

ID 961

electronic controllers for refrigeration units



- Eliwell Electronic controller for refrigeration units
- 2 NTC/PTC probes
- 1 relay

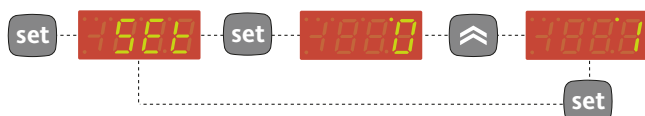
- TTL serial
- 115V

BUTTONS AND LEDS

- UP** (Up arrow button)
Scrolls through the menu items
Increases the values
Activates manual defrost function
- DOWN** (Down arrow button)
Scrolls through the menu items
Decreases the values
- fnc** (fnc button)
Escape (ESC) function -quit
- set** (set button)
(press once)
• Accesses the setpoint
• Displays the alarms (if active)
• Displays Pb1 and Pb2 (see)
(hold down) Accesses the parameter Configuration Menu
- Compressor** (Compressor icon LED)
ON when the compressor is started up;
blinking in case of delay, protection or blocked enabling
- Defrost** (Defrost icon LED)
ON when defrosting; blinking in case of manual enabling
- Alarm** (Alarm icon LED)
ON when the alarm is enabled;
blinking when the alarm is silenced

SETTING THE SET POINT - STATUS MENU

a) Press and release the “set” button to access the status menu. Under normal conditions, the label for the Set point value is found in this menu. Once the ‘SEt’ label is displayed, press the “set” button again to display the Setpoint value. The Setpoint value appears on the display.



To change the Set point value, use the “UP” and “DOWN” buttons within 15 seconds. If you press the “set” or “fnc” button or let 15 seconds elapse, the last value displayed will be stored and “SEt” label will reappear on the display.

b) If alarms are present, the “AL” label appears. By using the “UP” and “DOWN” buttons, you can scroll through all the folders in the menu:
-AL: alarm folder (if alarms present, except for faulty probes/probe

errors;



-SEt: Set point setting folder see pt. a)

-Pb1: probe 1 value folder;

-Pb2: probe 2 value folder.

c) If an alarm condition exists when the Status menu is accessed, the “AL” folder label appears.



(example: when maximum and minimum temperature alarms are present)

Use the UP and DOWN buttons to scroll through the list of active alarms and press ‘set’ to display the selected alarm.

d) Press the “fnc” button to escape and return to normal display.

CONFIGURATION MENU

To access the Configuration Menu, hold the “set” button down for more than 5 seconds.

- When the ‘set’ button is pressed, the first folder in the menu is displayed. (e.g.: “CP” folder)
- By using the ‘UP’ e ‘DOWN’ buttons, you can scroll through all the folders in the programming menu



- By pressing the “set” button for the selected folder (in this example, ‘DEF/dit’) the first parameter is displayed. Use the “UP” and “DOWN” buttons to select the required parameter.
- Press “set” to display the selected parameter value and use the “UP” and “DOWN” buttons to change it.

Once the “set” button has been pressed (or the 15 second time out elapses) the new value is stored and the label of the corresponding parameter will be displayed. To back out of the Configuration Menu press the “fnc” button several times to escape to normal display mode.

PASSWORD

Access to parameter handling can be limited by using a password. The password can be enabled by setting the PA1 parameter in the ‘dis’ folder. The password is enabled if the value of the PA1 parameter is not 0.

- To enter the Configuration menu hold the “set” button down for more than 5 seconds.
- If specified, the PASSWORD will be requested.



- If the PA1 password is enabled (not 0) you will be asked to enter it. Do this by selecting the correct value using the UP and DOWN buttons and confirm by pressing the ‘set’ button.

If the password is not entered correctly, the device will display the ‘PA1’ label again and the step will have to be repeated.

COPY CARD

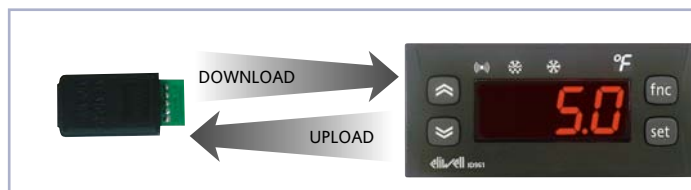
The Copy Card is an accessory connected to the TTL serial port used for quick programming of the unit parameters (upload and download parameter map to one or more units of the same type). upload (UL label), download (dL label) and copy card formatting (Fr label) operations are performed in the following way:

- The 'FPr' folder contains the commands necessary for use of the Copy Card. Press 'set' to access the functions.
- Use the 'UP' / 'DOWN' buttons to display the required function. Press the 'set' and uploading (or downloading) will be performed.
- If the operation is successful 'y' will be displayed, if it is not successful, 'n' will be displayed.

Download from reset

Connect the copy card when the controller is OFF. The programming parameters are downloaded when the device is switched on. At the end of the lamp test, the following messages are displayed for about 5 seconds:

- dLY label if copy operation is successful
- DLn label if operation fails



NOTE:

- after the parameters have been downloaded, the device uses the downloaded parameter map settings.
- see "FPr folder" in Parameter Table and Description of parameters

At each level in both menus, when the "fnc" button is pressed or the 15 second time out elapses, you are taken back to the higher display level and the last value on the display is stored.

KEYBOARD LOCKING

The controller includes a capability for disabling the keyboard:

- using the keys (pressing **UP+DOWN simultaneously** for 2 seconds; see KEYS AND LEDS)
- by programming the "Loc" parameter (see folder with "diS" label).

If the keyboard is locked, you can access the Configuration Menu by pressing the "set" key.

The Setpoint can also be viewed.

PARAMETERS TABLE

#	PAR.	RANGE	DEFAULT	U.M.	LEVEL	#	PAR.	RANGE	DEFAULT	U.M.	LEVEL
SETPOINT											
1	SEt	-58...+210	34	°C/°F	1						
CP FOLDER											
2	diF	0...30.0	4	°C/°F	1						
3	HSE	-58...302	40	°C/°F	1						
4	LSE	-58...210	32	°C/°F	1						
5	HC	0/1	1	flag	1						
6	Ont	0...250	8	min	1						
7	OFt	0...250	4	min	1						
8	dOn	0...250	0	sec	1						
9	dOF	0...250	1	min	1						
10	dbi	0...250	4	min	1						
11	OdO	0...250	0	min	1						
DEF Folder											
12	dit	0...250	3	h	1						
13	dCt	0/1/2	1	num	1						
14	dOH	0...59	0	min	1						
15	dEt	1...250	25	min	1						
16	dSt	-50...150	43	°C/°F	1						
17	dPO	n/y	n	flag	1						
18	dt	0...250	1	min	1						
						diS Folder					
19	LOC	n/y	n	flag	1						
20	PA1	0...250	0	num	1						
21	CA1	-120...120	7	°C/°F	1						
22	CA2	-120...120	0	°C/°F	1						
23	dLc	0/1/2	1	num	1						
24*	dro	0/1	1	flag	1						
						CnF Folder					
25**	H00	0/1	1	flag	1						
26	H42	0/1	1	flag	1						
/	rEL	/	/	/	/						
/	tAb	/	/	/	/						
						FPr Folder					
27	UL	/	/	/	/						
28	dL	/	/	/	/						
29	Fr	/	/	/	/						

* DEFAULT is °F

**DEFAULT column: for H00 parameter default is depending on model

NOTE: Switch off and switch on again the controller after changing the input type NTC/PTC (par. H00)

LEVEL column: indicates the level of visibility of parameters accessible by PASSWORD (see the related paragraph)

DESCRIPTION OF PARAMETERS

#/par	FOLDER & parameter description SETPOINT		
1/Set	Set point The Set points can be viewed from the Status Menu and not the Configuration Menu. The range is determined by parameters LSE and HSE.	19/LOC	DISPLAY (folder with "diS" label) Keyboard LOCK. Allows lock out of temperature Set-point changes etc. Parameter configuration and modification including this parameter is still possible, y (yes) = keyboard LOCK; n (no) = keyboard LOCK.
2/diF	COMPRESSOR CONTROL (folders with label "CP") Compressor relay activation differential: the compressor turns OFF upon reaching the Setpoint value (as indicated by the control probe - thermostat function) and turns ON at a temperature value equal to the Setpoint plus the value of the differential. Note: the value 0 cannot be assumed.	20/PA1	Password (code) 1. When enabled (value different from 0), it represents the access code for all configuration parameters.
3/HSE	Maximum value for set point.	21/CA1	Calibration of control (thermostat) probe (1). Addition of a positive or negative value to probe 1 reading/value.
4/LSE	Minimum value for set point.	22/CA2	Calibration of evaporator probe (2). Addition of a positive or negative value to probe 1 reading/value.
5/HC	If set to H, the controller operates in heating mode. If set to C, the controller operates in cooling mode.	23/dLc	Defrost display Lock. Display view during defrost. 0 = shows the temperature read by the thermostat probe (probe 1); 1 = locks the temperature reading value of the thermostat probe (probe 1) when defrost starts, and until the next time the temperature Setpoint value is reached; 2 = displays the label "deF" during defrost, and until the next time the temperature Setpoint value is reached.
6/Ont	Duty Cycle - Compressor ON time in the event of a faulty probe. If set to "1" with OfT set to "0", the compressor is always on, while with OfT > 0 it operates in duty cycle mode.	24/dro	Select °C or °F for displaying the temperature read by the probe. 0 = °C, 1 = °F. PLEASE NOTE: switching between °F and °C or vice versa DOES NOT modify the setpoint, differential, etc. (for example set=10°F become 10°C).
7/OfT	Duty Cycle - Compressor OFF time in the event of a faulty probe. If set to "1" with Ont at "0", the compressor is always off, while with Ont > 0 it operates in duty cycle mode.	25/H00	CONFIGURATION (folder with "CnF" label) Probe type selection, PTC or NTC. 0= PTC, 1= NTC.
8/dOn	Compressor Start delay. Time delay between the compressor on request and actual compressor turn ON.	26/H42	Evaporator probe presence. n= not present; y= present.
9/dOF	Minimum compressor OFF time - compressor short cycling protection. The set time must elapse between a compressor (relay) turn OFF and the successive compressor (relay) turn ON.	rEL	controller version: read only parameter.
10/dbi	Minimum time Delay between compressor turn ON's. - compressor short cycling protection. The set time must elapse between two consecutive compressor turn ON's.	tAb	Reserved: read-only parameter.
11/OdO	Output activation delay after power up. Delay time in activating the outputs after the controller is powered up or after a power failure. 0= not active.	27/UL	COPY CARD (folder with label "FPr") - (see "Copy Card" section) Upload. Programming parameter transfer from controller to Copy Card.
		28/dL	Download. Programming parameter transfer from Copy Card to controller.
		29/Fr	Format. Erases all parameters in the Copy Card. PLEASE NOTE: using the "Fr" parameter (Copy Card formatting) erases all data results in the Copy Card. Data will be permanently lost and the operation cannot be cancelled!

DEFROST CONDITIONS

The controller allows defrost to be performed under the following conditions:

- the evaporator temperature is lower than the defrost termination temperature set by the "dSt" parameter;
- manual defrost is not in progress; (if a manual defrost is in progress the request for automatic defrost will be cancelled).

Automatic defrost

In this case, defrost takes place at time intervals set by parameter dit (=0 defrost will not take place at all).

As mentioned above, if the parameter dit > 0 defrost will take place at fixed intervals and according to the parameter dCt

DEFROST CONTROL (folders with labels "dEF")

12/dit	Defrost interval time. Time interval between the start of two successive defrost cycles. 0= the function is disabled (defrost is NEVER performed)
13/dCt	Defrost Execution - time basis. Calculation basis for defrost time interval(s). 0 = Accumulated compressor hours of operation (DIGIFROST® method); NOTE: Compressor run time is counted regardless of the state of the evaporator probe (counting is active if evaporator probe is absent or faulty). 1 = Accumulated appliance (controller) hours of operation; defrost execution is always active when the appliance (controller) is on and counting starts at each power up. 2 = Compressor stop. Every time the compressor stops, a defrost cycle is performed.
14/dOH	Defrost start delay time. Defrost start delay time from power up of the controller.
15/dEt	Defrost duration time (fail-safe): determines the maximum duration of the defrost cycle.
16/dSt	Defrost termination temperature (determined by the evaporator probe). Defrost terminates (ends) at set temperature
17/dPO	Defrost at Power-On. Determines if the controller will enter defrost at Power-On (if the evaporator temperature probe allows this operation). y = yes, begin defrost at Power-On.; n = no, no defrost at Power-On.
18/dt	Drip time. The time between defrost termination and refrigeration start which allow the evaporator to led the water drip off.

ELECTRICAL CONNECTIONS

Warning! Always switch off machine before working on electrical connections. The controller has screw terminals for connecting electrical cables with a maximum diameter of 2.5 mm² (only one conductor per terminal for power connections): for terminal capacity, see controller label. 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 controller: special care must be used when wiring). Probe cables, power supply cables and the TTL serial cable should be kept separate from power cables.

MECHANICAL ASSEMBLY

The unit has been designed for panel-mounting: Drill a 29x71 mm hole, insert a tool and fix it in place with the brackets provided. Do not assemble the controller in excessively humid or dirty locations since it is designed to be used in locations with normal pollution levels. Always make sure that the area next to the 961ing openings of the tool is adequately ventilated.

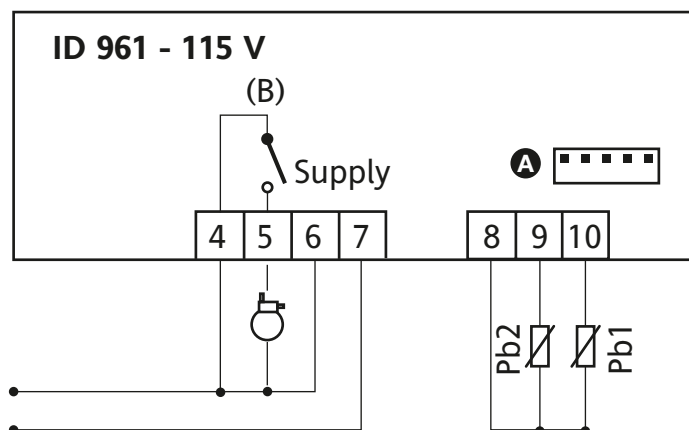
Front protection	IP65
Casing	PC+ABS UL94 V-0 resin plastic body, polycarbonate front, thermoplastic resin buttons.
Dimensions	front panel 74x32 mm, depth 59 mm (terminals excluded).
Assembly	on panel, with drilling template 71x29 mm (+0.2/-0.1 mm).
Ambient Operating temperature	+23...131°F (-5...+55°C).
Storage temperature	-22...+185 °F (-30 to +85°C).
Ambient operating and storage humidity	10...90 % RH (non-condensing).
Display range	• NTC probe: -58...230°F (-50.0...110.0°C); • PTC probe: -67...284°F (-55.0...140.0°C) on display 3 digits 1/2 + sign.
Analogue input	2 PTC or NTC inputs (parameter selectable).
Serial	TTL for connection to Copy Card
Digital output	1 SPST output relay (only NO contact available) 1HP @125V~(NO) 2HP - 16Amp @250V~(NO)
Measurement range	from -67...284°F (-55.0...140.0°C).
Accuracy	better than 0.5% of bottom scale + 1 digit.
Resolution	0.1°F (0.1°C).
Power consumption	3 VA max
Power supply	115V~ ±10%
PLEASE NOTE: please refer to label on the controller for relay capacity, power supply and terminals layout.	
The technical characteristics in this document concerning measurements (range, accuracy, resolution, etc.) refer to the controller in the strictest sense and not to any accessories provided such as probes, for example. This means, for example, that an error introduced by the probe is added to any error that is typical of the controller.	

TERMINALS

4 - 5	N.O. Compressor relay (B)
6 - 7	Power supply 115V~
8 - 9	Probe 2 input (evaporator - defrost)
8 - 10	Probe 1 input (control probe - thermostat)
A	TTL input for Copy Card

NOTE:

- for relay capacity, see label on controller.



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.

CONDITIONS OF USE - PERMITTED USE

For safety reasons the controller must be installed and used in accordance with the instructions supplied. Users must not be able to access parts with dangerous voltage levels under normal operating conditions. The device must be suitably protected from water and dust according to the specific application and only be accessible using special tools (except for the front keypad). The device can be fitted to equipment for household use and/or similar use in the refrigeration sector and has been tested with regard to safety in accordance with the European harmonized reference standards: It is classified as follows:

- as an automatic electronic control device to be integrated as regards its construction;
- as a 1 B type operated control device as regards its automatic operating features;
- as a Class A device in relation to 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.

DISCLAIMER

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