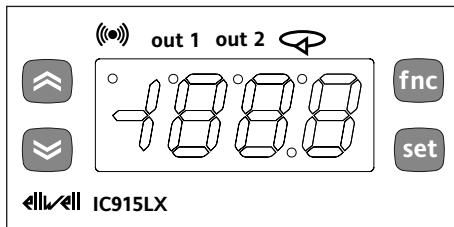




USER INTERFACE

The user has a display and four buttons for controlling instrument status and programming.



LEDs				
	out2	out1		°C
Alarm	out2	out1	ON when Set point is being set	Reduced set point
•ON for active alarm; •blinking when a silenced alarm is still present	Relay 2 (OUT2) ON for relay on (energized); blinking for protection delay or enabling blocked	Relay 1 (OUT1) ON for relay on (energized); blinking for protection delay or enabling blocked	(and Set point setting) blinking when Soft Start function is on	•ON to modify Set-Point; •blinking when reduced set point is entered
			Soft Start function is on	Set-point/ Set-point/

Scrolls through the menu items UP button
Increases the values
Parameter programmable (par. H31)



fnc button
ESC function (quit)
Parameter programmable (par. H33)

Scrolls through the menu items DOWN button
Decreases the values
Parameter programmable (par. H32)



Set point button
1-Accesses Machine Status Menu (SET POINTS, ACTIVE ALARMS, PROBE READING) and labels/values;
1-Accesses Programming Menu (PARAMETERS, COPY CARD) and relative labels/values;
3-Confirms commands

BUTTONS AND MENUS 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.

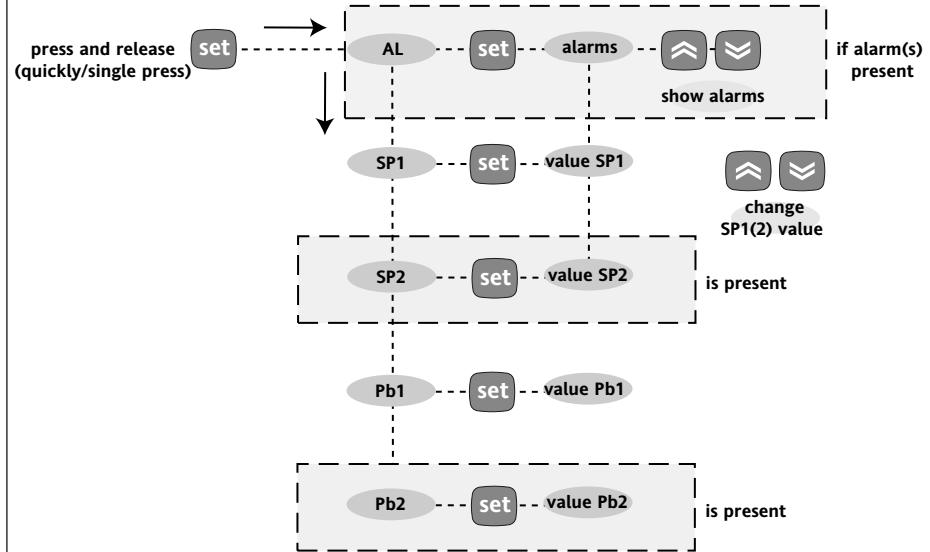
You can now scroll through the contents of each folder, modify it or use its functions. If you do not use the keyboard for over 15 seconds (time-out) or if you press the "fnc" button once, the last value shown on the display is confirmed and you are taken back to the previous screen mask.

-Pb1: probe 1 value folder;
-Pb2: probe 2 value folder;
The folders are present according to the presence and configuration of the associated resource.

Alarm on

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

MACHINE STATUS MENU DIAGRAM



MACHINE STATUS MENU

(See Machine Status Menu Diagram)

To access the Machine Status menu, press the "set" button and quickly release it.

The "SP1" label appears.

(If alarms are active, with the exception of faulty probes/probe errors, the "AL" label appears).

By using the "UP" and "DOWN" buttons you can scroll through the other folders in the menu: the folders are indicated below in the order they appear:

- SP1: Set point 1 setting folder or
- AL: alarm folder (if alarms present, with exception of faulty probes/probe errors);
- SP2: Set point 2 setting folder.

HOW TO SET THE SET POINTS

Setting Setpoint 1 (Setpoint 2)

Go to the "Machine Status" menu, press the "set" button and quickly release it. The "SP1" folder label appears.

(To set Set point 2 press the "UP" and "DOWN" buttons until "SP2" appears). To display the Set point 1 (2) value, press the "set" button again.

The Set point value appears on the display. To change the Set point 1 (2) value, press the "UP" and "DOWN" buttons within 15 seconds. If parameter LOC = y the Set points cannot be changed.

HOW TO DISPLAY THE TEMPERATURE READ BY PROBE(S)

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

ALARM PRESENT?

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

HOW TO LOCK THE KEYBOARD

Keyboard operating can be locked by programming the "LOC" parameter (see folder with "diS" table).

If the keyboard is locked you can only access the Programming MENU (see)

Functions CANNOT be activated with buttons (to silence alarms, for example) .

*FNC FUNCTION 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
Soft Start	Son	SoF**
Reduced set point	OSP	SP**
Controls blocked	bon**	boF
Periodic Cycle	con	coF
Aux	Aon	AoF
Stand-by	on**	oF
Maintenance request	Atn	AtF**

NOTE: In this case the UnP label is displayed (flashing)

**default

ADVANCED FUNCTIONS

DIFFERENTIAL AND SET POINT OFFSET ADJUSTMENT (see relevant paragraph)

SOFT START

Note: The SOFT START function is button, D.I. or function selectable.

The Soft Start controller can be used to set the temperature gradient required to reach a specific set point in a specific period of time.

This function automatically gives you a progressive increase of the control set point from the Ta value (ambient temperature at start-up) to the value actually displayed. This means that a rise in temperature can be immediately stopped and the risk of overshooting reduced. (continued on pg. 4)

USING 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

This command is used to format the copy card. This is **necessary** if:

- it is used for the first time,
- it is used with models that are incompatible,
- after use with a specific model if another model needs to be connected. 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 uploads 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 —> instrument**

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 unsuccessful an "n" will be displayed.

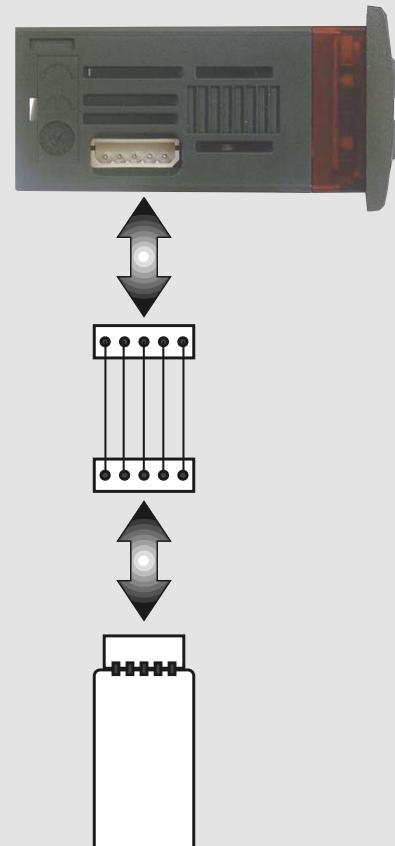
Download "from reset"

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

PLEASE NOTE:

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



PROGRAMMING MENU

(See Programming Menu Diagram)

1) Displaying level 1 parameters

To access the Programming menu, hold the "set" button for more than 5 seconds.

Level 1 parameters can be protected by a PASSWORD* (defined by parameter DIS/PA1). If the PASSWORD is enabled, the label "PA1" will appear when you access the **Programming Menu**; press the "set" button and the value "0" will appear; enter the password using the "UP"/"DOWN" buttons and press the "set" button again. This allows you to access the level 1 parameters.

The first folder that appears is "CP". 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.

2) Displaying level 2 parameters

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 "CP" label of the first folder in

the programming menu will appear.

The level 2 parameters can be protected by a second PASSWORD* (defined by parameter DIS/PA2).

(NOTE: not to be confused with the PA2 label in the "CnF" folder).

If the PASSWORD is enabled, the label "PA2" will appear in CnF/PA2 when you access the **Programming Menu**; press the "set" button and the value "0" will appear; enter the password using the "UP"/"DOWN" buttons and press the "set" button again. This allows you to access the level 2 parameters. The first folder that appears is "CP".

NOTE: At this level 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.

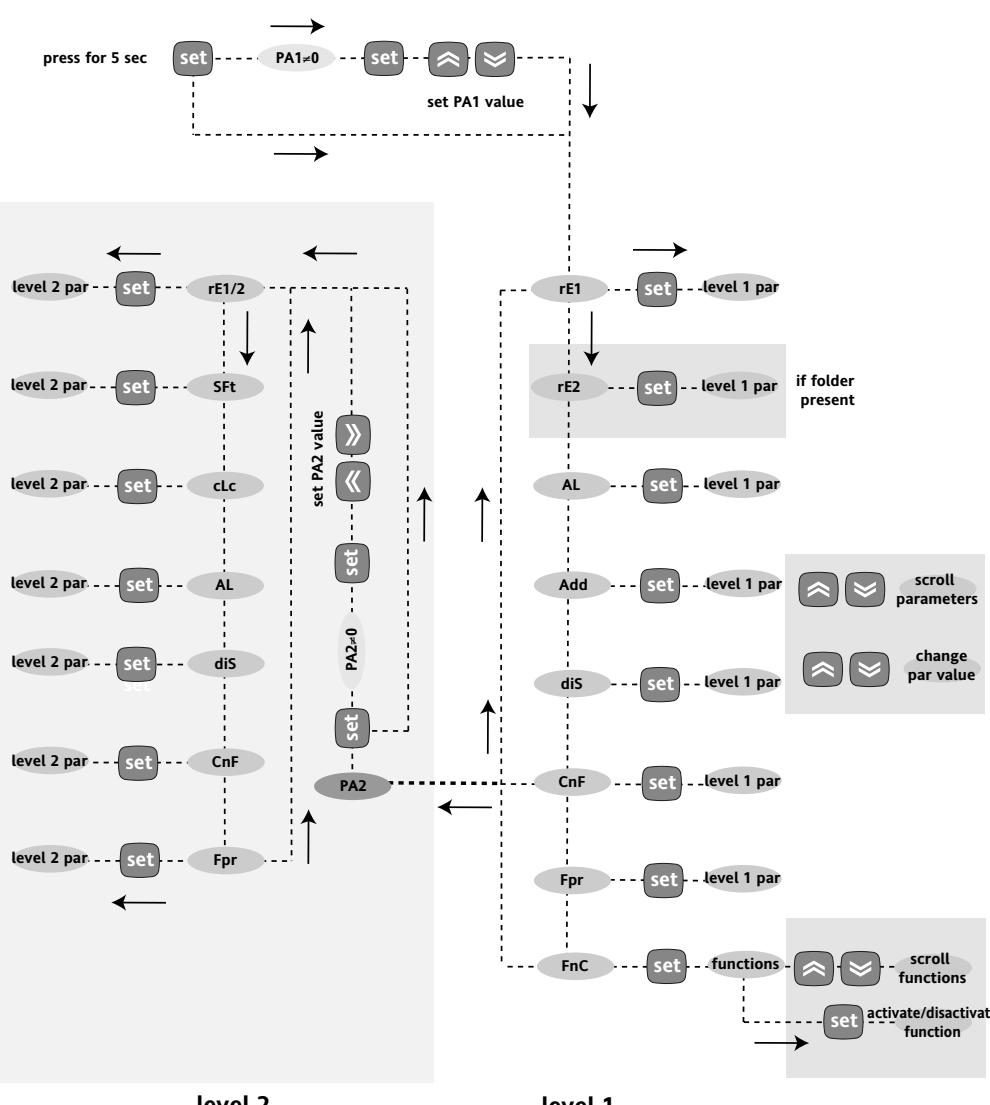
*PASSWORD

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 $\neq 0$) 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 the level 1 parameters.

PROGRAMMING MENU DIAGRAM



(continued from pg 2)

The Soft Start parameters are displayed in the "SOFT START" folder (with label "SFT")

PERIODIC CYCLE

Note: The PERIODIC CYCLE function is button, D.I. or function selectable.

This function can be associated with relay outputs (by setting parameters H21, H22 =4) and can be used for Duty Cycle adjustment with the ranges defined by the parameters Con and CoF (see Periodic Cycle Diagram on page 9).

AUX (Auxiliary Controller)

The digital input can be configured as auxiliary (parameter H11=5): if this is the case, the controller 1(2) command must be set as aux (auxiliary) using parameters H21(22).

This function can be used to activate the relay if it was de-energized or energize it if this was not the case. The status is stored so that the unit operates correctly in the event of a black-out unless parameter H11=5 (aux); if this is the case, the relay reflects the status of the digital input. Parameter H13 can be used to establish the priority/polarity between keyboard, relay and Digital Input activation.

NOTE: The meaning of the Digital Input (D.I.) must not change: for example, by activating the relay from the D.I. and deactivating using the keyboard, the relay does not change status if the D.I. is repositioned since it has been deactivated by the keyboard

MECHANICAL ASSEMBLY

The unit has been designed to be panel-mounted: Drill a 29x71 mm hole, insert the keyboard and fix it in place with the special brackets provided. Do not install the keyboard in excessively humid and/or dirty locations. It is suitable for use in locations with normal pollution levels. Always make sure that the area near the cooling slits of the device is adequately ventilated.

ELECTRICAL WIRING

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 mm² 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.

The sensor has no connection polarity and can be extended using an ordinary bipolar cable (note that extending the probe may affect 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.

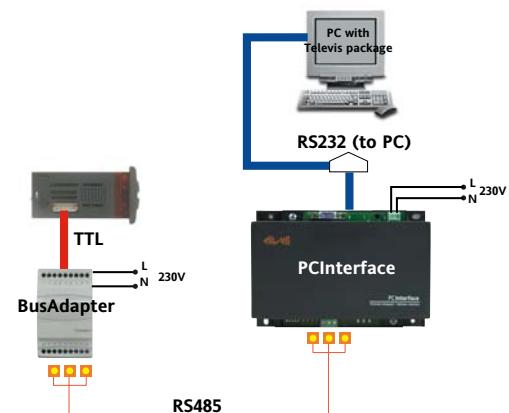
TELEVIS SYSTEM

BUSAdapter130/150

TTL - RS-485 serial interface on DIN rail for connecting device and a RS-485 network designed for connection to Televis monitoring system.

PCIInterface110

RS-232/RS-485 serial interface for connecting a PC and a series of instruments in an RS-485 network. The device needs the BlueCard activation module supplied with the Eliwell software package licence to be plugged in.



The Televis remote control systems can be connected using the TTL serial port (the TTL- RS 485 BUS ADAPTER 130 or 150 interface module must be used). To configure the instrument to do this, you need to access the folder with the "Add" label and use the "dEA" and "FAA" parameters.

TECHNICAL DATA

Front protection: IP65.

Casing: PC+ABS UL94 V-0 resin plastic body, polycarbonate front, thermoplastic resin buttons.

Dimensions: front panel 74x32 mm, depth 59 mm (terminals excluded).

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:

- NTC probe: -50...110°C (-58...230°F);
- PTC probe: -55...150°C (-67...150.00°C) on display 3 1/2 digits + sign.

Analogue inputs: two PTC or NTC inputs (H00 parameter-selectable).

Digital input: 1 voltage-free parameter-configurable digital input.

Serial: TTL for connection to Copy Card and Televis System.

Digital outputs: 1 output on SPDT relay 8(3)A 1/2 hp 250V~, 1 output on SPST relay 8(3)A 1/2 hp 250V~ configurable (for relay capacity, see instrument label).

Buzzer output: only in certain models.

Measurement range: from -55 a 150 °C.

Accuracy: better than 0.5% of bottom scale + 1 digit.

Resolution: 1°C or 0.1°C (displayed with decimal point).

Consumption:

- 230V model: 3 VA max.;
- 12/24V model: 1.5 VA max.

Power supply: 12/24 V~/... ±10% or 230V~ ±10% 50/60 Hz.

Warning: check the power supply specified on the instrument label; for information on relay capacity and power supplies contact the Sales Office.

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.

DIFFERENTIAL and SET POINT OFFSET ADJUSTMENT

DIFFERENTIAL ADJUSTMENT

- For this type of adjustment, set:
- folder CnF, parameter H42=y indicating the presence of probe Pb2;
 - folder CnF, parameter H03=1 indicating the type of adjustment (=1, adjustment according to Pb1-Pb2 difference compared with set point);

On the basis of these settings, the new adjustment value is calculated according to the difference between the values read by the two probes "diff" = Pb1 - Pb2.

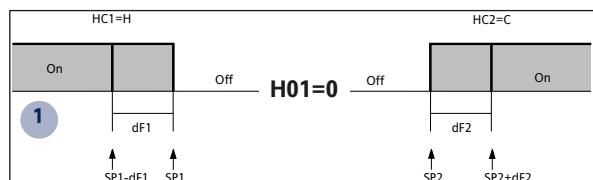
If the difference is positive (Pb1 > Pb2) or negative (Pb2 > Pb1) but **lower or equal** to the value of the set point (SP1 > "diff", or SP1 = "diff") the output set "for heating" will be activated.

If the difference is positive (Pb1 > Pb2) but **higher** than the value of the set point (SP1 > "diff") the output set "for cooling" will be activated.

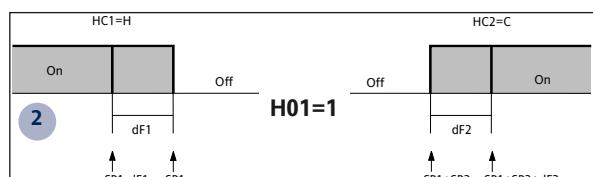
--> Adjustment varies according to parameter H01 that determines the link between the outputs. **See diagram on right.**

differential adjustment diagrams

independent outputs. The two outputs regulate as though they are completely independent

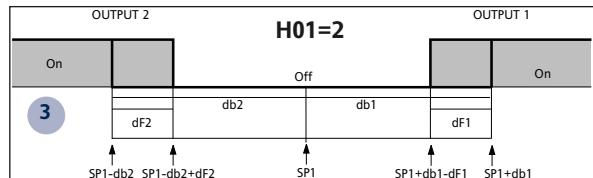


dependent outputs. The set point 2 SP2 regulates according to SP1



outputs with Neutral Zone adjustment (or window).

NOTE: if dF1 and dF2 are both =0 the outputs are deactivated when SP1 is reached



SETPOINT=OFFSET ADJUSTMENT compared with Pb2.

For this type of adjustment, set:

- folder CnF, parameter H42=y indicating the presence of probe Pb2;
- folder CnF, parameter H03=2 indicating the type of adjustment (H03=2, adjustment of set point calculated as offset from probe Pb2);

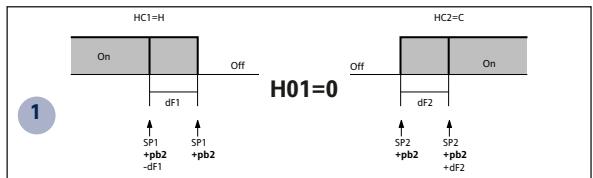
On the basis of these settings, the new adjustment value "SE = effective set point" is calculated according to the sum of the set point offset (see parameter SP1) and the value read by probe Pb2 **within the new setting limits defined by parameters LLS and HLS.**

The control input is always determined by Pb1.

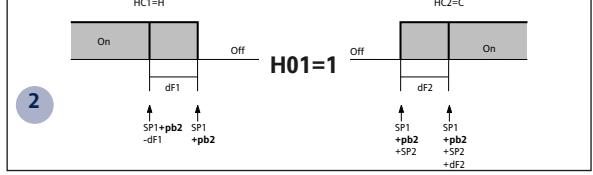
--> Adjustment varies according to parameter H01 that determines the link between the outputs. **See diagram on right.**

Setpoint=offset adjustment compared with Pb2 diagrams.

independent outputs. The two outputs are adjusted as if they were completely independent except for the Pb2 analogue input for both

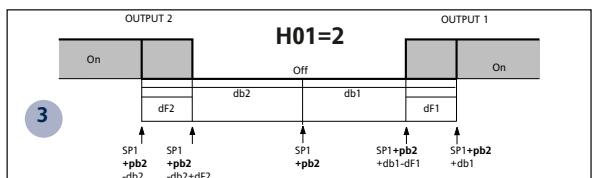


dependent outputs. The set point 2 SP2 is adjusted according to SP1 and Pb2



outputs with Neutral Zone adjustment (or window).

NOTE: if dF1 and dF2 are both =0 the outputs are deactivated when SP1 is reached



HC1	HC2	H01	type of regulation
H*	C**	0	independent set points
H*	C**	1	dependent set points
-	-	2	Neutral Area (or window)

H* maximum set point controller with differential dF1 negative
C** minimum set point controller with differential dF2 positive

NOTE:

- for 1 and 2 examples with HC1=H e HC2=C;
- for 3 HC1 and HC2 settings are ignored

DIAGNOSTICS

The alarm condition is always signalled by a buzzer (if present) and the alarm



LED. The alarm signals from the • control probe that measures values outside the nominal reading range • control probe faulty/shorted/open probe appears directly on the instrument display as E1.

Note: to prevent false alarms, the error condition must persist for more than 10 seconds.

An error condition in probe 1 (regulation) leads to:

- E1 code appears on display
- the controller being activated as indicated by the “On1(On2)” and “OF1(OF2)” parameters if programmed for the duty cycle or... (see DUTY CYCLE diagram)

MAXIMUM AND MINIMUM TEMPERATURE ALARM (SEE PAR. H04)

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

Alarm table		**VALUE H04 = 0 —> Pb1-Pb2; = 1 —> Pb1; = 3 —> Pb1 and Pb2.
DISPLAY	ALARM	Table of faulty probes
AH1**	High temperature alarm (referring to probe Pb1/Pb2 based on par. H04)	E1 Faulty probe 1 (thermostat control)
AL1**	Low temperature alarm (referring to probe Pb1/Pb2 based on par. H04)	E2 Faulty probe 2 (evaporator)
EA	External alarm	
Odp	Door Open Alarm	
	Press any button to silence the alarm. The LED will start to blink.	If simultaneous, they will be shown on the display alternately every 2 seconds

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(2) is set to positive values and LA1(2) to negative values.

This alarm condition can be viewed in the folder “AL” with labels “AH1-AL1”.

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. The alarm is signalled by turning on the fixed alarm icon, activating the relay configured as alarm and deactivating compressor, defrost and fan controls (if specified by the “H11=5” 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, 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 “Odp”.

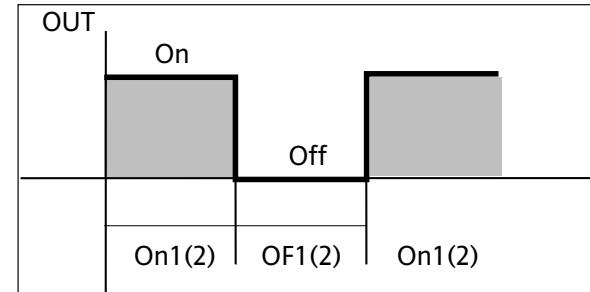
On1(2) OF1(2) parameters programmed for Duty Cycle

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

DUTY CYCLE DIAGRAM

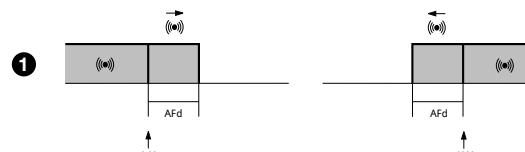
An error condition in probe 1 (regulation) leads to:

- E1 code appears on display
- activation of controller as indicated by the “On1(On2)” and “OF1(OF2)” parameters if programmed for the duty cycle



ALARM DIAGRAM HIGH AND LOW TEMPERATURE

Temperature expressed as an absolute value (par “Att0)
Abs(olute)



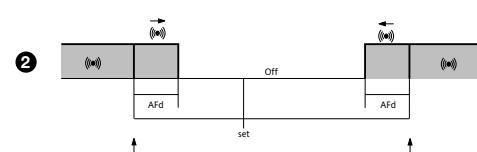
Minimum temperature alarm Temperature lower than or equal to LA1(2) (LA1(2) with sign)

Maximum temperature alarm Temperature greater than or equal to HA1(2) (HA1(2) with sign)

Minimum temperature alarm back swing Temperature greater than or equal to LA1(2)+AFd

Maximum temperature alarm back swing Temperature lower than or equal to HA1(2)-AFd

Temperature expressed in relation to set point
(par “Att”=0) reL(ative)



Temperature lower than or equal to set point +LA1(2) positive only)

Temperature greater than or equal to set point +HA1(2) (HA1(2) positive only)

Temperature greater than or equal to set point + LA1(2) + AFd
set point - | LA1(2) | + AFd

Temperature lower than or equal to set point+HAL-AFd

if Att=reL(ative) LA1(2) must be negative: therefore
set point+LAL<set point because set point+(-| LA1(2) |)=set-| LA1(2) |

Tab. 1 Table of parameters

SP1: Control SetPoint 1, range LS1...HS1
SP2: Control SetPoint 2, range LS2...HS2

PAR.	DESCRIPTION	RANGE	DEFAULT*	VALUE**	LEVEL***	U.M.
CONTROLLER 1 (folder with "rE1" label)						
HC1	Regulating mode. If set to H, the controller operates in heating mode. If set to C, the controller operates in cooling mode.	H/C	C	1	flag	
OS1	Offset Set point 1	-30.0...30.0	0	2	°C/°F	
db1	Regulation band 1 See ON-OFF regulation diagram	0...30.0	1	1	°C/°F	
dF1	Relay 1 intervention differential. The load will stop when Set point 1 is reached (as indicated by the control probe) and will restart at a temperature equal to Set point 1 plus (or minus depending on HC1) the value of the differential. See ON-OFF reg. diagram	0.0...30.0	1	1	°C/°F	
HS1	Maximum value for set point 1. By default, it will be set to the maximum value that the probe can reach.	LS1..HdL	140	1	°C/°F	
LS1	Minimum value for set point 1. By default, it will be set to the minimum value that the probe can reach.	LdL..HS1	-50	1	°C/°F	
HA1	Maximum alarm OUT 1 See Max/Min. Alarm diagram.	LA1...350.0	140	1	°C/°F	
LA1	Minimum alarm OUT 1 See Max/Min. Alarm diagram.	-99.9...HA1	-50	1	°C/°F	
CONTROLLER 1 PROTECTIONS (folder with "rE1" label)						
dn1	Start-up delay. The specified time must elapse between the controller relay start-up request and actual start-up.	0...250	1	1	°C/°F	
do1	Delay after shut-down. The specified time must elapse between shut-down of controller relay and a subsequent start-up.	0...250	0	1	sec	
di1	Delay between start-ups. The specified time must elapse between two subsequent start-ups of the controller.	0...250	0	1	min	
dE1	Shut-down delay. The specified time must elapse between the controller relay shut-down request and actual shut-down.	0...250	0	1	min	
NOTE: for parameters dn1, do1, di1, dE1 0= not active						
On1	Controller start-up time if probe is faulty. 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	sec	
OF1	Controller shut-down time if probe is faulty. 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	
CONTROLLER 2 (folder with "rE2" label)						
HC2	Regulating mode. If set to H, the controller operates in heating mode. If set to C, the controller operates in cooling mode.	H/C	C	1	min	
OS2	Offset Set point 2	-30.0...30.0	0	2	flag	
db2	Regulation band 2 See ON-OFF regulation diagram	0...30.0	1	1	°C/°F	
dF2	Relay 2 intervention differential. The load will stop when the Set point is reached (as indicated by the control probe) and will restart at a temperature equal to Set point 2 plus (or minus depending on HC2) the value of the differential. See ON-OFF reg. diagram	0.0...30.0	1	1	°C/°F	
HS2	Maximum value for set point 2. By default, it will be set to the maximum value that the probe can reach.	LS2..HdL	140	1	°C/°F	
LS2	Minimum value for set point 2. By default, it will be set to the minimum value that the probe can reach.	LdL..HS2	-50	1	°C/°F	
HA2	Maximum alarm OUT 2 SEE ALARM DIAGRAM HIGH AND LOW T.	LA2...350.0	140	1	°C/°F	
LA2	minimum alarm OUT 2 SEE ALARM DIAGRAM HIGH AND LOW T.	-99.9...HA2	-50	1	°C/°F	
CONTROLLER 2 PROTECTIONS (folder with "rE2" label)						
dn2	Delay in start-up of controller 2. See dn1	0...250	1	1	sec	
do2	Delay after shut-down. The specified time must elapse between shut-down of controller 2 relay and a subsequent start-up.	0...250	0	1	min	
di2	Delay between start-ups. The specified time must elapse between two subsequent start-ups of controller 2.	0...250	0	1	min	
dE2	Delay in shut-down of controller 2. The specified time must elapse between the controller relay shut-down request and actual shut-down.	0...250	0	1	sec	
NOTE: for parameters dn2, do2, di2, dE2 0= not active						
On2	Controller start-up time if probe is faulty. 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	
OF2	Controller shut-down time if probe is faulty. 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	
SFT (SOFT START folder with "SFT" label)						
dSi	dynamic Step increment (Step Value). Value (in degrees)of each of subsequent increases (dynamic) of adjustment point. 0=disables SOFT START function.	0...25.0 (0...twenty-five.0)	0	2	°C/°F	
dSt	dynamic Step time (Step Duration). Time between two subsequent increases (dynamic) of set point	0...250	0	2	H/m/sec	
Unt	Unit of measurement (hours, minutes, seconds)	0/1/2	1	2	H/m/sec	
SEn	Enabled outputs. Establishes which outputs the function must be enabled on: 0 = disabled; 1 = OUT 1; 2 = OUT 2; 3 = OUT 1 & 2;	0/1/2/3	1	2	num	
Sdi	Function reinsertion threshold. Establishes the threshold beyond which the SOFT START function is automatically re-inserted	0...30.0	0	2	°C/°F	
CLC (PERIODIC CYCLE folder with "cLc" label)						
Con	Output ON time.	0...250	0	2	min	
CoF	Output OFF time.	0...250	0	2	min	

***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.
	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.	Abs/reL	Abs	1	flag	
AFd	Alarm Fan differential. Alarm differential. Power-on Alarm Override.	1.0...50.0	2	2	°C/F	
PAO (!)	Alarm exclusion time after instrument start-up following a power failure.	0...10	0	1	hours	
(2)						
SAO	Set point Alarm Override. Alarm exclusion time after reaching set point. 0 = disabled. If >0, an alarm will be generated if the set point is not reached after the time (in hours) set by this parameter.	0...10	0	1	hours	
tAO (2)	temperature Alarm Override. Temperature alarm signal delay time.	0...250	0	1	min	
AOP	Alarm Output Polarity. Polarity of alarm output. 0 = alarm active and output disabled; 1 = alarm active and output enabled.	nc/no	nc/no	2	flag	
	COMMUNICATION (folder with "Add" label)					
dEA (!)	dEvice Address. dEA = device address in family (valid values from 0 to 14)	0...14	0	1	num	
FAA (!)	FAMILY Address. FAA = device family (valid values from 0 to 14) The pair of values FAA and dEA represents the device network address and is indicated as "FF.DD" (where FF=FAA and DD=dEA).	0...14	0	1	num	
	DISPLAY (folder with "dis" label)					
LOC	Keyboard locked (set point and buttons). However, you can still access the parameter programming menu and modify parameters including the status of this parameter to allow keyboard unlocking. y = yes; 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...250	0	2	num	
ndt	number display type. Display with decimal point. y = yes; n = no.	n/y	n	1	flag	
CA1	Calibration 1. Positive or negative temperature value that is added to the value read by control probe (probe 1) before being displayed or used for control.	-30.0...30.0	0	1	°C/F	
CA2	Calibration 1. Positive or negative temperature value that is added to the value read by control probe (probe 2) before being displayed or used for control.	-30.0...30.0	0	1	°C/F	
CAI	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.	-67.0...HdL	-50	2	°C/F	
HdL	High display Label. Maximum value the instrument is able to display.	LdL...302	140	2	°C/F	
LLS	Low Limit Setpoint. Minimum value the instrument is able to display.	LdL...HLS	-50	1	°C/F	
HLS	High Limit Setpoint. Maximum value the instrument is able to display.	LLS...HdL	140	1	°C/F	
dro	Select °C or °F to display temperature read by probe. N. B.: switching from °C to °F DOES NOT modify set points, differentials, etc. (for example set point=10°C becomes 10°F).	°C/F	°C	1	flag	
ddd	Selection of the value type to be displayed. 0 = Set point; 1 = probe 1 (Pb1); 2 = probe 2 (Pb2);	0/1/2	1	2	num	
	CONFIGURATION (folder with "CnF" label)					
H00(1)()	For selection of probe type, PTC or NTC.	PtC/ntC	PtC/ntC*	1	flag	
H01	Output link. 0 = independent; 1 = dependent; 2 = Neutral Zone (or window)	0/1/2	0	1	num	
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 rapid enabling is set. Aux is an exception and has a set time of 1 second	0..15	5	2	sec	
H03	Adjustment type SEE DIFFERENTIAL AND SETPOINT OFFSET ADJUSTMENT 0 = standard adjustment; 1 = adjustment according to difference between Pb1-Pb2 and set point; 2 = set point adjustment calculated as offset from probe Pb2 Setting	0/1/2	0	1	°C/F	
H04	value on basis of which temperature alarms will be signalled SEE ALARM DIAGRAM HIGH AND LOW TEMP.: 0 = Pb1-Pb2; 1 = Pb1; 2 = Pb2; 3 = Pb1 e Pb2.	0/1/2/3	1	1	num	
H05	Window filter. -2=very fast; -1=fast; 0=normal; 1=slow; 2=very slow	-2/+1/0/1/2	0	2	num	
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	
H10	Output delay from power-on. Attention! If = 0 is not active; if ≠ 0 the output will not be activated before this time has expired	0...250	0	1	min	

***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.
H11	Configuration of digital inputs 0 = disabled; 1 = SOFT START; 2 = Set point Offset; 3 = outputs shut down; 4 = periodic cycle; 5 = auxiliary output; 6 = stand-by 7 = maintenance request 8 = external alarm 9 = external alarm to lock controllers	0..9	0	2	num	
H13	Polarity and priority Digital Input no= normally open/ nc= normally closed / noP= normally open with polarity / ncP= normally closed with polarity	no/nc/noP/ncP	no	2	num	
H14	Enabling delay Digital Input	0...250	0	2	min	
H21 (!)	Configurability digital output 1 (OUT1) 0 = disabled; 1 = on-off 2 = not used; 3 = alarm; 4 = cyclic 5 = aux/light 6 = stand-by	0..6	1	2	num	
H22 (!)	Configurability digital output 2. (OUT2) Same as H21.	0..6	1	2	num	
H31 (!)	UP button configurability. 0 = disabled; 1 = SOFT START; 2 = Set point Offset; 3 = outputs shut down; 4 = periodic cycle; 5 = auxiliary output (aux); 6 = stand-by; 7 = maintenance request	0..7	0	2	num	
H32 (!)	DOWN button configurability. Same as H31.	0..7	0	2	num	
H33 (!)	ESC button configurability. Same as H31.	0..7	0	2	num	
H42	Presence of probe 2. n= not present; y= present.	n/y	y	2	flag	
rEL	Device version. Read only parameter.	/	/	1	/	
tAb	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	Upload: transfer of programming parameters from instrument to Copy Card.	/	/	1	/
dL	downLoad: transfer of programming parameters from Copy Card to instrument.	/	/	1	/
Fr	Format. Cancels all data entered in the copy card.				

Fpr

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. After the operation with the Copy Card the controller must be switched off and then switched back on

FUNCTIONS (folder with "FnC" label) The FnC folder (last folder visible from the Programming Menu) contains several functions that are activated using the "set" button
SEE FUNCTIONS paragraph

(1) Check the NTC/PTC default probe type installed (see label)

(2) Refers exclusively to high and low temperature alarms

* DEFAULT column: for parameters HC1, HS1, LS1, DF1, H00 the default value depends on the model.

** 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

(!) WARNING!

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.

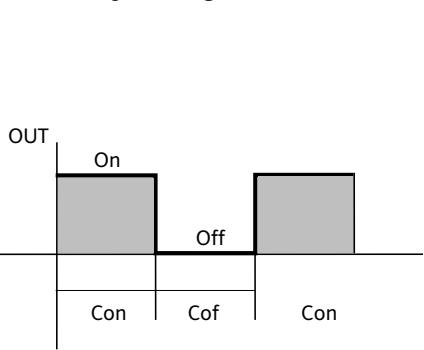
(*) The mathematical conversion for temperature is $^{\circ}\text{F}=(9/5)* ^{\circ}\text{C}+32$. For example: $32^{\circ}\text{F}=0^{\circ}\text{C}$; $50^{\circ}\text{F}=10^{\circ}\text{C}$.
dro parameter: when changing from $^{\circ}\text{C}$ to $^{\circ}\text{F}$ or vice versa the mathematical conversion is NOT performed and the values are NOT modified.

All the temperature values set will therefore need reviewing. e.g. with a set point set at 10°C , the set point will become 10°F and not 50°F when changing the value to $^{\circ}\text{F}$ (according to conversion table)

***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.

IC 915 LX

Periodic Cycle Diagram



TERMINALS (12V and 230V versions)

1 - 2	N.O. controller relay 1 (OUT1)
1 - 3	N.C. controller relay 1 (OUT1)
4 - 5	N.O. controller relay 2 (OUT2)
6 - 7	Power supply 1.5 VA max. (12V version) Power supply 3 VA max. (230V version)
8 - 10	Probe input 1 (control*) Pb1
8 - 9	Probe input 2 (control**) Pb2
8 - 11	Digital Input (D.I.)
A	TTL input for Copy Card and connection to TelevisSystem

NOTE:

- * used for differential adjustment
 - ** used for offset and set point differential adjustment
 - Default load settings
 - for relay capacity, see instrument label.
- The diagram only shows 12 and 230V power supplies and 8(3)A 250V capacity relays

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 is ideally suited 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.

**Eliwell & Controlli s.r.l.**

Via dell'Industria, 15 Zona Industriale Paludi
32010 Pieve d'Alpago (BL) ITALY
Telephone +39 0437 986111
Facsimile +39 0437 989066
Internet <http://www.elowell.it>

Technical Customer Support:

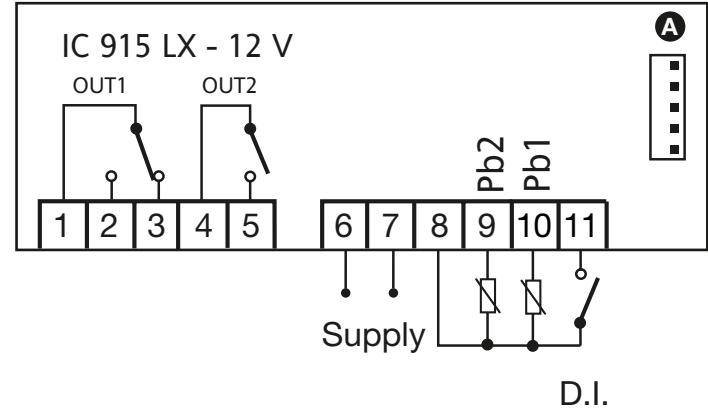
Email: techsuppeliwell@invensys.com
Telephone +39 0437 986300

Climate Controls Europe
An Invensys Company

12/2004 eng
cod. 9IS23071

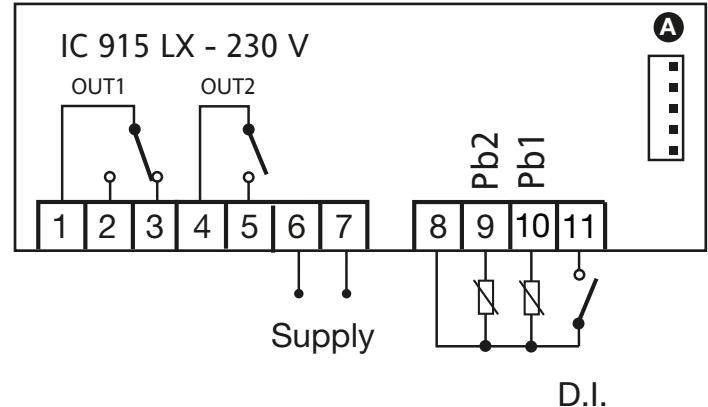


A



D.I.

A



D.I.

RESPONSIBILITY 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 equipment that does not guarantee adequate protection against electric shock, water or dust when assembled.
- use on equipment that allows dangerous parts to be accessed without the use of tools;
- tampering with and/or alteration of the product;
- use on equipment that does not comply with the standards and regulations in force.

DISCLAIMER

This document is the exclusive property of Eliwell & Controlli s.r.l. and cannot be reproduced and circulated unless expressly authorized by Eliwell & Controlli s.r.l..

Although Eliwell & Controlli s.r.l. has taken all possible measures to guarantee the accuracy of this document, it declines any responsibility for any damage arising out of its use.

The same applies to any person or company involved in preparing and writing this manual. Eliwell & Controlli s.r.l. reserves the right to make any changes or improvements without prior notice and at any time.

CONDITIONS OF USE**PROMPTED 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 is ideally suited 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 above 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.