KOSMOS SERIES

INSTRUCTIONS MANUAL
DIGITAL PANEL THERMOMETER

JUNIOR-TTC
JUNIOR20-TTC

CODE: 30727076 EDITION: 16-10-2006

ECF

DITEL

INTRODUCTION TO THE KOSMOS SERIES

This manual 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 instruments from s/n 221769

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 :

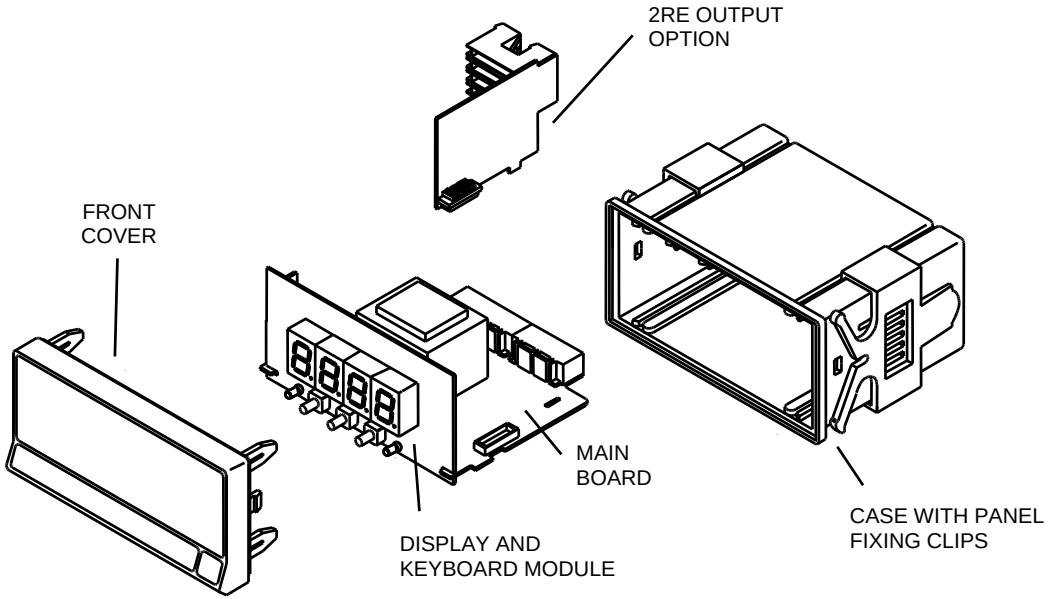
- CONNECTIONS via plug-in terminal blocks without screws and CLEMP-WAGO clips cable retention system.
- DIMENSIONS
  Models ALPHA & BETA 96x48x120 mm DIN 43700
  Models MICRA & JR/JR20 96x48x60 mm DIN 43700
- CASE MATERIAL UL-94 V0-rated polycarbonate.
- PANEL INSTALLATION by means of single part fingertip 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-TTC & JUNIOR20-TTC

INDEX


2RE OUTPUT
OPTION
FRONT
COVER
MAIN
BOARD
DISPLAY AND
KEYBOARD MODULE
CASE WITH PANEL
FIXING CLIPS

1. MODELS JUNIOR-TTC AND JUNIOR20-TTC

The Junior-TTC and Junior20-TTC models are small format, 3¾ digit instruments designed for temperature measurement with an input stage prepared for connection to thermocouple types J, K or T as selected by software.

The difference between both models is the size of the digits of the display. Model JR20-TTC 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-TTC.

Software configuration allows selection of reading units (Celsius or Fahrenheit), resolution (degrees or tenths of degree) and offset (-99 to 99 points).

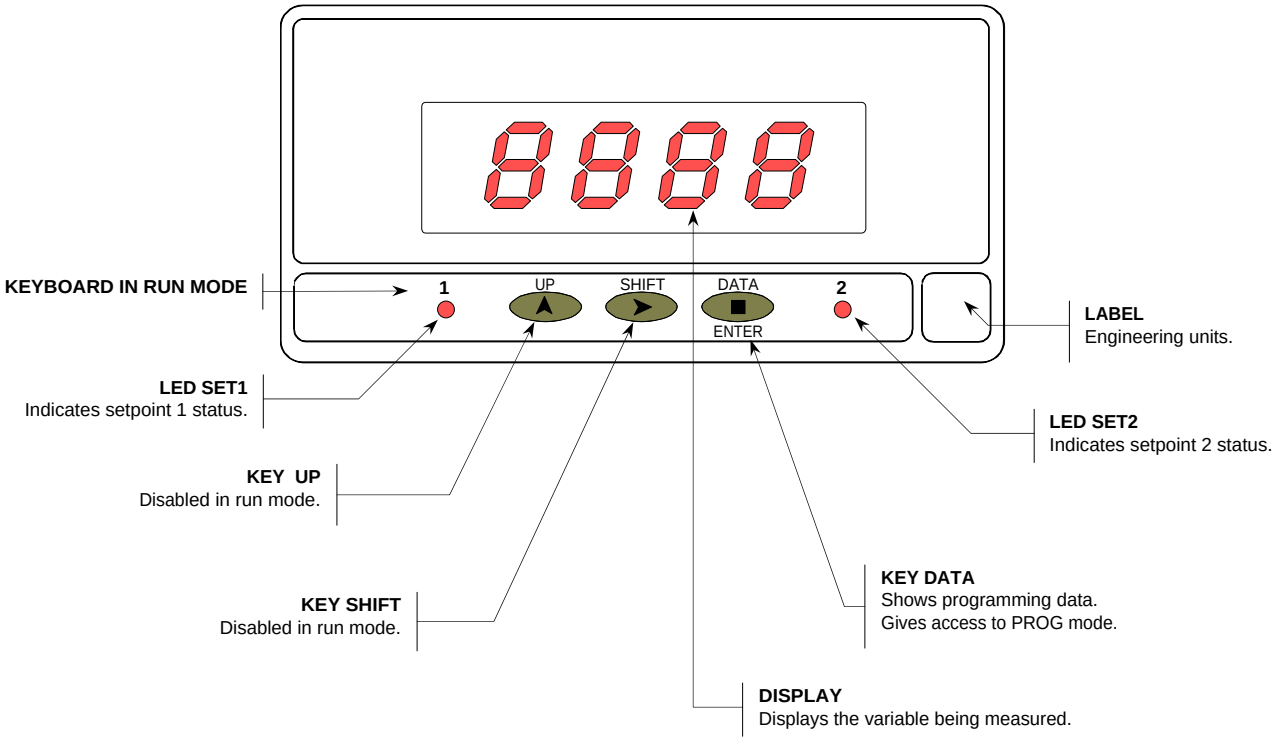
The basic instrument is a soldered assembly composed of the main board, and the display and keyboard module.

Optionally, it can be equipped 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.

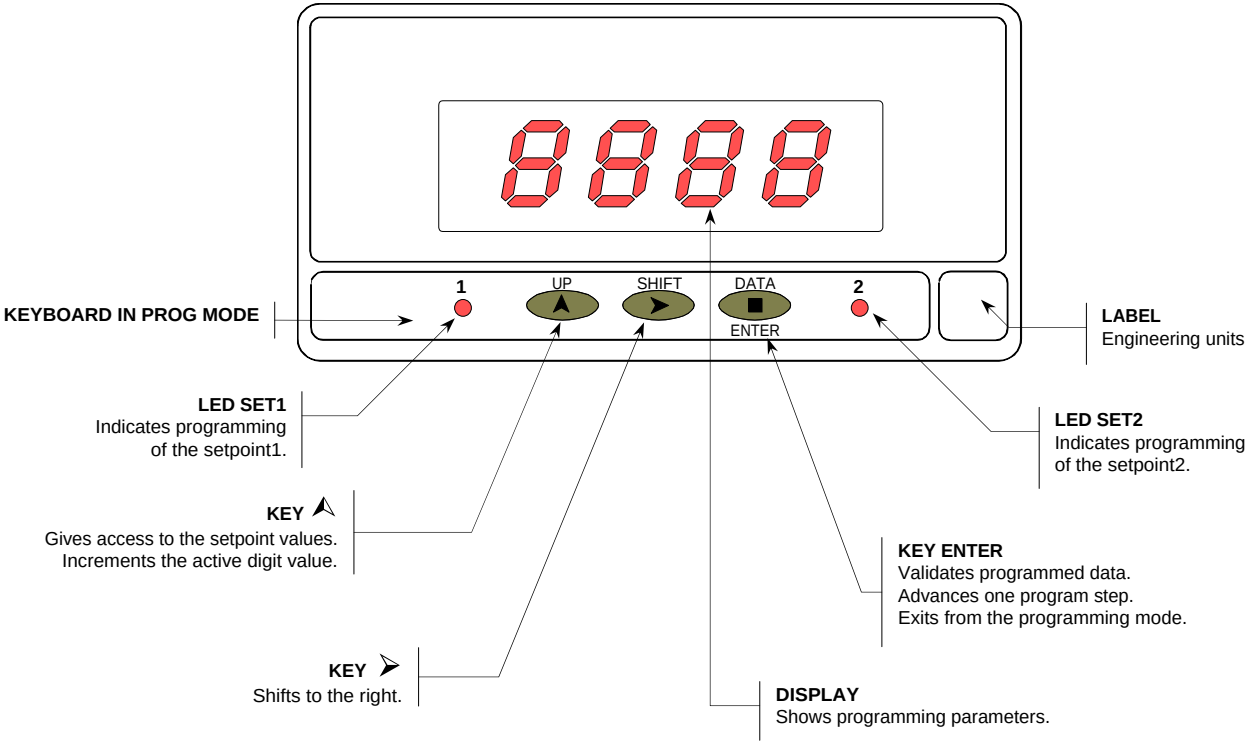
The outputs are isolated from signal ground.

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)



FRONT-PANEL FUNCTIONS DESCRIPTION (PROG MODE)



2. OPERATING INSTRUCTIONS

PACKING CONTENTS

- ❑ Instructions manual in English including Declaration of Conformity.
- ❑ The digital panel instrument JR/ JR20-TTC.
- ❑ Accesories for panel mounting (sealing gasket and fixing clips).
- ❑ Accesories for wiring connection (removable terminal block connectors and fingertip).
- ❑ Wiring label sticked to the instrument's case JR/ JR20-TTC
- ❑ Set of 2 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 at the factory for 230V AC. (USA market 115 V AC).
- ❑ The instruments for 24/48V AC power supply, are set up at the factory for 24V AC.
- ❑ If the instrument is supplied for 12V DC, 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 12-15)

- ❑ The instrument provides an input for thermocouple types J, K or T. The reading units may be Celsius or Fahreinheit with resolution of degrees or tenths of degree.

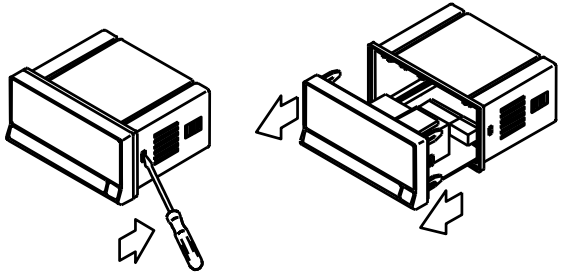
Programming lockout (page 19)

- ❑ As shipped from the factory, the instrument allows 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 match 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 match the new configuration.

Tabla 1. Jumper settings.

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

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

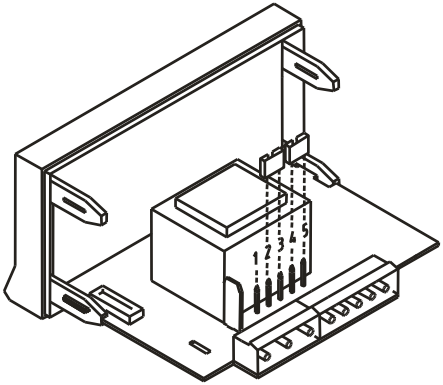


Fig. 9.2. Jumper settings for 230 V or 48 V AC

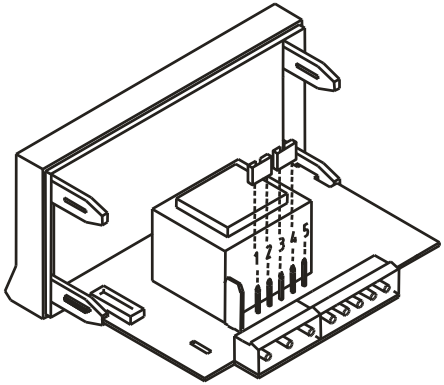
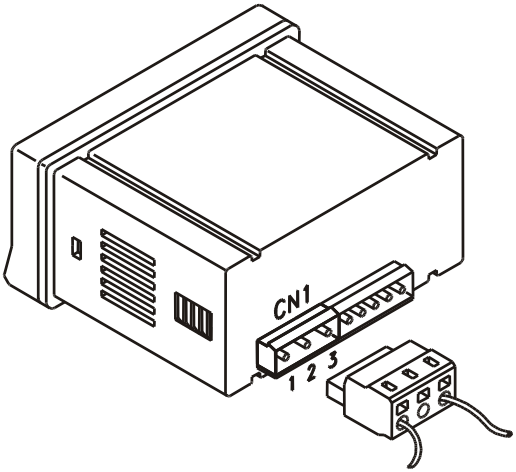


Fig. 9.3. Jumper settings for 115 V or 24 V AC

POWER CONNECTION



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

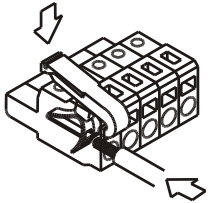
DC VERSIONS
PIN 1 – DC POSITIVE
PIN 2 – Not connected
PIN 3 – DC NEGATIVE

INSTALLATION
To meet the requirements of the directive EN61010-1, where the unit is permanently connected to the mains supply it is obligatory to install a circuit breaking device easy reachable to the operator and clearly marked as the disconnect device.

WARNING
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

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).
Some terminals have removable adaptors 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, for approx. 1s a self-test routine automatically activates all the digits of the display. After, 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

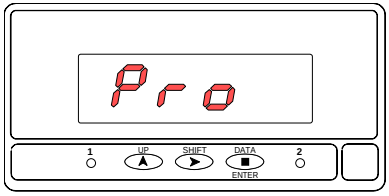
To return to the run mode, it is necessary to pass through the different menu steps by successively pressing the ENTER key until the meter displays the indication **Stor** while internally stores the programmed parameters into the memory. After, it automatically goes to the normal operating mode.

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.

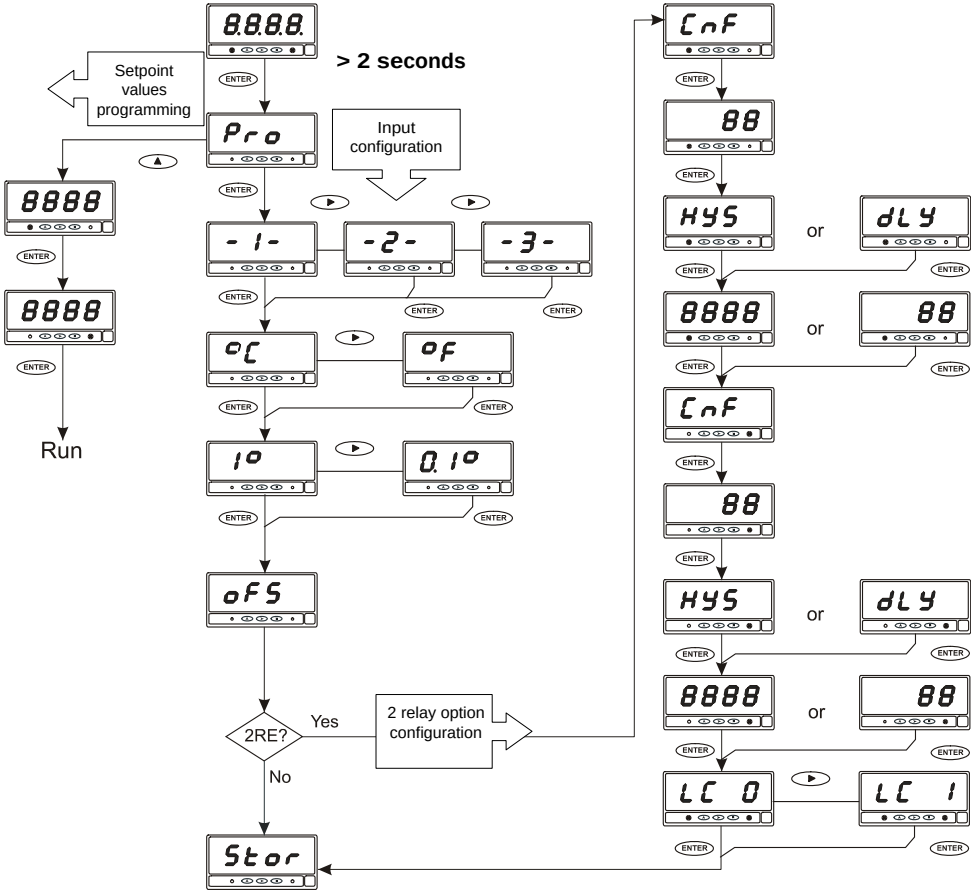
A series of blanked '8' represents any numerical value that can be changed by use of keys ▶ (change digit) and ▲ (change value).

2.3 – Instrument Configuration

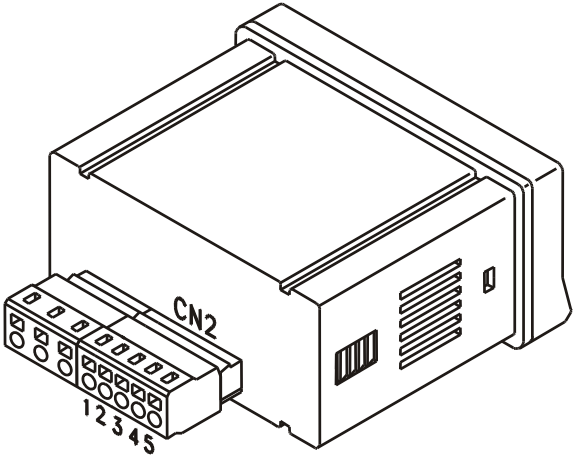
To properly configure the meter, the following steps should be followed :

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

Stepping through the list of programmable parameters is accomplished by succesively pressing 'ENTER'. the first four parameters refer to the input configuration (page 14), including units, resolution and offset. If no setpoint option is installed, the meter returns to the run mode (indication **Stor**) after setting the offset value.
If a 2-relay option is installed (page 20), immediately after the last input programming parameter, the unit gives access to the setpoint options configuration (page 16) including HI/LO mode, delay/hysteresis mode and setpoint values lock/unlock option.
The indication **Stor** returns the meter to the run mode.
The setpoint values are programmed in a separate routine which is entered by pressing ' ' from the **Pro** stage (page 18).



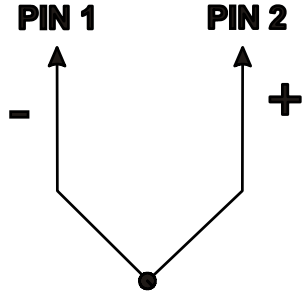
2. / Input Signal Connection.
See wiring guidelines on page 10.



INPUT SIGNAL CONNECTION (CN2)

PIN 1 = – Thermocouple
PIN 2 = + Thermocouple
PIN 3 = Not connected
PIN 4 = Not connected
PIN 5 = Not connected

Wiring schematic for thermoucple J, K or T
with two wires



INPUT CONFIGURATION

[14.1] Pro stage

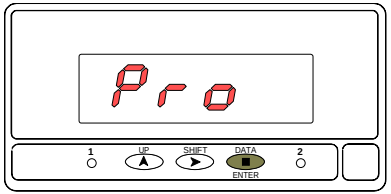
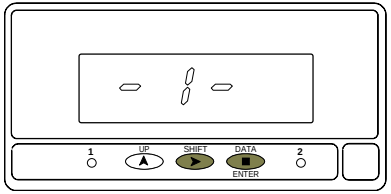


Figure 14.1 shows the indication corresponding to the first step of the programming routines.

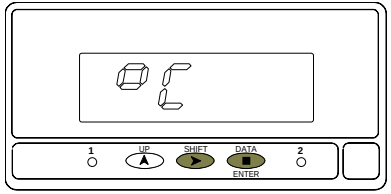
Press ENTER more than 5 seconds to acceed to the input configuration parameters.

[14.2] Input type



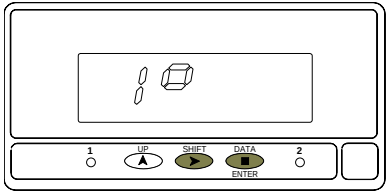
A press of 'ENTER' made at previous step, gives access to the first step of this menu corresponding to the input type selection.
There is a choice of three types of thermocouple inputs : **-1-** (thermocouple J), **-2-** (thermocouple K), **-3-** (thermocouple T).
Press the ▶ key to change the current input type if desired and press ENTER to validate the choice and advance to the next program step.

[14.3] Units



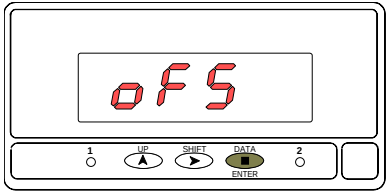
The current reading units appear on the display (Figure 14.2 shows one of the two possible options [**ºC** = Celsius, **ºF** = Fahreinheit]). To change this parameter, press the ▶ key to switch to the desired units. Press ENTER to validate the being displayed option and advance to the next program step.

[15.1] Resolution



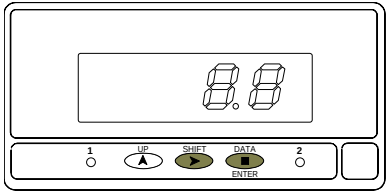
This step allows selection of the display resolution. The previously programmed choice appears on the display [**1º** = resolution in degrees or **0.1º** = resolution in tenths of degree]. Press ▶ if desired to change the option present on display and press ENTER to save changes in the memory and advance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

[15.2] Offset flag indicator



The indication shown in figure 15.2 is viewed for 2 seconds before entering in the programming of the offset value (fig. 15.3). The offset may be used to compensate for a difference that may exist between the temperature under measurement and the temperature read by the sensor.
For example, suppose the instrument is used to control the temperature of a baking oven, but the sensor is located at a distance from the oven where the temperature is 10 degrees below. To correct from this deviation, the offset should be programmed to –10 counts (with resolution of 1°).

[15.3] Offset value

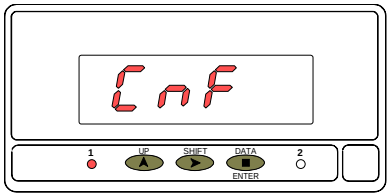


The previously programmed offset appears on the display with the first digit in flash.
To change the value, press ▲ to increment the active digit value (the first digit can only be '0' or a minus sign). Press ▶ to shift to the next digit to be modified and repeat these operations until desired offset is completed on the display. The offset is programmable from -9.9 to +9.9 with resolution of 0.1° and from -99 to +99 whith resolution of 1º.
Press ENTER to validate changes and exit from the input configuration.

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

If a two relay option is installed (see page 20) the instrument will enter automatically on the following routines after the last input configuration step (figure 14.3).
At the end of this routine, the meter returns to the run mode.
To program the setpoint numerical values, from the run mode press ENTER to call the **Pro** stage and press ▲ to acced the first setpoint value.

[16.1] Setpoint 1 Configuration



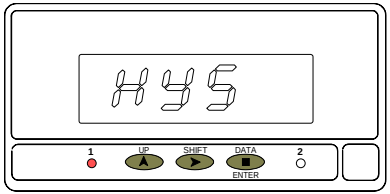
LEFT DIGIT VALUE	RIGHT DIGIT VALUE
MODE HI=0 MODE LO=1	DELAY=0 HYSTERESIS=1

The indication shown in figure 16.1 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 leftmost one 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.

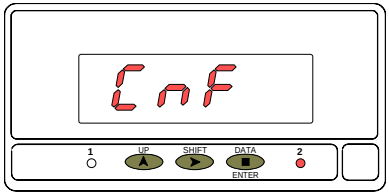
Press ENTER to validate selections and advance to the next phase.

[16.2] 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.

[17.1] Setpoint 2 Configuration



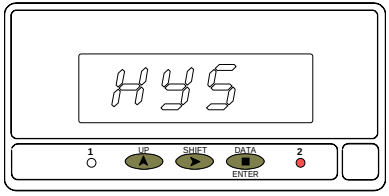
LEFT DIGIT VALUE	RIGHT DIGIT VALUE
MODE HI=0 MODE LO=1	DELAY=0 HYSTERESIS=1

The indication shown in figure 17.1 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-). See table in figure 17.1. Use the ▲ key to change the active digit value (in flash) and the ▶ key to go to the next digit to be modified.

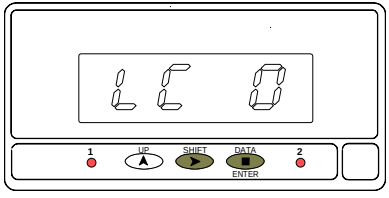
Press ENTER to validate changes and advance to the next phase.

[17.2] SET2 Histeresis/Delay



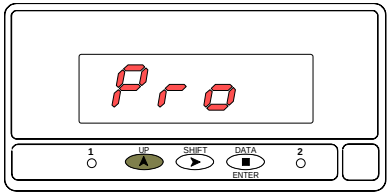
The display shows for 2 seconds the indication corresponding to the selected delay units before giving access to the programming of the time delay or hysteresis magnitude (**dLY**) or (**HYS**). After 2 seconds or by a press of ENTER, the initially programmed numerical value appears on the display with 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.

[17.3] Setpoint Program lockout



The figure 17.3 shows one of the two options available at this stage [**LC O** = 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 out the entire program routines (see page 19).
Press ENTER to validate the choice, save programmed data and return to the run mode (indication **Stor**).

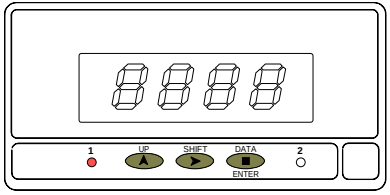
[18.1] Setpoints Programming



To program the setpoint values, press ENTER to acceed the programming mode (indication **Pro**, figure 18.1) and press ▲ to make the display show the previously programmed value of setpoint 1.

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

[18.2] Setpoint 1

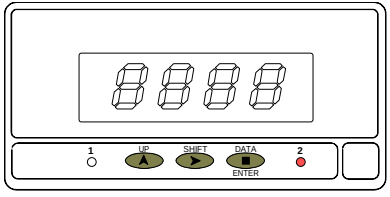


Program setpoint 1 value, LED 1 activated.

The initially programmed value appears on the display with the first digit in flash. Press repeatedly the ▲ key to increment the active 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.

[18.3] Setpoint 2



Program setpoint 2 value, LED 2 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** appears while the unit returns to the normal operation.

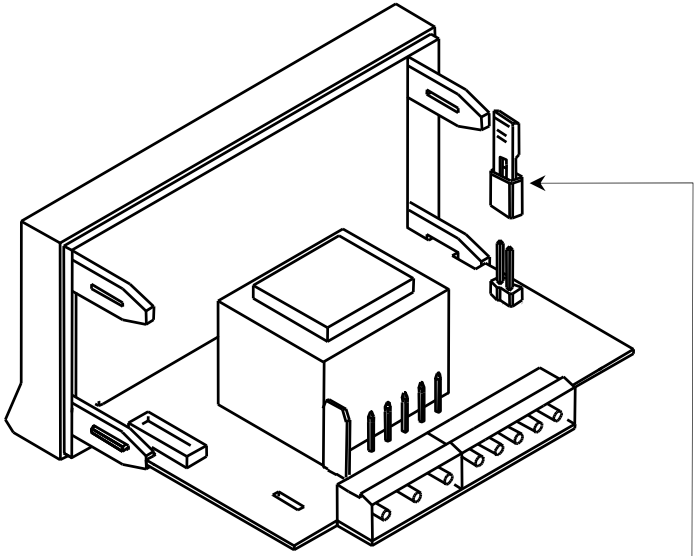
2.5 – Programming lockout

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**.



4. RELAY OUTPUT OPTION

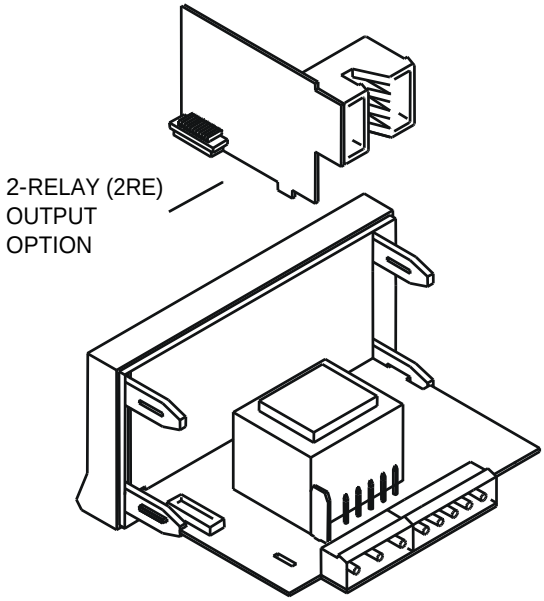
As an option, the JUNIOT-TTC models can be equipped with the following output option:

• A control output 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 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 a 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 (code 30727012).



5. TECHNICAL SPECIFICATIONS

INPUT SIGNAL

- Configuration.....differential asymmetrical
- Cold junction compesation.....-10ºC to 60ºC

Input	Range (res. 0.1 º)	Range (res. 1º)
TC "J"	-50.0 to 200.0ºC	-50 to 850ºC
	-58.0 to 392.0ºF	-58 to 1562ºF
TC "K"	-50.0 to 200.0ºC	-50 to 1250ºC
	-58.0 to 392.0ºF	-58 to 2282ºF
TC "T"	-100.0 to +100.0 ºC	-200 to +400 ºC
	-148.0 to +212.0 ºF	-328 to +752 ºF

ACCURACY

- Maximum error:
- TC J, K,T 0.1ºC/ ºF ....±(0.4% r +0.6ºC)/ ±(0.4% r +0.6ºC)
- TC J, K,T 1ºC/ ºF..... ±(0.4% r +1ºC)/ ±(0.4% r +2 ºC)
- Temperature coefficient .....100 ppm/ ºC
- Warm-up time ..... 5 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) – (Recommended)

- JR/ JR20-TTC (230/115V AC).....F 0.1A / 250 V
- JR/ JR20-TTC2 (24/48V AC) .....F 0.2A / 250 V
- JR/ JR20-TTC3 (12 V DC) ..... F 1A / 250 V
- JR/ JR20-TTC4 (24 V DC) .....F 0.5A / 250 V
- JR/ JR20-TTC5 (48 V DC) .....F 0.5A / 250 V

CONVERSION

- Technique.....Sigma-Delta
- Resolution .....16 bits
- Rate 25/s

DISPLAY

- Type ..... -1999/ 3999
- Junior-TTC..... 4 digits 14 mm red
- Junior20-TTC ..... 4 digits 20 mm red
- Decimal point..... programmable
- LEDs ..... 2 for output status indication
- Reading rate .....333 ms
- Display overrange indication .....OvE
- Input overrange indication.....OvE

ENVIRONMENTAL

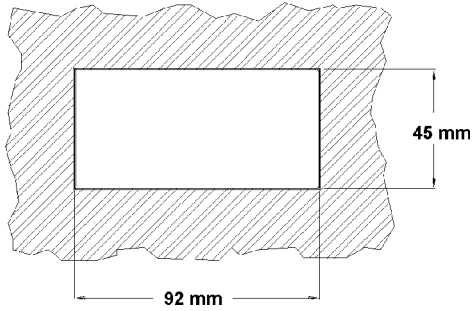
- Indoor Use
- Operating temp. .....-10ºC to 60ºC
- Storage temperature ..... -25 ºC to +85 ºC
- Relative humidity (non condensing).....<95 % at 40 ºC
- Max Altitude ..... 2000 meters

DIMENSIONS

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

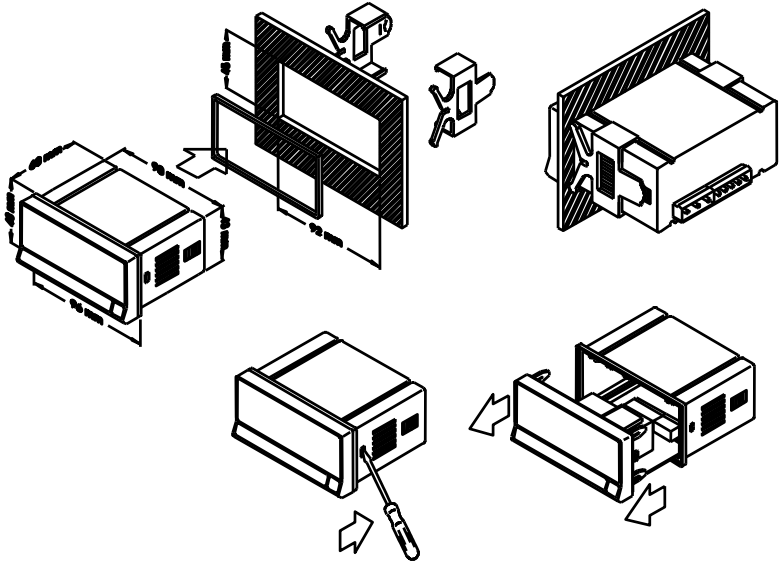
5.1 - Dimensions and mounting

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.



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 TC J, K & T input)

Model : JUNIOR-TTC and JUNIOR20-TTC

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

Date: 23 December 1999
Signed: José M. Edo
Position: Technical Manager

Applicable Standards : EN55022/CISPR22	**EN50081-1** Generic emission Class B
Applicable Standards : IEC1000-4-2	**EN50082-1** Generic inmunity 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 : IEC1010-1	**EN61010-1** Generic Safety Installation Category II Transient Voltages <2.5kV Degree of Pollution 2 Conductive pollution excluded Insulation type Enclosure : Double Inputs/Outputs : Basic

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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