

Series MAG-35

RATEMETER for Frequency signals

MAG-35-TF

Ratometer

up to 40 KHz



IDEAL SOLUTION to measure frequency signals in impulses per second , acquired from NPN, PNP, NAMUR sensors or directly from VAC signals. Frequencies up to 40KHz, with display scalable in engineering units (RPM, m/min, ...). Available options for relay output, analogue output, serial outputs and others.



FEMA ELECTRÓNICA, S.A.

USER'S MANUAL

(HT0802-r011206)

Model MAG-35-TF



Instrument for Frequency signals

Panel meters with ratemeter function to measure frequency signals in impulses per second. Accepts signals in NPN, PNP, Namur and Vac types. Display scalable in engineering units (m/min, RPM, ...). Provides output with excitation voltage at 24Vdc to power-up transducers (and 9V2 for Namur). Wide range of frequencies from 0/40 KHz up to 0/40 Hz, selectable by internal jumpers.

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
INPUT CONFIGURATION	Bipolar Simple
A/D CONVERTER	Dual slope
INTEGRATION TIME	80 mSec.
NUMBER OF READINGS	3.12 per second
WARM-UP TIME	2 minutes
ACCURACY	0.3% ±1 digit
NMRR	50 dB
THERMAL DRIFT	250 ppm
TEMP CO ZERO	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
PANEL CUT-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»	Parallel BCD
«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	24Vdc or 9,2Vdc
CURRENT MAX.	50 mA
RIPPLE	0.2% at 20mA (a 50/60 Hz)

ORDERING REFERENCE

Model	Power	Option1	Option2	Option3	Scaling
MAG-35 - TF	0	SP11	SAR	HM	NPN 0/30 KHz = 0/1500 RPM
	1	SP21	MPA2		NAMUR 0/250 Hz = 0/100.0 m/min
	2	SDA			...
	3	RS2			
	6	RS4			
	8				

SELECTING SIGNAL RANGE AND TYPE

Jumpers on module «MM» select the input signal type and the frequency range for the ratemeter, as shown on table below, and select jumpers «D» to light the decimal point (see figure1). Potentiometer «P1» allows manual adjustment of reading at full-scale. Potentiometer «SPAN» at the front of the instrument is for small «on-the-field» error corrections on the scaled display.

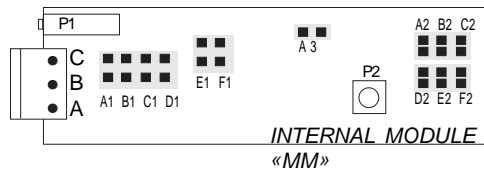
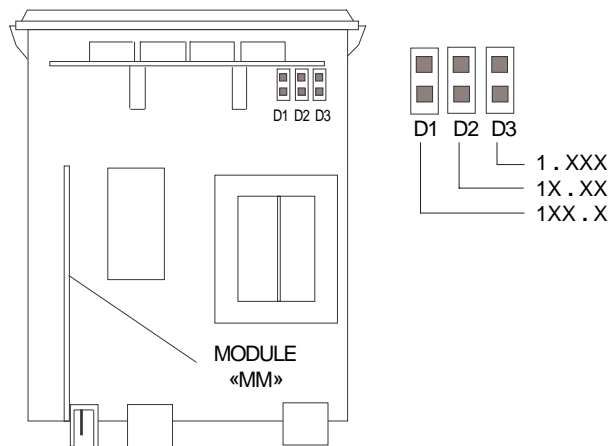


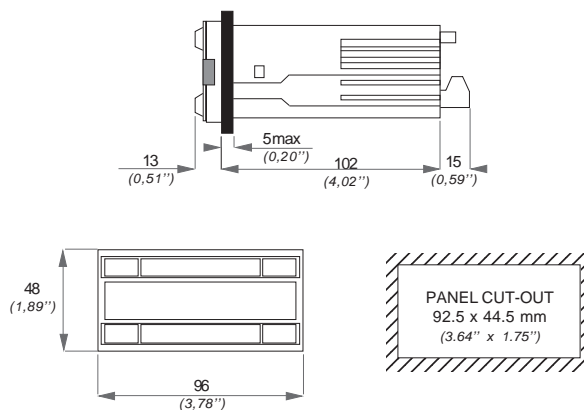
FIGURE1 - DECIMAL POINT SELECTION



Signal	Jumper	Frequency Range	Jumper
PNP / NPN 3 wire	A1	0-40/70 Hz	D2
NAMUR	A1,B1	0-70/125 Hz	D2, C2
PNP 2 wire	A1,C1	0-122/225 Hz	D2, B2
NPN 2 wire	A1,D1	0-225/400 Hz	D2, A2
Vac < 100Vac	A1	0-400/700 Hz	E2
Vac > 100Vac	---	0-700/1250 Hz	E2, C2
		0-1250/2250 Hz	E2, B2
		0-2250/4000Hz	E2, A2
		0-4000/7000 Hz	F2
		0-7/12,5 KHz	F2, C2
		0-12.5/22.5 KHz	F2, B2
		0-22.5/40KHz	F2, A2

Vexc	Jumper
24 Vdc	F1
9.2 Vdc Namur	E1

FIGURE2 - SIZES in mm (inches)



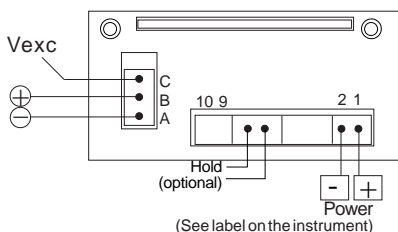
Adjust of Trigger levels .- Operating potentiometer «P2» modifies the «trigger» level (detection level for a change on the signal, from «0» to «1»). In applications where signal has low voltage levels for «0» and «1», the instrument may not recognize the transition between impulses. The adjust is an empirical process.

Filter «A3».- Select jumper «A3» to activate a stronger filter on the signal. The display will be more stable, and the response speed will be slower. Useful with low-frequency signals (signals lower than 10Hz could display oscillations up to 25% of the range) and with non-stable signals.

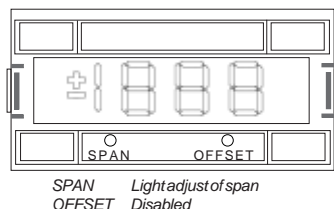
Scaling procedure

- 1.- Select jumpers for Sensor Type
- 2.- Select jumpers for Input Signal Range (Frequency Range)
- 3.- Generate a frequency of 0 Hz at the signal input terminals
- 4.- Operate offset potentiometer to adjust display at «0»
- 5.- Generate the maximum frequency desired at the input terminals
- 6.- Operate potentiometer «P1» to adjust display at the desired value
- 7.- In case of instability, select jumper «A3»

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

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Signal Converters &
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ELECTRONIC INSTRUMENTATION FOR INDUSTRY

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