FEMA ELECTRÓNICA

| Series C

MANUFACTURING FOR INDUSTRIAL AUTOMATION
PANEL METERS . SIGNAL CONVERTERS . LARGE DISPLAYS

C40-D multisignal panel meter

Vac/Aac
Vdc/Adc
°C °F
Process
Resistance
Hz

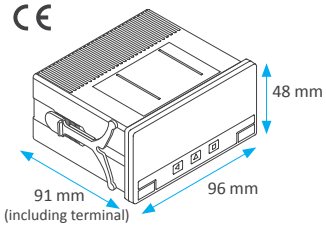
Multisignal digital panel meter, configurable to work as AC and DC voltmeter (up to 600 V), AC and DC ammeter (up to 5 A), process signals (mA and Vdc) with and without excitation voltage, thermocouples K, J, E, N, L, R, S, B, T and C, temperature probes Pt100 with 2 and 3 wires, Pt500, Pt1000, Ni100, Ni200, Ni1000, PTC and NTC, resistances, potentiometers and frequency. AC measures in True RMS. Standard 96 x 48 mm (1/8 DIN) size. Scalable reading with 4 digits (9999 to -1999) and configurable decimal point. 'Fast access' function to alarm setpoints, external contact for special functions, 'Eco' mode for reduced consumption, 5 brightness levels. Single universal power supply 18 to 265 Vac/dc. Optional relays, analog output and Modbus RTU serial communications. Recommended for OEM applications.

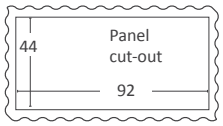
Technical specifications

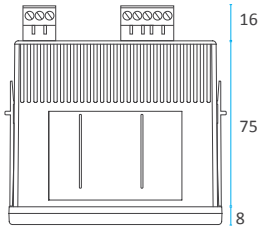
Digits	4
Reading	9999 / -1999
Decimal point	configurable
Led color	red
Digit height	14 mm
Accepted signal ranges	*see tables at page 3 for more information*
• AC voltages and AC currents	~600 Vac, ~200 Vac, ~20 Vac, ~2 Vac ~200 mVac, ~60 mVac, ~5 Aac, ~20 mAac (True RMS measure) (accepts phase-neutral and phase-phase measure) (frequency up to 150 Hz)
• DC voltages and DC currents	±600 Vdc, ±200 Vdc, ±20 Vdc, ±2 Vdc ±200 mVdc, ±60 mVdc, ±5 Adc, ±20 mAdc
• thermocouples	K, J, E, N, L, R, S, B, T and C (automatic cold junction compensation)
• resistive 'Pt' probes	Pt100 with 2 and 3 wires, Pt500, Pt1000
• resistive 'Ni' probes	Ni100, Ni200, Ni1000
• resistive NTC probes	*see table at page 3*
• resistive PTC probes	families KTY-121, KTY-210 and KTY-220
• process	4/20 mA, 0/10 Vdc (+15 Vdc excitation voltage configurable at terminal 5)
• frequency	up to 100 Hz (minimum 15 Hz). Vac and Aac ranges.
• resistances	ranges 0/5 K and 0/50 K
• potentiometers	with nominal values from 500 R up to 20 K
Thermal drift offset+span	150 ppm/ºC
Readings	3 readings/ second
Refresh	3 readings/ second
Response time	<300 mSec. (0 % to 99 % of signal)
Power 'U'	18 to 265 Vac/dc (isolated 1500 Veff @60 seconds)

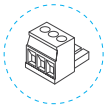
Dimensions (mm)

CE









Detail of the plug-in screw terminal. Both male and female terminals are included.

Output and control options	1 or 2 relays 1 analog output 4/20 mA isolated 1 Modbus RTU isolated serial output
Protection	IP50 standard (optional IP65)
Consumption (normal mode)	<1.0 W (meter only) <2.5 W (meter with options)
Consumption ('Eco' mode)	<0.3 W (meter only) <1.5 W (meter with options)
Connections	plug-in screw terminals
Weight	<150 grams
Temperature of operation	0 to 50 ºC

How to order

Series	Model	Power	Option 1	Option 2	Others	Customization
C40	D	U				

- Power: -U *(18-265 Vac/dc)*
- Option 1: -A1 *(1 relay)*; -M1 *(analog output)*; -S1 *(Modbus RTU)*; *-(empty)*
- Option 2: -A2 *(1 relay)*; *-(empty)*
- Others: -NBT *(no front keypad)*; -65 *(front IP65)*; *-(empty)*
- Customization: -XXXX *(customized execution)*; *-(empty)*

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Additional documentation

User's manual C40-D	www.fema.es/docs/4149_C40-D_manual_en.pdf
Datasheet C40-D	www.fema.es/docs/4148_C40-D_datasheet_en.pdf
Quick installation guide C40-D	www.fema.es/docs/4150_C40-D_installation_en.pdf
CE declaration of conformity	www.fema.es/docs/4152_CE-Declaration_C40-D_en.pdf
Warranty	www.fema.es/docs/4153_Warranty1_en.pdf

Functions included

'**Fast access**' menu ..... press the 'UP' ('▲') front key to access and modify the alarm setpoints, and / or the maximum and minimum memory. Configurable menu.

'**External control**' function... external contact at multifunctional terminal 5, configurable for : 'second scaling', decimal point change, 'hold' the reading, tare function, activate the maximum or minimum memory.

'**Eco**' mode..... automatic turn off of the display leds, to reduce the consumption of the instrument when the operator is not using it.

Alarms ..... 1 or 2 alarms, independent, configurable as maximum or minimum, with setpoint and hysteresis.

Reading offset ..... this function allows to configure a fixed number of counts to be added to the reading.

'**Second scaling**' function.... define two scalings for the same signal and control which one is active with the '**External control**' option.

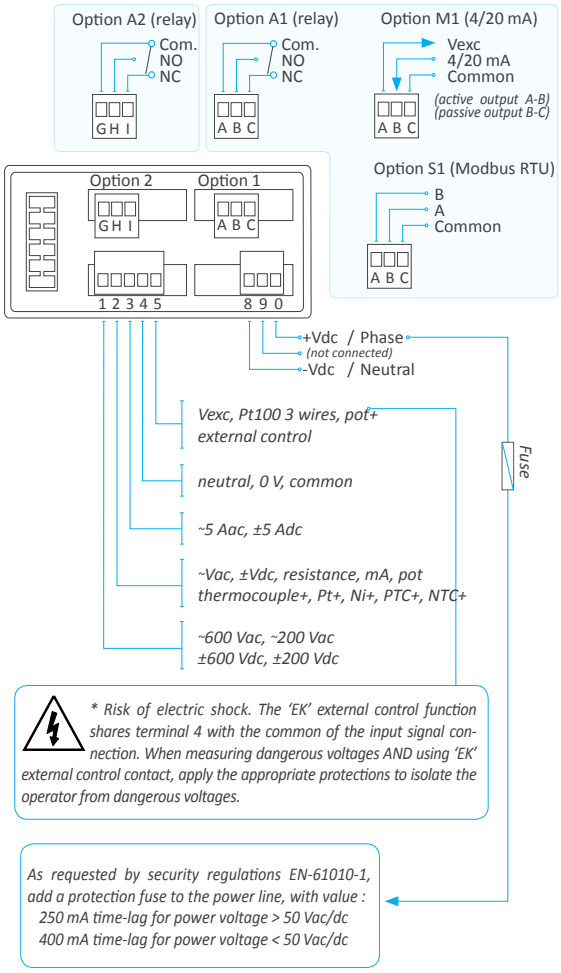
Display filters..... recursive filter for noisy signals and configurable steps for minimum predefined changes on the reading.

Output and control options .. optional 1 or 2 relay outputs, 1 analog 4/20 mA isolated output, 1 Modbus RTU isolated serial output.

Brightness ..... configurable 5 levels of brightness intensity.

Password ..... blocks the configuration menu.

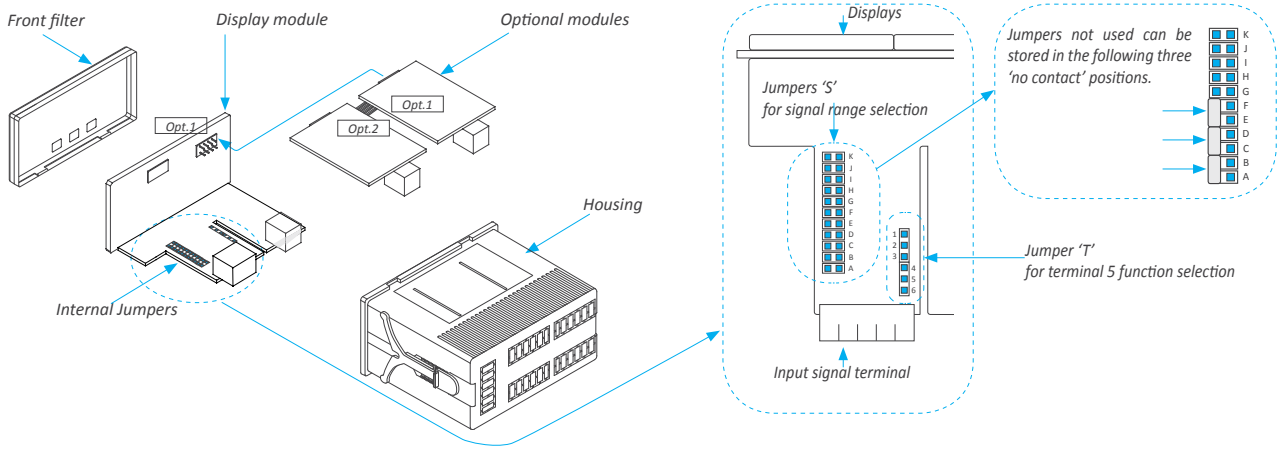
Connections and rear view



* Risk of electric shock. The 'EK' external control function shares terminal 4 with the common of the input signal connection. When measuring dangerous voltages AND using 'EK' external control contact, apply the appropriate protections to isolate the operator from dangerous voltages.

As requested by security regulations EN-61010-1, add a protection fuse to the power line, with value :
250 mA time-lag for power voltage > 50 Vac/dc
400 mA time-lag for power voltage < 50 Vac/dc

Internal structure - Jumpers for input range selection



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Input signal ranges - Technical specifications

Vac ranges (Veff.)	Scale by default	Scalable	Jumpers 'S'	Jumper 'T'	Accuracy (% FS)	Max. oversignal	Z_{in}
~600 Vac*	600	from 9999 to -1999	G I	4-5	<0.30 % (up to 150 Hz)	800 Vac	12 M
~200 Vac	200.0		I			800 Vac	12 M
~20 Vac	20.00		A I			150 Vac	1 M
~2 Vac	2.000		B I			100 Vac	100 K
~200 mVac	200.0		C I			30 Vac	10 K
~60 mVac	60.0		E I			3 Vac	1 M

* measure 300V CAT-III , 600V CAT-II. Measure of frequency available for all ranges.

Vdc ranges	Scale by default	Scalable	Jumpers 'S'	Jumper 'T'	Accuracy (% FS)	Max. oversignal	Z_{in}
±600 Vdc	600	from 9999 to -1999	G	4-5	<0.20 %	800 Vdc	12 M
±200 Vdc	200.0		---			800 Vdc	12 M
±20 Vdc	20.00		A			150 Vdc	1 M
±2 Vdc	2.000		B			100 Vdc	100 K
±200 mVdc	200.0		C			30 Vdc	10 K
±60 mVdc	60.0		E		<0.25 %	3 Vdc	1 M

Aac ranges (Aeff.)	Scale by default	Scalable	Jumpers 'S'	Jumper 'T'	Accuracy (% FS)	Max. oversignal	Z_{in}
~5 Aac	5.00	from 9999 to -1999	I	4-5	<0.50 % (up to 150 Hz)	7 Aac (max. 7 sec.)	20 mOhm
~20 mAac	20.00		D I			25 mAac	4.7 R

Adc ranges	Scale by default	Scalable	Jumpers 'S'	Jumper 'T'	Accuracy (% FS)	Max. oversignal	Z_{in}
±5 Adc	±5.00	from 9999 to -1999	- - -	4-5	<0.25 %	7 Adc (max. 7 sec.)	20 mOhm
±20 mAdc	±20.00		D	4-5	<0.15 %	25 mAdc	4.7 R

Process signals	Scale by default	Scalable	Jumpers 'S'	Jumper 'T'	Accuracy (% FS)	Max. oversignal	Z_{in}
4/20 mA	0/100.0	from 9999 to -1999	D	1-2*	<0.15 %	25 mA	4.7 R
0/10 Vdc	0/100.0		A		<0.20 %	25 Vdc	1 M

* Place jumper 'T' at position 1-2 for +15 Vdc excitation voltage at terminal 5. Optionally, place jumper 'T' at position 4-5 to work with 'external contact' at terminal 5.

NTC probes 'R_{25}'* (configurable)	Jumpers 'S'	Jumper 'T'	Range of measure	Accuracy (% of reading)	Beta* (configurable)
10K	F K	4-5	-60 ºC to 150 ºC	<1.5 % of reading	3500

*'Beta' configurable (2000 to 5500). R25 configurable. Resistance measure from 100R to 1MR.

PTC probes Family	Jumpers 'S'	Jumper 'T'	Range in ºC (in ºF)	Total error
KTY-121	F	4-5	-55 / 150 ºC (-67 / 302 ºF)	<1 º
KTY-210	F H K			
KTY-220	F H K			

Thermocouples	Jumpers 'S'	Jumper 'T'	Range in ºC (in ºF)	Total error (cold junction included)
tc. K	E	4-5	-100 / 1350 ºC (-148 / 2462 ºF)	<3 º
tc. J			-100 / 1200 ºC (-148 / 2192 ºF)	
tc. E			-100 / 1000 ºC (-148 / 1832 ºF)	
tc. N			-100 / 1300 ºC (-148 / 2372 ºF)	
tc. L			-100 / 900 ºC (-148 / 1652 ºF)	
tc. R	E J		0 / 1768 ºC (32 / 3214 ºF)	
tc. S			0 / 1768 ºC (32 / 3214 ºF)	
tc. T			-100 / 400 ºC (-148 / 752 ºF)	
tc. C	E		0 / 2300 ºC (32 / 4172 ºF)	<5 º
tc. B	E J		700 / 1820 ºC (1292 / 3308 ºF)	

Pt and Ni probes	Jumpers 'S'	Jumper 'T'	Range in ºC (in ºF)	Total error	Current at sensor
Pt100 (3 wires)	F H J	5-6	-200 / 700 ºC (-328 / 1292 ºF)	<1º	< 900 uA
Pt100 (2 wires)	F H	4-5	-200 / 700 ºC (-328 / 1292 ºF)		< 900 uA
Pt500	F		-150 / 630 ºC (-238 / 1166 ºF)		< 90 uA
Pt1000	F		-190 / 630 ºC (-310 / 1166 ºF)		< 90 uA
Ni100	F H		-60 / 180 ºC (-76 / 356 ºF)		< 900 uA
Ni200	F H		-60 / 120 ºC (-76 / 248 ºF)		< 900 uA
Ni1000	F		-60 / 180 ºC (-76 / 356 ºF)		< 90 uA

Resistance ranges	Scale by default	Scalable	Jumpers 'S'	Jumper 'T'	Accuracy (% of reading)
0 a 5 K	9.999	from 9999 to -1999	F H K	4-5	<1.5 % of reading
0 a 50 K	99.99		F K		

Potentiometers nominal value	Scale by default	Scalable	Jumpers 'S'	Jumper 'T'	Accuracy (% FS)
500 R to 20 K	0/100.0	from 9999 to -1999	A	2-3	<0.5 %

Frequency signals	Scale by default	Scalable	Jumpers 'S'	Jumper 'T'	Accuracy (% reading)
15 Hz to 100 Hz	0/100.0	from 9999 to -1999	Vac or Aac ranges	4-5	<0.15% of reading

Maximum oversignal is the maximum signal accepted by the instrument. Higher signal values may cause instrument damage. Lower values are not destructive but may be out of accuracy specifications.

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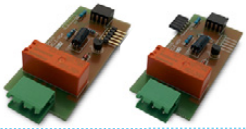
Options and accessories

Relay outputs

Module . . . . . A1 and A2

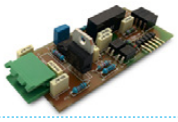
Function. . . . . 1 relay output
3 contacts (NC, NO, Common)
up to 250 Vac @ 8 Ampere



Analog output

Module M1

Function. . . . . 1 analog output isolated
4/20 mA
isolated 1000 Vdc



Modbus RTU output

Module S1

Function. . . . . 1 Modbus RTU output
9.600 bps, 4.800 bps
isolated 1000 Vdc

Benchtop housing

Reference . . . . . THM

DIN rail mount adapter

Reference . . . . . DRA-M

Wall mount housing

Reference . . . . . WME

Option without keypad

Reference . . . . . NBT

Protection IP65

Reference 65

Description . . . . . .O-ring for IP65 front protection

Set of units (included)

Reference Units7

Description . . . . . Set of labels ‘Vdc’, ‘Vac’, ‘Adc’, ‘Aac’, ‘mVdc’, ‘mVac’, ‘mAdc’, ‘mAac’, ‘%’, ‘ºC’, ‘ºF’, ‘ph’, ‘m’, ‘cm’, ‘mm’, ‘bar’, ‘psi’, ‘Pa’, N’, ‘Ω’, ‘KΩ’, ‘W’, ‘kW’, ‘MW’, ‘kV’, ‘kA’, ‘m/min’, ‘rpm’, ‘l’

Included with the instrument.

Option ‘customized’

Customization of standard instruments

- improved technical performances
- custom configurations
- special functions
- ...

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