

Flowmeters SITRANS F M

Sensor
MAGFLO MAG 1100

Overview



The SITRANS F M MAGFLO MAG 1100 is an electromagnetic flow sensor in a compact wafer design designed for flow applications in the process industry.

Benefits

- Sensor sizes: DN 6 ... 100 (1/4" ... 4")
- Compact wafer design meets EN 1092, DIN and ANSI flange standards
- Corrosion resistant AISI 316 stainless steel sensor housing
- Highly resistant liner and electrodes fitting most extreme process media
- Temperature rating up to 200 °C (390 °F)
- Hose proof IP67/NEMA 4X enclosure rating
- Designed that patented in-situ verification can be conducted. Using SENSORPROM fingerprints.

Application

The main applications of the SITRANS F M MAGFLO electromagnetic flow sensors can be found in the following fields:

- Process industry
- Chemical industry
- Pharmaceutical industry
- Water treatment like e.g. chemical dosing

Design

- Sanitary design for CIP/SIP cleaning
- Compact or remote mounting possible
- Easy "plug & play" field changeability of transmitter
- Simple onsite upgrade to IP68/NEMA 6

Mode of operation

The flow measuring principle is based on Faradays law of electromagnetic induction were the sensor converts the flow into an electrical voltage proportional to the velocity of the flow.

Integration

The complete flowmeter consists of a flow sensor and an associated transmitter SITRANS F M MAGFLO MAG 5000 or 6000.

The flexible communication concept USM II simplifies integration and update to a variety of fieldbus systems such as PROFIBUS DP & PA, DeviceNet, HART, CANopen, MODBUS RTU/RS 485.

Technical data

Measuring principle	Electromagnetic induction
Excitation frequency	
• MAG 1100	DN 6 ... 65 (1/4" ... 2 1/2"): 12.5 Hz DN 80 ... 100 (3", 4"): 6.25 Hz
• MAG 1100 PFA	DN 10 ... 65 (3/8" ... 2 1/2"): 12.5 Hz DN 80 ... 100 (3", 4"): 6.25 Hz
Input	
Nominal size	
• MAG 1100	DN 6 ... DN 100 (1/4" ... 4")
• MAG 1100 PFA	DN 10 ... DN 100 (3/8" ... 4")
Mating flanges	EN 1092-1, ANSI B 16.5 class 150 and 300 or equivalent (DIN 2501) Option: DN 6 or 10 (1/4" or 3/8"): 1/2" pipe connection adapters thread: 1/2" tapered ISO 7-1

Rated operating conditions

Ambient conditions

Ambient temperature

- Remote transmitter -40 ... +100 °C (-40 ... +210 °F)
- Compact transmitter -20 ... +50 °C (-4 ... +120 °F)

Temperature shock

- MAG 1100
 - Duration > 1 min
 - DN 6, 10, 15, 25:
Max. $\Delta T \leq 15$ °C/min (1/4", 3/8", 1/2", 1"):
Max. $\Delta T \leq 15$ K/min
 - DN 40, 50, 65:
Max. $\Delta T \leq 10$ °C/min (1 1/2", 2", 2 1/2"):
Max. $\Delta T \leq 10$ K/min
 - DN 80, 100: Max. $\Delta T \leq 5$ °C/min (3", 4"): Max. $\Delta T \leq 5$ K/min
 - Duration ≤ 1 min, followed by 10 min rest
 - DN 6, 10, 15, 25:
Max. $\Delta T \leq 80$ °C/min (1/4", 3/8", 1/2", 1"):
Max. $\Delta T \leq 80$ K/min
 - DN 40, 50, 65:
Max. $\Delta T \leq 70$ °C/min (1 1/2", 2", 2 1/2"):
Max. $\Delta T \leq 70$ K/min
 - DN 80, 100:
Max. $\Delta T \leq 60$ °C/min (3", 4"): Max. $\Delta T \leq 60$ K/min
- MAG 1100 PFA Max. ± 100 °C (210 °F) momentarily

Operating pressure

- MAG 1100
 - DN 6 ... 65: 40 bar (1/4" ... 2 1/2"): 580 psi
 - DN 80: 37.5 bar (3": 540 psi)
 - DN 100: 30 bar (4": 435 psi)
 - Vacuum: 1×10^{-6} bar (1.5×10^{-5} psi)

- MAG 1100PFA
 - 20 bar (290 psi)
 - Vacuum: 0.02 bar (0.3 psi)

Mechanical load

- 10 ... 1000 Hz random, 3.17 G rms in all directions to EN 60068-2-36



3

Degree of protection (enclosure)	
• Standard	IP67 to EN 60 529 (NEMA 4X), 1 mH ₂ O for 30 min
• Option	IP68 to EN 60 529 (NEMA 6), 10 mH ₂ O cont.

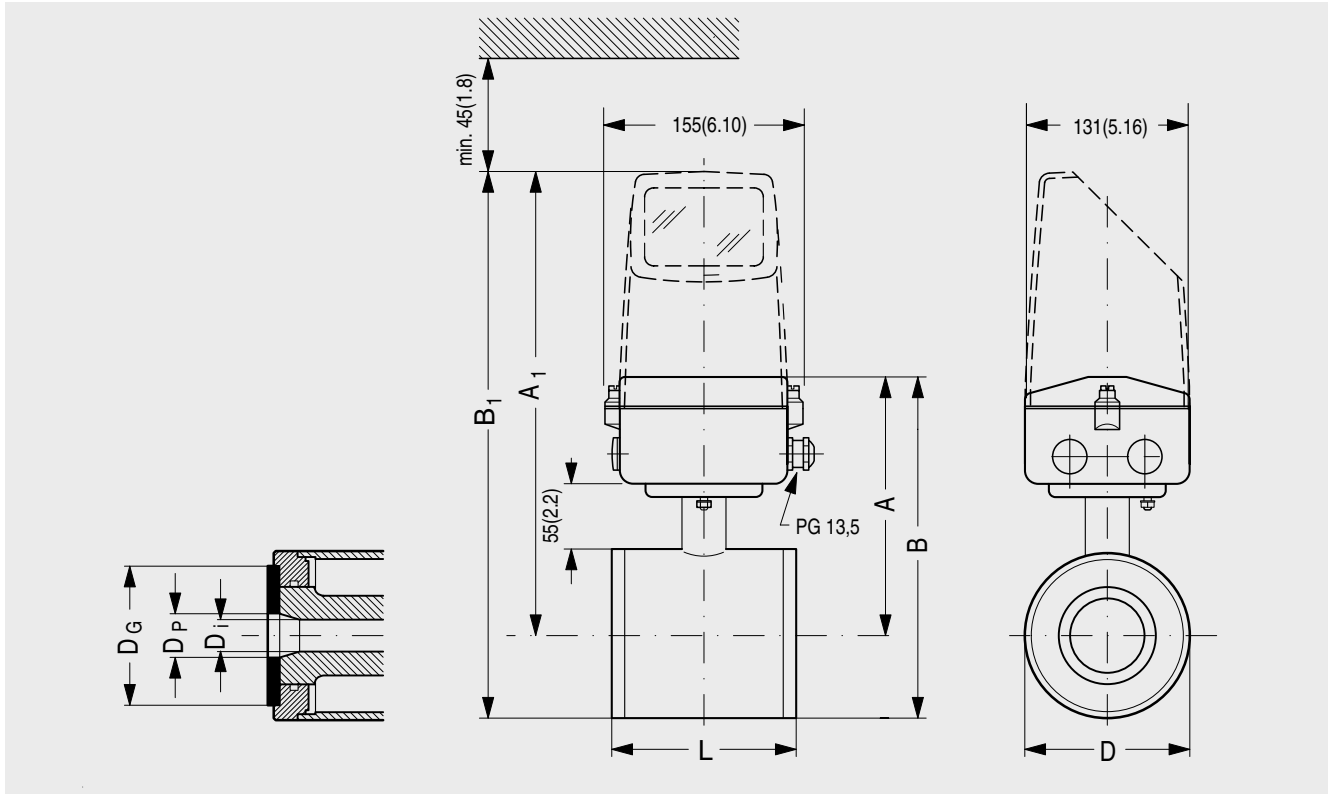
Medium conditions	
Temperature of medium	
• MAG 1100 ceramic	
- Standard	-20 ... +150 °C (-4 ... +300 °F)
- High temperature	-20 ... +200 °C (-4 ... +390 °F)
• MAG 1100 PFA	
- PFA	-30 ... +130 °C (-20 ... +270 °F) Suitable for steam sterilization at 150 °C (300 °F)

Design	
Weight	See Dimensional drawings
Material	
• Enclosure	
- MAG 1100	Stainless steel AISI 316L (1.4404)
- MAG 1100 PFA	Stainless steel AISI 316L (1.4404)
• Terminal box	
- Standard	Fibre glass-reinforced polyamide
- High temperature (remote version only)	Stainless steel AISI 316 (1.4436)
• Fixing studs	Stainless steel AISI 304 (1.4301), Number and size to EN 1092-1:2001
• Gaskets	
- Standard	EPDM (max. 150 °C, PN 40 (max. 300 °F, 600 psi))
- Option	<ul style="list-style-type: none"> • Graphite (max. 200 °C, PN 40 (max. 390 °F, 600 psi)) • PTFE (max. 130 °C, PN 25 (max. 270 °F, 300 psi))
• Metering tube connection DN 6 and DN 10 (1/4" and 3/8")	Stainless steel, AISI 316
Liner	
• MAG 1100	Aluminium oxide Al ₂ O ₃ (ceramics)
• MAG 1100 PFA	Reinforced PFA (teflon)
Electrodes	
• MAG 1100 ceramic	Platinum with gold / Titanium brazing alloy
• MAG 1100 PFA	Hastelloy C276

Certificates and approvals	
Ex approval sensor	EEx [ia][ib] IIB T4-T6
Conforms to PED, LVT, EMC	PED – 97/23 EC, LVD – 73/23 EEC and amendment 93/68 EEC, EMC – 89/336 EEC

Dimensional drawings

Sensor MAG 1100, compact/remote



3

Size	A ¹⁾	B ¹⁾	A ₁	B ₁	D	D _i (Al ₂ O ₃)	D _i PFA	D _p	D _G	Weight ²⁾
DN	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
6	161	186	314	339	48.3	6		17.3	34	2.2
10	161	186	314	339	48.3	10	10	13.6	34	2.2
15	161	186	314	339	48.3	15	16	17.3	40	2.2
25	169	201	322	354	63.4	25	26	28.5	56	2.7
40	181	223	334	376	84.0	40	38	43.4	75	3.4
50	189	240	342	393	101.6	50	50	54.5	90	4.2
65	199	259	352	412	120.0	65	66	68.0	112	5.5
80	205	271	358	424	133.0	80	81	82.5	124	7.0
100	218	297	371	450	159.0	100	100	107.1	145	10.0

Size	A ¹⁾	B ¹⁾	A ₁	B ₁	D	D _i (Al ₂ O ₃)	D _i PFA	D _p	D _G	Weight ²⁾
[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[lbs]
¼	6.34	7.33	12.36	13.35	1.90	0.24		0.68	1.34	4.8
3/8	6.34	7.33	12.36	13.35	1.90	0.39	0.39	0.53	1.34	4.8
½	6.34	7.33	12.36	13.35	1.90	0.39	0.63	0.68	1.57	4.8
1	6.66	7.92	12.68	13.94	2.50	0.98	1.02	1.12	2.20	4.9
1½	7.13	8.78	13.15	14.81	3.31	1.57	1.50	1.71	2.95	7.5
2	7.44	9.45	13.47	15.47	4.00	1.97	1.97	2.15	3.54	9.2
2½	7.84	10.20	13.86	16.22	4.72	2.56	2.60	2.68	4.41	12
3	8.07	10.67	14.10	16.70	5.24	3.15	3.19	3.25	4.88	15
4	8.59	11.70	14.61	17.72	6.26	3.94	3.94	4.22	5.91	22

1) 13 mm / 0.5" shorter when the AISI terminal box is used (high temperature 200 °C (390 °F))

2) With transmitter MAG 5000 or MAG 6000 installed, weight is increased by approximately 0.8 kg (1.8 lbs).



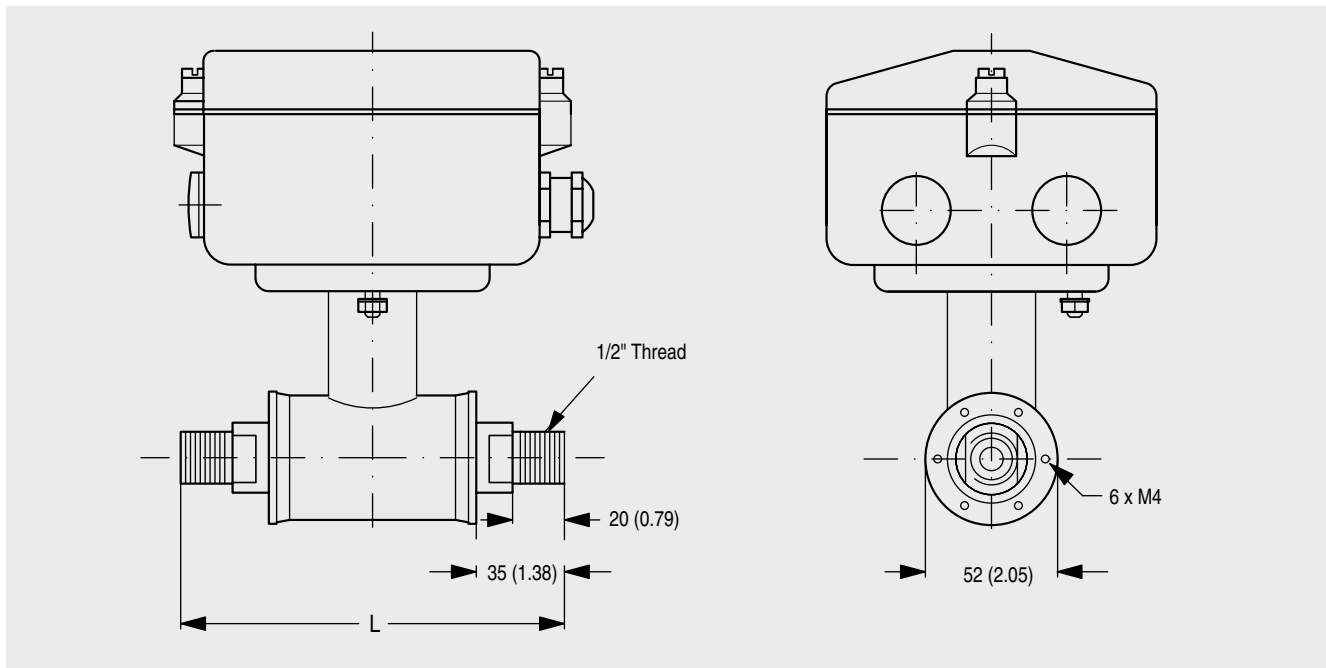
The total build-in length "L" [mm] / [inch] before assembling depends on the gasket selected

Size		EPDM		Graphite		PTFE (Teflon)		Without gasket		Earthing ring	
DN	Inch	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
6	1/4	64	2.52	66	2.60	70	2.75	64	2.52	77	3.03
10	3/8	64	2.52	66	2.60	70	2.75	64	2.52	77	3.03
15	1/2	65	2.56	66	2.60	70	2.75	64	2.52	77	3.03
25	1	80	3.15	81	3.19	85	3.35	79	3.10	92	3.62
40	1 1/2	95	3.74	96	3.78	100	3.94	94	3.70	107	4.21
50	2	105	4.13	106	4.17	110	4.33	104	4.05	117	4.61
65	2 1/2	130	5.12	131	5.15	135	5.31	129	5.05	142	5.60
80	3	155	6.10	156	6.14	160	6.30	154	6.00	167	6.57
100	4	185	7.28	186	7.31	190	7.48	184	7.20	197	7.76

The length "L" varies dependent on the gasket choice.

Without gasket		EPDM		Graphite		Teflon	
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
150	5.9	150	5.9	152	6.0	156	6.1

Sensor MAG 1100 compact/separate



The MAG 1100 DN 6 and DN 10 (1/4" and 3/8") are prepared for assembly with the 1/2" pipe connection.



Ordering Data	Order No.	Further Designs	Order code
Flow sensor MAGFLO MAG 1100 for connection to MAGFLO converters MAG 5000 and MAG 6000		Add-On-Services for sensors SITRANS FM MAGFLO Please add „-Z“ to Order No. and specify Order code(s) and plain text.	
MAG 1100 sensor – Standard, IP67 Ceramic (Al ₂ O ₃) liner, Electrodes: Platinum Included: 2 EPDM gaskets, studs and nuts		Customer specific transmitter set up When ordering, please send set up data per email to: Siemens Flow Instruments A/S	Y20
<ul style="list-style-type: none"> ▶ DN 6, ¼" ▶ DN 10, 3/8" ▶ DN 15, ½" 	<ul style="list-style-type: none"> ▶ FDK:083G4044 ▶ FDK:083G4046 ▶ FDK:083G4047 	Name tag made of SS fixed with SS wire (please add desired text as plain text)	Y17
<ul style="list-style-type: none"> ▶ DN 25, 1" ▶ DN 40, 1½" ▶ DN 50, 2" 	<ul style="list-style-type: none"> ▶ FDK:083G4049 ▶ FDK:083G4051 ▶ FDK:083G4052 	Name tag made of plastics (self adhesive)	Y18
<ul style="list-style-type: none"> ▶ DN 65, 2½" ▶ DN 80, 3" ▶ DN 100, 4" (Studs for PN 10/16 only) 	<ul style="list-style-type: none"> ▶ FDK:083G4053 ▶ FDK:083G4054 ▶ FDK:083G4055 	Factory certificate according EN 10204 2.1	C15
MAG 1100 sensor – Standard, IP67 PFA-liner, Electrodes: Hastelloy C Included: 2 EPDM gaskets, studs and nuts		Factory certificate according EN 10204 2.2	C14
<ul style="list-style-type: none"> ▶ DN 10, 3/8" ▶ DN 15, ½" ▶ DN 25, 1" 	<ul style="list-style-type: none"> ▶ FDK:083G5046 ▶ FDK:083G5047 ▶ FDK:083G5049 	Power cable wired Please specify cable Order No. in plain text. Electrode- and magnetizing coil cable must be ordered separately.	Y40
<ul style="list-style-type: none"> ▶ DN 40, 1½" ▶ DN 50, 2" ▶ DN 65, 2½" 	<ul style="list-style-type: none"> ▶ FDK:083G5051 ▶ FDK:083G5052 ▶ FDK:083G5053 	Junction box IP68 with wired cable Including sealing compound Please specify cable Order No. in plain text. Electrode- and magnetizing coil cable must be ordered separately	Y41
<ul style="list-style-type: none"> ▶ DN 80, 3" ▶ DN 100, 4" (Studs for PN 10/16 only) 	<ul style="list-style-type: none"> ▶ FDK:083G5054 ▶ FDK:083G5055 	Customer specific tests (Price and test procedure as agreed)	Y90
MAG 1100 sensor – High temperature, IP67 Ceramic (Al ₂ O ₃) liner, max. 200 °C (390 °F) Included: 2 graphite gaskets, studs and nuts		Special version with order no/date (please add desired text as plain text)	Y99
<ul style="list-style-type: none"> ▶ DN 15, ½" ▶ DN 25, 1" ▶ DN 40, 1½" 	<ul style="list-style-type: none"> ▶ FDK:083G4057 ▶ FDK:083G4059 ▶ FDK:083G4061 		
<ul style="list-style-type: none"> ▶ DN 50, 2" ▶ DN 80, 3" ▶ DN 100, 4" (Studs for PN 10/16 only) 	<ul style="list-style-type: none"> ▶ FDK:083G4062 ▶ FDK:083G4064 ▶ FDK:083G4065 		
MAG 1100 sensor – EEx version ATEX Ceramic (Al ₂ O ₃) liner, IP67, Nema 4X, max. 120 °C (248 °F) Included: 2 EPDM gaskets, studs and nuts			
<ul style="list-style-type: none"> ▶ DN 6, ¼" ▶ DN 10, 3/8" ▶ DN 15, ½" 	<ul style="list-style-type: none"> ▶ FDK:083G4024 ▶ FDK:083G4026 ▶ FDK:083G4027 		
<ul style="list-style-type: none"> ▶ DN 25, 1" ▶ DN 40, 1½" ▶ DN 50, 2" 	<ul style="list-style-type: none"> ▶ FDK:083G4029 ▶ FDK:083G4031 ▶ FDK:083G4032 		
<ul style="list-style-type: none"> ▶ DN 65, 2½" ▶ DN 80, 3" ▶ DN 100, 4" (Studs for PN 10/16 only) 	<ul style="list-style-type: none"> ▶ FDK:083G4033 ▶ FDK:083G4034 ▶ FDK:083G4035 		

▶ Available ex stock.





3

Accessories	Order No.
for MAGFLO MAG 1100 flow sensor	
Pipe connection ½" external thread	
Material: AISI 316; 2 pipe connections, 2 gaskets (EPDM), 12 M4 screws (12 mm)	
• For DN 6, ¼" and DN 10, 3/8" sensor ▶	FDK:083G0080
EPDM gaskets	
Material: EPDM; each set includes: 2 EPDM gaskets, 2 earthing wires, 3 M6 screws	
• DN 6/DN 10, ¼" / 3/8"	FDK:083G3116
• DN 15, ½"	FDK:083G3117
• DN 25, 1"	FDK:083G3119
• DN 40, 1½"	FDK:083G3121
• DN 50, 2"	FDK:083G3122
• DN 65, 2½"	FDK:083G3123
• DN 80, 3"	FDK:083G3124
• DN 100, 4"	FDK:083G3125
PTFE gaskets	
Material: PTFE; each set includes: 2 gaskets, 2 earthing wires, 3 M6 screws	
• DN 6/DN 10, ¼" / 3/8"	FDK:083G0156
• DN 15, ½"	FDK:083G0157
• DN 25, 1"	FDK:083G0159
• DN 40, 1½"	FDK:083G0161
• DN 50, 2"	FDK:083G0162
• DN 65, 2½"	FDK:083G0163
• DN 80, 3"	FDK:083G0164
• DN 100, 4"	FDK:083G0165
Graphite gaskets	
Material: Graphite; each set includes: 2 gaskets	
• DN 6/DN 10, ¼" / 3/8"	FDK:083G0116
• DN 15, ½"	FDK:083G0117
• DN 25, 1"	FDK:083G0119
• DN 40, 1½"	FDK:083G0121
• DN 50, 2"	FDK:083G0122
• DN 65, 2½"	FDK:083G0123
• DN 80, 3"	FDK:083G0124
• DN 100, 4"	FDK:083G0125
Grounding ring	
Material: AISI 316 (mat. no. 1.4436); each set includes: 1 grounding ring, 3 teflon gaskets, 1 earth strap, 1 M6 screw	
• DN 6/DN 10, ¼" / 3/8"	FDK:083G0686
• DN 15, ½"	FDK:083G0687
• DN 25, 1"	FDK:083G0689
• DN 40, 1½"	FDK:083G0691
• DN 50, 2"	FDK:083G0692
• DN 65, 2½"	FDK:083G0693
• DN 80, 3"	FDK:083G0694
• DN 100, 4"	FDK:083G0695
Grounding ring	
Material: Hastelloy C; each set includes: 1 grounding ring, 3 teflon gaskets, 1 earth strap, 1 M6 screw	
• DN 6/DN 10, ¼" / 3/8"	FDK:083G3256
• DN 15, ½"	FDK:083G3257
• DN 25, 1"	FDK:083G3259
• DN 40, 1½"	FDK:083G3261
• DN 50, 2"	FDK:083G3262
• DN 65, 2½"	FDK:083G3263
• DN 80, 3"	FDK:083G3264
• DN 100, 4"	FDK:083G3265

▶ Available ex stock.