

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 2 to 100 (1/12" to 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/6 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

- Compact or remote mounting possible
- Easy "plug & play" field changeability of transmitter
- Simple on site upgrade to IP68/NEMA 6P
- Ex ATEX version (MAG 1100 Ex only)

Mode of operation

The flow measuring principle is based on Faraday's law of electromagnetic induction where 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, 6000 or 6000 I. The flexible communication concept USM II simplifies integration and update to a variety of fieldbus systems such as HART, PROFIBUS DP & PA, MODBUS RTU/RS 485.

Technical specifications

Measuring principle	Electromagnetic induction
Excitation frequency	DN 2 ... 65 (1/12" ... 2 1/2"): 12.5 Hz DN 80, 100 (3", 4"): 6.25 Hz
Process connection	
Nominal size	
• MAG 1100 (Ceramic)	DN 2 ... DN 100 (1/12" ... 4")
• MAG 1100 (PFA)	DN 10 ... DN 100 (3/8" ... 4")
Mating flanges	EN 1092-1 (DIN 2501), ANSI B 16.5 class 150 and 300 or equivalent Option: DN 2 ... 10 (1/12" ... 3/8"): G 1/2" / NPT 1/2" pipe connection adapters
Rated operating conditions	
<u>Ambient conditions</u>	
Ambient temperature ¹⁾	
• Remote transmitter	-40 ... +100 °C (-40 ... +210 °F)
• Compact transmitter MAG 5000/6000	-20 ... +50 °C (-4 ... +120 °F)
• Compact transmitter MAG 6000 I	-20 ... +60 °C (-4 ... +140 °F)
<u>Temperature shock</u>	
• MAG 1100 (Ceramic)	
- Duration ≤ 1 min, followed by 10 min rest	<ul style="list-style-type: none"> • DN 2, 3 (1/12", 1/8") No limitations • DN 6, 10, 15, 25: Max. ΔT ≤ 80 °C/min (1/4", 3/8", 1/2", 1"): Max. ΔT ≤ 80 K/min) • DN 40, 50, 65: Max. ΔT ≤ 70 °C/min (1 1/2", 2", 2 1/2"): Max. ΔT ≤ 70 K/min) • DN 80, 100: Max. ΔT ≤ 60 °C/min (3", 4"): Max. ΔT ≤ 60 K/min)
• MAG 1100 (PFA)	Max. ±100 °C (210 °F) momentarily
<u>Operating pressure</u>	
• MAG 1100 (Ceramic)	DN 2 ... 65: 40 bar (1/12" ... 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 1100 (PFA)	20 bar (290 psi) Vacuum: 0.02 bar (0.3 psi)
<u>Mechanical load</u>	
	10 ... 1000 Hz random, 3.17 G rms in all directions to EN 60068-2-36 For compact installation with the MAG 6000 I, transmitter to be supported to avoid tension on sensor part.

¹⁾ Conditions are also dependent on liner characteristics

SITRANS F flowmeters

SITRANS F M

MAGFLO MAG 1100

Technical specifications (continued)

Degree of protection (enclosure)

- Standard IP67 to EN 60529 (NEMA 4X/6),
1 mH₂O for 30 min
- Option IP68 to EN 60529 (NEMA 6P),
10 mH₂O cont.

Medium conditions

Temperature medium

- MAG 1100 (Ceramic)
 - Standard -20 ... +150 °C (-4 ... +300 °F)
 - High temperature version -20 ... +200 °C (-4 ... +390 °F)
 - Ex version
 - T4: -20 ... +100°C (-4... +212°F)
 - T5: -20 ... +82°C (-4 ... +180°F)
 - T6: -20 ... +67°C (-4 ... +153°F)
- MAG 1100 (PFA)
 - PFA -30 ... +130 °C (-20 ... +270 °F)
Suitable for steam sterilization at
150 °C (300 °F)

EMC 89/336 EEC

Design

- Weight See Dimensional drawings
- Material
- Enclosure
 - MAG 1100 Stainless steel AISI 316L (1.4404)
- Terminal box
 - Standard Fibre glass reinforced polyamide
 - Option Stainless steel AISI 316 (1.4436)
 - High temperature and Ex (re-
mote 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)
 - Optional
 - 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 2, 3,
6 and 10 (1/12", 1/8", 1/4" and 3/8") Stainless steel, AISI 316 or
Hastelloy, G1/2" tapered ISO 7-1 or
1/2" NPT thread

Liner

- MAG 1100 (Ceramic)
 - DN 2, 3 (1/12", 1/8"):
Zirconium oxide (ZrO₂)
(ceramic)
 - DN 6 ... 100 (1/4" ... 4"):
Aluminium oxide Al₂O₃
- MAG 1100 (PFA) Reinforced PFA

Electrodes

- MAG 1100 (Ceramic) Platinum with gold / Titanium
brazing alloy
- MAG 1100 (PFA) Hastelloy C276

Cable entries 4 x M20; 1/2" NPT

Certificates and approvals

- Conforms to PED – 97/23 EC
- MAG 1100 (Ceramic)
 - ATEX EEx [ia] [ib] IIB T4-T6
 - FM Class 1 div 2
- MAG 1100 (PFA)
 - FM Class 1 div 2

Selection and Ordering data	Order No.
Sensor SITRANS F M	
MAGFLO MAG 1100 EPDM gaskets	7 ME 6 1 1 0 - A 0 -
Diameter	
DN 2 (1/12")	▶ 1 D
DN 3 (1/8")	▶ 1 H
DN 6 (1/4")	▶ 1 M
DN 10 (3/8")	▶ 1 R
DN 15 (1/2")	▶ 1 V
DN 25 (1")	▶ 2 D
DN 40 (1 1/2")	▶ 2 R
DN 50 (2")	▶ 2 Y
DN 65 (2 1/2")	▶ 3 F
DN 80 (3")	▶ 3 M
DN 100 (4")	▶ 3 T
Liner material	
PFA - DN 10 ... 100 (3/8" ... 4")	▶ 1
Ceramic	▶ 2
Electrode material	
Hastelloy C276 (only with PFA liner)	▶ 1
Platinum (only with ceramic liner)	▶ 2
Transmitter	
No transmitter (can be ordered separately)	▶ A
MAG 6000 I, 18 V ... 90 V DC; 115 ... 230 V AC, 50 ... 60 Hz	▶ C
Communication	
No communication, add-on possible	▶ A
HART	B
PROFIBUS PA Profile 3	F
PROFIBUS DP Profile 3	G
MODBUS RTU/RS 485	E
Cable glands/terminal box	
Metric: polyamid terminal box or 6000 I compact	▶ 1
1/2" NPT: polyamid terminal box or 6000 I compact	▶ 2
Metric: SS terminal box	▶ 3
1/2" NPT: SS terminal box	▶ 4
▶ Available ex stock	

Selection and Ordering data	Order code
Additional information	
Please add "-Z" to Order No. and specify Order code(s) and plain text.	
Customer specific converter setup	Y20
Tag name plate, stainless steel fixed with SS wire (add plain text)	Y17
Tag name plate, plastic (self adhesive)	Y18
Factory certificate according to EN 10204-2.1	C15
Factory certificate according to EN 10204-2.2	C14
Sensor cables wired (specify cable order no.)	Y40
Junction box potted to IP68 with wired cable (specify cable order no.)	Y41
Other postproduction requirements (add desired text)	Y99

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

Selection and Ordering data	Order No.
Sensor SITRANS F M	
MAGFLO MAG 1100 Ex, ATEX Ceramic liner, Platinum electrode, EPDM gaskets	7 ME 6 1 3 0 - A 2 0 - 2
Diameter	
DN 2 (1/12")	1 D
DN 3 (1/8")	1 H
DN 6 (1/4")	1 M
DN 10 (3/8")	1 R
DN 15 (1/2")	1 V
DN 25 (1")	2 D
DN 40 (1 1/2")	2 R
DN 50 (2")	2 Y
DN 65 (2 1/2")	3 F
DN 80 (3")	3 M
DN 100 (4")	3 T
Transmitter	
No transmitter (can be ordered separately)	
MAG 6000 I, 18 V ... 30 V DC, ATEX	A
MAG 6000 I, 115 V ... 230 V, ATEX	D
Communication	
No communication, add on possible	
HART	A
PROFIBUS PA Profile 3	B
Cable glands/terminal box	
Metric: 6000 I, ATEX	1
1/2" NPT: 6000 I, ATEX	2
Metric: SS terminal box	3
1/2" NPT: SS terminal box	4

Selection and Ordering data	Order No.
Sensor SITRANS F M	
MAGFLO MAG 1100 High Temperature Ceramic liner, Platinum electrode, Graphite gaskets	7 ME 6 1 2 0 - A 2 0 - 2 A A
Diameter	
DN 15 (1/2")	1 V
DN 25 (1")	2 D
DN 40 (1 1/2")	2 R
DN 50 (2")	2 Y
DN 80 (3")	3 M
DN 100 (4")	3 T
Cable glands/terminal box	
Metric: SS terminal box	3
1/2" NPT: SS terminal box	4

Selection and Ordering data	Order code
Additional information	
Please add "-Z" to Order No. and specify Order code(s) and plain text.	
Customer specific converter setup	Y20
Tag name plate, stainless steel fixed with SS wire (add plain text)	Y17
Tag name plate, plastic (self adhesive)	Y18
Factory certificate according to EN 10204-2.1	C15
Factory certificate according to EN 10204-2.2	C14
Sensor cables wired (specify cable order no.)	Y40
Junction box potted to IP68 with wired cable (specify cable order no.)	Y41

Please use online Product selector to get latest updates.

Product selector link: www.pia-selector.com/its_main_en.asp

SITRANS F flowmeters

SITRANS F M

MAGFLO MAG 1100

Accessories

Order No.

for MAGFLO MAG 1100 sensor

Pipe connection 1/2" external thread

For DN 2 ... 10 (1/12" ... 3/8") sensor
2 pipe connections, 2 EPDM gaskets,
12 pcs M4 x 12 screws

- 1/2" G, ISO 7-1 tapered thread, SS 316 ▶ **FDK-083G0080**
- 1/2" G, ISO 7-1 tapered thread, Hastelloy C ▶ **FDK-083G4332**
- 1/2" NPT thread, SS 316 ▶ **FDK-083G4330**
- 1/2" NPT thread, Hastelloy C ▶ **FDK-083G4331**

EPDM gaskets

Material: EPDM; each set includes:
2 EPDM gaskets, 2 earthing wires,
3 M6 screws

- DN 2 ... 10, 1/12" ... 3/8" **FDK-083G3116**
- DN 15, 1/2" **FDK-083G3117**
- DN 25, 1" **FDK-083G3119**
- DN 40, 1 1/2" **FDK-083G3121**
- DN 50, 2" **FDK-083G3122**
- DN 65, 2 1/2" **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 2 ... 10, 1/12" ... 3/8" **FDK-083G0156**
- DN 15, 1/2" **FDK-083G0157**
- DN 25, 1" **FDK-083G0159**
- DN 40, 1 1/2" **FDK-083G0161**
- DN 50, 2" **FDK-083G0162**
- DN 65, 2 1/2" **FDK-083G0163**
- DN 80, 3" **FDK-083G0164**
- DN 100, 4" **FDK-083G0165**

Graphite gaskets

Material: Graphite;
each set includes: 2 gaskets

- DN 2 ... 10, 1/12" ... 3/8" **FDK-083G0116**
- DN 15, 1/2" **FDK-083G0117**
- DN 25, 1" **FDK-083G0119**
- DN 40, 1 1/2" **FDK-083G0121**
- DN 50, 2" **FDK-083G0122**
- DN 65, 2 1/2" **FDK-083G0123**
- DN 80, 3" **FDK-083G0124**
- DN 100, 4" **FDK-083G0125**

Grounding ring (S/S)

Material: AISI 316 (mat. no. 1.4436);
each set includes: 1 grounding ring, 3 teflon
gaskets, 1 earth strap, 1 M6 screw

- DN 2 ... 10, 1/12" ... 3/8" **FDK-083G0686**
- DN 15, 1/2" **FDK-083G0687**
- DN 25, 1" **FDK-083G0689**
- DN 40, 1 1/2" **FDK-083G0691**
- DN 50, 2" **FDK-083G0692**
- DN 65, 2 1/2" **FDK-083G0693**
- DN 80, 3" **FDK-083G0694**
- DN 100, 4" **FDK-083G0695**

Accessories

Order No.

for MAGFLO MAG 1100 sensor

Grounding ring (Hastelloy C)

Material: Hastelloy C; each set includes:
1 grounding ring, 3 teflon gaskets, 1 earth
strap, 1 M6 screw

- DN 2 ... 10, 1/12" ... 3/8" **FDK-083G3256**
- DN 15, 1/2" **FDK-083G3257**
- DN 25, 1" **FDK-083G3259**
- DN 40, 1 1/2" **FDK-083G3261**
- DN 50, 2" **FDK-083G3262**
- DN 65, 2 1/2" **FDK-083G3263**
- DN 80, 3" **FDK-083G3264**
- DN 100, 4" **FDK-083G3265**

Studs and nuts

for DN 100 PN 25/40, 8 M20 studs,
16 M20 nuts

Material: AISI 304 (mat. no. 1.4305)

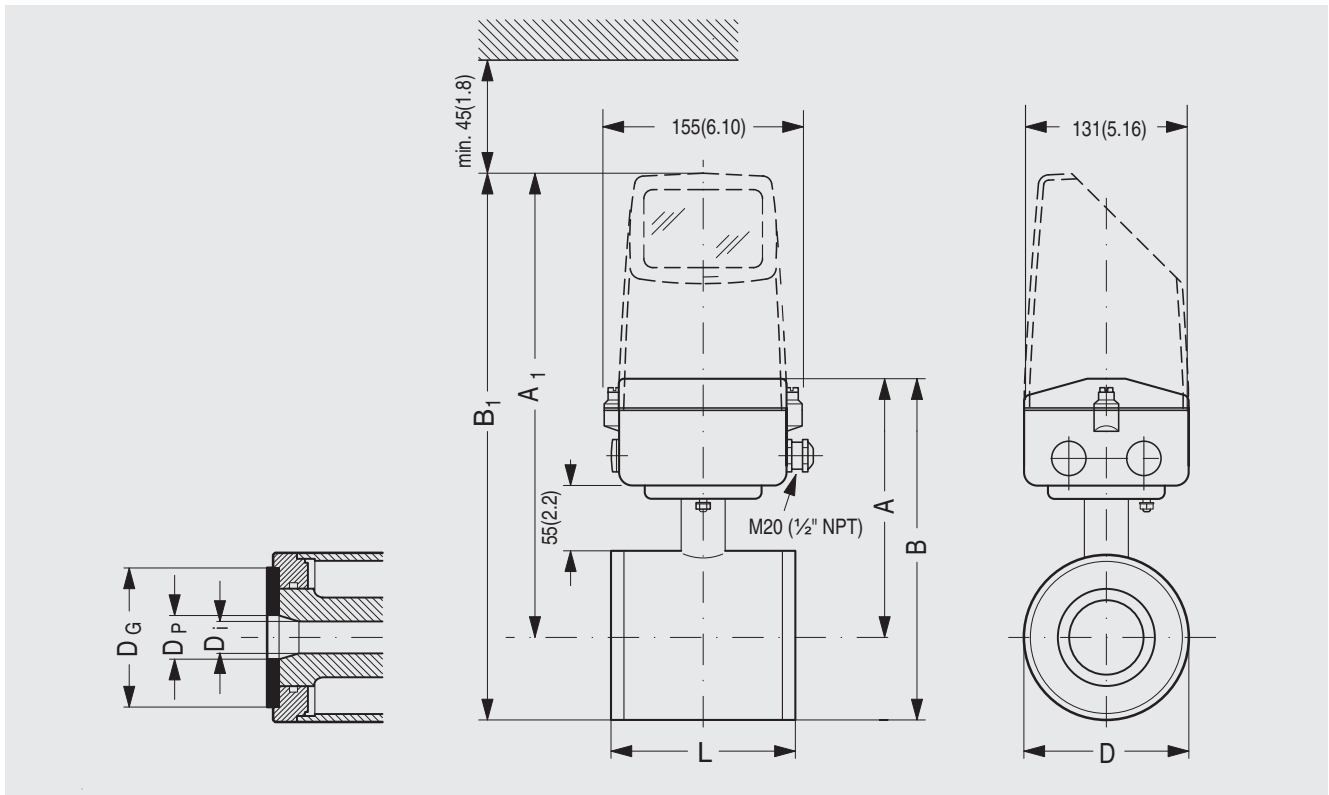
- DN 100, 4" **FDK-083G0226**

▶ Available ex stock.

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Dimensional drawings

Sensor MAG 1100, compact/remote



Size DN	A ¹⁾ [mm]	B ¹⁾ [mm]	A ₁ [mm]	B ₁ [mm]	D [mm]	D ₁ ³⁾ [mm]	D ₁ (PFA) [mm]	D _P [mm]	D _G [mm]	Weight ²⁾ [kg]
2	161	186	314	339	48.3	2		17.3	34	2.2
3	161	186	314	339	48.3	3		17.3	34	2.2
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 [inch]	A ¹⁾ [inch]	B ¹⁾ [inch]	A ₁ [inch]	B ₁ [inch]	D [inch]	D ₁ ³⁾ [inch]	D ₁ (PFA) [inch]	D _P [inch]	D _G [inch]	Weight ²⁾ [lbs]
1/12	6.34	7.33	12.36	13.35	1.90	0.08		0.68	1.34	4.8
1/8	6.34	7.33	12.36	13.35	1.90	0.12		0.68	1.34	4.8
1/4	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
1/2	6.34	7.33	12.36	13.35	1.90	0.59	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
1 1/2	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
2 1/2	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 (Ex or high temperature 200 °C (390 °F) version)

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

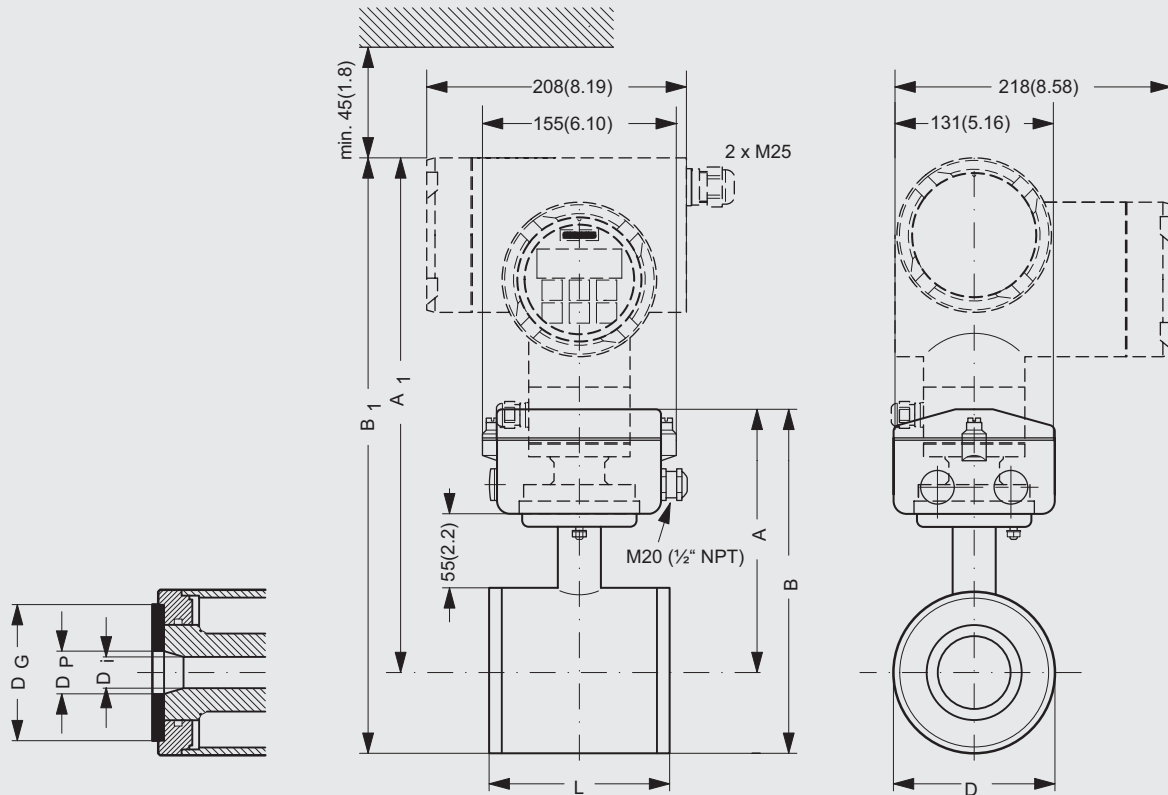
3) DN 2 (1/12") and 3 (1/8"): Zirconium oxide (ZrO₂), DN 6 ...100 (1/4" ... 4"): Ceramic (Al₂O₃)

SITRANS F flowmeters

SITRANS F M

MAGFLO MAG 1100

Sensor MAG 1100/6000 I Compact



Important note: For compact installation with the MAG 6000 I, transmitter to be supported to avoid tension on sensor part.

Size DN	A [mm]	B [mm]	A ₁ ¹⁾ [mm]	B ₁ ¹⁾ [mm]	D [mm]	D _i ³⁾ [mm]	D _i (PFA) [mm]	D _p [mm]	D _G [mm]	Weight ²⁾ [kg]
2	161	186	312	336	48.3	2		17.3	34	2.2
3	161	186	312	336	48.3	3		17.3	34	2.2
6	161	186	312	336	48.3	6		17.3	34	2.2
10	161	186	312	336	48.3	10	10	13.6	34	2.2
15	161	186	312	336	48.3	15	16	17.3	40	2.2
25	169	201	319	351	63.4	25	26	28.5	56	2.7
40	181	223	329	371	84.0	40	38	43.4	75	3.4
50	189	240	338	389	101.6	50	50	54.5	90	4.2
65	199	259	347	407	120.0	65	66	68.0	112	5.5
80	205	271	354	420	133.0	80	81	82.5	124	7.0
100	218	297	367	446	159.0	100	100	107.1	145	10.0

Size [inch]	A [inch]	B [inch]	A ₁ ¹⁾ [inch]	B ₁ ¹⁾ [inch]	D [inch]	D _i ³⁾ [inch]	D _i (PFA) [inch]	D _p [inch]	D _G [inch]	Weight ²⁾ [lbs]
1/12	6.34	7.33	12.28	13.23	1.90	0.08		0.68	1.34	4.8
1/8	6.34	7.33	12.28	13.23	1.90	0.12		0.68	1.34	4.8
1/4	6.34	7.33	12.28	13.23	1.90	0.24		0.68	1.34	4.8
3/8	6.34	7.33	12.28	13.23	1.90	0.39	0.39	0.53	1.34	4.8
1/2	6.34	7.33	12.28	13.23	1.90	0.39	0.63	0.68	1.57	4.8
1	6.66	7.92	12.57	13.82	2.50	0.98	1.02	1.12	2.20	4.9
1 1/2	7.13	8.78	12.95	14.61	3.31	1.57	1.50	1.71	2.95	7.5
2	7.44	9.45	13.31	15.31	4.00	1.97	1.97	2.15	3.54	9.2
2 1/2	7.84	10.20	13.66	16.02	4.72	2.56	2.60	2.68	4.41	12
3	8.07	10.67	13.92	16.54	5.24	3.15	3.19	3.25	4.88	15
4	8.59	11.70	14.43	17.56	6.26	3.94	3.94	4.22	5.91	22

¹⁾ 7.6 mm (0.3 inch) higher in Ex version

²⁾ With transmitter MAG 6000 I weight is increased by approximately 5.5 kg (12.1 lb).

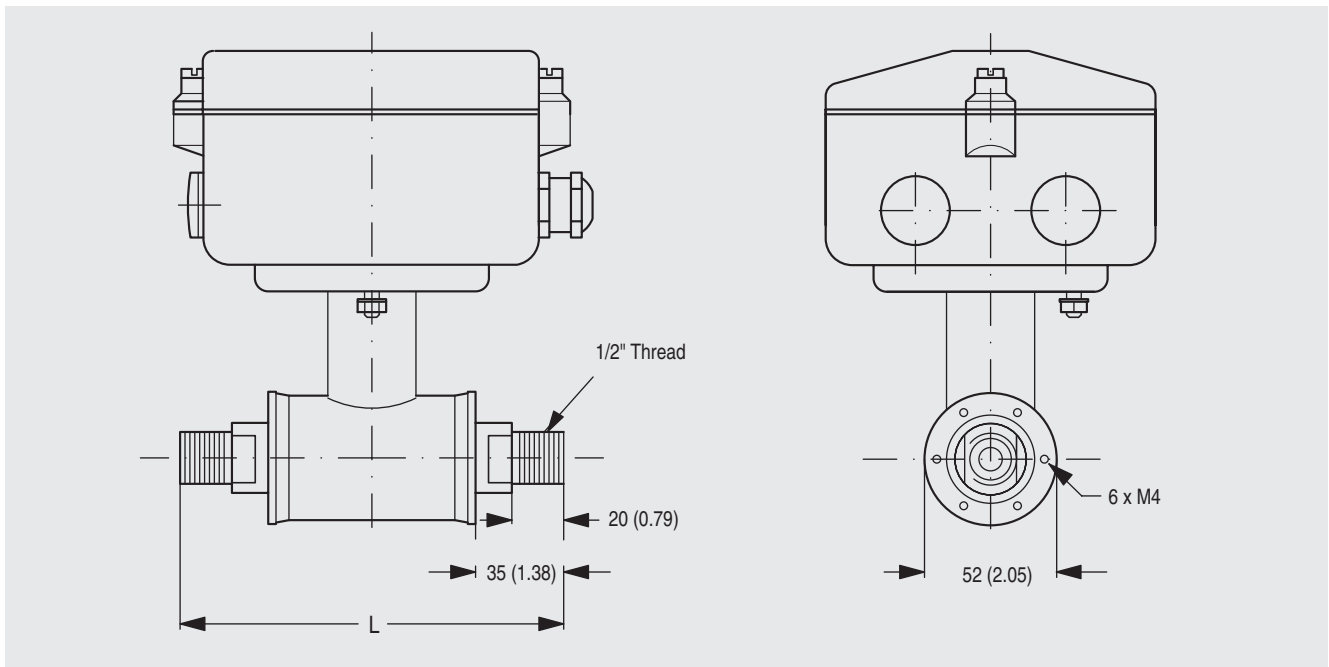
³⁾ DN 2 (1/12") and 3 (1/8"): Zirconium oxide (ZrO₂), DN 6 ...100 (1/4" ... 4"): Ceramic (Al₂O₃)

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]
2 ... 10 ¹⁾	1/12 ... 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

¹⁾ Mounting between two flanges

Sensor MAG 1100 DN 2 ... 10 (1/12" ... 3/8") with adapters



The MAG 1100 DN 2, 3, 6 and 10 (1/12", 1/8", 1/4" and 3/8") are prepared for assembly with the 1/2" pipe connections.

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

Important note:

For compact installation with the MAG 6000 I, transmitter to be supported to avoid tension on sensor part.