KOSMOS SERIE

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ECF

INSTRUCTIONS MANUAL
PROGRAMMABLE TACHOMETER

JUNIOR-TAC
JUNIOR20-TAC

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 232851

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.

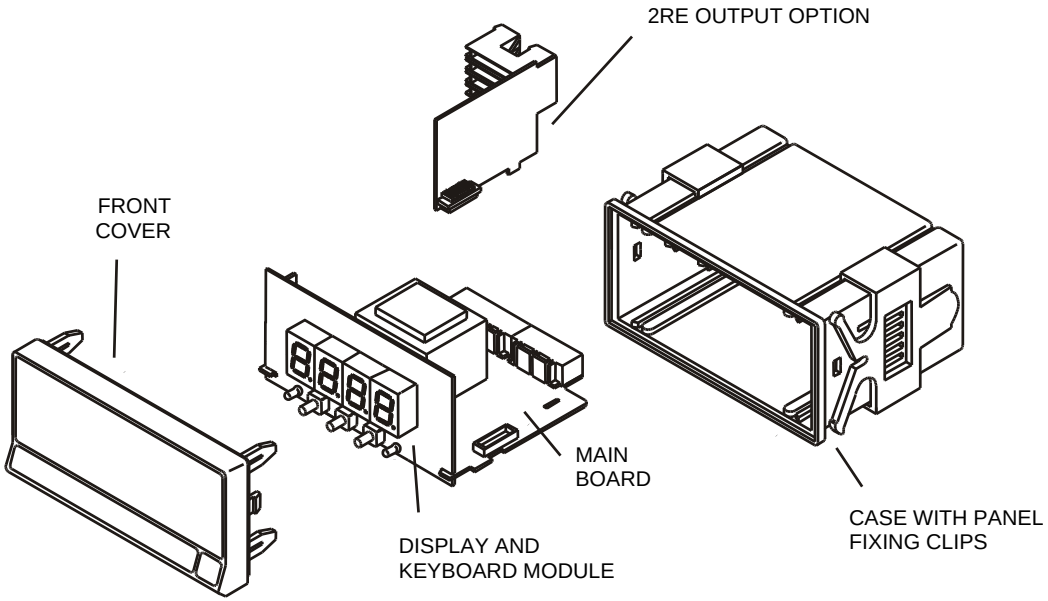
Other features of the KOSMOS family include :

- 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.

JUNIOR-TAC & JUNIOR20-TAC

INDEX


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

1. MODELS JUNIOR-TAC and JUNIOR20-TAC

This manual describes the models Junior-TAC and Junior20-TAC, both instruments are small format.

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

Models JR/JR20-TAC are fully configurable by software to measure rpm or rate in the desired units. The input stage admits direct connection of several sensor types which are selected by a DIP-switch.

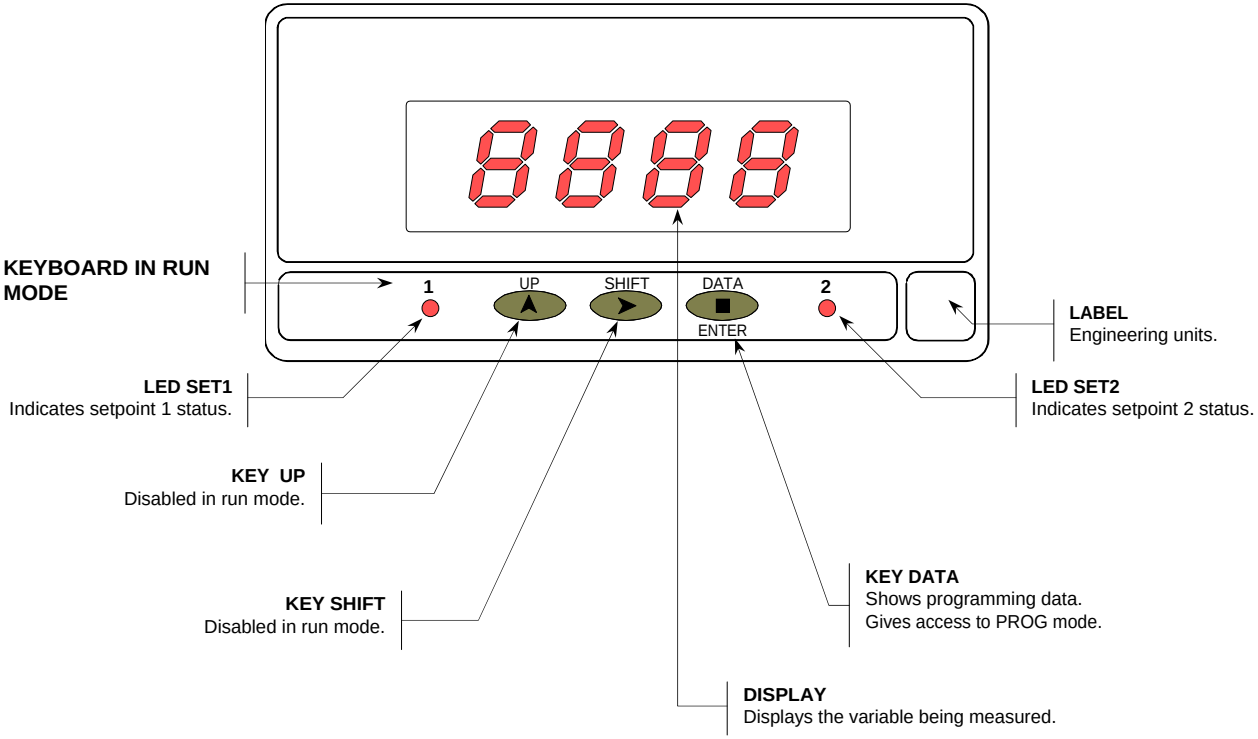
The basic instrument is a soldered assembly composed of the main board, and the display and keyboard module.

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.

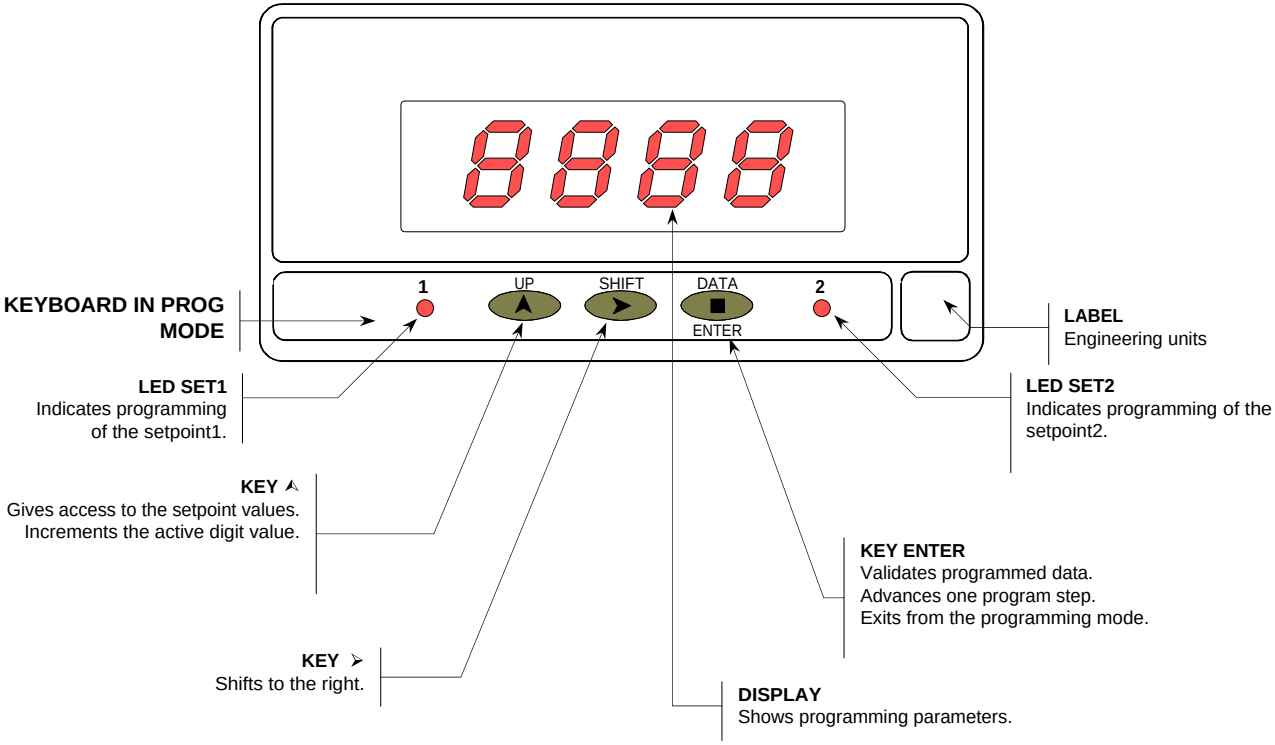
The outputs are isolated from signal input and power supply.

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-TAC.
- ❑ Accessories 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-TAC
- ❑ 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 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 supply.**

Programming instructions (page 11)

- ❑ The software inside the instrument allows configuring the input and display parameters. If a two-relay output option is installed ref. 2RE (page 27), the software detects it on power up enabling a specific routine for setpoints configuration.

✓ **Read carefully this parragraph.**

Input type (page 12-15)

- ❑ The instrument provides an input for several sensor types including magnetic pickup, Namur, NPN/PNP type and TTL/24V DC (see page 13).

✓ **Check the 5-position DIP-switch located on the main board.**

Programming lockout (page 26)

- ❑ 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.

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).

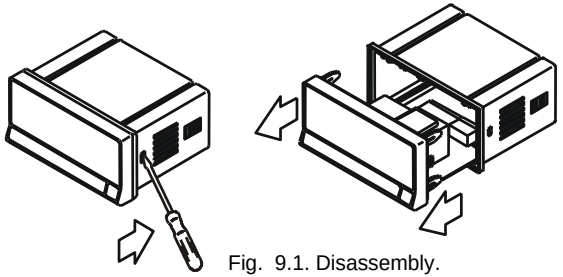


Fig. 9.1. Disassembly.

Tabla 1. Jumper settings.

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

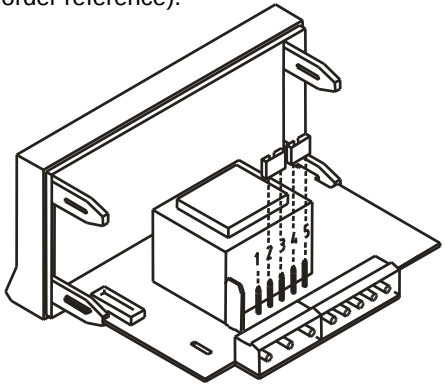


Fig. 9.2. Jumper settings for 230 V or 48 V AC

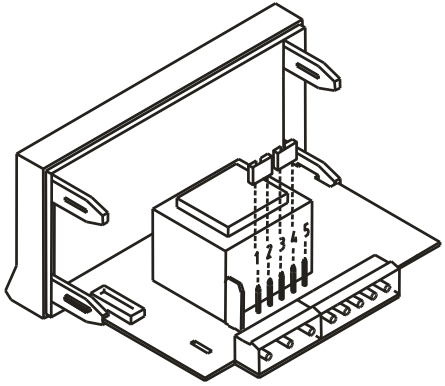
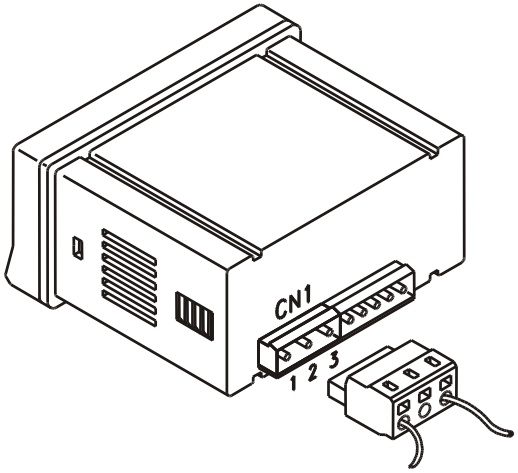


Fig. 9.3. Jumper settings for 115 V or 24 V AC

POWER CONNECTION



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

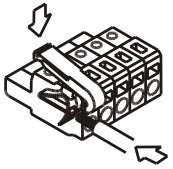
DC VERSIONS
PIN 1 – DC POSITIVE
PIN 2 – Not connected
PIN 3 – DC NEGATIVE

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

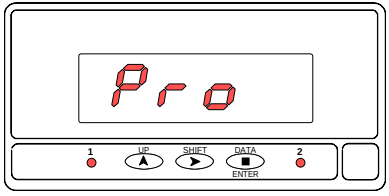
To enter in the programming mode
Connect the meter to the main supply, for approx. 1s a self-test routine automatically activates all the digits of the display. After, the instrument goes to the normal operating mode (RUN).
To enter in the programming mode press for 5 seconds until the indication **Pro** 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.

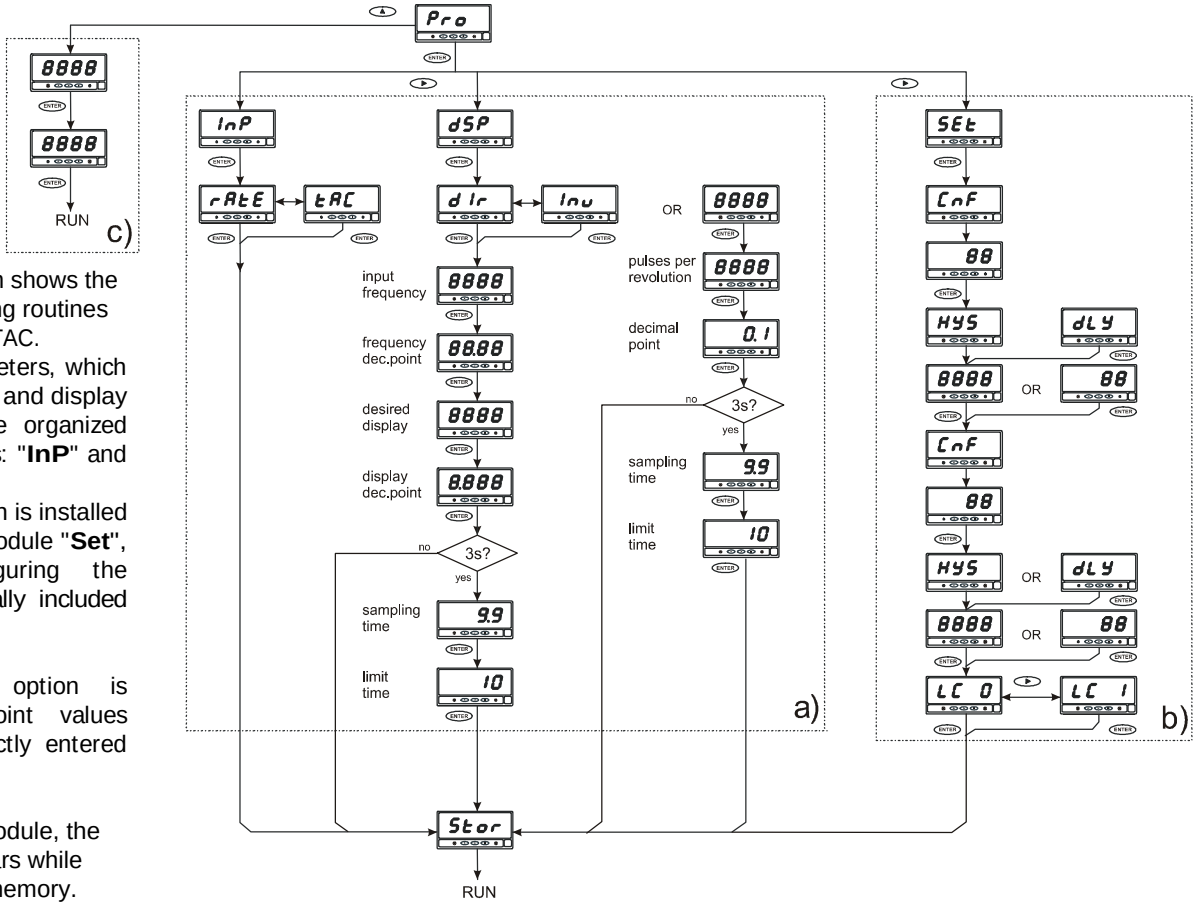
The elements used along the programming instructions are described following.

[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's setup



The enclosed diagram shows the complete programming routines for models JR/ JR20-TAC.

a) The basic parameters, which refer to the input and display configuration are organized into two modules: "**InP**" and "**dSP**".

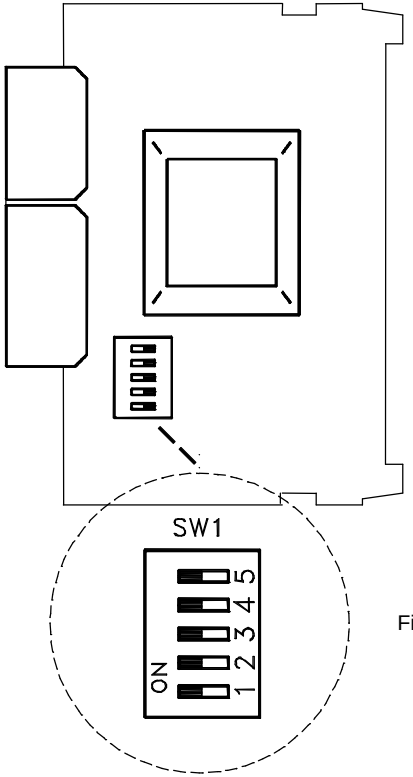
b) If a 2-relay option is installed (see page 27), the module "**Set**", that allows configuring the option, is automatically included in the routines.

c) If a 2-relay option is installed, the setpoint values programming is directly entered from the **Pro** stage.

At the end of each module, the indication **Stor** appears while data is saved in the memory.

2.4 – INPUT CONFIGURATION

To configure the input to the indicator, set the switch SW1 as indicated in the table



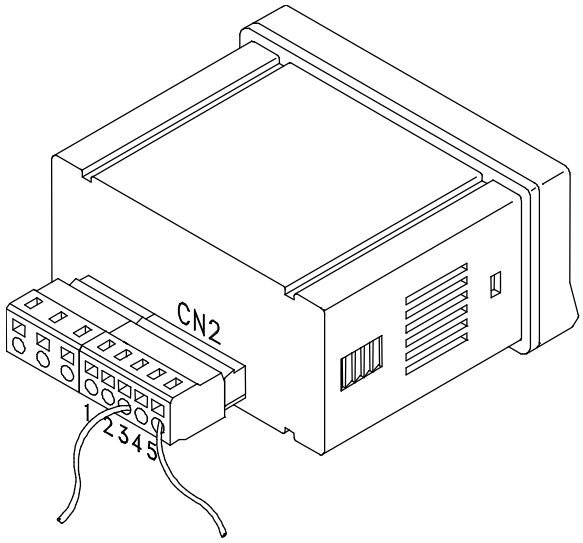
1./ Sensor type switch settings
Before connecting the input signal to the instrument, set the 5-position DIP-switch SW1 (see figure) according to the sensor type as indicated in the table below.
To make changes remove the instrument from the case as shown in figure 9.1.

SW1	1	2	3	4	5
Magnetic pickup	off	off	on	off	off
NAMUR sensor	on	off	on	on	off
NPN type sensor	on	on	off	off	off
PNP type sensor	on	off	off	on	off
TTL/ 24V (encoder) *	on	off	off	off	on
Contact closure	on	on	on	off	on
Voltage up 600 V AC	off	off	off	off	off

* Factory setup

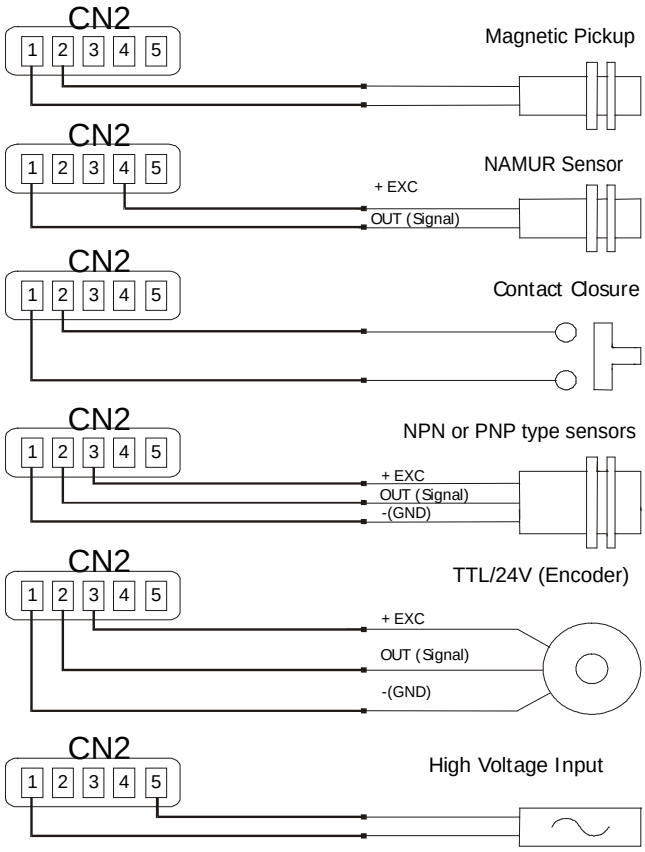
Fig. 13.1. Main circuit, component side

2./ Signal connections.
Consult wiring advisements given in page 10.



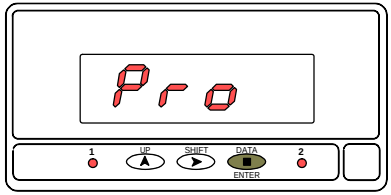
INPUT SIGNAL CONNECTION (CN2)
PIN 1 = -IN [common (-)]
PIN 2 = +IN [LOW]
PIN 3 = +EXC [24V DC (+)]
PIN 4 = +EXC [8V DC (+)]
PIN 5 = IN [HIGH, 10-600V AC]

3./ Sensor wiring schematics.
Consult wiring advisements given in page 10.



ACCESS TO THE PROGRAMMING MODE

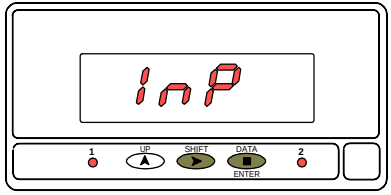
[15.1] Programming mode



Connect the instrument to the main supply, it automatically enters in a self-test routine which briefly illuminates all segments and LED's then shows the software version and finally goes to the normal reading ("RUN" mode).
Press ENTER to acceed the programming mode.
The display shows the indication given in fig. 15.1. The LED's 1 and 2 will flash during the programming mode (except when programming the setpoints).
Press ENTER to have access to the programming parameters.

2.5 - INPUT CONFIGURATION

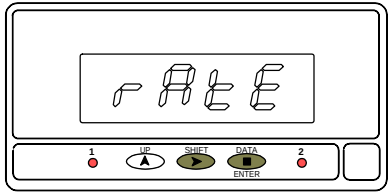
[15.2] Input Module



Press ENTER to get access to the input configuration module (fig. 15.2).

Other modules (dSP = display, and, if option installed, SEt = setpoints) are selected by pressing the ▶ key.

[15.3] Input type



The display presents the previously selected input type : **tAC** = tachometer for RPM or **rAtE** = rate meter.
To change this parameter, press ▶ to switch to the desired option and press ENTER to save the choice in the memory and automatically return to the run mode (indication **Stor**).

2.6 - DISPLAY CONFIGURATION

The display configuration depends on the input type selected in the input module.

- As RATE METER, the display module includes programming of the input frequency with decimal point and the desired display with decimal point. The display/frequency ratio may be set for direct or reverse operation.
- As RPM METER, the only parameter necessary to configure the display is the number of pulses per revolution that delivers the sensor. Programming is completed with the display resolution.

To adjust the display to the particular system characteristics, the display module includes the parameters sampling time and limit time, which are accessible by holding the "ENTER" key for 3 seconds before exiting from the program routines.

2.6.1 RATE METER PROGRAMMING

INPUT FREQUENCY (INP1)

The "INP1" parameter refers to the input frequency generated by the transducer. This frequency must be within the specified limits (0.1Hz to 7KHz) and can be programmed with two, one or no decimal places.

DESIRED DISPLAY (DSP1)

The "DSP1" parameter is the desired display readout corresponding to the frequncy programmed in the "INP" phase. The decimal point can be located in any of the digits of the display.

The display variation can be directly proportional to the input variation (increasing frequency $\rightarrow$ increasing display) or inversely proportional (increasing frequency $\rightarrow$ decreasing display and vice-versa).
The first menu step allows to select one of these modes (dir = direct, inv = reverse).

EXAMPLE
It is desired to measure the rate in m/s of a conveyor belt which is driven by a turning shaft of 20 cms diameter and 300 rpm that gives 4 pulses per revolutiion.

In 1 second, the shaft gives 20 pulses (300 rpm = 5 revolutions per second and 1 revolution = 4 pulses). The input frequency is then 20Hz. At such frequency, the rate of the conveyor belt is :

$$rpm \times \pi \times d = 300 \times \pi \times 20 = 18849.6 \text{ cm/min} = 3.142 \text{ m/s}$$

The INP1 and DSP1 parameters must be : INP1 = 20, DSP1 = 3.142.

The display mode must be selected for direct variation with respect to the input frequency (**dIr** option).

With the setting of "INP1" and "DSP1", the instrument should be able to operate correctly. Notwithstand, depending on the system characteristics, it may be necessary to modify the internal measurement times.
After programming the "DSP1" parameter with decimal point, a push of ENTER of approx. 3s provides access to set the numerical values of sampling and limit times.

SAMPLING TIME (TIME)

With irregular input signals, the display may present fluttering or unwanted variations due that the number of input cycles detected at each reading are not equal.

The "TIME" parameter allows stretching the measurement interval while making an average of the readings taken along the programmed time. This reduces possible display jittering.
The sampling time is programmable from 0.0 to 9.9 seconds. A value of 0.0 means that no average will be made. It is set at the factory to 1 second.

To help stabilizing the display in case of irregular input signals it is recommended to increment this parameter, taking into account that the display readout will be update at the programmed time.
The sampling time can be reduced, if the input signal is stable at the operating frequency, to increment the display update rate.

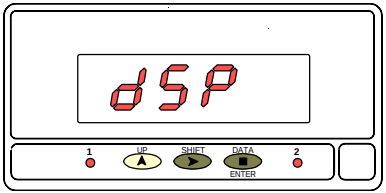
LIMIT TIME (LIM)

The limit time, programmable from 1 to 10 seconds, is applied in order to limitate the waiting time for at least 1 pulse is produced at the input before considering it to be zero.
The limit time is initialized at the reception of each input pulse. If no pulse is detected before completion of the programmed time, the display goes to zero.
The instrument is shipped from the factory with a limit time of 10 seconds.

Decreasing the limit time makes the instrument be able to respond more quickly to the zero condition when the system stops but this reduction leads to an increment of the minimum displayable reading before the display goes to zero.

For example suppose that the desired readout for an input frequency of 1KHz is 1000 lit/s.
With a limit time of 10s, the minimum frequency is 0.1Hz and the display readout at this frequency is 0.1 lit/s. Since this value would not be readable in a display of 1000 counts, the limit time could be reduced to 1s, so the minimum frequency will be 1Hz and the minimum readout before displaying zero will be 1 lit/s.

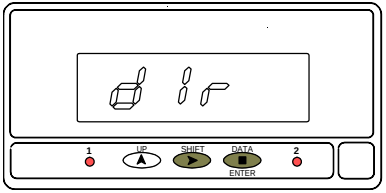
[18.1] Display module



From the Pro stage (see fig. 15.1), press ENTER to get access to the different configuration modules (InP = input, dSP = display, and, if option installed, SEt = setpoints). Select the display module by a press of ▶ (the indication given in figure 18.1 appears on the display).

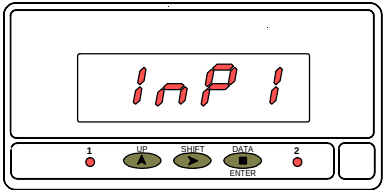
Press ENTER to enter this module.

[18.2] Display mode



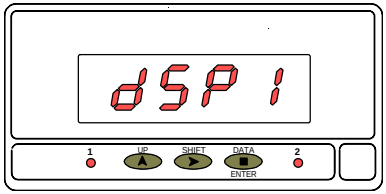
The first menu parameter allows selection between two display modes.
The direct mode must be selected when the display readout and the input frequency are to be in a direct proportion, that is, the display goes high as the frequency grows.
The reverse mode should be selected when reading variables that are inversely proportional to the input frequency.
Press ▶ to change the previously selected option if desired (**dir** = direct mode, **inv** = reverse mode) and press ENTER to validate the choice and advance to the next programming phase.

[18.3] Input frequency



The indication shown in figure 18.3 is viewed for 2s before passing to the input frequency programming phase. After 2s or by a press of ENTER, the display shows any numerical value (depending on previous setting) with the first digit in flash.
If desired to modify this value, press ▲ to vary the flashing digit from 0 to 9, and the ▶ key to advance to the next digit to be modified. Repeat these operations until the display reads the required value and press ENTER to save the entry in the memory; the decimal point goes in flash. Press repeatedly the ▶ key to move the decimal point to the desired position if required.
Press ENTER to save changes and go to the next programming phase.

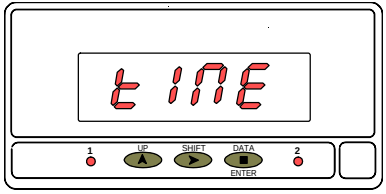
[19.1] Desired display



After programming the input frequency, a press of "ENTER" provides access to program the desired display for this frequency. The indication given by figure 19.1 is shown for 2s before giving access to set the numerical value. Proceed as in section 18.3. (▲ increments digit value, ▶ changes digit) until the display registers the desired value. Press ENTER to make the decimal point flash and use ▶ to move it to the desired location. Finally press ENTER to save and go to the run mode.

To have access to the programming of the sampling and limit times (see page 17), hold down the ENTER key for 3 seconds, at the end of which the indication shown on next figure appears on the display.

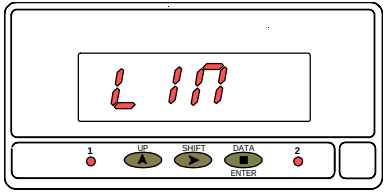
[19.2] Sampling time



The sampling time (two digits with a decimal place, see page 17) is present on the display after the symbol shown in figure 19.2.

Use the ▲ and ▶ procedure to modify the initially programmed value (from 0.1 to 9.9 seconds). Press ENTER to validate the entry and pass to the limit time programming phase.

[19.3] Limit time



A press of "ENTER" made at previous step makes the display show the symbol corresponding to the limit time program step (see figure 19.3) followed, after 2s by the previously programmed numerical value with the first of its two digits in flash.

Use the ▲ and ▶ procedure to modify the initially programmed value (from 1 to 10 seconds). Press ENTER to validate the entry and automatically return to the normal operation.

2.6.2 RPM TACHOMETER PROGRAMMING

PULSES PER REVOLUTION (PPR)

The "PPr" parameter is the number of pulses given by a complete revolution of the sensor connected to the instrument's input.. It is programmable from 1 to 9999.

RESOLUTION (DCP)

The "dCP" parameter allows setting the display resolution to units (without decimal point) or to tenths (with one decimal place).

EXAMPLE
It is desired to display the rate of a turning shaft that delivers 50 pulses per each revolution.

As the only necessary parameter, the "PPr" (pulses per revolution) must be programmed to 50. The "dCP" parameter should be set to the desired resolution according to the max. reading.
With the setting of "PPr" and "dCP" the instrument should be able to operate correctly, notwithstand, depending on sensor characteristics, it may be necessary to adjust the internal sampling and limit times.
After programming "dCP", a push of "ENTER" of 3s gives access to program these parameters.

SAMPLING TIME (TIME)

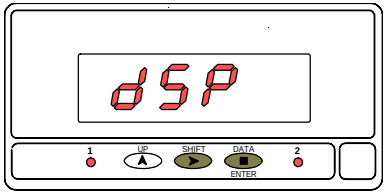
With irregular input signals, the display may present fluttering or unwanted variations due that the number of input cycles detected at each reading are not equal.
The "TIME" parameter allows stretching the measurement interval while making an average of the readings taken along the programmed time. This reduces possible display jittering.
The sampling time is programmable from 0.0 to 9.9 seconds.
A value of 0.0 means that no average will be made. It is set at the factory to 1 second.

LIMIT TIME (LIM)

The limit time, programmable from 1 to 10 seconds, is applied in order to limitate the waiting time for at least 1 pulse is produced at the input before considering it to be zero.
The limit time is initialized at the reception of each input pulse. If no pulse is detected before completion of the programmed time, the display goes to zero.
The instrument is shipped from the factory with a limit time of 10 seconds.
Decreasing the limit time makes the instrument be able to respond more quickly to the zero condition when the system stops but this reduction leads to an increment of the minimum displayable reading before the display goes to zero.

TACHOMETER CONFIGURATION (RPM)

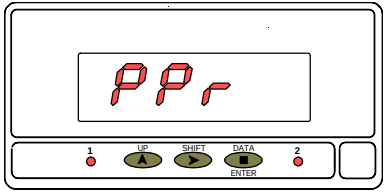
[21.1] Display module



From the Pro stage (see fig. 15.1), press ENTER to get access to the different configuration modules (InP = input, dSP = display, and, if option installed, SEt = setpoints). Select the display module by a press of ▶ (the indication given in figure 21.1 appears on the display).

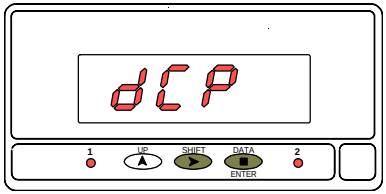
Press ENTER to enter this module.

[21.2] Pulses per revolution



The indication shown in figure 21.2 is viewed for 2s before entering in the programming phase for the number of pulses per revolution (**PPr**). This value can be set from 1 to 9999 ppr. After 2s or by a press ENTER, the numerical value appears on the display with the first digit in flash. To modify this value, press ▲ to increment the flashing digit until it takes desired value and press ▶ to pass to the next digit to be modified. Repeat these operations until desired value is completed on the display and press ENTER to go to the next programming phase.

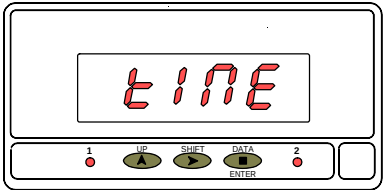
[22.1] Resolution



A press of "ENTER" made at previous step gives access to set the resolution of the display, after the 2s flag indication shown in figure 22.1 (**dCP**). Available options are **"1"** = reading without decimal point and **"0.1"** = reading with one decimal place. Press ▶ if wanted to change the option present on the display. Press ENTER to save the entry and return to the run mode.

To have access to the programming of the sampling and limit times (see page 20), hold down the ENTER key for 3 seconds, at the end of which the indication shown on next figure appears on the display.

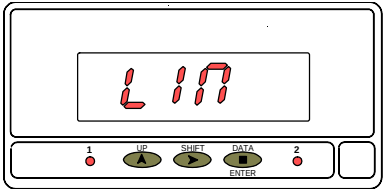
[22.2] Sampling time



The sampling time (two digits with a decimal place, see page 20) is present on the display after the symbol shown in figure 22.2.

Use the ▲ and ▶ procedure to modify the initially programmed value (from 0.1 to 9.9 seconds). Press ENTER to validate the entry and pass to the limit time programming phase.

[22.3] Limit time



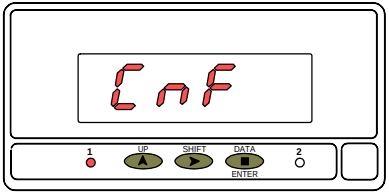
A press of "ENTER" made at previous step makes the display show the symbol corresponding to the limit time program step (see figure 22.3) followed, after 2s by the previously programmed numerical value with the first of its two digits in flash.

Use the ▲ and ▶ procedure to modify the initially programmed value (from 1 to 10 seconds). Press ENTER to validate the entry and automatically return to the normal operation.

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

If a two relay option is installed (see page 23) the instrument will allow to enter on the following routines: activation mode, delay or hysteresis and setpoint program lockout.From the **Pro** stage (see fig. 15.1), press the ▶ key to acceed to the setpoint configuration module, indication "**SET**".The setpoint numerical values, from the run mode press ENTER to recall the **Pro** stage and press ▲ to acced the first setpoint value.

[23.1] Setpoint 1 Configuration



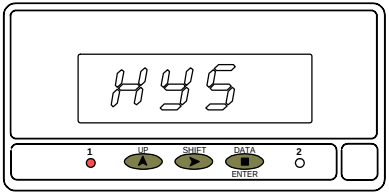
LEFT DIGIT VALUE	RIGHT DIGIT VALUE
MODE HI=0 MODE LO=1	DELAY=0 HYSTERESIS=1

The indication shown in figure 23.1 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.

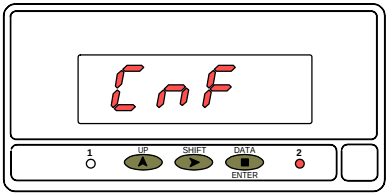
Press ENTER to validate selections and advance to the next phase.

[23.2] 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 time delay or hysteresis magnitude programming (**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 flashing. To program the desired value (from 0 to 9999 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.

[24.1] Setpoint 2 Configuration



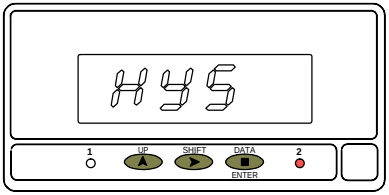
LEFT DIGIT VALUE	RIGHT DIGIT VALUE
MODE HI=0 MODE LO=1	DELAY=0 HYSTERESIS=1

The indication shown in figure 24.1 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 on 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 20.1. Use the ▲ key to change the active digit value (in flashing) and the ▶ key to go to the next digit to be modified.

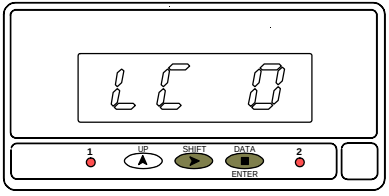
Press ENTER to validate changes and advance to the next phase.

[24.2] SET2 Histeresis/Delay



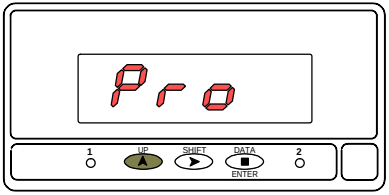
The display shows for 2 seconds the indication corresponding to the selected delay units before giving access of the time delay or hysteresis magnitude programming (**dLY**) or (**HYS**). After 2 seconds or by a press ENTER, the initially programmed numerical value appears on the display with the first digit in flashing. To change the value (from 0 to 9999 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.

[24.3] Setpoint Program lockout



The figure 24.3 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 18).
Press ENTER to validate the choice, save programmed data and return to the run mode (indication **Stor**).

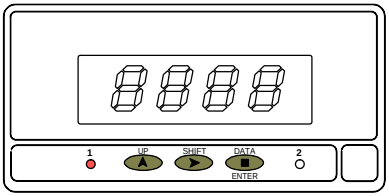
[25.1] Setpoints Programming



To program the setpoint values, press ENTER to acceed the programming mode (indication **Pro**, figure 25.1) 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.

[25.2] Setpoint 1

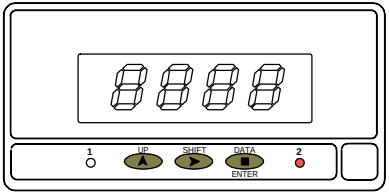


Program setpoint 1 value, LED 1 activated.

The initially programmed value appears on the display with the first digit flashing. 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.

[25.3] 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.

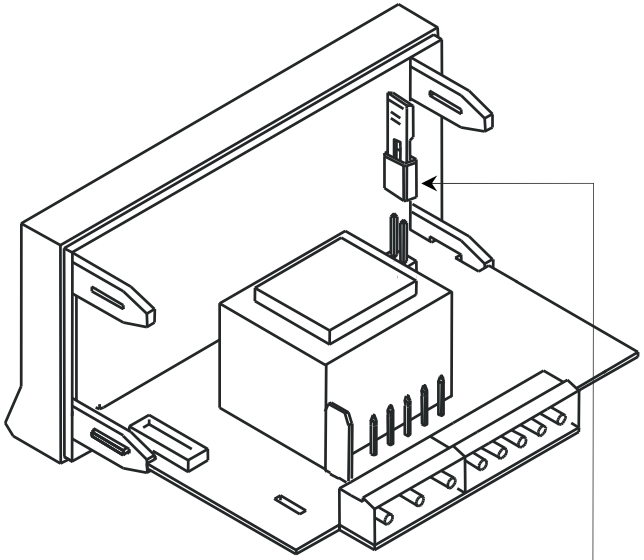
2.8 – Programming lockout

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**.



3. RELAY OUTPUT OPTION

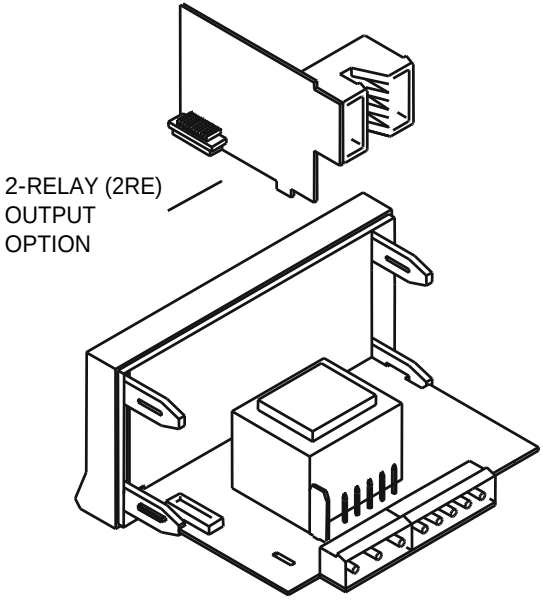
As an option, the Jr/Jr20-TAC models can be equipped with the following output option:

• 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-TAC manual.

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



4. TECHNICAL SPECIFICATIONS

INPUT

- Max. Frequency ..... 7 KHz
- Min. frequency..... 0.1 Hz
- Excitation ..... 8V @ 20mA or 22V ±5 @ 20mA

High voltage input

- Input range .....10 to 600 V AC

Magnetic pickup

- Sensitivity.....Vin (AC) > 120 mV eff.

NAMUR sensor

- Rc ..... 1 KΩ (incorporated)
- Ion..... < 1 mA DC
- Ioff..... > 3 mA DC

NPN and PNP type sensors

- Rc ..... 1 KΩ (incorporated)
- Logic levels....."0" < 2.4 V DC, "1" > 2.6 V DC

TTL/24V DC (encoder)

- Logic levels....."0" < 2.4 V DC, "1" > 2.6 V DC

Contact closure

- Vc .....5 V
- Rc .....3.9 KΩ (incorporated)
- Fc.....100 Hz

ACCURACY

- Max. error ..... ± (0.01% of the reading +1 digits)
- 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 16 V), 24V (21 to 32 V), 48V (42 to 64V)
- Consumption .....3 W

FUSES (DIN 41661) - (Recommended)

- JR/ JR20-TAC (230/115V AC)..... F 0.1A / 250 V
- JR/ JR20-TAC2 (24/48V AC)..... F 0.2A / 250 V
- JR/ JR20-TAC3 (12 V DC) ..... F 1A / 250 V
- JR/ JR20-TAC4 (24 V DC) ..... F 0.5A / 250 V
- JR/ JR20-TAC5 (48 V DC) ..... F 0.5A / 250 V

DISPLAY

- Type.....9999, 7-segment red LED
- Junior-TAC..... 4 digits, 14mm high
- Junior20-TAC ..... 4 digits, 20mm high
- Decimal point..... programmable
- LED's.....2, setpoint status
- Over-range indication .....OvE

ENVIRONMENTAL

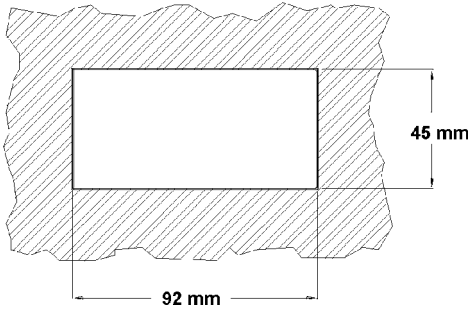
- Indoor use
- Operating temp..... -10 ºC to +60 ºC
- Storage temperature ..... -25 ºC to +85 ºC
- Relative humidity (non condensing).....<95 % at 40 ºC
- Max. altitude..... 2000m

DIMENSIONS

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

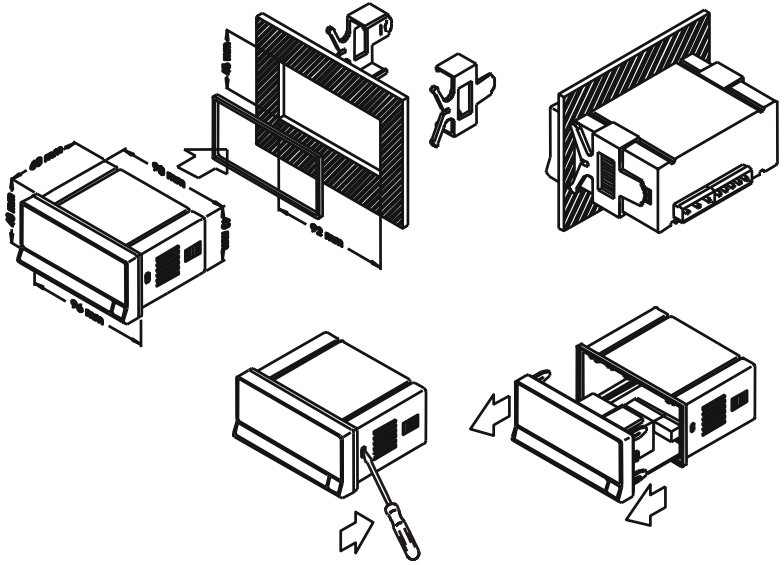
4.1 - Dimensions and mounting

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 you have received with the instrument or visit our website:
http://www.ditel.es/warranty

6 - 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 meter

Model : JUNIOR-TAC and JUNIOR20-TAC

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

Date: 1 February 2000
Signed: José M. Edo
Charge: 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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