Overview

Transmitter MAG 5000/6000 compact version (left) and 19“ insert version (right)

The MAG 5000 and 6000 are transmitters engineered for high performance, easy installation, commissioning and maintenance. The transmitters evaluate the signals from the SITRANS F M sensors type MAG 1100, MAG 1100 F, MAG 3100, MAG 3100 P and MAG 5100 W.

Transmitter types:

- MAG 5000: Max. measuring error ± 0.4 % ± 1 mm/s (incl. sensor)
- MAG 6000: Max. measuring error ± 0.2 % ± 1 mm/s (incl. sensor, see also sensor specifications) and with additional features such as: "plug & play" add-on bus modules; integrated batch functions.

Benefits

- 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 additional 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 (see under SITRANS F M diagnostics)
- Batch control (MAG 6000 only)
- Custody transfer approval: PTB, OIML R 117, OIML R 49, MI-001, PTB K 7.2 and OE12/C 040 for chilled water
- MAG 6000 with add-on bus modules for HART, FOUNDATION Fieldbus H1, DeviceNet, Modbus RTU/RS 485, PROFIBUS PA and DP

Application

The SITRANS F M flowmeters are suitable for measuring the flow of almost all electrically conductive liquids, pastes and slurries. The main applications can be found in:

- Water and waste water
- Chemical and pharmaceutical industries
- Food and beverage industries
- Power generation and utility

Design

The transmitter is designed as either IP67 NEMA 4X/6 enclosure for compact or wall mounting or 19" version as a 19” insert as a base to be used in:

- 19" rack systems
- Front panel mounting IP65/NEMA 2
- Panel mounting IP20/NEMA 1
- Wall mounting IP66/NEMA 4X

Several options on 19” versions are available such as:

- Transmitters mounted in safe area for Ex ATEX approved flow sensors (incl. barriers)
- Transmitters with electrode cleaning unit on request

Function

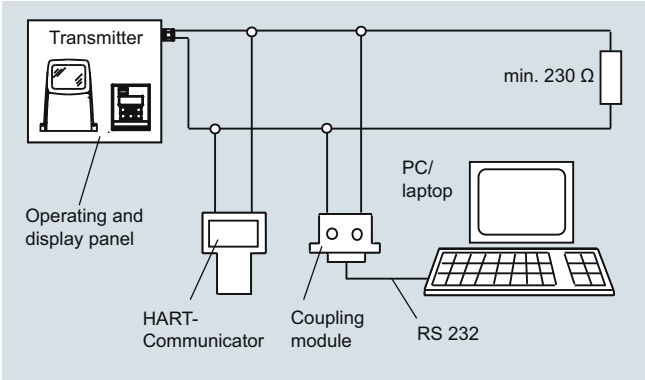
The MAG 5000/6000 are transmitters with a built-in alphanumeric display in several languages. The transmitters evaluate the signals from the associated electromagnetic sensors and also fulfil the task of a power supply unit which provides the magnet coils with a constant current.

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

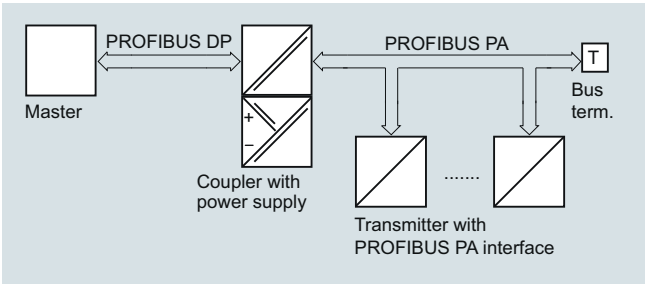
Displays and controls

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 or Modbus communication



HART communication



PROFIBUS PA communication

3

Technical specifications

Mode of operation and design	
Measuring principle	Electromagnetic with pulsed constant field
Empty pipe	Detection of empty pipe (special cable required in remote mounted installation)
Excitation frequency	Depend on sensor size
Electrode input impedance	> 1 x 10^{14} Ω
Input	
Digital input	11 ... 30 V DC, R_i = 4.4 KΩ
• Activation time	50 ms
• Current	$I_{11\ V\ DC}$ = 2.5 mA, $I_{30\ V\ DC}$ = 7 mA
Output	
Current output	
• Signal range	0 ... 20 mA or 4 ... 20 mA
• Load	< 800 Ω
• Time constant	0.1 … 30 s, adjustable
Digital output	
• Frequency	0 ... 10 kHz, 50 % duty cycle (uni/bidirectional)
• Pulse (active)	24 V DC, 30 mA, 1 KΩ ≤ R_i ≤ 10 KΩ, short-circuit-protected (power supplied from flowmeter)
• Pulse (passive)	3 … 30 V DC, max. 110 mA, 200 Ω ≤ R_i ≤ 10 KΩ (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 (incl. sensor and zero point)[1)]	
• MAG 5000	0.4 % ±1 mm/s
• MAG 6000	0.2 % ±1 mm/s
Rated operation conditions	
Ambient temperature	
• Operation	• Display version: -20 ... +60 °C (-4 ... +140 °F) • Blind version: -20 ... +60 °C (-4 ... +140 °F) • MI-001 version -25 ... +55 °C (-13 ... +131 °F) • Custody transfer (CT) version -20 ... +50 °C (-4 ... +122 °F)
• Storage	-40 ... +70 °C (-40 ... +158 °F)
Mechanical load (vibration)	
Compact version	18 ... 1000 Hz, 3.17 g RMS, sinusoidal in all directions to IEC 60068-2-36
19“ insert	1 ... 800 Hz, 1 g, sinusoidal in all directions to IEC 60068-2-36
Degree of protection	
Compact version	IP67/NEMA 4X/6 to IEC 529 and DIN 40050 (1 mH_2O 30 min.)
19“ insert	IP20/NEMA 1 to IEC 529 and DIN 40050
EMC performance	IEC/EN 61326-1 (all environments) IEC/EN 61326-2-5

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
Time constant	Time constant as current output time constant
Design	
Enclosure material	
• Compact version	Fiber glass reinforced polyamide; stainless steel AISI 316/1.4436 (IP65)
• 19" insert	Standard 19“ insert of aluminum/steel (DIN 41494), width: 21 TE, height: 3 HE
• Back of panel	IP20/NEMA 1; Aluminum
• Panel mounting	IP20/NEMA 1 (prepared for IP65/NEMA 2 display side); ABS plastic
• Wall mounting	IP66/NEMA 4X; ABS plastic
Dimensions	
Compact version	See dimensional drawings
19“ insert	See dimensional drawings
Weight	
Compact version	0.75 kg (2 lb)
19“ insert	See dimensional drawings
Power supply	• 115 ... 230 V AC +10 % -15 %, 50 ... 60 Hz • 11 ... 30 V DC or 11 ... 24 V AC
Power consumption	• 230 V AC: 17 VA • 24 V AC: 9 VA, I_N = 380 mA, I_{ST} = 8 A (30 ms) • 12 V DC: 11 W, I_N = 920 mA, I_{ST} = 4 A (250 ms) • 24 V DC: 8.4 VA, I_N = 350 mA, I_{ST} = 4 A (10 ms) I_{ST}= 4 A (250 ms): For solar panel please secure stable current supply
Certificates and approvals	
General purpose	• CE (LVD, EMC, PED, RoHS) • UL (c-UL-us)
Hazardous areas	• FM, CSA - NI Class I Div. 2 Groups A, B, C, D
Custody transfer	• Cold water: MI-001 • Chilled water - PTB K 7.2 (Germany) - OE12/C 040 (Austria) - TS 27.02 008 (Denmark)
Marine (only for remote version with MAG 5100 W, DN 50 ... DN 300)	• ABS • Bureau Veritas • DNV • GL • Lloyd' s Register of Shipping
Others	• CMC/CPA (China) • C-TICK (Australia and New Zealand EMC) • EAC (Russia,Belarus, Kazakhstan) • KCC (South Korea)

Communication	
Standard	
• MAG 5000	Without serial communication or HART as option
• MAG 6000	Prepared for client-mounted add-on modules
Optional (MAG 6000 only)	HART, Modbus RTU/RS 485, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS PA, PROFIBUS DP as add-on modules
• MAG 5000/6000 CT	No communication moduls approved

[1] For detailed accuracy specifications, see page 3/20

Safety barrier (e/ia)

Application	**For use with MAG 5000/6000 19" and MAG 1100 Ex/MAG 3100 Ex**		
Ex approval	MAG 1100 Ex [EEx e ia] IIB ATEX, EAC Ex		
	MAG 3100 Ex [EEx e ia] IIC ATEX, EAC Ex		
Cable parameter	Group	Capacity in µF	Inductance in mH
Electrode	IIC	≤ 4.1	≤ 80
	IIB	≤ 45	≤ 87
	IIA	≤ 45	≤ 87
Ambient temperature			
• During operation	-20 ... +50 °C (-4 ... +122 °F)		
• During storage	-20 ... +70 °C (-4 ... +158 °F)		
Enclosure			
• Material	Standard 19" insert in aluminum/steel (DIN 41494)		
• Width	21 TE (4.75")		
• Height	3 HE (5.25")		
• Rating	IP20 / NEMA 1 to EN 60529		
• Mechanical load	1 g, 1 … 800 Hz sinusoidal in all directions to EN 60068-2-36		

3

Selection and Ordering data

Transmitter MAG 5000

Description	Article No.	
Transmitter MAG 5000 Blind for compact and wall mounting; IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	**7ME6910-1AA30-0AA0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6910-1AA10-0AA0**	
Transmitter MAG 5000 Display for compact and wall mounting; IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	**7ME6910-1AA30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6910-1AA10-1AA0**	
• 115 ... 230 V AC, 50/60 Hz, with HART	**7ME6910-1AA10-1BA0**	
Transmitter MAG 5000 CT for compact and wall mounting, approved for custody transfer, without verification (no approval marks - only a complete flowmeter can be verified, i.e. sensor together with the transmitter); IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	**7ME6910-1AA30-1AD0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6910-1AA10-1AD0**	
Transmitter MAG 5000 for 19" rack and wall mounting		
• 11 ... 30 V DC/ 11 ... 24 V AC	**7ME6910-2CA30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6910-2CA10-1AA0**	

Transmitter MAG 6000

Description	Article No.	
Transmitter MAG 6000 Blind for compact and wall mounting; IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	**7ME6920-1AA30-0AA0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6920-1AA10-0AA0**	
Transmitter MAG 6000 for compact and wall mounting; IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	**7ME6920-1AA30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6920-1AA10-1AA0**	
Transmitter MAG 6000 for compact and wall mounting; IP65/NEMA 4, stainless steel AISI 316/1.4436 (only for sensor with stainless steal terminal box) (for remote version order stainless steal terminal box separately)		
• 11 ... 30 V DC/ 11 ... 24 V AC	**7ME6920-1QA30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6920-1QA10-1AA0**	
Transmitter MAG 6000 CT for compact and wall mounting, approved for custody transfer, without verification (no approval marks - only a complete flowmeter can be verified, i.e. sensor together with the transmitter); IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	**7ME6920-1AA30-1AD0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6920-1AA10-1AD0**	
Spare part transmitter for CT systems produced before 12/2016 or with firmware version 3.03		
• 11 ... 30 V DC/ 11 ... 24 V AC	**7ME6920-1AA30-1AB0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6920-1AA10-1AB0**	
Transmitter MAG 6000 SV for compact and wall mounting; special excitation frequency 44 Hz for Batch application DN ≤ 25/1" IP67/NEMA 4X/6, fibre glass reinforced polyamide		
11 ... 30 V DC/ 11 ... 24 V AC	**7ME6920-1AB30-1AA0**	
115 ... 230 V AC, 50/60 Hz	**7ME6920-1AB10-1AA0**	

Description	Article No.	
Transmitter MAG 6000 for 19“ rack and wall mounting		
• 11 ... 30 V DC/ 11 ... 24 V AC	**7ME6920-2CA30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6920-2CA10-1AA0**	
Transmitter MAG 6000 SV for 19“ rack and wall mounting; special excitation frequency 44 Hz for Batch application DN ≤ 25/1“		
• 11 ... 30 V DC/ 11 ... 24 V AC	**7ME6920-2CB30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6920-2CB10-1AA0**	
MAG 6000 19" insert, complete mounted with IP66/ NEMA 4X wall mounting enclosure in ABS plastic; 115 ... 230 V AC, 50/60 Hz; cable gland PG13.5	**7ME6920-2EA10-1AA0**	
MAG 6000 19” insert with safety barrier for Ex-approved sensors, complete mounted with IP66/NEMA 4X wall mounting enclosure in ABS plastic, 115 ... 230 V AC, 50/60 Hz; cable gland PG13.5		
• For ATEX 2G D sensors	**7ME6920-2MA11-1AA0**	
MAG 6000 SV 19” insert, complete mounted with IP66/NEMA 4X wall mounting enclosure in ABS plastic, special excitation frequency 44 Hz for Batch application DN ≤ 25/1“; cable gland PG13.5		
• 11 … 30 V DC, 11 … 24 V AC	**7ME6920-2EB30-1AA0**	
• 115 … 230 V AC, 50/60 Hz	**7ME6920-2EB10-1AA0**	

Operating instructions for SITRANS F M MAG 5000/6000

Description	Article No.
For SITRANS F M MAG 5000/6000 IP67	
• English	**A5E02338368**
• German	**A5E02944982**
For SITRANS F M MAG 5000/6000 19"	
• English	**A5E02082880**

All literature is available to download for free, in a range of languages, at www.siemens.com/processinstrumentation/documentation

Communication modules for MAG 6000

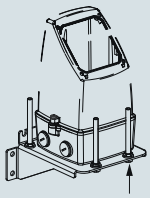
Description	Article No.	
HART (not for MAG 6000 I)	**FDK:085U0226**	
Modbus RTU/RS 485	**FDK:085U0234**	
PROFIBUS PA Profile 3	**FDK:085U0236**	
PROFIBUS DP Profile 3	**FDK:085U0237**	
DeviceNet	**FDK:085U0229**	
FOUNDATION Fieldbus H1	**A5E02054250**	

Operating instructions for SITRANS F add-on modules

Description	Article No.
HART	
• English	**A5E03089708**
PROFIBUS PA/DP	
• English	**A5E00726137**
• German	**A5E01026429**
Modbus	
• English	**A5E00753974**
• German	**A5E03089262**
FOUNDATION Fieldbus	
• English	**A5E02318728**
• German	**A5E02488856**
DeviceNet	
• English	**A5E03089720**

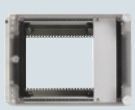
All literature is available to download for free, in a range of languages, at www.siemens.com/processinstrumentation/documentation

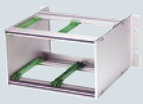
Accessories for MAG 5000 and MAG 6000

Description	Article No.	
Accessory kit for remote use of sensor with two 5-pin terminal blocks	**A5E34827189**	
Wall mounting unit for MAG 5000/6000 IP67/NEMA 4X/6, terminal box in polyamide[1]		
• 4 x M20 cable glands	**FDK:085U1018**	
• 4 x ½“ NPT cable glands	**FDK:085U1053**	
Special wall mounting unit for MAG 5000/6000 IP67/ NEMA 4X/6, mounting bracket in stainless steel AISI 316 (1.4401), terminal box in polyamide		
• 4 x M20 cable glands	**A5E36699702**	
• 4 x ½“ NPT cable glands	**A5E36699938**	
Sun lid for MAG 5000/6000 transmitter (Frame and lid)	**A5E02328485**	
Standard coil or electrode cable, 3 x 1.5 mm²/ 18 gage, single shielded with PVC jacket, Temp. range: -30 ... +70 °C (-22 ... +158 °F)		
• 5 m (16.5 ft)	**A5E02296523**	
• 10 m (33 ft)	**FDK:083F0121**	
• 20 m (65 ft)	**FDK:083F0210**	
• 30 m (98 ft)	**A5E02297309**	
• 40 m (131 ft)	**FDK:083F0211**	
• 50 m (164 ft)	**A5E02297317**	
• 60 m (197 ft)	**FDK:083F0212**	
• 100 m (328 ft)	**FDK:083F0213**	
• 150 m (492 ft)	**FDK:083F3052**	
• 200 m (656 ft)	**FDK:083F3053**	
• 500 m (1640 ft)	**FDK:083F3054**	

[1] For stainless steel wall mounting kit, order:
- M20: FDK:085U1018 and A5E00836867
- ½ NPT: FDK:085U1053 and A5E00836868

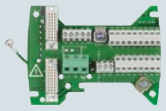
Transmitter MAG 5000/6000

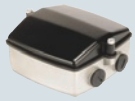
Description	Article No.	
Special electrode cable[1] (empty pipe detection or low conductivity), 3 x 0.25 mm², double shielded with PVC jacket; Temperature range : -30 ... +70 °C (-22 ... +158 °F)		
• 10 m (33 ft)	**FDK:083F3020**	
• 20 m (65 ft)	**FDK:083F3095**	
• 40 m (131 ft)	**FDK:083F3094**	
• 60 m (197 ft)	**FDK:083F3093**	
• 100 m (328 ft)	**FDK:083F3092**	
• 150 m (492 ft)	**FDK:083F3056**	
• 200 m (656 ft)	**FDK:083F3057**	
• 500 m (1640 ft)	**FDK:083F3058**	
Low-noise electrode coax cable for low conductivity and high vibration levels, 3 x 0.13 mm²; Temp. range: -25 ... +85 °C (-13 ... +185 °F)		
• 2 m (6.6 ft)	**A5E02272692**	
• 5 m (16.5 ft)	**A5E02272723**	
• 10 m (33 ft)	**A5E02272730**	
Cable kit including standard coil cable (3 x 1.5 mm²/ 18 gage, single shielded with PVC jacket) and special electrode cable[1] (3 x 0.25 mm², double shielded with PVC jacket); Temperature range: -30 ... +70 °C (-22 ... +158 °F)		
• 5 m (16.5 ft)	**A5E02296329**	
• 10 m (33 ft)	**A5E01181647**	
• 15 m (49 ft)	**A5E02296464**	
• 20 m (65 ft)	**A5E01181656**	
• 25 m (82 ft)	**A5E02296490**	
• 30 m (98 ft)	**A5E02296494**	
• 40 m (131 ft)	**A5E01181686**	
• 50 m (164 ft)	**A5E02296498**	
• 60 m (197 ft)	**A5E01181689**	
• 100 m (328 ft)	**A5E01181691**	
• 150 m (492 ft)	**A5E01181699**	
• 200 m (656 ft)	**A5E01181703**	
• 500 m (1640 ft)	**A5E01181705**	
Potting kit for IP68/NEMA 6P sealing of sensor junction box	**FDK:085U0220**	
19" safety barrier (21 TE)[1] [EEx e ia] IIC for MAG 1100 Ex sensors and MAG 3100 Ex sensors 12 ... 24 V, 115 ... 230 V, incl. back plate (A5E02559810)	**FDK:083F5034**	
Front panel mounting enclosure IP65/NEMA 2 in ABS plastic for 19" insert (21 TE)	**FDK:083F5030**	
Front panel mounting enclosure IP65/NEMA 2 in ABS plastic for 19" insert (42 TE)	**FDK:083F5031**	

Description	Article No.	
Panel mounting enclosure IP20/NEMA 1 in aluminium for 19" insert (21 TE)	**FDK:083F5032**	
Panel mounting enclosure IP20/NEMA 1 in aluminium for 19" insert (42 TE)	**FDK:083F5033**	
Wall mounting enclosure IP66/NEMA 4X in ABS plastic for 19" insert (cable glands and connection board not included)		
• 21 TE	**FDK:083F5037**	
• 42 TE	**FDK:083F5038**	
Front cover (7TE) for panel mounting enclosure	**FDK:083F4525**	
Sun shield for MAG 5000/6000 transmitters in remote design	**A5E01209496**	
Sun Shield for MAG 5000/ 6000 transmitter in compact design on MAG 3100 (DN 15 ... 2000/½" ... 78") or MAG 5100 W (DN 150 ... 1200/6" ... 48")	**A5E01209500**	

[1] Special cables cannot be used with 19" safety barrier

Spare parts

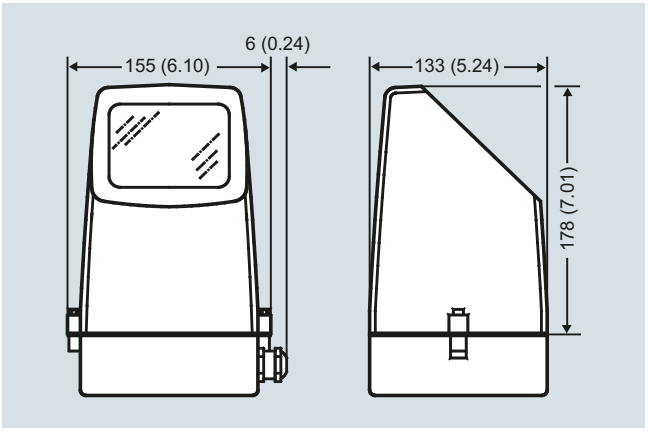
Description	Article No.	
Connection board (for polyamide terminalbox)		
• 12 ... 24 V	**A5E02559817**	
• 115 ... 230 V	**A5E02559816**	
Connection board (for stainless steel terminalbox)		
• 12 ... 24 V	**A5E02604280**	
• 115 ... 230 V	**A5E02604272**	
Connection board MAG 5000/6000 19“ insert for panel mounting enclosure, 12 ... 24 V/115 ... 230 V	**A5E02559809**	
Connection board MAG 5000/6000 19" insert with safety barrier for panel mounting enclosure, 12 ... 24 V/115 ... 230 V	**A5E02559810**	
Connection board MAG 5000/6000 19" insert with safety barrier for panel mounting enclosure, 12 ... 24 V/115 ... 230 V (only for sensors produced before October 2007)	**A5E02559811**	
Connection board MAG 5000/6000 19" insert with cleaning unit for panel mounting enclosure, 12 ... 24 V/115 ... 230 V	**FDK:083F4123**	
SENSORPROM memory unit (Sensor code and serial numbers must be specified on order)		
• 2 kB (for MAG 5000/6000/ MAG 6000 I)		
- 1 pc.	**FDK:085U1005**	
- 10 pcs.	**FDK:083F5052**	
• 250 B (for MAG 2500/3000)	**FDK:085U1008**	
Display unit for MAG 5000/6000		
• Black neutral front	**FDK:085U1038**	
• Siemens front	**FDK:085U1039**	
HW key	**On request**	
Cable glands (polyamide), 4 pcs.		
• M20	**A5E00822490**	
• ½“ NPT	**A5E00822501**	
• PG 13.5, 2 pcs.	**FDK:083G0228**	 ½“ NPT M20

Description	Article No.	
Sealing screws for sensor/ transmitter, 2 pcs	**FDK:085U0221**	
Terminal box, in polyamide, inclusive lid, terminal blocks, gasket and screws		
• M20	**FDK:085U1050**	
• ½" NPT	**FDK:085U1052**	
Terminal box lid, in polyamide	**FDK:085U1003**	
Terminal box, in stainless steel, inclusive lid, terminal blocks, gasket and screws, for MAG 6000 in stainless steel and for all Ex sensors,		
• M20	**A5E00836867**	
• ½" NPT	**A5E00836868**	
Terminal box (3A) for MAG 1100 F in polyamide, inclusive lid, terminal blocks, gasket and screws		
• M20	**A5E00822478**	
• ½" NPT	**A5E00822479**	
Gasket for terminal box lid in polyamide or for MAG 5000/ 6000 IP67/ NEMA 4X/6 enclosure in polyamide (5 pcs.)	**A5E37086797**	
Spare part kit for remote use of sensor with 20 pcs. 5-pin terminal blocks	**A5E34346873**	
Display frame in polyamide for MAG 5000/6000 IP67/ NEMA 4X/6 (5 pcs.)	**A5E43491675**	
Connection board MAG 5000/6000 19“ insert for wall mounting enclosure, 12 ... 24 V / 115 ... 230 V	**A5E02559813**	
Connection board MAG 5000/ 6000 19" insert with safety barrier for wall mounting enclosure, 12 ... 24 V/115 ... 230 V	**A5E02559814**	
Connection board MAG 5000/ 6000 19" insert with safety barrier for wall mounting enclosure, 12 ... 24 V/115 ... 230 V (only for sensors produced before October 2007)	**A5E02559812**	
Connection board MAG 5000/ 6000 19" insert with cleaning unit for wall mounting enclosure, 12 ... 24 V/115 ... 230 V	**A5E02559815**	
SENSORPROM programmer with RS 232 interface	**FDK:083H4246**	

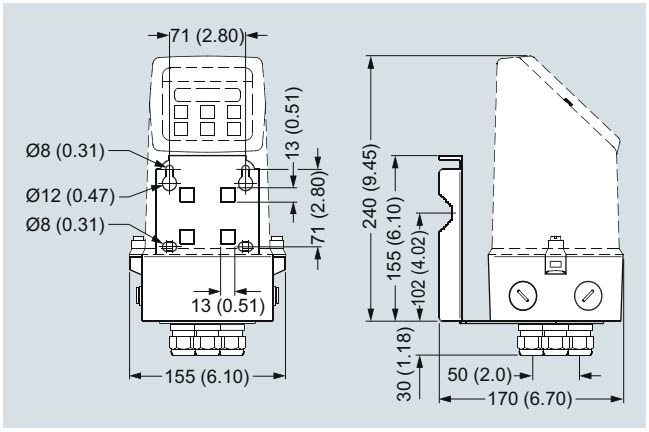
3

Dimensional drawings

Transmitter IP67/NEMA 4X/6 compact polyamide

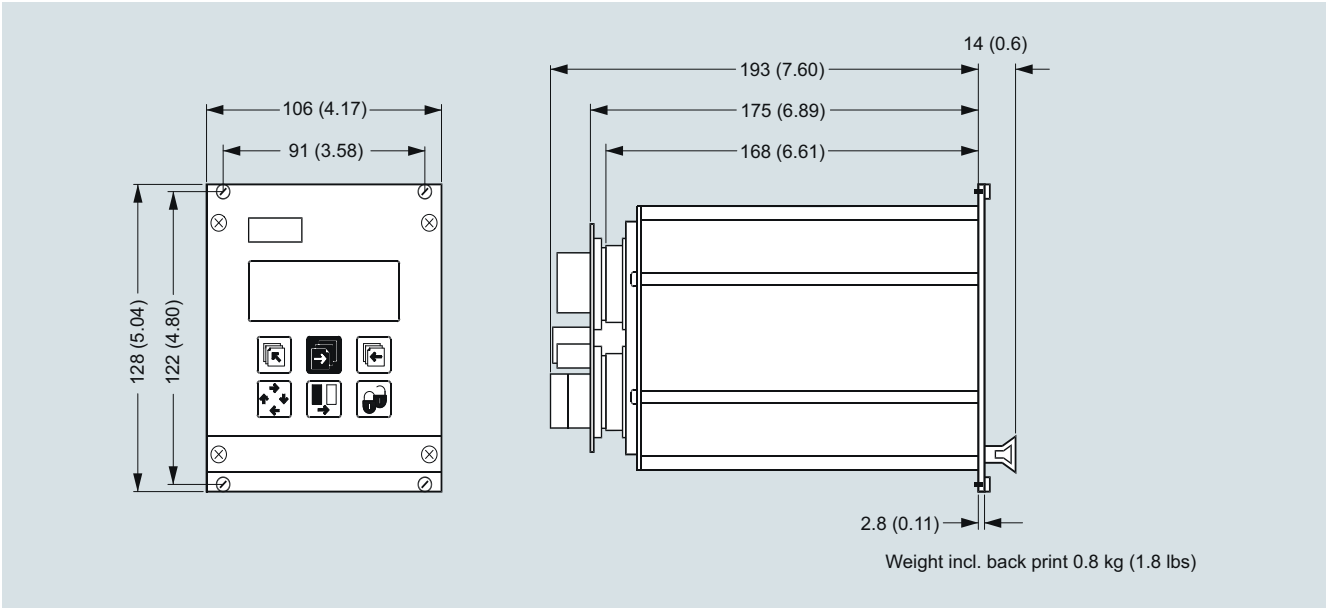


Transmitter compact mounted, dimensions in mm (inch)



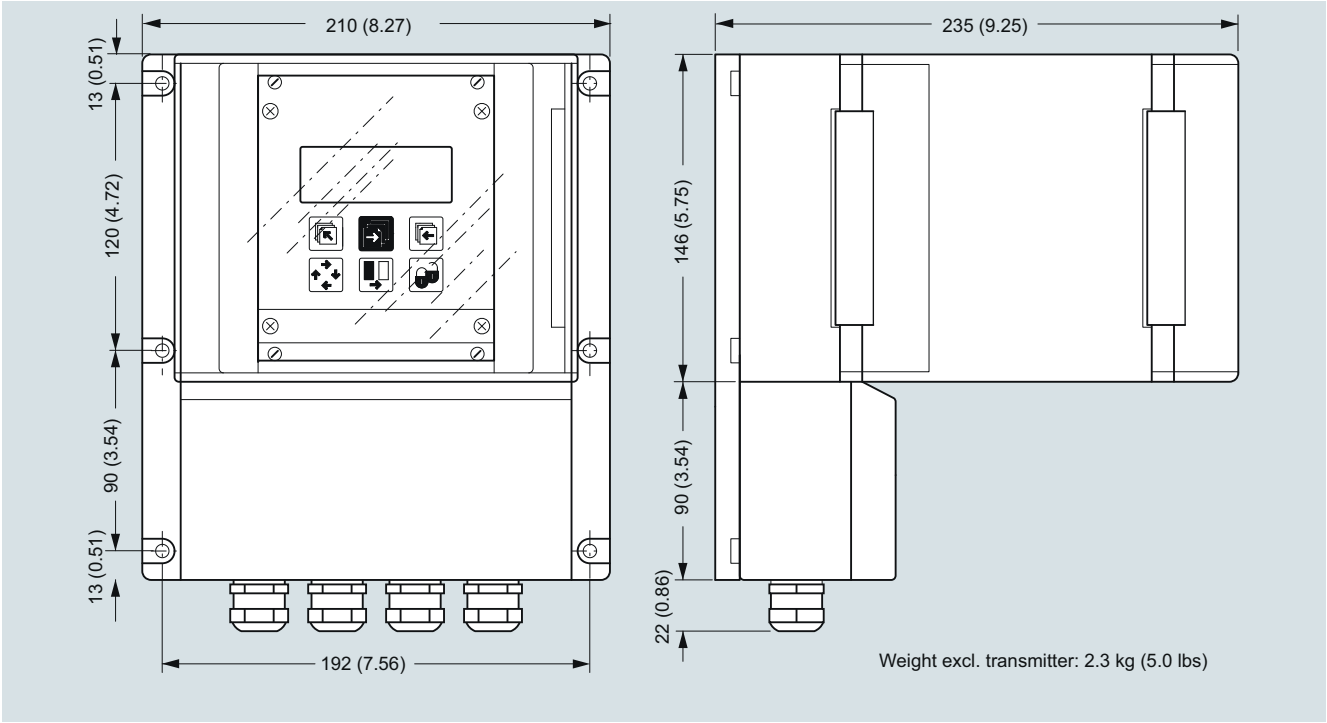
Transmitter wall mounted, dimensions in mm (inch)

Transmitter, 19" IP20/NEMA 1 standard unit



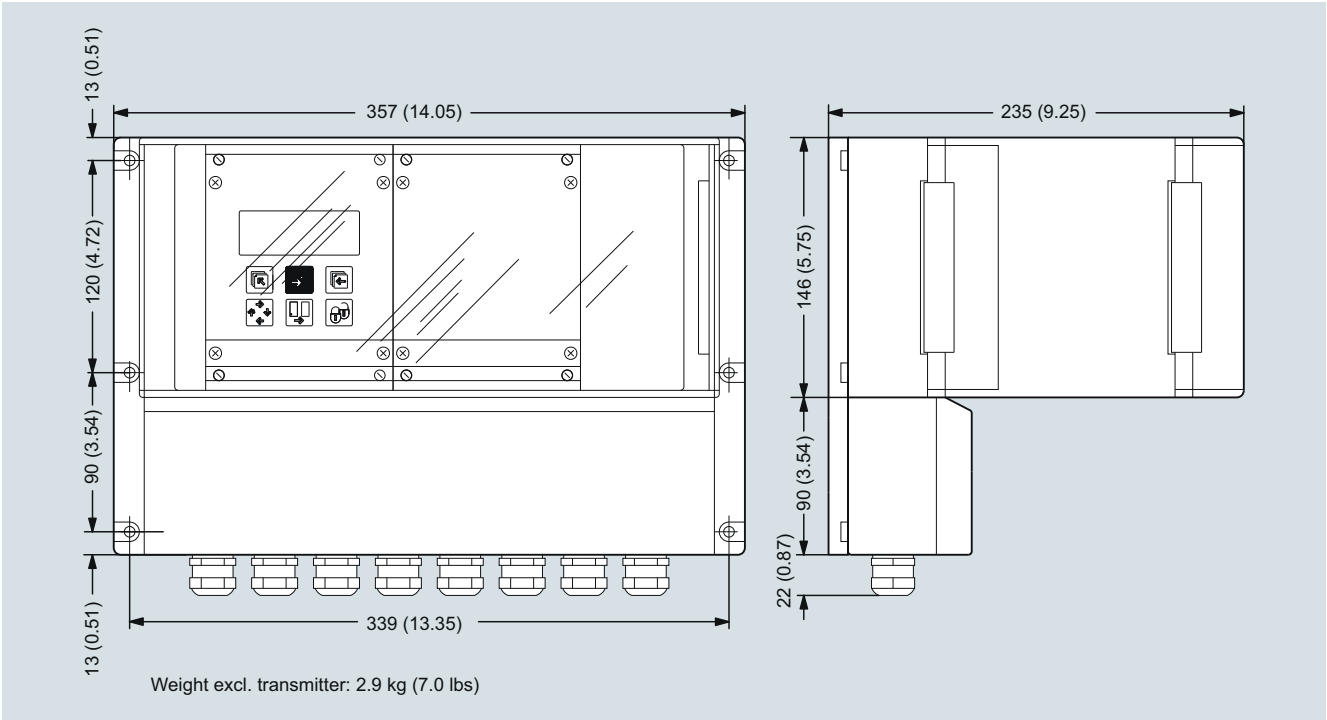
Dimensions in mm (inch)

Transmitter, wall mounting IP66/NEMA 4X, 21 TE



Dimensions in mm (inch)

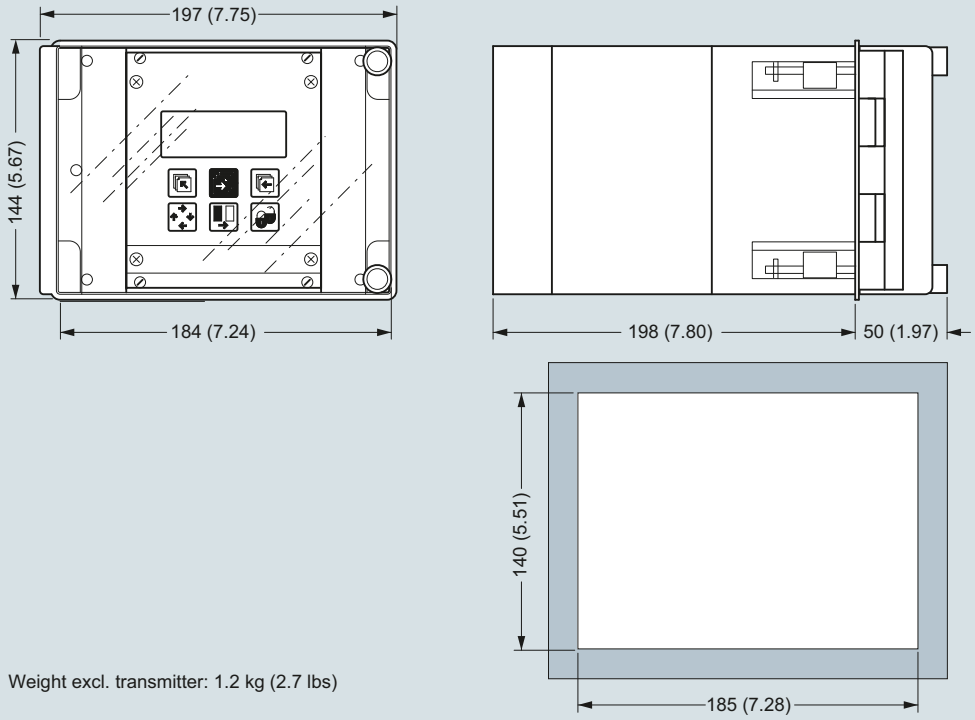
Transmitter, wall mounting IP66/NEMA 4X, 42 TE



Dimensions in mm (inch)

3

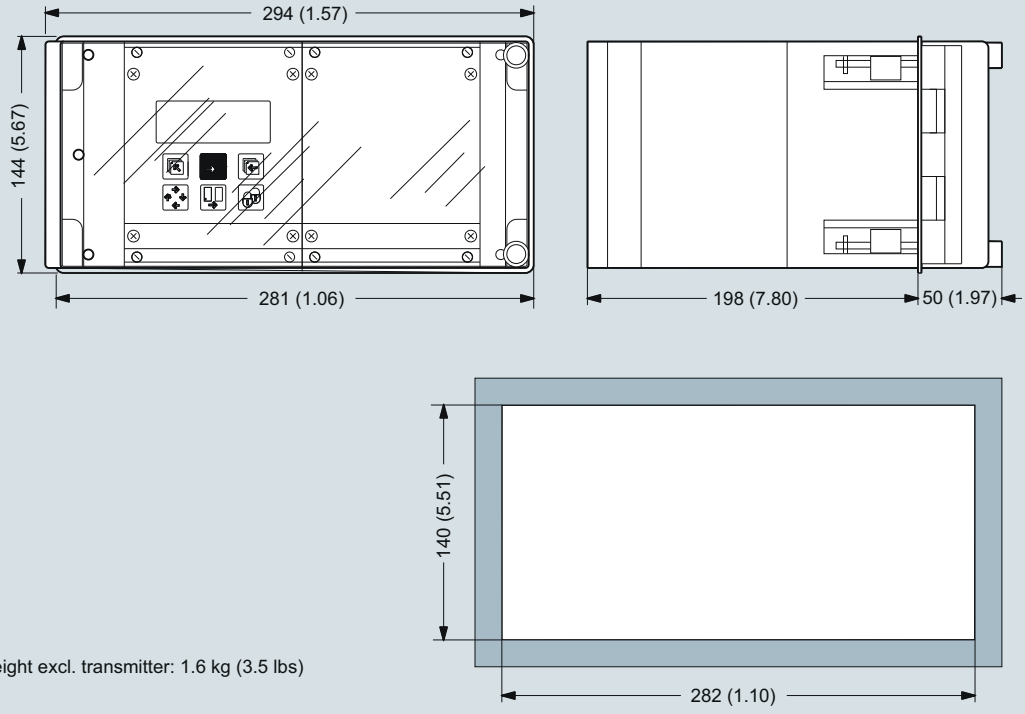
Transmitter, panel front IP20/NEMA 1, 21 TE



Weight excl. transmitter: 1.2 kg (2.7 lbs)

Dimensions in mm (inch)

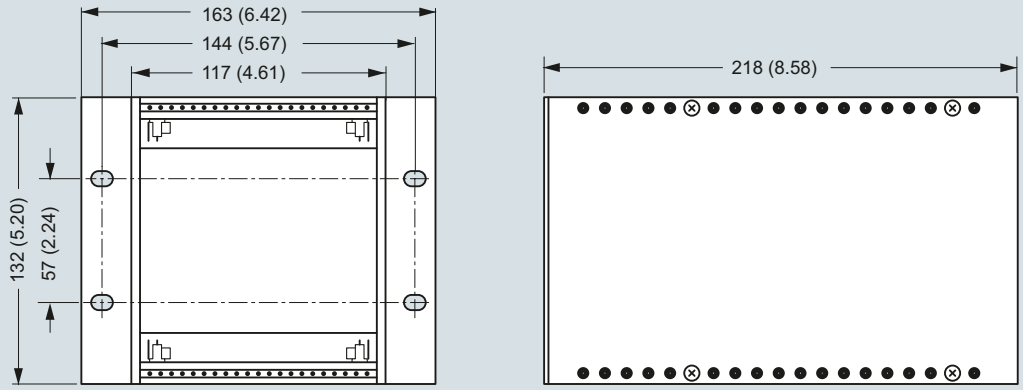
Transmitter, panel front IP20/NEMA 1, 42 TE



Weight excl. transmitter: 1.6 kg (3.5 lbs)

Dimensions in mm (inch)

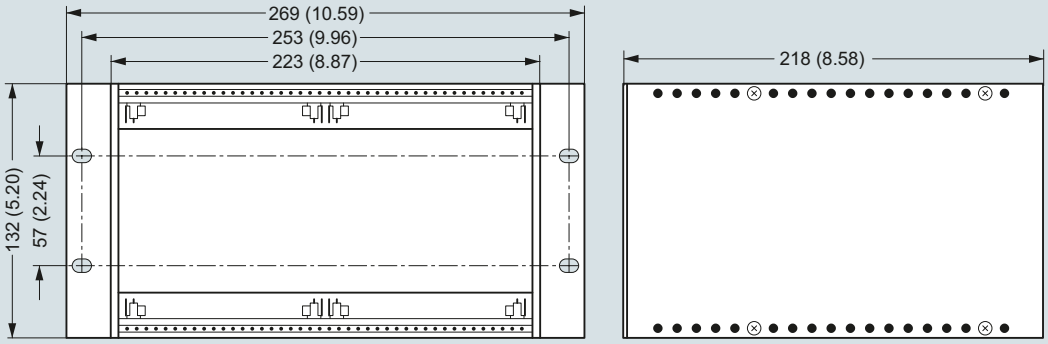
Transmitter, back of panel IP20/NEMA 1, 21 TE



Weight: 0.7 kg (1.6 lbs)

Dimensions in mm (inch)

Transmitter, back of panel IP20/NEMA 1, 42 TE



Weight: 0.9 kg (2.0 lbs)

Dimensions in mm (inch)

3

Schematics

Electrical connection

Grounding

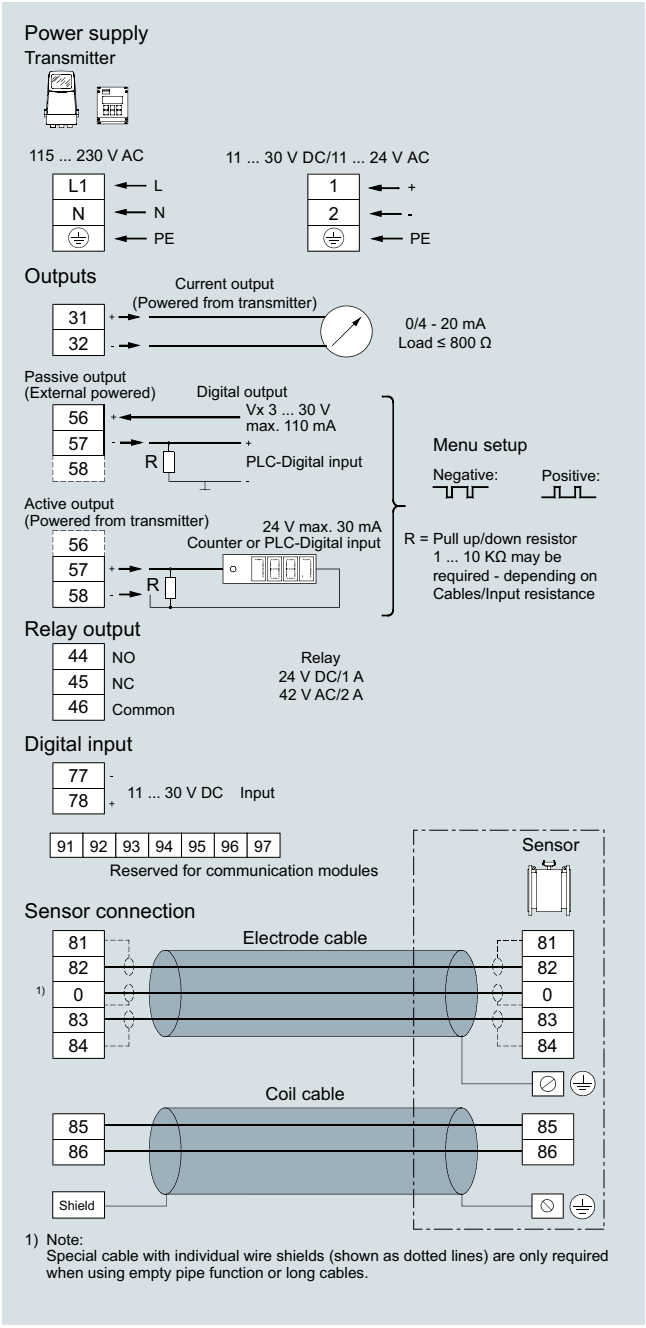
PE must be connected due to safety class 1 power supply.

Mechanical counters

When mounting a mechanical counter to terminals 57 and 58 (active output), a 1000 µF capacitor must be connected to the terminals 56 and 58. Capacitor + is connected to terminal 56 and capacitor - to terminal 58.

Output cables

If the output cable length is long in noisy environment, we recommend to use shielded cable.



Overview

The SITRANS F M MAG 6000 I/MAG 6000 I Ex transmitter is designed for the demands in the process industry. The robust die cast aluminum 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 Ex-rated flowmeters with intrinsically safe rated input and outputs
- For compact or remote installation
- HART, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS PA and DP, Modbus RTU/RS 485 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
- MAG 6000 I NAMUR: compliant with NAMUR NE 21, NE 32, NE 43, NE 53 and NE 70

Design

The transmitter is designed for either compact or remote installation in non-hazardous or hazardous areas (compact mounted transmitter to be ordered together with the sensors).

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 is a 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 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 or Modbus 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 remote mounted installation)
Excitation frequency	Depend on sensor size
Electrode input impedance	> 1 x 10^{14} Ω
Input	
Digital input	11 ... 30 V DC, Ri = 4.4 kΩ
• Activation time	50 ms
• Current	$I_{11\ V\ DC}$ = 2.5 mA, $I_{30\ V\ DC}$ = 7 mA
Output	
Current output	
• Signal range	4 ... 20 mA (active/ passive)
• Load	< 560 Ω
• 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 Ω ≤ Ri ≤ 10 kΩ (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 galvanic isolated
Max. measuring error	
MAG 6000 I/MAG 6000 I Ex (incl. sensor)	± 0.2 % ± 1 mm/s

Transmitter MAG 6000 I/6000 I Ex

Rated operation conditions	
Ambient temperature	
• Operation	
- MAG 6000 I	-20 … +60 °C (-4 … +140 °F)
- MAG 6000 I Ex	-20 … +60 °C (14 … 140 °F)
• Storage	-40 … +70 °C (-40 … +158 °F)
Mechanical load	18 ... 1000 Hz random in x, y, z, directions for 2 hours according to EN 60068-2-36 Transmitter: 1.14 g RMS
Degree of protection	IP67/NEMA 4X to IEC 529 and DIN 40050 (1 mH_2O 30 min.)
EMC performance	IEC/EN 61326-1 (all environments) IEC/EN 61326-2-5 NAMUR NE 21
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 aluminum, with corrosion resistant Basic Polyester powder coating (min. 60 µm)
• Wall mounting	Wall mounting bracket enclosed for remote version
Dimensions	See dimensional drawings
Weight	See dimensional drawings
Power supply	• Standard transmitter: 18 ... 90 V DC; 115 ... 230 V AC +10 %/-15 %; 50 ... 60 Hz • Ex transmitter: 18 ... 30 V DC • Ex transmitter: 115 ... 230 V AC; 50 ... 60 Hz • Ex transmitter NAMUR: 18 ... 30 V DC; 115 ... 230 V AC; 50 ... 60 Hz
Power consumption	• 230 V AC: 20 VA • 24 V DC: 9.6 W, I_N = 0.4 A, I_{ST} = 1 A (3 ms)
Certificates and approvals	
General purpose	• CE (LVD, EMC, PED, RoHS)
Hazardous areas	• ATEX, IECEx, FM, CSA, EAC Ex, NEPSI - Zone 1 Ex d e [ia] ia IIC T6 Gb • ATEX, IECEx, CSA - Zone 21 Ex tD A21 IP67 T85 °C • FM - XP IS Class I Div. 1 Groups A, B, C, D - DIP Class II+III Div. 1 Groups E, F, G
Others	• CMC/CPA (China) • C-TICK (Australia and New Zealand EMC) • EAC (Russia, Belarus, Kazakhstan) • KCC (South Korea)

Cable entries	Remote installation
MAG 6000 I	2 x M25 (for supply/output) and 2 x M16 (for sensor connection) or 2 x ½" NPT (for supply/output) and 2 x M16 (for sensor connection)
MAG 6000 I Ex ATEX 2G D	2 x M20 (for supply/output) and 2 x M16 (for sensor connection)
Communication	
Standard versions	HART, Modbus RTU/RS 485, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS PA, PROFIBUS DP add-on modules
Ex versions	HART, PROFIBUS PA,

[1] Applicable for: Compact mounted MAG 6000 I Ex on MAG 3100 (sizes DN 15 ... DN 300 (½" ... 12"))

Selection and Ordering data	Article No.
SITRANS F M Transmitter MAG 6000 I ↗	**7ME6930-**
Remote with standard wall mounting bracket, local display, die cast aluminum	**2BA□□-1□A□**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Supply voltage	
Standard transmitter: 18 ... 90 V DC; 115 ... 230 V AC, 50 ... 60 Hz	**2**
Standard transmitter (NAMUR): 18 ... 30 V DC; 115 ... 230 V AC, 50 ... 60 Hz	**3**
Ex transmitter: 18 ... 30 V DC	**4**
Ex transmitter: 115 ... 230 V AC, 50 ... 60 Hz	**5**
Ex transmitter (NAMUR): 18 ... 30 V DC; 115 ... 230 V AC, 50 ... 60 Hz	**6**
Ex approval	
Standard sensor: FM Class I, Div 2, CSA Class I, Div 2	**0**
Ex sensor: Hazardous area (ATEX 2 GD; FM Class I, Zone 1; CSA Class I, Zone 1)	**2**
Communication	
None	**A**
HART	**B**
PROFIBUS PA Profile 3	**F**
PROFIBUS DP Profile 3 (not for Ex version)	**G**
Modbus RTU/RS 485 (not for Ex version)	**E**
FOUNDATION Fieldbus H1	**J**
Cable gland entries	
Metric	**0**
½" NPT	**2**

Selection and Ordering data	Order code
Further design	
Please add **"-Z"** to Article No. and specify Order code(s) and plain text.	
Tag name plate, stainless steel (specify in plain text)	**Y17**
Tag name plate, plastic (self adhesive)	**Y18**
Special version (specify in plain text)	**Y99**

Operating instructions for SITRANS F M MAG 6000 I

Description	Article No.
• English	**A5E02083319**
• German	**A5E02210835**

All literature is available to download for free, in a range of languages, at www.siemens.com/processinstrumentation/documentation

Communication modules for MAG 6000 I (All standard outputs can still be used)

Description	Article No.	
HART (only for MAG 6000 I/Ex)	**FDK:085U0321**	
Modbus RTU/RS 485[1)]	**FDK:085U0234**	
PROFIBUS PA Profile 3	**FDK:085U0236**	
PROFIBUS DP Profile 3[1)]	**FDK:085U0237**	
DeviceNet[1)]	**FDK:085U0229**	
FOUNDATION Fieldbus H1	**A5E02054250**	

[1)] Not for Ex versions

Operating instructions for SITRANS F add-on modules

Description	Article No.
HART, English	**A5E03089708**
PROFIBUS PA/DP	
• English	**A5E00726137**
• German	**A5E01026429**
Modbus	
• English	**A5E00753974**
• German	**A5E03089262**
FOUNDATION Fieldbus	
• English	**A5E02318728**
• German	**A5E02488856**
DeviceNet, English	**A5E03089720**

All literature is available to download for free, in a range of languages, at www.siemens.com/processinstrumentation/documentation

Accessories MAG 6000 I/MAG 6000 I Ex

Description	Article No.	
Standard coil or electrode cable, 3 x 1.5 mm²/ 18 gage, single shielded with PVC jacket, Temperature range: -30 ... +70 °C (-22 ... +158 °F)		
• 5 m (16.5 ft)	**A5E02296523**	
• 10 m (33 ft)	**FDK:083F0121**	
• 20 m (65 ft)	**FDK:083F0210**	
• 30 m (98 ft)	**A5E02297309**	
• 40 m (131 ft)	**FDK:083F0211**	
• 50 m (164 ft)	**A5E02297317**	
• 60 m (197 ft)	**FDK:083F0212**	
• 100 m (328 ft)	**FDK:083F0213**	
• 150 m (492 ft)	**FDK:083F3052**	
• 200 m (656 ft)	**FDK:083F3053**	
• 500 m (1640 ft)	**FDK:083F3054**	
Special electrode cable (empty pipe detection or low conductivity), 3 x 0.25 mm², double shielded with PVC jacket, Temperature range: -30 ... +70 °C (-22 ... +158 °F)		
• 10 m (33 ft)	**FDK:083F3020**	
• 20 m (65 ft)	**FDK:083F3095**	
• 40 m (131 ft)	**FDK:083F3094**	
• 60 m (197 ft)	**FDK:083F3093**	
• 100 m (328 ft)	**FDK:083F3092**	
• 150 m (492 ft)	**FDK:083F3056**	
• 200 m (656 ft)	**FDK:083F3057**	
• 500 m (1640 ft)	**FDK:083F3058**	

Description	Article No.	
Cable kit including standard coil cable (3 x 1.5 mm²/ 18 gage, single shielded with PVC jacket) and special electrode cable (3 x 0.25 mm², double shielded with PVC jacket); Temperature range: -30 ... +70 °C (-22 ... +158 °F)		
• 5 m (16.5 ft)	**A5E02296329**	
• 10 m (33 ft)	**A5E01181647**	
• 15 m (49 ft)	**A5E02296464**	
• 20 m (65 ft)	**A5E01181656**	
• 25 m (82 ft)	**A5E02296490**	
• 30 m (98 ft)	**A5E02296494**	
• 40 m (131 ft)	**A5E01181686**	
• 50 m (164 ft)	**A5E02296498**	
• 60 m (197 ft)	**A5E01181689**	
• 100 m (328 ft)	**A5E01181691**	
• 150 m (492 ft)	**A5E01181699**	
• 200 m (656 ft)	**A5E01181703**	
• 500 m (1640 ft)	**A5E01181705**	
Low noise electrode coax cable for low conductivity and high vibration levels, 3 x 0.13 mm²; Temperature range: -25 ... +85 °C (-13 ... +185 °F)		
• 2 m (6.6 ft)	**A5E02272692**	
• 5 m (16.5 ft)	**A5E02272723**	
• 10 m (33 ft)	**A5E02272730**	

Spare parts

Description	Article No.	
Display unit	**FDK:085U3122**	
Accessory bag including cable gland inserts and connectors for sensor cables	**FDK:085U3144**	
Display lid (Ex) in die-cast aluminum, with corrosion resistant coating (min. 60 µm).	**7ME5933-0AC01**	
Blind lid for sensor cables connection compartment (only remote version) in die-cast aluminum, with corrosion resistant coating (min. 60 µm) incl. O-ring seal.	**7ME5933-0AC02**	
Blind lid (mains supply, input/outputs) in die-cast aluminum, with corrosion resistant coating (min. 60 µm).	**7ME5933-0AC03**	

Description	Article No.	
Safety clamp	**7ME5933-0AC06**	
Standard wall-mounting bracket, stainless steel AISI 316L/1.4404	**7ME5933-0AC04**	
Special wall-mounting bracket, BI 2.5 DIN59382 X6Cr17	**7ME5933-0AC05**	

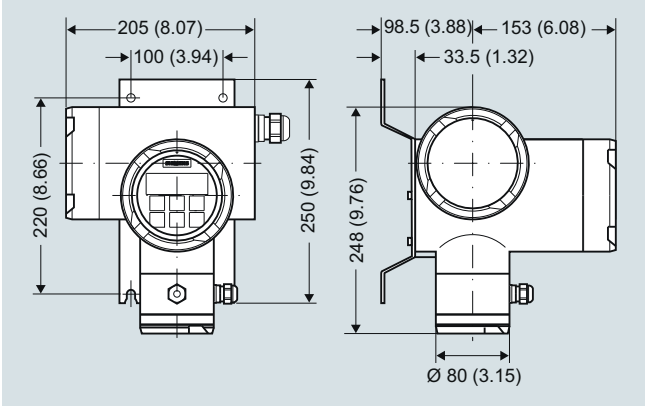
Complete spare part PCB unit

Description	Article No.	
MAG 6000 I std. (not for Ex) 18 ... 30 V DC; 115 ... 230 V AC Spare PCBA	**FDK:085U3123**	
MAG 6000 I std. (NAMUR), 18 ... 30 V DC; 115 ... 230 V AC Spare PCBA	**A5E31426892**	
MAG 6000 I Ex (NAMUR), 18 ... 30 V DC; 115 ... 230 V AC Spare PCBA for use with Ex sensors with increased safety e (For Ex sensors: 7ME6110, 7ME6120, 7ME6140, 7ME6310, 7ME6320, 7ME6340) (For 7ME6330 > DN300)	**A5E31426877**[1)]	
MAG 6000 I Ex d 115 ... 230 V AC Spare PCBA for use with ATEX sensors with increased safety e	**A5E01013127**	
MAG 6000 I Ex d 18 ... 30 V DC Spare PCBA for use with ATEX sensors with increased safety e	**A5E01013340**	

1) Ex spare parts may only be exchanged by authorized personnel from Siemens.

Please use online Product selector to get latest updates.
Product selector link:
www.pia-portal.automation.siemens.com

Dimensional drawings



SITRANS F M transmitter MAG 6000 I with wall-monting bracket, dimensions in mm (inch)

Schematics