

COUNTERS
for IMPULSES

Series MAG983-X

COUNTERS for IMPULSE signals

MAG983-1

MAG983-2

MAG983-3

MAG983-4



IDEAL SOLUTION for impulse counting applications where the operator has no access to the configuration of the unit. Instruments with scaling capability, in order to visualize in different units such as units, meters, accumulated flow, ...



FEMA ELECTRÓNICA, S.A.

USER'S MANUAL

(HT0695-r050705)

FEMA ELECTRÓNICA

Series MAG983-X

Impulse COUNTERS

The MAG983-X is a series of impulse counters with 6 digits for panel mounting. The main input channel for impulse counting is defined as «INPUT1», and the additional input channel defined as «INPUT2» has a variable function depending on the model selected. All units can «RESET» from frontal push button and also from rearside terminal for mechanical contact.

The reading of the instruments can be scaled activating scale factors, together with the position of the decimal point. By default, all units are configured as :

1 impulse = +1
Signal type NPN
Without decimal points

If a different configuration is needed, request your needs with the order, or see instructions on section 8 for self configuration.

Model MAG983-1

Impulse counter with Inhibit Control
«INPUT1» Input for impulses
«INPUT2» Control for Inhibit
Note .- «INPUT2» at negative logic, activates inhibit

Model MAG983-2

Impulse counter with Add/Subtract control
«INPUT1» Input for impulses
«INPUT2» Control for ADD/SUBTRACT
Note .- «INPUT2» at negative logic SUBTRACTS

Model MAG983-3

Impulse counter with Add/Subtract inputs
«INPUT1» Impulses to ADD
«INPUT2» Impulses to SUBTRACT

Model MAG983-4

Impulse counter for Quadrature (Encoder)
«INPUT1» Impulses from encoder CHANNEL-A
«INPUT2» Impulses from encoder CHANNEL-B

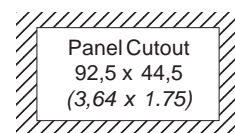
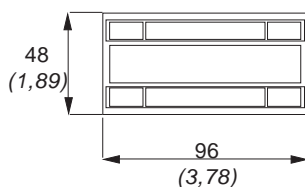
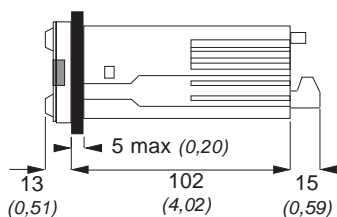
0.- Ordering Reference

	Model	Power	Signal Type	Counting Relation	Decimal Point
MAG983					
	1	230 Vac	NPN	1 imp = +1	xxxxxx
	2		PNP	1 imp = +2.5	xxxxx.x
	3		Namur	1 imp = +0.1	xxx.xxx
	4		Pick-Up		...
			Mechanical		

1.- Technical Data

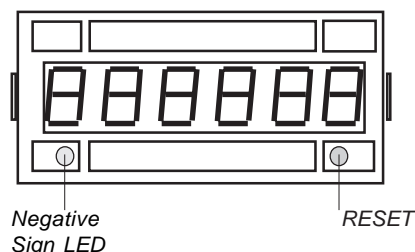
DISPLAYS	Led 7 segments red color	FREQUENCY	maximum up to 10 KHz
SEGMENTS	9.9.9.9.9.9	MEMORY	E ² Prom non volatile
DIGITHEIGHT	14,2 mm. (0,56")	ON/OFF CYCLES	100.000 minimum
POLARITY	negative counting indicated by LED	DATA RETENTION	10 years minimum
READING	from 0 to 999999	TRIGGER LEVELS	Selectable (See section 4) «0» < 1.50 Vdc or «0» < 5.50 Vdc «1» > 3.75 Vdc or «1» < 7.50 Vdc
DECIMAL POINT	6 positions, factory selected (or see section 8)	POWER	230 Vac (50 Hz)
INPUT SIGNAL	PNP, NPN, Namur, Contact, Pick-Up Jumper selectable maximum 28Vdc at input	CONSUMPTION	3VA
PICK-UP Data	only on «INPUT1» Sensibility 150 mV peak Hysteresis 100 mV Impedance 26.5 Kohms at 60 Hz Maximum input voltage ±50 Vpp	EXTERNAL FUSE	50 mA at 230 Vac (not included)
RESET	Contact at rearside terminals Frontal push button	CONNECTIONS	Plug-in screw clamps
Vexc OUTPUT	+10Vdc (maximum 70 mA)	WIRE SECTION	max. 2.5 mm ² (recommended 1mm ²)
		WORKING TEMP.	from 0 to +50 °C
		STORAGE TEMP.	from -40 to +70 °C
		RELATIVE HUMIDITY	90 % a 40°C
		HOUSING	DIN 43700
		DIMENSIONS	96 x 48 x 117 mm (3,78 x 1,89 x 4,61")
		PANEL CUTOUT	92,5 x 44,5 mm (3,64 x 1,75")
		MATERIAL HOUSING	ABS, black color
		WEIGHT	310 gr.

2.- Mechanical Dimensions (mm / inches)



3.- Front View

The frontal of the MAG983 instruments shows the 6 displays for counting value, the led for negative sign polarity indication, and the «RESET» push button. This button can be disabled acting on jumper L (See section 4.3)



4.- Internal Jumpers (Trigger Levels, Antirrebound Filters, Front Reset):

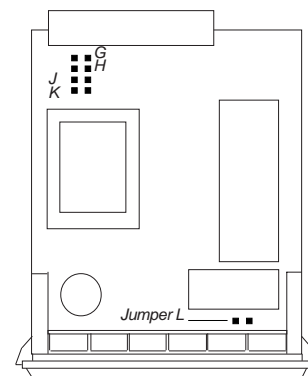
4.1.- Trigger Levels for NPN, PNP, NAMUR signals

Jumper H,G Closed	Jumpers H,G open
Trigger Level LOW	Trigger Level HIGH
Logical «1» >3.75 Vdc	Logical «1» >7.50 Vdc
Logical «0» <1.50 Vdc	Logical «0» <5.50 Vdc

4.2.- Antirrebound Filters.- Jumpers J,K

Closed.-	Antirrebound filters at <100 Hz
Open .-	Antirrebound filters at <10KHz

Note .- Use filter <100Hz for input type mechanical contact, in order to filter contact rebounds

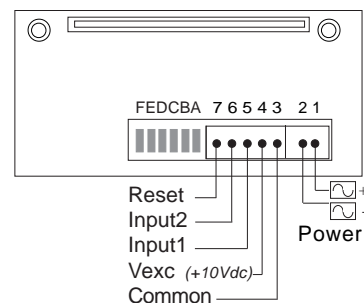


4.3.- Frontal Reset.- Jumper L

Closed .-	Enables front button for RESET
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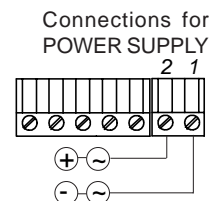
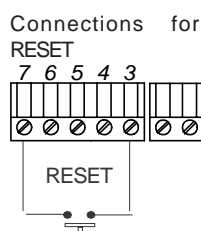
5.- Rear side view

The rear side of the instrument shows the terminals for connecting signals, power of the instrument, and contact for «RESET», and the jumpers for signal type selection (Jumpers A,B,C,D,E,F)



6.- Power connections and Rearside Reset

The «RESET» connection at the rearside terminal is operated with a mechanical contact connected at terminals 7 and 3. Power is connected at terminals 1 and 2.



7.- Connections for input signals and Signal Type selection

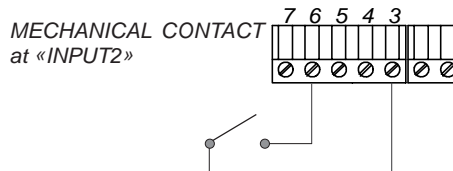
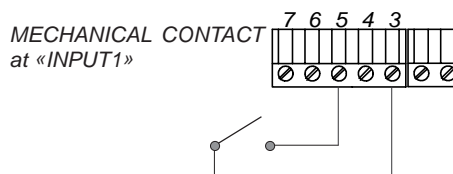
7.1.- Sensor Type MECHANICAL CONTACT

Select Jumpers ADF

«INPUT1» terminals 5 (Signal) and 3 (Common)

«INPUT2» terminals 6 (Signal) and 3 (Common)

Note -. close internal jumpers J,K. See section 4.2



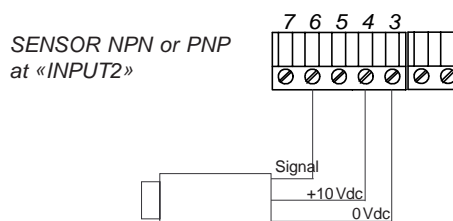
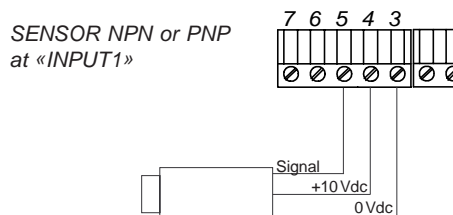
7.2.- Sensor Type NPN or PNP

NPN .- Jumpers ADF

PNP .- Jumpers ABCDF

«INPUT1» terminals 5 (Signal), 3 (Common) y 4 (Vexc)

«INPUT2» terminals 6 (Signal), 3 (Common) y 4 (Vexc)

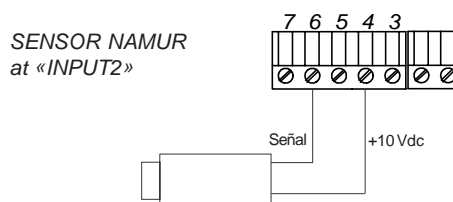
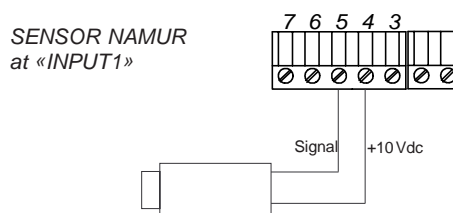


7.3.- Sensor Type NAMUR

Select Jumpers BCDF

«INPUT1» terminals 5 (Vexc), 4 (Signal)

«INPUT2» terminals 6 (Vexc), 4 (Signal)



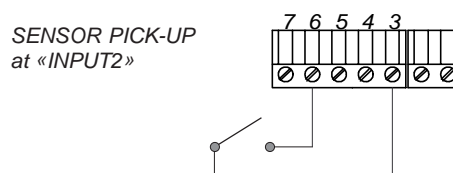
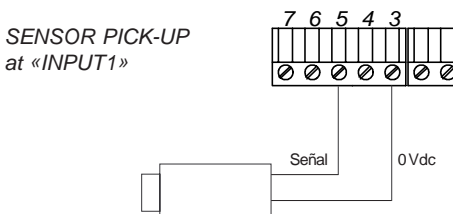
7.4.- Sensor Type PICKUP

Select Jumpers AE

«INPUT1» terminals 5 (Signal) y 3 (Common)

«INPUT2» terminals 6 (Signal) y 3 (Common)

Note -. Input2 will be Mechanical Contact. It can not be configured for PICK-UP type



8.- Introducing how to programm the instrument

The MAG983 instruments do not have programming keypad accesible to the end user. To modify the configuration of the instrument, access the internal pins and configure the contacts indicated on «figure 1». These contacts will allow the activation of the required programming codes.

Example .- To activate code «65 2E» (activation of decimal point at position XXXX.X) close one after the other contacts «6», «5», «2» and «E»

Contact 6	Number «6» appears on display	6
Contact 5	Number «5» appears on display	65 1
	<i>Together with code «65» appears also the number «1» indicating that code «65» already has a value of «1», this means, configuration without decimal point</i>	
Contact 2	Number «2» replaces number «1»	65 2
Contact E	The instrument activates the decimal point	XXXX.XX

Note .- the programming codes «1», «2» and «3», are composed of 1 digit only. When closing contact «3» the display will show a 5 digits number, which is the actual value of the «Scale Factor» (by default its value is «1.0000»). To modify each one of these 5 digits, close contacts «1» to «5» and once the desired value is on the display close «E» to validate.

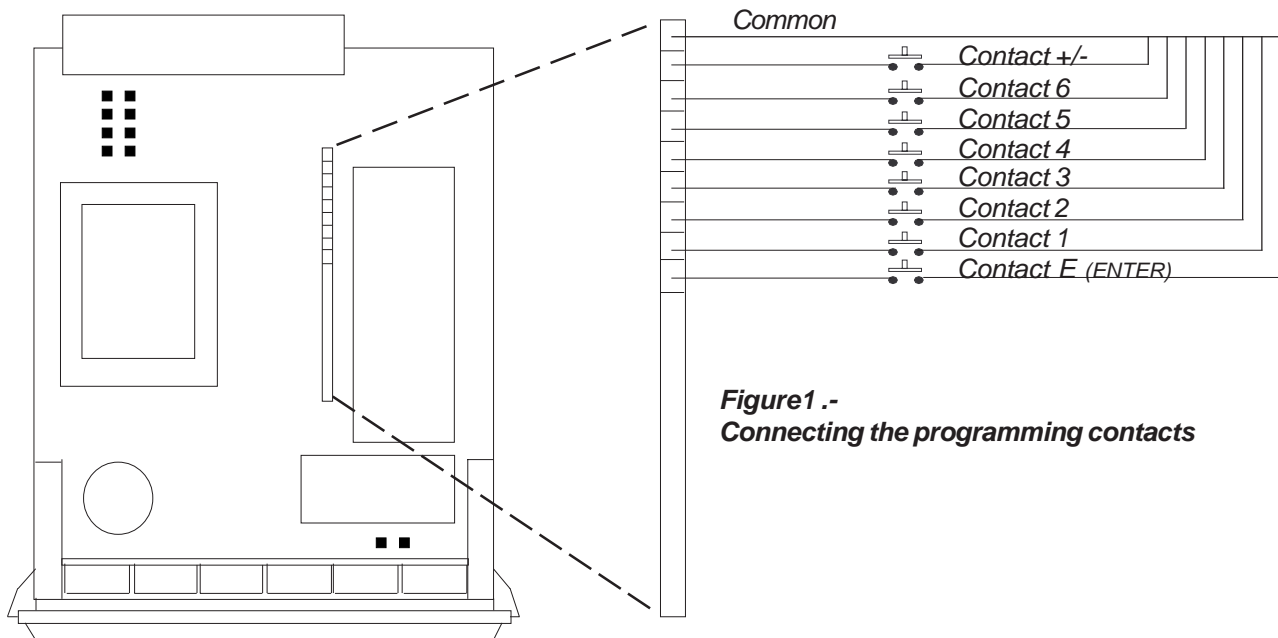


Figure1 .-
Connecting the programming contacts

9.- Reset of the Configuration and Default Parameters

«41 -1E» Reset of the instruments configuration. Activates the default parameters
In order to place this code, close «4», «1», «1», «±» and «E»

± Select «±» to switch between active instruments. MAG983 units have 2 internal instruments, a ratemeter and a counter. By default after the activation of a «41 -1» code, the ratemeter remains activated. Close «±» to activate the counter

Default Parameters

«41 1E»	Default Parameters	«65 1E»	Default Parameters
«42 3E»	Default Parameters	«51 2E»	«AL1» and «AL2» assigned to Counter
«43 1E»	«Input1» input, «Input2» inhibit control	«52 3E»	Default Parameters
«44 1E»	«Flanges multiplication» x1	«53»	Default Parameters
«45 1E»	«Multiplication Factor» x1	«54 3E»	Default Parameters
«46 1E»	without Decimal Point	«55»	Default Parameters
«61 4E»	Default Parameters	«56 1E»	Special functions. Normal Reset
«62 1E»	Default Parameters	«66 1E»	Default Parameters
«63 1E»	Default Parameters	«1» 500	Value for memory «AL1»
«64 4E»	Default Parameters	«2» 1000	Value for memory «AL2»
		«3» 1.0000	«Scale Factor»

10.- Instrument Selection and Maximum Frequencies

The Instrument Selection codes define if the instrument will work as impulse add, add/subtract, etc, and it corresponds to the different units of MAG983 available.

	«INPUT1»	«INPUT2»	Max. Frequency	Comments
«43 1E»	impulses	control Inhibit	10 KHz	Inhibits at logical state «0»
«43 2E»	impulses	control Add/Subtract	10 KHz	Subtracts at logical state «0»
«43 3E»	imp. Add	imp. Subtract	4.0 KHz	
«43 4E»	<i>Does not apply</i> -----			
«43 5E»	Channel AB from bidirectional encoder		5.0 KHz	Quadrature signal x1
«43 6E»	Channel AB from bidirectional encoder		2.5 KHz	Quadrature signal x4

11.- Programming the Multipliers

«3» «Scale Factor» is a multiplier with a value between 0.0000 and 5.9999. By default is 1.0000

«45 1E» «Multiplication Factor» x1 Acts on the displayed value x0.1
 «45 2E» «Multiplication Factor» x0,1 and shows counted impulses /10
 «45 3E» «Multiplication Factor» x0,01
 «45 4E» «Multiplication Factor» x0,001

«44 1E» «Multiplication Flanges» x1 (Counts at down flanges)
 «44 2E» «Multiplication Flanges» x2 (Counts at up flanges and down flanges)

Note .- Not compatible with code «43 6E». Reduces maximum frequencies to the half

12.- Decimal Point Position

«46 1E»	0	<i>Note .- The same codes but with negative, allow visualization of zeroes to the left. For example code «46 -2E» will show 00000.0</i>
«46 2E»	0.0	
«46 3E»	0.00	
«46 4E»	0.000	
«46 5E»	0.0000	

13.- Specials Functions with the «RESET» and memories «AL1» and «AL2»

«56 1E» When pressing «RESET» loads on display 000000
 «56 2E» When pressing «RESET» loads on display the value of «AL2» and the impulses subtract
 «56 3E» *Does not apply*
 «56 4E» *Does not apply*
 «56 5E» When pressing «RESET» loads on display 000000 and when «AL2» value is reached, display loads 000000
 «56 6E» When pressing «RESET» loads on display the value of «AL2» and the impulses subtract
 When reaching 000000 the value of «AL2» is loaded again and the impulses SUBTRACT

«1» Show the value of memory «AL1»
 «2» Show the value of memory «AL2»

To modify the value of the memory «AL1» or «AL2, once loaded on display, use contacts 1,2,3,4,5,6 to modify the values of digits 1,2,3,4,5,6 and when the desired value is displayed close «E» to apply.

ATTENTION - Limit on the Internal Counter
 The MAG983 instrument works with a 23 bits internal counter (maximum 8.388.608 impulsos can be counted). If this value is exceeded, the negative led sign is activated and the display will work in

SUBSTRACT mode. Do a «RESET» of the display in order to recover functionality. Memory «AL2» can be also programmed to activate a «RESET» when its value is reached (see code «56 5E»).

14.- Security Prescriptions



INSTALLATION PRECAUTIONS.- The installation and use of this unit must be done by qualified operators. The unit has not power switch, and ***the unit has not internal protection fuse***, and will start operation as soon as power is connected. The installation must incorporate an external main switch with a protection fuse of :

fuse 50 mA (at 230 Vac power)

Also the necessary devices to protect the operator and the process when using the unit to control a machine or process where injury to personnel or damage to equipment or process, may occur as a result of failure of the unit.



SAFETY PRESCRIPTIONS.- The unit has been designed and tested under UNE 20553 rules and is delivered in good condition. This manual contains information for electrical connections. Do not make wiring signal changes or connections when power is applied to the unit. Make signal connections before power is applied and, is reconnection is required, disconnect the AC (mains) power before such wiring is attempted. Install the unit in places with a good ventilation to avoid the excessive heating. And far from electrical noise source or magnetic field generators such as power relays, electrical motors, speed controls etc... The unit cannot be installed in open places. Do not use until the installation is finished.

POWER SUPPLY.- The power supply must be connected to the adequate terminals (see the connection instructions). The characteristics of the power supply are written on the attached label. Please make sure that the unit is correctly connected to a power supply of the correct voltage and frequency. Do not use other power supply otherwise permanent damage may be caused to the unit. Do not connect the unit to power sources heavily loaded or to circuits which power loads in cycle ON-OFF or circuits with power inductive loads.

SIGNAL WIRING.- Certain considerations must be given when install the signal input and control wires. Long wires can act like antennas and introduce electrical noise to the unit, therefore :

A.- Do not install the signal input or control wires in the same conduit with power lines, heaters, solenoids, SCR controls etc....and always far from these elements.

B.- When shielded wires are used, connect the shield to the

common terminal and leave unconnected the other end of the shield and do not connect to the machine ground.



EXCITATION VOLTAGE.- The unit supplies excitation voltage for sensors, at terminals 3 and 4. Do not connect these terminals to external power supply, permanent damages may result to the unit.

SAFETY CONSIDERATIONS .- Before starting any operation of adjustment, replacement, maintenance or repair, the unit must be disconnected from the power supply. Keep the unit clean, to assure good functioning and performance. To prevent electrical or fire hazard, do not expose the unit to excessive moisture. Do not operate the unit in the presence of flammable gases or fumes, such as environment constitutes a definite safety hazard. The unit is designed to be mounted in a metal panel.

If the unit shows signs of damage, or is not able to show the expected measures, or has been stored in a bad conditions or a protection failure can occur, then do not attempt to operate and keep the unit out of service.

IN CASE OF FIRE

- 1.- Disconnect the unit from the power supply.
- 2.- Give the alarm according to the local rules.
- 3.- Switch off all the air conditioning devices.
- 4.- Attack the fire with carbonic snow, do not use water in any case.



WARNING : In closed areas do not use systems with vaporized liquids.

CONNECTIONS

All wiring connections are made using push-in cable connectors. There is a separate connector block for power supply, input signals and each relay output. Please make sure that each connector block is connected on the adequate place.

PANEL MOUNTING.- The instrument size case is 1/8 DIN. The internal electronic circuit can be inserted or removed by the front part and is held on to the case by the two lateral lugs, which must be put in their corresponding holes placed on each case side. Verify that the panel cut-out is correctly according to the dimensions indicated with a minimum depth of 135 mm. (5.31"). Install the fixation clips of blue colour in the lateral guides of the unit by its rear part and then slide and press them firmly against the panel, until the unit is totally hold on.

15.- Declaration of Conformity

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
Model .- MAG983-1, MAG983-2, MAG983-3, MAG983-4

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

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

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 75 Vdc.

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

STANDARDS

IMMUNITY	UNE EN 50082-1 (1998)
EMISSIONS	UNE EN 50081-1 (1994)
ELECTRICAL SAFETY	UNE EN 61010-1 (1996)
	UNE EN 60204-1 (1997)

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