MODEL · P4P
PROCESS AND TEMPERATURE

4/20mA Process | 0/10Vdc Process | Pt Temperature | tc Temperature | NTC Temperature | Resistances

Miniature panel meter for process and temperature signals, for industrial applications

Panel meter for process and temperature signals, in a miniature 48x24mm housing size. Accepts a wide range of process and temperature signals including 4/20mA, 0/10Vdc, resistances, Pt100, Pt500, Pt1000, thermocouples J, K, E, R and S, NTC sensors from 44004 to 44008 and from 44030 to 44034, and a configurable NTC range with configurable R_{25} and ß parameters.

Includes 1 alarm controlling a transistor output and a front led. Powered 24Vdc, isolated.

Two configuration modes: (1) easy and fast using predefined configuration codes, and (2) advanced configuration trough the '*configuration menu*' to customize input signal ranges and scaled reading. Configuration through push-button keypad accessible behind the front filter. '*Password*' function to block non-authorized access to configuration menu. Designed for industrial use, with potential integration into a wide range of applications, excellent quality and optional customization.

1. TECHNICAL SPECIFICATIONS

DISPLAY	
digits	4 digits
digit color	red color
digit type	7 segment led
digit height	10mm
max. / min. reading	9999 / -1999
decimal point positions	x.x.x.x
display refresh	3 refresh / second
INPUT SIGNAL RANGES	
process	4/20 mA, 0/10 Vdc
thermocouples	J, K, E, R and S (conforming to ITS-90)
'Pt' sensors	Pt100 (2 and 3 wires), Pt500, Pt1000 (2 wires)
'NTC' sensors	44004 to 44008, 44030 to 44034, R_{25} and ß
resistances	ranges from 0/1 KOhm up to 0/1 MOhm
ACCURACY AT 25 ºC	
	see for each type of signal at section 10
THERMAL DRIFT	
process mA, Vdc	±100 ppm/ºC (F.S.)
thermocouples, Pt	±150 ppm/ºC (F.S.)
resistances	±0.4 %/ºC (F.S.)
thermocouple CJC	±0.05 ºC/ºC
STEP RESPONSE	
Typical response values to reach 99% of the reading value, as a response to a 100% step at the signal input. Indicated values are typical values, as tasks performed in parallel with the acquisition can affect the response time.	
mA, Vdc	<0.8 seconds
Pt100	<1.0 seconds
thermocouple	<2.5 seconds
Ntc, resistances	<0.8 seconds
OUTPUT	
type	transistor
configuration	open collector
max. voltage on terminals	30 Vdc
max. current through terminals	30 mA

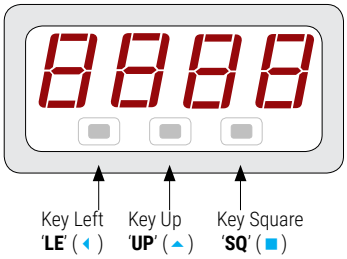
2. HOW TO ORDER

P4P	Process and temperature miniature meter

CONFIGURATION SYSTEM	
push buttons	accessible at the front of the instrument, behind the front filter
configuration	'*configuration menu*' and '*predefined codes*'
POWER SUPPLY	
voltage range	24Vdc ±10%
consumption	<1.0W
power wires	0.13mm² to 1.3mm² (AWG26 to AWG16)
overvoltage category	II
ISOLATION	
power	1000Vdc
input Vs output	500Vdc
ENVIRONMENTAL	
IP protection	IP40
impact protection	IK06
operation temperature	from 0 to +50 ºC
storage temperature	from -20 to +70 ºC
'warm-up' time	15 minutes
relative humidity	0 to 95% non condensing
altitude	up to 2000 meters
MECHANICAL	
front size	48x24mm
mounting	panel mount
panel cut-out	45 x 22.2 mm
connections	plug-in screw terminal (pitch 3.81 mm)
housing material	polyamide V0
front filter material	polycarbonate
weight	<100 grams
total deep	71mm
deep from panel	66mm (including terminal)
packaging	95x85x43mm, cardboard

3. CONFIGURATION SYSTEM

The instrument allows for 2 configuration modes: (1) easy and fast using predefined configuration codes, and (2) advanced configuration through the '*configuration menu*'. Configuration is applied through the 3 push buttons accessible behind the front filter.



4. FUNCTIONS INCLUDED

'**Alarms**' . . . . . one alarm that controls a front led and a transistor output. Configurable as maximum or minimum alarm, with single and double set points, hysteresis, activation and deactivation delays.

'**Scaling**' . . . . . input and reading scaling available to customize the input and the desired reading to process units.

'**Field correction**' . . . . . automatic field correction, to easily compensate for offsets and signal variations, on the field.

'**Temperature**' functions read in ºC or ºF, with resolution of 1º or 0.1º. Automatic or manual CJC compensation. Configure for 'alpha' 385 or 390.

'**Display**' functions. . . . . configure manual offset to add to the reading. Configure minimum changes in steps, averaging filter and dead band to remove noises close to '0' signal value. Configure the brightness.

'**Tools**' functions . . . . . configure the behavior of the transistor output when '*on error*' and when accessing the '*configuration menu*', configurable delay when 'on power-up', and password.

5. CONNECTIONS: INPUT, POWER AND OUTPUT

Table 1 | **Input signal connections**

	Input terminals			
Input signal	3	4	5	6
4/20 mA (active loop)	mA+ (out)			mA- (in)
0/10 Vdc	common			+Vdc
Thermocouples	tc-	tc+		
Ntc	ntc-		ntc+	
Pt100 (3 wires)	pt100-	pt100- (3rd wire)	pt100+	
Pt100 (2 wires)	pt100-	short to terminal 3	pt100+	
Pt500, Pt1000	pt-		pt+	
Resistances	res-		res+	

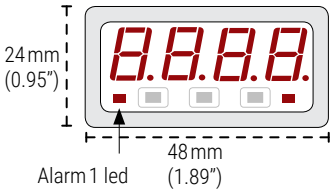
Table 2 | **Power connections**

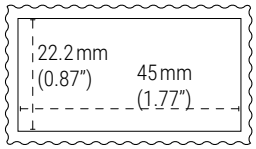
	Power terminals	
Power	1	2
24 Vdc	- (0 Vdc)	+ (24 Vdc)
Install power fuse : 400mA time-lag fuse		

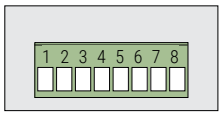
Table 3 | **Transistor output connections**

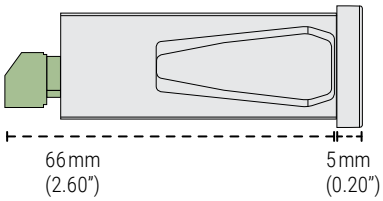
	Output terminals	
Output	7	8
Transistor	collector	emitter

6. DIMENSIONS









7. PRECONFIGURED SIGNAL RANGES AND TYPICAL APPLICATIONS

The instrument has 2 different configuration modes: (1)easy and fast using predefined configuration codes, and (2)advanced configuration through the '*configuration menu*'.

The tables below provide a list of preconfigured input signal ranges, together with technical specifications for each range, and the associated preconfiguration codes.

Custom configurations

The '*configuration menu*' allows to configure custom scales for both the input and the reading. For additional information see the '*User's Manual*' (see section 8).

Typical applications

- pressure transducers that provide 4/20 mA signals.
- measurement of temperature with direct connection to specific NTC probes or use the range with beta and R25 configurable values.
- measurement of temperature with direct connection to Pt100 probes, 2 and 3 wires, Pt500 and Pt1000 probes.
- measurement of temperature with direct connection to a wide range of thermocouple types. Cold junction compensation can be disabled to work with electronic thermocouple simulators.
- measurement of resistance values.

INPUT and READING are fully configurable through the configuration menu (see the *User's Manual* at section 8).

Table 4 | **Input signal ranges for process signals**

Input range	Configuration code	Default reading	Accuracy (%FS)	Max. oversignal	Zin
4/20 mA	010	0.0/100.0	<0.15 %	1 Adc	V*<1 V
0/10 Vdc	011	0.0/100.0	<0.15%	50 Vdc	2 MOhm

** Voltage drop on terminals <1 Vdc.*

Table 5 | **Input signal ranges for NTC sensors**

Sensor	Configuration code	Default reading °C	Default reading °F	Total error
Ntc 44004	030	-80.0 / 120.0 °C	-112.0 / 248.0 °F	<1.0º
Ntc 44005	031	-80.0 / 120.0 °C	-112.0 / 248.0 °F	<1.0º
Ntc 44006	032	-70.0 / 120.0 °C	-94.0 / 248.0 °F	<0.8º
Ntc 44007	033	-80.0 / 120.0 °C	-112.0 / 248.0 °F	<1.0º
Ntc 44008	034	-40.0 / 120.0 °C	-40.0 / 248.0 °F	<0.8º
Ntc 44030	035	-80.0 / 75.0 °C	-112.0 / 167.0 °F	<0.8º
Ntc 44031	036	-70.0 / 75.0 °C	-94.0 / 167.0 °F	<0.8º
Ntc 44032	037	-40.0 / 75.0 °C	-40.0 / 167.0 °F	<0.8º
Ntc 44033	038	-80.0 / 75.0 °C	-112.0 / 167.0 °F	<1.0º
Ntc 44034	039	-80.0 / 75.0 °C	-112.0 / 167.0 °F	<0.8º
Ntc (R_{25}=10K,β=3500)	040	-50.0 / 90.0 °C	-58.0 / 194.0 °F	<1.0º

Table 6 | **Input signal ranges for resistances**

Input range	Configuration code	Default reading	Accuracy (%FS)	Current on resistance	Max. overvoltage
0/1 KOhm	045	0/1.000	<0.7 %	167 uA	3 Vdc
0/10 KOhm	046	0/10.00	<0.7 %	45 uA	3 Vdc
0/100 KOhm	047	0/100.0	<0.7 %	4.5 uA	3 Vdc
0/1 MOhm	048	0/1.000	<2.5 %	1 uA	3 Vdc

Table 7 | **Temperature ranges for Pt100, Pt500 and Pt1000**

Sensor	Configuration code	Default reading °C	Default reading °F	Total error
Pt100	015	-200.0/850.0 °C	-328/1562 °F	<1.5º (up to 200º) <3.0º (up to 850º)
Pt500	016	-200.0/630.0 °C	-328/1166 °F	<1.5º (up to 400º) <3.0º (up to 630º)
Pt1000	017	-200.0/630.0 °C	-328/1166 °F	<1.5º (up to 300º) <5.0º (up to 630º)

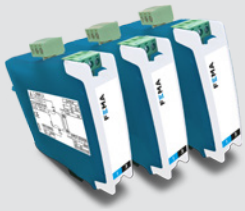
Table 8 | **Temperature ranges for thermocouples**

Sensor	Configuration code	Default reading °C	Default reading °F	Total error
Tc. J	020	-200/1200 °C	-328/2192 °F	<1.5º (>0º) <6.0º (<0º)
Tc. K	021	-200/1372 °C	-328/2501 °F	<3.0º (>0º) <7.0º (<0º)
Tc. E	022	-200/1000 °C	-328/1832 °F	<1.5º (<800º) <4.0º (<1000º)
Tc. R	023	-50/1768 °C	-58/3214 °F	<3.0º (>700º) <4.0º (<700º)
Tc. S	024	-50/1768 °C	-58/3214 °F	<3.0º (>350º) <4.0º (<350º)

8. ADDITIONAL DOCUMENTATION

User's manual	www.fema.es/docs/5895_P4P_manual_en.pdf
Datasheet	www.fema.es/docs/5897_P4P_datasheet_en.pdf
Quick installation guide	www.fema.es/docs/5899_P4P_installation_en.pdf
Web	www.fema.es/docs/Series_P4

9. OTHER PRODUCTS



SERIES I3
Section **OEM**

output signal . . . . . 4/20 mA, 0/10 Vdc
configuration . . . . . by codes (inside)
isolation . . . . . 3 ways

SERIES I4
FULLY CONFIGURABLE

output signal . . . . . 4/20 mA, 0/10 Vdc, ...
configuration . . . . . menu (front keypad)
isolation . . . . . 3 ways

SERIES I5
FIELD BUS

output signal . . . . . Modbus RTU, CANbus, ...
configuration . . . . . by menu (front keypad)
isolation . . . . . 3 ways

SERIES B
LARGE FORMAT DISPLAYS

digit . . . . . 60 and 100 mm
reading . . . . . 25 and 50 meters
mounting . . . . . wall, panel, hanging
housing . . . . . metallic, IP65

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