ID 985 LX HG(/C/CK)

cod. 9IS54010
rel. 4/05

GB

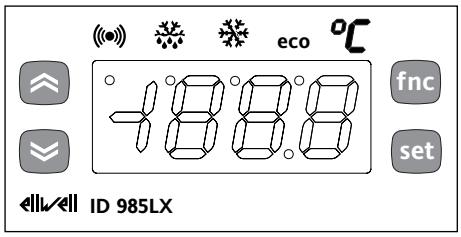
electronic controllers for "ventilated" refrigeration units

USER INTERFACE

The user has a display and four buttons that can be used to control the status of the device and program it.

BUTTONS AND MENUS

UP Button		Scrolls through the menu items Increases the values Activates manual defrosting (see H31 parameter)
DOWN button		Scrolls through the menu items Decreases the values Parameter programmable (see H32 parameter)
fnc button		ESC function (quit) Parameter programmable (see H33 parameter)
Set point button		Accesses the set point Accesses the Menus Confirms the commands Displays the alarms (if active) Stores hours/min



At start-up the instrument performs a Lamp Test; the display and LEDs flash for a few seconds to check that they are working correctly. The instrument has two main menus: the Machine Status menu and the Programming menu.

LEDS

Position	Associated function	Status
ECO/ °C	Set point/Reduced set point (set point	ON for parameter programming level 2 blinking when reduced set point is entered (ON for setting set point)
❄	Compressor or relay 1	ON for compressor on; blinking for protection delay or enabling blocked
❄	Defrost	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	aux	ON when auxiliary output is operating
o	decimal point	ON when instrument is on stand-by

ACCESSING AND USING MENUS

The resources are arranged in a menu that can be accessed by pressing and quickly releasing the "set" button (Machine Status menu) or holding down the "set" button for more than 5 seconds (Programming menu).
To access the contents of each folder indicated by the relevant label, just press the "set" button once.
You can now scroll through the contents of each folder, modify it or use its functions.

If the keyboard is not used for more than 15 seconds (timeout) or the "fnc" button is pressed once, the last value shown on the display is confirmed and the display returns to the previous screen.

MACHINE STATUS MENU
(See Machine Status Menu Diagram)

To access the Machine Status menu, press the "set" button and quickly release it.
If no alarms are present, the label "SEt" appears. By using the "UP" and "DOWN" buttons you can scroll through the other folders in the menu:
-AL: alarm folder (if alarms present, except for faulty probes/probe errors;
-SEt: Setpoint setting folder.
-rtc (/C, /CK models): real time clock folder;
-Pb1: probe 1 value folder;
-Pb2: probe 2 value folder;
-Pb3: probe 3 value folder (if present);

Set Setting

Access the "Machine Status" menu, press the "set" button and quickly release it. The "Set" folder label appears. To display the Set point value, press the "set" button again.
The Set point value appears on the display. To change the Set point value, use the "UP" and "DOWN" buttons within 15 seconds.
If the parameter is LOC = y the Set point cannot be changed.

Real Time Clock (/C /CK models)

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 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 the keyboard is not used for more than 15 seconds (timeout) or the "fnc" button is pressed once, the last value shown on the display is confirmed and the display returns to the previous screen.
NOTE: Always use the "set" button to confirm the hours/minutes/days setting.
NOTE2: We recommend considering the first day d00 as SUNDAY.

Alarm on

If an alarm condition exists when the Machine Status menu is accessed the "AL" folder label appears (see section on "Diagnostics").

Displaying probes

If you press the "set" button when the corresponding label appears, the value of the probe associated with it is displayed.

PROGRAMMING MENU
(See Programming Menu Diagram)

<u>1) Displaying level 1 parameters</u>

To access the Programming menu, hold the "set" button for more than 5 seconds. If specified, the level 1 access PASSWORD will be requested (see parameter "PA1") and (if the password is correct) the label of the first folder will appear. If the password is incorrect, the display will show the PA1 label again. Use the "UP" and "DOWN" buttons to scroll through the other folders; **the folders will only display level 1 parameters**.
NOTE: at this point level 2 parameters are NOT visible even if NOT password-protected.

<u>2) Displaying level 2 parameters</u>

Go to the "CnF" folder in the Programming Menu and scroll down the

parameters until you reach the PA2 label. By pressing and releasing the "set" button you will enter the level 2 parameters and the label of the first folder in the programming menu will appear.
Level 2 parameters can be protected by a second password (see "PA2" parameter in the "diS" folder, which is different from the PA2 label in the "CnF" folder). If specified, level 2 parameters are not visible to the user. To access the "CnF" folder, users will have to insert the level 2 access PASSWORD. If the correct password is entered, the label of the first folder in the programming menu displays.
NOTE: At this point the folders will only display all the level 2 parameters. Therefore level 1 parameters will only be visible if you quit the Programming Menu and repeat procedure 1).
To open 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.
PLEASE NOTE: We strongly recommend that you switch the device off and on again after changing the configuration of parameters to prevent configuration problems and/or ongoing timings.

PASSWORD
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 ≠0) and assign them the desired value, access the Programming menu in the "diS" folder. If passwords are enabled, they will be requested:
- Use PA1 to open the Programming menu (see the "Programming Menu" section);
- Use PA2 in the "Cnf" folder containing the level 1 parameters.

ACTIVATING MANUAL DEFROST CYCLE
To activate the defrost cycle manually, press the "UP" button (if configured =1) for 5 seconds.
If the right defrosting conditions are not present (the temperature of the evaporator probe is higher than the end of defrost temperature, for example) or parameter OdO≠0, the display will flash three (3) times to indicate that the operation will not be performed.

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 parameter)
This command can be used to format the copy card. This operation **must** be performed when it is used for the first time or used with models that are not compatible.
Warning: When the copy card has been programmed, all the data entered is cancelled when the "Fr" parameter is used. 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.
These operations can be performed by accessing the folder with the "FPr" label and selecting the "UL", "dL" or "Fr" commands. The operation is confirmed when you press the "set" button. If the operation is successful, a "y" is displayed whereas if it is unsuccessful an "n" will be displayed.
Download "from reset"
Connect the copy card with the instrument OFF. Programming parameters are downloaded when the device is switched on. At the end of the lamp test, the following messages are displayed for about 5 seconds:
• Label dLY if copy operation is successful
• Label DLn if operation fails
PLEASE NOTE:
• After the parameters have been downloaded, the device uses the downloaded parameter map settings.

DISTANCE-MANAGED SYSTEMS
The Televis remote control systems can be connected using the TTL serial port (the TTL- RS 485 BUS ADAPTER 130 interface module must be used).
To configure the instrument to do this, you need to access the "Add" folder and use the "dEA" and "FAA" parameters.

KEYBOARD LOCKED
Keyboard operating can be locked by programming the "Loc" parameter (see folder with "diS" table).
If the keyboard is locked you can access the Programming Menu by pressing the "set" button. The Set point can also be displayed.

ADVANCED FUNCTIONS

DOOR SWITCH INPUT
This is a clean contact digital input with programmable polarity. The door switch input functions are controlled by the values of the following parameters:

Par	Description
dOd	Digital input switches off loads
dAd	D.I. activation delay
OAOE	Alarm signal delay after disnabling the digital input (door closed)
tdO	Time out door open. Time out signalled when D.I is enabled (door open)
dOA	Forced behaviour from digital input
PEA	Enables forced behaviour from door switch and/or external alarm
dCO	Delay in enabling compressor with consensus
dFO	Delay in enabling fans with consensus
H11	Digital output configurability/polarity 1
H21...H25	Digital output configurability 1...5

If activation state forcing is enabled (dOA is not 0), the compressor and/or fan outputs can be activated when the time set in parameters dCO and dFO expires.

Parameter H11 is used to configure the digital input with values between -9 and +9. Positive and negative values are used to select the polarity assigned to the input and:
NOTE: the sign "-" indicates that the input is activated when the contact is closed.
The '+' sign indicates that the input is activated when the contact is open

LINK (for /CK models only)
The Link function is used to connect up to 8 instruments (1 Master device and 7 slave and echo devices). The distance between one device and another must be 7 metres maximum whereas the maximum distance between the first and last instrument in the network must be approximately 50m.
PLEASE NOTE: the serial link between the devices is powered.
Master
Instrument that controls the networks and sends commands to the Slaves. The Master is selected using parameter L00 (the value 0 defines the Master)
Slave
Instrument(s) supplied with own controls that also perform(s) commands issued by the Master (with parameters L00..L07).
Echo
Instrument(s) that only display(s) the values of the instrument that it is associated with (it does not therefore have its own I/O resources but only serves as a repeater).
PLEASE NOTE: only one Echo can be connected to the same instrument (Master or Slave; if it is connected to a Slave, you must set parameter L04=n).

Defrosting
The Link network controls defrosting. The Master sends the defrost command which can be performed synchronously (at the same time) or sequentially (one defrost after another) without affecting the normal protections or delays for each instrument (see parameter L03).
The Master can also activate the functions associated with buttons or the Digital Input for all the Slaves: switching lights on/off, alarm silencing, auxiliary set point, auxiliary relay, stand-by (on/off) and functions related to Night & Day controller (see parameter L05).
Other Functions
The Master can also synchronize the displays on the Slave or Echo devices with the display on the Master or a Slave (for the Echo devices) (see parameter L04).
NOTE: synchronized defrosting refers to actual defrosting and not to dripping and subsequent defrosting. The defrost LED on the Slave units blinks when synchronized defrosting has terminated and the Slaves are waiting for the thermostat control to be enabled by the Master.
The functions are associated with the instruments by correctly setting the parameters (see the parameter table for the "Lin" label folder)

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 holidays) to be enabled for each day of the week.
By pressing the "set" button when the "lad" label appears, the label d0**(day 1) displays in the "Programming" menu. Tip: consider d0 = Sunday)**. use the"UP" and "DOWN" buttons to set the other days **(d1 (day 2 = Monday)...d6 (day 7 = Saturday))** and Every Day. By pressing "ENTER" 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)

ADJUSTMENT OF HOT GAS
The instrument can be used to select different types of defrosting with the parameter **dty, defrost type**.
(defrost execution mode).
The dty parameter can have these values:
0 = electrical defrosting; the compressor is turned off.
1 = Defrost with cycle reversal (hot gas, not to be mixed with HOT GAS, see paragraph 3); the compressor continues running.
2 = "Free" mode defrost (compressor disabled).
3 = Hot gas defrost **(HOT GAS);** even in this case the compressor continues running.

The hot gas defrost adjustment (HOT GAS) is performed using the 4 digital outputs (relays) R1...R4 ... and can be divided in 3 or 8 steps, depending on whether R1=ON or OFF:

A. (R1=OFF) OPERATION WITHOUT COLD REQUEST
The defrost request occurs when valve R1 is off. R2 is immediately enabled and the defrost input is immediate.
A request is to be intended as manual request.
After the defrost is stopped by the probe (within the limits of parameter ndt) or due to a timeout (par.dEt), dripping occurs (par.dt). Then, the device returns to the ordinary operating mode and it is possible to switch R4 on if the temperature controller requests so and R1 is above PdC.
• **Phase 1: defrost request (defrost)**
compressor status control with defrost input: pause before the enabling of the defrost input due to the operation of the compressor.
The tcd parameters (Minimum On or OFF compressor time before defrost) and **Cod** (Compressor off (before) defrost) are managed in this phase. OFF compressor time before defrost cycle.
PLEASE NOTE: These parameters must be set to 0.
If the fans are off, they are started depending on the setting of parameter FdC.
If the fans were running, they are maintained on for the FdC time, then the defrost is started. In this phase, fans must switch off as soon as the defrost temperature (par.FSt) is reached.
• **Phase 2: temperature is reached.**
NOTE: It is possible to define a minimum duration for the defrost (see parameter ndE).
Fans switch ON, depending on the largest delay value (dt and Fdt).
In this phase, fans must stop when they reach the preset temperature.
NOTE: Parameter Fdt will start to decrease at the end of the defrost.
• **Phase 3: by-pass**
The bypass time can be set with parameter dt.
You can use parameter bPS to specify if the fans have to stay on during the dt time.
If the fans are forced to ON, they must stop as soon as the preset temperature (par. FSt) is reached.
Parameters Fdt and dt are related: priority is given to the highest value.
• **Phase 4: suction solenoid ON**
After this interval of time has expired, the suction solenoid relay is ALWAYS switched on, even if no cold is requested.
If cold is requested, the compressor will ALWAYS switch on after the time specified for parameter PdC.
NOTE: During phases 1-4, fans are NOT dependant on parameter FCO.

B. (R1=on)OPERATION WITH COLD REQUEST
The defrost request is issued when valve R1 is on, R1 is switched off, R4 is switched off after period FdC, in accordance with the stop procedures, R2 is enabled and the defrost starts. After this phase, operation is the same as illustrated in example 1.
• **Phase 1: suction solenoid ON**
The suction solenoid is always switched to ON, even if no defrost is requested.
• **Phases 2-3: cold request**
• **Phase 4: defrost request (defrost)**
See paragraph A, phase 1, defrost request.
• **Phase 5: defrost**
The suction solenoid switches off after the delay specified for FdC.
If the fans are running during the defrost, they must stop as soon as the preset temperature is reached;
• **Phase 6: by-pass**
see paragraph related to phase 3 bypass

• **Phase 7: suction solenoid ON**
• **Phase 8: cold request**
R1 waits for time PdC to expire.
This time is loaded afer dt only.
Fans switch ON, depending on the largest delay value (dt and Fdt).
In this phase, fans must stop when they reach the preset temperature.
NOTE: Parameter H45 (see related chapter) can be used to specify the setting for the probe (2 or 3) used to adjust the exit from defrost. Default =0 (probe 2), customized setting=1 (probe3))

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 device display as E1, E2, and E3 respectively.

Operation diagram for HOT GAS defrost (HG)

R1 Liquid solenoid (compressor)
R2 Hot gas solenoid (defrost)
R4 Suction solenoid
R3 Evaporator fan (fan)

A. Defrost request when R1= OFF (compressor off)
B. Defrost request when R1=ON (on)

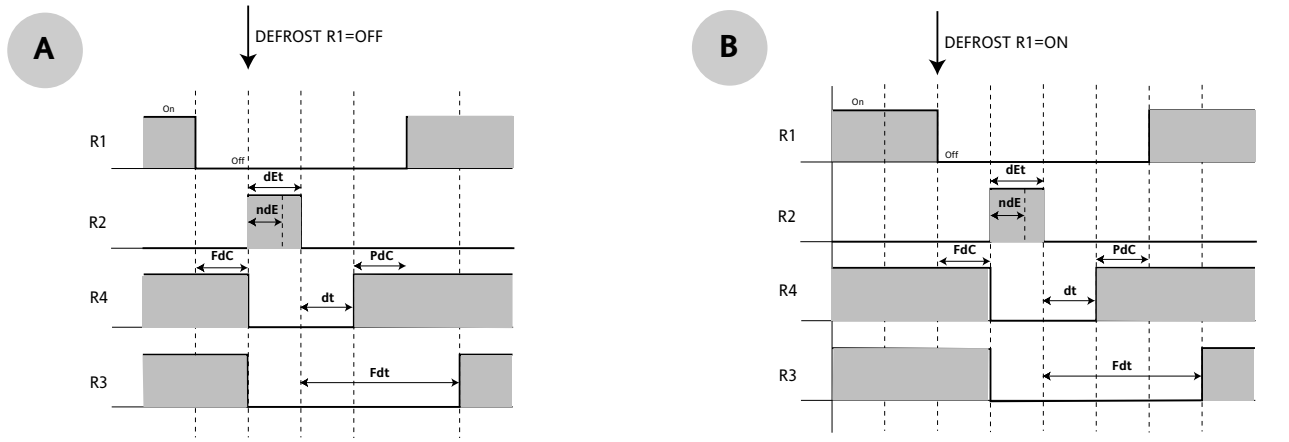


Table of faulty probes

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

If simultaneous, they will be shown on the display alternately every 2 seconds

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: The error condition for probe 2 (evaporator) causes the following:

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

• E2 code appears on display
• End of defrost due to time-out The error condition for probe 3 (display) causes the following:
• E3 appears on the display. Other alarms signals do not appear directly on the display of the device, but can be viewed by selecting the "Machine Status" menu in the "AL" folder. The minimum and maximum temperature alarm refers to the temperature control probe (probe 1) and/or the display probe (probe 3). Temperature limits are defined by parameters "HAL" (maximum alarm), "LAL" (minimum alarm) and PbA (configuration of alarm on probe 1,3 or both).

MAXIMUM AND MINIMUM TEMPERATURE ALARM

If an alarm condition occurs and alarm exclusion times are not running (see alarm exclusion parameters), the alarm icon lights up permanently and the relay 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. If the alarms are relative (Att=1), the parameter HA1 is set to positive values and LA1 to negative values.
This alarm condition can be viewed in the folder "AL" with 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 for probe 3: for delays and back-swings, refer to standard alarms

DEFROST ALARM

If the defrost stops due to a timeout (instead of being stopped by the detection of the end defrost temperature), an alarm is generated and the icon lights up.
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, a buzzer (if present) and the relay configured as alarm are activated and the compressor, defrost and fan controllers are deactivated according to the value of the **rLO** parameter):

Value	Description
0	no resources are disabled
1	disables compressor and defrosting
2	disables compressor, defrosting and fans

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, the Open Door alarm is signalled in response to a delay defined by the tdO parameter.
The alarm is signalled by the flashing alarm icon.
This alarm condition can be viewed in the "AL" folder with the label "Opd".
NOTE: Do not set parameter tAo to zero when the door is closed since if the door is continually opened and closed, any alarms would never be signalled.

LINK ALARM

If there is a master/slave/echo communication failure, the No Link alarm is signalled. 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.

Table of alarms

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 (/CK model)
E10	Clock battery alarm (/C or /CK models)

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

MECHANICAL MECHANICAL ASSEMBLY

The unit has been designed for panel-mounting. Drill a 29x71 mm hole, insert a tool and fix it in place with the brackets provided. Do not assemble the instrument in excessively humid or dirty locations since it is designed to be used in locations with normal levels of pollution.

Always make sure that the area next to the unit cooling slits is adequately ventilated.

ELECTRICAL ELECTRICAL CONNECTIONS

Warning! Always switch off machine before working on electrical connections.

The instrument has screw terminals 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 (N.B. extending the probes affects the electromagnetic compatibility (EMC) of the device. special care must be used when wiring).
Probe cables, power supply cables and the TTL serial cable should be kept separate from power cables.

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 suitably protected from water and dust according to the specific application and only be accessible using special tools (except for the front keypad).
The device can be fitted to equipment for household use and/or similar use in the refrigeration sector and has been tested with regard to safety in accordance with the European harmonized reference standards:
It is classified as follows:
• as an automatic electronic control device to be independently mounted as regards its construction;
• 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.

RESPONSIBILITIES AND RESIDUAL RISKS

Eliwell & Controlli S.r.L. shall not be liable for any damages deriving from:
- installation/use other than that prescribed and, in particular, which does not comply with the safety standards specified in the regulations and/or those given herein;
- 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.

TECHNICAL DATA

Front protection: IP65.
Casing: PC+ABS UL94 V-0 resin plastic body, polycarbonate front, thermoplastic resin buttons.
Dimensions: front 74x32 mm, 60 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.
Analogue inputs: three PTC or NTC inputs (parameter-selectable).
Digital inputs: 2 voltage-free parameter-configurable digital inputs.
Serial: TTL for Televis or Copy Card connection.
Digital outputs: 4 outputs on relays: first output (A) SPDT 8(3)A 250V~, second and third output (B-C) SPST 8(3)A 250V~, fourth output (D) SPST 5(2)A 250V~.
Link: Link network output (**FOR /CK MODEL ONLY)**
Measurement range: from –55 a 140 °C.
Accuracy: better than 0.5% of bottom scale +1 digit.
Resolution: 1 or 0.1 °C.
Consumption: 3 VA.

Power supply: 12 V~/⎓ ±10% 50/60 Hz
Caution: check the power supply specified on the instrument label; for information on relay capacity and power supplies contact the Sales Office).

MODELS AVAILABLE

Model	Characteristics
ID 985LX HG	Base model with hot gas defrost (Hot Gas) without LINK and CLOCK Base model with hot gas
ID 985LX HG/C	defrost (Hot Gas) without LINK and with CLOCK Base model with hot gas defrost (Hot Gas) with
ID 985LX HG/CK	LINK and CLOCK

N.B.:
HG = HOT GAS
C= CLOCK (CLOCK)
K=LINK

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, for example, that an error introduced by the probe is added to any error that is typical of the device.

Tab. 1 Table of parameters

****PLEASE 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.**

PAR.	DESCRIPTION	RANGE	DEFAULT	VALUE*	LEVEL**	U.M.
	COMPRESSOR CONTROLLER (folder with "CP" label)					
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	2	1	°C/°F
HSE	Higher SEt. Maximum possible set point value.	LSE..302	50.0	18	1	°C/°F
LSE	Lower SEt. Minimum possible set point value.	-55.0...HSE	-50.0	-22	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 using a specially configured button.	-30.0...30.0	0	-10	**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	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	0	**2**	min
	COMPRESSOR PROTECTIONS (folder with "CP" label)					
Ont	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	10	1	min
OFt	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	5	1	min
dOn	delay (at) On compressor. Delay in activating compressor relay after switch-on of instrument.	0...250	0	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	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	1	min
OdO (!)	delay Output (from power) On. Delay time in activating outputs after the start of the device or after a power failure. 0= not active.	0...250	0	1	1	min
	DEFROSTING CONTROLLER (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). 3 = Hot gas defrost (hot gas)	0/1/2/3	0 (std. model) **3 (/HG model)**	0 (std. model) **3 (/HG model)**	1	num
dit	defrost interval time. Period of time between the start of two defrost operations. **0= function disabled (defrost is NEVER performed)**	0...250	6h	0	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	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	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. Defrost at times set by dE1...dE8, F1...F8	0/1/2/3 **(0=df, digifrost 1=rt, real time, 2=SC, stop compressor 3=RTC)**	1	3	1	num
"dd" (1)	dE1...dE8 parameters daily defrost start time 1...8. Range 0...23, 24= off (default)	0...23/0...59	24	24	1	hours/min
"Fd" (1)	F1...F8 festive defrost start time 1...8. Range 0...23, 24= off (default) The d1...d8, F1...F8 parameters are only visible if dit=0, dCt=3 with clock option present. They are included in the dd and Fd	0...23/0...59	24	24	1	hours/min
dOH	defrost Offset folders. Start of defrost delay time from start-up of instrument.	0...59	0	0	1	min
dEt	defrost Endurance time. Defrosting time-out; determines maximum duration of defrosting. **NOTE: Defrost does not stop if a minimum defrost time has been set. See also ndE**	1...250	30min	25min	1	hours/min/sec (see dt2)
dSt	defrost Stop temperature. Defrosting end temperature (determined by evaporator probe). **NOTE: Defrost does not stop if a minimum defrost time has been set. See also ndE**	-50.0... 150	8.0	12	1	°C/°F
dPO	defrost (at) Power On. Determines if the instrument must start defrost 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	n	1	flag
ndE	This parameter enables to specify a minimum duration for defrost (unless external alarms occur (with EAL=1, see) or device stop), even if the temperature measured on the evaporator is above dSt (see). If the parameter is set to 0, the function is disabled.	0...250	0	0	1	hours/min/sec
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	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. If =0 function is stopped.	0...60	0	0	**2**	min
	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	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	8	1	°C/°F

PAR.	DESCRIPTION	RANGE	DEFAULT	VALUE*	LEVEL**	U.M.
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 do not start. 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	-50	**2**	°C/°F
FAd	FAn differential. Fan activation intervention differential (see par. "FSt" and "Fot").	1.0...50.0	2.0	4	1	°C/°F
Fdt	Fan delay time. Delay time between start-up of fan after defrosting.	0...250	0	1	1	min
dt	drainage time. Dripping time.	0...250	0	2	1	min
dFd	defrost Fan disable. Used to select exclusion of evaporator fans during defrosting. y = yes; n = no.	n/y	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	**n**	**n**	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	n	**2**	flag
FdC	Fan delay Compressor off. Fan switch off delay time after compressor stop. In minutes. 0= Function excluded	0..99	0	1	**2**	min
PdC	Compressor start time/start valve suction valve. This parameter enables to set the start delay of the compressor when the suction solenoid valve is started (provided that the valve stays on for the whole duration of PdC). If this parameter is set to 0, the function is disabled.	0...250	1	1	1	min
Fon	Fan on (in duty cycle). Fan ON time for duty cycle. Use of fans in duty cycle mode; valid for FCO = d.c. and H42=1 (probe 2 (evaporator) present)	0..99	0	0	1	min
FoF	Fan oFF (in duty cycle). Fan OFF time for duty cycle. Use of fans in duty cycle mode; valid for FCO = dc and H42=1 (probe 2 present) (evaporator)).	0..99	0	0	1	min
bPS	Fans ON during dt (bypass) time. This parameter can be used to decide if the fans are ON (n=No, y=Yes (si)) during the bypass phase (see Hot Gas algorithm).	n/y	n	n	1	flag
	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	1	**2**	flag
AFd	Alarm differential. Alarm differential.	1.0...50.0	2.0	4	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	9	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	-2	1	°C/°F
PAO (!) (3)	Power-on Alarm Override. Alarm exclusion time after instrument start-up, after a power failure.	0...10	0	1	1	hours
dAO	defrost Alarm Override. Alarm exclusion time after defrost.	0..999	0	60	1	min
OAO	Alarm signal delay after disabling digital input (door open). Alarm refers to a high and low temperature alarm.	0...10	0	0	1	hours
tdO	time out door Open. Time out after alarm signal following digital input disabling (door open).	0...250	0	2	**2**	min
tAO (3)	temperature Alarm Override. Temperature alarm signal delay time.	0...250	0	30	**2**	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	y	1	flag
rLO	Controllers disabled by external alarm: 0=Does not block resources 1=Blocks compressor and defrost 2=Blocks compressor, defrost and fans.	0/1/2	2	2	**2**	
AOP	Alarm Output Polarity. Polarity of alarm output. 0 = alarm active and output disabled; 1 = alarm active and output enabled.	0/1	1	0	**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 (thermostat control and display) on external threshold	0...3	0	0	**2**	min
SA3	Probe 3 alarm set point (display)	-50.0...150.0	50.0	150	**2**	°C/°F
dA3	Probe 3 alarm differential (display)	-30.0...30.0	2.0	2	**2**	°C/°F
	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	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	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	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	n	**2**	flag
dAd	Digital input activation delay (digital input)	0...255	0	0	**2**	min
dOA	Status forced by digital input 0=No enabling 1=Compressor enabling 2=Fan enabling 3=Compressor and fan enabling	0/1/2/3	0	0	**2**	num
PEA	Enables forced behavior from door light and/or external alarm 0=Disabled 1=Linked to door lamp 2=Linked to external alarm 3=Linked to door lamp and external alarm	0/1/2/3	0	0	**2**	num
dCO	Delay in enabling compressor with consensus	0...250	0	0	**2**	min
dFO	Delay in enabling fans with consensus	0...250	0	0	**2**	min
L00	**(FOR MODELS /CK ONLY) LINK CONTROLLER (folder with "Lin" label)** 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	1	**2**	num

PAR.	DESCRIPTION	RANGE	DEFAULT	VALUE*	LEVEL**	U.M.
L01	Refers to Master only. Number of Slaves in network (from 0 to 7). Per Slaves/Echoes leave value =0	0...7	0	0	**2**	num
L02	Presence of local Echoes referring to single Slave. 0 = Local echo not present; 1 = Echo present and shares the Slave display at a set rate; if Master or Slave, it determines if the device is active and shares its local display at a set rate. 2 = the Echo shows the display of the associated Slave (Slave and associated Echo must have the same address L00). If it is directly connected to the Master, it displays the Master display.	0/1/2	0	0	**2**	num
L03	Refers to Master and Slave. Simultaneous/sequential defrosting. Master: n = simultaneous; y = sequential. Slave: n = ignore; y = accept.	n/y	n	n	**2**	flag
L04	Refers to Slave only. Distributed display. n = the Slave displays local values; y = the Slave displays Master display	n/y	y	n	**2**	flag
L05	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	n	**2**	flag
L06	Locks resources (compressors, fans, etc) at the end of defrosting. n=no; y=yes NOTE: related to Ldd parameter which has priority over L06 (see)	n/y	y	n	**2**	flag
	(FOR /C /CK MODELS ONLY) DAY/NIGHT CONTROLLER (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	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	0	**2**	hours/min
E02	Duration of event. Sets duration of event (for type of event, see E00)	0...99	0	0	**2**	hours
E03	Blocking/unblocking daily or holidays defrosting. 0= "work days" defrost sequence defined by par. dE1...dE8; 1= "festive/holidays" defrost sequence defined by par. F0...F8; **N.B.: does not affect timed defrosting like Every Day (same defrost sequence for working days/holidays).**	0/1	0	0	**2**	flag
	COMMUNICATION (folder with "Add" label)					
dEA (!) (4)	Device address in family (values ranging from 0 to 14)	0...14	0	0	1	num
FAA (!) (4)	Device family (values ranging from 0 to 14)	0...14	0	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	n	1	flag
PA1	PAssword 1. When enabled (value is not 0) it represents the access key to level 1 parameters.	0...250	0	0	1	num
PA2***	PAssword 2. When enabled (value is not 0) it represents the access key to level 2 parameters.	0...255	0	0	**2**	num
ndt	number display type. Display with decimal point. y = Yes (display with decimal point); n = No (only integer numbers).	n/y	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	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	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	0	1	°C/°F
CA	CAlibration Intervention. Offset intervenes 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	**2**	num
LdL	Low display Label. Minimum value the instrument is able to display.	-55.0...302	-50.0	-50	**2**	°C/°F
HdL	High display Label. Maximum value the instrument is able to display.	-55.0..302	140.0	140	**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	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	60	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	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	1	**2**	num
	CONFIGURATION (folder with "CnF" label)					
H00 (5)	(!) Selection of probe type, PTC or NTC. 0 = PTC; 1 = NTC.	0/1	1	1	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	5	**2**	sec
H06	button/aux input/door switch light active when instrument is off (but powered)	n/y	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	**2**	num
H11 (6)	Configuration of digital inputs/polarity. 0 = disabled; 1 = defrosting; 2 = reduced set; 3 = Auxiliary 4 = Door micro 5 = external alarm *6 = Disables storage of HACCP alarms (*only in HACCP models) 7 = Standby (ON-OFF) 8 = Maintenance request	-8...8	0	2	**2**	num
H12 (6)	Configuration of digital inputs/polarity. Same as H11 (7) WARNING! positive or negative values change polarity	-8...8	0	0	**2**	num

PAR.	DESCRIPTION	RANGE	DEFAULT	VALUE*	LEVEL**	U.M.
H21 (!)	Digital output configurability 2. (B) 0 = Disabled; 1 = Compressor; 2 = Defrost; 3 = Fans; 4 = Alarm; 5 = Auxiliary. 6 = Standby 7 = Light 8 = Buzzer 9 = Suction solenoid	0...9	1	1	**2**	num
H22 (!)	Digital output configurability 1. (A) Same as H21. (2 = defrost; default)	0...9	2	2	**2**	num
H23 (!)	Digital output 3 configurability. (C) Same as H21.	0..9	3	3	**2**	num
H24 (!)	Digital output configurability 4. (D) Same as H21.	0...9	4	9	**2**	num
H25 (!)	**PARAMETER DISPLAYED ON THE MODELS WITH BUZZER**					
(7)	Buzzer output configurability. 0 = disabled; 8 = enabled (default) ; 1-7; 9 = not used	0...9	8	8	**2**	num
H31 (!)	UP button configurability. 0 = disabled; 1 = defrosting (default) 2 = auxiliary; 3 = reduced set point; *4 = reset HACCP alarm reset (*only in HACCP models); *5 = disables HACCP alarms (*only in HACCP models) 6 = light; 7 = stand-by; 8 = maintenance request	0...8	1	1	**2**	num
H32 (!)	DOWN button configurability. Same as H31. (0 = disabled; default)	0...8	0	0	**2**	num
H33 (!)	ESC button configurability. Same as H31. (0 = disabled; default)	0...8	0	0	**2**	num
H41	Presence of control probe. n= not present; y= present.	n/y	y	y	**2**	flag
H42	Presence of Evaporator probe. n= not present; y= present.	n/y	y	y	**2**	flag
H43	Presence of display probe. n= Not present; y= Display.	n/y	n	y	**2**	flag
H45	Configurability of the analog input used to adjust the defrost output 0 = Defrost exit on probe 2 (evaporator probe) 1 = Exist from defrost on probe 3 (display probe)	0/1	0	1	**2**	flag
reL	reLease firmware. Device version: read only parameter.	/	/	/	**2**	/
tAb	tAble of parameters. Reserved: read only parameter.	/	/	/	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**					
	COPY CARD (folder with "Fpr" label)					
UL	Up load. Transfer of programming parameters from instrument to Copy Card.	/	/	/	**2**	/
dL	Down load. Transfer of programming parameters from Copy Card to instrument.	/	/	/	**2**	/
Fr	Format. Cancels all data entered in the copy card. **N.B.: If "Fr" parameter (copy card formatting) is used, the data entered in the card will be permanently lost. This operation cannot be undone.**	/	/	/	**2**	/

*** CUSTOM SETTINGS**

(1) In the deF folder there are two folders: "dd" (daily defrost) and "Fd" (Festive Defrost); the first folder includes the parameters t 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 pres**DO NOT confuse the days d0...d6 related to the nad folder with dE1...dE8 daily defrost**

(2) If the alarms are relative, the parameter HA1 is set to positive values and LA1 to negative values.

(3) Refers exclusively to high and low temperature alarms

(4) The pair of values FAA and dEA represents the device network address and is indicated as "FF.DD" (where FF=FAA and DD=dEA).

(5) For information on the NTC/PTC probe, see label on device.

(6) Positive values: active input when the contact is closed; negative values: active input when contact is open. WARNING! positive or negative values change polarity;

(7) Parameter can be seen in models with optional buzzer.

*** VALUE column: CUSTOMIZED SETTINGS FOR HOT GAS**

** 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**

(!) WARNING!

• If one or more parameters marked with (!) are modified, the controller must be switched off after the modification and then switched back on

•**PLEASE NOTE**: We strongly recommend that you switch the device off and on again after changing the configuration of parameters to prevent configuration problems and/or ongoing timings.

•**folder with "nad" label NIGHT/DAY CONTROL (night and day) FOR /C, /CK MODELS ONLY**

•**folder with "Lin" label LINK CONTROLLER FOR /CK MODELS ONLY**

Duty Cycle Diagram

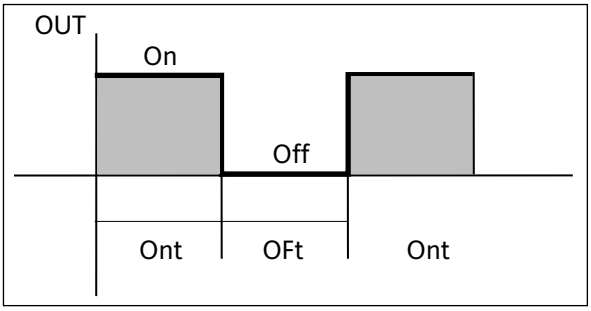
Ont, OFt parameters programmed for Duty Cycle

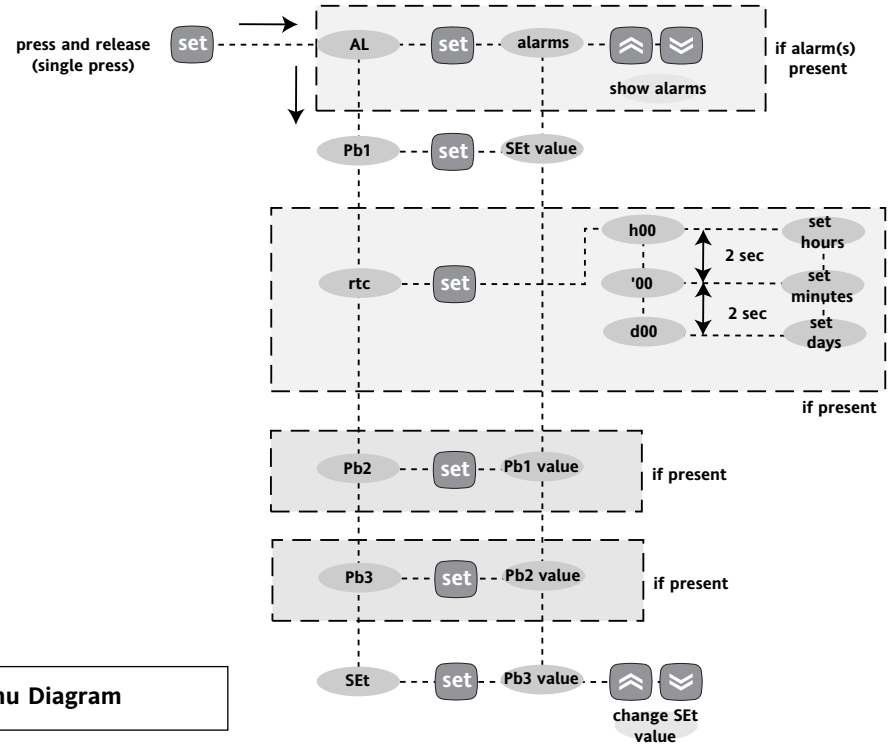
Ont	OFt	Compressor output
0	0	OFF
0	>0	OFF
>0	0	ON
>0	>0	D.C.

The error condition for probe 1 (compressor) causes the following:

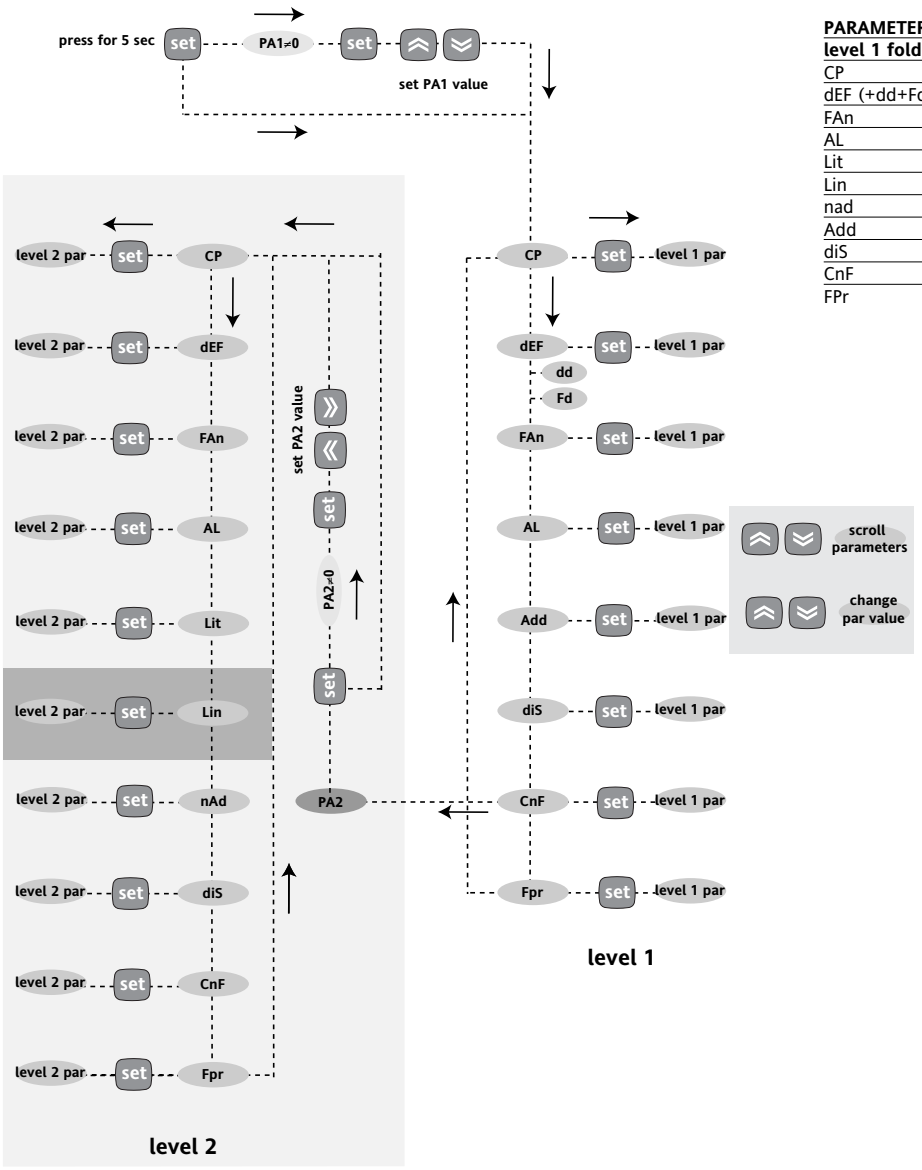
• E1 code appears on display

• The controller is activated as indicated by the "Ont" and "OFt" parameters if programmed for the duty cycle





Machine Status Menu Diagram



PARAMETERS

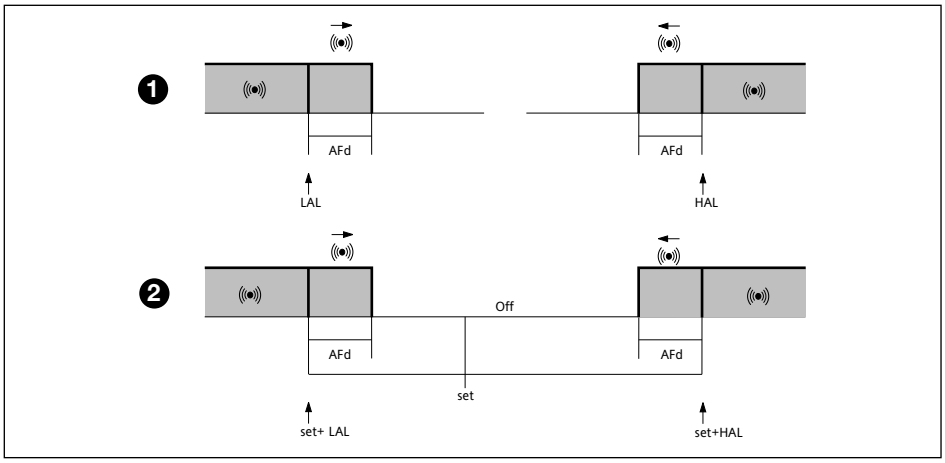
level 1 folders	level 2 folders
CP	CP
dEF (+dd+Fd)	dEF
FAn	FAn
AL	AL
Lit	-
Lin	-
nad	-
Add	Add
diS	diS
CnF	CnF
FPr	FPr

Programming Menu Diagram

Max/Min. Alarm Diagram (minimum and maximum temperature)

The maximum temperature alarm occurs when the probe temperature is:
(1) higher than or equal to HAL if Att=Ab(solute)
(2) higher than or equal to Set + HAL if Att=rEl(ative)

• If Att=Abs(olute) HAL must be with a sign
• If Att=rEL(ative) HAL can only be positive



The minimum temperature alarm occurs when the probe temperature is:
(1) lower than or equal to LAL if Att=Ab(solute)
(2) lower than or equal to Set + LAL if Att=rEl(ative)

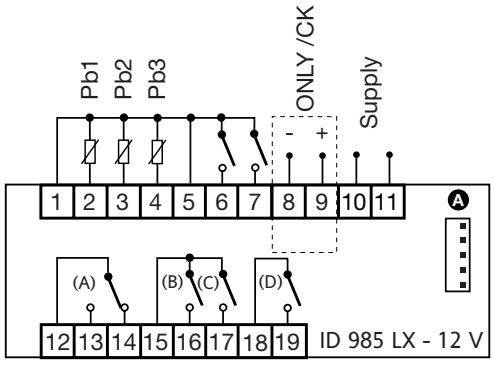
• If Att=Abs(olute) LAL must be with a sign
• If Att=rEL(ative) LAL can only be negative*

The maximum temperature alarm back swing occurs when the probe temperature is:
(1) lower than or equal to HAL - AFd if Att=Ab(solute)
(2) lower than or equal to + HAL- AFd if Att=rE(lative)

The minimum temperature alarm back swing occurs when the probe temperature is:
(1) higher than or equal to LAL + AFd if Att=Ab(solute)
(2) greater than or equal to set + LAL + AFd if Att=rE(lative)
* (set -|LAL|+AFd)

***NOTE: if Att=rEL(ative) LAL must be negative: therefore set point+LAL<set point because set+(-|LAL|)=set-|LAL|**

Wiring Diagram



TERMINALS

STANDARD CONFIGURATION

1 - 2	Probe input 1 (thermostat control)
1 - 3	Probe input 2 (evaporator)
*1 - 4	Probe input 3 (display)
5 - 6	Digital input 2
5 - 7	Digital input 1
8 - 9	Link (powered; 8=-, 9=+) (FOR**/CK** MODEL ONLY)
10 - 11	Power supply
**12 - 13	N.O. defrost output (A)
12 - 14	N.C. defrost output (A)
15 - 16	N.O. compressor relay (B)
15 - 17	N.O. fan output (C)
18 - 19	N.O. alarm relay (D)
A	TTL input for Copy Card And for the connection to the Televis system

CONFIGURATION OF I/O FOR HOT GAS

*1 - 4	Probe input 3 (display)
**12 - 13	N.O. solenoid output for hot gas; see paragraph H22=2
**12 - 14	N.C. bypass contact
**15 - 16	N.O. solenoid output for liquid; see paragraph H21=1
**15 - 17	N.O. evaporator fan output; see par. H23=3
**18 - 19	N.O. solenoid output for suction; see paragraph H24=9

NOTA:
***Available by default on CUSTOMIZED models**
****CUSTOMIZED SETTINGS FOR HOT GAS**

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