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 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, 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" … 2½"): 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"): G½" / NPT ½" pipe connection adapters
Rated operating conditions	
Ambient conditions	
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)
Temperature shock	
• MAG 1100 (Ceramic)	
- Duration ≤ 1 min, followed by 10 min rest	• DN 2, 3 (1/12", 1/8") No limitations • DN 6, 10, 15, 25: Max. ΔT ≤ 80 °C/min (¼", 3/8", ½", 1": Max. ΔT ≤ 80 K/min) • DN 40, 50, 65: Max. ΔT ≤ 70 °C/min (1½", 2", 2½": 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
Operating pressure	
• MAG 1100 (Ceramic)	DN 2 ... 65: 40 bar (1/12" … 2½": 580 psi) DN 80: 37.5 bar (3": 540 psi) DN 100: 30 bar (4": 435 psi) Vacuum: 1 x 10^{-6} bar (1.5 x 10^{-5} psi)
• MAG 1100 (PFA)	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 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

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MAGFLO MAG 1100

Technical specifications (continued)

Degree of protection (enclosure)	
• Standard	IP67 to EN 60529 (NEMA 4X/6), 1 mH_2O for 30 min
• Option	IP68 to EN 60529 (NEMA 6P), 10 mH_2O 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 (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)
- 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“, ¼” and 3/8”)	Stainless steel, AISI 316 or Hastelloy, G½” tapered ISO 7-1 or ½” NPT thread
Liner	
• MAG 1100 (Ceramic)	• DN 2, 3 (1/12“, 1/8“): Zirconium oxide (ZrO_2) (ceramic) • DN 6 ... 100 (¼“ ... 4“): Aluminium oxide Al_2O_3
• 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; ½" 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		7ME6110- ■■A■0-■■■■
Diameter		
DN 2 (1/12“)	▶	1D
DN 3 (1/8“)	▶	1H
DN 6 (¼“)	▶	1M
DN 10 (3/8“)	▶	1R
DN 15 (½“)	▶	1V
DN 25 (1“)	▶	2D
DN 40 (1½“)	▶	2R
DN 50 (2“)	▶	2Y
DN 65 (2½“)	▶	3F
DN 80 (3“)	▶	3M
DN 100 (4“)	▶	3T
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
½" NPT: polyamid terminal box or 6000 I compact		2
Metric: SS terminal box		3
½" 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		7ME6130- ■■A20-2■■
Diameter		
DN 2 (1/12“)		1D
DN 3 (1/8“)		1H
DN 6 (¼“)		1M
DN 10 (3/8“)		1R
DN 15 (½“)		1V
DN 25 (1“)		2D
DN 40 (1½“)		2R
DN 50 (2“)		2Y
DN 65 (2½“)		3F
DN 80 (3“)		3M
DN 100 (4“)		3T
Transmitter		
No transmitter (can be ordered separately)		A
MAG 6000 I, 18 V ... 30 V DC, ATEX		D
MAG 6000 I, 115 V ... 230 V, ATEX		E
Communication		
No communication, add on possible		A
HART		B
PROFIBUS PA Profile 3		F
Cable glands/terminal box		
Metric: 6000 I, ATEX		1
½" NPT: 6000 I, ATEX		2
Metric: SS terminal box		3
½" 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		7ME6120- ■■A20-2AA■
Diameter		
DN 15 (½“)		1V
DN 25 (1“)		2D
DN 40 (1½“)		2R
DN 50 (2“)		2Y
DN 80 (3“)		3M
DN 100 (4“)		3T
Cable glands/terminal box		
Metric: SS terminal box		3
½" 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

MAGFLO MAG 1100

Accessories for MAGFLO MAG 1100 sensor		Order No.
Pipe connection ½" external thread		
For DN 2 ... 10 (1/12" ... 3/8") sensor 2 pipe connections, 2 EPDM gaskets, 12 pcs M4 x 12 screws		
• ½" G, ISO 7-1 tappered thread, SS 316	►	**FDK-083G0080**
• ½" G, ISO 7-1 tappered thread, Hastelloy C	►	**FDK-083G4332**
• ½" NPT thread, SS 316	►	**FDK-083G4330**
• ½" 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, 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 2 ... 10, 1/12" ... 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 2 ... 10, 1/12" ... 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 (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, 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**

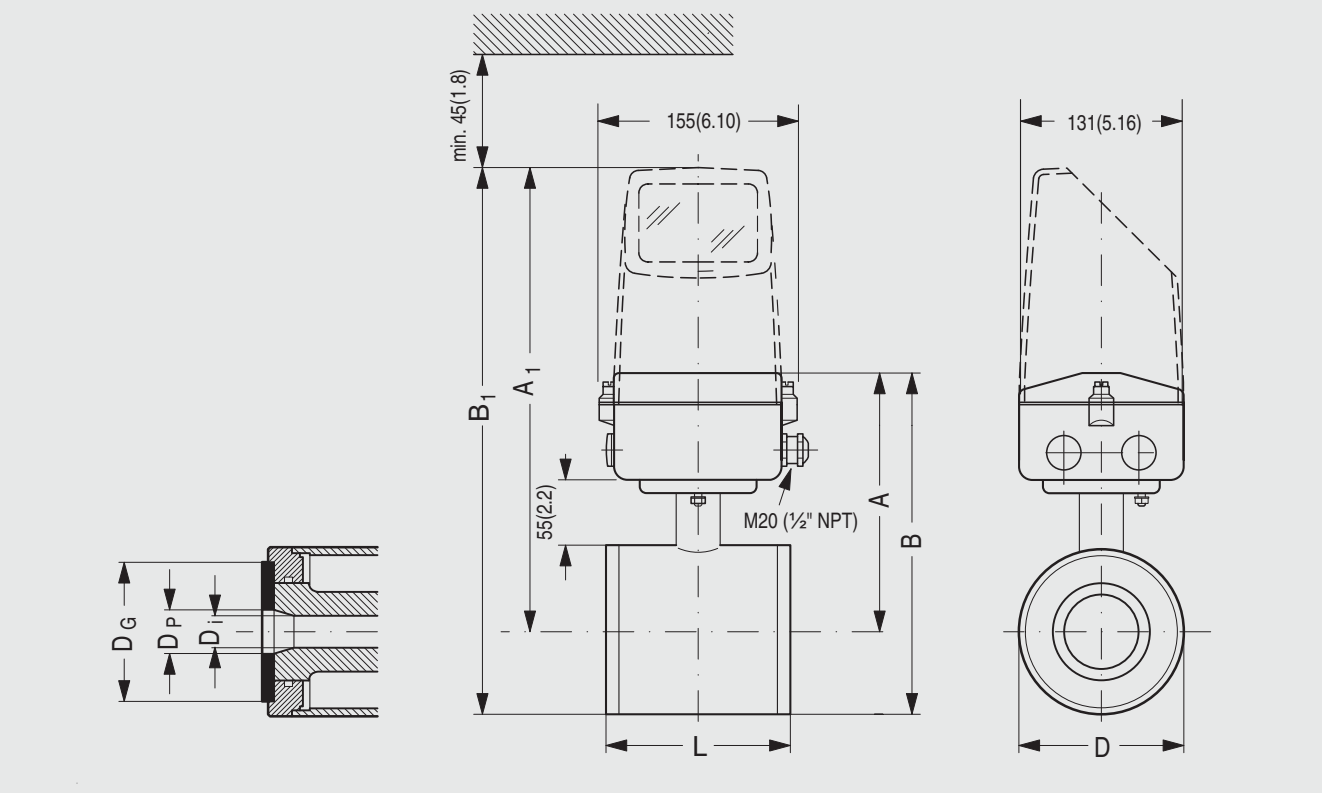
Accessories for MAGFLO MAG 1100 sensor	Order No.
Grounding ring (Hastelloy C)	
Material: Hastelloy C; each set includes: 1 grounding ring, 3 teflon gaskets, 1 earth strap, 1 M6 screw	
• DN 2 ... 10, 1/12" ... 3/8"	**FDK-083G3256**
• DN 15, ½"	**FDK-083G3257**
• DN 25, 1"	**FDK-083G3259**
• DN 40, 1½"	**FDK-083G3261**
• DN 50, 2"	**FDK-083G3262**
• DN 65, 2½"	**FDK-083G3263**
• DN 80, 3"	**FDK-083G3264**
• DN 100, 4"	**FDK-083G3265**
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.

A.P.O. - ELMOS v.o.s., Pražská 90, 509 01 Nová Paka, Tel.: +420 493 504 261, Fax: +420 493 504 257, E-mail: apo@apoelmos.cz, Internet: www.apoelmos.cz

Dimensional drawings

Sensor MAG 1100, compact/remote



Size DN	A[1] [mm]	B[1] [mm]	A_1 [mm]	B_1 [mm]	D [mm]	D_i[3] [mm]	D_i (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_i[3] [inch]	D_i (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
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	0.59	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
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

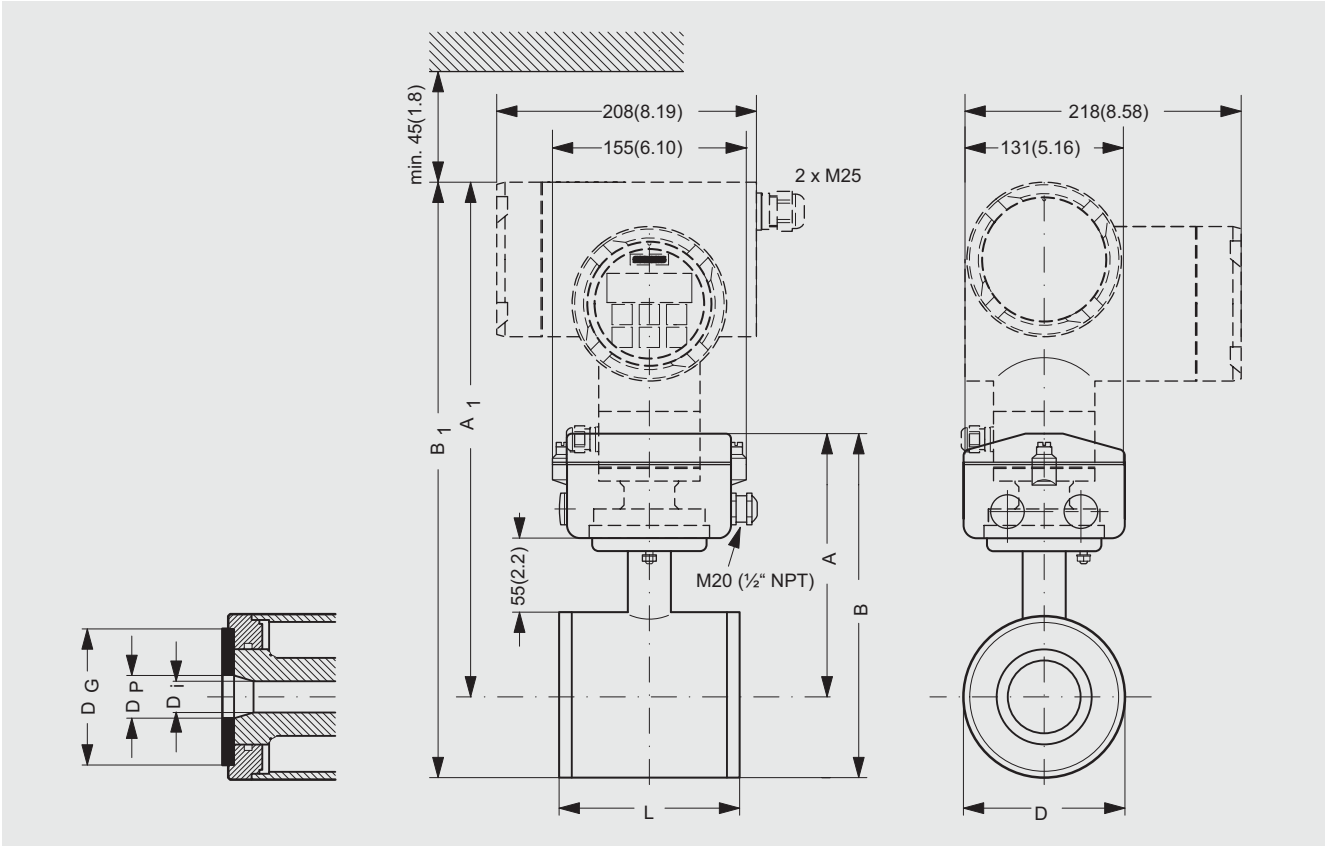
1) 13 mm / 0.5" shorter when the AISI terminal box is used (Ex or high temperature 200 °C (390 °F) version)

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 (ZrO_2), DN 6 ...100 (¼“ ... 4“): Ceramic (Al_2O_3)

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
¼	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
½	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
1½	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
2½	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

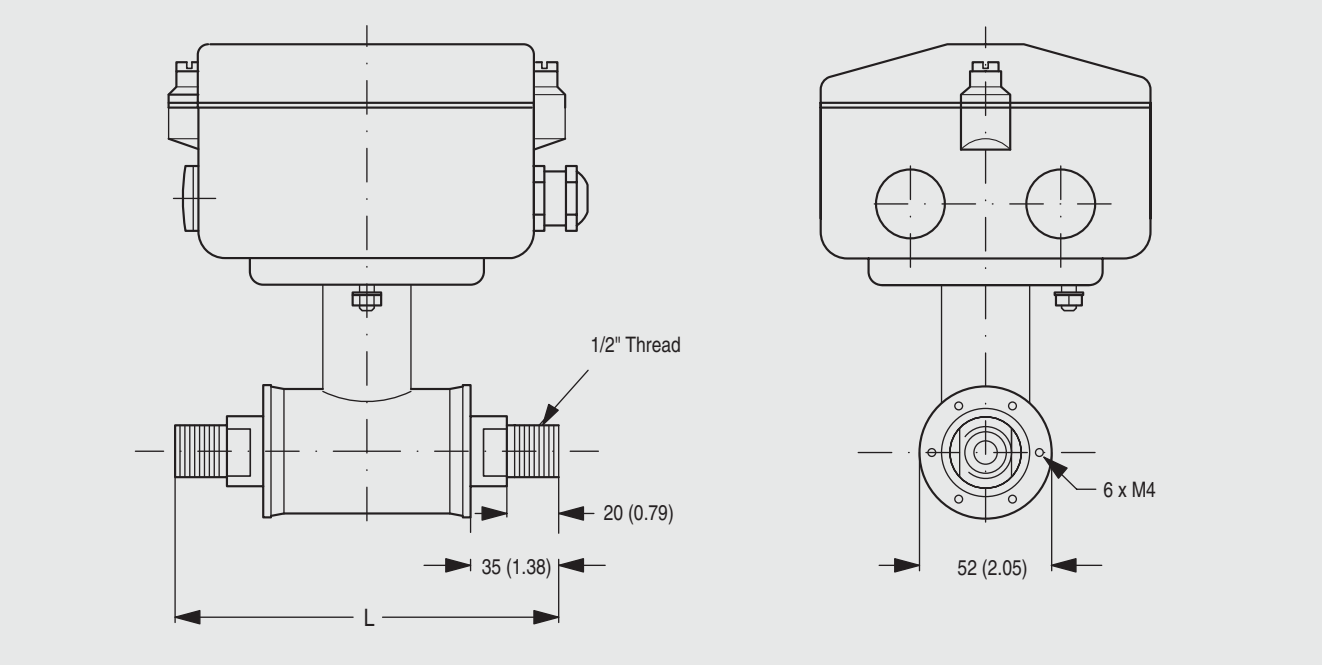
1) 7.6 mm (0.3 inch) higher in Ex version
2) With transmitter MAG 6000 I weight is increased by approximately 5.5 kg (12.1 lb).
3) DN 2 (1/12") and 3 (1/8"): Zirconium oxide (ZrO_2), DN 6 ...100 (¼" ... 4"): Ceramic (Al_2O_3)

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	½	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	1½	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	2½	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“, ¼” and 3/8”) are prepared for assembly with the ½” 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.