IC 912
Pt100 Tc / P R V-I I-V
single stage electronic controller

| KEYS | | UP
Scrolls through the menu items
Increases the values | | DOWN
Scrolls through the menu items
Decreases the values | **fnc** fnc
ESC function (quit) | | **set** set
Accesses the Set point and the Menus
Confirms the commands |

| LEDs | out Relay OUT
ON for relay on (energized);blinking for
delay, protection or enabling blocked. | Allarme
ON for active alarm; blinking for
silenced alarm | At start-up the instrument performs a Lamp Test for 5
seconds. Afterwards, only for IC 912 Pt100, the label 'Lod'
(Loading) will appear for 10 seconds. |

SETTING THE SET POINT - MACHINE STATUS MENU

Press the 'set' button and release it to access the machine status menu.
In normal conditions, the labels for the two Set point values are found in the menu.
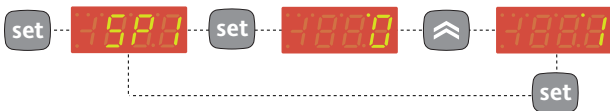
Once the 'SP1' label has been displayed, press the "set" button to display the Set point 1 value.
The Set point value appears on the display. To change the Set point value, use the "UP" and "DOWN" buttons within 15 seconds.

If you press the "set" button again, when the fnc button is pressed or 15 seconds elapse, the last value displayed will be stored and the "SP1" label will reappear on the display.

PROGRAMMING MENU

To access the Programming 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.: "rE1" folder)

• By using the 'UP' and '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, 'CnF') 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.

> 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.

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 Programming 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 command needed to use the Copy Card. Press 'set' to access the functions.

• Use the 'UP' and 'DOWN' buttons to display the required function. Press the 'set' to perform uploading (or downloading).

• If the operation is successful 'y' will be displayed, if it is not, 'n' will be displayed.

Download from reset
Connect the copy card when the instrument 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 downloading, the instrument will work with the parameter map settings that have just been downloaded.
• **see** "FPr folder" in Parameter Table and Description of parameters

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ALARMS

Label	Alarm	Cause	Effects	Resolving problems
E1	Probe 1(control) faulty	• measuring of values outside the nominal reading range • control probe faulty/shorted/open probe	"E1" label appears on display; Controller enabled as indicated by the On1 and OF1 parameters if programmed for the Duty Cycle	• check the probe wiring • replace the probe

PARAMETER TABLE

	PAR.		RANGE	DEFAULT	M.U.
	SP1		LS1...HS1	0.0	°C/°F
Controller - rE1 label	HC1		H/C	H/C*	Flag
	dF1		0...30.0	1	°C/°F
	HS1		LS1...HdL	*	°C/°F
	LS1		LdL...HS1	*	°C/°F
	dn1		0...250	1	sec
	do1		0...250	0	min
	di1		0...250	0	min
	dE1		0...250	0	sec
	On1		0...250	0	min
	OF1		0...250	1	min
Display - diS label	LOC		n/y	n	flag
	PA1		0...250	0	num
	ndt	IC 912 V-I	n/y/int	n	num
		IC 912 Pt100-Tc	n/y		flag
	CA1		-30.0...30.0	0.0	num
	dro**	IC 912 Pt100-Tc	°C/°F	°C	flag
	LdL***	IC 912 V-I	-99.9...HdL	0*	num
	HdL***	IC 912 V-I	LdL...100	100/100.0/1000*	num

	PAR.		RANGE	DEFAULT	M.U.
Configuration- CnF label	H00 (!)	IC 912 V-I	420/020/010/05/01	*	num
		IC 912 Pt100-Tc(1)	Pt1/JtC/HtC	*	num
	H03***	IC 912 V-I	(ndt=n) -99...100 (ndt=y) -99.0...100.0 (ndt=int) -990...1000	*	num
	H04***	IC 912 V-I	(ndt=n) -99...100 (ndt=y) -99.0...100.0 (ndt=int) -990...1000	*	num
	H10		0...250	0	min
	rEL		/	/	/
	tAb		/	/	/
Fpr	UL		/	/	/
	dL		/	/	/
	Fr (2)		/	/	/

NOTE:

(1) The Pt100 model only works with the Pt100 input (3 wires) whereas Tcj/TcK models, on the basis of this parameter, can work with the Tc input and the Pt100 input.

(2) If the **Fr** command 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

WARNING(!) If one or more parameters marked with (!) are modified, the controller must be switched off after the modification and then switched back on

* The default value depends on the model

** The **dro** parameter is not present in IC 912 Pt100-Tc models

*** The **LdL**, **HdL**, **H03** and **H04** parameters are only present in the IC 912 V-I models

DESCRIPTION OF PARAMETERS

CONTROLLER (folder with "rE1" label)

HC1 If set to H, the controller operates in heating mode. If set to C, the controller operates in cooling mode.

dF1 Relay 1 intervention differential. The load will stop when Set point is reached (as indicated by the control probe) and will restart at a temperature equal to Set point plus (or minus depending on HC1) the value of the differential. **See ON-OFF control diagram**

HS1 Maximum value for set point.

LS1 Minimum value for set point.

CONTROLLER PROTECTIONS (folders with "rE1" label)

dn1 Start-up delay. The specified time must elapse between the controller relay start-up request and actual start-up.

do1 Delay after shut-down. The specified time must elapse between shut-down of the controller 1 relay and a subsequent start-up.

di1 Delay between start-ups. Between two subsequent start-ups of the controller, the specified time must elapse.

dE1 Shut-down delay. The specified time must elapse between the controller relay shut-down request and actual shut-down.

NOTE: for parameters dn1, do1, di1, dE1 0= not active

On1 Controller start-up time if probe is faulty. If set to "1" with Of1 at "0" the controller is always on whereas if Of1>0 it operates in duty cycle mode.

OF1 Controller shut-down time if probe is faulty. If set to "1" with On1 at "0" the controller is always off whereas if On1>0 it operates in duty cycle mode.

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.

PA1 Password 1. When enabled (value is not 0) it represents the access key to level 1 parameters.

ndt number display type.Display with decimal point.
y = yes, range = -99...100
n = no, range = -99,9...100.0
int=integer, range = -990...1000

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.

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).

LdL Minimum value the instrument is able to display.

HdL Maximum value the instrument is able to display.

CONFIGURATION (folder with "CnF" label)

H00 Selection of probe type.:
IC 912 V-I: 420=4...20mA, 020=0...20mA, 010=0...10V, 05=0...5V, 01=0...1V
IC 912 TcJ: Pt1=Pt100, JtC=Tcj, HtC=Tck

H03 Minimum value of current input

H04 Maximum value of current input

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

rEL Device version. Read only parameter.

tAb Reserved. Read only parameter.

COPY CARD (folder with "Fpr" label)

UL UpLoad: transfer of programming parameters from instrument to Copy Card.

dL downLoad: transfer of programming parameters from Copy Card to instrument.

Fr Format. Cancelling all data entered in the copy card.
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

| TECHNICAL DATA	IC 912 P/R/V-I/I-V	IC 912 Pt100/TC
Front protection	IP65	IP65
Casing	resin plastic casing PC+ABS UL94 V-0, polycarbonate front polycarbonate front, thermoplastic resin buttons	resin plastic casing PC+ABS UL94 V-0, polycarbonate front polycarbonate front, thermoplastic resin buttons
Dimensions	front panel 74x32 mm, depth 59mm (terminals excluded)	front panel 74x32 mm, depth 59mm (terminals excluded)a
Mounting	panel-mounted with drilling template 71x29mm (+0.2/-0.1 mm)	panel-mounted with drilling template 71x29mm (+0.2/-0.1 mm)
Operating temperature	-5°C...55°C	-5°C...55°C
Storage temperature	-30°C...85°C	-30°C...85°C
Usage and storage ambient humidity	10...90% RH (non-condensing)	10...90% RH (non-condensing)
Display range	-99...100 (ndt=n), -99,9...100,0 (ndt=y), -999...1000 (ndt=int) on display 3 1/2 digits plus sign	Pt100: -150...650°C / TcJ: -40...750°C / TcK: -40...1350°C* on display 3 1/2 digits plus sign
Analogue input	1 V-I (0-1V, 0-5V, 0-10V, 0-20...mA, 4...20mA par.H00)	1 Pt100 or 1 TcJ or TcK (depending on model)
Serial	TTL for Copy Card connection	TTL for Copy Card connection
Digital ouputs	1 SPST relay 8(3)A 1/2 hp 250 V~	1 SPST relay 8(3)A 1/2 hp 250 V~
Buzzer output	only in some models	only in some models
Measurement range	from -999 to 1000	from -150 to 1350
Accuracy	better than 0.5% of full scale + 1 digit.	see "Pt100/TcJ/TcK models" table
Resolution	1 or 0.1 digits depending on parameter settings	see "Pt100/TcJ/TcK models" table
Consumption	1,5 W max(mod. 12V) / 3 VA max (mod. 230V)	1,5 W max(mod. 12V) / 3 VA max (mod. 230V)
Power supply	12V~/=, 12/24 V~/=, 24V~/= 10%, 110/115V~, 220/230 V~ 10% 50/60 Hz	12V~/=, 12/24 V~/=, 24V~/= 10%, 110/115V~, 220/230 V~ 10% 50/60 Hz

WIRING DIAGRAMS

IC 912 P/R/VI - 12 V

IC 912 P/R/VI - 230 V
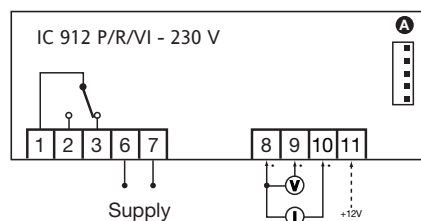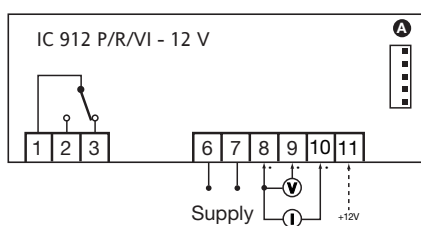
1-2	N.A. controller relay OUT
1-3	N.C. controller relay OUT
6-7	Power supply
8-9-11	Voltage input (8=ground; 9=signal; =12V)
8-10-11	Voltage input (8=ground; 9=signal; =12V)
A	TTL input for Copy Card

IC 912 Pt100/TC - 12 V

IC 912 Pt100/TC - 230 V
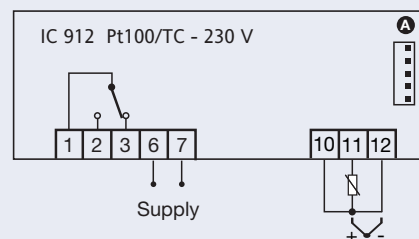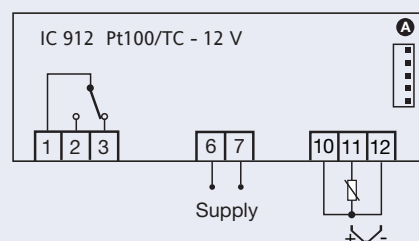
1-2	N.A. controller relay OUT
1-3	N.C. controller relay OUT
6-7	Power supply
10-11-12	Probe input Pt100 3 wires Pb1
11-12	TcJ/TcK input (11= + ; 12= -)
A	TTL input for Copy Card

ON-OFF CONTROL DIAGRAM

HC1	Heat/Cool Mode
SP1	Setpoint 1
dF1	Relay 1 tripping differential.
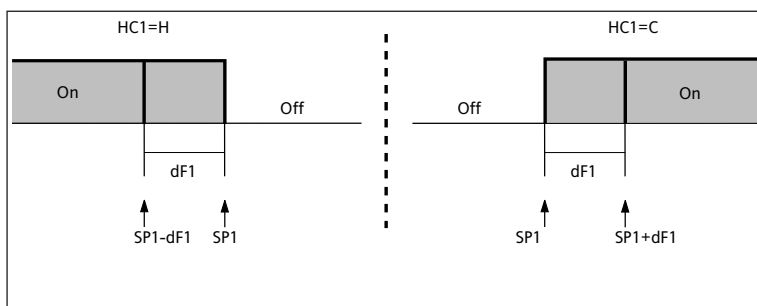
MECHANICAL ASSEMBLY

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 instrument in excessively humid or dirty locations since it is designed to be used in locations with normal levels of pollution.
Always make sure that the area next to the cooling openings of the tool is adequately ventilated.

Pt100/ TcJ/ TcK MODELS

Pt100:
Accuracy:
0,5% for full scale value + 1 digit;
0.2% from -150 to 300°C
Resolution:
0.1°C (0.1°F) up to 199.9°C; 1°F over

TcJ:
Accuracy:
0.4% for full scale value + 1 digit;
Resolution:
0.1°C (0.1°F) up to 199.9°C; 1°F over

TcK:
Accuracy:
0,5% for full scale value + 1 digit;
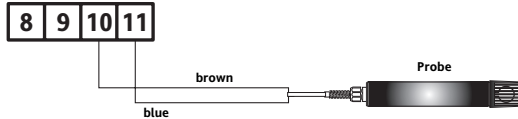0.3% from -40 to 800°C
Resolution:
1°C (1°F)

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, for example, that an error introduced by the probe is added to any error that is typical of the instrument.
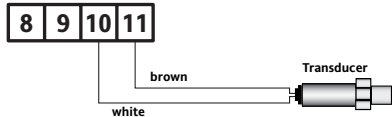
ELECTRICAL CONNECTIONS

Caution! Always switch off machine before working on electrical connections. The instrument has screw terminals for connecting electrical cables with a maximum diameter of 2.5 mm^2 (only one conductor per terminal for power connections): for terminal capacity, see instrument 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 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.
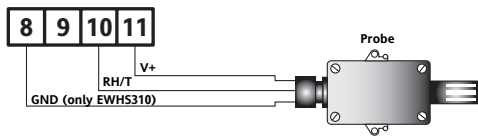
CONFIGURATION OF EWPA-EWHS PROBES
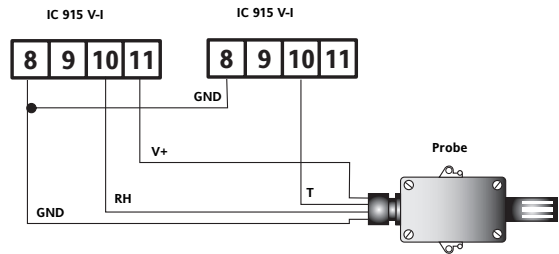
- EWHS 280 2 wires

8	9	10	11

brown — Probe
blue

- EWPA 007/030 2 wires / Transducer

8	9	10	11

brown — Transducer
white

- EWHS 300/310 3 wires

8	9	10	11

V+
RH/T
GND (only EWHS310) — Probe

- EWHS 310 4 wires

IC 915 V-I   IC 915 V-I

| 8 | 9 | 10 | 11 | | 8 | 9 | 10 | 11 |
|---|---|----|----| |---|---|----|----|

GND
V+
GND   RH   T — Probe

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 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.

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- 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.