IWP 985 (LX)

ELECTRONIC CONTROLLERS FOR VENTILATED REFRIGERATING UNITS WITH PROGRAMMABLE OUTPUTS

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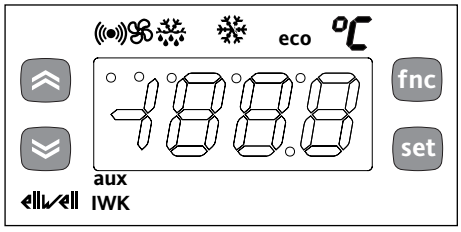
The device consists of two units:
• a IWK STD keyboard;
• IWP985(LX) power module. The keyboard is connected to the IWP985 by a LINK PLUS serial connection.
***The functions and connection of the standard 32x74 4 button IWK keyboard are illustrated below. For information on this keyboard, refer to the relevant technical data sheets.**

IWP 985

USER INTERFACE

(example of a standard 32x74 4-button keyboard).

The user has a keyboard with a 6 LED display and four buttons for controlling status and programming of the instrument.



BUTTONS AND MENUS

UP Button	Scrolls through the menu items Increases the values Parameter programmable
DOWN button	Scrolls through the menu items Decreases the values Parameter programmable
esc button fnc	ESC function (quit) Parameter programmable
Fnc button set	(press once) MACHINE STATUS MENU •Accesses set point •Displays alarms (if active) •Displays Pb1,Pb2 and Pb3 •displays RTC (hold down) •Accesses Parameter Programming menu
Button UP+esc pressed simultaneously fnc	(press for 2 seconds) •Locks/unlocks keyboard

Functions of "secondary" buttons

These functions can be associated with the buttons described above.

Function	Description
DEF H02)	(hold down, see par.) Activation of defrost cycle
AUX	Switches on/off associated relay
STAND-BY	Switches unit on/off and forces associated relay if present
Reduced set point	Enables the reduced set function
Light	Switches on/off associated relay
Request for maintenance	Asks for the desk to undergo maintenance
Evaporator fans	Activates the evaporator fan relay

NOTE:
The "primary" buttons can be programmed using the parameters H31...H33 (see)
In standard configuration the buttons are set by default as:

• "UP" button; par. H31=1; activates manual defrosting
• "DOWN" button; par. H32=0 no related function (disabled)
• "esc" button; par. H33=3 enables the reduced set function
• "set" button; not programmable.

START-UP

At Start-up the instrument performs a Lamp Test; the display and LEDs flash for a few seconds **(888)**, to check that they are working correctly.

IWK KEYBOARD LOCKED

Press the "UP" and "esc" buttons for 2 seconds to lock the keyboard. Repeat to unlock. The keyboard can also be locked with a parameter (par. LOC)NOTE: If the keyboard is locked you can access the Programming Menu by pressing the "set" button. The Set point can also be displayed.

DESCRIPTION OF MENU

Access to both menus is controlled by the 'set' button. If it is pressed and immediately released, the 'machine status menu' is displayed. Hold the same button down for 5 seconds to access the 'parameter programming menu'.
When one of the two menus has been accessed, you can navigate between the level 1 folders using the 'UP' and 'DOWN' buttons. Press the 'set' button once to access the selected folder. You can display its contents and modify or use its functions.
You can exit each level of both menus in three ways: using the ''ESC/Fnc' button if a new value is confirmed by pressing the 'set' button or when the time-out has elapsed (15 seconds inactivity on the device).

LEDS

Position	Associated function	Status
°C	Set point/Reduced set point	ON for parameter programming level 2 blinking when reduced set point is entered (set point ON for setting set point)
	Compressor or relay 1 for protection	ON for compressor on; blinking delay or enabling blocked
	Defrosting	ON when defrosting in progress; blinking when activated manually or by digital input
	Alarm	ON for active alarm; blinking for silenced alarm
	Fans	ON when fan is on
	aux	ON when auxiliary output is operating
o	decimal point	ON when instrument is on stand-by

MACHINE STATUS MENU
The 'machine status menu' contains the folders and basic information on the device:
-AL: alarm folder (if active alarms are present)
-SEt: Set point setting folder
-rtc: 'real time clock' folder
-Pb1: 'probe 1 value' folder
-Pb2: 'probe 2 value' folder
-Pb3: 'probe 3 value' folder If no alarms are present, the "SEt" label is displayed.
From here you can scroll down the other menu items using the UP' and 'DOWN' buttons.
Each folder can be accessed by pressing the 'set' button once. Values are modified using the 'UP' and 'DOWN' buttons and the 'set' button that confirms the selected value and takes you back to the higher level.

Setting the set point
Access the 'machine status menu'. If no alarms are present, the "SEt" label is displayed. By pressing and immediately releasing the 'set' button, the set point value can be set using the UP' and 'DOWN' buttons. Press and release the 'set' button again or the 'Fnc' button to go back to the main menu level. The set point setting folder is also closed when the time-out elapses (15 seconds).

Alarm on
If an alarm condition exists when the Machine Status menu is accessed the "AL" folder label appears.

PARAMETER PROGRAMMING MENU
Access the menu by pressing the 'set' button for at least 5 seconds. The menu structure enables all parameter folders to be divided into two levels. All the level 1 folders can be accessed by entering the password 'PA1'.
Scroll down the level 1 folders using the 'UP' and 'DOWN' buttons. To access the parameters press and release the 'set' button next to the selected label. Scroll through the labels in the folder using the 'UP' and 'DOWN' buttons, press 'set' to display the current value of the selected parameter, use the 'UP' and 'DOWN' buttons and set the required value by pressing 'set'.
To access the level 2 folders in the 'Cnf' folder, select the 'PA2' label, then enter the password 'PA2' and confirm with the 'set' button. All the parameters that cannot be changed at level 1 are in this level.
NOTE: Level 1 parameters will only be displayed if you quit the 'parameter programming menu' and repeat the steps for manipulation of level 1 folders.
The steps to follow for manipulation of level 2 parameters are the same as those described for the level 1 structure.
NOTE: It is strongly recommended that the instrument is switched off and on again each time parameter configuration is changed in order to prevent malfunctioning of the configuration and/or ongoing timings.

PASSWORD 1)
Programming menu
Passwords "PA1" and "PA2" allow level 1 and level 2 parameters to be accessed. There are no passwords in the standard configuration.
To enable them (value must not be 0) and assign them the desired value, access the "Programming" menu in the "diS" folder.
If passwords are enabled, they will be requested:
- PA1 when entering the Programming menu (see the "Programming Menu" section);
- PA2 in the "Cnf" folder containing level 1 parameters.

2) KEYBOARD LOCAL PARAMETERS
Password "PA3" gives access to the keyboard local parameters. This password is not present in the standard configuration. To enable it (value is not 0)) and assign it the desired value, access the "Keyboard Local Programming" menu in the "PLO" folder.
If passwords are enabled, they will be requested:
- PA3 when entering the "PLO" menu

ACTIVATING MANUAL DEFROST CYCLE
To activate the defrost cycle manually, press the button configured for the function for H02 seconds (see "Secondary" button functions).
If there are not the right defrosting conditions (the temperature of the evaporator probe is higher than the end of defrosting temperature, for example) or parameter OdO≠0, the display will flash three (3) times to indicate that the operation will not be performed.
Real Time Clock
By pressing the "set" button when the "rtc" label appears, the label d00 (days) is displayed. Use the "UP" and "DOWN" buttons to set days.
If you do not use the buttons for over 2 seconds or if you press "set" you switch to the hours (h00) and minutes ('00) folders: use the "UP" and "DOWN" buttons to set the hours and minutes respectively.
If you do not use the keyboard for over 15 seconds (time-out) or if you press the "fnc" button once you are taken back to the previous screen mask.
NOTE1: Always use the "set" button to confirm the hours/minutes/days setting.
NOTE2: We recommend considering the first day d00 as SUNDAY.

LOCAL KEYBOARD PROGRAMMING MENU
Hold down the "UP" and "DOWN" buttons for at least 3 seconds to access the "Keyboard Local Programming" menu.
If specified, the access PASSWORD will be requested (see parameter "PA3") and (if the password is correct) the **PLO (Local Parameters) label will appear.**
This folder contains the keyboard local parameters (see Keyboard Local Parameters table).
If the password is incorrect, the display will show the PA3 label again.
NOTE: the folder may NOT be visible; if this is the case, keyboard local programming cannot be accessed).
To enter the folder, press "set". The label of the first visible parameter will appear.
To scroll through the other parameters, use the "UP" and "DOWN" buttons.
To change the parameter, press and release "set", then set the desired value using the "UP" and "DOWN" buttons and confirm with the "set" button. Move on to the next parameter.

FnCFUNCTION FOLDER
The FnC folder (last folder visible from the Programming Menu, level 1) contains the following functions. They are activated using the "set" button.
If the unit is switched off, the function labels go back to their default status.

Function	Function label ACTIVE	Function label INACTIVE
Defrost request	dEF	SoF**
Reduced set point	OSP	SP**
Aux	Aon	AoF
Alarm silencing	tAL	tAL
Pressure switch alarm reset	rPA	rPA

***LX MODELS ONLY**
NOTE: In this case the UnP label is displayed (flashing)
**default

USING THE COPY CARD
The Copy Card is an accessory connected to the TTL serial port used for quick programming of the unit parameters (upload and download parameter map to one or more units of the same type). Operations are described below:
Fr-Format (level 2 par.)
This command can be used to format the copy card **necessary** when used for the first time or when used with models that are not compatible.
Warning: when the copy card has been programmed using the "Fr" parameter all the data entered is cancelled. This operation cannot be undone.
UL-Upload
This operation unloads the programming parameters from the instrument.
dL-Download
This operation downloads the programming parameters to the instrument.
NOTE:
- **UPLOAD: instrument —> Copy Card**
- **DOWNLOAD: Copy Card —> instr.**

The operations are performed by accessing the folder identified by the "FPr" label and selecting the "UL", "dL" or "Fr" commands. The operation is confirmed by pressing the "set" button. If the operation is successful, a "y" is displayed whereas if it is unsuc-

cessful an “n” will be displayed.

Download “from reset”

Connect the copy card with the instrument OFF.

When the instrument is switched on the programming parameters will be downloaded into the copy card; when the lamp test has been completed, the following appear on the display for about 5 seconds:

- label dLY if copy operation is successful
- label DLn if operation fails

NOTE: after downloading the instrument will work with the parameter map settings that have just been downloaded.

DISTANCE-MANAGED SYSTEMS (LX MODELS ONLY)

Televis remote control systems can be connected using the RS 485 serial link (see connection diagram for terminals on base board 10-11-12.

To configure the instrument to do this, you need to access the folder **(LX models only)** with the “Add” label and use the “dEA” and “FAA” parameters.

FUNCTIONS

LINK PLUS

Normally used for connecting the IWP 985 (LX) module and 3-way cable IWK keyboard with a JST quick connector, it is also used to connect several IWP 985 (LX) base units and IWK keyboards up to a maximum of 10 instruments (1 Master base device and 4 slaves, 1 IWK keyboard for the Master base and 4 IWK Slave keyboards).

NOTE: two adjoining modules must be less than 10 m apart whereas the two furthest modules must be less than 50 m apart.

MASTER-SLAVE-ECHO DEFINITIONS AND NETWORK COMMANDS

1) IWP base

•Master Base

Instrument that controls the networks and sends commands to the Slaves. The Master is selected using parameter L00 (the value 0 defines the Master).

The Master Base is the only default device capable of:

Activate for all the Slaves:

a) switching lights on/off;

b) silencing alarms;

c) activating auxiliary Set point (reduced set point);

d) placing devices in STAND-BY (ON- OFF);

e) activating the auxiliary relay.

The Master also:

1) synchronizes the displays on all the Slaves and Echoes with its own display;

2) synchronizes defrosting (simultaneous or sequential);

3) synchronizes the compressors (with a delay in activating them, see par. don);

4) shares probe 1 (temperature probe) so that there is only one thermostat control: if this is the case, the Master probe is used by all the Slaves for regulation.

•Slave Base

Instrument(s) supplied with own controls which also perform(s) commands issued by the Master (with parameters L00..L09).

The Slave Base according to parameter L08 is also enabled for:

a) switching lights on/off;

b) placing devices in STAND-BY (ON- OFF).

According to parameters L00..L09 it may also become dependent on/independent of the Master with regard to points a)-b) with regard to defrosting management and thermostat control probe sharing.

By using parameter L09, the slave decides whether to use the probe shared by the Master or its own to adjust temperature. In the first case, the probe can be omitted on the Slave.

2) IWK keyboard

•Master keyboard

Keyboard connected to the network that configures and displays the status of the Master base unit. Each keyboard can be configured to control the Master or Slave base units.

•Slavekeyboard

Keyboard connected to the network that configures and displays the status of the Slave base unit. Each keyboard can be configured to control the Master or Slave base units. (using parameters L00..L09).

•Echo keyboard

Keyboard connected to the network that only displays the values of the instrument which it is associated to (it does not therefore have with its own I/O resources, but only acts as a repeater).

NOTE: several Echo keyboards can be connected to the same Master or Slave base unit.

LINK Network Defrosting

The main characteristics of the Link network is the control of defrosting; the Master sends the defrost command which can be performed synchronously **(1)** or sequentially **(2)** (defrost after defrost), without affecting the normal protections or delays of each instrument (see parameter L03).

(1) Synchronized Defrost

The synchronization of defrosting is effected with regard to the actual defrosting phase; dripping and all the functions that follow the defrosting stage are therefore not considered.

The Master only supplies the commands that enable the start of defrosting or thermostat control without interfering with the normal protections or delays on each device.

When the slave units are awaiting thermostat control enabling from the Master (when synchronized defrosting has terminated) the defrost LED blinks.

WARNING: if the Slaves connected to the network are programmed to accept the commands from the Master concerning defrosting and network functions, no defrosting or functions associated with the events requested by the Slaves will be enabled.

Only in the event of a “no link” (error E7), the Slaves will activate defrosting and functions associated with the events requested by the Slaves.

(2) Sequential Defrosting

The Master activates defrosting for the various devices in the network one after another. When each device has completed defrosting (and not dripping) it begins thermostating.

Finally, using the parameters **dty, defrost type (**and **dCt, defrost Counting type** the defrosting **modes are defined.**

DOOR SWITCH-LIGHT

- button enabled

If you press the “LIGHT” button the auxiliary relay/light is activated (if it was off, otherwise if it was on it is deactivated.

- digital input enabled

The digital input can be configured as auxiliary/door switch (parameter H11=3/4): in this case, a digital output can be configured as light/AUX (parameters H21...24=5). As stated, this function can be used to activate the light relay if it was de-energized or energize it if this was not the case. When the digital input (D.I.) is activated, the light relay is enabled **(if par. dSd=y)** and the light relay is disabled when the D.I. is disabled.

The status is recorded so that it functions correctly in the event of a black-out; the light button and the light enable function can also be activated if the unit is on STAND-BY see**par. H06)**.

The light button always disables the light relay if **par. OFL=y**

STAND BY/ON-OFF

Note: The STAND BY/ON-OFF function can be selected quickly by pressing the dedicated on/off button for at least 2 seconds.

Once the STAND-BY/ON-OFF function has been enabled, the display goes out, the controllers are blocked including the alarms and the cycle times are reset.

OFF will also be displayed.

The status is recorded so that when power is restored after a black-out the device can continue to operate in the same way as before the power failure. After start-up, the temperature alarm is excluded for the period of time set by parameter PAO.

%RH FUNCTION

Press one of the programmable buttons to activate the %RH function (enabling the humidity reduction control) **if parameter H31...33=9 has been set.**

The %RH function can also be D.I.-enabled **if par. H11=9.**

If this control is enabled, the fans operate continuously (always on).

During defrosting the fans are controlled by the defrosting parameters and during the dripping cycle they will be turned off even if RH% is active.
NOTE: RH% status has priority over all other parameters.
If there is a power failure or the machine has been turned off, the RH% status will be restored as soon as the mains power supply returns or the machine is turned on.

NIGHT & DAY CONTROL
The Night & Day control algorithm can be used to set events and cycles at predefined times of the week.
You can set an event start time and duration, as well as functions and defrostings (daily or festive) to be enabled for each day of the week.
By pressing the "set" button when the "nad" label appears, the label d0 (day 1) is displayed in the "Programming" menu.
Tip: consider d0 = Sunday). Use the "UP" and "DOWN" buttons to set other days (d1 (day 2 = Monday)...d6 (day 7 = Saturday)) and Every Day. By pressing "set" the first parameter E00 is displayed; use the "UP" and "DOWN" buttons to scroll through other parameters E01...03. If you do not use the keyboard for over 15 seconds (time-out), or if you press the "fnc" button once, the last value shown on the display is confirmed and you return to the previous screen mask.
The different functions are set using the appropriate parameters (see the parameter table for the folder with the "nad" label).

GENERAL PRESSURE SWITCH CONTROL
The Pressure switch algorithm can be used to effect a diagnostic role on a digital input (see par. H11-H14 =11).
Every time the pressure switch is triggered, the compressor is deactivated, the alarm LED is turned on and a subfolder called nPA is displayed in the alarm folder.
The number of times the pressure switch has been activated is stored in this folder: once the number set by the parameter PEn has been reached this folder is replaced by the PA (pressure alarm) Label.
When the pressure switch input is reset, control restarts automatically and any timings and protections are observed. If the number of activations in the interval specified by parameter PEI (pressure switch error count interval) exceeds the number specified by parameter PEn (number of errors allowed per pressure switch input) the controller activates an alarm condition.
This condition consists in
1. Deactivation of compressor outputs, fans and defrosting;
2. Display of PA label in the alarm folder;
3. Switching on of alarm LED and alarm relay if configured.
Once the device is in alarm mode, it must be switched off and on again or reset using the rPA (pressure switch alarm reset) in the Fnc functions menu (see).
During the pressure switch intervention time, counting of the defrosting time proceeds normally. If parameter PEn = 0 the function is excluded, the alarms are excluded and the counts deleted and disabled.

MAXIMUM AND MINIMUM PRESSURE SWITCH CONTROL
As above with the digital input set correctly (see par. H11-H14 =9, Minimum pressure switch input; H11-H14 =10, Maximum pressure switch input). In this case the labels displayed will be LPA (minimum) or HPA (maximum).
PREHEATING CONTROL (THERMAL SWITCH)
As above with the digital input set correctly (see par. H11-H14 =12). In this case the label displayed in the Alarm folder will be Prr and the compressor LED will blink.

DIAGNOSTICS

The alarm condition is always signalled by a buzzer (if present) and the alarm icon LED. The alarms from the faulty thermostat control probe (probe 1), the faulty evaporator probe (probe 2), and the faulty display probe (probe 3) appear directly on the instrument display as E1, E2, and E3 respectively.

Table of faulty probes

DISPLAY	FAULT
E1	Faulty probe 1 (thermostat control)
E2	Faulty probe 2 (evaporator)
E3	Faulty probe 3 (display)

If simultaneous, they will be showed on the display alternatively every 2 seconds

If E1 or E2 appears on the Master (see LINK network) and the display is shared, the slaves will always show the Master display: to understand which unit is faulty, refer to the alarm LED for each instrument.

An error condition in probe 1 (thermostat control) causes the following:
• E1 code appears on display
• compressor is activated as indicated by "Ont" and "Oft" parameters if these are programmed for duty cycle or:

Ont	Oft	Compressor output
0	0	OFF
0	>0	OFF
>0	0	ON
>0	>0	dc

The error condition for probe 2 (evaporator) causes the following:
• E2 code appears on display
• End of defrost due to time-out. The error condition for probe 3 (display) causes the following:
• E3 code appears on display Other alarms do not appear on the instrument display but can be seen in the "Machine Status" menu in the "AL" folder.
The maximum and minimum temperature alarm is regulated according to the thermostat control probe (probe1) and/or display probe (probe 3). The temperature limits are defined by the "HAL" (maximum alarm), "LAL" (minimum alarm) and PbA (alarm configuration on probe 1,3 or both) parameters.

MAXIMUM AND MINIMUM TEMPERATURE ALARM
If an alarm condition occurs and alarm exclusion times are not in progress (see alarm exclusion parameters), the alarm icon lights up permanently and the relay that is configured as an alarm is activated. This type of alarm does not affect the regulating in progress.
Alarms are considered as absolute (default) values or as values related to the Set point (the distance from the Set point itself) and based on the Att parameter.
This alarm condition can be viewed in the folder "AL" with the labels "AH1-AL1".

ALARM WITH THRESHOLD (PROBE 3)
By setting the PbA=3 parameter an alarm is associated to probe 3. It refers to a specific threshold (defined by the SA3 parameter).
An over-temperature or an under-temperature alarm is generated and the icon is turned on. This alarm condition can be viewed in the "AL" folder with the labels "AH3-AL3".
The alarm is handled as a temperature alarm referring to probe 3: for delays and backswings, refer to standard alarms.

DEFROST ALARM
If the end of defrosting is caused by a time-out (rather then because an end of defrost temperature is detected by the defrosting probe), an alarm is generated and the icon lights up **(if dAt=y)**.
This condition can be viewed in the "AL" folder with the label "Ad2".
Automatic back swinging occurs when the next defrost starts. By pressing any button during the alarm condition, the signal light disappears.
In order to cancel the alarm properly, you must wait until the next defrost.

EXTERNAL ALARM
The device can also control an external alarm, i.e. from a digital input.
If the digital input is enabled, the alarm control is activated by programming and remains enabled until the next time the digital input is deactivated.
When an alarm is set off, the alarm icon lights up permanently, the relay configured as alarm is activated and the compressor, defrost and fan controllers are deactivated (if specified by the "EAL" parameter).
This alarm condition can be displayed in the "AL" folder using the "EA" label.

The relay can be silenced; even if the alarm icon starts blinking, the controllers remain locked until the next time the digital input is deactivated.

OPEN DOOR ALARM
If a door is open, in response to a delay preset by the tdO parameter, the Open Door alarm is signalled.
The alarm is signalled by the alarm icon that starts blinking.
This alarm condition can be viewed in the "AL" folder with the label "Opd".

LINK ALARM
If there is a communication failure between the IWP 985(LX) module/IWK keyboard or master/slave/echo, the NO LINK alarm is generated.
This alarm condition can be viewed in the "AL" folder with the label "E7".
NOTE:
•The E7 error is signalled after approx. 20 seconds in "no link" condition to avoid any link disturbance causing communication errors.
•The E7 error is also signalled for addressing conflicts when:
a) the number of Slaves set on the MASTER is different from the actual number of Slaves on the network
b) 2 or more Slaves have the same address.

PRESSURE SWITCH ALARM
If the pressure switch alarm is activated by the general pressure switch control, the label "PA" will appear in the "AL" folder.
The device must be switched off and then on again (machine reset) or the alarms can be reset in the alarm folder.
If the pressure switch alarm is activated by the minimum (maximum) pressure switch control, the label "LPA" ("HPA") will appear in the "AL" folder.
Once in alarm mode, the device must be switched off and then on again (machine reset) or the alarms reset in the alarm folder.

Alarm table

DISPLAY	ALARM
AH1	High temperature alarm (referring to room probe or probe 1)
AL1	Low temperature alarm (referring to room probe or probe 1)
AH3	High temperature alarm (referring to probe 3)
AL3	Low temperature alarm (referring to probe 3)
Ad2	Defrosting timed out
EA	External alarm
Opd	Door Open Alarm
E7	Master-Slave Communication failure
E10	Clock battery alarm
PA	General pressure switch alarm
LPA	Minimum pressure switch alarm
HPA	Maximum pressure switch alarm

Press any button to silence the alarm. The LED will start to blink.

MECHANICAL ASSEMBLY

The unit has been designed for:
• 32x74 4 button IWK keyboard: panel mounted. Drill a 29x71 mm hole, insert the keyboard and fix it in place with the special brackets provided.

• IWP985 power module, Mount on DIN Omega rail or panel with 2 screws attached to hooks.
Do not assemble the keyboard in excessively humid and/or dirty locations because it is designed to be used in locations with normal pollution levels.
Always make sure that the area next to the unit cooling slits is adequately ventilated.

ELECTRICAL WIRING

Warning! Always switch off machine before working on electrical connections.
The unit is fitted with:
• **IWP985 power base**: screw connectors for connecting electrical cables with a diameter of 2.5 mm^2 max. (only one conductor per terminal for power connections): for terminal capacity, see the label on the instrument.
The relay contacts are voltage free.
Do not exceed the maximum current allowed.
For higher loads, use a suitable contactor.
Make sure that the power voltage complies with the device voltage. Probes have no connection polarity and can be extended using an ordinary bipolar cable (note that if probes are extended this affects the electromagnetic compatibility (EMC) of the instrument: special care must be used when wiring).
Probe cables, power supply cables and the TTL serial cable should be kept separate from power cables.
• **4 button IWK standard keyboard** screw connectors** (or quick disconnect connectors) for connection of electrical cables;
**with diameter of 2.5 mm^2 max. (only one conductor per terminal for power connections): for terminal capacity, see the label on the instrument.

CONDITIONS OF USE

PERMITTED USE
For safety reasons the instrument must be installed and used in accordance with the instructions supplied.
Users must not be able to access parts with dangerous voltage levels under normal operating conditions. The device must be protected from water and dust depending on the specific application and only be accessible using special tools (except for the front panel).
The device is ideally suited for use on household appliances and/or similar refrigeration equipment and has been tested with regard to safety in accordance with the European harmonized reference standards: It is classified as follows:
• with regard to construction, as an automatic electronic control device to be independently mounted;
• as a 1 B type operated control device as regards its automatic operating features;
• as a Class A device as regards the category and structure of the software.

UNPERMITTED USE
The use of the unit for applications other than those described is forbidden.
It should be noted that the relay contacts supplied with the device are functional and therefore exposed to potential faults.
Any protection devices required to comply with product requirements or dictated by common sense due to obvious safety reasons should be installed externally.

TECHNICAL DATA

IWP 985 (LX) BASE BOARD

Casing: plastic 4 Din modules
Dimensions: front 70x85 mm, depth 61mm.
Mounting: on DIN rail (Omega 3) or wall-mounted. Connections: on screw terminal block for conductors ≤ 2.5mm^2 (only one conductor per terminal block for power connections).
Operating temperature: -5...55°C.
Storage temperature: -30...85°C.
Operating and storage ambient humidity: 10...90 % RH (non-condensing).
Analogue inputs: 3 NTC/PTC parameter configurable inputs Serial: TTL and RS-485 for connection to Televis**System** or Copy Card **(for /LX model only).**
Serial: "Link Plus", 3-way JST quick connection: GND, 12V, DATA
Digital outputs: 4 digital outputs on relays: 8A 1/2hp 250V SPST; 8A 1/2hp 250V SPDT; 16A 1hp 250V SPST; 8A 1/2hp 250V SPST;
Resolution: 1 or 0.1°C.
Accuracy: better than 0.5% of bottom scale +1 digit
Consumption: 5VA Power supply: 230V

STANDARD IWK KEYBOARD (4 BUTTONS)

Front protection: IP65. Casing: PC+ABS UL94 V-0 resin plastic body, polycarbonate front, thermoplastic resin buttons.
Dimensions: front 74x32 mm, 30 mm depth.
Mounting: on panel, with drilling template 71x29 mm (+0.2/-0.1 mm).
Operating temperature: -5...55 °C. Storage temperature: -30...85 °C.
Usage ambient humidity: 10...90 % RH (non-condensing).
Storage ambient humidity: 10...90% RH (non-condensing).
Display range: -50...110 (NTC); -55...140 (PTC) °C without decimal point (parameter selectable), on display 3 digits + sign.
Measurement range: from -55 a 140 °C.
Accuracy: better than 0.5% of bottom scale +1 digit.
Resolution: 1 or 0.1 °C.
Serial links: **see IWP985 (LX) Technical Data**
Consumption: **see IWP985 (LX) Technical Data**
Power supply: from IWP985 power module

TABLE OF SERIAL OUTPUTS

Type	Use	Lines
TTL	Copy Card	TTL
RS 485 serial link	for Televis Connection	GND, 485+, 485-
Powered serial	Base Board-Keyboard Connection	GND, 12V, DATA

NOTE: see network connection diagram as well

Tab. 1 SET POINTS, Table of parameters and FUNCTIONS

****NOTE: At level 1 the folders will only display all the level 1 parameters. At level 2 the folders will only display all the level 2 parameters.**

SET	DESCRIPTION	RANGE	DEFAULT*			U.M.
SEt	Setpoint **The Set point can be displayed from the machine status menu and not the programming menu.** The range is determined by parameters LSE and HSE.	**-LSE...HSE**	**0.0**			**•C/•F**
PAR.	**DESCRIPTION**					
	COMPRESSOR CONTROLLER (folder with "CP" label)	**RANGE**	**DEFAULT**	**VALUE***	**LEVEL****	**U.M.**
diF	diFferential. Compressor relay intervention differential; the compressor stops when the Set point value is reached (as indicated by the control probe), and restarts at temperature value equal to the Set point plus the value of the differential. Note: cannot be 0.	0.1...30.0	2.0		1	°C/°F
HSE	Higher SEt. Maximum possible set point value.	LSE..302	50.0		1	°C/°F
LSE	Lower SEt. Minimum possible set point value. **NOTE: The two sets are interdependent: HSE (maximum set point) cannot be less than LSe (minimum set point) and vice versa**	-55.0...HSE	-50.0		1	°C/°F
OSP	Offset SetPoint. Temperature value to be added algebraically to the set point if reduced set enabled (Economy function). It can be enabled by a specially configured button or Digital Input.	-30.0...30.0	0		**2**	°C/°F
Cit	Compressor min on time. Minimum compressor activation time before disabling. If set at 0 it is not active.	0...250	0		**2**	min
CAt	Compressor mAx on time. Maximum compressor activation time before disabling. If set at 0 it is not active.	0...250	0		**2**	min
	COMPRESSOR PROTECTIONS (folder with "CP" label)					
Ont (1)	On time (compressor). Compressor activation time in the event of a faulty probe. If set to "1" with Oft at "0" the controller is always on whereas if Oft >0 it operates in duty cycle mode. **See Duty Cycle diagram.**	0...250	0		1	min
OFt (1)	OFF time (compressor). Compressor in disabled state time in the event of a faulty probe. If set to "1" with Oft at "0" the controller is always off whereas if Oft >0 it operates in duty cycle mode. **See Duty Cycle diagram.**	0...250	1		1	min
dOn	Delay (at) On compressor. Delay in activating compressor relay after switch-on of instrument.	0...250	0		1	sec
dOF	Delay (after power) OFF. Delay after switch off; the indicated time must elapse between switch-off of the compressor relay and the subsequent switch-on.	0...250	0		1	min
dbi	Delay between power-on. Delay between switch-ons; the indicated time must elapse between two subsequent switch-ons of the compressor.	0...250	0		1	min
OdO (!)	Delay Output (from power) On. Delay time in activating outputs after switch-on of the instrument or after a power failure. 0= not active.	0...250	0		1	min
dSc	2nd compressor activation delay	0...250	0		2	sec
	DEFROSTING REGULATOR (folder with "dEF"label) (6)					
dty	Defrost type. Type of defrost. 0 = electrical defrosting; 1 = cycle reversing defrosting (hot gas); 2 = Free mode defrosting (compressor disabled). defrost interval time.	0/1/2	0	**see table dCt-dty**	1	num
dit	Period of time elapsing between the start of two defrosting operations. **0= function disabled (defrost is NEVER performed)**	0...250	6h		1	hours/min/sec (see dt1)
dt1	Defrost time 1. Unit of measurement for defrost times ("dit" parameter). 0 = "dit" parameter expressed in hours. 1 = "dit" parameter expressed in minutes. 2 = "dit" parameter expressed in seconds.	0/1/2	0		**2**	num
dt2	Defrost time 2. Unit of measurement for duration of defrosting ("dEt" parameter). 0 = "dEt" parameter expressed in hours. 1 = "dEt" parameter expressed in minutes. 2 = "dEt" parameter expressed in seconds.	0/1/2	1		**2**	num
dCt	Defrost Counting type. Selection of defrosting time count mode. 0 = compressor operating hours (DIGIFROST® method); Defrosting active ONLY with compressor on. NOTE: compressor time of operation is counted irrespective of evaporator probe (counting is active if evaporator probe is absent or faulty). The value is ignored if RTC is enabled. 1 = Real Time - equipment operating hours; defrost counting is always active when the machine is on and starts at each power-on. 2 = compressor stop. Every time the compressor stops, a defrost cycle is performed according to the parameter dtY 3= With RTC. Defrosting at times set by dE1...dE8, F1...F8	0/1/2/3 0=df 1=rt 2=SC 3=RTC	1	**see dCt-dty table**	1	num
"dd"	dE1...dE8 parameters daily efrost start time 1...8. Range 0...23, 24= off (default)	0...23/0...59	24		1	hours/min
"Fd"	F1...F8 festive defrost start time 1...8. Range 0...23, 24= off (def1ault)	0...23/0...59	24		1	hours/min
	CAUTION: d1...d8, F1...F8 parameters are visible only if dCt=3 with clock option present. They are included in the dd and Fd folders.					
	If dit=0 defrosting is NEVER performed (manual defrosting is also not possible).					
SEE table 4a "dd" daily defrost start time and table 4b "Fd" Festive defrost start time						
dOH	defrost Offset Hour. Start of defrost delay time from start-up of instrument.	0...59	0		1	min
dEt	defrost Endurance time. Defrosting time-out; determines maximum duration of defrosting.	1...250	30min		1	hours/min/sec (see dt2)
dSt	defrost Stop temperature. Defrosting end temperature (determined by evaporator probe).	-50.0... 150	8.0		1	°C/°F
dS2	End of defrost temperature 2nd evaporator	-50...150	8.0		2	°C/°F
dE2	Defrost time-out on 2nd evaporator	1...250	30		2	min/sec
dPO	Defrost (at) Power On. Determines if the instrument must start defrosting at start-up (if the temperature measured by the evaporator allows this) y = yes, starts defrost at start-up; n = no, does not start defrost at start-up.	n/y	n		1	flag
tcd	time compressor for defrost. Minimum time for compressor ON or OFF before defrost If >0 (positive value) the compressor remains ACTIVE for tcd minutes; If<0 (negative value) the compressor remains INACTIVE for tcd minutes; If =0 the parameter is ignored.	-31...31	0		**2**	min
Cod	Compressor off (before defrost). Time for compressor OFF before defrost cycle. If a defrost cycle is set within the programmed time for this parameter, the compressor is not started up. If =0 function is stopped.	0...60	0		**2**	min

PAR.	DESCRIPTION	RANGE	DEFAULT	VALUE*	LEVEL**	U.M.
	FAN CONTROLLER (folder with "FAn" label)					
FPt	Fan Parameter type. Characterizes the "FSt" parameter that can be expressed as an absolute temperature value or as a value related to the Set point. 0 = absolute; 1 = relative.	0/1	0		**2**	flag
FSt	Fan Stop temperature. Fan stop temperature; a value read by the evaporator probe that is higher than the set value causes the fans to stop. The value is positive or negative and, depending on the FPt parameter, could represent the temperature in absolute value or relative to Set point.	-50.0..150.0	2.0		1	°C/°F
Fot	Fan on-start temperature. Fan start temperature; if the temperature read by the evaporator is lower than the value set for this parameter, the fans remain deactivated. The value is positive or negative and, depending on the FPt parameter, could represent the temperature in absolute value or relative to Set point.	-50.0..150.0	-50.0		**2**	°C/°F
FAd	FAn differential. Fan activation intervention differential (see par. "FSt" and "Fot").	1.0...50.0	2.0		1	°C/°F
Fdt	Fan delay time. Delay time between start-up of fan after defrosting.	0...250	0		1	min
dt	Drainage time. Dripping time.	0...250	0		1	min
dFd	defrost Fan disable. Used to select exclusion of evaporator fans during defrosting. y = yes; n = no.	n/y	y		1	flag
FCO	Fan Compressor OFF. Used to select fan stop when compressor is switched OFF. y = fans active (with thermostat; in response to the value read by the defrost probe, see "FSt" parameter); n = fans off; dc = duty cycle (using parameters "Fon" and "FoF").	n/y/dc	y		1	num
Fod	Fan open door open. Used to select the fan stop when door is open and fan re-start when door is closed (if they were active). n=fans stop; y=fans unchanged.	n/y	n		**2**	flag
FdC	Fan delay Compressor off. Fan switch off delay time after compressor stop. In minutes. 0= function excluded	0..99	0		**2**	min
Fon	Fan on (in duty cycle). Time fans are ON in duty cycle. Use of fans in duty cycle mode; valid for FCO = dc and H42=1 (probe 2 present) (evaporator)	0..99	0		**2**	min
FoF	Fan OFF (in duty cycle). Time fans are OFF in duty cycle. Use of fans in duty cycle mode; valid for FCO = dc and H42=1 (probe 2 present) (evaporator)	0..99	0		**2**	min
	ALARMS (folder with "AL" label)					
Att	Alarm type. Parameter "HAL" and "LAL" modes, as absolute temperature values or as differential compared to the Set point. 0 = absolute value; 1 = relative value.	0/1	0		**2**	flag
AFd	Alarm Fan differential. Alarm differential.	1.0...50.0	2.0		1	°C/°F
HAL (2)	Higher Alarm. Maximum alarm. Temperature value (considered as distance from Set point or as an absolute value based on Att) which if gone above triggers the alarm signal. **See Max/Min. Alarm Diagram;**	LAL...150.0	50.0		1	°C/°F
LAL (2)	Lower ALarm. Minimum alarm. Temperature value (considered as distance from Set point or as an absolute value based on Att) which if gone below triggers the alarm signal. **See Max/Min. Alarm Diagram;**	-50.0...HAL	-50.0		1	°C/°F
PAO (!) (3)	Power-on Alarm Override. Alarm exclusion time after instrument start-up, after a power failure.	0...10	0		1	hours
dAO	defrost Alarm Override. Alarm exclusion time after defrost.	0..999	0		1	min
OAO	Alarm signal delay after disabling digital input (door open). Alarm refers to a high and low temperature alarm.	0...10	0		**2**	hours
tdO	time out door Open. Time out after alarm signal following digital input disabling (door open).	0...250	0		**2**	min
tAO (3)	temperature Alarm Override. Temperature alarm signal delay time.	0...250	0		1	min
dAt	defrost Alarm time. Alarm signal for defrost end due to time-out. n = does not activate alarm; y = activates alarm.	n/y	n		**2**	flag
EAL	External Alarm Lock. External alarm to lock controllers (n=does not lock, y=locks).	n/y	n		**2**	flag
AOP	Alarm Output Polarity. Polarity of alarm output. 0 = alarm active and output disabled; 1 = alarm active and output enabled.	0/1	1		**2**	flag
PbA	Configuration of temperature alarm on probe 1 and/or 3. 0 = alarm on probe 1 (thermostat control); 1 = alarm on probe 3 (display); 2 = alarm on probe 1 and 3 (thermostat control and display). 3 = alarm on probe 1and 3 on external threshold	0/1/2/3	0		**2**	num
SA3	Probe 3 alarm set point (display)	-50.0...150.0	0		**2**	°C/°F
dA3	Probe 3 alarm differential (display)	-30.0...30.0	2.0		**2**	°C/°F
tA3	Probe 3 alarm delay (display)	0...59	0		**2**	min
	LIGHT AND DIGITAL INPUTS (folder with "Lit" label)					
dSd	Light relay enable from door switch. n = door open, light does not turn on; y = door open, light turns on (if it was off).	n/y	y		**2**	flag
dLt	Light relay disabling (switch off) delay (cell light). The cell light will remain on for dLt minutes after closing the door if the dSd parameter is set to do this.	0...31	0		**2**	min
OFL	Light switch always disables light relay. Enables switching off with light button even if the delay after closing the door set by dLt is active.	n/y	n		**2**	flag
dOd	Door switch switches off loads. When commanded by the digital input, programmed as door-switch, it stops all the loads when the door is opened and re-starts them when the door is closed (observing any timings in progress).	n/y	n		**2**	flag
dAd	Digital input activation delay	0...255	0		**2**	min

dCt	defrost relay	dty	compressor relay (in defrost mode)
0= compressor operating hours (DIGIFROST® method);	ON when dit is reached OFF when Pb2=dSt or for time (dEt)	0 = electrical defrosting; 1 = cycle reversing defrosting 2 = Free mode defrosting	OFF ON ON if requested by set point
1= Real time	ON when dit is reached OFF when Pb2=dSt or for time (dEt)	0 = electrical defrosting; 1 = cycle reversing defrosting 2 = Free mode defrosting	OFF ON ON if requested by set point
2 = compressor stop.	ON when compressor OFF OFF when Pb2=dSt or for time (dEt)	0 = electrical defrosting; 1 = cycle reversing defrosting 2 = Free mode defrosting	OFF **NOT RECOMMENDED!!!** ON if requested by set point
3= With RTC.	ON in dd and Fd OFF when Pb2=dSt or for time (dEt)	0 = electrical defrosting; 1 = cycle reversing defrosting 2 = Free mode defrosting	OFF ON ON if requested by set point

PAR.	DESCRIPTION	RANGE	DEFAULT	VALUE*	LEVEL**	U.M.
	LINK CONTROLLER (folder with "Lin" label)					
L00	Master, Slave, Keyboard Selection Selects the instrument as Master (0), Slave (from 1 to 7), Echo (0, in this case the Echo serves as a repeater for the Master even if connected to a Slave).	0...7	0		**2**	num
L01	Number of Slaves in the Network Refers to Master only. Number of Slaves connected in network (from 0 to 7). For Slaves/Echoes leave value =0	0...7	0		**2**	num
L03	Sequential /Contemporary Defrost Refers to Master and Slave. Master: y = contemporary; n = sequential. Slave: y = accept; n = ignore.	n/y	n		**2**	flag
L04	Distributed Display Refers to Slave only. Distributed display. n = Slave displays local values; y = Slave displays Master display	n/y	y		**2**	flag
L05	Network Command Enabled Refers to Master and Slave. Master: n = does not ask Slaves to activate remote functions; y = asks Slaves to activate remote functions. Slave: n = ignores activation of remote functions from Master; y = accepts activation of remote functions from Master.	n/y	n		**2**	flag
L06	Resources Lock At End Of Defrost Locks resources (compressor/fans, etc) at the end of defrosting. n=no; y=yes N.B: related to Ldd parameter which has priority over L06 (see)	n/y	y		**2**	flag
L07	Alarm Relay with slave Alarm Alarm relay activated if slave alarm is generated	n/y	y		**2**	flag
L08	Network Command Enabled from Slave Network function enabled from slave	n/y	y		**2**	flag
L09	Control Probe Sharing. Master probe shared (n=no, y=yes)	n/y	n		**2**	flag
	NIGHT/DAY CONTROL (night and day) (folder with "nad" label, parameters E00...E03) **SEE Event table (NIGHT AND DAY) for day0, day1, day2, day3, day4, day5, day6 and every day**					
	NIGHT/DAY CONTROL (night and day) (folder with "nad" label)					
E00	Functions enabled during events: 0 = control disabled. 1 = reduced set point; 2 = reduced set+light; 3 = reduced set+light+aux. 4= instrument off	0...4	0		**2**	num
E01	Hours/minutes of start of event. Sets start time of event. Starting from this time, the "NIGHT" mode will be enabled. The duration is determined by EO2.	0...23/0...59	0		**2**	hours/min
E02	Duration of event. Sets duration of event (for type of event, see E00)	0...99	0		**2**	hours
E03	Blocking/unblocking daily or festive defrosting. 1= "work days" defrost sequence defined by par. d0...d8; 0= "festive/holidays" defrost sequence defined by par. F0...F8; **N.B.: does not affect defrosting at intervals like Every Day event (same defrost sequence for festive/holidays).**	0/1	0		**2**	flag
	COMMUNICATION: FOLDER ONLY PRESENT IN LX **COMMUNICATION MODELS (folder with "Add" label)**					
dEA (!)	dEvice Address. Indirizzo dispositivo: indicates the device address to the management protocol.	0...14	0		1	num
FAA (!)	FAmily Address. Indirizzo famiglia: indicates the device family to the management protocol.	0...14	0		1	num
	DISPLAY (folder with "diS" label)					
LOC	(keyboard) LOCK. Keyboard locked. However, you can still access the parameter programming menu and modify parameters including the status of this parameter to allow keyboard unlocking. y = yes (keyboard locked); n = no.	n/y	n		1	flag
PA1	PAssword 1. When enabled (value is not 0) it represents the access button to level 1 parameters.	0...250	0		1	num
PA2***	PAssword 2. When enabled (value is not 0) it represents the access button to level 2 parameters.	0...255	0		**2**	num
ndt	number display type. Display with decimal point. y = yes (display with decimal point); n = no (only whole numbers).	n/y	n		1	flag
CA1	CAlibration 1. Calibration 1. Positive or negative temperature value added to the value read by probe 1, based on "CA" parameter settings.	-12.0...12.0	0		1	°C/°F
CA2	CAlibration 2. Calibration 2. Positive or negative temperature value added to the value read by probe 2, based on "CA" parameter settings.	-12.0...12.0	0		1	°C/°F
CA3	CAlibration 3. Calibration 2. Positive or negative temperature value added to the value read by probe 3, based on "CA" parameter settings.	-12.0...12.0	0		1	°C/°F
CA	CAlibration Intervention. Intervention of offset on display, thermostat control or both. 0 = only modifies the temperature displayed; 1 = adds to the temperature used by controllers, not the temperature displayed that remains unchanged; 2 = adds to temperature displayed that is also used by controllers.	0/1/2	2		**2**	num
LdL	Low display Label. Minimum value the instrument is able to display. High display Label.	-55.0...302	-50.0		**2**	°C/°F
HdL	Maximum value the instrument is able to display.	-55.0..302	140.0		**2**	°C/°F
ddL	defrost display Lock. Display mode during defrosting. 0 = displays the temperature read by the thermostat control probe; 1 = locks the reading on the temperature value read by thermostat control probe when defrosting starts until the next time the Set point value is reached; 2 = displays the label "deF" during defrosting until the next time the Set point value is reached (or until Ldd expires).	0/1/2	1		1	num
Ldd	Lock defrost disable. Time-out value for unlocking display (dEF label) if reaching the set point takes too long during defrosting or if the Link (Master-Slave) communication fails (E7 error)	0...255	0		1	min
dro (°)	display read-out. Select °C or °F to display temperature read by probe. 0 = °C, 1 = °F. **N. B: switching from °C to °F DOES NOT modify set points, differentials, etc. (for example set point=10°C becomes 10°F).**	0/1	0		1	flag
ddd	Selection of the value type to be displayed. 0 = Set point 1 = probe 1 (thermostat control); 2 = probe 2 (evaporator); 3 = probe 3 (display)	0/1/2/3	1		**2**	num

(°) The mathematical conversion for temperature is °F=(9/5)* °C+32. For example: 32°F=0°C; 50°F=10°C. Wwhen changing from °C to °F or vice versa the mathematical conversion is NOT performed and the set point values, differentials, etc. are NOT modified. All the temperature values set will therefore need reviewing. e.g. with a set point set to 10°C, when changing the value to °F the set point will become 10°G=F and not 50°F (according to conversion table)

PAR.	DESCRIPTION	RANGE	DEFAULT	VALUE*	LEVEL**	U.M.
	CONFIGURATION (folder with "CnF" label)					
H00	Selection NTC/PTC probe 0=PTC 1=NTC	0/1	0		1	flag
H02	Button activation time if buttons are configured for a second function. For the ESC, Up and DOWN buttons configured for a second function (defrost, aux, etc) the time for quick enabling is set. Aux is an exception and has a set time of 1 second	0...15	5		**2**	sec
H06	button/aux input/door switch light active when instrument is off (but powered)	n/y	y		**2**	flag
H08	Stand-by operating mode. 0= only display switched off; 1= display on and controllers locked; 2= display off and controllers locked;	0/1/2	2		**2**	num
H11 (4)	Configuration of digital inputs/polarity. (4) WARNING! positive or negative values change polarity 0 = disabled; 7 = stand-by (ON-OFF) 1 = defrost; 8 = maintenance request **(LX models only)** 2 = reduced set; 9 = minimum pressure switch 3 = auxiliary; 10 = maximum pressure switch 4 = door switch 11 = general pressure switch 5 = external alarm 12 = preheating 6 = not used 13 = evaporator fan forcing	-13...13	4		**2**	num
H12 (4)	Configuration of digital inputs/polarity. Same as H11	-13...13	0		**2**	num
H21 (!)	Digital output configurability 1. (C) 0 = disabled; 1 = compressor; 2 = defrost; 3 = fans; 4 = alarm; 5 = auxiliary. 6 = stand-by 7 = light 8 = buzzer 9 = not used 10 = not used	0...10	7		**2**	num
H22 (!)	Digital output configurability 2. (B) Same as H21.	0...10	2		**2**	num
H23 (!)	Digital output configurability 3. (D) Same as H21.	0...10	3		**2**	num
H24 (!)	Digital output configurability 4. (A) Same as H21.	0...10	1		**2**	num
H25	Buzzer output enable Same as H21	0...10	0		**2**	num
H31 (!)	UP button configurability. 0 = disabled; 1 = defrost; (default) 2 = auxiliary; 3 = reduced set point; 4 = not used 5 = not used 6 = light; 7 = stand-by; 8 = maintenance request **(LX models only)** 9 = not used	0...9	1		**2**	num
H32 (!)	DOWN button configurability. Same as H31. (0 = disabled; default)	0..9	6		**2**	num
H33 (!)	ESC button configurability. Same as H31. (0 = disabled; default)	0...9	7		**2**	num
H41	Presence of control probe. n= not present; y= present.	n/y	y		**2**	flag
H42	Presence of Evaporator probe. n= not present; y= present.	n/y	y		**2**	flag
H43	Display probe configuration. n= not present; y= present (display probe);	n/y	n		**2**	flag
PEn	Number of errors allowed per maximum/minimum pressure	0...15	10		1	num
PEI	switch input Error count range	0...99	60		1	min
reL	reLease firmware. Device version: read only parameter.	/	/		1	/
tAb	tAble of parameters. Reserved: read only parameter.	/	/			
	COPY CARD (folder with "Fpr" label)				1	/
UL	Up load. Transfer of programming parameters from instrument to Copy Card.	/	/		1	/
dL	Down load. Transfer of programming parameters from Copy Card to instrument.	/	/		1	/
Fr	Format. Cancels all data entered in the copy card. **Fr parameter N.B.: if "Fr" parameter (formatting of copy card) is used the data entered in the card will be permanently lost. This operation cannot be undone.**	/	/		1	/

label PA2
In the CnF folder you can access all level 2 parameters from label PA2 by pressing the "set" button
SEE paragraph 2) Displaying level 2 parameters

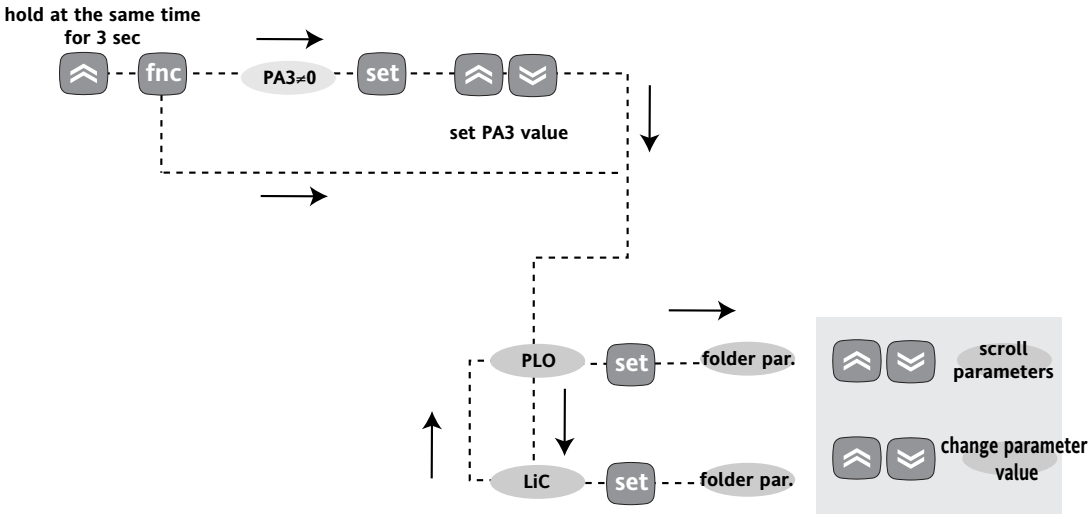
Table of Parameters NOTES

(1) See Duty Cycle diagram
(2) See Max/Min. Alarm Diagram
(3) Refers exclusively to high and low temperature alarms
(4) WARNING! positive or negative values change polarity Positive values: active input when the contact is closed; negative values: active input when contact is open.

In the deF folder there are two folders: "dd" (daily defrost) and "Fd" (Festive Defrost); the first folder includes the parameters dE1...dE8 (start of daily defrost) and the second folder includes the parameters F1...F8 (start of festive defrost). The two folders are only visible if dit =3 and RTC is present. If dit=0 defrosting is NEVER performed (manual defrosting is also not possible).
NOTE: DO NOT confuse the days d0...d6 related to the nad folder with dE1...dE8 daily defrost

* VALUE column: to be compiled manually with any custom settings (if different from default value).
** LEVEL column: indicates the visibility level of parameters accessed using a PASSWORD (see relevant paragraph)
**** PA2 is visible (or will be requested, if specified) at level 1 **in the CnF folder** and can be set (modified) at level 2 **in the diS folder**
(!) CAUTION!
• If one or more parameters marked with (!) are modified, the controller must be switched off after the modification and then switched back on
•**NOTE**: We strongly recommend that you switch the instrument off and on again each time parameter configuration is changed in order to prevent malfunctioning of the configuration and/or ongoing timings.

KEYBOARD LOCAL PARAMETER MENU DIAGRAMS



Tab. 2 Keyboard local parameters table

PARAMETER	DESCRIPTION	RANGE	DEFAULT*	U.M.
	ECO (folder with "PLO" label)			
ECO	Type of keyboard 0= Master keyboard 1= ECO keyboard	0...1	0	num
adb	address base. Address base	0...4	0	num
PA3	Keyboard PAssword. When enabled (value is not 0) it represents the access button for the local keyboard parameters.	0...255	0	num
bE	Buzzer enable n=not enabled; y=enabled	n/y	n	flag
rEL	reLease firmware. Device version: read only parameter. timeout Address.	0...999	0	num
toA	Timeout of address tbA.	0...250	1	min
	LiC (folder with "LiC" label)			
Li1	Broadcast communication n= the keyboard communicates with the address base adb (see par.) (in this case, there are several bases); y= the keyboard communicates with the broadcast address base (in this case there must only be one base).	n/y	n	num
tbA	Temporary navigation base address. Temporary address for network navigation. -1=disabled	-1...4	0	num

* DEFAULT column: The term default identifies the standard factory-set configuration;

(!) CAUTION!
• We strongly recommend that you switch the instrument off and on again each time parameter configuration is changed in order to prevent malfunctioning of the configuration and/or ongoing timings.

“dd” and ”Fd” folders

0In the deF folder there are two folders: “dd” (daily defrost) and “Fd” (Festive Defrost); the first folder includes the parameters dE1...dE8 (start of daily defrost) and the second folder includes the parameters F1...F8 (start of festive defrost). The two folders are only visible if dit =3 and RTC is present. **If dit=0 defrosting is NEVER performed (manual defrosting is also not possible).**
dE1...dE8 daily defrost start time 1...8. Range 0...23, 24= off (default) F1...F8 festive defrost start time 1...8. Range 0...23, 24= off (default)
CAUTION: d1...d8, F1...F8 parameters are visible only if dCt=3 with clock option present. They are included in the dd and Fd folders.

TAb. 4a “dd” daily defrost start time

PAR.	DESCR.	RANGE	DEFAULT	CUSTOM	U.M.	LEVEL
dE1	**Time1**	00-24, 00-59	24.00*		hours/min	1
dE2	**Time2**	00-24, 00-59	24.00*		hours/min	1
dE3	**Time3**	00-24, 00-59	24.00*		hours/min	1
dE4	**Time4**	00-24, 00-59	24.00*		hours/min	1
dE5	**Time5**	00-24, 00-59	24.00*		hours/min	1
dE6	**Time6**	00-24, 00-59	24.00*		hours/min	1
dE7	**Tilme7**	00-24, 00-59	24.00*		hours/min	1
dE8	**Time8**	00-24, 00-59	24.00*		hours/min	1

* 24=disabled

Tab 4b “Fd” Festive defrost start time

PAR.	DESCR.	RANGE	DEFAULT	CUSTOM	U.M.	LEVEL
F1	**Time1**	00-24, 00-59	24.00*		hours/min	1
F2	**Time2**	00-24, 00-59	24.00*		hours/min	1
F3	**Time3**	00-24, 00-59	24.00*		hours/min	1
F4	**Time4**	00-24, 00-59	24.00*		hours/min	1
F5	**Time5**	00-24, 00-59	24.00*		hours/min	1
F6	**Time6**	00-24, 00-59	24.00*		hours/min	1
F7	**Tilme7**	00-24, 00-59	24.00*		hours/min	1
F8	**Time8**	00-24, 00-59	24.00*		hours/min	1

* 24=disabled

Tab. 5 Event Table

NIGHT/DAY CONTROL (night and day)
(folder with “nad” label)
Event table (NIGHT AND DAY) for day0, day1, day2, day3, day4, day5, day6, and Every day

For every day of the week d0...d6 (Sunday...Saturday) the Event parameters E00...E03 can be displayed/set. (see also nad diagram)
Compile the CUSTOM column manually with the required settings for each day of the week.

d0 Day 1 Sunday

PARAMETER	DESCRIPTION	RANGE	DEFAULT	CUSTOM	U.M.
E00	**Functions enabled during events** Functions enabled during events: 0 = control disabled. 1 = reduced set point; 2 = reduced set+light; 3 = reduced set+light+aux. 4= instrument off	0...4	0		num
E01	**Event Start hours/minutes** Hours/minutes of start of event. Sets start time of event. Starting from this time, the “NIGHT” mode will be enabled. The duration is determined by EO2.	0...23/0...59	0		hours/min
E02	**Event Duration** Duration of 1st event. Sets the duration of the event.	0...99	0		hours
E03	**Daily or Festive Defrost Block** Blocking/unblocking daily or festive defrosting. NOTE: does not affect defrosting at intervals like Every Day event	0/1	0		flag

d1 Day 2 Monday

PARAMETER	DESCRIPTION	RANGE	DEFAULT	CUSTOM	U.M.
E00	**Functions enabled during events** Functions enabled during events: 0 = control disabled. 1 = reduced set point; 2 = reduced set+light; 3 = reduced set+light+aux. 4= instrument off	0...4	0		num
E01	**Event Start hours/minutes** Hours/minutes of start of event. Sets start time of event. Starting from this time, the “NIGHT” mode will be enabled. The duration is determined by EO2.	0...23/0...59	0		hours/min
E02	**Event Duration** Duration of 1st event. Sets the duration of the event.	0...99	0		hours
E03	**Daily or Festive Defrost Block** Blocking/unblocking daily or festive defrosting. NOTE: does not affect defrosting at intervals like Every Day event	0/1	0		flag

d2 Day 3 Tuesday

PARAMETER	DESCRIPTION	RANGE	DEFAULT	CUSTOM	U.M.
E00	**Functions enabled during events** Functions enabled during events: 0 = control disabled. 1 = reduced set point; 2 = reduced set+light; 3 = reduced set+light+aux. 4= instrument off	0...4	0		num
E01	**Event Start hours/minutes** Hours/minutes of start of event. Sets start time of event. Starting from this time, the “NIGHT” mode will be enabled. The duration is determined by EO2.	0...23/0...59	0		hours/min
E02	**Event Duration** Duration of 1st event. Sets the duration of the event.	0...99	0		hours
E03	**Daily or Festive Defrost Block** Blocking/unblocking daily or festive defrosting. NOTE: does not affect defrosting at intervals like Every Day event	0/1	0		flag

d3 Day 4 Wednesday

PARAMETER	DESCRIPTION	RANGE	DEFAULT	CUSTOM	U.M.
E00	**Functions enabled during events** Functions enabled during events: 0 = control disabled. 1 = reduced set point; 2 = reduced set+light; 3 = reduced set+light+aux. 4= instrument off	0...4	0		num
E01	**Event Start hours/minutes** Hours/minutes of start of event. Sets start time of event. Starting from this time, the "NIGHT" mode will be enabled. The duration is determined by EO2.	0...23/0...59	0		hours/min
E02	**Event Duration** Duration of 1st event. Sets the duration of the event.	0...99	0		hours
E03	**Daily or Festive Defrost Block** Blocking/unblocking daily or festive defrosting. NOTE: does not affect defrosting at intervals like Every Day event	0/1	0		flag

d4 Day 5 Thursday

PARAMETER	DESCRIPTION	RANGE	DEFAULT	CUSTOM	U.M.
E00	**Functions enabled during events** Functions enabled during events: 0 = control disabled. 1 = reduced set point; 2 = reduced set+light; 3 = reduced set+light+aux. 4= instrument off	0...4	0		num
E01	**Event Start hours/minutes** Hours/minutes of start of event. Sets start time of event. Starting from this time, the "NIGHT" mode will be enabled. The duration is determined by EO2.	0...23/0...59	0		hours/min
E02	**Event Duration** Duration of 1st event. Sets the duration of the event.	0...99	0		hours
E03	**Daily or Festive Defrost Block** Blocking/unblocking daily or festive defrosting. NOTE: does not affect defrosting at intervals like Every Day event	0/1	0		flag

d5 Day 6 Friday

PARAMETER	DESCRIPTION	RANGE	DEFAULT	CUSTOM	U.M.
E00	**Functions enabled during events** Functions enabled during events: 0 = control disabled. 1 = reduced set point; 2 = reduced set+light; 3 = reduced set+light+aux. 4= instrument off	0...4	0		num
E01	**Event Start hours/minutes** Hours/minutes of start of event. Sets start time of event. Starting from this time, the "NIGHT" mode will be enabled. The duration is determined by EO2.	0...23/0...59	0		hours/min
E02	**Event Duration** Duration of 1st event. Sets the duration of the event.	0...99	0		hours
E03	**Daily or Festive Defrost Block** Blocking/unblocking daily or festive defrosting. NOTE: does not affect defrosting at intervals like Every Day event	0/1	0		flag

d6 Day 7 Saturday

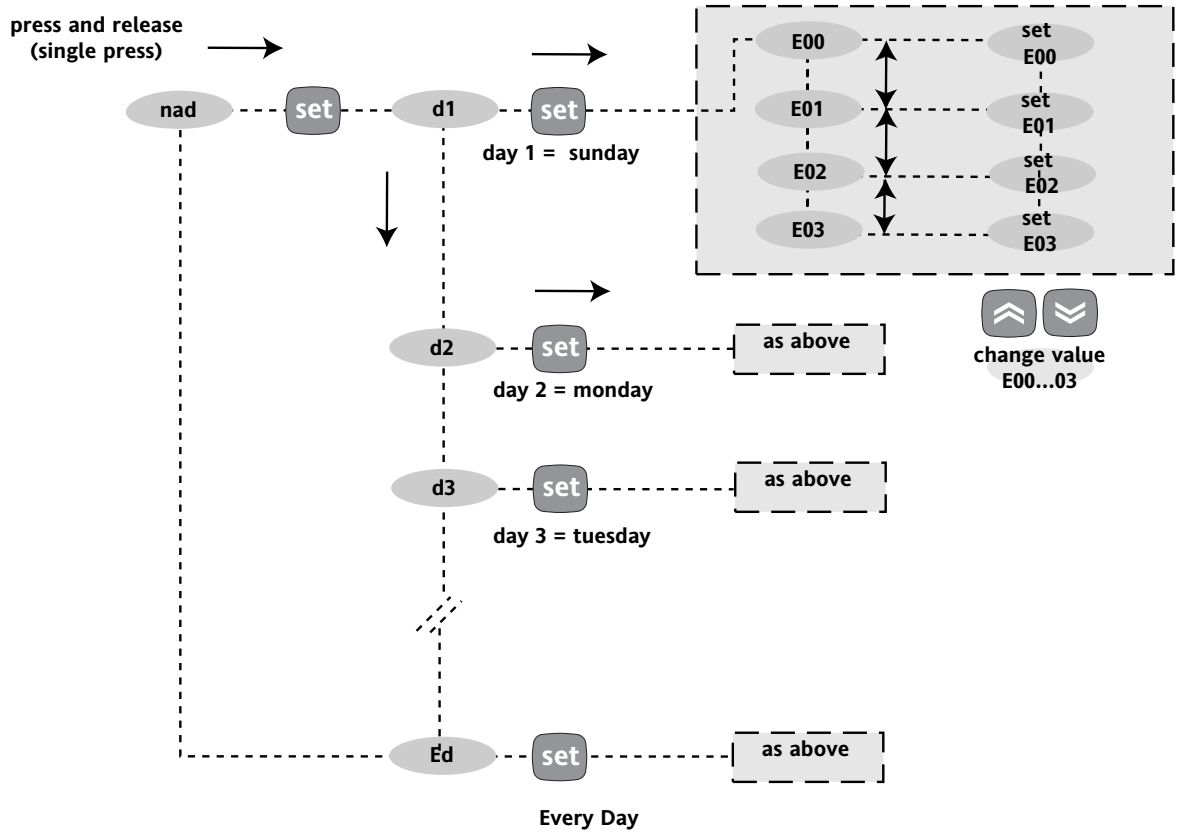
PARAMETER	DESCRIPTION	RANGE	DEFAULT	CUSTOM	U.M.
E00	**Functions enabled during events** Functions enabled during events: 0 = control disabled. 1 = reduced set point; 2 = reduced set+light; 3 = reduced set+light+aux. 4= instrument off	0...4	0		num
E01	**Event Start hours/minutes** Hours/minutes of start of event. Sets start time of event. Starting from this time, the "NIGHT" mode will be enabled. The duration is determined by EO2.	0...23/0...59	0		hours/min
E02	**Event Duration** Duration of 1st event. Sets the duration of the event.	0...99	0		hours
E03	**Daily or Festive Defrost Block** Blocking/unblocking daily or festive defrosting. NOTE: does not affect defrosting at intervals like Every Day event	0/1	0		flag

Every Day

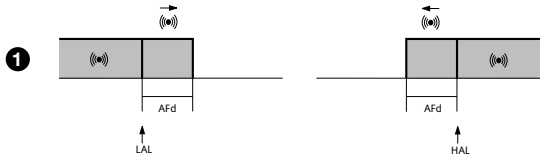
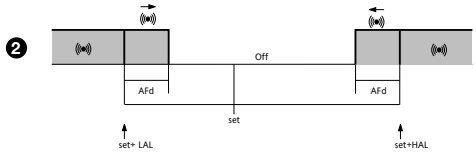
PARAMETER	DESCRIPTION	RANGE	DEFAULT	CUSTOM	U.M.
E00	**Functions enabled during events** Functions enabled during events: 0 = control disabled. 1 = reduced set point; 2 = reduced set+light; 3 = reduced set+light+aux. 4= instrument off	0...4	0		num
E01	**Event Start hours/minutes** Hours/minutes of start of event. Sets start time of event. Starting from this time, the "NIGHT" mode will be enabled. The duration is determined by EO2.	0...23/0...59	0		hours/min
E02	**Event Duration** Duration of 1st event. Sets the duration of the event.	0...99	0		hours
E03	**NOT USED**	-	-		-

NOTE: All the parameters in the folders day0, day1, day2, day3, day4, day5, day6 and Every Day are displayed at level 2.

nad (night and day) DIAGRAM



MINIMUM/MAXIMUM ALARM DIAGRAM — DUTY CYCLE DIAGRAM

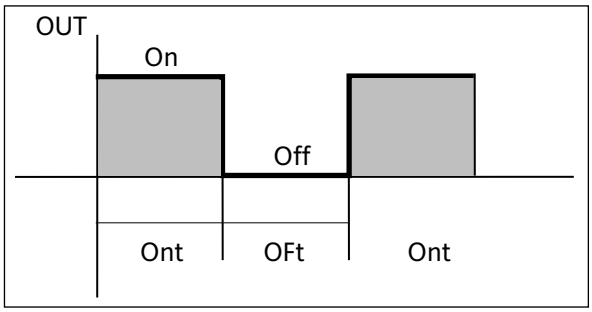
	Temperature expressed as an absolute value (par "Att"=0) Abs(olute)	Temperature expressed in relation to set point (par "Att"=0) reL(ative)
	❶ 	❷ 
Minimum temperature alarm	Temperature lower than or equal to LAL (LAL with sign)	Temperature lower than or equal to set point+LAL (LAL only positive)
Maximum temperature alarm	Temperature higher than or equal to HAL (HAL with sign)	Temperature higher than or equal to set point+HAL (HAL only positive)
Minimum temperature alarm back swing	Temperature higher than or equal to LAL+AFd	Temperature higher than or equal to set point + LAL + AFd set point -|LAL|+AFd
Maximum temperature alarm back swing	Temperature lower than or equal to HAL-AFd	Temperature lower than or equal to set point+HAL-AFd
		if Att=reL(ative) LAL must be negative: therefore set point+LAL<set point because set point+(-|LAL|)=set point-|LAL|

Duty Cycle Diagram

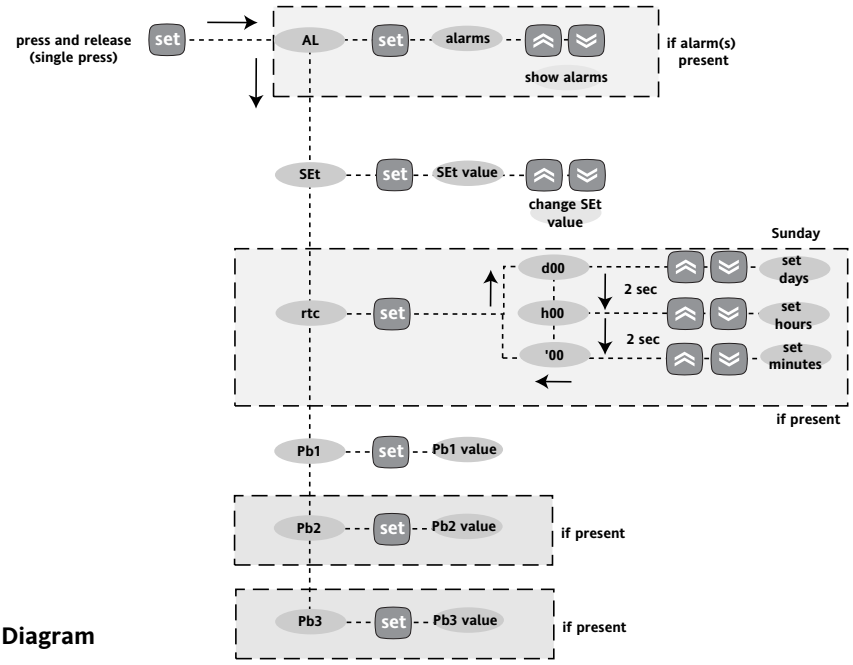
Ont, OFt parameters programmed for Duty Cycle

Ont	OFt	Compressor output
0	0	OFF
0	>0	OFF
>0	0	ON
>0	>0	dc

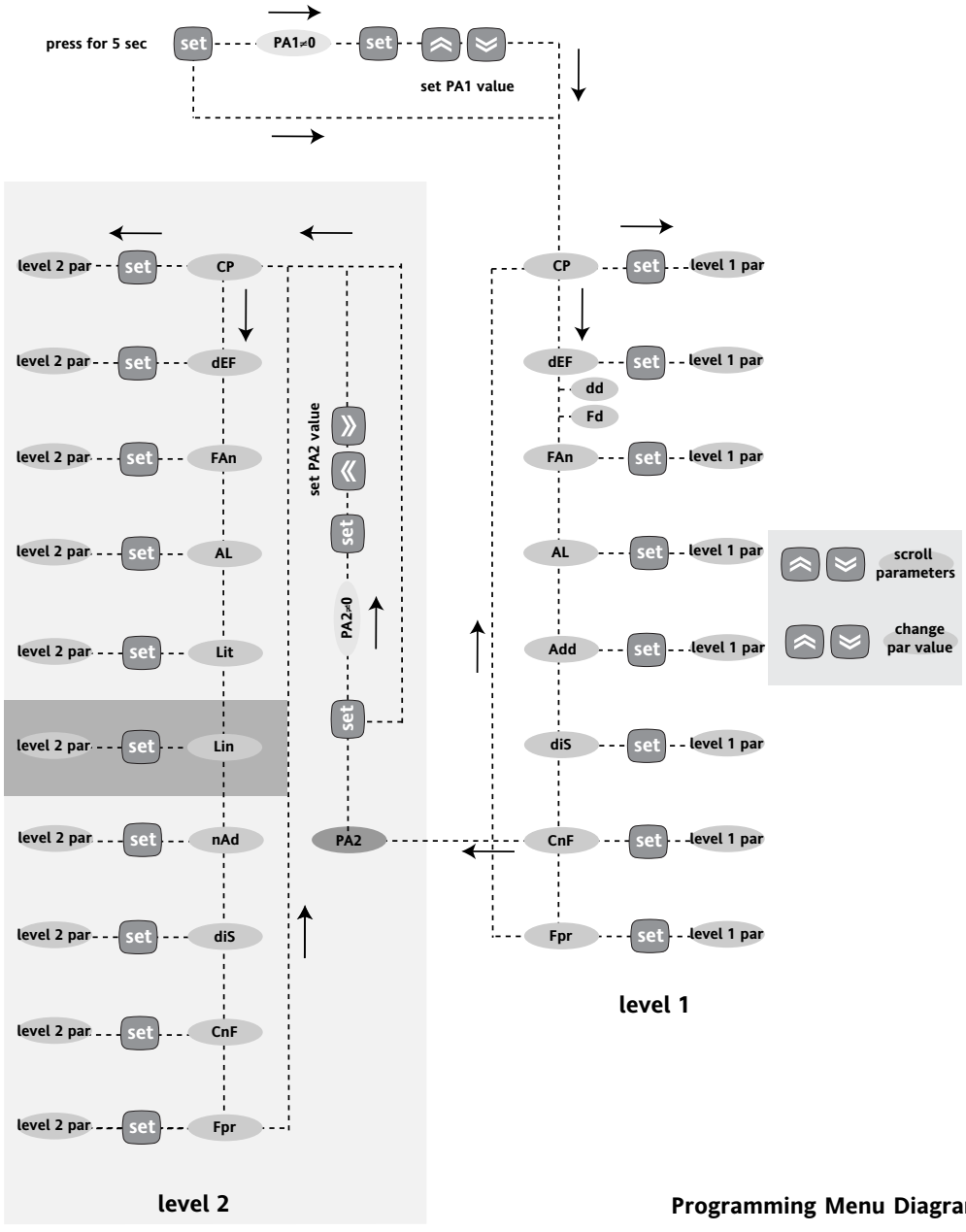
The error condition for probe 1 (compressor) causes the following:
- E1 code appears on display
- the controller is activated as indicated by the "Ont" and "OFt" parameters if programmed for the duty cycle



MACHINE STATUS AND PROGRAMMING MENU DIAGRAMS

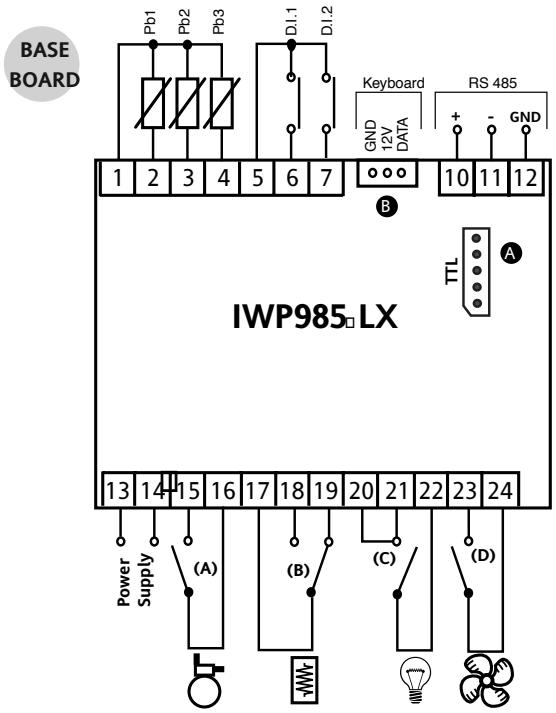


Machine Status Menu Diagram



Programming Menu Diagram

IWP 985 (LX) BASE BOARD CONNECTIONS



TERMINALS

1-2	Pb1 probe input
1-3	Pb2 probe input
1-4	Pb3 probe input
5-6	Digital input 1
5-7	Digital input 2
10-12	RS485 serial connection to Televis
13-14	Power supply 230Vac
15-16	N.O. relay output (C) see par. H21 (compressor default)
17-18	N.O. relay output (B) see par. H22 (defrost default)
17-19	N.C. relay output (B) see par. H22 (defrost default)
20-22	N.O. relay output (D) see par. H23 (light default)
23-24	relay output (A) see par. H24 (fan default)

A	Input for Copy Card
B	DATA;GND;12V

NOTE: BASE UNIT/KEYBOARD CONNECTION/PROGRAMMING.

1 — THE BASE UNIT/KEYBOARD PROGRAMMING/CONFIGURATION CANNOT BE CARRIED OUT IF THE DEVICES ARE CONNECTED TO THE LINK NETWORK. THEREFORE, IT IS FIRST NECESSARY TO CONFIGURE THE MASTER AND SLAVE DEVICES (WITH RELATED KEYBOARDS) AND THEN CONNECT THEM TO THE LINK NETWORK.

2 — "FLICKERING" OF THE DISPLAYS ON THE KEYBOARD INDICATES THAT THE CONNECTED UNITS ALL HAVE THE SAME ADDRESS: DISCONNECT THE LINK NETWORK AND PROGRAM EACH UNIT AS DESCRIBED ABOVE.

NOTE: The technical characteristics in this document concerning measurements (range, accuracy, resolution, etc.) refer to the instrument in the strictest sense and not to any accessories provided such as probes, for example. This means that an error introduced by the probe is added to any error that is in the instrument.

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• use on boards which do not guarantee adequate protection against electric shock, water or dust when assembled;
• use on boards which allow dangerous parts to be accessed without the use of tools;
• tampering with and/or alteration of the product;
• installation/use on boards that do not comply with the standards and regulations in force.

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