

# EWDC 112

Controller for Refrigerating Units

release 01.01

05-2000/b Eng

cod. 9IS41017



## USER INTERFACE

Instrument frontlet





### BUTTON USE

Buttons and programming menu

Button	Description	Function
	UP	It scrolls parameters down, it increases values. When keeping pressed, the increase is faster
	SET/DOWN	It scrolls parameters down, it decreased values. When keeping pressed, the decrease is faster

Buttons and associated functions

Button	Description	Function
	UP	It enables the manual defrost (press the button for at least 5 seconds)
	SET/DOWN	Access to the display and Setpoint programming

**"COMPRESSOR" LED** : LED associated to the state of the compressor relay. It is on when the compressor is powered on, it blinks in the case of protection or blocked power-on.




**"DEFROST" LED**: LED associated to the state of the defrost relay. It is in the case

of the automated defrost and it blinks in the case of the manual defrost.

**"ALARM" LED** : It is on in the case of a probe error, alarm high/low temperature. It blinks in the case of a silenced alarm.

**"SET/PRG" LED**: LED associated to the state of the parameter and Setpoint programming. It is on in the case of the Setpoint display. It blinks in the case of the parameter programming:

LED

LED	Associated symbol	Details
Defrost		It is constantly on during automatic defrost, it blinks during manual defrost
Compressor		It is constantly on when the compressor is powered on, it blinks in the case of protection or blocked power-on
Setpoint	set	It is constantly on during the Setpoint display, it blinks in the parameter programming mode
alarm		It is constantly on when the alarm is on, it blinks when the alarm is silenced

### DISPLAY AND PROGRAMMING THE SETPOINT VALUE (SET/DOWN BUTTON)

When pressing and releasing the SET/DOWN button, the Setpoint value is displayed and the LED (Setpoint) switches on.

To modify the value, press the UP or DOWN buttons within 10 seconds. The selected value is stored through confirmation (pressing buttons UP and DOWN at the same time) or automatically not pressing the same buttons for at least 10 seconds

### DEFROST CYCLE MANUAL POWER ON (UP BUTTON)

It is possible to manually power on the defrost cycle by pressing the button UP for at least 7 seconds. The led associated to the function will immediately be switched on blinking.

It is possible to enable the manual defrost cycle only through the instrument when in the main displaying phase (i.e. when displaying the room probe temperature). When the instrument is processing the parameters programming or is under setpoint displaying, it will not be possible to enable such a function.

### ALARM SILENCING

Only in the case the instrument is in the normal display function.

It is possible to silence an alarm by simply pressing one of the UP or SET/DOWN buttons. The LED associated with the function will start blinking.

### KEYBOARD BLOCK

Through the special programming of the LOC parameter, it is possible to disable the instrument keyboard thus avoiding any function or parameter undesired change.

### ACCESS PASSWORD TO THE PARAMETER PROGRAMMING

It is possible to set an instrument password to access the parameter programming phase. To program (or modify) the password, it is simply enough to enter the PAS parameter and program a value between 1 and 250 (when programming the value 0, the password is disabled). It is possible to only enable the password when out from the parameter programming phase. When the password is enabled and a parameter programming phase access is demanded, the PAS label is displayed. Press the buttons UP and SET/DOWN at the same time to enter the password programming, which can be modified by means of buttons UP AND SET/DOWN.

Parameter description table

Parameter	Description
diF	Setpoint intervention differential. In the case of defrost applications, the differential must be set to positive values: the compressor will stop when the programmed Setpoint value is reached (on the adjusting probe information) to restart when the temperature value accounts for the Setpoint value added the differential value. Note: the value 0 can not be programmed.
LSE	Lower Setpoint. Generally it is set to the minimum value which the probe can measure.
HSE	Higher Setpoint.
rEF	Control Mode. Set to H, the compressor regulation algorithm enables a warm operation, when set to C, it enables a cold operation.
Ont	Compressor ON time when the probe fails.
Oft	Compressor OFF time when the probe fails
dOn	Power-on delay.
dOF	Delay after power-off. Between the relay power-on and the next power-on, it is necessary that the specified time elapses.
dbi	Delays between power-on. Between two compressor power-on, it is necessary that the specified time elapses.
OdO	Delay time output since the instrument power on or the voltage cut out.
dit	Interval between defrost cycles. In hour or in minutes according to the dtU
dtU	Unit of measure for defrosting interval/duration
dCt	Selection of the interval defrost counting mode. 0 Compressor operating hours 1 Instrument power-on hours 2 Compressor power-off
dOH	Defrost off-set hours.
dEt	Defrost endurance time, In hours or minutes according to the dtU
dPO	Defrost regulation algorithm enabling request during power on
dri	Such a parameter allows to decide whether the defrost interval counting must be reset or not during the manual defrost request
AFd	Alarm/fans set differential
Att	HAL and LAL parameter interpretation mode. 0= it interprets values in absolute mode (which do not refer to the Setpoint) 1= it interprets values as relating to the Setpoint
LAL	Lower temperature alarm. The temperature value which, when overcome, will lead to the alarm enabling and signalling
HAL	Higher temperature alarm. The temperature value which, when overcome, will lead to the alarm enabling and signalling
PAO	Alarm cut out when the instrument is switched on
DAO	Alarm cut out after defrost
tAO	Delay time from the temperature alarm signalling
LOC	Keyboard block. It is still possible to enter the programming parameters and change such a parameter state thus allowing to enable the keyboard. N=it does not block, y=it blocks
PAS	Password. See Access Password to Parameter Programming section
ndt	Temperature display format. On=whole numbers only, y=decimals
CAL	Calibration. Positive or negative temperature offset which is added to the value which the temperature thermal setting probe reads before being displayed and used throughout the adjusting
LdL	Higher probe value which can be displayed on the display
HdL	Lower probe value which can be displayed on the display
dLc	Display mode during defrost 0= it displays temperature read by the room probe 1= it displays temperature read by the room probe when starting defrost 2= it displays the "deF" label during defrost
dro	Select °C or °F to display temperature read by the room probe. 0=°C, 1=°F
rEL	Instrument release. Read only
tAb	Reserved. Read only

If the password is correct, by pressing the button UP and SET/DOWN at the same time, you will be able to enter into the parameter Programming Phase. If the password is wrong the device prompts the label PAS to enter it again.

## PARAMETER PROGRAMMING

It is possible to enter the parameter programming by pressing the button UP and SET/DOWN at the same time for at least 5 seconds. The label of the first parameter will be displayed. LED SET will blink during the entire programming mode. To move to the other parameters, press UP or SET/DOWN. To display the parameter value, press the two buttons at the same time. To change it, press the UP or the SET/DOWN buttons.

Storing of the selected value is only possible through confirmation, pressing buttons UP and SET/DOWN at the same time or automatically avoiding pressing the two buttons for 10 seconds about. In the latter case, you exit the programming parameter function, going back to the main displaying mode.

## PARAMETERS

Parameters are visible in two different tables (*Parameter description table*) which describes the parameter function and while the second table (*Parameter features table*) provides for a list of the specific features of each parameter.

## DIAGNOSTICS

### PROBE ALARM

Alarms depending on possible failures are displayed on the instrument display by means of the following symbols.

◆ E1: failed room cell; fixed display

The room probe error state leads to:

1. The E1 code displayed on the display
2. Compressor power on as specified by parameters Ont and Oft
3. Maximum or minimum alarm regulation algorithm disabling.

### TEMPERATURE ALARM

The error mode depends on values at the HAL, LAL and Att parameters level. In the case of Att=absolute, the error depends on the overcoming of one of the two values entered at the HAL and LAL parameter level. In the case of

Parameter table: features

Parameter	Description	Range	Default	Measure unit
diF	Differential	0..30	2	°C/°F
LSE	Lower Set	-67..HSE	-50	°C/°F
HSE	Higher Set	LSE..302	50	°C/°F
rEF	Control mode	H/C	C	Flag
Ont	On time (compressor)	0..250	0	Minutes
Oft	OFF time (compressor)	0..250	0	Minutes
dOn	Power-on delay	0..250	0	Seconds
dOF	Delay after power-off	0..250	0	Minutes
dbi	Delay between power-on	0..250	0	Minutes
OdO	Delay output from power on	0..250	0	Minutes
dit	Defrost interval mode	0..250	6	Hours/Minutes
dtU	Unit of measure for defrosting interval/duration	0..1	0	Flag
dCt	Defrost counting mode	0..2	1	Flag
dOH	Defrost offset hour	0..250	0	Minutes
dEt	Defrost Endurance time	1..250	30	Minutes (dtU=H) Seconds(dtU=P)
dPO	Defrost (at) Power On	n..y	n	Flag
dri	Defrost reset interval	n..y	y	Flag
Afd	Alarm differential	1..30	2	°C/°F
Att	Alarm temperature mode	0..1	0	Flag
LAL	Lower Alarm	-67..HAL	-50	°C/°F
HAL	Higher alarm	LAL...302	50	°C/°F
PAO	Power on alarm override	0..10	2	Hours
dAO	Defrost alarm override	0..999	60	Minutes
tAO	Temperature alarm override	0..999	0	Minutes
LOC	(keyboard) lock	n..y	n	Flag
PAS	Password	0..250	0	Number
ndt	Display mode number	n..y	y	N/y
CAL	Calibration	-30..30	0	°C/°F
LdL	Lower display Limit	-67..302	-50	°C/°F
HdL	Higher display Limit	-67..302	110	°C/°F
dLc	Display Lock	0..2	0	Flag
dro	Selection °C or °F	0..1	0	Flag
rEL	Release firmware	0..99	/	Number
tAb	Table of parameters	-99..99	/	Number

Att=relative, HAL and LAL parameter are read as offset in comparison with the SetPoint.

The error occurs at the overcoming of the values obtained by the algebraic sum between the SetPoint value and the value setup by those parameters. When one of the alarm conditions is detected, if not during the alarm cut off (see parameter tAO), the LED associated with the function switches on. When such an alarm is detected, the actual differential temperature control is not affected.

## MECHANICAL ASSEMBLY

The instrument was designed to be assembled to the frontlet. Drill a hole, 29x71mm and fix the instrument by means of the special supplied bracket.

The admitted room temperature range for a current instrument power on varies between -5 and 60 °C.

Avoid assembling the instrument in moist and/or dirty places. It must be power on in ordinary or normally polluted places. Ventilate the area next to the instrument cooling vents.

## ELECTRICAL CONNECTIONS

The instrument exhibit screw terminal blocks to connect electrical cables, section max. 2.5 mm<sup>2</sup> (as for the power contacts, a unique wire per terminal). Adjust and service the electrical connection, when the machine is opened only.

Check that the power supply voltage complies with the instrument demanded power supply voltage.

The probe does not need an introduction polarity and it can be extended by means of a simple bipolar cable (the instrument behaviour depends on the probe extension from an electro-magnetical compatibility viewpoint: pay the due attention to cabling).

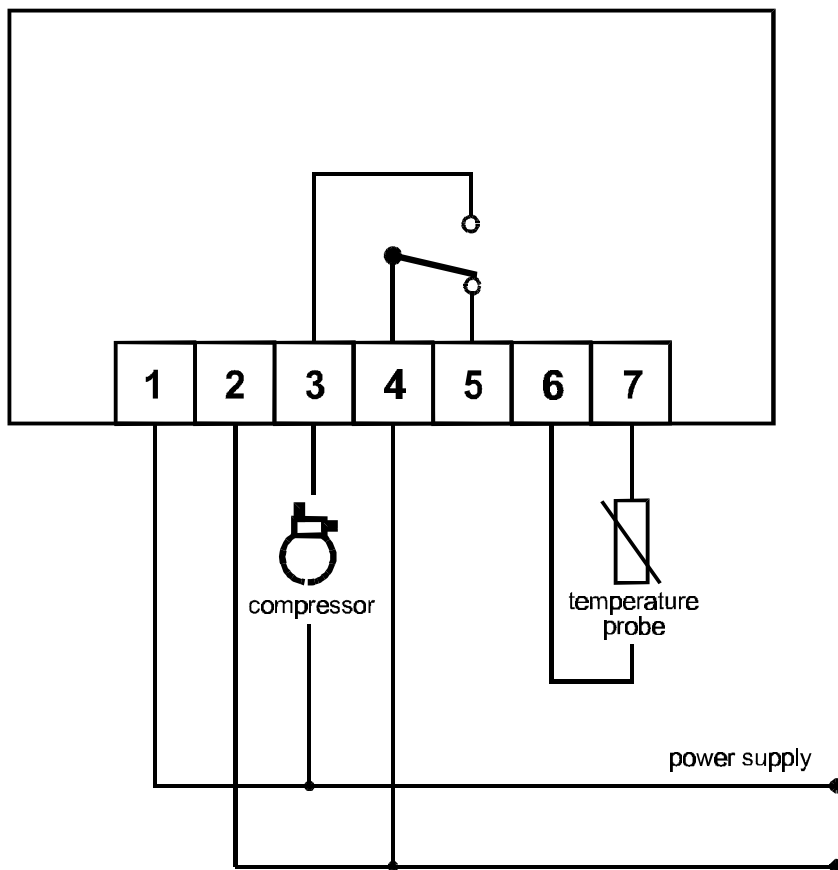
No insulation is present between voltage circuit, relay and probe contact wires, so the instrument generally has not extremely low safety voltage wires. Relays outputs are voltage-free.

## OPERATING INSTRUCTIONS

### POSSIBLE USE

For safety reasons, the control instrument must be always installed and used according to the specific instructions provided by the manufacturer. More precisely, under normal conditions, any element under dangerous voltage must be accessed. The instrument must be protected from water and dust and it must only be accessed by simply using the specific tool, with the exception of the frontlet. The instrument is suitable to be assembled inside a domestic appliance and/or similar in the case of conditioning. Its safety was controlled according to the European reference harmonised Standards.

It is classified as an electronic automated control instrument to be independently assembled according to its construction, as a control instrument, type 1B action according to the automated power on features; as a Class A instrument according to the software class and structure.



## TECHNICAL DATA

Frontlet protection: IP65  
 Unit: plastic resin PC+ABS, VO extinction degree  
 Sizes: Frontlet 76x34mm, 58mm deep  
 Assembly: to the frontlet by means of a drilling template 29x71mm  
 Display and LED: 3 displays and 7 segments with decimal point  
 Room temperature: 25°C (Min. -5°C, Max 60°C)  
 Room moist (non-condensing): 30% (Min. 10°C, Max 90°C)  
 Storage temperature: 25°C (Min. -30°C, Max 75°C)  
 Storage moist (non-condensing): 30% (Min. 10°C, Max 90°C)  
 Analogue inputs: 1 NTC probe *reinforced insulation*  
 Digital outputs: 1 relay 15A 1hp 250V~  
 Accuracy: better than 0.5% at the end scale  
 Resolution: 0.1 °C or 1°C  
 Power supply: 230 V~/12V~/±10%,  
 Power supply frequency 50/60 Hz  
 Absorbed power: 1W max.

### FORBIDDEN USE

Any possible use difference from what prescribed is totally forbidden. Supplied relay contact are functional and they can fail (as they are controlled by an electronics, they can undergo short circuits or remain opened). It is therefore important that protection devices demanded by the regulations or demanded by evident safety reasons must be supplied outside the instrument.

- Operation on boards which dangerous elements can be easily accessed on without any special tool;
- Tempering and/or any product change;
- Installation/operation on boards which do not comply with regulations and standards in force.

## LIABILITY AND RESIDUAL RISKS

**Invensys Climate Controls s.p.a.** is not liable for possible damages depending on:

- Installation/operation different from what prescribed and, more precisely different from safety regulations in existing standards and/or described in the present operating instructions;
- Operation on boards which do not provide for the necessary protection against electric shocks, water and dust under the specified assembly standards;

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