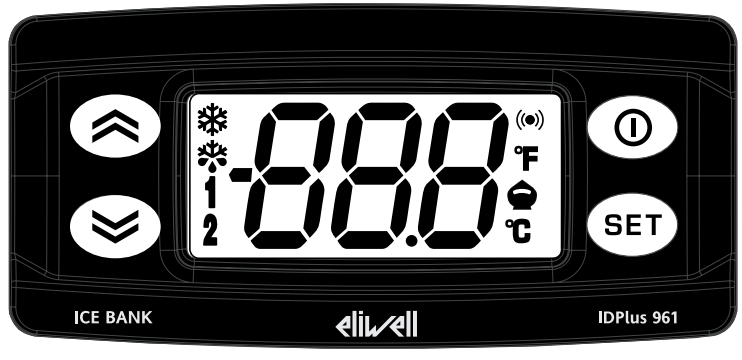
eliwell

by Schneider Electric

9IS5437401

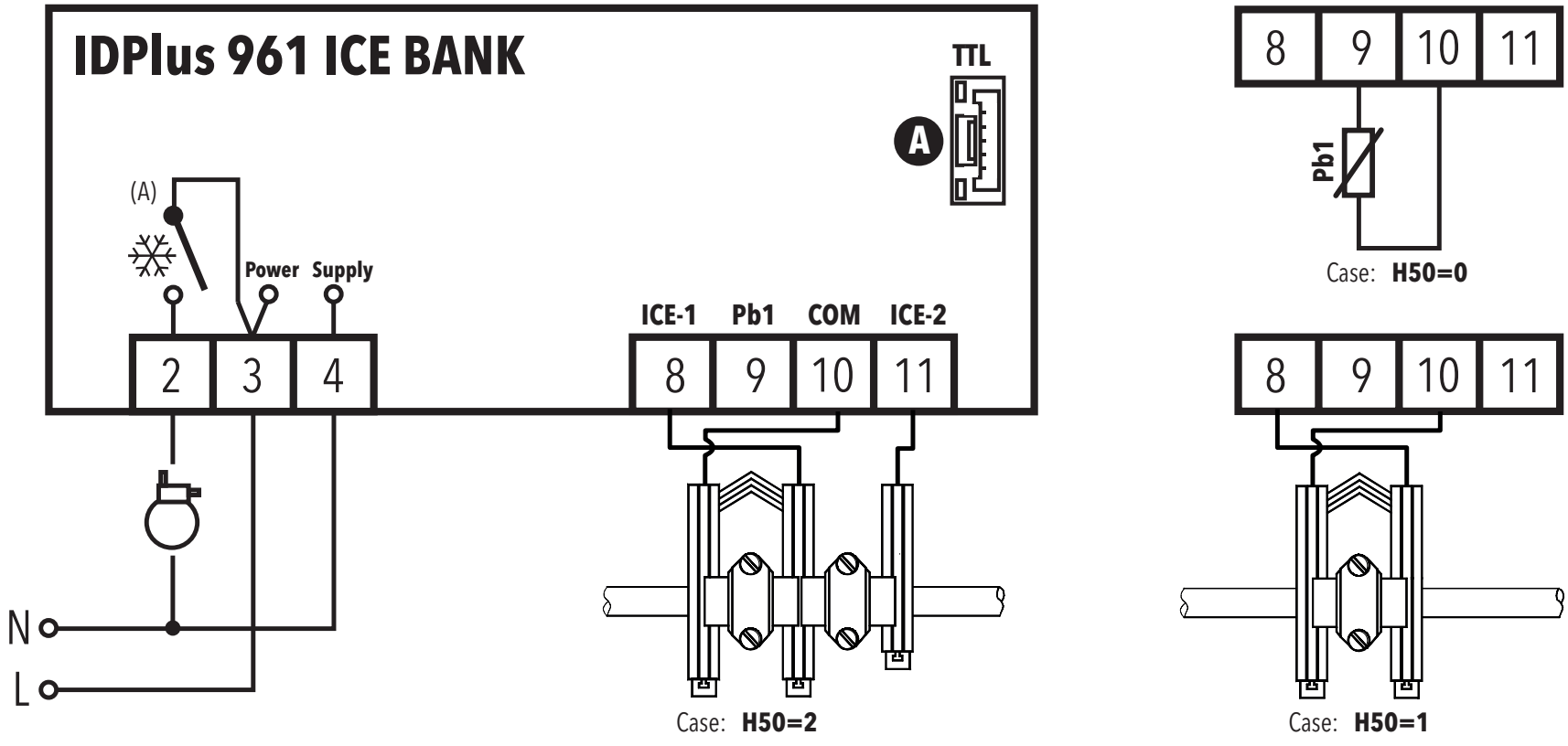
IDPlus 961 ICE BANK



EN **Electronic controllers for refrigeration units**

www.eliwell.com

CONNECTIONS



TERMINALS			
2-3	Compressor relay (❄)	**8-10**	ICE-1: Ice bank 1 (Minimum level)
3-4	230 Vac power supply input	**9-10**	Probe Pb1
N-L	230 Vac power supply	**11-10**	ICE-2: Ice bank 2 (Maximum level)
A	TTL input to connect UNICARD/Copycard		

USER INTERFACE

KEYS	
UP **Press and release** Scroll through menu items Increase values **Press and hold for at least 5 secs** Activates Manual Defrost function	**DOWN** **Press and release** Scroll through menu items Decreases values
STAND-BY (ESC) **Press and release** Go back to previous menu level Confirm parameter value **Press and hold for at least 5 secs** Activates Stand-by (OFF) function (from outside menus)	**SET (ENTER)** **Press and release** Displays any alarms (if active) Open Machine Status menu **Press and hold for at least 5 secs** Open programming menu Confirm commands

ICONS

	**Compressor ICON** Permanently on: compressor active Blinking: delay, protection or start blocked Off: otherwise		**Alarms ICON** Permanently on: alarm active Blinking: alarm acknowledged Off: otherwise
	**NOT USED**	°F	**NOT USED**
1	**NOT USED**		**NOT USED**
2	**2 ICON** Rapid blinking: access to installer parameters Off: otherwise	°C	**°C ICON** Permanently on: temperature displayed in °C Off: otherwise

TECHNICAL SPECIFICATIONS

The product complies with the following harmonized Standards: EN 60730-1 and EN 60730-2-9

Construction of control:	Electronic automatic Incorporated Control
Purpose of control:	Operating control (non-safety related)
Type of action:	1.B
Pollution class:	2
Over-voltage category:	II
Rated impulse voltage:	2500 V
Power supply:	230 Vac ±10% 50/60 Hz
Power Draw:	4.5 W maximum
Ambient 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
Loads	1 Compressor relay: UL 60730 12FLA - 72LRA maximum 240 Vac o EN 60730 12(8) A maximum 230 Vac

NOTE: check the power supply rating on the device's label; contact our Sales Office for available power ratings.

FURTHER INFORMATION

Input Characteristics

Display range:	**NTC**: -50...110 °C (-58...230 °F) (on 3-digit display with +/- sign)
Accuracy:	Better than 0.5% of full-scale +1 digit
Resolution:	0.1 °C (0.1 °F)
Buzzer:	NO
Analogue Inputs:	1 NTC input

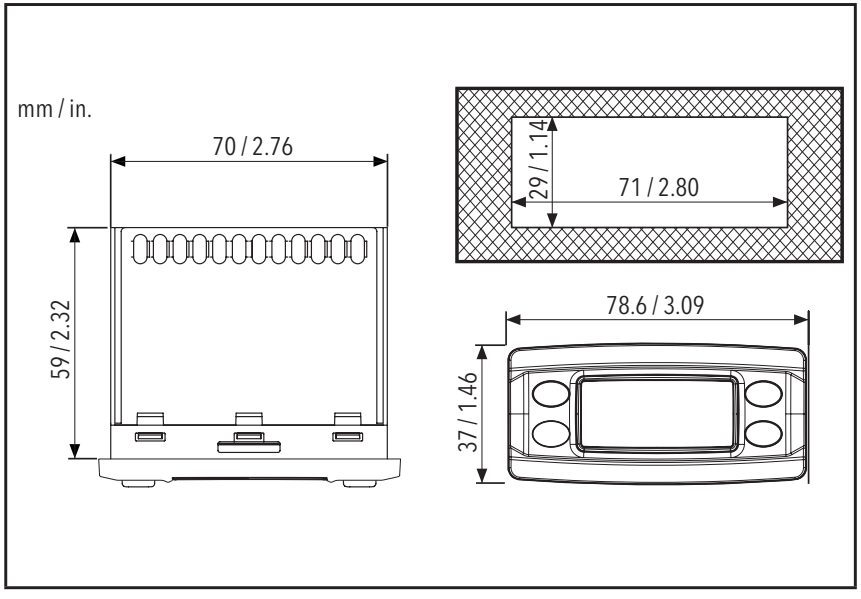
Mechanical Characteristics

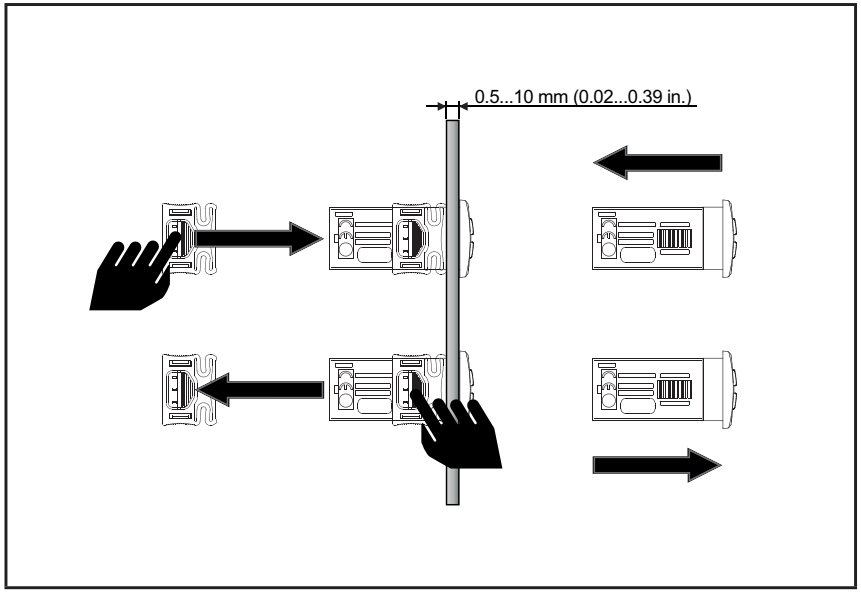
Dimensions:	front panel 78.6x37 mm (3.09x1.46 in.), depth 59 mm (2.32 in.) (terminals excluded)
Terminals:	screw/disconnectable terminals for wires with 2.5 mm^2 cross-section
Connectors:	TTL for connection to UNICARD/CopyCard

NOTE: The technical specifications stated in this document regarding the measurement (range, accuracy, resolution, etc.) refer strictly to the instrument and not to any accessories provided, such as the probes.

MOUNTING - DIMENSIONS

The device is designed for panel mounting. Drill a 29x71 mm (2.80x1,14 in.) hole and insert the device; secure it with the special brackets provided. Keep the area around the instrument cooling slots adequately ventilated.
The panel must be between 0.5 mm (0.02 in.) and 10 mm (0.39 in.) thick.





CONTROLLER ON/OFF

To switch the controller off, press and hold the ⏻ key for more than 5 seconds.

USING THE UNICARD/COPYCARD

The UNICARD/CopyCard is an accessory connected to the TTL serial port used for quick programming of the device parameters (upload and download a parameter map to one or more devices of the same type). Open '**Installer**' parameters by entering password **PA2**, then browse parameters ⌃ and ⌄ and select the function using **set** (e.g. **UL**).
If the operation completes successfully, the display will show '**y**', if not it will show '**n**'.

- **Upload** (**UL**): This function uploads the programming parameters from the instrument to UNICARD/CopyCard.
- **Format** (**Fr**): This command is used to format the UNICARD/CopyCard, which must be done when using the card for the first time. **IMPORTANT**: using parameter '**Fr**' deletes all data present. This operation cannot be reversed.
- **Download**: Connect the UNICARD/CopyCard with the device switched off.
  On switching the controller on, the copy card download starts automatically. At the end of the lamp test, the display will show '**dLy**' if it has completed successfully and '**dLn**' if it has not.

NOTE: After parameters have downloaded, the device uses the new downloaded parameter map settings.

ACCESSING AND USING THE MENUS

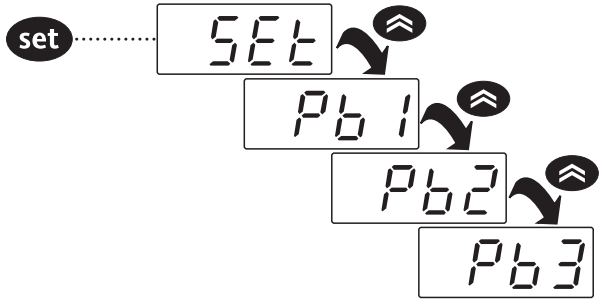
The resources are organized into 2 menus which are accessed as follows:

- 'Machine Status' menu: press and release the set key.
- 'Programming' menu: press and hold the set key for 5 seconds.

Either do not press any keys for 15 seconds (timeout) or press the ⏻ key once, to confirm the last value displayed and return to the previous screen.

'MACHINE STATUS' MENU

Access the 'Machine Status' menu by pressing and releasing the set key. If no alarms are active, the 'SEt' label appears. By pressing the ⌃ and ⌄ keys, you can scroll through all folders in the menu:



- **AL**: alarm folder (**only visible when alarms are active**);
- **SEt**: setpoint configuration folder
- **Pb1**: probe 1 value folder
- **Pb2**: ice probe ICE-1 status folder
- **Pb3**: ice probe ICE-2 status folder

Programming the setpoint: To display the Setpoint value press the set key when the 'SEt' label is showing. The Setpoint value will appear on the display. To change the Setpoint value, press the ⌃ and ⌄ keys within 15 seconds. Press set to confirm the modification.

View probe value: When label Pb1 is displayed, press set to see the associated probe value.
NOTE: the value is not editable.

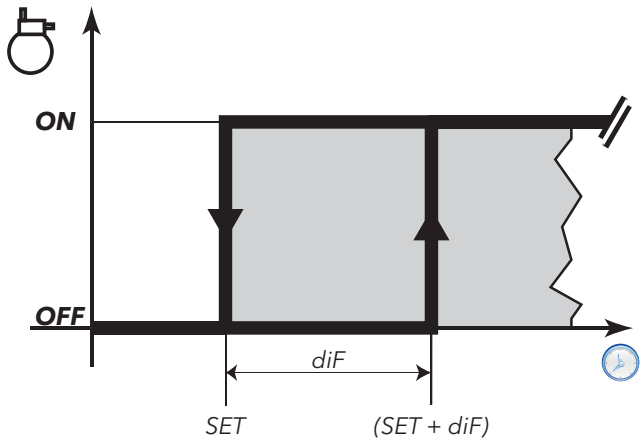
'PROGRAMMING' MENU

To access the 'Programming' menu, press and hold the **set** key for more than 5 seconds. Depending on configuration, a **PA2** access PASSWORD may be required to access 'Installer' parameters (see note below). When accessed the display will show the first parameter ('**diF**'). Select the desired parameter using the ⌃ and ⌄ keys. Press the **set** key to see the current value of the selected parameter. Press the ⌃ and ⌄ keys to change the value and then press **set** to save it.

NOTES:
- Password **PA2** allow access to the 'installer' (level 2) parameters. By default the password is disabled (**PA2=0**). To enabled it (**PA2 ≠ 10**) you have to change the value of parameter 'PS2'. If the wrong password is entered, the display will show the **PA2** label and you will have to repeat the entry procedure.
- It is strongly recommended that you switch the device off and on again each time the parameter configuration is changed, in order to prevent malfunctioning of the configuration and/or ongoing timings.

REGULATOR SETTING (H50 PARAMETER)

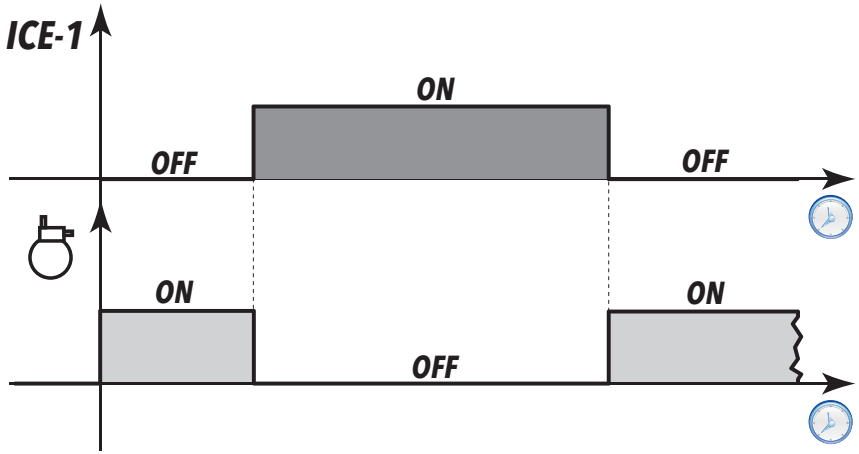
WITH TEMPERATURE PROBE (**H50 = 0**)



The regulator is **ACTIVE** only if:

1) the instrument is ON.
2) there is no Pb1 probe alarm failure (detected a number of points over allowed limits).
3) the time set by parameter **OdO** has expired.

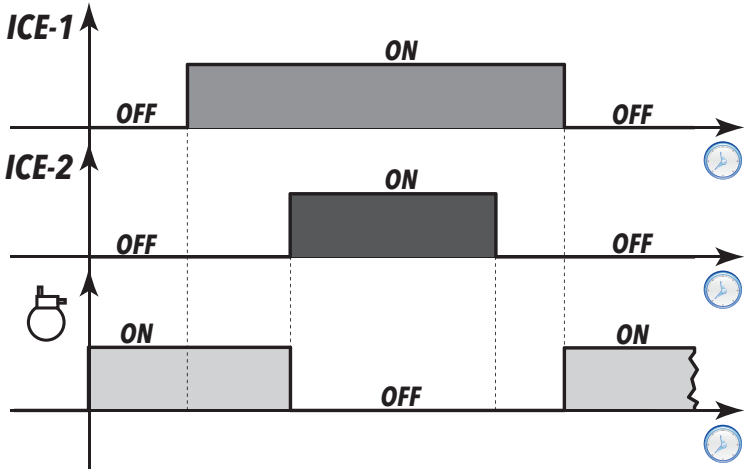
WITH SINGLE ICE PROBE (**H50 = 1**)



The compressor is **turned ON** (request) when the sensor detects the presence of liquid.

The compressor is **turned OFF** when the sensor detects the presence of ice (or air).

WITH DOUBLE ICE PROBE (**H50 = 2**)



The compressor is **turned ON** when both sensors detect the presence of liquid.

The compressor is **turned OFF** when both sensors detects the presence of ice (or air).

At **Start-up**, the compressor will be turned ON also if ICE-1 is in water.

MINIMUM AND MAXIMUM THRESHOLD

Minimum threshold for the state of ice.

- Set **H51** to the maximum possible value and **H52** to the minimum value (**H51**=650 and **H52** =1)
- Leave the tips of the sensor completely wrapped in ice
- Decrease the value of **H51** up to the controller recognizes the ice (compressor OFF).

Maximum threshold for the state of ice.

- Set **H51** to the maximum possible value and **H52** to the minimum value (**H51**=650 and **H52**=1)
- When the tips of the sensor are completely immersed in the liquid, decrease the value of **H51** until to the controller switches the compressor ON.

The value of H51 and H52 will be calculate on the following way:

- **H51** is the average of the two values.
- **H52** should be lower than 1/5 of the difference between the two values of **H51** previously found.

The compressor ICON (❄) will be:

- OFF: there is presence of ice
- ON or Flashing: the controller has recognized the presence of liquid.

DIAGNOSTICS

Alarms are always indicated by the buzzer (if present) and the alarm icon ((●)).

A probe error alarm (Pb1) will appear directly on the display with the indication **E1**.

NOTE: If alarm exclusion times have been set, the alarm will not be signaled
(The parameters can be modified via 'Device Manager' only).

ALARMS

Label	Description	Cause	Effects	Remedy
E1	Pb1 probe error (cold room)	• measured values outside operating range • probe inoperable / short-circuited / open-circuit	• Label **E1** displayed • Alarm icon permanently on • Max/min alarm regulator disabled • Compressor function based on parameters '**Ont**' and '**OFt**'	• check probes wiring • replace probe
AH1	Pb1 HIGH temperature alarm	Value read by probe Pb1>HAL after time '**tAO**'.	• Label **AH1** recorded in folder AL • no effect on regulation	Wait until temperature value read by Pb1 drops returns below (**HAL−AFd**).
AL1	Pb1 LOW temperature alarm	Value read by probe Pb1<LAL after time '**tAO**'.	• Label **AL1** recorded in folder AL • no effect on regulation	Wait until the temperature value read by Pb1 rises back above (**LAL+AFd**).

'INSTALLER' PARAMETER TABLE

PAR.	DESCRIPTION	RANGE	M.U.	VALUE
SEt	Temperature regulation SEtpoint. **The Setpoint is only visible in the 'machine status' menu**.	LSE...HSE	°C/°F	0.0
diF	diFferential. Compressor relay activation differential; the compressor stops on reaching the Setpoint value (as indicated by Pb1 probe) and restarts at a temperature value equal to (**SEt+diF**). **NOTE:** diF cannot be equal to 0.	0.1...30.0	°C/°F	2.0
HSE	Max value that can be assigned to SEt. **NOTE: The two setpoints are interdependent: HSE cannot be less than LSE and vice-versa**.	LSE...230	°C/°F	99.0
LSE	Min value that can be assigned to SEt. **NOTE: The two setpoints are interdependent: LSE cannot be greater than HSE and vice versa**.	-55.0...HSE	°C/°F	-50.0
Ont	Controller ON time for inoperable probe. If **Ont = 1** and **OFt = 0**, the compressor stays ON permanently; if **Ont > 0** and **OFt > 0**, it will run in duty cycle mode.	0...250	min	0
OFt	Controller OFF time for inoperable probe. If **OFt = 1** and **Ont = 0**, the compressor will always stay OFF; if **Ont > 0** and **OFt > 0**, it will run in duty cycle mode.	0...250	min	1
dOn	Delay time between switch-ons; the indicated delay time must elapse between two consecutive compressor switch-ons.	0...250	secs	4
dOF	Delay time after switch off; the delay time indicated must elapse between deactivation of the compressor relay and the next switch-on.	0...250	min	1
dbi	Delay time between switch-ons; the delay time indicated must elapse between two consecutive compressor switch-ons.	0...250	min	3

PAR.	DESCRIPTION	RANGE	M.U.	VALUE
OdO	Delay in activating outputs after the instrument is switched on or after a power failure. **0 = not active**.	0...250	min	1
Att	Parameters **HAL** and **LAL** intended as the absolute temperature value or differential in relation to the setpoint. **0** = absolute value; **1** = relative value.	0/1	num	1
AFd	Alarm diFferential.	1.0...50.0	°C/°F	2.0
HAL	Maximum temperature alarm. Temperature value which, if exceeded in an upward direction, triggers the activation of the alarm signal.	LAL...150	°C/°F	50.0
LAL	Minimum temperature alarm. Temperature value which, when exceeded downwards, triggers the activation of the alarm signal.	-50.0...HAL	°C/°F	-50.0
PAO	Alarm exclusion time after instrument switch on, after a power failure. **This parameter refers to high/low temperature alarms only**.	0...10	hours	0
tAO	Temperature alarm signal delay time. **This parameter refers to high/low temperature alarms only**.	0...250	min	0
LOC	LOCk. Setpoint change shutdown. There is still the possibility to enter into parameters programming and modify these, including the status of this parameter to permit keyboard shutdown. **n** (0) = no; **y** (1) = yes.	n/y	flag	n
PS2	PAssword 2. When enabled (**PS2 ≠ 0**), this is the access key to 'Installer' parameters (level2).	0...250	num	10
ndt	number display type. Display values with decimal point. **n** (0) = no (integers only); **y** (1) = yes (display with decimal point).	n/y	flag	y
CA1	Calibration1. Positive or negative temperature value added to the value read by **Pb1**.	-12.0...12.0	°C/°F	0.0
dro	display read-out. Selection of °C or °F to display the temperature read by the probe. **0** = °C; **1** = °F. **NOTE**: setpoint = 10 °C becomes 10 °F.	0/1	num	0

PAR.	DESCRIPTION	RANGE	M.U.	VALUE
ddd	Selects type of value to display. **0** = probe Pb1; **1** = Setpoint; **2** = "ICE".	0/1/2	flag	2
H41	Presence of Cold Room probe (**Pb1**). **n** (0) = not present; **y** (1) = present.	n/y	flag	n
H50	Selects regulation type: **0** = regulates on probe Pb1; **1** = regulates on single ice bank sensor (Ice bank 1); **2** = regulates on double ice bank sensor (1 and 2).	0/1/2	num	2
H51	Threshold (setpoint) for ice sensor. **NOTE**: the threshold value was calculated with reference to the use of natural water. If you notice that the instrument does not correctly detect the presence of ice, reduce the value of the parameter.	0...650	num	35
H52	Differential (hysteresis) for ice sensor.	0...250	num	5
H53	Mode at start-up with double ice probe (**H50 = 2**). **0** = the compressor is turned on; **1** = the compressor is not turned on (See paragraph "**REGULATOR SETTING**")	0/1	num	0
rEL	Firmware version. Device software release: read-only parameter.	/	/	/
tAb	Parameter table. Reserved: read-only parameter.	/	/	/
UL	Upload. Transfer programming parameters from Controller to Copy Card.	/	/	/
dL	Download. Transfer programming parameters from Copy Card to Controller.	/	/	/
Fr	Formatting. Delete data on Copy Card. **IMPORTANT: If parameter "Fr" is used, the data entered will be permanently lost. This operation cannot be reversed**.	/	/	/

ELECTRICAL CONNECTIONS

IMPORTANT! Make sure the appliance is switched off before working on the electrical connections.

The device is equipped with screw/disconnectable terminal boards for connection of wires having a maximum cross section of 2.5 mm^2 (a single conductor per terminal for the power feeding connections): refer to the label on the instrument for details of the terminal ratings.

The relay outputs are voltage free. Do not exceed the maximum permitted current; for higher loads, use a contactor with sufficient power capacity. Make sure that the power supply is of the correct voltage for the device.

The probe has no specific connection polarity and can be extended using a normal two-pole cable (note that extending the probe has a negative effect on the device's EMC characteristics: take great care with the wiring).

The probe cables, power supply cables and the TTL serial cable should be kept separate from the power cables.

CONDITIONS OF USE

Permitted use

The device must be installed and used in accordance with the instructions provided. In particular, parts carrying dangerous voltages must not be accessible under normal conditions. It must be adequately protected from water and dust with regard to the application, and must only be accessible using tools or a keyed locking mechanism (with the exception of the front panel). The device is suitable for use in household and commercial refrigeration appliances and/or similar equipment and has been tested in accordance with the harmonized European reference standards.

Improper use

Any use other than that expressly permitted is prohibited. The relays provided are of a functional type and can be subject to failure: any protection devices required by product standards, or suggested by common sense for obvious safety requirements, must be installed externally to the controller.

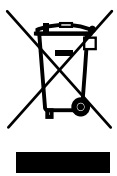
LIABILITY AND RESIDUAL RISKS

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 devices which allow access to dangerous parts without the aid of a keyed or tooled locking mechanism;
- tampering with and/or modification of the product;
- installation/use on equipment that does not comply with the regulations in force in the country of installation.

DISCLAIMER

DISPOSAL



The appliance (or the product) must be disposed of separately in compliance with the local standards in force on waste disposal.

Eliwell Controls s.r.l.
Via dell'Industria, 15 • Z.I. Paludi
32016 Alpago (BL) - ITALY
T: +39 0437 986111
F: +39 0437 989066
www.eliwell.com

Technical Customer Support:
T: +39 0437 986300
E: Techsuppeliwell@schneider-electric.com

Sales:
T: +39 0437 986100 (Italy)
T: +39 0437 986200 (other countries)
E: saleseliwell@schneider-electric.com

cod. 9IS54374 • IDPlus 961 ICE BANK • EN • rel. 05/19