

SITRANS F flowmeters

SITRANS F M

Transmitter
MAGFLO MAG 6000 I/6000 I Ex d

Overview



The SITRANS F M MAGFLO MAG 6000 I / I Ex d transmitter is designed for the demands in the process industry. The robust die cast aluminium housing provides superb protection, even in the most harsh industrial environments. Full input and output functionality is given even in the Ex version.

Benefits

- Full range of ATEX rated flowmeters with intrinsically safe rated input and outputs
- For compact or remote installation
- HART, PROFIBUS PA/DP, MODBUS RTU/RS485 add-on communication modules available
- Superior signal resolution for optimum turn down ratio
- Digital signal processing with many possibilities
- Automatic reading of SENSORPROM data for easy commissioning
- User configurable operation menu with password protection
 - 3 lines, 20 characters display in 11 languages
 - Flow rate in various units
 - Totalizer for forward, reverse and net flow as well as much more information available.
- Multiple functional outputs for process control, minimum configuration with analogue, pulse/frequency and relay output (status, flow direction, limits)
- Comprehensive self-diagnostic for error indication and error logging
- Batch control

Design

The transmitter is designed for either compact or remote installation in non-hazardous or hazardous areas.

Function

The following functions are available:

- Flow rate
- 2 measuring ranges
- 2 totalizers
- Low flow cut-off
- Flow direction
- Error system
- Operating time
- Uni-/bidirectional flow
- Limit switches and pulse output
- Batch control

The MAG 6000 I/6000 I Ex d is a microprocessor-based transmitter with a build-in alphanumeric display in several languages. The transmitters evaluate the signals from the associated electromagnetic sensors and also fulfil the task of a power supply unit which provides the magnet coils with a constant current.

Further information on connection, mode of operation and installation can be found in the data sheets for the sensors.

Displays and keypads

Operation of the transmitter can be carried out using:

- Keypad and display unit
- HART communicator
- PC/laptop and SIMATIC PDM software via HART communication
- PC/laptop and SIMATIC PDM software using PROFIBUS communication

Technical specifications

Mode of operation and design

Measuring principle	Electromagnetic with pulsed constant field
Empty pipe	Detection of empty pipe (special cable required in separate mounted installation)
Excitation frequency	Sensor size dependent pulsating DC current
Electrode input impedance	$> 1 \times 10^{14} \Omega$

Input

Digital input	DC 11 ... 30 V, $R_i = 4.4 \text{ k}\Omega$
• Activation time	50 ms
• Current	$I_{DC 11 \text{ V}} = 2.5 \text{ mA}$, $I_{DC 30 \text{ V}} = 7 \text{ mA}$

Output

Current output	
• Signal range	0 ... 20 mA or 4 ... 20 mA (Active/passive)
• Load	$< 560 \Omega$
• Time constant	0.1 ... 30 s, adjustable
Digital output	
• Frequency	0 ... 10 kHz, 50% duty cycle (uni-/bidirectional)
• Time constant	0.1 ... 30 s, adjustable
• Pulse (passive)	3 ... 30 V DC, max 110 mA (30 mA Ex version), $200 \Omega \leq R_i \leq 10 \text{ k}\Omega$ (powered from connected equipment)
• Time constant	0.1 ... 30 s, adjustable

Relay output

• Time constant	Changeover relay, same as current output
• Load	42 V AC/2 A, 24 V DC/1 A

Low flow cut off	0 ... 9.9% of maximum flow
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Galvanic isolation	All inputs and outputs are galvanic isolated
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Max. measuring error

• MAG 6000 I	0.25% of rate
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Technical specifications (continued)

Rated operation conditions

Ambient temperature	
• Operation	-20 ... +60 °C (-4 ... +140 °F)
• Storage	-40 ... +70 °C (-40 ... +158 °F)
Mechanical load	18 ... 1000 Hz, 1.14 G rms, sinusoidal in all directions to IEC 68-2-36
Degree of protection	IP67/NEMA 4X to IEC 529 and DIN 40050 (1 mH ₂ O 30 min.)
EMC performance	EN 61326

Display and keypad

Totalizer	Two eight-digit counters for forward, net or reverse flow
Display	Background illumination with alphanumeric text, 3 x 20 characters to indicate flow rate, totalized values, settings and faults; Reverse flow indicated by negative sign
Keypad	Capacitive touch keypad with LED light for feedback indication
Time constant	Time constant as current output time constant

Design

Enclosure material	Die cast aluminium, painted
• Wall mounting	Wall mounting bracket enclosed for remote version
Dimensional drawings	See dimensional drawings
Weight	See dimensional drawings

Power supply

Power consumption	• Non Ex d: 18 ... 90 V DC; 115 ... 230 V AC; 50 ... 60 Hz
	• Ex d: 18 ... 30 V DC
Power consumption	• Ex d: 115 ... 230 V AC; 50 ... 60 Hz
	• 230 V AC: 21.5 VA
	• 24 V DC: 12 W, I _N = 380 mA, I _{ST} = 1 A (3 ms)

Certificates and approvals

Ex-version	CE, C-tick, FM Class 1, div 2
For compact and remote mounting DN 2 ... 300	SIRA 03 ATEX 1503X, EEx d e [ia] [ib] ib IIC T6 ATEX zone 2 ¹⁾
For use with MAG 3100 Ex sizes DN 350 ... 2000	• SIRA 03 ATEX 1503X • EX II 2 (1) G D • EEx d [ia] [ib] ib IIB, T6 • SIRA 03 ATEX 2072X • EX II 2 (1) (2) G D • EEx d e [ia] [ib] ib IIC, T6

Communication

• Non Ex-version	HART, MODBUS RTU/RS 485, PROFIBUS PA, PROFIBUS DP add-on modules
• Ex-version	HART, PROFIBUS PA available as integrated version

¹⁾ For compact mounting

Selection and Ordering data

SITRANS F M Transmitter	Order-No.
MAGFLO MAG 6000 I / Ex d	7ME6930 -
Remote, local display, die cast aluminium	2BA - 1A
Supply voltage	2
115 ... 230 V AC, 50 ... 60 Hz; 18 ... 90 V DC	4
ATEX, 18 ... 30 V DC	5
ATEX, 115 ... 230 V AC, 50...60 Hz	
Ex approval	0
FM Class 1 div 2/No ATEX	1
ATEX, ≤ 300 mm/12" sensor	2
ATEX, > 300 mm/12" sensor	
Communication	A
None (add-on modules can be ordered separately, see below)	B
HART	F
PROFIBUS PA Profile 3	G
PROFIBUS DP Profile 3 (not Ex version)	E
MODBUS RTU/RS 485 (not Ex version)	
Cable gland entries	0
M25/M16	2
½" NPT	

Communication modules for MAG 6000 I

Description	Order No.	Symbol
HART (only for MAG 6000 I/Ex)	FDK-085U0321	
MODBUS RTU/RS485	FDK-085U0234	
PROFIBUS PA Profile 3	FDK-085U0236	
PROFIBUS DP Profile 3	FDK-085U0237	

Accessories MAG 6000 I

Description	Order No.	Symbol
Cable for standard electrode or coil, 3 x 1.5 mm ² / 18 gage with shield PVC		
• 10 m (33 ft)	▶ FDK-083F0121	
• 20 m (65 ft)	▶ FDK-083F0210	
• 40 m (130 ft)	▶ FDK-083F0211	
• 60 m (200 ft)	▶ FDK-083F0212	
• 100 m (330 ft)	FDK-083F0213	
• 150 m (500 ft)	FDK-083F3052	
• 200 m (650 ft)	FDK-083F3053	
• 500 m (1650 ft)	FDK-083F3054	
Electrode cable for empty pipe or low conductivity, double shielded, 3 x 0.25 mm ²		
• 10 m (33 ft)	FDK-083F3020	
• 20 m (65 ft)	▶ FDK-083F3095	
• 40 m (130 ft)	FDK-083F3094	
• 60 m (200 ft)	FDK-083F3093	
• 100 m (330 ft)	FDK-083F3092	
• 150 m (500 ft)	FDK-083F3056	
• 200 m (650 ft)	FDK-083F3057	
• 500 m (1650 ft)	FDK-083F3058	

▶ Available ex stock

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Spare parts

Description	Order No.	Symbol
Display	FDK-085U3122	
Accessory bag including cable gland inserts coil & electrode connectors	FDK-085U3144	

Complete spare part PCB unit

Description	Order No.	Symbol
Not Ex	FDK-085U3123	
Ex d version 18 ... 30 V DC for sensors ≤ DN 300 (12")	FDK-085U3124	
Ex d version 115 ... 230 V AC for sensors ≤ DN 300 (12")	FDK-085U3125	

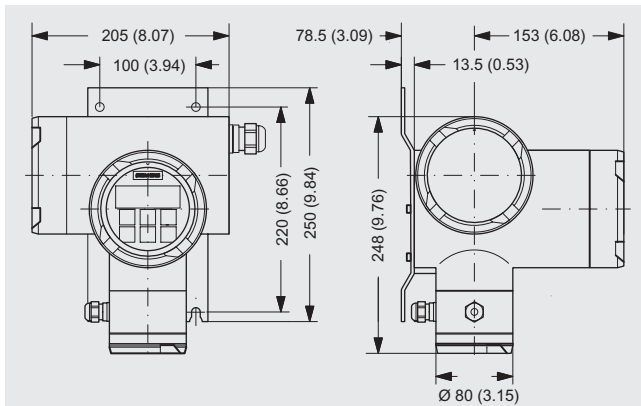
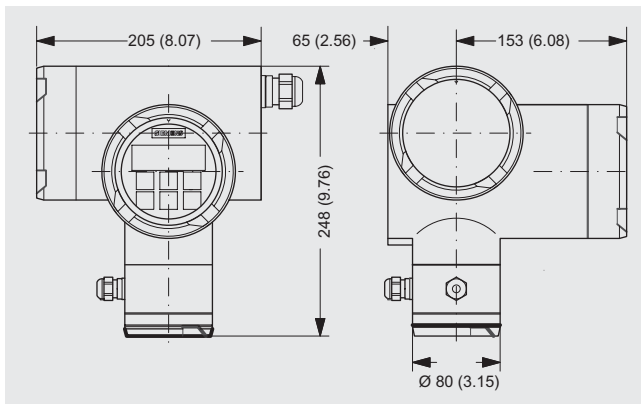
Please use online Product selector to get latest updates.

Product selector link:

www.pia-selector.com/its_main_en.asp

Please also see www.siemens.com/SITRANSforordering for practical examples of ordering

Dimensional drawings



Dimensions in mm (inch), weight: 6 kg (13.5 lbs)

Schematics

