eliwell

by Schneider Electric

EMPlus 600

EN **Electronic digital indicator**

USER INTERFACE

EMPlus 600

KEYS

UP
Press and release
Scroll menu items
Increases values

STAND-BY (ESC)
Press and release
Returns to the previous menu level
Confirms parameter value
Press for at least 5 sec
Activates the Standby function (OFF)

DOWN
Press and release
Scroll menu items
Decrease values

SET (ENTER)
Press and release
Displays alarms (if active)
Opens Machine Status menu
Confirm commands
Press for at least 5 sec
Opens Programming menu

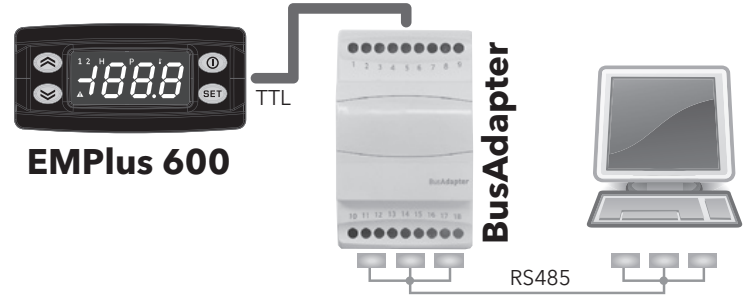
ICONS

Decimal Point Permanently on: decimal point Off: otherwise	**Temperature** Permanently on: displays a temperature Off: otherwise
P **Pressure** Permanently on: displays a pressure Off: otherwise	H **Humidity** Permanently on: displays a humidity Off: otherwise
1 **Not Used**	2 **Not Used**
Alarm Permanently on: alarm active Flashing: alarm acknowledged Off: otherwise	**NOTE**: When switched on, the device performs a Lamp Test; the display and LEDs will flash for several seconds to check that they all function correctly.

TELEVIS SYSTEM

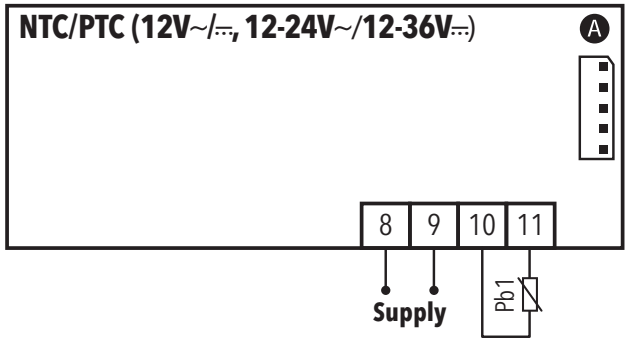
The Televis remote control systems can be connected using the TTL serial port (TTL-RS485 **Bus**Adapter 130 or 150 interface module must be used).

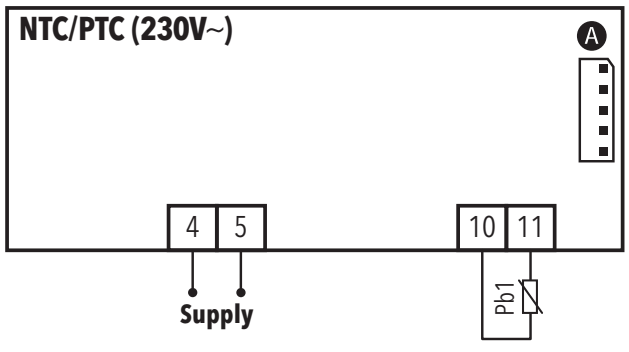
To configure the instrument to do this, you need to access the **Add** folder and use the **dEA** and **FAA** parameters.



NTC/PTC MODEL

CONNECTIONS





INPUT/OUTPUT CHARACTERISTICS

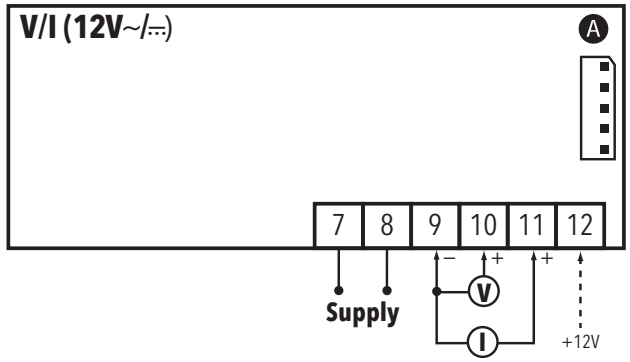
Display range	**NTC**: -50...110°C (-58...230°F) **PTC**: -50...140°C (-58...302°F) on display with 3½ digits + sign
Analogue input	1 **NTC** or 1 **PTC** (selectable by parameter **H00**)
Serial	TTL for connection to Copy Card or Televis/Modbus remote control systems
Measurement range	-50 ... 140°C (-58 ... 284°F)
Accuracy	better than 0.5% of end of scale +1 digit
Resolution	0.1°C (0.1°F up to +199.9°F; 1°F over)

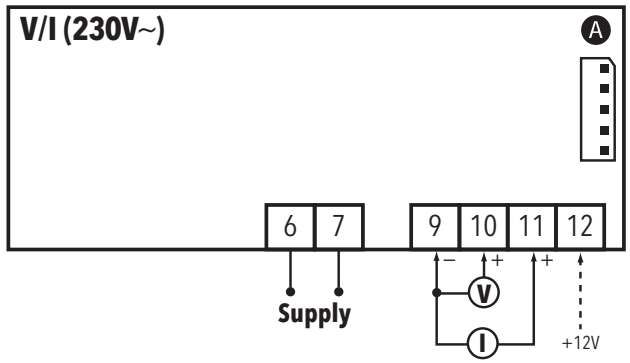
TERMINALS

***4-5**	Power supply 230V~.	**10-11**	Probe Pb1 Input
***8-9**	Power supply 12V~/⎓ and 12-24V~/12-36V⎓.		
A	TTL input for Copy Card and TelevisSystem connection		*** depends on model**

V/I MODEL

CONNECTIONS





INPUT/OUTPUT CHARACTERISTICS

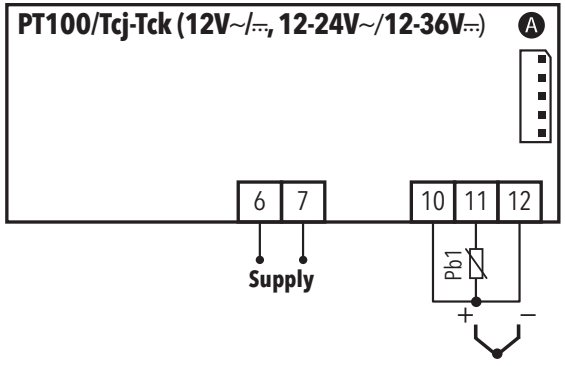
Display range	-199...199 (ndt = **n**) -199.9...199.9 (ndt = **y**) -1999...1999 (ndt = **int**) on display with 3½ digits + sign
Analogue input	1 **V/I** (0-1V, 0-5V, 0-10V, 0...20mA, 4...20mA) (selectable by parameter **H00**) Maximum load: - current = 100 Ω - voltage = 20 kΩ
Serial	TTL for connection to Copy Card or Televis/Modbus remote control systems
Measurement range	-1999 ... 1999
Accuracy	Depends on model: **0-1V**: better than 1% of e.o.s. +1 digit **other**: better than 0.5% of e.o.s. +1 digit
Resolution	1 or 0.1 digit according to settings

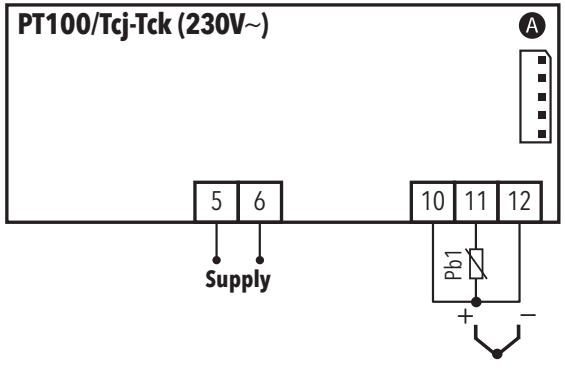
TERMINALS

***6-7**	Power supply 230V~.	***9-10-12**	Voltage input (**9**=GND; **10**="+"; **12**=12V)
***7-8**	Power supply 12V~/⎓.	***9-11-12**	Current input (**9**=GND; **11**="+"; **12**=12V)
A	TTL input for Copy Card and TelevisSystem connection		*** depends on model**

PT100/Tcj-Tck MODEL

CONNECTIONS





INPUT/OUTPUT CHARACTERISTICS

Display range	**PT100**: -150...650°C **TcJ**: -40...750°C **TcK**: -40...1350°C on display with 3½ digits + sign
Analogue input	1 **PT100** or 1 **TcJ** / **Tck** (selectable by parameter **H00**)
Serial	TTL for connection to Copy Card or Televis/Modbus remote control systems
Measurement range	-150 ... 1350°C (-238 ... 2462°F)
Accuracy	see 'Pt100/TcJ/TcK models' table
Resolution	see 'Pt100/TcJ/TcK models' table

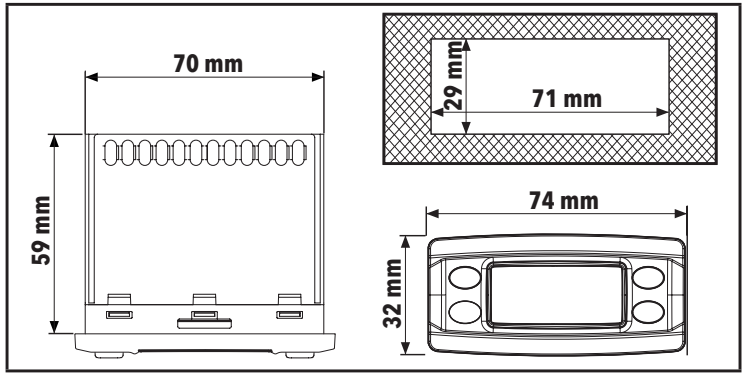
TERMINALS

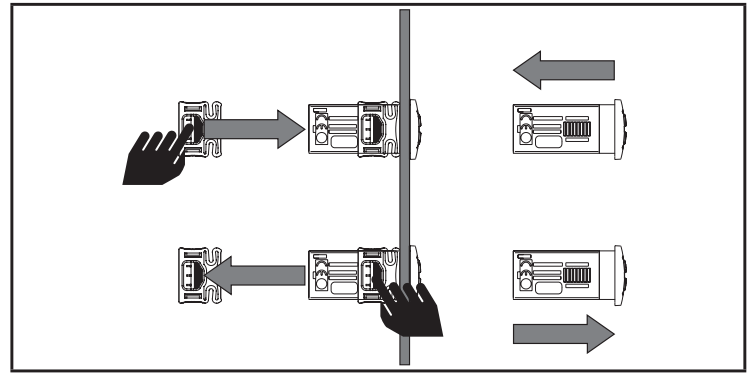
***5-6**	Power supply 230V~.	***10-11-12**	Probe **PT100** input - 3 wires (Pb1)
***6-7**	Power supply 12V~/⎓ and 12-24V~/12-36V⎓.	***11-12**	**TcJ**/**TcK** input
A	TTL input for Copy Card and TelevisSystem connection		*** depends on model**

PT100/Tcj-Tck MODELs		
PT100:	ACCURACY:	0.5% for whole scale + 1 digit 0.2% from -150 to 300°C
	RESOLUTION:	0.1°C (0.1°F) from -199.9°C up to 199.9°C; 1°C (1°F) beyond
TcJ:	ACCURACY:	0.4% for whole scale + 1 digit
	RESOLUTION:	0.1°C (0.1°F) from -199.9°C up to 199.9°C; 1°C (1°F) beyond
Tck:	ACCURACY:	0.5% for whole scale + 1 digit 0.3% from -40 to 800°C
	RESOLUTION:	0.1°C (0,1°F) from -199.9°C up to 199.9°C; 1°C (1°F) beyond

MOUNTING - DIMENSIONS

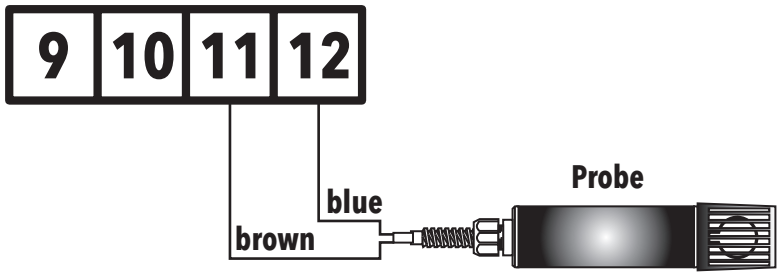
The device is designed for panel mounting. Drill a 29x71 mm hole and insert the instrument; secure it with the special brackets provided. Do not install the instrument in damp and/or dirty places; in fact, it is suitable for use in places with ordinary or normal levels of pollution. Keep the area around the instrument cooling slots adequately ventilated.



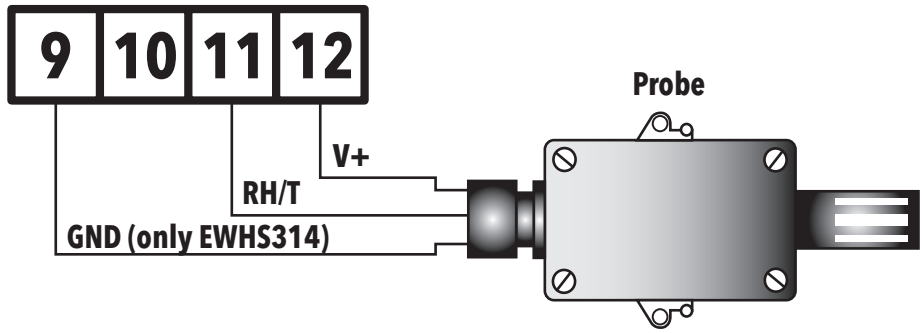


EWPA-EWHS PROBE CONFIGURATION

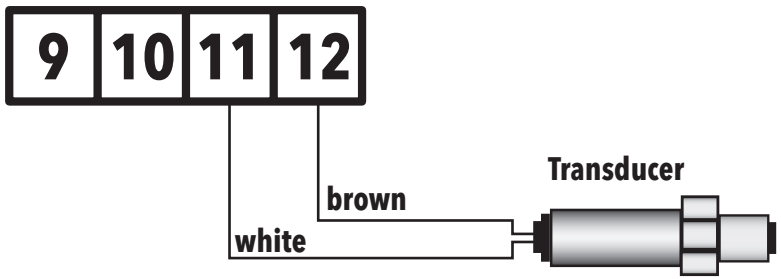
EWHS 284 2 wires



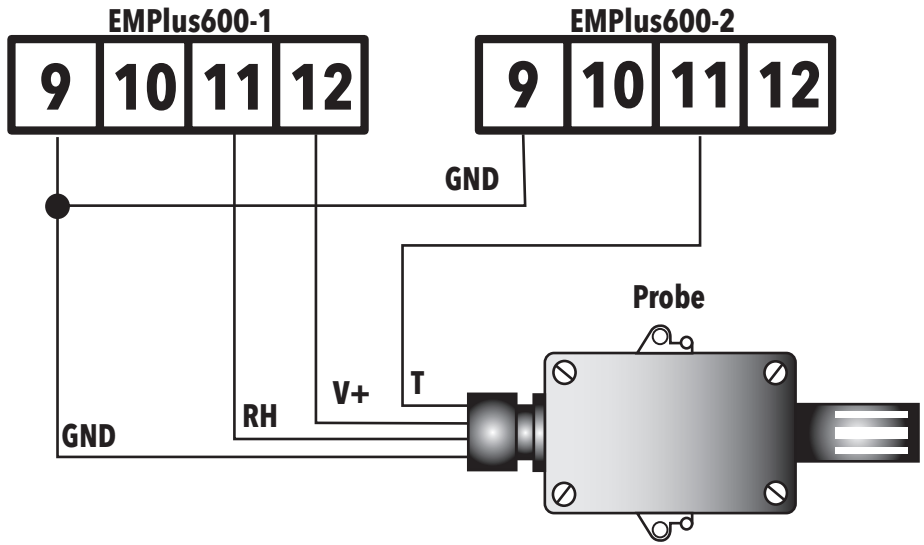
EWHS 304/314 3 wires



EWPA 007/030 2 wires / Transducer



EWHS 314 4 wires (V-I model)



USING THE COPY CARD

The Copy Card is connected to the serial port (TTL) and allows rapid programming of the instrument parameters.
Access **Installer** parameters by entering 'PA2', scroll through the folders using ⌃ and ⌄ until folder **FPr** appears.
Select it using SET, scroll through the parameters using ⌃ and ⌄, then select the function using SET (eg. **UL**).

- **Upload** (**UL**): select **UL** and press SET. This function uploads the programming parameters from the instrument to the card. If the procedure is a success, '**y**', will appear on the display, otherwise '**n**' will appear.
- **Format** (**Fr**): select **Fr** and press SET. This function is used to format the copy card (recommended when using the card for the first time).
  Important: the **Fr** parameter deletes all data present. This operation cannot be cancelled.
- **Download (dL)**:
  - select **dL** and press SET. This function downloads the programming parameters from the card to the instrument. If the procedure is a success, '**y**', will appear on the display, otherwise '**n**' will appear.
  - Connect the Copy Card when the instrument is switched off. At power-on, data is downloaded from the copy card to the instrument automatically. At the end of the lamp test, the display will show '**dLy**' if the operation was successful and '**dLn**' if not.

NOTE: **After downloading, the instrument works with the settings of the new map just downloaded.**

ACCESSING AND USING THE MENUs

The resources are organized into 2 menus which are accessed as follows:

- 'Machine Status' menu: press and release the SET key.
- 'Programming' menu: hold down the SET key for 5 seconds.

Either do not press any keys for 15 seconds (timeout) or press the ⓘ key once, to confirm the last value displayed and return to the previous screen.

PASSWORD

Password 'PA1': used to access **User** parameters. The password is not enabled by default (**PS1**=0).
To enable it (**PS1**≠0): press and hold SET for longer than 5 seconds, scroll through the parameters using ⌃ and ⌄ until you see the label **PS1**, press SET to display the value, modify it using ⌃ and ⌄, then save it by pressing SET or ⓘ. If enabled, it will be required in order to access the User parameters.

Password 'PA2': used to access **Installer** parameters. The password is enabled by default (**PS2**=15).
To modify it (**PS2**≠15): press and hold SET for longer than 5 seconds, scroll through the parameters using ⌃ and ⌄ until you see the label **PA2**, press SET, set the value to '15' using ⌃ and ⌄, then confirm using SET. Scroll through the folders until you find the label **diS** and press SET to enter. Scroll through the parameters using ⌃ and ⌄ until you see the label **PS2**, press SET to display the value, modify it using ⌃ and ⌄, then save it by pressing SET or ⓘ.

The visibility of **'PA2'** is as follows:

1) **PA1** and **PA2 ≠ 0**: Press and hold SET for longer than 5 seconds to display **PA1** and **PA2**. It will then be possible to decide whether to access the 'User' parameters (**PA1**) or the 'Installer' parameters (**PA2**).

2) **Otherwise**: The password **PA2** is amongst the level1 parameters. If enabled, it will be required when accessing the Installer parameters; to enter it, proceed as instructed for password **PA1**.

If the value entered is incorrect, the label **PA1**/**PA2** will be displayed again and the procedure will need to be repeated.

MACHINE STATUS MENU

Access the Machine Status menu by pressing SET and releasing the key.
Use the keys ▲ and ▼ to scroll through all the folders in the menu:

- **AL**: alarms folder (only visible if an alarm is active);
- **Pb1**: probe 1 - Pb1 folder;

Displaying probes: when label Pb1 is present, press the SET key to view the value measured by the corresponding probe (**NOTE**: the value cannot be modified).

PROGRAMMING MENU

To access the 'Programming' menu, press the SET key for more than 5 seconds. If specified, an access PASSWORD will be requested: 'PA1' for User parameters and 'PA2' for Installer parameters (see 'PASSWORD' paragraph).

User Parameter: When accessed, the display will show the first parameter (e.g. 'HAL').
Press ▲ and ▼ to scroll through all the parameters on the current level. Select the desired parameter by pressing SET.
Press ▲ and ▼ to modify it and SET to save the changes.

Installer Parameter: When accessed, the display will show the first folder (e.g. 'AL').
Press ▲ and ▼ to scroll through the folders on the current level. Select the desired folder using SET.
Press ▲ and ▼ to scroll through the parameters in the current folder and select the parameter using SET.
Press ▲ and ▼ to modify it and SET to save the changes.

NOTE: Switch the instrument off and on again each time the parameter configuration is changed.

DIAGNOSTICS

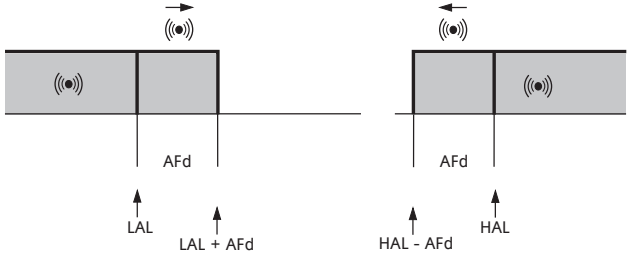
Alarms are always indicated by the alarm icon ⚠.
To switch off the alarm, press and release any key; the corresponding icon will continue to flash.

NOTE: If alarm exclusion times have been set (see 'AL' folder in the parameters table) the alarm will not be signalled.

ALARMS

Label	Fault	Description	Effects	Remedy
E1	Probe1 faulty	• measured values are outside operating range • Probe faulty/short-circuited/open	• Display label **E1** • Alarm icon permanently on • Disable max/min alarm controller	• check probe type (**H00**) • check probe wiring • replace probe
AH1	Alarm for HIGH value (Pb1)	value read by **Pb1** ≥ **HAL** after time of **tAO**. (see "MAX/MIN TEMPERATURE ALARMS")	• Recording of label **AH1** in folder AL • Alarm icon permanently on	Wait until value read by Pb1 returns below **HAL-AFd**.
AL1	Alarm for LOW value (Pb1)	value read by **Pb1** ≤ **LAL** after time of **tAO**. (see "MAX/MIN TEMPERATURE ALARMS")	• Recording of label **AL1** in folder AL • Alarm icon permanently on	Wait until value read by Pb1 returns above **LAL+AFd**.

MAX/MIN TEMPERATURE ALARM



Minimum temperature alarm:	Temp. ≤ **LAL** (LAL with sign)
Maximum temperature alarm:	Temp. ≥ **HAL** (HAL with sign)
Returning from min temp. alarm:	Temp. ≥ **LAL + AFd**
Returning from max temp. alarm:	Temp. ≤ **HAL - AFd**

TECHNICAL DATA (EN 60730-2-9)

Classification:	operation (not safety) device for incorporation
Mounting:	panel mounting with 71x29 mm (+0.2/-0.1 mm) drilling template
Type of action:	1.B
Pollution class:	2
Material class:	IIIa
Overvoltage category:	II
Rated impulse voltage:	2500V
Temperature:	Operating: –5 … +55 °C - Storage: –30 … +85 °C
Power supply:	• 12V~/⎓ (±10%) • 12-24V~/12-36V⎓ ±10% (dedicated power supply not grounded or earth connected) • 230V~ ±10% 50/60 Hz
Consumption:	• 1.5 VA max (model 12V~/⎓) • 3 W max (models: 24V~, 12-24V~/12-36V⎓, 115V~ and 230V~)
Fire resistance category:	D
Software class:	A

NOTE: check the power supply specified on the instrument label.

FURTHER INFORMATION

Input/Output Characteristics

See 'Connections' section

Mechanical Characteristics

Casing:	PC+ABS UL94 V-0 resin casing, polycarbonate window, thermoplastic resin keys
Dimensions:	front panel 74x32 mm, depth 59 mm (without terminals)
Terminals:	screw/disconnectable terminals for cables with a diameter of 2,5mm^2
Connectors:	TTL for connection of Unicard/Copy Card
Humidity:	Operating / Storage: 10…90 % RH (non-condensing)

Regulations

Food Safety: The device complies with standard EN13485 as follows:

- suitable for storage
- application: air
- climate range A
- measurement class 1 in the range from -25°C to 15°C (*)

(* exclusively using Eliwell probes)

NOTE: The technical specifications given in this document regarding measurement (range, accuracy, resolution, etc.) refer to the instrument and not to any accessories provided, such as the probes. This means, for example, that the error introduced by the probe must be added to the typical error of the instrument.

PARAMETERS TABLE

PAR.	DESCRIPTION	MODEL	RANGE	VALUE	U.M.	LEVEL
	ALARMs (folder 'AL')					
HAL	Maximum temperature alarm.	**NTC/PTC**	LAL...150.0	50.0	°C/°F	User/Inst
		PT100-Tc	LAL...1999	1200	°C/°F	
		V/I	LAL...150	150	num	
LAL	Minimum temperature alarm.	**NTC/PTC**	-150.0...HAL	-50.0	°C/°F	User/Inst
		PT100-Tc	-328...HAL	-199,9	°C/°F	
		V/I	-150...HAL	-150	num	
AFd	Alarm differential.	**NTC/PTC**	1.0...50.0	2.0	°C/°F	Inst
		PT100-Tc	1.0...50.0	2.0	°C/°F	
		V/I	1...50	2	num	
PAO	Alarm exclusion time after device is switched on following a power failure.	ALL	0...10	0	hours	Inst
tAO	Delay preceding temperature alarm signal.	ALL	0...250	1	min	Inst
tP	Enable all keys to acknowledge an alarm. **n** (0) = no; **y** (1) = yes.	ALL	n/y	y	flag	Inst
	COMMUNICATION (folder 'Add')					
PtS	Selection of communication protocol. **t** = Televis; **d** = Modbus.	ALL	t/d	t	flag	Inst
dEA	Index of the device within the family (valid values from 0 to 14).	ALL	0...14	0	num	Inst
FAA	Device family (valid values from 0 to 14).	ALL	0...14	0	num	Inst
Adr	Modbus protocol controller address.	ALL	1...255	1	num	Inst
bAU	Baudrate selection. **48** (0) = 4800; **96** (1) = 9600; **192** (2) = 19200; **384** (3) = 38400.	ALL	48/96/ 192/384	96	num	Inst
Pty	Modbus parity bit. **n** (0) = none; **E** (1) = even; **o** (2) = odd.	ALL	n/E/o	E	num	Inst
StP	Modbus stop bit. **1b** (0) = 1 bit; **2b** (1) = 2 bit.	ALL	1b/2b	1b	flag	Inst

PAR.	DESCRIPTION	MODEL	RANGE	VALUE	U.M.	LEVEL
	DISPLAY (folder 'diS')					
LOC	LOCk. Setpoint edit lock. The parameter programming menu can still be accessed, and the settings changed, which means also that the status of this parameter can be changed so as to unlock the keypad. **n** (0)= no; **y** (1) = yes.	ALL	n/y	n	flag	User/Inst
PS1	Password 1. When enabled (**PS1 ≠ 0**) it is the password to the **User** parameters (User).	ALL	0...250	0	num	User/Inst
PS2	Password 2. When enabled (**PS2 ≠ 0**) it is the password to the **Installer** parameters (Inst).	ALL	0...250	15	num	Inst
ndt	Display values with decimal point. **n** (0) = no (without decimal point); **y** (1) = yes (with decimal point); **int** (2) = integer (V/I models only).	ALL	n/y/int	n	num	User/Inst
CA1	Calibration 1. Positive or negative value added to the value read by **Pb1**.	**NTC/PTC**	-30.0...30.0	0.0	°C/°F	User/Inst
		PT100-Tc	-30.0...30.0	0.0	°C/°F	
		V/I	-30...30	0	num	
LdL	Minimum value that can be displayed by the device.	**NTC/PTC**	-199.9...HdL	-50.0	°C/°F	Inst
		PT100-Tc	-328...HdL	-199.9	°C/°F	
		V/I	-199...HdL	-199	num	
HdL	Maximum value that can be displayed by the device.	**NTC/PTC**	LdL...199.9	140.0	°C/°F	Inst
		PT100-Tc	LdL...1350	1350	°C/°F	
		V/I	LdL...199	199	num	
dro	Select the unit of measurement of probe 1. • **NTC/PTC** and **PT100-Tc**: **C** (0) = °C, **F** (1) = °F • **V/I**: **n** (0) = no unit of measure selected, **t** (1) = temperature, **P** (2) = pressure, **H** (3) = humidity	**NTC/PTC**	C/F	C	flag	Inst
		PT100-Tc	C/F	C	flag	
		V/I	n/t/P/H	n	num	

PAR.	DESCRIPTION	MODEL	RANGE	VALUE	U.M.	LEVEL
	CONFIGURATION (folder 'CnF') ➡ If one or more parameters are changed, the controller MUST be switched off and switched on again.					
H00	Probe type selection. • **NTC/PTC**: **Ptc** (0) = PTC, **ntC** (1) = NTC • **PT100-Tc**: **Jtc** (0) = TcJ, **Htc** (1) = Tck, **Pt1** (2) = PT100. • **V/I**: **420** (0) = 4...20mA, **020** (1) = 0...20mA, **t10** (2) = 0...10V, **t05** (3) = 0...5V, **t01** (4) = 0...1V.	**NTC/PTC**	Ptc/ntC	ntc	flag	User/Inst
		PT100-Tc	Jtc/Htc/Pt1	Jtc	num	
		V/I	420/020 t10/t05/t01	420	num	
H03	Lower input current/voltage limit. (**only present on model V/I**)	**NTC/PTC**				User/Inst
		PT100-Tc				
		V/I	-1999...1999	0	num	
H04	Upper current/voltage limit for input. (**only present on model V/I**)	**NTC/PTC**				User/Inst
		PT100-Tc				
		V/I	-1999...1999	1000	num	
rEL	firmware version. Device software release: **read-only parameter**.	ALL	/	/	/	User/Inst
tAb	Parameters table. Reserved: **read-only parameter**.	ALL	/	/	/	User/Inst
	COPY CARD (folder 'FPr')					
UL	Upload. Transfer of programming parameters from instrument to Copy Card.	ALL	/	/	/	Inst
dL	Download. Transfer of programming parameters from Copy Card to device.	ALL	/	/	/	Inst
Fr	Format. Cancels all data entered in the Copy Card. **IMPORTANT**: If parameter Fr (Copy Card formatting) is used, the data entered in the card will be permanently lost. This operation cannot be reversed.	ALL	/	/	/	Inst

ELECTRICAL CONNECTIONs

Attention! Make sure the machine is switched off before working on the electrical connections.

The instrument is equipped with screw or disconnectable terminal blocks for connecting electrical cables with a max. diameter of 2,5mm^2.

Make sure the power supply voltage complies with that required by the instrument.

NTC/PTC/PT100 probes have no connection polarity and can be extended using a normal bipolar cable (Note that extending the probes burdens the behaviour of the instrument in terms of EMC electromagnetic compatibility: specifically, if Pt100 probes with cable longer than 3 mt are used, an extreme care must be taken during wiring operations).

CONDITIONS OF USE

Permitted use

For safety reasons, the instrument must be installed and used according to the instructions supplied and, in particular, parts under dangerous voltages must not be accessible in normal conditions.

The device must be adequately protected from water and dust with regard to its application, and must only be accessible using tools (except for the front panel). The device is suitable for use in household refrigeration appliances and/or similar equipment and has been tested for safety aspects in accordance with the harmonised European reference standards.

Improper use

Any use other than that expressly permitted is prohibited. The relay contacts provided are of a functional type and subject to failure: any protection devices required by product standards, or suggested by common sense for obvious safety requirements, must be installed externally to the instrument.

LIABILITY AND RESIDUAL RISKS

ELIWELL CONTROLS SRL declines any liability for damage due to:

- installation/uses different from those specified and, in particular, not complying with the safety regulations and/or instructions given in this document;
- use on panels that do not provide adequate protection against electric shocks, water or dust when assembled;
- use on panels allowing access to dangerous parts without the use of tools;
- tampering with and/or modifying the product;
- installation/use on panels not complying with current standards and regulations.

DISCLAIMER

DISPOSAL

The appliance (or the product) must be disposed of separately in compliance with the local standards in force on waste disposal.

by Schneider Electric

Eliwell Controls s.r.l.
Via dell'Industria, 15 - Z.I. Paludi
32010 Pieve d'Alpago (BL) ITALY
T: +39 0437 986 111
F: +39 0437 989 066
www.eliwell.com

Technical Customer Support:
T: +39 0437 986 300
E: Techsuppeliwell@schneider-electric.com

Sales
T: +39 0437 986 100 (Italy)
T: +39 0437 986 200 (other countries)
E: saleseliwell@schneider-electric.com

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