

# EWDR 983-985/CS (LX) EWDR 985/CSK (LX)



electronic controllers for ventilated refrigeration units

## USER INTERFACE

The user interface has a 6 LED display to indicate alarm status and five buttons for controlling instrument status and programming.



### BUTTONS AND LEDS

UP		Increase in value of parameter Menu scrolling and activation of defrost function (Parameter programmable H31)
DOWN		Decrease in value of parameter Menu scrolling and activation of associated function (Parameter programmable H32)
set		Access to different levels of menu Alarm display, set point, probes and rtc Access to programming of parameters
fnc		Exit current level of menu Confirmation of value of parameter (Parameter programmable H33)
aux		Activation of associated function using parameter H34

LED	Description	Indication
	Reduced set point inserted LED	Lights up when set point is displayed*, blinking when reduced set point is inserted
	LED	'on' with compressor LED on. Blinking for delay, protection or activation blocked
	defrost LED	'on' during defrosting Blinking when activated manually or by digital input
	fan LED	permanently on when fans are operating
	alarm LED	'on' if alarm is present. Blinking for silenced alarm
	auxiliary LED	'on' for active output
	decimal point	'on' to indicate of voltage when on stand-by and display 'off'

### SIGNAL LED

The status of the external devices, functions and controllers is described by the device LEDs.

### DISPLAY

This is used to display the inputs, the set point, the parameters and related values, alarms, functions and the status of the device.

### DESCRIPTION OF MENU

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

### MACHINE STATUS MENU

The 'machine status menu' contains the folders and basic information on the device:

- AL: alarm folder
- SEt: Set point setting folder
- rtc: Real Time Clock folder(if present)
- Pb1: 'probe 1 value' folder
- Pb2: 'probe 2 value' folder
- Pb3: 'probe 3 value' folder

If no alarms are present, the "SEt" label is displayed. From here, you can scroll down the other menu items using the UP' and 'DOWN' buttons. Each folder can be accessed by pressing the 'set' button once.

Values are modified using the 'UP' and 'DOWN' buttons and the 'set' button that confirms the selected value and takes you back to the higher level.

### Setting the set point

Access the 'machine status menu'. If no alarms are present, the "SEt" label is displayed. By pressing and immediately releasing the 'set' button, the set point value can be set using the UP' and 'DOWN' buttons. Press and release the 'set' button again or press the 'fnc' button to go back to the main menu level.

The set point setting folder is also closed when the time-out elapses.

### Alarm on

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

### Real Time Clock (/C 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 if you press "set" you switch to the hours (h00) and minutes ('00) folders: use the "UP" and "DOWN" buttons to set the hours and minutes respectively. If you do not use the keyboard for over 15 seconds (time-out) or if you press the "fnc" button once, the last value shown on the display is confirmed and you go back to the previous screen mask.

**NOTE: Always use the "set" button to confirm the hours/minutes/days setting.**

**NOTE2: We recommend considering the first day d00 as SUNDAY.**

### PARAMETER PROGRAMMING MENU

Access the menu by pressing the 'set' button for at least 5 seconds. The menu structure enables all parameter folders to be divided into two levels. All the level 1 folders can be accessed by entering the password 'PA1'. Scroll down the level 1 folders using the 'UP' and 'DOWN' buttons. Press and release the 'set' button next to the selected label to access the parameters. Scroll through the labels in the folder using the 'UP' and 'DOWN' buttons, press 'set' to display the current value of the selected parameter, use the 'UP' and 'DOWN' buttons and set the required value by pressing 'set'. To access the level 2 folders in the 'Cnf' folder, select the 'PA2' label, enter the password 'PA2' and confirm with the 'set' button. All the parameters that cannot be changed at level 1 are in this level.

**NOTE: Level 1 parameters will only be displayed if you quit the 'parameter programming menu' and repeat the steps for manipulation of level 1 folders.**

The steps to follow for manipulation of level 2 parameters are the same as those described for the level 1 structure.

**NOTE: It is strongly recommended that the instrument is switched off and on again each time parameter**

**configuration is changed in order to prevent malfunctioning of the configuration and/or ongoing timings.**

**PASSWORD**

The passwords “PA1and “PA2” are used to access level 1 and level 2 parameters. To change them and assign them the desired value, access the ‘parameter programming menu’ in the “diS” label folder.

The password is requested:

- PA1 when entering the ‘parameter programming menu’;
- PA2 in the “Cnf” folder containing the level 1 parameters.

**USING THE COPY CARD**

The Copy card function can be used to upload and download parameter maps of one or more of the same type of instrument. The accessory is connected to the device using the special TTL serial port on the instrument. The Copy card can be used for the following functions:

**Upload (UL)**

The upload function reads the instrument parameters and writes them onto the Copy card

**Download(dL)**

The download function writes the parameter map present at that time on the copy card onto the instrument memory.

**NOTE:**

**Upload = instrument—> Copy card**

**Download = Copy card —> instrument**

The operations are performed by accessing the folder with 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.

**Formatting the copy card**

This function is necessary when using the copy card for uploading for the first time or when using the copy card on device models that are not compatible.

**NOTE: formatting deletes all the data on the Copy card and cannot be undone. Download from reset**

Once the copy card has been connected the instrument is switched on. When the lamp test is over, one of the following two labels will be displayed for 5 seconds:

- dLY if the operation is successful
- label DLn if operation fails The display will then go into default position (probe or set point).

**NOTE: after downloading the instrument will begin to work with the new parameter map that has just been downloaded.**

**REMOTE CONTROL SYSTEMS (/CS LX - /CSK LX models only)**

Televis remote control systems can be connected using the RS 485 serial input. To configure the instrument to do this, you need to access the folder with the “Add” label and use the “dEA” and “FAA” parameters.

**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
OAO	Alarm signal delay after disabling the digital input (door closed)
tdO	Time out door open. Time out signal after activation of D.I. (door open)
H11	Digital output configurability/polarity 1
H21...H25	Digital output configurability 1...5

(+ parameters dOA, PEA, dCO and DFO for model EWDR 985/CSK (LX))

Parameter H11 is used to configure the door switch input with values between -8 and +8. Positive and negative values are present in order to select the polarity assigned to the input:

**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.**

**LIGHT CONTROLLER**

Controls the light relay. The function can be started in two different ways. If you press the light button the light relay is switched on if it was off and is switched off if it was on. The light status is recorded by the device as soon as the button is pressed so that when power is restored after a black-out the device can continue to operate in the same way as before the power failure. The following parameters control how the light works:

Par	Description
H06	Button/aux input/door switch light active when instrument off
dSd	Enabling light relay by door switch
dLt	Delay Light Relay deactivation delay
OFL	Light switch always disables light relay
OAO	Alarm signal delay after disabling the digital input (door closed)
tdO	Time out door open. Time out signal after activation of D.I. (door open)
H11	Digital output configurability/polarity 1
H21...H25	Digital output configurability 1...5

The configuration of these parameters controls the status of the light relay by using the digital input as well as the normal button. The parameter dSd automatically switches on the light relay when the digital input is enabled and switches it off when the digital input is disabled following the delay set by parameter dLt. Parameter H06 activates the light button and enables the relay when the door is open even when the instrument is powered but is ‘off’. The dedicated button always deactivates the light relay even if the digital input is on or during the dLt delay only if the parameter OFL=Y.

**DIAGNOSTICS**

**PROBE ALARMS**

When one of the probes is outside the nominal operating range or the probe is open or has shorted, an alarm is generated if at least one of these conditions persists for at least 10 seconds.

Signal	Description
E1	Faulty room probe
E2	Faulty defrost probe
E3	Faulty display probe

If at least one of these 3 alarms is signalled the alarm LED and relay are enabled.

When activated code E1 appears on the display. If several alarms are activated at the same time, they are displayed alternately for 2 seconds each.

An error condition in the room probe leads to:

- E1 code appears on display
- activation of compressor as indicated by Ont and OFt

- deactivation of maximum and minimum alarm controller. An error condition in the defrost probe leads to:

- E2 code appearing on display
- end of defrost due to a time-out

## MINIMUM AND MAXIMUM TEMPERATURE ALARM

If an alarm condition occurs and alarm exclusion times are not in progress (see alarm exclusion parameters), the alarm icon lights up permanently and the relay that is configured as an alarm is activated. This type of alarm does not affect the regulating in progress.

Alarms are considered as absolute (default) values or as values related to the Set point (the distance from the Set point itself) and based on the Att parameter.

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".

## CLOCK BATTERY ALARM

This alarm is activated in the following situations:

- when the instrument is switched on for the first time and the clock is set
- when the instrument is switched on again after a power off lasting more than 24/32 hours.

The alarm will stop as soon as the day/hour/minutes are set using the set parameters.

Resetting is automatic and there is no need to restart the instrument.

## ALARM WITH THRESHOLD REFERRING TO PROBE 3

An alarm is associated with probe 3 that refers to a threshold that is reset at a specified differential.

By setting parameter PbA=3 probe 3 will signal a high or low temperature alarm for exceeding the set value.

The alarm is handled in the same way as the other temperature alarms and standard signal delays are used.

## DEFROST ALARM

If defrosting does not reach the end of cycle temperature but is terminated by a time out, the alarm controller is immediately activated.

An alarm LED remains on and the alarm is recorded in the Ad2 label alarm menu. The alarm is automatically reset as soon as the next defrost cycle starts. The alarm LED can only be manually switched off with a silencing procedure.

## EXTERNAL ALARM

It is set if the digital input is enabled with the delay specified by parameter dAd and remains enabled until the next time the digital input is deactivated.

The alarm consists of an alarm LED that remains on, activation of a buzzer and deactivation of all the device loads (if specified by the EAL parameter).

If an external alarm is present the EA label is displayed in the AL folder.

It is reset the next time the digital input is deactivated and the buzzer can be manually silenced.

## OPEN DOOR ALARM

This alarm is generated when the door is open for longer than the value specified in parameter tdO.

door open alarm is signalled in the alarm folder (AL) and the LED and alarm relay are switched on.

The OPd label is also displayed.

The relay can be deactivated by pressing the silencing button. The LED continues to flash intermittently and the OPd label remains in the alarm menu until the door is closed.

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

Press any button to silence the alarm. The LED will start to blink. If simultaneous, they will be showed on the display alternately every 2 seconds

**\*ONLY FOR EWDR 985/CSK (LX)**  
**In the event of addressing errors, E7 will not be shown, but the display will blink.**

## MECHANICAL ASSEMBLY

The **EWDR 983-985/CS (LX) - EWDR 985/CSK (LX)** is designed to be wall-mounted (removable brackets) or mounted on DIN rail (Omega 3). The unit operates correctly with an ambient temperature range of between -5 and 55 °C. Units must not be installed in excessively humid and/or dirty locations.

## ELECTRICAL CONNECTIONS

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

The instrument has screw terminal blocks for connecting cables with a maximum diameter of 2.5 mm<sup>2</sup> (only one conductor

per terminal block for power connections): for terminal capacity, see the label on the instrument.

The relay outputs are voltage free.

Do not exceed the maximum current allowed. For higher loads, use a suitable contactor.

Make sure that the power voltage complies with the device voltage.

Probes have no connection polarity and can be extended using an ordinary bipolar cable (note that if probes are extended this affects the electromagnetic compatibility (EMC) of the instrument: special care must be used when wiring).

The RS-485 serial and TTL serial cables must be kept separate from the power cables.

## TECHNICAL DATA

Casing: plastic 4 Din modules

Dimensions: front 70x85 mm, depth 61mm.

Mounting: on DIN rail (Omega 3) or wall-mounted.

Connections: on screw terminal block for ≤ 2.5mm<sup>2</sup> conductors

(only one conductor per terminal block for power connections)

Operating temperature: -5...55°C.

Storage temperature: -30...85°C.

Operating and storage ambient humidity: 10...90 % RH (non-condensing).

Display: 3 digits + sign

Analogue inputs: 3 NTC/PTC inputs (parameter configurable)

Digital inputs: 2 voltage-free parameter-configurable digital inputs.

Serial:

-TTL for Copy Card

-RS485 for connection to Televis**System**

(for /CS LX - /CSK LX models only)

Digital outputs:

EWDR 983 (/CS LX):

2 digital outputs on relay: 8A 1/2hp 250V SPDT; 16A 1hp 250V SPDT;

EWDR 985 (/CS LX):

4 digital outputs on relays: 8A 1/2hp 250V SPST; 8A 1/2hp 250V SPDT; 16A 1hp 250V SPST; 8A 1/2hp 250V SPST. Configurable 12V~/24mA output

EWDR 985/CSK (LX):

4 digital outputs on relays: 8A 1/2hp 250V SPST; 8A 1/2hp 250V SPDT; 16A 1hp 250V SPST; 8A 1/2hp 250V SPST.

Link: Output for Link network

Resolution: 1 or 0.1°C.

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

Consumption: 5VA

Power supply: 230V~

PAR.	DESCRIPTION	RANGE	DEFAULT	VALUE	LEVEL	U.M.
SEt	Set point with range falling between the minimum LSE set point and the maximum HSE set point. The value of the set point is in the <i>machine status menu</i>	LSE...HSE	0.0			°C/°F

Compressor controller-CP label	diF	When the compressor stops when it reaches the set point value, it restarts at a value corresponding to the set point plus the value of the differential. It must not be 0	0.1...30.0	2.0		1-2	°C/°F
	HSE	Maximum set point value	LSE...302	50.0		1-2	°C/°F
	LSE	Minimum set point value	-58.0...HSE	-50.0		1-2	°C/°F
	OSP	Offset point. Value to be added to set point if reduced set point is activated Economy function).	-30.0...30.0	0		2	°C/°F
	Cit	Minimum compressor ON time. Minimum time for activating a compressor before deactivation. Not active if=0	0...250	0		2	min
	CAt	Maximum compressor ON time. Maximum time for activating a compressor before deactivation. Not active if=0	0...250	0		2	min
	Ont (1)	Compressor activation time if probe is faulty. If set to 1 with OFt=0 the compressor always remains on whereas if OFt>0 it operates in duty cycle mode (see <b>Duty Cycle</b> diagram)	0...250	0		1-2	min
	OFt (1)	Compressor shut-down time if probe is faulty. If set to 1 with Ont=0 the compressor always remains off whereas if OFt>0 it operates in duty cycle mode (see <b>Duty Cycle</b> diagram)	0...250	1		1-2	min
	dOn	Delay in activating compressor relay after start-up	0...250	0		1-2	sec
	dOF	Delay after shut-down; between compressor relay shut-down and subsequent start-up the specified time must elapse.	0...250	0		1-2	min
	dbi	Delay between switch-ons; the specified time must elapse between two subsequent switch-ons	0...250	0		1-2	min
OdO	Delay in activating outputs after start-up of instrument or after a power failure. Not active if=0	0...250	0		1-2	min	

Defrosting controller-dEF label	dty	Defrost type: 0 = Electrical or Off Cycle defrost (Compressor OFF during Defrost); 1 = Reverse cycle defrost (hot gas - Compressor On during Defrost); 2 = 'Free' : Independent defrost (compressor cycles ON/OFF according to temperature during defrost)	0/1/2	0		1-2	flag
	dit	Period of time elapsing between the start of two defrosts 0=function disabled	0...250	6		1-2	hours
	dt1	Unit of measurement for defrost times (par. dit) 0="dit" expressed in hours 1="dit" expressed in minutes 2="dit" expressed in seconds	0/1/2	0		2	flag
	dt2	Unit of measurement for duration of defrosting (dEt parameter) 0= "dEt" parameter expressed in hours 1= "dEt" parameter expressed in minutes 2= "dEt" parameter expressed in seconds	0/1/2	1		2	flag
	dCt	Selection of defrosting time count mode. 0=compressor operating hours DIGIFROST® method). Defrosting active only if compressor is on. 1 = equipment operating hours; defrost counting is always active when the machine is on 2=compressor stop Each time the compressor stops a defrosting cycle according to par. dtY 3=con RTC. Defrosting at times set by dE1...dE8, F1...F8 parameters.	0/1/2/3	1		1-2	flag
	dOH	Delay between start of first defrosting operation and start-up of instrument.	0...59	0		1-2	min
	dEt	Defrosting time-out; determines maximum duration of defrosting.	1...250	30		1-2	min
	dE2	Defrosting time-out on second evaporator; determines maximum duration of defrosting on 2nd evaporator	1...250	30		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. The symbol 1-2 indicates the parameters that are displayed at both menu levels

	PAR.	DESCRIPTION	RANGE	DEFAULT	VALUE*	LEVEL**	U.M.
Defrosting controller-DEF label	dSt	End of defrost temperature (determined by evaporator probe)	-50.0...150	8.0		1-2	°C/°F
	dS2	End of defrost temperature (determined from probe on 2nd evaporator)	-50.0...150	8.0		2	°C/°F
	dPO	Determines when instrument starts up if the defrosting cycle must be activated (if the temperature on the evaporator allows this) y=defrosting activated at start-up n=defrosting not activated at start-up	n/y	n		1-2	flag
	tcd	minimum time for each compressor state before defrosting "On" if >0; "Off" if >0	-31...31	0		2	min
	Cod	Compressor "Off" time before defrost cycle. The compressor is not turned on if a defrost cycle is expected in the time indicated by the parameter. 0=Function excluded	0...60	0		2	min
	"dd (2)	dE1...dE8; daily defrost start time <b>ONLY VISIBLE WHEN dCt=3</b>	0...23/0...59	24		1-2	hours/min
	"Fd (2)	F1...F8 festive defrost start time <b>ONLY VISIBLE WHEN dCt=3</b>	0...23/0...59	24		1-2	hours/min
Fan controller-FAN label	Fpt	Determines if "FSt" and "Fot" are expressed as absolute values or in relation to set point 0=absolute value; 1=value related to set point	0/1	0		2	flag
	FSt	Fan stop temperature. Temperature limit that, if exceeded by the value read by the evaporator probe, stops the fans.	-50.0...150.0	2.0		1-2	°C/°F
	Fot	Fan start temperature. If the temperature read by the evaporator probe is lower than the set value the fans remain off.	-50.0...150.0	-50.0		2	°C/°F
	FAd	Fan activation intervention differential. (see "FSt", "Fot")	1.0...50.0	2.0		1-2	°C/°F
	Fdt	Delay before fan activation after defrosting	0...250	0		1-2	min
	dt	Dripping time	0...250	0		1-2	min
	dFd	Disables evaporator fans. y=fans disabled n=fans enabled	y/n	y		1-2	flag
	FCO	Disables fans with compressor off (Off) y = fans active (with thermostat; in response to value read by defrost probe, see "FSt" parameter); n = fans off; dc = duty cycle (using parameters "Fon" and "FoF")	n/y/dc	y		1-2	flag
	Fod	Enables fan stop with door open and fan re-start when door is closed (if fans were on). n=fans stop; y=fans unchanged	n/y	n		2	flag
	FdC	Fan shut-down delay after compressor stop 0=function excluded	0...99	0		2	min
	Fon	Fan start-up time in Duty Cycle mode; valid for FCO=dc and H42=1 (presence of probe 2)	0...99	0		2	min
FoF	Fan shut-down time in Duty Cycle mode; valid for FCO=dc and H42=1 (presence of probe 2)	0...99	0		2	min	
Alarms-AL label	Att	Determines if "LAL" and "HAL" are expressed as absolute values or as a differential related to the set point 0=absolute value 1=value related to set point	0/1	0		2	flag
	AFd	Alarm differential	1.0...50.0	2.0		1-2	°C/°F
	HAL (4)	Maximum alarm. Temperature limit (whose absolute or relative value status is regulated by "Att") above which the alarm is activated.	LAL...150.0	50.0		1-2	°C/°F
	LAL (4)	Minimum alarm. Temperature limit (whose absolute or relative value status is regulated by "Att") below which the alarm is activated.	-50.0...HAL	-50.0		1-2	°C/°F
	PAO (5)	Alarm exclusion time after start-up of instrument following a power failure	0...10	0		1-2	hours
	dAO	Alarm exclusion time after defrosting	0...999	0		1-2	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. The symbol 1-2 indicates the parameters that are displayed at both menu levels

	PAR.	DESCRIPTION	RANGE	DEFAULT	VALUE*	LEVEL**	U.M.
Alarms-AL label	OAO	High and low temperature alarm delay after disabling digital input (door closed)	0...10	0		2	hours
	tdO	Time out after alarm signal when digital input is disabled (door open)	0...250	0		2	min
	tAO (5)	Temperature alarm delay time	0...250	0		1-2	min
	dAt	Alarm for defrosting ended due to time out. n=alarm not active y=alarm active	n/y	n		2	flag
	EAL	External alarm to lock controllers n=does not lock, y=locks	n/y	n		2	flag
	AOP	Polarity of alarm output: 0 = alarm active and output disabled; 1 = alarm active and output enabled	0/1	1		2	flag
	PbA	Configuration of temperature alarm on probe 1 and/or 3: 0=on probe 1 (thermostat control) 1=on probe 3 (display) 2=on probe 1 and 3 (thermostat control and display) 3=on probe 1 and 3 (thermostat control and display) on external threshold	0/1/2/3	0		2	num
	SA3	Probe 3 alarm set point	-50.0...150.0	50		2	°C/°F
	dA3	Probe 3 alarm differential	-30.0...30.0	2.0		2	°C/°F

Light & digital inputs Lit Label	dSd	Light relay enable from door switch. n = door open, light does not turn on; y = door open, light turns on (if it was off)	n/y	y		2	flag
	dLt	Light relay disabling delay after closing door if "dSd"=y	0...31	0		2	min
	OFL	Light relay disabled even if disabling delay "dLt" is active	n/y	n		2	flag
	dOd	Digital input switches off loads	n/y	n		2	flag
	dAd	Delay in enabling digital input	0...255	0		2	min
	dOA*	Forced behaviour from digital input: 0=no enabling; 1=compressor enabled 2=fans enabled; 3=compressor and fans enabled	0/1/2/3	0		2	num
	PEA*	Enables forced behaviour from door light and/or from external alarm 0=function disabled; 1=associated with door light 2=associated with external alarm; 3=associated with door light and external alarm	0/1/2/3	0		2	num
	dCO*	Delay in enabling compressor with consensus	0...250	0		2	min
	dFO*	Delay in enabling fans with consensus	0...250	0		2	min

### LINK PARAMETERS - Label Lin - EWDR 985/CSK (LX) ONLY - SEE PAGE 12

folder nAd For each day of the week d0...d6/Ed parameters Evento E00...E03 can be displayed/programmed (see also nad table).

Night & Day Control- nAd label	E00	Functions enabled during events; 0=control disabled 1=reduced set point 2=reduced set point+light 3=reduced set point+light+aux / 4=instrument off	0...4	0		1-2	num
	E01	Hours/minutes of start of intervention. Starting from this time, the "NIGHT" mode will be enabled. The duration is determined by E02	0...23/0...59	0		1-2	hours/min
	E02	Duration of event. Sets the duration of the event that begins at time E01 determined by value E00	0...99	0		1-2	hours
	E03 (6)	Blocking/unblocking daily or holidays defrosting. 0= "work days" defrost sequence defined by parameters dE1...dE8; 1= "festive/holidays" defrost sequence defined by parameters F1...F8	0/1	0		1-2	flag
Communication Add label	dEA	DEA= device number within the family (valid values: from 0 to 14)	0...14	0		1-2	num
	FAA	FAA= device family (valid values: from 0 to 14)					

The value couple FAA and dEA represents the network address of the device and it is indicated in the following way: "FF.DD" (where FF=FAA and DD=dEA).

	PAR.	DESCRIPTION	RANGE	DEFAULT	VALUE*	LEVEL**	U.M.
Display - dis label	LOC	Keyboard locked. Parameters can still be programmed. n= keyboard not locked y= keyboard locked	n/y	n		1	flag
	PA1	Contains the password for level 1 parameters. Enabled if not 0	0...250	0		1	num
	PA2	Contains the password for level 2 parameters. Enabled if not 0	0...250	0		2	num
	ndt	Display with decimal point. n= without decimal point (only whole numbers) y= with decimal point	n/y	n		1-2	flag
	CA1	Temperature value to be added to that read by probe 1 as specified by parameter CAI	-12.0...12.0	0		1-2	°C/°F
	CA2	Temperature value to be added to that read by probe 2 as specified by parameter CAI	-12.0...12.0	0		1-2	°C/°F
	CA3	Temperature value to be added to that read by probe 3 as specified by parameter CAI	-12.0...12.0	0		1-2	°C/°F
	CAI	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	Minimum value that can be displayed	-55.0...140	-50.0		2	°C/°F
	HdL	Maximum value that can be displayed	-55.0...302	140.0		2	°C/°F
	ddL	display during defrosting: 0= displays temperature read by thermostat control probe 1= displays temperature read entering defrost cycle until set point is reached 2= displays "dEF" label during defrosting until set point is reached (or when Ldd expires)	0/1/2	1		1-2	flag
	Ldd	Time out for unlocking display (with ddL=2) if defrosting lasts too long	0...255	0		1-2	min
	dro (7)	Select °C or °F to display temperature: 0= °C 1= °F	0/1	0		1-2	flag
	ddd	Value to be displayed: 0 = Set point 1 = probe 1 (thermostat control) 2 = probe 2 (evaporator) 3 = probe 3 (display)	0/1/2/3	1		2	num

**NOTE: It is mandatory to power cycle (switch off and back on) the controller anytime the parameters in CnF folder have been changed to prevent malfunctioning and ensure correct configuration.**

Configuration- CnF label	H00	Selects probe, PTC or NTC 0= PTC 1= NTC It is mandatory to power cycle (switch off and back on) the controller anytime this parameter has been changed to prevent malfunctioning and ensure correct configuration.	0/1	1		1-2	flag
	H02	Quick activation time for functions with configured buttons. Not possible for aux (time expected = 1 second)	0...15	5		2	sec
	H06	Button/input aux/door switch light active when instrument is off	n/y	y		2	flag
	H08	Stand-by operating mode 0= only display switched off; 1= display on and controls locked; 2= display off and controls locked	0/1/2	2		2	num
	H11 (8)	Configuration of digital inputs/polarity: 0= disabled                    1 = defrost 2 = reduced set point       3 = auxiliary 4 = door switch               5= external alarm 6= disables storage of HACCP alarms 7= stand-by (On/Off)       8= maintenance request	-8...8	4		2	num

	PAR.	DESCRIPTION	RANGE	DEFAULT	VALUE*	LEVEL**	U.M.	
Configuration- CnF label	H12 (8)	Configuration of digital inputs/polarity Same as H11	-8...8	0		2	num	
	H21	Digital output configurability: 0= disabled                    1= compressor 2= defrosting                3 = fans 4 = alarm                        5= auxiliary 6= stand-by                    7= light 8= buzzer                        9 = defrosting on 2nd evaporator						
	<b>EWDR 983</b>							
	H21	Digital output configurability C	0...9	1		2	num	
	H24	Digital output configurability B	0...9	2		2	num	
	<b>EWDR 985</b>							
	H21	Digital output configurability C	0...9	7		2	num	
	H22	Digital output configurability B	0...9	2		2	num	
	H23	Digital output configurability D	0...9	3		2	num	
	H24	Digital output configurability A	0...9	1		2	num	
	H25 (9)	Auxiliary output configurability 12V~/20mA (E) Same as H21(alarm default)	0...9	4		2	num	
	H31	UP button configurability 0=disabled                    1=defrosting 2=auxiliary                    3=reduced set point 4=HACCP alarm reset        5=disables alarm HACCP 6=light                        7=stand-by 8= maintenance request	0...8	1		2	num	
	H32	DOWN button configurability Same as H31(0=disabled default)	0...8	0		2	num	
	H33	ESC button configurability Same as H31(0=disabled default)	0...8	0		2	num	
	H34	AUX button configurability Same as H31(0=disabled default)	0...8	0 (EWDR 983) 6 (EWDR 985)		1-2	num	
	H41	Presence of control probe: n= not present                y= present	n/y	y		2	flag	
	H42	Presence of evaporator probe: n= not present                y= present	n/y	y		2	flag	
	H43	Presence of display probe: n= not present                y= present (display probe) 2EP= present (probe on 2nd evaporator)	n/y/2EP	y		2	flag	
H45	Start of defrosting for dual evaporator: 0= defrost activated if temperature of 1st evaporator<dSt 1= defrosting activated if at least one of the conditions is met: -temperature 1st evaporator<dSt -temperature 2nd evaporator<dS2 2= defrosting activated if both conditions are met: -temperature 1st evaporator<dSt -temperature 2nd evaporator<dS2	0/1/2	1		2	num		
PA2	<b>in the CnF folder when you enter the correct password you can access level 2 parameters from label PA2 by pressing the "set" button</b>							
rEL	Device version. Read only parameter	0...1999	/		1	/		
tAb	Parameter table; Reserved; Read only parameter	0...1999	/		1	/		
Copy Card Fpr label	UL	Transfer of parameter map from instrument to Copy Card	/	/		1	/	
	dL	Transfer of parameter map from Copy Card to instrument	/	/		1	/	
	Fr (10)	Formatting. Cancels all data in the Copy Card	/	/		1	/	

**NOTES:**

- (1) See Duty Cycle diagram
- (2) In the dEF folder there are two folders: "dd" (daily defrost) and "Fd" (festive defrost); the first folder includes the parameters dE1...dE8 (start of daily defrost) and the second folder includes the parameters F1...F8 (start of festive defrost). The two folders can only be seen if parameter dit=3 and RTC is declared present.  
**NOTE: Do not confuse the days d0...d6 related to the nAd folder with dE1...dE8 daily defrost.**
- (3) In this group 'evaporator' always refers to 'evaporator 1'
- (4) If relative values are present (par. Att=1) parameter HAL is set to positive values and the parameter LAL is set to negative values (-LAL)
- (5) Refers exclusively to high and low temperature alarms
- (6) Does not affect defrosting at set times like Every Day event (same defrost sequence for working days/holidays).
- (7) when changing from °C to °F or vice versa the set points, differentials, etc. are NOT converted (for example, "set=10 °C becomes set=10°F")
- (8) CAUTION: positive or negative values change polarity, Positive values: active input when contact is closed; Negative values: active input when contact is open.
- (9) Auxiliary output 12V~/24mA
- (10) If the Fr parameter is used, the data previously stored on the Copy Card will be permanently lost. **This operation cannot be undone**

**NOTE: At level 1 the folders will only display all the level 1 parameters. At level 2 the folders will only display all the EWDR 983-985/CS (LX) - EWDR 985/CSK (LX)**



\* Value: to be compiled manually by user with any custom settings (if different from default settings)  
 \*\* Level: indicates the visibility level of parameters accessed using a password (see relevant paragraph)  
 \*\*\* PA2 is visible at level 1 in the CnF folder whereas it can be modified at level 2 in the diS folder

### 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	Label	Function label
Reduced set point	OSP	SP**
Aux	Aon	AoF
**default		

### 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 depending on 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.

### RESPONSIBILITY AND RESIDUAL RISKS

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

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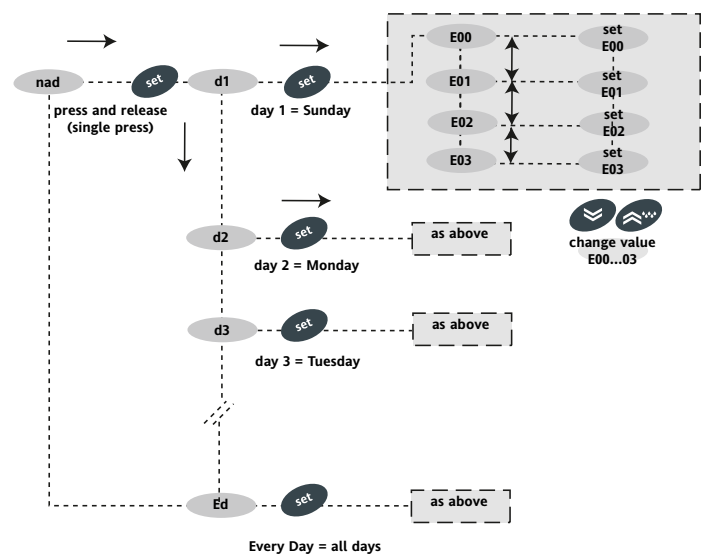
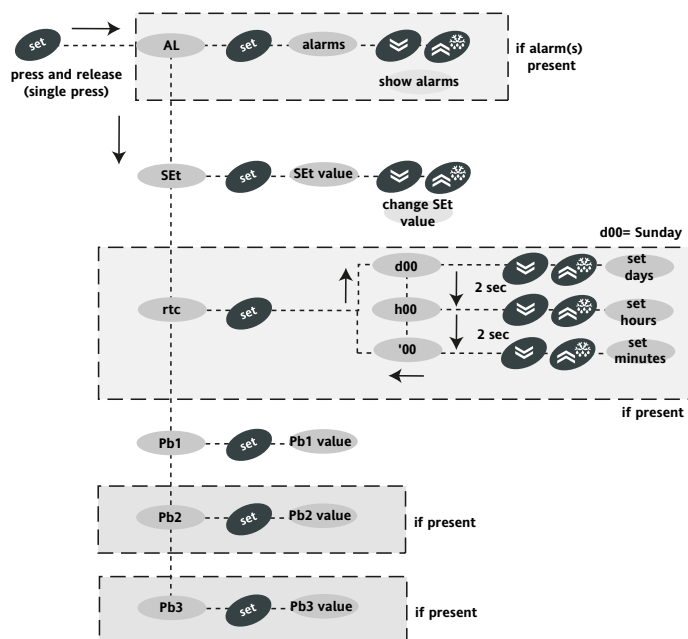
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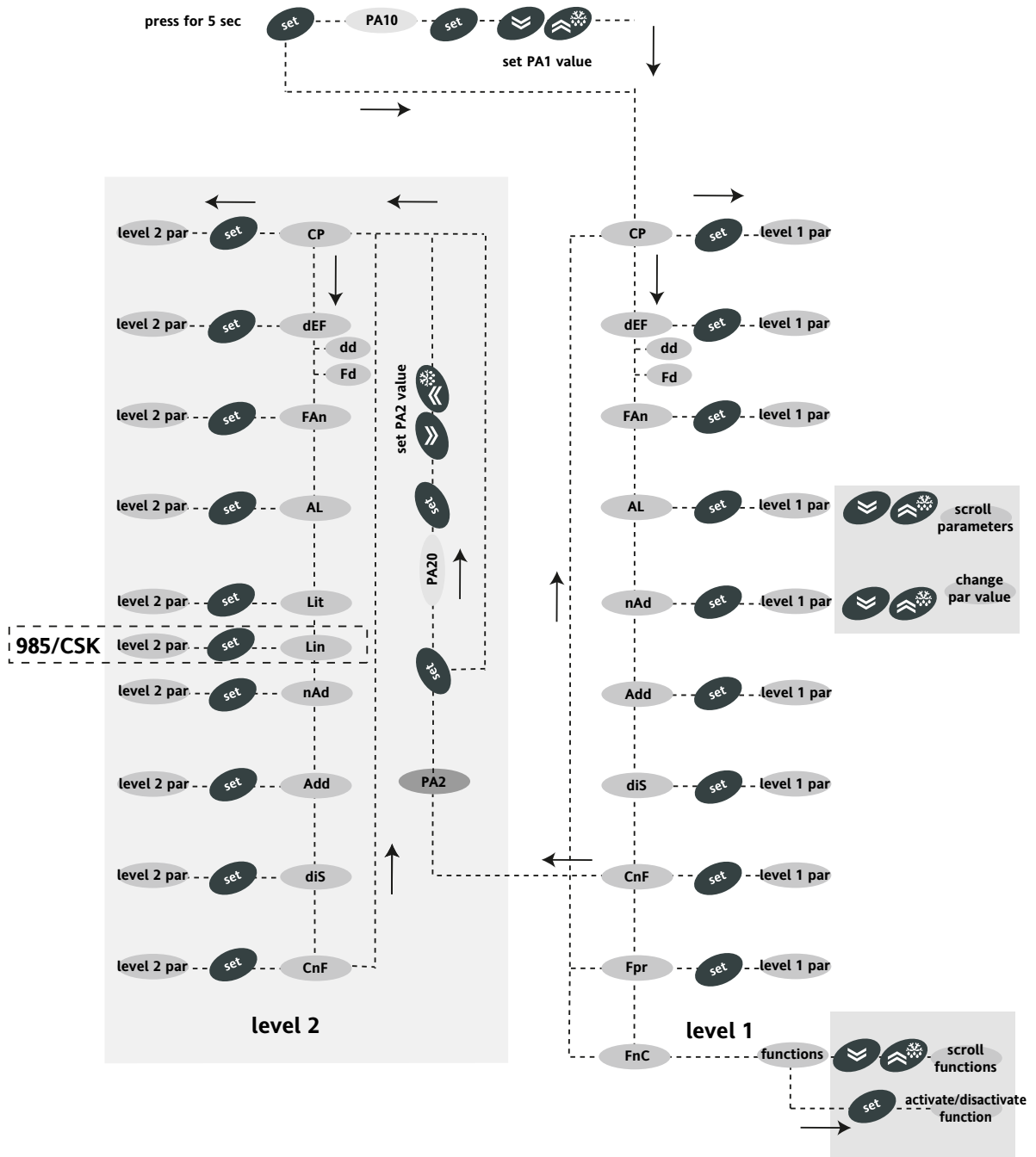
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## MACHINE STATUS MENU

## MENU nAd



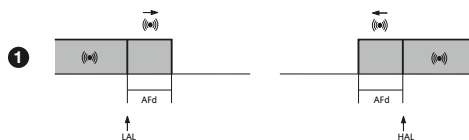
## PROGRAMMING MENU



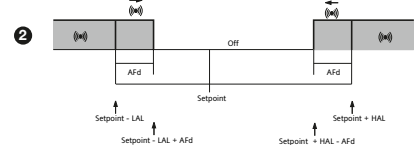
## MAX/MIN ALARMS

### MAX-MIN ALARMS

Temperature expressed as an absolute value (par "Att"=0) Abs(olute)



Temperature in relation to set point (par "Att"=1) rEL(ative)



<b>Minimum temperature alarm</b>	Temperature lower than or equal to LAL (LAL with sign)	Temperature lower than or equal to Set point + LAL*
<b>Maximum temperature alarm</b>	Temperature greater than or equal to HAL (HAL with sign)	Temperature greater than or equal to Setpoint + HAL**
<b>Minimum temperature alarm release</b>	Temperature higher than or equal to LAL + AFd	Temperature greater than or equal to Setpoint + LAL + AFd
<b>Maximum temperature alarm release</b>	Temperature lower than or equal to HAL - AFd	Temperature lower than or equal to Setpoint + HAL - AFd

\*if LAL is negative it will be subtracted from the Setpoint  
 \*\*if HAL is negative it will be subtracted from the Setpoint

if Att=rEL(ative) LAL must be negative: therefore [Setpoint + LAL] is equal to [Setpoint - LAL]

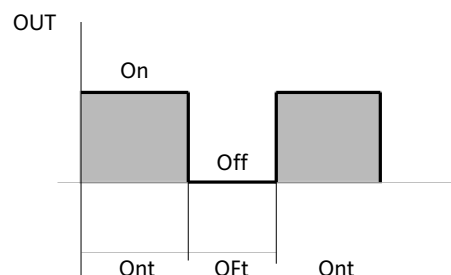
## DUTY CYCLE DIAGRAM

Ont, OFt parameters programmed for Duty Cycle

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

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

- E1 code appears on display
- the controller is activated as indicated by the "Ont" and "OFt" parameters if programmed for Duty Cycle



## WIRING DIAGRAM EWDR 983-985 (/CS LX)

### SHARED TERMINALS

1-2	Probe input 1 (room probe)
1-3	Probe input 2 (evaporator probe)
1-4	Probe input 3 (display or 2nd evaporator probe)
5-6	Digital input 1
5-7	Digital input 2
8-9	Auxiliary output 12V~/20mA (E) see par. H25 (alarm default)
10-12	RS485 network (/CS LX models only)
13-14	Power supply 230V~
A	TTL input for Copy Card

### EWDR 983 /CS (LX)

15-16*	N.O. relay output (B) see par. H24 (defrost default)
15-17*	N.C. relay output (B) see par. H24 (defrost default)
20/21-22*N.O.	relay output (C) see par. H21 (compressor default)
19-22*	N.C. relay output (C) see par. H21 (compressor default)

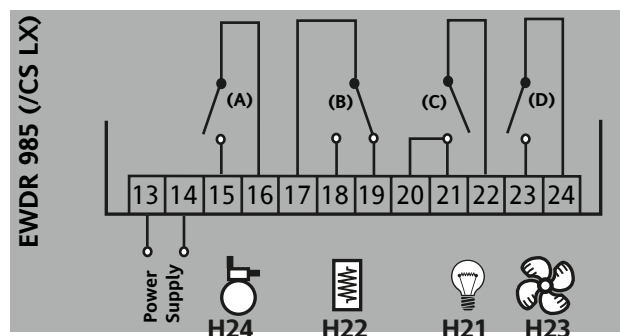
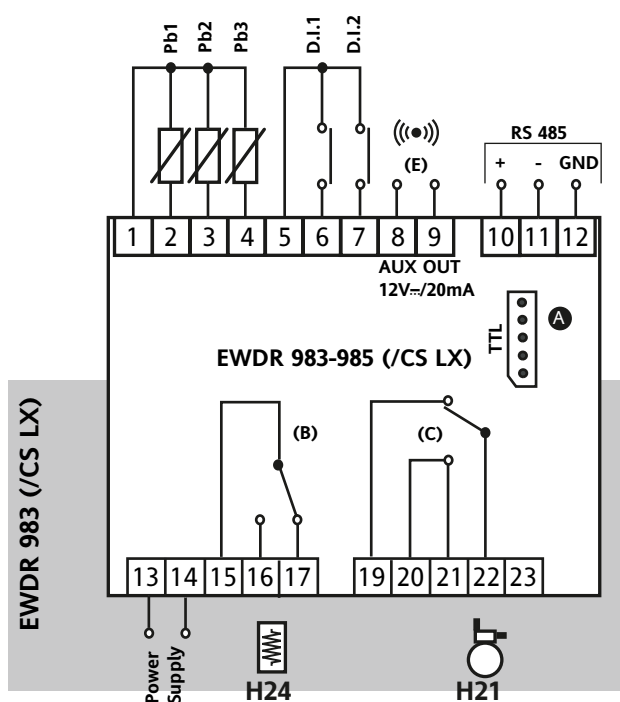
### EWDR 985 /CS (LX)

15-16*	N.O. relay output (A) see par. H24 (compressor default)
17-18*	N.O. relay output (B) see par. H22 (defrost default)
17-19*	N.C. relay output (B) see par. H22 (defrost default)
20/21-22*N.O.	relay output (C) see par. H21 (light default)
23-24*	N.O. relay output (D) see par. H23 (fan default)

### \* Relay characteristics

<b>EWDR 983/CS (LX)</b>	
Relay output (C)	16A 1hP 250V~
Relay output (B)	8A 1/2 hP 250V~
<b>EWDR 985/CS (LX)</b>	
Relay output (C)	15A 1hP 250V~
Relay output (A) (B) (D)	8(3)A 1/2hP 250V~

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



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**EWDR 983-985/CS (LX) - EWDR 985/CSK (LX)**

ISO 9001



11/12

## WIRING DIAGRAM EWDR 985/CSK (LX) - LINK

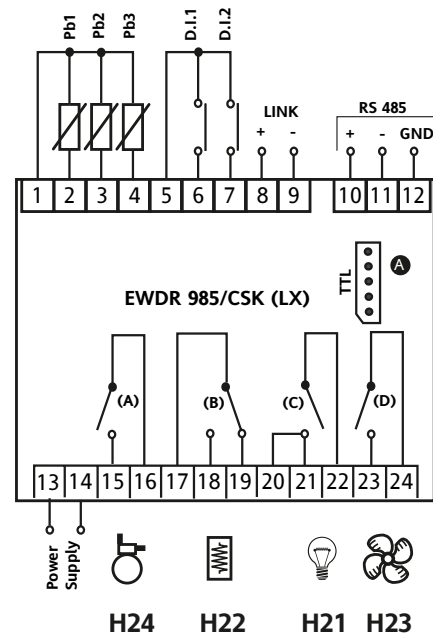
### TERMINALS

1-2	Probe input 1 (room probe)
1-3	Probe input 2 (evaporator probe)
1-4	Probe input 3 (display or 2nd evaporator probe)
5-6	Digital input 1
5-7	Digital input 2
8-9	Link (8= +; 9= -)
10-12	RS485 network
13-14	Power supply 230V~
A	TTL input for Copy Card

15-16*	N.O. relay output (A) see par. H24 (compressor default)
17-18*	N.O. relay output (B) see par. H22 (defrost default)
17-19*	N.C. relay output (B) see par. H22 (defrost default)
20/21-22*	N.O. relay output (C) see par. H21 (light default)
23-24*	N.O. relay output (D) see par. H23 (fan default)

### \* Relay characteristics

Relay output (C) 15A 1hP 250V~
Relay output (A) (B) (D) 8(3)A 1/2hP 250V~



### LINK

The Link function is used to connect up to 8 instruments (1 Master device and 7 slave 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.

**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) with own controllers that also perform(s) commands issued by the Master (with parameters L03..L06).

### 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).

### Other Functions

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).

The Master can also synchronize the Slave displays with the Master device display (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 awaiting 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)

### LINK ALARM

In the event of a master/slave communication failure, the No Link alarm is signalled. This alarm condition can be viewed on the master and slaves, if present, in the "AL" folder with the "E7" label.

### 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.
- In the event of addressing errors, E7 will not be shown, but the display will blink.

Link-label Lin	Parameter	Description	Min	Max	Unit	Default
L00	Selects the instrument as Master (0), Slave (from 1 to 7).	0..7	0	7		2
L01	Number of Slaves in the Network Refers to Master only Number of Slaves in network (from 0 to 7). For the Slaves leave value =0	0..7	0	7		2
L03	Refers to Master and Slave Defrosting Simultaneous/sequential. Master: n = sequential; y = simultaneous. Slave: y = accept; n = ignore.	n/y	n	y		2
L04	Refers to Slave only. Distributed display. n = Slave displays local values; y = Slave displays Master display	n/y	y	n		2
L05	Activation of Master network functions: n = does not ask Slaves for activation of remote functions; y = asks Slaves for activation of remote functions. Slave: n = ignores activation of remote functions from Master; y = accepts activation of remote functions from Master.	n/y	n	y		2
L06	Shuts down resources (compressors, fans, etc) at end of defrosting. n=no; y=yes	n/y	y	n		2