

SITRANS F flowmeters

SITRANS F

Transmitter MAGFLO MAG 6000 I/
MAG 6000 Industry/Ex d

Overview



The SITRANS F M MAGFLO MAG 6000/Ex d Industry transmitter is designed for the special demands in the process industry. The robust die cast aluminium housing provides superb protection, even in the harshest 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, CANOpen or DeviceNet 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 are microprocessor-based transmitter with a built-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 controls

Operation of the transmitter can be carried out using:

- Control and display unit
- HART communicator
- PC/laptop and SIMATIC PDM software via HART communication
- PC/laptop and SIMATIC PDM software using PROFIBUS PA 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)
Zero point adjustment	Automatic
Excitation frequency	Sensor size dependent pulsating DC current (125 mA)
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
• Load	$< 800 \Omega$
Digital output	
• Frequency	0 ... 10 kHz, 50% duty cycle (uni-/bidirectional)
• Time constant	0.1 ... 30 s, adjustable
• Pulse (active) (not Ex version)	24 V DC, 30 mA, $1 \text{ k}\Omega \leq R_i \leq 10 \text{ k}\Omega$, short-circuit-protected (power supplied from flowmeter)
• 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
Galvanic isolation	All inputs and outputs are galvanically isolated

Max. measuring error

• MAG 6000 I	0.25% of rate
--------------	---------------

SITRANS F flowmeters

SITRANS F

Transmitter MAGFLO MAG 6000 I/
MAG 6000 Industry/Ex d

Technical specifications (continued)

Rated operation conditions

Ambient temperature	
• Operation	-20 ... +60 °C (-4 ... +140 °F)
• Storage	-40 ... +70 °C (-40 ... +185 °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 controls

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 or 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

	<ul style="list-style-type: none"> • Non Ex d: 18 ... 90 V DC; 115 ... 230 V AC; 50 ... 60 Hz • Ex d: 18 ... 30 V DC • Ex d: 115 ... 230 V AC; 50 ... 60 Hz (pending)
Power consumption	<ul style="list-style-type: none"> • 230 V AC: 8 VA • 24 V DC: 6 W, I_N = 300 mA, I_{ST} = 8 A (30 ms)

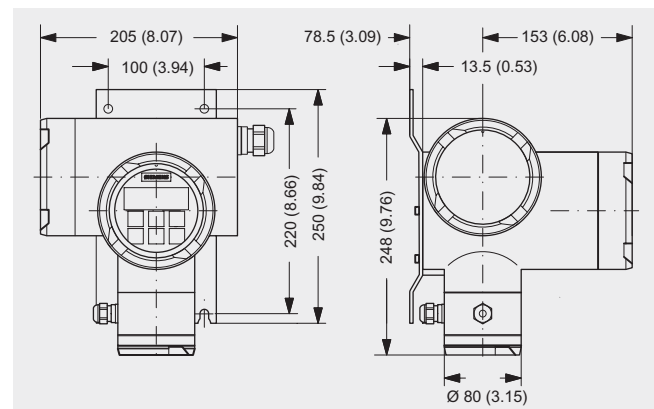
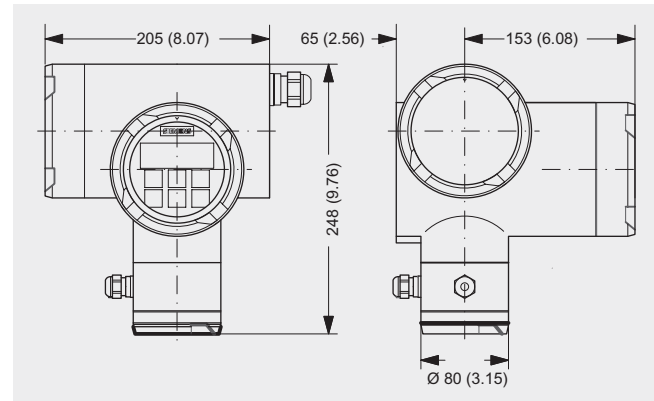
Certificates and approvals

	CE, C-tick; FM Class 1, div 2 (pending)
Ex-version	SIRA 03 ATEX 1503X, EEx d e [ia] ia [ib] ib IIB T6

Communication

• Non Ex-version	HART, MODBUS RTU/RS 485, PROFIBUS DP, CANOpen and DeviceNet as add-on modules (PROFIBUS PA pending)
• Ex-version	HART, PROFIBUS PA available as integrated version

Dimensional drawings

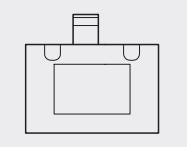


SITRANS F flowmeters

SITRANS F

Transmitter MAGFLO MAG 6000 I/ MAG 6000 Industry/Ex d

Selection and Ordering data	Order-No.
SITRANS F M Transmitter MAGFLO MAG 6000 Industry / Ex d Remote, local display, die cast aluminium Cable glands M25	7ME6930 - 2BA - 1A0
Supply voltage 115 ... 230 V AC, 50 ... 60 Hz; 18 ... 90 V DC (Non Ex version) 18 ... 30 V DC (Ex version) 115 ... 230 V AC, 50...60 Hz (Ex version) (pending)	2 4 (5)
Ex approval None ATEX	0 1
Communication None (add-on modules can be ordered separately) HART (Ex versions only) PROFIBUS PA (Ex versions only)	A B C

Description	Order No.	Symbol
HART (for MAG 6000 I/Ex)	FDK:085U0321	
MODBUS RTU/RS485	FDK:085U0234	
PROFIBUS PA	FDK:085U0232	
PROFIBUS DP	FDK:085U0230	
CANopen	FDK:085U0228	
DeviceNet	FDK:085U0229	

Spare parts

Description	Order No.	Symbol
Display	FDK:085U3122	

Complete spare part PCB unit

Description	Order No.	Symbol
Not Ex	FDK:085U3123	
Ex d version 18 ... 30 V DC	FDK:085U3124	
Ex d version 115 ... 230 V AC	FDK:085U3125	