

Series MAG-35

Panel meters for PROCESS signals in mA

MAG-35-32 for process in 4/20 mA and similar signals
MAG-35-35 for differential 4/20 mA signals

mA



IDEAL SOLUTION to display process signals in 4/20mA and similar with display scaled in engineering units. Also display proportional to the difference between two mA signals. Available options for relay output, analogue output, serial outputs and others. Multiple input signal ranges selectable by internal jumpers.



FEMA ELECTRÓNICA, S.A.

USER'S MANUAL
(HT5793-r011206)

Series MAG-35

Models for PROCESS signals in mA

Panel meters to measure and display process signals in 4/20 mA and other similar signals. Display scalable in engineering units. Also display proportional to the difference between two mA signals. Input signal ranges selectable by internal jumpers and scaling of the display by potentiometers. Includes excitation voltage to power-up transducers from the instrument.

Additional options with relay outputs (1 or 2 relay), analogue outputs (in mA and Vdc), digital outputs in serial code (RS232 or RS485), parallel BCD code, display «Hold» function and power options in AC and DC.



GENERAL SPECIFICATIONS

DISPLAYS	Led 7 Segments Red Color
DIGITHEIGHT	14 mm (0.55")
DISPLAY	±1.8.8.8
POLARITY	Automatic ±
DECIMALPOINTS	Jumper selectable
INPUTCONFIGURATION	Bipolar Simple
A/D CONVERTER	Dual slope
INTEGRATIONTIME	80 mSec.
NUMBER OF READINGS	3.12 per second
WARM-UP TIME	2 minutes
ACCURACY	0.15% ±1 digit
NMRR	50 dB
THERMALDRIFT	100 ppM
TEMPCOZERO	0.13% /°C F.S.
OVERRANGE	+1999 flash
UNDERRANGE	-1999 flash
WORKING TEMP.	0°C to +50°C
STORAGE TEMP.	-40°C to +80°C
BURN-IN	48 hours
RECALIBRATION	Yearly
HOUSING	DIN 43700
DIMENSIONS	96 x 48 x 117 mm
PANELCUT-OUT	44.5 x 92.5 mm
WEIGHT	310 gr.
CONNECTIONS	Plug-in screw clamps
CONSUMPTION	5.5 VA in AC 3.5 W in DC

OUTPUT AND CONTROL OPTIONS

MAG-35 instruments can be supplied with different options for data output and control. Compatibility between them is indicated at the «Ordering Reference» section down on this page. Technical data and operating instructions for these options are indicated in a separate user's manual.

«SP11»	1 Relay Output
«SP21»	2 Relay Output
«SAR»	Analogue Output
«HM»	Hold of display
«MPA2»	Detection of «peak and drop» signals
«SDA»	ParallelBCD
«RS2»	Serial RS232 output
«RS4»	Serial RS485 output

POWER OPTIONS

MAG-35 instruments can be supplied with different power options, for different AC and DC power ranges. The instruments do not have internal protection fuse. The value and type of the recommended fuse for each power type is indicated below.

Ref.	Power	Recommended Fuse
«0»	230 Vac 50/60 Hz	50 mA Time Lag
«1»	115 Vac 50/60 Hz	100 mA Time Lag
«2»	24 Vac 50/60 Hz	300 mA Time Lag
«3»	48 Vac 50/60 Hz	150 mA Time Lag
«6»	24 Vdc (15/30 Vdc Isolated)	350 mA Fast Fuse
«8»	48 Vdc (24/65 Vdc Isolated)	200 mA Fast Fuse

SPECIFICATIONS FOR Vexc

VOLTAGE	from 10 to 24 Vdc regulated
CURRENTMAX.	50 mA
RIPPLE	0.2% at 20mA (at 50/60 Hz)

ORDERING REFERENCE

Model	Power	Option1	Option2	Option3	Scaling
MAG-35	-	-	-	-	-
32	0	SP11	SAR	HM	4/20 mA = 0/150.0 mm
35	1	SP21	MPA2		0/20 mA = 0/580 BAR
	2	SDA			...
	3	RS2			
	6	RS4			
	8				

MAG-35-32

Panel meter for PROCESS in 4/20 mA and similar



Instrument to measure process signals in 4/20 mA and similar signals. Display scalable in engineering units, by selecting internal jumpers and potentiometers. Provides voltage excitation output from 10 to 24 Vdc regulated, to power-up transducers. Accepts connections from transducers working in 2, 3 and 4 wire connection techniques.

READING SCALE SELECTION

Select the desired input range and the reading scale, by selecting the jumpers on the «MM» module, as shown on table below, and select jumpers «D» to light the decimal point (see figure1 on page 4). Potentiometer «P2» allows manual adjustment of the display at full-scale. Potentiometers «SPAN» and «OFFSET» at the front of the instrument are for small «on-the-field» error corrections on the scaled display. Potentiometer «P1» is to adjust the excitation voltage output.

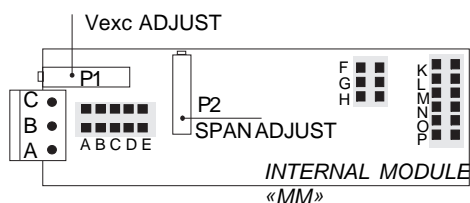


Table1 - Signal

RANGE	JUMPER «MM»	Zin	I _{max}	ACCURACY ±1digit
4/20 mA	A,C,F	25 Ohm	70 mA	0.15%
0/20 mA	A,C,F,G	25 Ohm	70 mA	0.15%
0/50 mA	A,B,F,G	10 Ohm	100 mA	0.15%
10/50 mA	A,B,F	100 Ohm	100 mA	0.15%
0/1 mA	A,D,G	100 Ohm	35 mA	0.15%
0/5 mA	A,D,F,G	100 Ohm	35 mA	0.15%
1/5 mA	A,D,F	100 Ohm	35mA	0.15%

Table2 - Span display

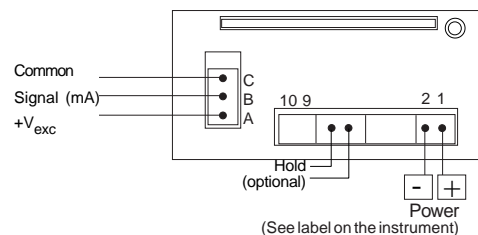
SPAN	JUMPER «MM»
0 / 1000	K
1001 / 2000	---
2001 / 4000	L

Table3 - Offset display

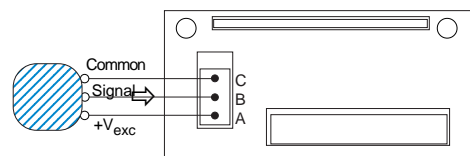
OFFSET RANGE	JUMPER «MM»
0 / 500	P
501 / 1000	---
1001 / 1999	N

OFFSET TYPE	JUMPER «MM»
POSITIVE	O
NEGATIVE	M

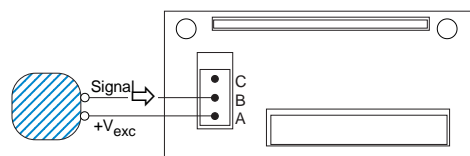
CONNECTIONS



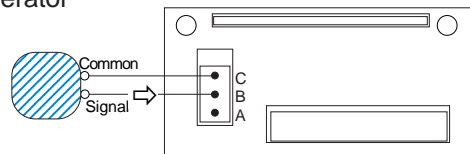
Connections for Pasive Transducer 3 wires



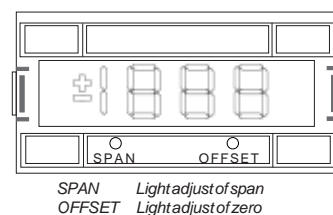
Connections for Pasive Transducer 2 wires



Connections for Active Transmitter or Current Generator



FRONT VIEW



Example .- To visualize from «0» to «145.9» on display for a 4/20 mA signal, the high value on «Display» is «1459» (decimal point is not considered) and the high value «Signal» is «20mA». The offset value is the display at 0mA input signal. In our case, display at 0mA is «-291».

Select range 4/20 mA	Jumpers A,C,F
Select span	Nojumper Aprox. 1459
Select offset range	Jumper P Aprox. -291
Select offset type	Jumper M Negative
Select decimal point	Jumper D1 1XX.X

Generate 4 mA and adjust display to «0» operating the front «OFFSET»
Generate 20 mA and adjust display «145.6» operating «P2»
Iterate to improve accuracy

MAG-35-35

Panel meter for Difference of 2 x 4/20mA signals



Instrument to display a value proportional to the difference between two 4/20 mA signals (or 0/20 mA signals). Display scalable in engineering units. If both signals are the same, the display is «0». Usually the instrument is configured to display «±100.0%» for a maximum difference between signals, but it can be configured to any engineering unit by internal potentiometers. Does not include excitation voltage for external transducers.

READING SCALE SELECTION

Select the desired input range and the reading scale, by selecting the jumpers on the «MM» module, as shown on table below, and select jumpers «D» to light the decimal point (see figure1 on page 4). Potentiometer «P2» allows manual adjustment of the display at full-scale. Potentiometer «P1» allows manual adjustment of the display at zero signal. Potentiometers «SPAN» and «OFFSET» at the front of the instrument are for small «on-the-field» error corrections on the scaled display.

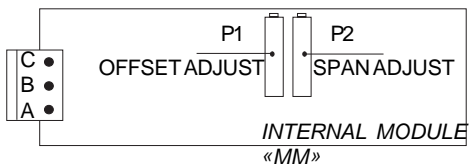


FIGURE1 - DECIMAL POINT SELECTION

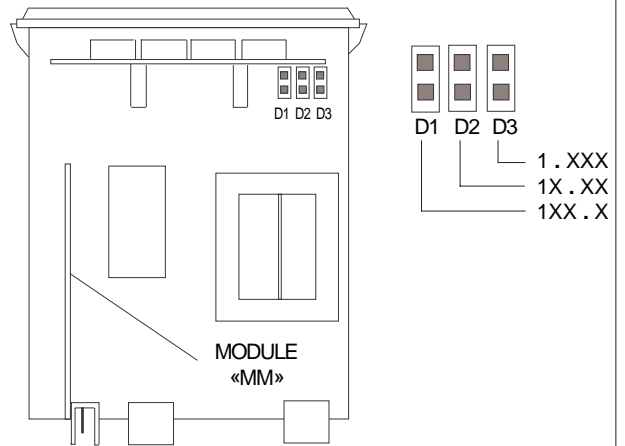
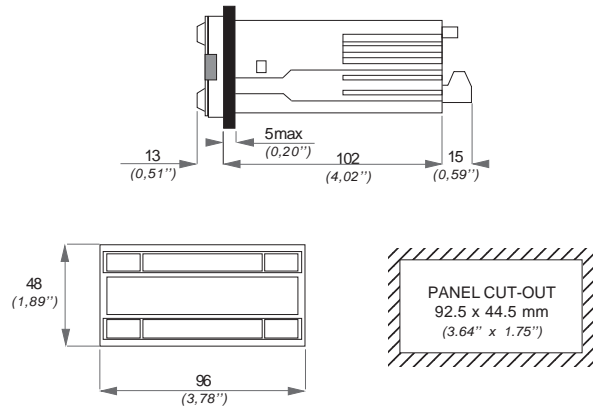


FIGURE2 - SIZES in mm (inches)



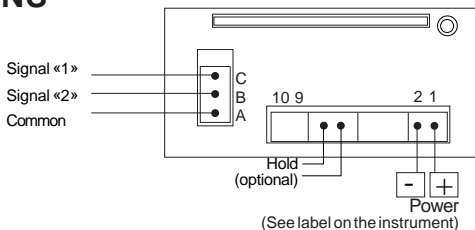
Example .- The instrument realizes the subtraction between the two signals in the following order

$$\text{Signal to display} = \text{«Signal1»} - \text{«Signal2»}$$

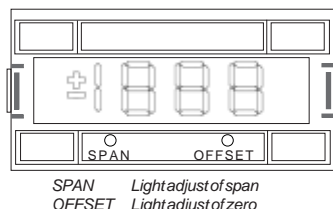
The result of the subtraction will be always a value between «-16 mA» and «+16 mA» (for 4/20 mA signals). From this point the instrument is scaled like a standard process meter. Display by default is :

- +16 mA = +100.0 %
- 0 mA = 0%
- 16 mA = -100.0%

CONNECTIONS



FRONT VIEW



CE DECLARATION OF CONFORMITY

Manufacturer.- **FEMA ELECTRÓNICA, S.A.**
Address .- Pol. Ind. Santiga - Altimira 14 (T14 - N2)
E-08210 Barberà - BARCELONA
ESPAÑA - SPAIN

Conforming Products
Series .- MAG-35
Models .- 01, 02, 03, 04, 06, 07, 08, 10, 11, 12, 15, 16, 17, 20, 21, 22, 23, 24, 25, 26, 27, 32, 35, 36, 80, 90, 95

We hereby declare that the above products conform to the essential protection requirements of Directives and Standards stated below.

DIRECTIVES

EUROPEAN DIRECTIVE FOR LOW VOLTAGE D73/23/CEE AMENDED BY D93/68/CEE. Equipments powered from 50 to 1000 Vac and/or from 75 to 1500 Vdc

ELECTROTECHNICAL REGULATION FOR LOW VOLTAGE (RBT) ITC21, ITC29, ITC35. Equipments with power supply lower than 50 Vac and/or 75Vdc.

EUROPEAN DIRECTIVE FOR ELECTROMAGNETIC COMPATIBILITY D89/336/CEE AMENDED BY D93/68/CEE

STANDARDS

IMMUNITY
UNE EN 50082-1 (1997)

ELECTRICAL SAFETY
UNE EN 61010-1 (1996)
UNE EN 60204-1 (1997)

EMMISSIONS
UNE EN 50081-1 (1993)

Signed .- D. Juncà
Position .- Quality Manager
Barberà, 2005