

## **FOR REFERENCE ONLY**

### **Eliwell EWPC 972 Temperature Control**



The EWPC 972 is a micro-processor based digital controller specifically designed for refrigeration systems; it is particularly suited for medium or low temperature range "forced air" units.

It incorporates three 12 Vdc/30 mA outputs to activate the auxiliary and external relays for (1) compressor, (2) defrost system and (3) evaporator fan control. This instrument must be used with the Din-rail mounted EWDR SLAVE (972 version) module which contains the auxiliary relays; connection is achieved through a compatible MULTILEAD CABLE, equipped on both ends with telephone type quick-disconnect and polarized connectors.

This MULTI-LEAD CABLE conducts all signals, i.e. input signals from the PTC probes, output signals to energize the relays in the module, as well as the power supply to the EWPC 972.

A number of parameters are displayed alphanumerically to set up the EWPC 972 for each specific application.

The EWPC 972 is supplied in the popular "32x74" ELIWELL housing and is manufactured according to VDE and UL norms. The EWDR SLAVE (972 version) is supplied in the 70x85 mm (4 modules) housing for Din-rail (Omega 3) or surface mounting and is manufactured according to VDE and UL norms.

### **Operation**

#### **Please Note: These are Low Temp Control Setting Instructions for Oscartek Gelato & Ice Cream Showcases**

The temperature control is always subject to a positive temperature differential (make on rise): the compressor stops when setpoint is reached and starts again upon reaching the setpoint temperature plus the differential.

A choice of two defrost types is available: electric defrost (during which the compressor stops) or hot gas defrost (during which the compressor is running). Other programming options include: defrost frequency time, time count mode, defrost termination temperature, and a defrost safety limit (time-out).

The evaporator probe is used to control the defrost cycle as well as the evaporator fan: a selection can be made of the temperature above which the fan is OFF, the post-defrost fan delay time and the link between fan and compressor.

A number of compressor short-cycle protection solutions (i.e., delay on start, delay at switching off, delay between two successive starts) are incorporated in the system.

Thanks to a wide selection of other available parameters the controller can be adapted to virtually any application requirement.

### **Front Keypad**

**SET:** push and release to display the setpoint for 5 seconds.

During this period the "SET" status light is on and the setpoint can be changed with the "UP" or "DOWN" button only.

The system will automatically switch to normal display after 5 seconds upon release of buttons and the new value will be memorized.

**UP:** used to increase the setpoint value, as well as the parameter when in programming.

When held down for a few seconds, the change rate accelerates.

**DOWN:** same functions except to decrease a value.

**DEFROST:** this momentary push button will start a manual defrost cycle whenever it is activated for at least 5 seconds.

Not accessible when in setpoint or parameter programming.

The programmed interval to the next defrost cycle is automatically reset.

The "DEF" goes on when the defrost is initiated, whether the defrost is manual or automatic.

**Led "COMP":** status light of the internal compressor relay.

It is ON when the compressor is ON.

**Led "SET":** it is on during Setpoint display and programming.

It blinks during parameter programming.

**Led "DEF":** status light of the defrost.

It is on during automatic defrost; it blinks during manual defrost.

### **Parameter Programming**

Programming is easily accessed by holding the "SET" button down for more than 5 seconds; the first parameter is displayed while the status light "SET" remains blinking during the programming period.

Other parameters are accessed with the "UP" and "DOWN" button. With the "SET" button, the actual setting of each parameter is displayed. It can be changed with "UP" and "DOWN".

The system will automatically return to its normal operating mode a few seconds after the programming procedure is completed or interrupted.

### **Description of Parameters**

**diF: diFferential.**

Switching differential (hysteresis); it will always be set with positive value (make on rise).

**LSE: Lower SEt.**

This is the lower limit below which the user cannot change the setpoint.

**HSE: Higher SEt.**

Similar to "LSE", however setting an upper limit for the setpoint.

**dty: defrost type selection.**

EL = ELectric defrost;

in = hot gas (reverse cycle) defrost.

**dit: defrost interval time.**

Defrost initiation frequency in hours.

**dct: defrost count type.**

dF = digifrost<sup>®</sup>Feature; defrost starting time ("dit") is calculated based on accumulative compressor running time.

rt = real time; defrost initiation frequency is based on real time. Time between defrost starts is always the same.

SC = Stop Compressor; a defrost cycle is activated each time the compressor stops.

Fr = Free (the compressor relay has no relation with the defrost functions and continues to regulate on Setpoint).

**doh: defrost offset.**

Time delay of defrost start, expressed in minutes.

**dEt: defrost Endurance time-out.**

Defrost safety limit, in minutes. Defrost cycle is terminated, regardless whether fully completed.

**dSt: defrost Stop temperature.**

Adjustable defrost termination temperature.

**FSt: Fan Stop temperature.**

Setting of temperature (measured by the evaporator defrost probe) above which the fan is always OFF.

**Fdt: Fan delay time.**

Selection of post-defrost fan delay, expressed in minutes.

**dt: drainage time.**

Upon defrost completion, evaporator fan and compressor remain OFF for this amount of time to allow coil drainage; expressed in minutes.

**dPo: defrost (at) Power on.**

Selects whether the system should go through a defrost cycle at start-up (or after a power failure).

n = no; y = yes.

**ddL: defrost display Lock.**

Select whether or not to lock in the actual box temperature display during a defrost.

n = no; during defrost the actual box temperature is displayed.

y = yes; the temperature displayed at the start of a defrost is locked in and does not change during this cycle.

Lb = Label; during the defrost the label "dEF" is displayed to indicate a defrost is in progress.

Note: with the "y" and "Lb" selection, the display remains locked until the box temperature is pulled down again and reaches setpoint.

**dFd: defrost Fan disable.**

Fan OFF during defrost.

n = no; y = yes.

**AFd: Alarm (and) Fan differential.**

The allowable temperature swing between ON and OFF of fan functions (see parameter "FSt").

**Fco: Fan compressor off.**

The evaporator fan is OFF whenever the compressor is cycled OFF.

oF = yes; on = no.

**cPP: compressor Probe Protection.**

Select compressor relay status in case of room probe defect.

oF = compressor OFF in case of probe defect.

on = compressor ON in case of probe defect.

**ctP: compressor type Protection.**

Select the type of (short-cycle) protection best suited for the compressor; the actual delay time is programmed with the next parameter.

nP = no Protection.

don = delay on start; delay applies when relay is energized.

doF = delay at switching oFf. Minimum off cycle time period.

dbi = delay between two successive starts. Limits the number of start-ups per hour.

**cdP: compressor delay Protection.**

The time delay - in minutes - applicable to the previous parameter "ctP".

**odo: output delay (at) on.**

Time delay - in minutes - applied to activation of the relays after start-up (this parameter is not present on standard models).

**EPr: Evaporator Probe read-out.**

With this parameter the evaporator temp. can be displayed, even during normal operation.

**CAL: CALibration.**

Temperature read-out offset to allow for a fixed adjustment up or down due to probe location, if desired.

**tAb: tAble of parameters.**

This shows the configuration of the parameters as set in the factory; can not be modified (for factory identification and diagnostic purposes only).

Parameter	Description	Range	Default	Unit
diF	diFferential	1...15	2	°C / °F
LSE	Low SEt	-99...HSE	-55	°C / °F
HSE	High SEt	LSE...99	40	°C / °F
dtY	defrost type selection	EL / in	EL	flag
dit	defrost interval time	0...31	6	hours
dct	defrost count type	dF / rt / SC / Fr	dF	flag
doh	defrost offset	0...59	0	minutes
dEt	defrost Endurance time-out	1...99	30	minutes
dSt	defrost Stop temperature	-70...99	8	°C / °F
FSt	Fan Stop temperature	-70...99	2	°C / °F
Fdt	Fan delay time	0...99	10	minutes
dt	drainage time	0...99	0	minutes
dPo	defrost (at) Power on	n / y	n	flag
ddL	defrost display Lock	n / y / Lb	n	flag
dFd	defrost Fan disable	n / y	y	flag
AFd	Alarm (and) Fan differential	1...50	2	°C / °F
Fco	Fan compressor off	oF / on	on	flag
cPP	compressor Probe Protection	oF / on	oF	flag
ctP	compressor type Protection	nP / don / doF / dbi	doF	flag
cdP	compressor delay Protection	0...15	0	minutes
odo	output delay (at) on	0...99	0	minutes
EPr	Evaporator Probe read-out	/	/	°C / °F
CAL	CALibration	-20...20	0	°C / °F
tAb	tAble of parameters	/	/	/

## Technical Specs

- **Housing:** black ABS plastic, self-extinguishing
- **Dimensions:** front 74x32mm (2.913x1.260D"), depth 67mm (2.637")
- **Mounting:** flush panel moun with mounting bracket
- **Protection:** the instrument front panel is waterproof !P65; an optional snap-on cover can be supplied to provide additional protection of the rear terminal block
- **Connections:** telephone type receptacle for connection with the EWDR SLAVE module

- **Display:** 12.5mm LED (.5D")
- **Push Buttons:** located on front panel
- **Outputs:** three output signals 12Vdc/30 mA to control the auxiliary relays of the EWDR SLAVE Din-module (compressor, evaporator fan control and defrost)
- **Inputs:** two (2) PTC probes for temperature control and defrost termination; these are connected to the EWDR SLAVE module only
- **Resolutions:** 1 °C (°F)
- **Accuracy:** better than 0.5% of full scale
- **Power supply:** supplied by the EWDR SLAVE

## Installation

The EWPC 972 is designed for flush panel mounting. Insert the unit through a 29x71mm panel cut-out and affix with the U-bracket supplied.

The EWDR SLAVE (972 version) is designed for surface mounting (pull out both lugs) or for Din-rail mounting (Omega 3). Connection between these two units is achieved through a compatible MULTI-LEAD CABLE, equipped on both ends with quick-disconnect and polarized connectors.

The ambient temperature around the instruments should be kept between  $-5$  and  $65$  °C ( $23\dots149$  °F); select a location which will not be subject to high humidity or condensation.

Allow some ventilation to provide cooling to the EWPC 972.

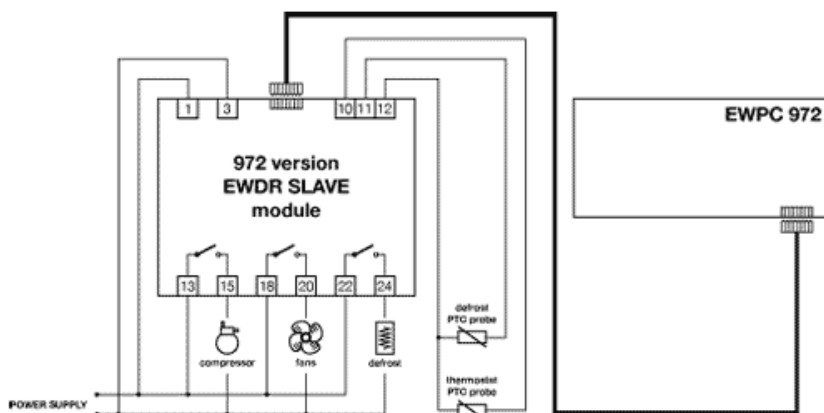
## Electrical Wiring

The EWPC 972 has a telephone multi-lead connector for the Din-rail mounted EWDR SLAVE module.

The EWDR SLAVE (972 version) module - aside from the telephone connector for the EWPC 972 - has two screw terminal blocks (2.5 mm<sup>2</sup>; one wire each terminal only, in compliance with VDE norms) for the remaining electrical wiring.

Make sure that the power supply to the EWDR SLAVE corresponds with the rating shown on the instrument. The two 2-lead PTC probe cables do not require polarity and can easily be extended by using regular 2-lead stranded wire.

It is strongly recommended to run the probe cable and the MULTI-LEAD CABLE separate from line voltage wiring. Also, it is good practice to install the tip of the probe in upright position, to avoid moist from entering into the stainless steel sensor housing.



## **Error Messages**

The EWPC 972 causes the display to read "E1" in the event of a problem with the box probe. This could mean: either an open or shorted sensor, sensor not connected, temperature "under range" (below  $-55\text{ }^{\circ}\text{C}$  or  $-67\text{ }^{\circ}\text{F}$ ) or temperature "over range" (over  $99\text{ }^{\circ}\text{C}$  or  $210\text{ }^{\circ}\text{F}$ ).

An error reading "E2" means a problem with the evaporator probe.

It is recommended to double-check the sensor wiring before diagnosing a probe as defective.