KOSMOS SERIE

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INSTRUCTION MANUAL
DIGITAL PANEL THERMOMETER

JUNIOR-TPT
JUNIOR20-TPT

(ECF) 🌲

DITEL ●

INTRODUCTION TO THE KOSMOS SERIES

This catalogue does not constitute a formal agreement. All information given in this manual is subject to change without notice.

The KOSMOS SERIES brings a new phylosophy in digital panel instrumentation which is expressed by multipurpose, modular-concept devices providing a rich array of basic functions and advanced capabilities.

With a fully MODULAR DESIGN, it is possible to implement a wide variety of applications by only adding the adequate options.

Intelligence within allows the meter to recognize the options installed and ask for the necessary parameters to properly function within desired margins. The basic instrument without output options omits these data in the program routines.

The instruments CALIBRATION is realized at the factory eliminating the need for adjustment potentiometers.
Any circuit or option liable to be adjusted incorporates a memory where calibration parameters are stored, making it possible the optional cards be totally interchangeable without need of any subsequent adjust.

Valid for panel meters #221769 and so on

Custom CONFIGURATION for specific applications can be made quickly and easily through five front panel keys, following structured choice menus aided by display prompts at each programming step.

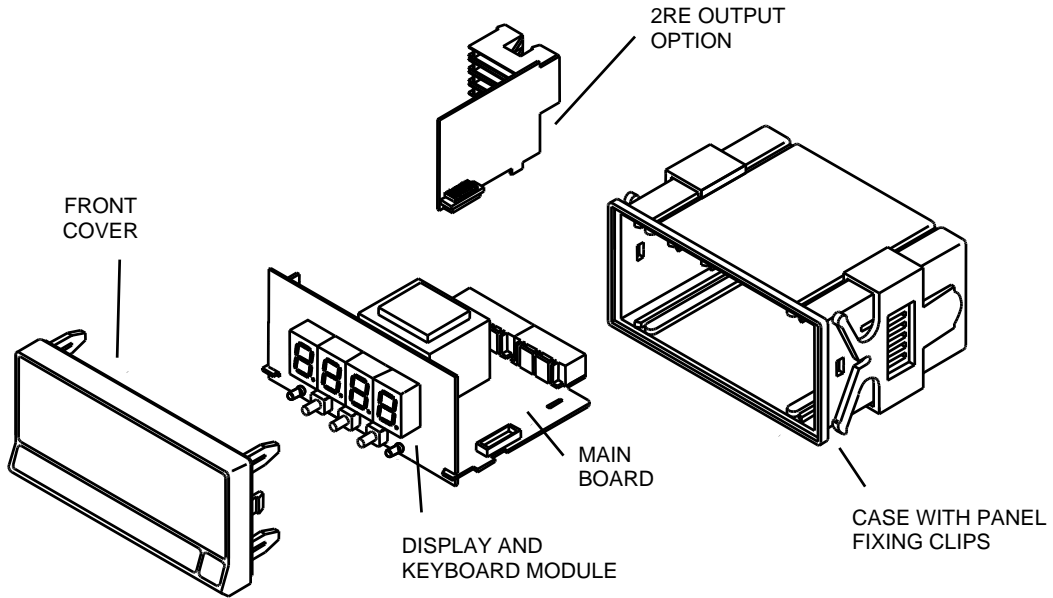Other features of the KOSMOS family include :

- CONNECTIONS via plug-in terminal blocks without screws and CLEMP-WAGO clips cable retention system.

- DIMENSIONS
  Models ALPHA & BETA 96x48x120 mm DIN 43700
  Models MICRA & JR/JR20 96x48x60 mm DIN 43700

- CASE MATERIAL UL-94 V0-rated polycarbonate.

- PANEL INSTALLATION by means of single part fingertip without screws.

To guarantee the meter's technical specifications, its is advised to check calibration parameters at periodical intervals according to the ISO9001 standards for the particular application operating criteria.
Recalibration of the meter should be made at the factory or in a qualified laboratory.

DIGITAL PANEL METER   JUNIOR FAMILY

JUNIOR-TPT & JUNIOR20-TPT

INDEX

2RE OUTPUT
OPTION

FRONT
COVER

MAIN
BOARD

DISPLAY AND
KEYBOARD MODULE

CASE WITH PANEL
FIXING CLIPS

1. MODELS JUNIOR-TPT AND JUNIOR20-TPT

The Junior-TPT and Junior20-TPT models are small format, 3 ¾ digit instruments designed for temperature measurement with an input stage prepared for connection of Pt100 sensors with three wires.

The difference between both models is the size of the digits of the display. Model JR20-TPT provides 20mm-high digits which makes it easy readable at long distances. In this manual both models are referred with the generic name of JR/ JR20-TPT.

Software configuration allows selection of reading units (Celsius or Fahreinheit) and resolution (degrees or tenths of degree).
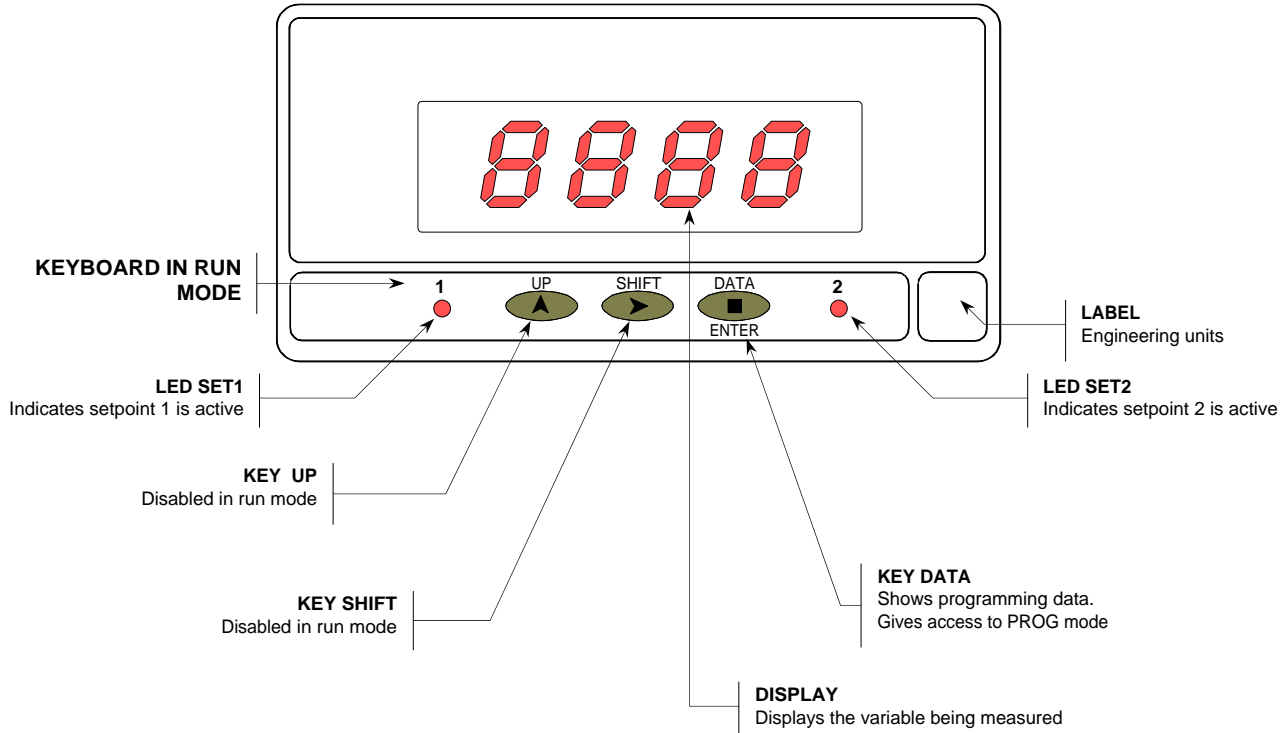
The basic instrument is a soldered assembly composed of the main board, and the display and keyboard module.

Optionally, it can be equiped with a 2-relay control output card (2RE). This option provides an output connector at the rear of the meter, status LED's visible from the front and specific programming routines which are enabled automatically once the card is installed.
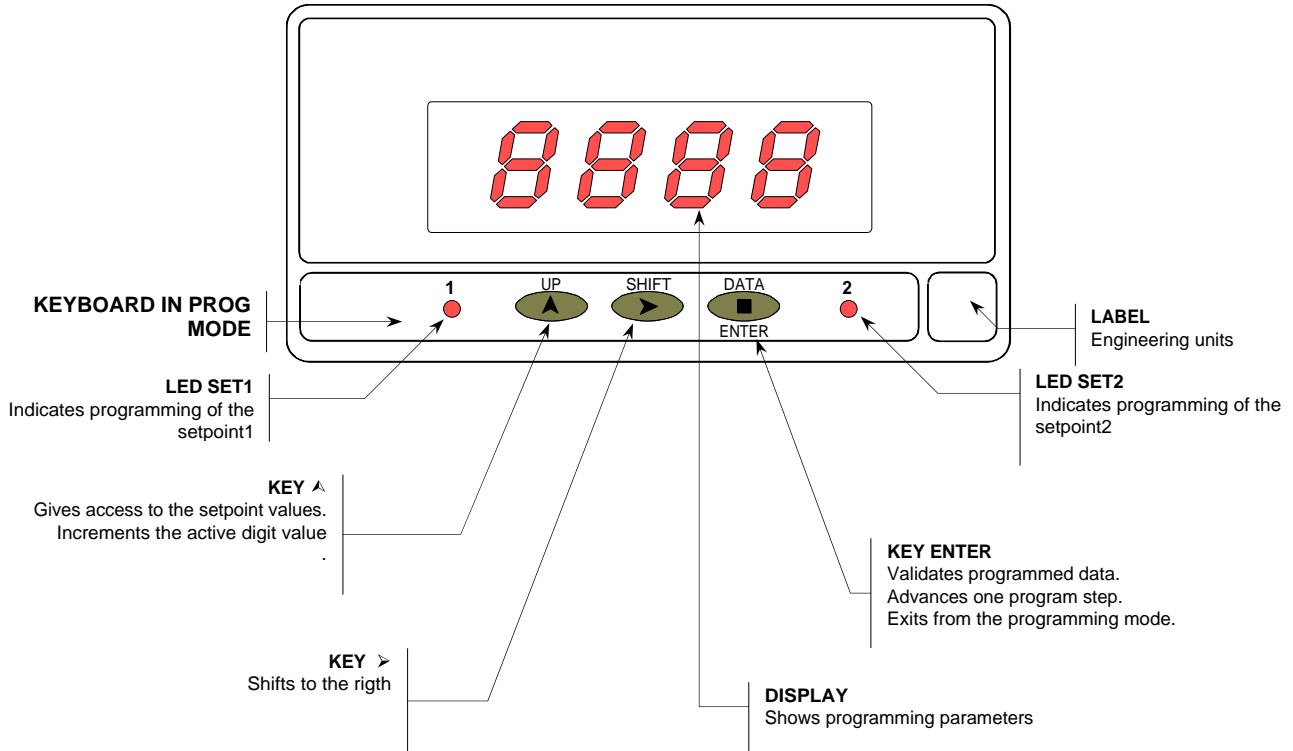
⚠ This instrument conforms the following community standards: 89/336/CEE and 73/23/CEE
WARNING: Refer to the instructions manual to preserve safety protections.

FRONT-PANEL FUNCTIONS DESCRIPTION (RUN MODE)

KEYBOARD IN RUN MODE

1 UP SHIFT DATA 2
ENTER

LABEL
Engineering units

LED SET1
Indicates setpoint 1 is active

LED SET2
Indicates setpoint 2 is active

KEY UP
Disabled in run mode

KEY DATA
Shows programming data.
Gives access to PROG mode

KEY SHIFT
Disabled in run mode

DISPLAY
Displays the variable being measured

KEYBOARD IN PROG MODE

LABEL
Engineering units

LED SET1
Indicates programming of the setpoint1

LED SET2
Indicates programming of the setpoint2

KEY ⋏
Gives access to the setpoint values.
Increments the active digit value
.

KEY ENTER
Validates programmed data.
Advances one program step.
Exits from the programming mode.

KEY ⋗
Shifts to the rigth

DISPLAY
Shows programming parameters

1   UP   SHIFT   DATA   2
                    ENTER

2. OPERATING INSTRUCTIONS

PACKING CONTENTS

❑ Instructions manual in English
including Declaration of Conformity.
❑ The digital panel instrument JR/ JR20-TPT.
❑ Accesories for panel mounting (sealing gasket and fixing clips).
❑ Accesories for connection (removable terminal block connectors and wiring fingertip).
❑ Wiring label sticked on the instrument's case JR/ JR20-TPT
❑ Set of 4 labels with different engineering units.

✓ **Check packing contents.**

CONFIGURATION

Power supply (pages 9 & 10)

❑ The instruments for 115/230V AC power supply, are set up for 230V AC. (USA market 115 V AC).
❑ The instruments for 24/48V AC power supply, are set up for 24V AC.
❑ If the instrument is supplied for 12V, 24V or 48V DC power supply, it is not necessary to make any change.

✓ **Check wiring label before connecting the instrument to the mains supply.**

Programming instructions (page 11)

❑ The software inside the instrument allows configuring the input parameters. If a two-relay output option is installed (2RE), the software detects it on power up enabling a specific routine for setpoints configuration.

✓ **Read carefully this parragraph.**

Type of input (page 12-14)

❑ The instrument provides an input for Pt100 temperature sensor. The reading units may be Celsius or Fahreinheit with a resolution of degrees or tenths of degree.

✓ **The Pt100 sensor connection must be made with 3 wires.**

Programming lockout (page 18)

❑ As shipped from the factory, the instrument is set to allow full access to change programming parameters.
To disable the possibility of making changes on the configuration, it is necessary to remove a plug-in jumper located on the main board.

✓ **Check jumper position.**

2.1 – Power supply and connectors

To change the meter's physical configuration remove the case as shown in figure 9.1.

115/ 230 V AC: The instruments with 115/230 V AC power are set up at fabrication for 230 V AC (USA market 115 V AC), see figure 9.2. To change power supply configuration to 115 V AC, make the jumpers indicated in figure 9.3 and table 1. The wiring label should be modified to reflect the new configuration.

24/48 V AC: The instruments with 24/48 V AC power are set up at fabrication for 24 V AC, see figure 9.2. To change power supply configuration to 48 V AC, make the jumpers indicated in figure 9.3 and table 1. The wiring label should be modified to reflect the new configuration.

12, 24 or 48 V DC: Instruments for DC power are set up for the supply voltage specified in the wiring label (12 V , 24 V, or 48V according to the order reference).
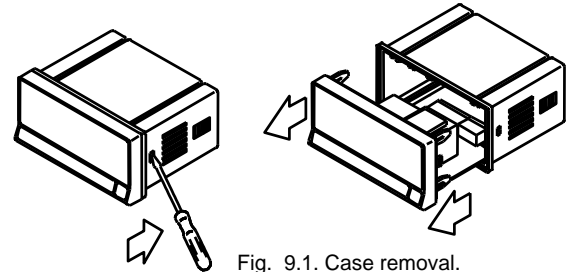

Fig. 9.1. Case removal.

Tabla 1. Jumper settings.

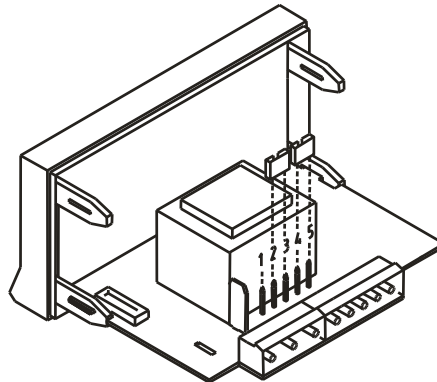| Pin	1	2	3	4	5
230V AC	-	▬▬	▬▬	▬▬	▬▬
115V AC	▬▬	▬▬	▬▬	▬▬	-
48V AC	-	▬▬	▬▬	▬▬	▬▬
24V AC	▬▬	▬▬	▬▬	▬▬	-

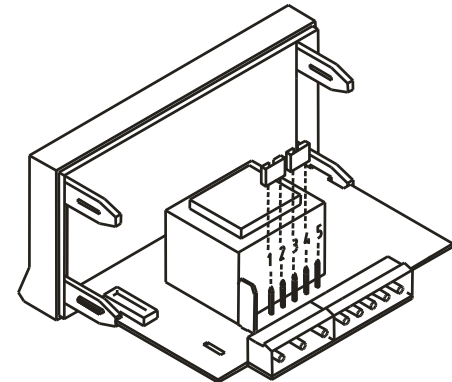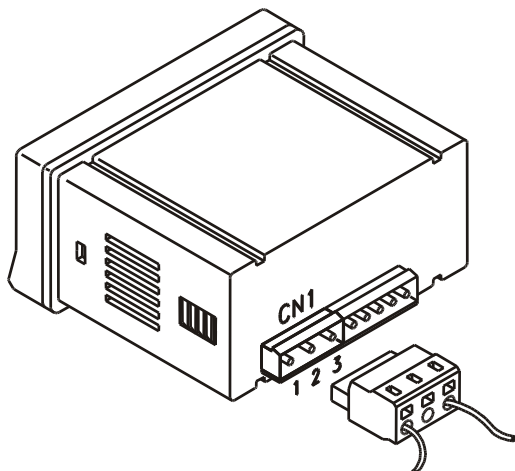Fig. 9.2. Jumper settings for 230 V or 48 V AC

Fig. 9.3. Jumper settings for 115 V or 24 V AC

POWER CONNECTION

AC VERSIONS
PIN 1 – AC PHASE
PIN 2 – GND (GROUND)
PIN 3 – AC NEUTRAL

DC VERSIONS
PIN 1 – DC POSITIVE
PIN 2 – Not connected
PIN 3 – DC NEGATIVE

WARNING

ATTENTION
In order to guarantee the electromagnetic compatibility, the following guidelines should be kept in mind :
- Power supply wires may be routed separated from signal wires. Never run power and signal wires in the same conduit.
- Use shielded cable for signal wiring and connect the shield to the ground of the indicator (pin2 CN1).
- The cables section should be ≥ 0.25 mm^2

INSTALLATION
To meet the requirements of the directive EN61010-1, in situations where the unit is permanently connected to the mains supply, it is obligatory to install a circuit breaking device near the equipment and easy accessible to the operator. This dispositive should be marked as protection device.
WARNING: If not installed and used in accordance with these instructions, protection against hazards may be impaired.

CONNECTORS

To perform wiring connections, remove the terminal block from the meter's connector, strip the wire leaving from 7 to 10mm exposed and insert it into the proper terminal while pushing the fingertip down to open the clip inside the connector as shown in the figure.
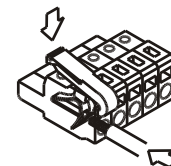
Proceed in the same manner with all pins and plug the terminal block back to the corresponding meter's connector.
Each terminal can admit wires of section between 0.08 mm² and 2.5 mm² (AWG 26 ÷ 14).
Blocks are shipped with removable adaptors inserted in each terminal to provide proper fastening for wires of sections less than 0.5 mm².

2.2 – Programming Instructions

To enter in the programming mode
Connect the meter to the mains supply, a self-test routine automatically activates all the digits of the display. After, the software version appears on the display for a few seconds and then the instrument goes to the normal operating mode (RUN).
To enter in the programming mode press ⟨ENTER⟩ for 2 seconds until the the indication **Pro** shown in figure 11.1 appears on the display.

To exit from the programming mode
To return to the run mode, it is necessary to pass through the different menu steps by successively pressing the ⟨ENTER⟩ key until the meter displays the indication **Stor** while internally stores the programmed parameters into the memory. After, it automatically goes to the normal operating mode.

How to interpret the programming instructions
The programming software routine is composed by a series of hierarchically organized menus, each allowing the setting of a specific parameter. In general, the normal sequence at each step is to push the ⟨▶⟩ key a number of times to make changes and the ⟨ENTER⟩ key to store them in the memory and advance to the next step.

The elements used along the programming instructions are described following.

[11.1] Programming Method
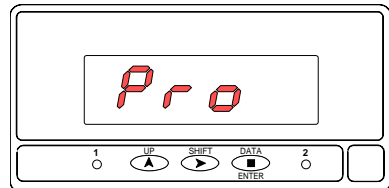
The programming instructions for each menu step are accompanied by a figure representing the display indication for the corresponding parameter. Pay special attention to the LED indications and active keys and follow the procedure described on the text to introduce correctly the desired data.
When the display indication is represented with blank segments, it means that this is one of the possible options of this menu (normally the default one) depending on the previous selection.
A series of blanked '8' represents any numerical value that can be changed by use of keys ⟨▶⟩ (change digit) and ⟨▲⟩ (change value).

2.3 - Instrument Configuration

To adequately configure the instrument, the following steps should be followed :

1. / The enclosed diagram shows the entire programming chart of model JR/ JR20-TPT.

All programmable parameters appear in a sequential order at each press of 'ENTER'. first the input configuration (page 14), including units and resolution. The indication **Stor** returns the meter to the run mode.

If a 2-relay option is installed (page 19), immediately after the last input programming parameter, the instrument gives access to the setpoint options configuration (page 15) including HI/LO mode, delay/hysteresis mode and setpoint values lock/unlock option.
The indication **Stor** returns the meter to the run mode.
The access to the setpoint values programming is made by a new entry to the **Pro** stage (page 17).
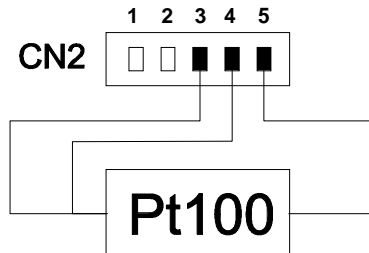

12
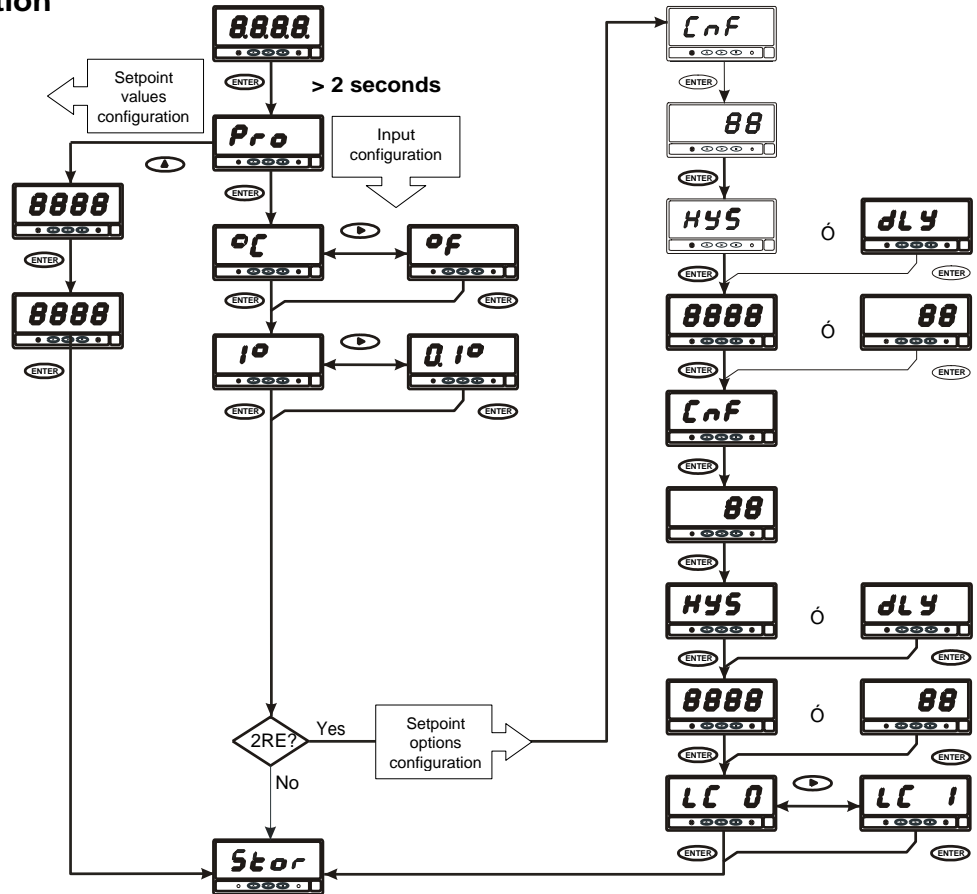
2. / Input Signal Connection.
See wiring recommendations on page 10.
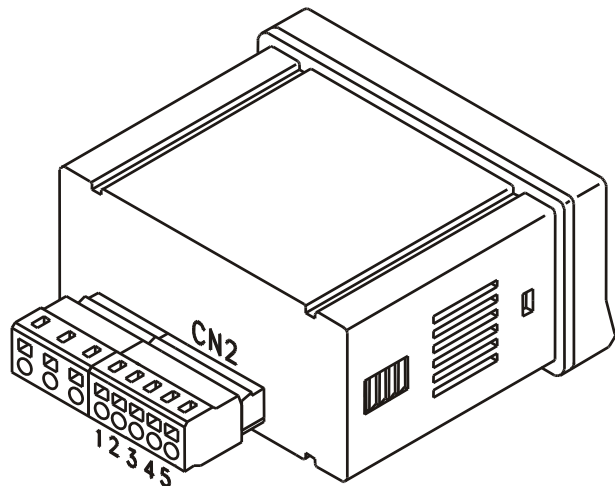
INPUT SIGNAL CONNECTION (CN2)
PIN 1 = Not connected
PIN 2 = Not connected
PIN 3 = Pt100
PIN 4 = Pt100 (same end as pin 3)
PIN 5 = Pt100 COMMON

Three-wire Pt100 input connection schema.

CN2

1 2 3 4 5

Pt100

INPUT CONFIGURATION

[14.1] Programming
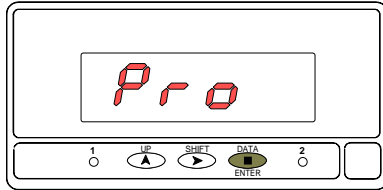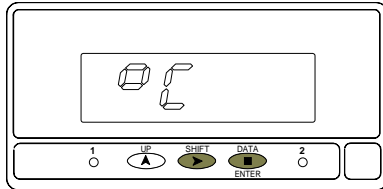

Figure 14.1 shows the indication corresponding to the first step of the programming routine.

Press ENTER to acceed to the input configuration parameters.

[14.2] Unit

The current reading units appear on the display (Figure 14.2 shows one of the two possible options [**ºC** = Celsius, **ºF** = Fahreinheit]). To change this parameter, press the ► key to switch to the desired units and press ENTER to validate the being displayed option and advance to the next program step.

[14.3] Resolution
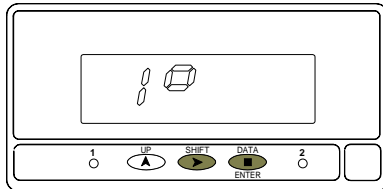
This step allows selection of the display resolution. The previously programmed choice appears on the display [**1º** = resolution in degrees or **0.1º** = resolution in tenths of degree]. Press ► if you desire to change the option present on display and press ENTER to save changes in the memory and advance to the next program step (if 2RE option is installed) or to exit from the programming mode.

2.4 SETPOINT CONFIGURATION (accessible if 2RE option is installed)

If a two-relay option is installed (see page 19) the instrument will enter automatically in the following routines after last input step, (figure 14.3).
At the end of this routine, the indication **Stor** will return the meter to the run mode. Finally, a new press of ENTER to call the **Pro** indication and a press of ▲ will allow setting the numerical value of the setpoints.

[15.1] Setpoint 1 Configuration
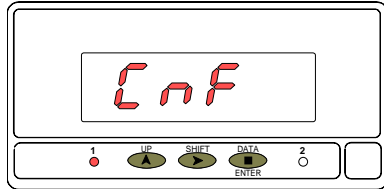
LEFT DIGIT VALUE	RIGHT DIGIT VALUE
MODE HI=0	DELAY=0
MODE LO=1	HYSTERESIS=1

The indication shown in figure 15.1 appears on the display to indicate that the next step is to program the setpoint1 operating parameters (led Setpoint 1 activated). After 2 seconds or by a press of ENTER the meter allows access to this menu.

The display then shows two digits; the one at left corresponds to the output mode (HI or LO) and the rightmost one corresponds to the delay unit (time -delay- or counts of display -hysteresis-) according to the table below the figure. Use the ▲ key to change the active digit value (in flash) and the ▶ key to go to the next digit to be set.

Press ENTER to validate selections and advance to the next phase.

[15.2] SET1 Hysteresis/Delay
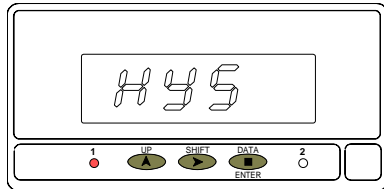
Depending on previous phase choice, the display will show for 2 seconds the indication corresponding to the selected delay units before giving access to the programming of the time delay or hysteresis magnitude (**dLY**) or (**HYS**). After 2 seconds or by a press of ENTER, the initially programmed numerical value appears on the display with the first digit in flash. To program the desired value (from 0 to 3999 counts of hysteresis or from 0 to 99 seconds of time delay) use the ▲ key to increment the active digit value and the ▶ key to advance to the next digit to be modified. Repeat this procedure until desired value is completed on the display and press ENTER to validate and acceed to the programming of the setpoint 2 parameters.

15

[16.1] Setpoint 2 Configuration
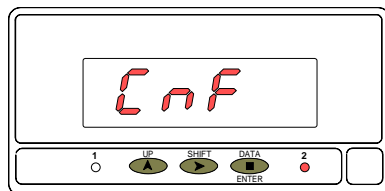
$$CnF$$

LEFT DIGIT VALUE	RIGHT DIGIT VALUE
MODE HI=0	DELAY=0
MODE LO=1	HYSTERESIS=1

The indication shown in figure 16.1 appears on the display to indicate that the next step is to program the setpoint 2 operating parameters (led Setpoint 2 activated). After 2 seconds or by a press of ENTER the meter allows access to this menu.

The display then shows two digits; the one at left corresponds to the output mode (HI or LO) and the rightmost one to the delay unit (time -delay- or counts of display -hysteresis-) according to the table below the figure. Use the ▲ key to change the active digit value (in flash) and the ► key to go to the next digit to be set.

Press ENTER to validate selections and advance to the next phase.

[16.2] SET2 Histeresis/Delay

$$HYS$$
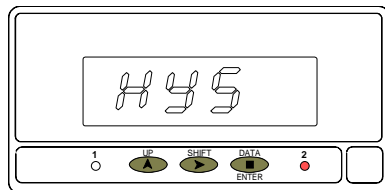
The display shows for 2 seconds the indication corresponding to the selected delay units before giving access to the programming of the time delay or hysteresis magnitude (**dLY**) or (**HYS**). After 2 seconds or by a press of ENTER, the initially programmed numerical value appears on the display with the first digit in flash. To change the value (from 0 to 3999 counts of hysteresis or from 0 to 99 seconds of time delay) use the ▲ key to increment the active digit value and the ► key to advance to the next digit to be modified. Repeat this procedure until desired value is completed on the display and press ENTER to validate and advance to the next step.

[16.3] Setpoint Program lockout

$$LC\ 0$$
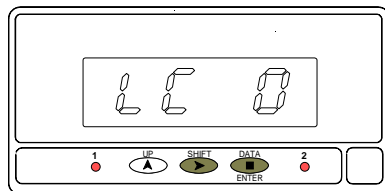
The figure 16.3 shows one of the two options available at this stage [**LC 0** = setpoint values programming enabled (unlocked) or **LC 1** = setpoint values programming disabled (locked)].
If wanted to modify this parameter, use the ► key to switch to the desired option. If you decide to lock the setpoint values, it will be also necessary to lock the full programming (see page 18).
Press ENTER to validate the choice, save programmed data and return to the run mode (indication **Stor**).

[17.1] Setpoints Programming
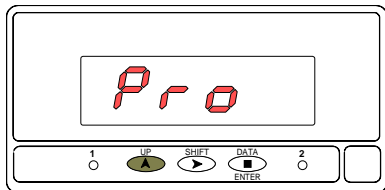
To program the setpoint values, press ENTER to acceed the programming mode (indication **Pro**, figure 17.1) and press ▲ to make the display show the previously programmed value of setpoint 1.

NOTE: The setpoint values should be within the selected measurement range.

[17.2] Setpoint 1

Programming of the setpoint 1 value, LED 1 activated.
The initially programmed value appears on the display with the first digit in flash. Press repeatedly the ▲ key to increment the acti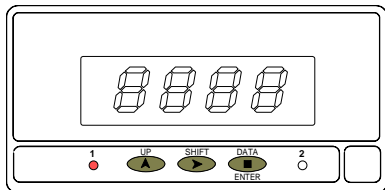ve digit from 0 to 9 until it takes the desired value and press ▶ to advance to the next digit to be modified. Repeat these operations to complete the desired setpoint value with sign.

Press ENTER to validate the entry and pass to the programming of setpoint 2.

[17.3] Setpoint 2
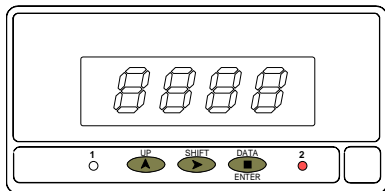
Programming of the setpoint 2 value, LED 1 activated.

Program the setpoint 2 value with sign by means of the ▲ (change value) and ▶ (change digit) procedure as described in previous phase.

Press ENTER to store programmed data in the memory and exit from the programming mode. The indication **Stor** returns the units to the normal operation.

2.5 – Programming lockout

After completing the instrument's programming, it is recommended to lockout the access to the programming to prevent from accidental or unauthorized modifications.

This operation is made by taking off a plug-in jumper located on the main board circuit (see figure at right).

NOTE :   Disconnect power before changing
the jumper position.

While the instrument is locked out it is however possible to acceed to the programming routines to check the current configuration, but it won't be possible to entry or modify data. In this case, a push of ENTER to acceed the programming routines will show the indication **dAtA** instead of **Pro**.

Remove jumper to
lock out the programming
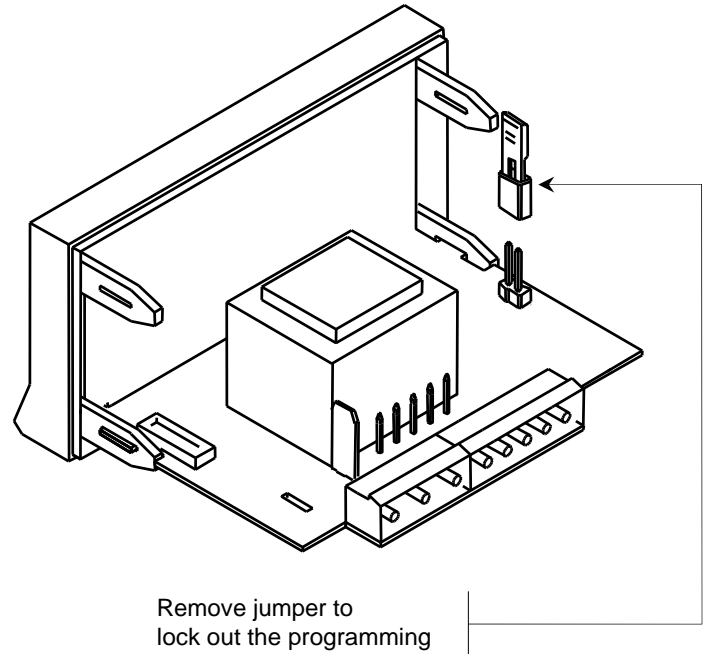
4. RELAY OUTPUT OPTION

As an option, the JR/ JR20-TPT models can be equipped with the following output option:

• A control option card with two SPDT relay outputs rating 8 A @ 250 V AC / 150 V DC. The outputs can be programmed for HI or LO operation and selectable time delay or hysteresis action. **Ref. 2RE**

The 2RE output option consists of an additional card installable to the meter's main board by means of a plug-in connector.
The option is supplied with its specific instructions manual describing installation and characteristics. Nevertheless, the programming instructions are given in the JR/ JR20-TPT manual.

For more detailed information on characteristics, applications and mounting, please refer to the specific 2RE instructions manual.

2-RELAY (2RE)
OUTPUT
OPTION
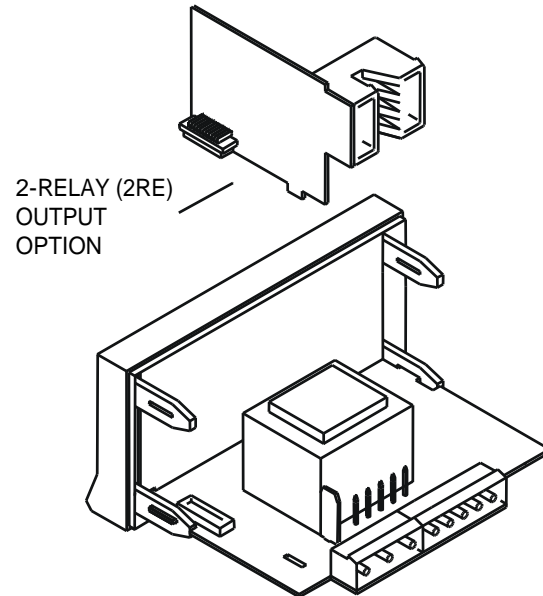
5. TECHNICAL SPECIFICATIONS

INPUT SIGNAL
- Configuration............................ differential asymmetrical
- Pt100 excitation current .... < 1 mA
- Max. lead resistance .... 40 Ω/ wire (balanced)

Input	Range (res. 0.1 º)	Range (res. 1º)
Pt100	-100.0 to +200.0 ºC	-200 to +800 ºC
	-148.0 to +392.0 ºF	-328 to +1472 ºF

- Linearization... DIN 43760
- Alpha coefficient .... α=0.0385

ACCURACY
- Maximum error:
- Pt100 (res. 0.1 ºC) ....± (0.1% of the reading +0.3 ºC)
- Pt100 (res. 1 ºC) .... ± (0.1% of the reading +1 ºC)
- Pt100 (res. 0.1 ºF)........± (0.1% of the reading +0.5 ºF)
- Pt100 (res. 1 ºF) ....± (0.1% of the reading +1.5 ºF)
- Temperature coefficient .... 100 ppm/ ºC
- Warmup time .... 15 minutes

POWER SUPPLY
- AC ....230/115 V, 24/48 V (±10%) 50/60 Hz AC
- DC ...12V (10.5 to 16V), 24V (21 to 32V), 48V (42 to 64V)
- Consumption .... 3 W

FUSES (DIN 41661) – Not Supplied
- JR/ JR20-TPT (230/115V AC)..................... F 0.1A / 250 V
- JR/ JR20-TPT2 (24/48V AC) .... F 0.2A / 250 V
- JR/ JR20-TPT3 (12 V DC) .... F 1A / 250 V
- JR/ JR20-TPT4 (24 V DC) .... F 0.5A / 250 V
- JR/ JR20-TPT5 (48 V DC) .... F 0.5A / 250 V

CONVERSION
- Technique .... Sigam-Delta
- Resolution .... 16 bits
- Rate... 25/ s

DISPLAY
- Type .... -1999/ 3999
- Junior-TPT...................................... 4 digits 14 mm red
- Junior20-TPT .... 4 digits 20 mm red
- Decimal point .... programmable
- LEDs .... 2 for output status indication
- Reading rate... 500 ms
- Display overrange indication .... OvE
- Input overrange indication.. OvE

ENVIRONMENTAL
- Indoor Use
- Operating temp. .... -10ºC to 60ºC
- Storage temperature .... -25 ºC to +85 ºC
- Relative humidity (non condensing) .... <95 % at 40 ºC
- Max Altitude .... 2000 meters

DIMENSIONS
- Dimensions... 96x48x60 mm
- Panel cutout .... 92x45 mm
- Weight .... 250 g
- Case material.......................... polycarbonate s/UL 94 V-0

5.1 - Dimensions and mounting

To install the instrument into the panel, make a 92x45mm cutout and insert the instrument from the front placing the sealing gasket between this and the front bezel.
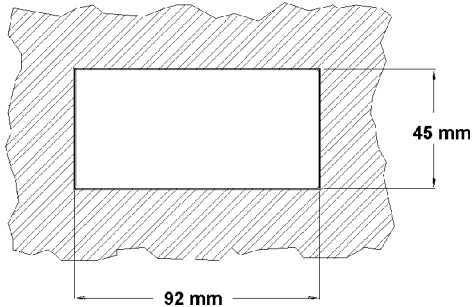
Place the fixing clips on both sides of the case and slide them over the guide tracks until they touch the panel at the rear side.
Press slightly to fasten the bezel to the panel and secure the clips.

To remove the instrument from the panel, pull outwards the fixing clips rear tabs to disengange and slide them back over the case.

SEALING GASKET

FIXING CLIPS

PANEL

CLIPS RETENTION
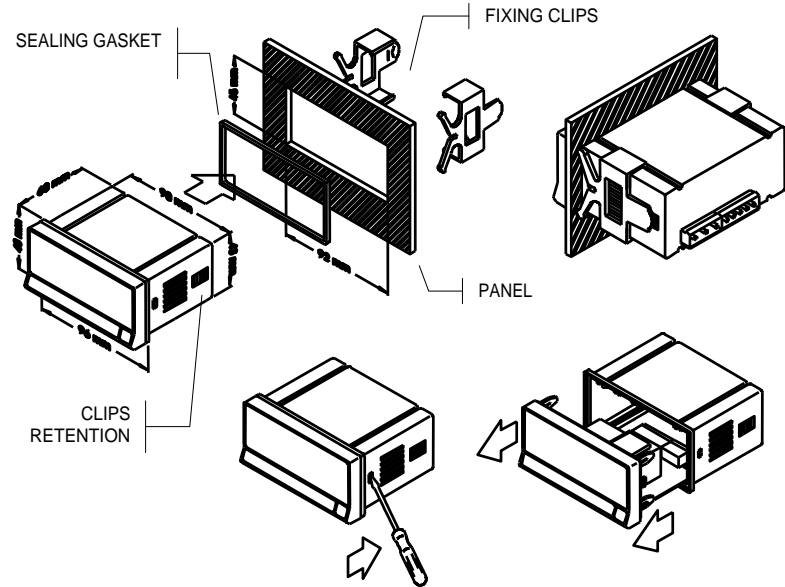
CLEANING: The front cover should be cleaned only with a soft cloth soaked in neutral soap product.

DO NOT USE SOLVENTS

The instruments are warranted against defective materials and workmanship for a period of three years from date of delivery.

If a product appears to have a defect or fails during the normal use within the warranty period, please contact the distributor from which you purchased the product.

This warranty does not apply to defects resulting from action of the buyer such as mishandling or improper interfacing.

The liability under this warranty shall extend only to the repair of the instrument. No responsibility is assumed by the manufacturer for any damage which may result from its use.

All the DITEL products benefit from an unlimited and unconditional warranty of THREE (3) years from the date of their purchase. Now you can extend this period of warranty up to FIVE (5) years from the product commissioning, only by fulfilling a form.

Fill out the form in our website:
http://www.ditel.es/warranty

DECLARATION OF CONFORMITY

Manufacturer :   DITEL - Diseños y Tecnología S.A.

Address :   Travessera de les Corts, 180
08028 Barcelona
ESPAÑA

Declares, that the product :

Name : Digital panel temperature indicator
(for Pt100 sensor)

Model : JUNIOR-TPT and JUNIOR20-TPT

Conforms with : EMC 89/336/CEE
LVD 73/23/CEE

Applicable Standards :   **EN50081-1** Generic emission
EN55022/CISPR22   Class B

Applicable Standards :   **EN50082-1** Generic inmunity
IEC1000-4-2   Level 3   Criteria B
Air Discharge 8kV
Contact Discharge 6kV

IEC1000-4-3   Level 2   Criteria A
3V/m   80..1000MHz

IEC1000-4-4   Level 2   Criteria B
1kV Power Lines
0.5kV Signal Lines

Applicable Standards :   **EN61010-1** Generic Safety
IEC1010-1   Installation Category II
Transient Voltages <2.5kV
Degree of Pollution 2
Conductive pollution excluded
Insulation type
Enclosure :   Double
Inputs/Outputs :   Basic

Date: 16 December 1999
Signed: José M. Edo
Position: Technical Manager

INSTRUCTIONS FOR THE RECYCLING

This electronic instrument is covered by the **2002/96/CE** European Directive so, it is properly marked with the crossed-out wheeled bin symbol that makes reference to the selective collection for electrical and electronic equipment which indicates that at the end of its lifetime, the final user cannot dispose of it as unsorted municipal waste.

In order to protect the environment and in agreement with the European legislation regarding waste of electrical and electronic equipments from products put on the market after 13 August 2005, the user can give it back, without any cost, to the place where it was acquired to proceed to its controlled treatment and recycling.

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