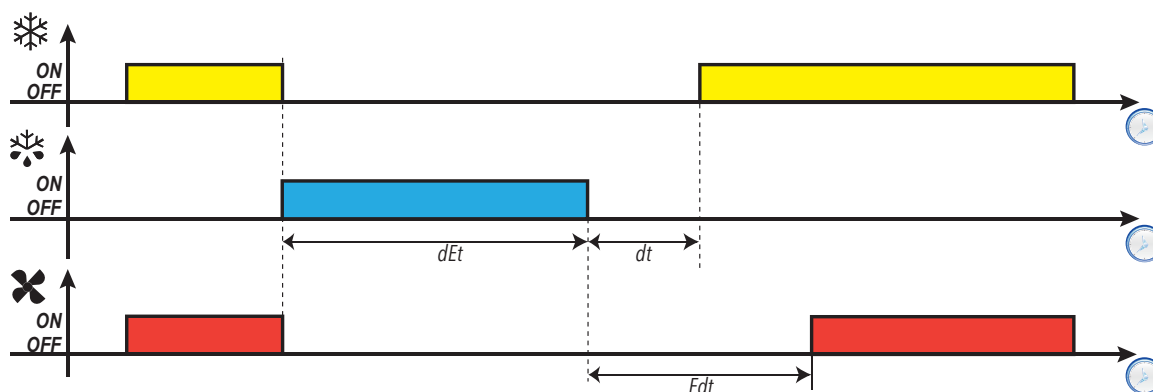
Condition	H42 value	Evaporator probe (Pb2)
End of timeout period set using parameter dEt .	0	Not managed
Defrost end setpoint set using parameter dSt reached or due to timeout if the setpoint is not reached within the time period dEt .	1	Managed

Notes:

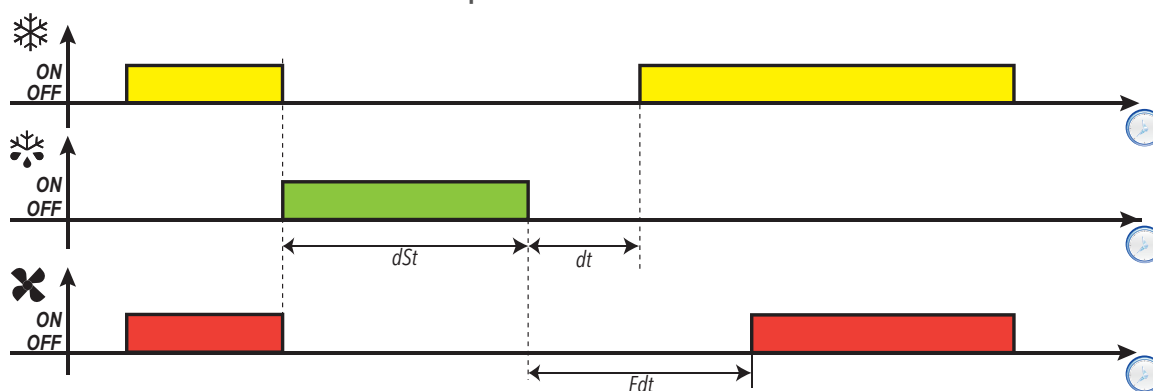
- To end defrost manually, switch the controller off and on again or use Stand-by function
- Temperature alarms are excluded during defrost
- If **dSt** intervenes before **dEt**, dripping (managed by parameters **dt** and **Fdt**) is activated in correspondence with **dSt** intervention
- If **Fdt** < **dt** **Fdt** = **dt** is set
- During the defrost the fans are off if **dFd** = y, otherwise they follow the other settings for the fan regulator
- The programmed defrost is carried out independently of the Pb1 status
- Defrost and dripping are carried out independently of the door switch activation or not

Regulation diagram

End of electric heater defrost due to timeout



End of electric heater defrost due to temperature



Parameters

Parameter	Description
don	Compressor relay activation delay time from call.
doF	Delay time after compressor relay switch-off and the next switch-on.
dbi	Delay time between two compressor switch-ons.
dty	Type of defrost.
dEt	Defrost timeout. Determines the maximum duration of the defrost.
dSt	Evaporator 1 defrost end temperature.
Fdt	Fan activation delay after a defrost.
dFd	Evaporator fan exclusion during defrost.
dt	Dripping duration.

Defrost due to compressor stoppage

When electric defrost is activated ($dt_y = 0$),

- The compressor stops
- No relay is configured as defrost regulator output

End of defrost

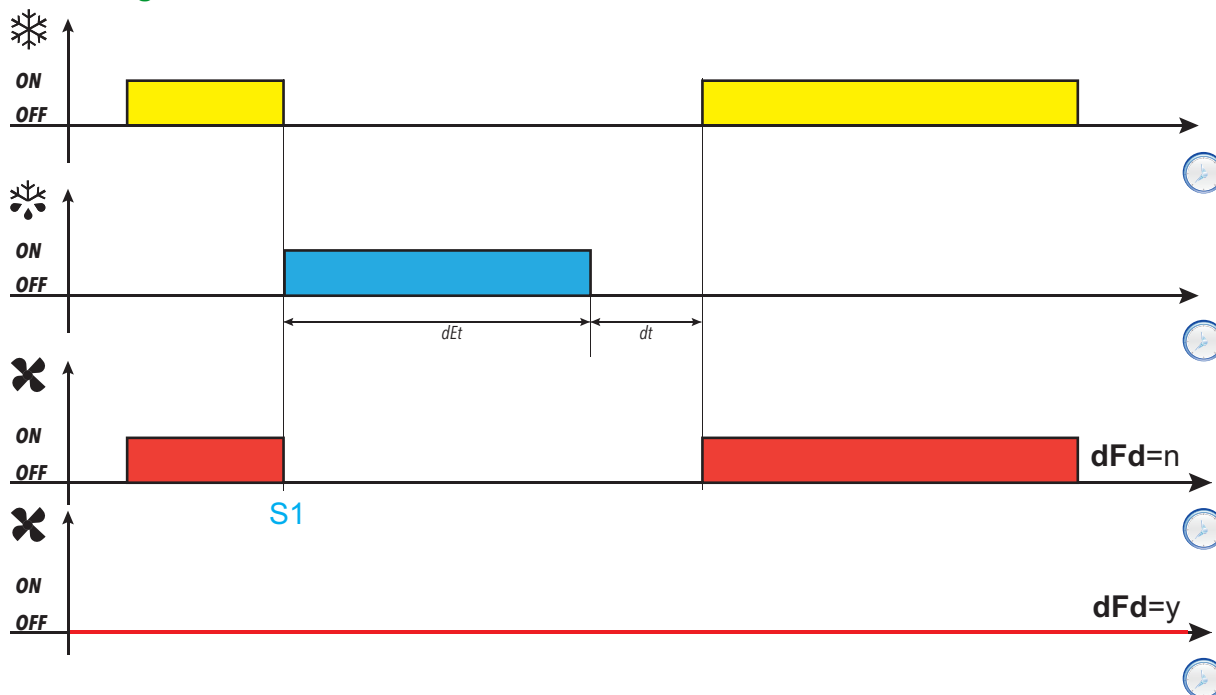
Defrost ends in the following conditions:

Condition	H42 value	Evaporator probe (Pb2)
End of timeout period set using parameter dEt .	0	Not managed
Defrost end setpoint set using parameter dSt reached or due to timeout if the setpoint is not reached within the time period dEt .	1	Managed

Notes:

- To end defrost manually, switch the controller off and on again or use Stand-by function
- Temperature alarms are excluded during defrost
- If $dt \neq 0$, at the end of defrost the compressor and fans remain off for the time period dt (dripping time)
- During the defrost the fans are off if $dFd = y$, otherwise they follow the other settings for the fan regulator
- The programmed defrost is carried out independently of the Pb1 status
- Defrost and dripping are carried out independently of the door switch activation or not

Regulation diagram



Legend: S1 = Start of defrost

Parameters

Parameter	Description
dt_y	Type of defrost.
dEt	Defrost timeout. Determines the maximum duration of the defrost.
dSt	Evaporator 1 defrost end temperature.
dFd	Evaporator fan exclusion during defrost.
dt	Dripping duration.

Cycle inversion (hot gas) defrost

When defrost is activated (**dt** = 1):

- The compressor remains active for the entire duration of the defrost
- the relay to which the solenoid valve is connected, configured as defrost regulator output, is activated

At the end of defrost the valve relay and the compressor relay are deactivated. The compressor relay is stopped for the entire duration of the dripping cycle, set via parameter **dt** (if a value other than zero). At the end of the dripping cycle regulation begins again as normal.

End of defrost

Defrost ends in the following conditions:

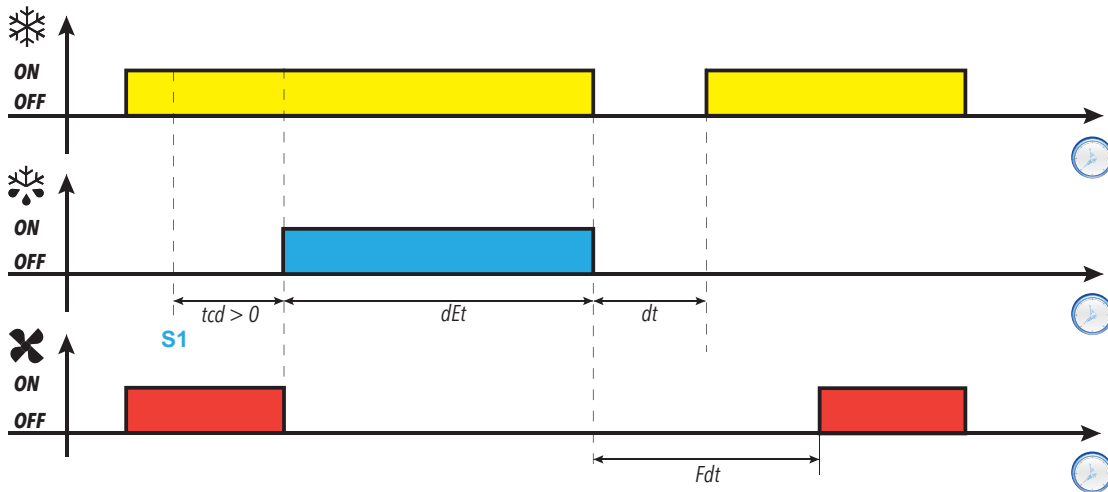
Condition	H42 value	Evaporator probe (Pb2)
End of timeout period set using parameter dEt	0	Not managed
Defrost end setpoint set using parameter dSt reached or due to timeout if the setpoint is not reached within the time period dEt .	1	Managed

Notes:

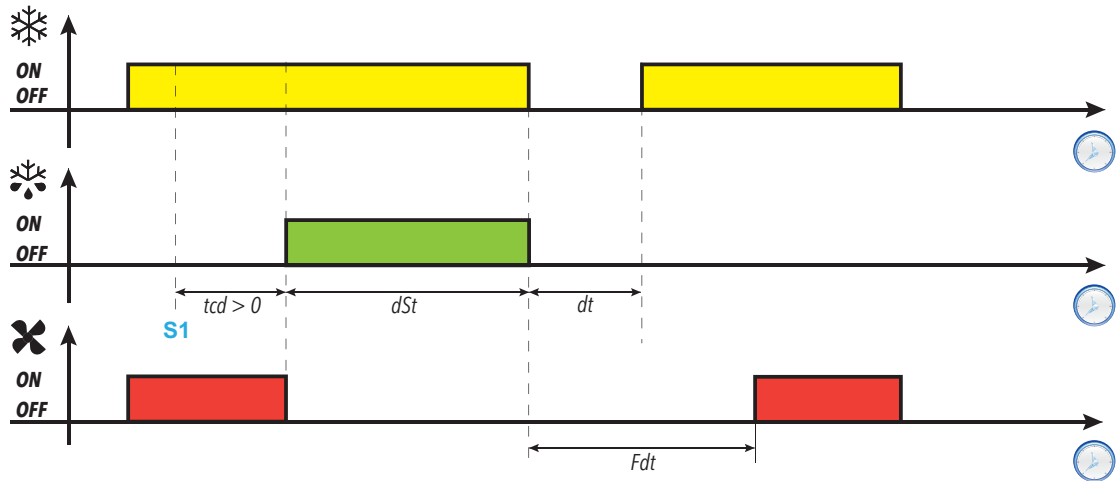
- To end defrost manually, switch the controller off and on again or use Stand-by function
- Temperature alarms are excluded during defrost
- The compressor safety timings (managed by parameters **don**, **dOF** and **dbi**) take priority over defrost
- If **dSt** intervenes before **dEt**, dripping (managed by parameters **dt** and **Fdt**) is activated in correspondence with **dSt** intervention
- If **Fdt < dt** **Fdt = dt** is set
- During the defrost the fans are off if **dFd = y**, otherwise they follow the other settings for the fan regulator
- The programmed defrost is carried out independently of the Pb1 status
- Defrost and dripping are carried out independently of the door switch activation or not

Regulation diagrams

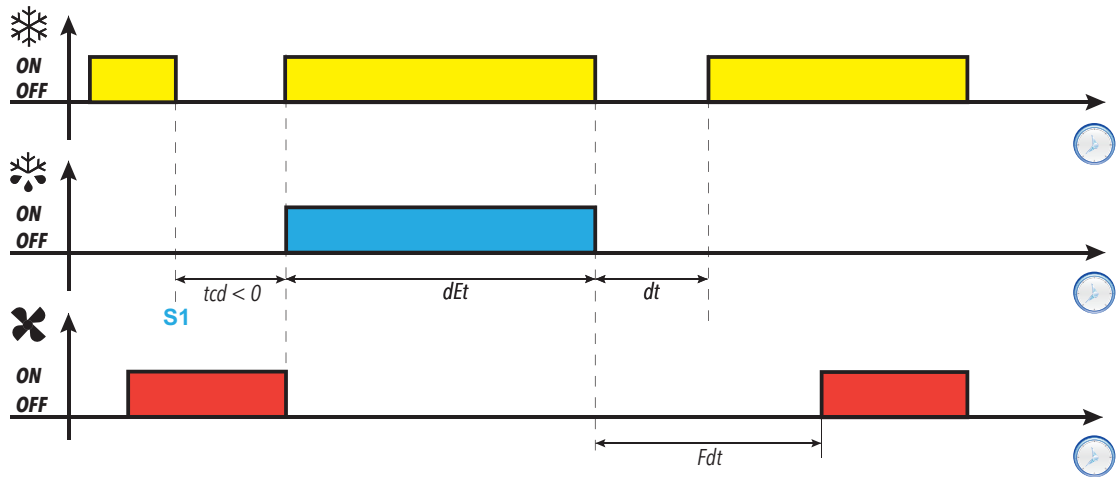
End of hot gas defrost due to timeout, with **tcd > 0**



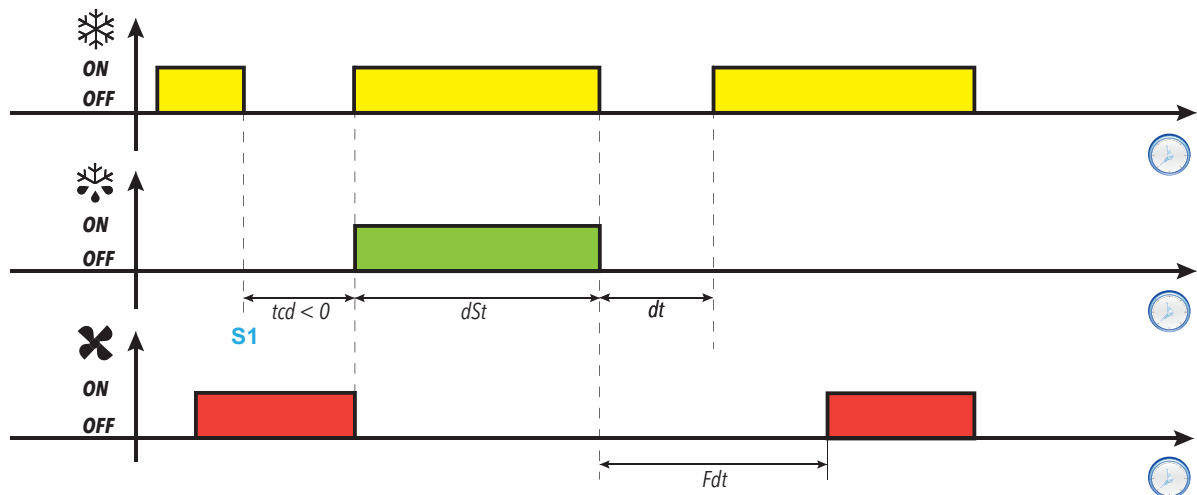
End of hot gas defrost due to temperature, with $tcd > 0$



End of hot gas defrost due to timeout, with $tcd < 0$



End of hot gas defrost due to temperature, with $tcd < 0$



Legend: S1 = Defrost request

Parameters

Parameter	Description
don	Compressor relay activation delay time from call.
doF	Delay time after compressor relay switch-off and the next switch-on.
dbi	Delay time between two compressor switch-ons.
tcd	Minimum compressor on or off time which must elapse before defrost is activated.
dty	Type of defrost.
dEt	Defrost timeout. Determines the maximum duration of the defrost.
dSt	Evaporator 1 defrost end temperature.
Fdt	Fan activation delay after a defrost.
dt	Dripping duration.

Free defrost

When defrost is activated (**dt** = 2):

- The compressor remains under control of the compressor regulator for the duration of the defrost
- the relay to which the electric heaters are connected, configured as defrost regulator output, is activated

At the end of the defrost the heaters switch off.

During the dripping cycle the compressor continues to run.

End of defrost

Defrost ends in the following conditions:

Condition	Evaporator probe (Pb2)	H42 value
End of timeout period set using parameter dEt	Not managed	0
End of defrost temperature setpoint, set using parameter dSt , reached. Note: (only models that manage probe Pb2) If the setpoint is not reached within the time set using parameter dEt (defrost timeout), the defrost ends in any case due to timeout.	Managed	1

Notes:

- To end defrost manually, switch the controller off and on again or use Stand-by function
- Temperature alarms are excluded during defrost
- If **dSt** intervenes before **dEt**, dripping (managed by parameters **dt** and **Fdt**)
- The programmed defrost is carried out independently of the Pb1 status
- Defrost and dripping are carried out independently of the door switch activation or not

Parameters

Parameter	Description
dt	Type of defrost.
dEt	Defrost timeout. Determines the maximum duration of the defrost.
dSt	Evaporator 1 defrost end temperature.
Fdt	Fan activation delay after a defrost.
dt	Dripping duration.

Tools

Contents

This section includes the following topics:

Door switch	53
Stand-by	54
Copy parameters (UNICARD/Copy Card)	55

Door switch

Description

By setting **H11** = ±4 it is possible to connect a door switch to the digital input. When it is activated, the compressor and/or fans are deactivated instantly or after a time period set with parameter **dCO**.

By setting **H2x** = 5, an AUX relay output can be associated with the door switch regulator output (**IDEPlus 974 -HC** only).

Operating mode

Controller operation on opening of the door switch depends on parameters **dOd**, **dAd** and **dCO**:

dOd	dCO	Fans	Compressor
0 = function disabled	NO	On	On
1 = fans disabled	NO	Off	On
2 = compressor disabled	0	On	Off
	> 0		Off after dCO time
3 = compressor and fans disabled	0	Off	Off
	> 0		Off after dCO time

Note: If the door is opened during a defrost cycle, the defrost continues normally.

Parameters

Parameter	Description
dOd	Loads switched off upon activation of the digital input set for the door switch.
dAd	Digital input activation delay.
dCO	Compressor switch-off delay from door switch.
OA0	Alarm signaling delay after deactivation of the digital input (door closure).
tdO	Delay time due to door open alarm.
H11	DI digital input/polarity configuration.
H21	Configuration of digital output Out1
H22	Configuration of digital output Out2
H23	Configuration of digital output Out3

Stand-by

Description

The stand-by function maintains the controller power supply and:

- shows **OFF**
- deactivates all regulators
- excludes alarms

Activation

The stand-by function can be activated in one of the following ways:

- press and hold a key (configured with **H3x** = 4)
- via digital input (configured with **H11** = ±6)

Note: the digital input takes priority over the key. If both are configured, the key command will be excluded.



Operation

When the stand-by function is activated, the display shows the text **OFF**, all relays are de-energized and the alarms deactivated

On exiting stand-by function, the temperature alarm is excluded for the time period set with parameter **PAO** and the outputs are deactivated for the time period set with parameter **OdO**. These timing are reset every time the controller is switched off.

If stand-by had been active when the controller was switched off (as the result of a blackout, to the opening of the general switch, etc.), it will also remain active the next time it is switched on.

Parameters

Parameter	Description
PAO	Alarm exclusion at startup
OdO	Output activation delay after startup
H11	DI digital input/polarity configuration.
H31	 key configuration.
H32	 key configuration.

Copy parameters (UNICARD/Copy Card)

Introduction







The UNICARD/Copy Card connects to the TTL serial port and allows uploading/downloading of a parameters map.

Note: Format the UNICARD/Copy Card the first time it is used.







The UNICARD:

- Can be connected directly to a computer by means of a USB port.
- If powered by a USB power supply device, it can power **IDEPlus -HC** during the upload/download phases.

Formatting the UNICARD/Copy Card

1. Access the installer parameters, entering the **PA2** password if enabled.
2. Scroll through the folders with  and  until you find the folder **FP**
3. Press  to confirm.
4. Scroll through the parameters using  and  until you see parameter **Fr**
5. Press  to confirm. If the operation is a success, the display will show **y**, otherwise it will show **n**.

Uploading parameters from the controller to the UNICARD/Copy Card

1. Access the installer parameters, entering the **PA2** password if enabled.
2. Scroll through the folders with  and  until you find the folder **FP**
3. Press  to confirm
4. Scroll through the parameters using  and  until you see parameter **UL**
5. Press  to confirm. If the operation is completed, the display will show **y**, otherwise it will show **n**.

Downloading parameters from the UNICARD/Copy Card to the controller

Connect the UNICARD/Copy Card when the controller is switched off. When the controller is switched on, the data is downloaded automatically from the UNICARD/Copy Card to the controller. On the display shows **dLy** if the operation was successful, otherwise it will show **dLn**.

Note: after downloading the data, the instrument will work with the settings for the loaded map straight away.

Regulators

Contents

This section includes the following topics:

Compressor/general	57
Managing the compressor with the probe in error	59
Evaporator fans	60
Auxiliary output	63

Compressor/general

Description

The compressor is controlled by a relay and switches on/off according to the following elements:

- The temperature value measured by probe Pb1
- the temperature control functions set
- the defrost/dripping functions


For compressor-controller wiring diagrams, refer to the "Electrical Connections" section.

Note: digital output **Out1** is set as "Compressor" by default.


Functioning conditions

The regulator is activated if the following conditions occur:

- The controller is on
- Regulation probe Pb1 is not in error (alarm **E1** is not present)
- From power-on the time set using parameter **OdO** has elapsed (only if **OdO**≠0)
- There are no active defrosts (depending on the defrost type)
- There are no external alarms blocking the compressor

The Compressor activation request at startup can be delayed by setting parameter **OdO**. During this period, the compressor remains off and, if an activation request is made, the compressor icon  flashes.

Parameter **COd** makes it possible to avoid regulator activation near a defrost cycle. Before activating the compressor, the controller checks whether the next defrost is scheduled after a time period that is less than the value of parameter **COd**.

If the next defrost is scheduled after a time period...	Then the compressor...
less than the value of parameter COd	is not activated and the icon  flashes.
greater than the value of parameter COd	is activated.

There is a fixed interval of one second between the request and the actuation of the linked relay.

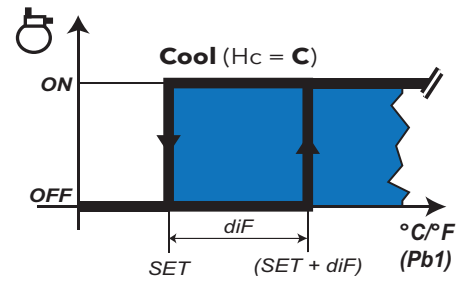
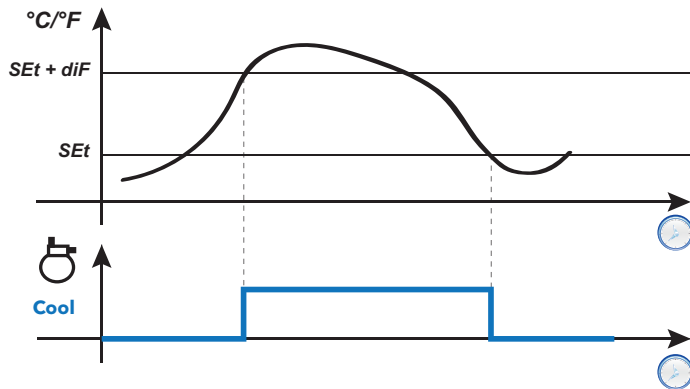
Compressor protections

To avoid damaging the compressor, the following protections can be set up:

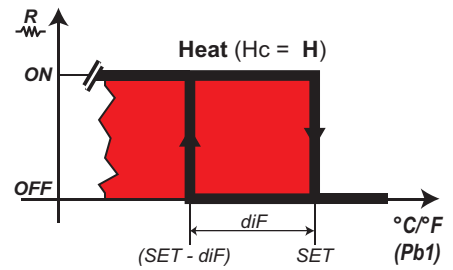
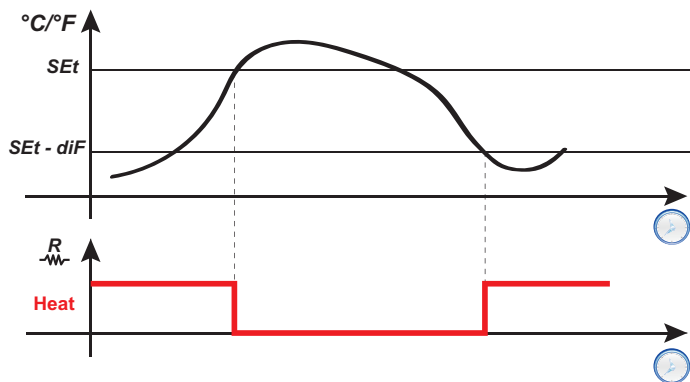
- a delay **dOF** between compressor relay switch-off and the next switch-on. If a new activation request arises during the delay **dOF**, the compressor icon will flash on the display.
- a delay **dbi** between one compressor startup and the next. The delay **dbi** is calculated from the previous compressor startup. If a request arises during the delay **dbi**, the compressor icon will flash on the display.
- a delay **dOn** for compressor startup after the request. During the delay **dOn**, the compressor icon will flash on the display

Regulation diagrams

Cooling Regulation (HC = 0)



Heating Regulation (HC = 1)



Legend: Heat = Heating; Cool = Cooling.

Parameters

Parameter	Description
SEt	Regulation setpoint
diF	Regulator activation differential
HC	Select regulation mode (H = Heat / C = Cool)
OSP	Offset on setpoint
dOn	Compressor relay activation delay from call
dOf	Delay between compressor relay switch-off and the next switch-on
dbi	Delay between two subsequent compressor starts
OdO	Output activation delay from startup
COd	Time compressor remains off before a defrost

Managing the compressor with the probe in error

Description

The compressor relay operates in Duty cycle mode (according to parameters **Ont** and **OFt**) if:

- probe Pb1 is in error and the display shows **E1** (see list of alarms)

The first time to consider is always **Ont**. If **Ont** >0 the compressor protections set using **dOn**, **dOF**, and **dbi** still apply.

Note: parameter **OdO** inhibits activation of the relay outputs for its duration, with the exception of the alarm relay and the buzzer (if present).

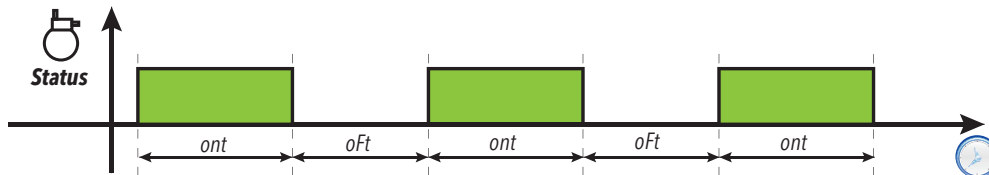
Functioning conditions

Ont	OFt	Compressor output
0	0	off
0	>0	off
>0	0	active
>0	>0	Duty cycle, regardless of the probe values (probe Pb1 not working)

Note: if probe Pb1 is functioning, Duty cycle mode is not active and conventional regulation is activated (see compressor section).

Note: when the probe is restored (connected/replaced), normal regulation starts up again.

Regulation diagram



Parameters

Parameter	Description
Ont	Compressor output ON time if probe Pb1 is not functioning
OFt	Compressor output OFF time if probe Pb1 is not functioning
dOn	Compressor relay activation delay from call
dOF	Delay between compressor relay switch-off and the next switch-on
dbi	Delay between two subsequent compressor starts
OdO	Output activation delay after startup

Evaporator fans

Functioning conditions

The evaporator fans regulator is activated if the following conditions occur:

- From power-on the time set using parameter **OdO** has elapsed (only if **OdO**≠0).
- The temperature read by the evaporator probe (Pb2) is lower than the value of parameter **FSt**.
- The fans regulator is not deactivated from parameter **dFd** during the defrost (**dFd** = y).
- Dripping is not active (**dt**).
- Fan delay after defrost is not active (**Fdt**).

Note: this regulator is only present in models that manage probe Pb2.

Regulator activation

The request for fans activation or deactivation can come:

- from the compressor regulator (temperature control mode)
- from the defrost regulator, to control and/or limit the circulation of hot air.

Fans operating modes

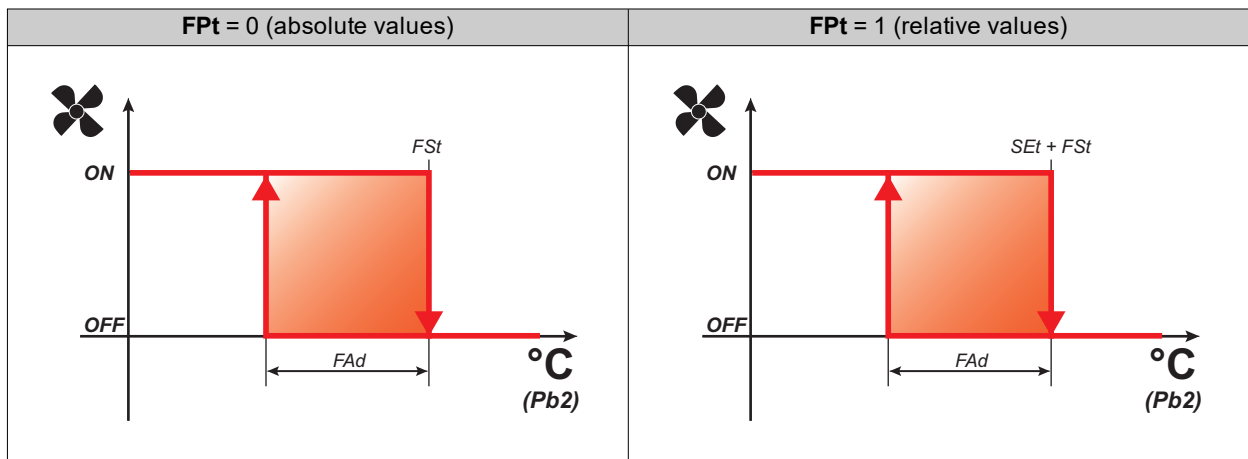
Probe Pb2	H42	FCo	Day		Night	
			Compressor ON	Compressor OFF	Compressor ON	Compressor OFF
Present	y	0	Thermostat controlled	Off	Thermostat controlled	Off
		1	Thermostat controlled	Thermostat controlled	Thermostat controlled	Thermostat controlled
		2	Thermostat controlled	Day duty cycle	Thermostat controlled	Night duty cycle
In error E2	y	0	On	Off	On	Off
		1	On	On	On	On
		2	On	Day duty cycle	On	Night duty cycle
Absent	n	0	On	Off	On	Off
		1	On	On	On	On
		2	On	Day duty cycle	On	Night duty cycle

Fans operation in regulation mode

During cooling, fan regulation is carried out based on values **FSt** (fan disabling temperature) and **FAd** (fan differential). Parameter **Fpt** can be used to select whether the set temperature values are absolute or relative to the setpoint.

Note: around the fan start temperature (-40 °C / -40 °F), the differential will always be specified by **FAd** but with the sign inverted.

Regulation diagrams based on whether the values are absolute or relative are shown below:



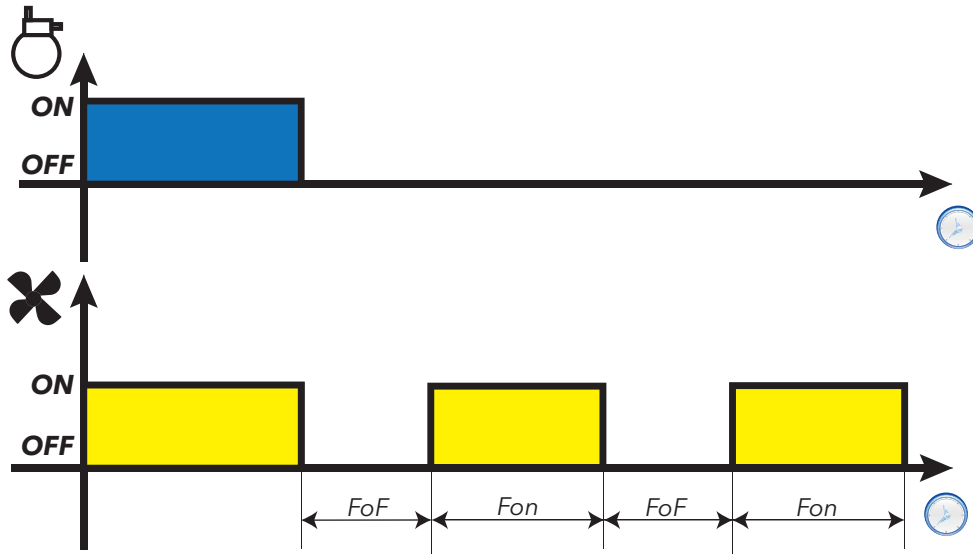
Fans operation in duty cycle

The fans run in duty cycle mode when the compressor is off and this mode is specified by parameter **FCO**.

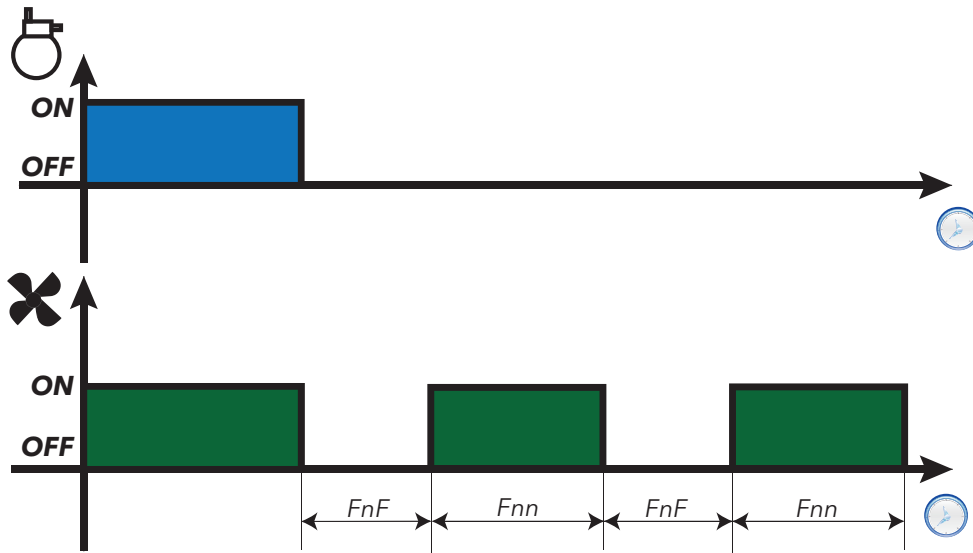
Depending on whether the controller is in day or night mode, fan operation is based on parameters **FOn** and **FOF** (day) or **Fnn** and **FnF** (night):

FOn / Fnn	FOF / FnF	Fans
0	0	Off
0	≠0	Off
≠0	0	On
≠0	≠0	Duty cycle

Regulation diagram for Day duty cycle with compressor off



Regulation diagram for Night duty cycle with compressor off



Fans operation in defrost mode

Operation depends on parameter **dFd**:

dFd	Fans
y	Off
n	Regulation or duty cycle

Note: to exclude the fans during a defrost, you must set **dFd** = y. Otherwise fans run normally.

Fans operation in dripping mode

During dripping the fans remain stopped for the time set using parameter **dt**.

Note: if **Fdt** is greater than **dt** the fans remain off for the time set in **Fdt**.

Parameters

Parameter	Description
OdO	Output activation delay from startup
FSt	Evaporator fan disabling temperature
FAd	Evaporator fan trigger differential
Fdt	Evaporator fan activation delay time after a defrosting cycle
dt	Dripping time
dFd	Evaporator fan exclusion during a defrost cycle
FCO	Evaporator fan operating mode
FOn	Evaporator fan ON time in day duty cycle mode
FOF	Evaporator fan OFF time in day duty cycle mode
Fnn	Evaporator fan ON time in night duty cycle mode
FnF	Evaporator fan OFF time in night duty cycle mode

Auxiliary output

Description

To set a relay as an auxiliary output **AUX**, set the corresponding parameter **H2x**= 5.

Note: The outputs may not be present, depending on the model.

Activation

The regulator can be activated in one of the following ways:

- press and hold a key (configured with **H3x** = 2)
- digital input (only if **H11** = ±3)

Note: every time a key associated to the AUX function is pressed the output changes (inverts) status; the digital input, if associated to the AUX function, changes the status of the output in correspondence with its variations.

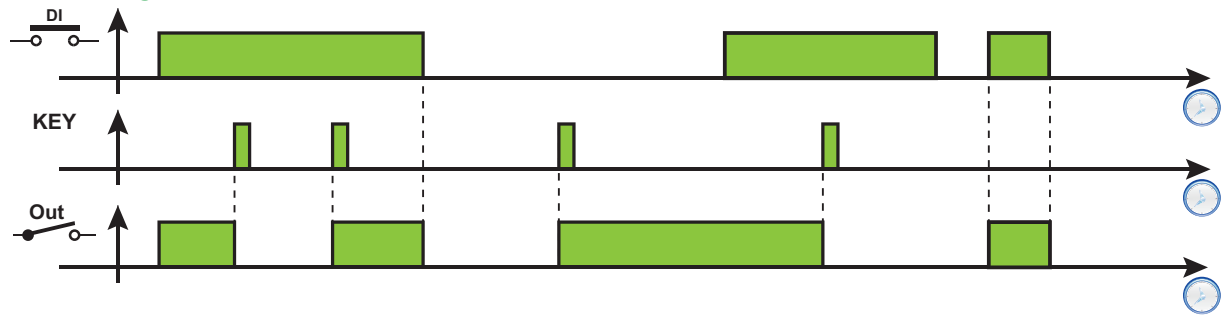
Controlling the auxiliary output via key

To control the output (relay opening/closing) via key, set **H3x** = 2.

Note: depending on the model, some keys may not be present.

Note: the relay status is restored after a blackout.

Regulation diagram



Legend: DI = Digital input; KEY = Key; Out = Digital output.

Parameters

Parameter	Description
H11	Digital input 1/Polarity configuration
H21	Digital output 1 configuration
H22	Digital output 2 configuration
H23	Digital output 3 configuration
H31	☞ key configuration.
H32	☞ key configuration.

Diagnostics

Contents

This section includes the following topics:

Alarms and indications	66
Minimum and maximum temperature alarm	67

Alarms and indications

Introduction

All alarms are deactivated automatically when their cause is removed.

Detecting an alarm condition

If there is an alarm condition, the alarm icon (●) comes on permanently. If present and enabled, the buzzer and alarm relay are also activated.

Note: If alarm exclusion timings are in progress, the alarm is not signaled.

All active alarms, except those relating to probe error, are listed in the **AL** folder within the "Machine status" menu.

Silencing an alarm

Press any key or use the menu function: the buzzer is silenced, the alarm icon (●) flashes and the alarm relay is de-energized.

Alarms legend

Code	Description	Buzzer and alarm relay	Cause	Effects	Solutions
E1	Probe Pb1 in error	Active	<ul style="list-style-type: none"> Reading of values outside the operating interval Probe or corresponding wiring in short-circuit or open circuit 	<ul style="list-style-type: none"> E1 shown Alarm icon permanently ON Disabling of the maximum/minimum alarm regulator Compressor operation based on parameters Ont and OFt 	<ul style="list-style-type: none"> Check the type of probe (default NTC) Check the probe wiring Replace probe.
E2	Probe Pb2 in error Note: only models that manage probe Pb2	Active	<ul style="list-style-type: none"> Reading of values outside the operating interval Probe or corresponding wiring in short-circuit or open circuit 	<ul style="list-style-type: none"> E2 shown Alarm icon permanently ON Defrost ends due to timeout (dEt) The evaporator fans are: on (compressor ON), or run according to parameter FCO, (compressor OFF). 	<ul style="list-style-type: none"> Check the type of probe (default NTC) Check the probe wiring Replace probe.
AH1	Probe Pb1 high temperature alarm	Active	Value read by Pb1 > HAL after time equal to tAo (see section "Minimum and maximum temperature alarm" on the facing page)	<ul style="list-style-type: none"> Alarm AH1 added to folder AL No effect on regulation 	Wait for the temperature read by Pb1 to drop below the alarm threshold (HAL-AFd)
AL1	Probe Pb1 low temperature alarm	Active	Value read by Pb1 < LAL after time equal to tAo (see section "Minimum and maximum temperature alarm" on the facing page)	<ul style="list-style-type: none"> Alarm AL1 added to folder AL No effect on regulation 	Wait for the temperature read by Pb1 to rise above the alarm threshold (LAL+AFd)
EA	External alarm	Active	Activation of the digital input (H11 = ±5)	<ul style="list-style-type: none"> Alarm EA added to folder AL Alarm icon permanently ON Regulation inhibited if EAL = y 	Check and remove the external cause that caused the alarm on the digital input.
OPd	Door open alarm	Active	Digital input activation (H11 = ±4) for a time greater than tdo	<ul style="list-style-type: none"> Alarm OPd added to folder AL Alarm icon permanently ON Regulator inhibited, on the basis of parameter dod 	<ul style="list-style-type: none"> Close the door Increase the value of parameter oAo
Ad2	Defrost due to timeout Note: only models that manage probe Pb2	Not active	End of defrost due to timeout, instead of the defrost end temperature being detected by Pb2	<ul style="list-style-type: none"> Alarm Ad2 added to folder AL Alarm icon permanently ON 	Wait for the next defrost for automatic deactivation.

Minimum and maximum temperature alarm

Description

The alarms operate according to the temperature read by regulation probe Pb1. The accepted temperature interval limits are set using parameters **HAL** and **LAL**.

Alarm codes

Code	Description
AH1	High temperature alarm
AL1	Low temperature alarm

High and low temperature alarms are excluded during a defrost. The triggering of these alarms does not have any effect on the regulation in progress.

Absolute or relative temperature values

Depending on the value of parameter **Att**, the temperature is expressed as an absolute or relative value (differential in respect to the setpoint):

Att value	Description
0	Absolute values. The HAL and LAL values must have a sign.
1	Relative values. HAL > 0 and LAL < 0.

Alarm conditions

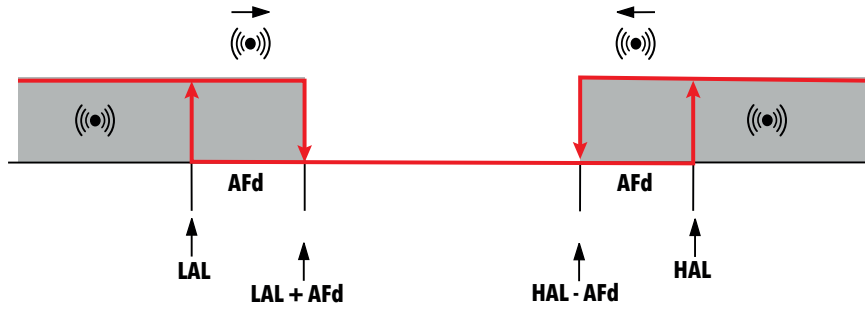
Att value	Temperature read by Pb1	Alarm generated
0	$\geq \text{HAL}$	Maximum temperature
	$\leq \text{LAL}$	Minimum temperature
1	$\geq (\text{SEt} + \text{HAL})$	Maximum temperature
	$\leq (\text{SEt} + \text{LAL})$	Minimum temperature

Conditions for alarm deactivation

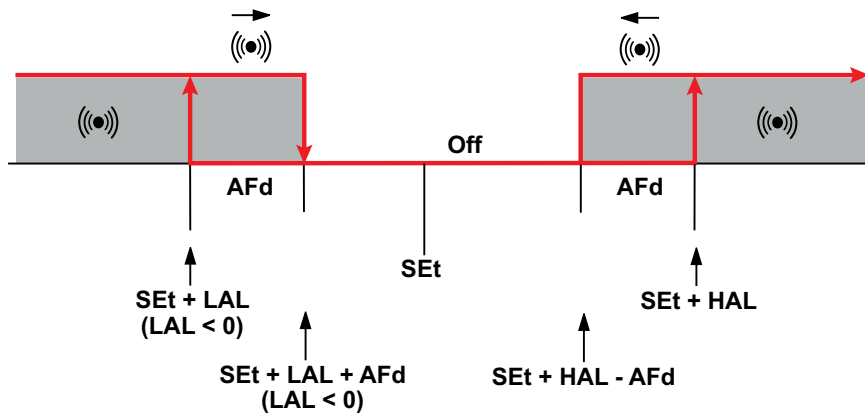
Att value	Temperature read by Pb1	Alarm generated
0	$\leq (\text{HAL} - \text{AFd})$	Maximum temperature
	$\geq (\text{LAL} + \text{AFd})$	Minimum temperature
1	$\leq (\text{SEt} + \text{HAL} - \text{AFd})$	Maximum temperature
	$\geq (\text{SEt} + \text{LAL} + \text{AFd})$	Minimum temperature

Operating diagrams

Operation with Att=0 (absolute values)



Operation with Att=1 (relative values)



Parameters

Parameter	Description
Att	Expression mode for HAL and LAL values (absolute or relative)
AFd	Alarm activation differential
HAL	Maximum temperature limit
LAL	Minimum temperature limit
PAO	Temperature alarm exclusion time from startup
dAO	Exclusion time for temperature alarms after a defrost cycle
OAO	Exclusion time for temperature alarms after closing the door
tAO	Temperature alarm signaling delay time

Parameters IDEPlus -HC

Contents

This section includes the following topics:

User parameters IDEPlus -HC



Parameter	Description	Range	UM	IDEPlus 902	IDEPlus 961	IDEPlus 974
SEt	Regulation setpoint with range between the minimum setpoint LSE and the maximum setpoint HSE . The setpoint value is set in the "Machine status" menu.	LSE ... HSE	°C/°F	0.0	0.0	0.0
dIF	Compressor relay activation differential; the compressor stops when reaching the entered setpoint (upon indication of the regulation probe) and restarts at a temperature value equal to the setpoint plus the value of the differential. Note: always a value other than 0.	0.1...30.0	°C/°F	2.0	2.0	2.0
HSE	Maximum setpoint value	LSE ...320	°C/°F	140	140	140
LSE	Minimum setpoint value	-67.0... HSE	°C/°F	-55.0	-55.0	-55.0
dtY	Type of defrost. <ul style="list-style-type: none"> 0 = electric defrost or due to stoppage - compressor OFF during defrost 1 = cycle inversion (hot gas) defrost; compressor on during defrost 2 = defrost with "Free" mode; defrost independent of compressor. 	0/1/2	num	-	-	0
dit	Interval between the start of two defrost cycles	0...250	hours	6	6	6
dEt	Defrost timeout. Determines the maximum duration of the defrost	1...250	min	30	30	30
dSt	Evaporator defrost end temperature (measured by probe Pb2)	-67.0...320	°C/°F	-	-	8.0
FSt	Fan disabling temperature; a value, read by the evaporator probe.	-67.0...320	°C/°F	-	-	50.0
Fdt	Fan activation delay time after a defrost.	0...250	min	-	-	0
dt	Dripping time.	0...250	min	-	-	0
dFd	Used to select or deselect the exclusion of the evaporator fans during defrosting. <ul style="list-style-type: none"> n(0) = no y(1) = yes (fan excluded or off). 	n/y	flag	-	-	y
HAL	Maximum temperature alarm. Temperature value (in an absolute or relative value - see Att) which, when exceeded, will lead to the activation of alarm signaling.	LAL ...320	°C/°F	150	150	150
LAL	Minimum temperature alarm. Temperature value (in an absolute or relative value - see Att) which, when not reached, will lead to the activation of alarm signaling.	-67.0... HAL	°C/°F	-50.0	-50.0	-50.0
LOC	Setpoint edit lock. It is still possible to open parameter programming to change parameters, including the status of this parameter to unlock the keypad. <ul style="list-style-type: none"> n(0) = no y(1) = yes 	n/y	flag	n	n	n
PS1	When enabled (PS1 ≠0) this is the access key for the User parameters.	0...250	num	0	0	0
CA1	Positive or negative temperature value to be added to the value of Pb1.	-12.0...12.0	°C/°F	0.0	0.0	0.0
CA2	Positive or negative temperature value to be added to the value of Pb2.	-12.0...12.0	°C/°F	-	-	0.0
H42	Probe Pb2 present. <ul style="list-style-type: none"> n(0) = not present y(1) = present. 	n/y	flag	-	-	y
rEL	Controller version. Read-only parameter.	/	/	/	/	/
tAb	Reserved. Read-only parameter.	/	/	/	/	/

Installer parameters IDEPlus -HC

Parameter	Description	Range	UM	IDEPlus 902	IDEPlus 961	IDEPlus 974
SEt	Regulation setpoint with range between the minimum setpoint LSE and the maximum setpoint HSE . The setpoint value is set in the "Machine status" menu.	LSE...HSE	°C/°F	0.0	0.0	0.0
CP (Compressor)						
diF	Compressor relay activation differential; the compressor stops when reaching the entered setpoint (upon indication of the regulation probe) and restarts at a temperature value equal to the setpoint plus the value of the differential. Note: always a value other than 0.	0.1...30.0	°C/°F	2.0	2.0	2.0
HSE	Maximum setpoint value	LSE...320	°C/°F	140	140	140
LSE	Minimum setpoint value	-67.0... HSE	°C/°F	-55.0	-55.0	-55.0
OSP	Temperature value to be added to the setpoint if reduced set enabled (Economy function)	-30.0...30.0	°C/°F	3.0	3.0	3.0
HC	The regulator will execute operation for cooling (set " C (0)") or heating (set " H (1)")	C/H	flag	-	-	-
Ont	Regulator switch-on time for faulty probe: <ul style="list-style-type: none"> if Ont = 1 and OFt = 0 compressor always on if Ont = 1 and OFt > 0 compressor in duty cycle 	0...250	min	0	0	0
OFt	Regulator switch-off time for faulty probe: <ul style="list-style-type: none"> if OFt = 1 and Ont = 0 compressor always off if OFt = 1 and Ont > 0 compressor in duty cycle 	0...250	min	1	1	1
dOn	Compressor relay activation delay time from call	0...250	s	0	0	0
dOF	Delay time after switch-off; the indicated time must elapse between compressor relay switch-off and a subsequent switch-on.	0...250	min	0	0	0
dbi	Delay time between switch-ons; the indicated time must elapse between two consecutive compressor switch-ons.	0...250	min	0	0	0
OdO	Output activation delay time from switching on the controller or after a power failure. 0 = not active	0...250	min	0	0	0
dEF (Defrost)						
dtY	Type of defrost. <ul style="list-style-type: none"> 0 = electric defrost or due to stoppage - compressor OFF during defrost 1 = cycle inversion (hot gas) defrost; compressor on during defrost 2 = defrost with "Free" mode; defrost independent of compressor. 	0/1/2	num	-	-	0
dit	Interval between the start of two defrost cycles	0...250	hours	6	6	6
dCt	Selection of the defrost interval count mode. <ul style="list-style-type: none"> 0 = compressor operating hours (DIGIFROST® method); defrost active only when the compressor is on 1 = Real Time - controller operating hours; defrost count is always active when the machine is on and starts each time it is powered on 2 = compressor stop. A defrost cycle runs at each stop (parameter dtY). 	0/1/2	num	1	1	1
dOH	Defrost cycle activation delay from the call	0...59	min	0	0	0
dEt	Defrost timeout. Determines the maximum duration of the defrost	1...250	min	30	30	30
dSt	Evaporator defrost end temperature (measured by probe Pb2)	-67.0...320	°C/°F	-	-	8.0

Parameter	Description	Range	UM	IDEPlus 902	IDEPlus 961	IDEPlus 974																																																														
dPO	Defrost activation request at startup, if the temperature measured by Pb2 allows it. <ul style="list-style-type: none"> n(0) = no y(1) = yes. 	n/y	flag	n	n	n																																																														
Fan (Fans)																																																																				
FSt	Fan disabling temperature; a value, read by the evaporator probe.	-67.0...320	°C/°F	-	-	50.0																																																														
FAd	Evaporator fan trigger differential.	1,0...50.0	°C/°F	-	-	2.0																																																														
Fdt	Fan activation delay time after a defrost.	0...250	min	-	-	0																																																														
dt	Dripping time.	0...250	min	-	-	0																																																														
dFd	Used to select or deselect the exclusion of the evaporator fans during defrosting. <ul style="list-style-type: none"> n(0) = no y(1) = yes (fan excluded or off). 	n/y	flag	-	-	y																																																														
FCO	Evaporator fan operating mode. <table border="1" data-bbox="363 757 880 1142"> <thead> <tr> <th rowspan="2">Pb2</th> <th rowspan="2">H42</th> <th rowspan="2">FCo</th> <th colspan="2">day</th> <th colspan="2">night</th> </tr> <tr> <th>Cn</th> <th>Cf</th> <th>Cn</th> <th>Cf</th> </tr> </thead> <tbody> <tr> <td rowspan="3">ok</td> <td rowspan="3">y</td> <td>0</td> <td>T</td> <td>Off</td> <td>T</td> <td>Off</td> </tr> <tr> <td>1</td> <td>T</td> <td>T</td> <td>T</td> <td>T</td> </tr> <tr> <td>2</td> <td>T</td> <td>DCd</td> <td>T</td> <td>DCn</td> </tr> <tr> <td rowspan="3">ko</td> <td rowspan="3">y</td> <td>0</td> <td>On</td> <td>Off</td> <td>On</td> <td>Off</td> </tr> <tr> <td>1</td> <td>On</td> <td>On</td> <td>On</td> <td>On</td> </tr> <tr> <td>2</td> <td>On</td> <td>DCd</td> <td>On</td> <td>DCn</td> </tr> <tr> <td rowspan="3">no</td> <td rowspan="3">n</td> <td>0</td> <td>On</td> <td>Off</td> <td>On</td> <td>Off</td> </tr> <tr> <td>1</td> <td>On</td> <td>On</td> <td>On</td> <td>On</td> </tr> <tr> <td>2</td> <td>On</td> <td>DCd</td> <td>On</td> <td>DCn</td> </tr> </tbody> </table> <p>Headings legend: Pb2 = probe Pb2 status (ok = present; ko = in E2 error and no = absent; day = day mode; night = night mode; Cn = compressor on; Cf = compressor off. Status legend: T = thermostat controlled fans; On = fans on; Off = fans off; DCd = Day duty cycle or DCn = Night duty cycle.</p>	Pb2	H42	FCo	day		night		Cn	Cf	Cn	Cf	ok	y	0	T	Off	T	Off	1	T	T	T	T	2	T	DCd	T	DCn	ko	y	0	On	Off	On	Off	1	On	On	On	On	2	On	DCd	On	DCn	no	n	0	On	Off	On	Off	1	On	On	On	On	2	On	DCd	On	DCn	0/1/2	num	-	-	0
Pb2	H42				FCo	day		night																																																												
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FOn	Day duty cycle: time with fans on.	0...99	min	-	-	0																																																														
FOF	Day duty cycle: time with fans off.	0...99	min	-	-	0																																																														
Fnn	Night duty cycle: time with fans on.	0...99	min	-	-	0																																																														
FnF	Night duty cycle: time with fans off.	0...99	min	-	-	0																																																														
ESF	"Night" mode activation. <ul style="list-style-type: none"> n(0) = no y(1) = yes. 	n/y	flag	-	-	n																																																														
AL (Alarms)																																																																				
Att	Sets the absolute or relative value for parameters HAL and LAL . <ul style="list-style-type: none"> 0 = absolute value 1 = relative value 	0/1	flag	0	0	0																																																														
AFd	Alarm differential.	1.0...50.0	°C/°F	2.0	2.0	2.0																																																														
HAL	Maximum temperature alarm. Temperature value (in an absolute or relative value - see Att) which, when exceeded, will lead to the activation of alarm signaling.	LAL ...320	°C/°F	150	150	150																																																														
LAL	Minimum temperature alarm. Temperature value (in an absolute or relative value - see Att) which, when not reached, will lead to the activation of alarm signaling.	-67.0... HAL	°C/°F	-50.0	-50.0	-50.0																																																														
PAO	Alarm exclusion time when switching on the controller, after a power failure.	0...10	hours	0	0	0																																																														

Parameter	Description	Range	UM	IDEPlus 902	IDEPlus 961	IDEPlus 974
dAO	Temperature alarm exclusion time after defrosting.	0...999	min	0	0	0
OAO	Alarm signaling delay after deactivation of the digital input (door closure). Alarm refers to high and low temperature alarms.	0...10	hours	0	0	0
tdO	Door open alarm activation delay time.	0...250	min	0	0	0
tAO	Temperature alarm signaling delay time.	0...250	min	0	0	0
dAt	Defrost ended due to timeout alarm indication. <ul style="list-style-type: none"> • n(0) = alarm not activated • y(1) = alarm activated. 	n/y	flag	-	-	n
rLO	An external alarm inhibits the regulators. <ul style="list-style-type: none"> • n(0) = not inhibits the regulators • y(1) = inhibits the regulators 	n/y	flag	n	n	n
Lit (Lights and digital inputs)						
dOd	Digital input shuts off loads. <ul style="list-style-type: none"> • 0 = disabled • 1 = disables fans • 2 = disables compressor • 3 = disables fans and compressor. 	0...3	num	0	0	0
dAd	Digital input activation delay	0...255	min	0	0	0
dCO	Compressor switch-off delay from door opening.	0...255	min	1	1	1
Add (Communication)						
dEA	Device address: indicates the device address to the management protocol.	0...14	num	0	0	0
FAA	Family address: indicates the device family to the management protocol.	0...14	num	0	0	0
diS (Display)						
LOC	Setpoint edit lock. It is still possible to open parameter programming to change parameters, including the status of this parameter to unlock the keypad. <ul style="list-style-type: none"> • n(0) = no • y(1) = yes 	n/y	flag	n	n	n
PS1	When enabled (PS1 ≠0) this is the access key for the User parameters.	0...250	num	0	0	0
PS2	When enabled (PS2 ≠0) this is the access key for the Installer parameters.	0...250	num	15	15	15
ndt	Display with decimal point. <ul style="list-style-type: none"> • n(0) = no (Integer only) • y(1) = yes. 	n/y	flag	y	y	y
CA1	Positive or negative temperature value to be added to the value of Pb1.	-12.0...12.0	°C/°F	0.0	0.0	0.0
CA2	Positive or negative temperature value to be added to the value of Pb2.	-12.0...12.0	°C/°F	-	-	0.0
ddL	Display mode during defrosting. <ul style="list-style-type: none"> • 0 = display the temperature read by Pb1 • 1 = inhibits reading on the value of Pb1 at the start of defrost and until the setpoint is reached • 2 = displays label dEF during defrost until the setpoint is reached. 	0/1/2	num	0	0	0
Ldd	Display unlock timeout value - label dEF	0...255	min	30	30	30
drO	Selects the unit of measure used when displaying the temperature read by the probes. (0 = °C, 1 = °F). Note: changing from °C to °F or vice-versa does NOT change the SEt , diF values, etc. (example: SEt = 10 °C becomes 10 °F).	0/1	flag	0	0	0
ddd	Selects the type of value to show on the display. <ul style="list-style-type: none"> • 0 = setpoint • 1 = Pb1 probe • 2 = Pb2 probe. 	0/1/2	num	1	1	1

Parameter	Description	Range	UM	IDEPlus 902	IDEPlus 961	IDEPlus 974
CnF (Configuration)						
H00	Selects probe type. <ul style="list-style-type: none"> • 0 = PTC • 1 = NTC. 	0/1	flag	1	1	1
H11	Digital input 1 (DI)/ polarity configuration. <ul style="list-style-type: none"> • 0 = disabled • ±1 = defrost • ±2 = reduced set • ±3 = auxiliary • ±4 = door switch • ±5 = external alarm • ±6 = stand-by Note: <ul style="list-style-type: none"> • the "+" sign indicates that the input is active if the contact is closed. • the "-" sign indicates that the input is active if the contact is open. 	-6...+6	num	0	0	0
H21	Configuration of digital output 1 (Out1). <ul style="list-style-type: none"> • 0 = disabled • 1 = compressor • 2 = defrost • 3 = evaporator fans • 4 = alarm • 5 = auxiliary • 6 = stand-by 	0...6	num	1	1	1
H22	Configuration of digital output 3 (Out2). Same as H21 .	0...6	num	-	-	2
H23	Configuration of digital output 3 (Out3). Same as H21 .	0...6	num	-	-	3
H25	Enables/disables the buzzer. <ul style="list-style-type: none"> • 0 = disabled • 4 = enabled • 1-2-3-5-6-7 = reserved • 8 = positive logic alarm. 	0...8	flag	-	-	4
H31	 key configuration. <ul style="list-style-type: none"> • 0 = disabled • 1 = defrost • 2 = auxiliary • 3 = reduced set • 4 = stand-by 	0...4	num	1	1	1
H32	 key configuration. Same as H31 .	0...4	num	0	0	0
H42	Probe Pb2 present. <ul style="list-style-type: none"> • n(0) = not present • y(1) = present. 	n/y	flag	-	-	y
rEL	Controller version. Read-only parameter.	/	/	/	/	/
tAb	Reserved. Read-only parameter.	/	/	/	/	/
FPr (UNICARD/COPY CARD)						
UL	Transfer of the programming parameters from the controller to the UNICARD/Copy Card.	/	/	/	/	/
Fr	UNICARD/Copy Card formatting. Deletes all data on the UNICARD/Copy Card. Note: the use of parameter Fr results in the loss of all data entered. This operation cannot be reversed.	/	/	/	/	/

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