

SITRANS F flowmeters

SITRANS F M

MAGFLO MAG 3100 W

Overview



The SITRANS F M MAGFLO MAG 3100 W is an electromagnetic flow sensor designed to meet ground water, drinking water, wastewater, sewage or sludge applications.

Benefits

- Available in sizes from DN 25 to DN 1200 (1" - 48")
- High grade stainless steel integrated grounding and measuring electrodes
- Drinking water approvals
- Custody transfer approved
- Meets EEC directives: PED, 97/23/EC pressure directive for EN 1092-1 flanges
- Suitable for direct burial and constant flooding
- Build-in length according to ISO 13359
- Simple onsite upgrade to IP68 / NEMA 6P of a standard sensor.
- Easy commissioning, SENSORPROM automatically uploads calibration values and settings
- Designed that patented in-situ verification can be conducted. Using SENSORPROM fingerprint.

Application

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

- Water abstraction
- Water treatment
- Water distribution network (leak detection management)
- Custody transfer water meters
- Irrigation
- Waste water treatment
- Filtration plant (e.g. reverse osmosis, ultra filtration)
- Industrial water applications

Design

The sensor is built up of a steel pipe, 2 coils, 2 electrodes, an isolated liner, a housing and one of different flange connections.

Mode of operation

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

Function

Individually calibrated on UKAS EN 45001 accredited calibration facility with a $\pm 0.1\%$ uncertainty.

Integration

The complete flow meter consists of a flow sensor and an associated transmitter SITRANS F M MAGFLO MAG 5000, 6000 and 6000 I (remote version only).

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 specifications

Measuring principle	Electromagnetic induction
Excitation frequency	3.125 Hz

Input

Nominal size	DN 25 ... DN 1200 (1" ... 48")
Flanges	
• EN 1092-1 (EN 1092-1, DIN 2501 and BS 4504 have the same mating dimensions)	DN 25 ... 50 (1" ... 2"): PN 40 (580 psi) DN 65 ... 150 (2½" ... 6"): PN 16 (232 psi) DN 200 ... 1200 (8" ... 48): PN 10/PN 16 (145/232 psi)
• ANSI B16.5	¾" ... 24": Class 150 (20 bar (200 psi))
• AWWA C-207	28" ... 48": Class D (10 bar (145 psi))

Rated operating conditions

<u>Ambient conditions</u>	
Ambient temperature	
• Remote transmitter	-40 ... +100 °C (-40 ... +210 °F)
• Compact transmitter	-20 ... +50 °C (-4 ... +122 °F)
Operating pressure	
• Liner	
- Neoprene, EPDM	0.01 ... 40 bar (0.15 ... 580 psi)
Enclosure rating	
• Standard	IP67/NEMA 4X to EN 60529, 1 mH ₂ O for 30 min
• Option	IP68/NEMA 6P to EN 60529, 10 mH ₂ O cont.
<u>Medium conditions</u>	
Temperature of medium	
• Liner	
- Neoprene (standard)	0 ... 70 °C (32 ... 158 °F)
- EPDM (with WRC (Water Research Council, UK) approval)	-10 ... +95 °C (14 ... 203 °F)
EMC	89/336 EEx

Design

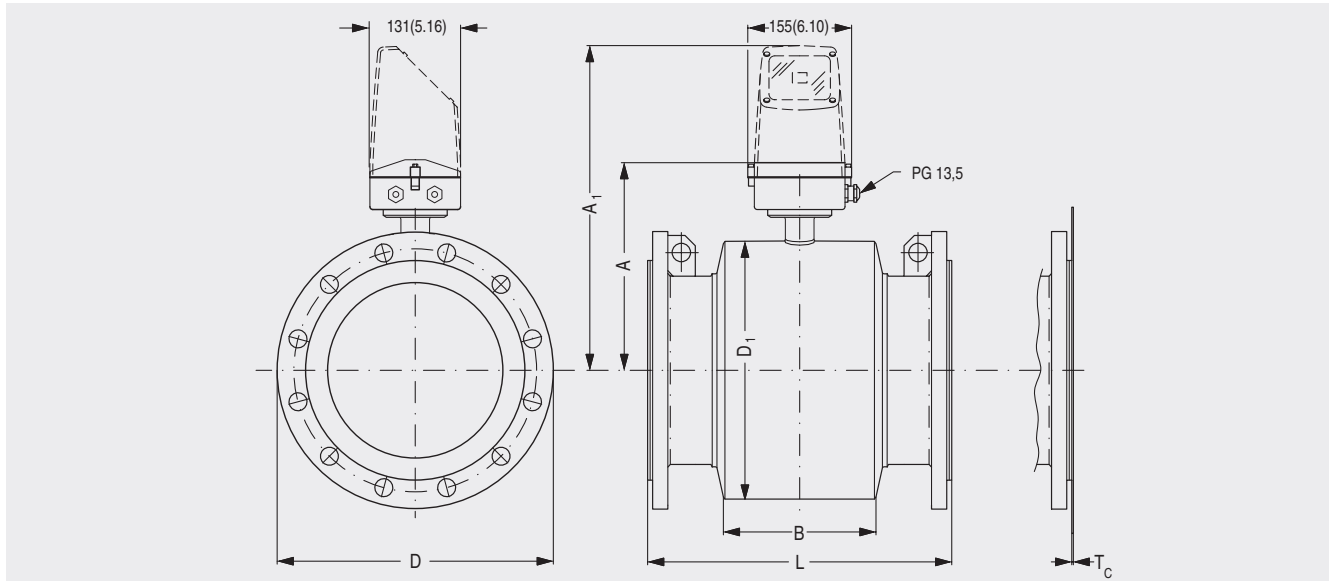
Weight	See Dimensional drawings
Material	
• Flange and housing	Carbon steel
• Measuring pipe	AISI 304 (1.4301)
• Electrodes	AISI 316 Ti (1.4571)

Certificates and approvals

Approvals	PED – 97/23 EC
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Dimensional drawings

Sensor MAG 3100 W compact/remote



DN	A	A ₁	B	D ₁	L ¹⁾			T _C ²⁾	Weight ³⁾
					EN 1092-1-201	BS 1560/ ANSI 16.5 Class 150	AWWA C-207 Class D		
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
25	187	338	59	104	200	200	-	1.2	5
40	197	348	82	124	200	200	-	1.2	8
50	205	356	72	139	200	200	-	1.2	9
65	212	363	72	154	200	200	-	1.2	11
80	222	373	72	174	200	272	-	1.2	12
100	242	393	85	214	250	250	-	1.2	16
125	255	406	85	239	250	250	-	1.2	19
150	276	427	85	282	300	300	-	1.2	27
200	304	455	137	338	350	350	-	1.2	40
250	332	483	137	393	450	450	-	1.2	60
300	357	508	137	444	500	500	-	1.6	80
350	362	513	270	451	550	550	-	1.6	110
400	387	538	270	502	600	600	-	1.6	125
450	418	569	310	563	600	600	-	1.6	175
500	443	594	350	614	625	680	-	1.6	200
600	494	645	430	715	750	820	-	1.6	300
700	544	695	500	816	875	-	875	2.0	350
750	571	722	556	869	-	-	937	2.0	380
800	606	757	560	927	1000	-	1000	2.0	475
900	653	804	630	1032	1125	-	1125	2.0	560
1000	704	906	670	1136	1250	-	1250	2.0	700
1100	755	906	770	1238	1375	-	-	2.0	1200
1200	810	961	792	1348	1500	-	1500	2.0	1250

1) When earthing rings are used, the thickness of the earthing flange must be added to the build-in length

2) T_C = Type C grounding ring

3) Weights are approx. for PN 16 without transmitter

D = Outside diameter of flange, see flange tables

- Means not available

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Sensor MAG 3100 W integrated or remote and separate

DN	A	A ₁	B	D ₁	L ¹⁾			T _C ²⁾	Weight ³⁾
					EN 1092-1-201	BS 1560/ ANSI 16.5 Class 150	AWWA C-207 Class D		
[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[lb]
1	7.36	13.31	2.32	4.09	7.87	7.87	-	0.05	13
1½	7.76	13.70	3.23	4.88	7.87	7.87	-	0.05	17
2	8.07	14.01	2.83	5.47	7.87	7.87	-	0.05	28
2½	8.35	14.29	2.83	6.06	7.87	7.87	-	0.05	30
3	8.74	14.69	2.83	6.85	7.87	10.71	-	0.05	33
4	9.53	15.47	3.35	8.43	9.84	9.84	-	0.05	44
5	10.04	15.98	3.35	9.41	9.84	9.84	-	0.05	55
6	10.87	16.81	5.39	11.10	11.81	11.81	-	0.05	66
8	11.97	17.91	5.39	13.31	13.78	13.78	-	0.05	110
10	13.07	19.02	5.39	15.47	17.72	17.72	-	0.05	155
12	14.05	20.00	5.39	17.48	19.69	19.69	-	0.06	176
14	14.25	20.20	10.63	17.76	21.65	21.65	-	0.06	242
16	15.24	21.18	10.63	19.76	23.62	23.62	-	0.06	275
18	16.45	22.40	12.20	22.16	23.62	23.62	-	0.06	385
20	17.44	23.39	13.78	24.17	24.61	26.77	-	0.06	440
24	19.45	25.39	16.93	28.15	29.53	32.28	-	0.06	660
28	21.42	27.36	19.69	32.13	34.45	-	34.5	0.08	770
30	22.48	28.43	21.89	34.21	-	-	36.9	0.08	880
32	23.86	29.80	22.05	36.50	39.37	-	39.4	0.08	1045
36	25.71	31.65	24.80	40.63	44.29	-	44.3	0.08	1233
40	27.72	35.67	26.38	44.72	49.21	-	49.2	0.08	1541
42	27.72	35.67	26.38	44.72	49.21	-	49.2	0.08	1541
44	29.72	35.67	30.31	48.74	-	-	59.1	0.08	-
48	31.89	37.83	31.18	53.07	59.06	-	59.1	0.08	2751

1) When grounding rings are used, the thickness of the earthing flange must be added to the build-in length

2) T_C = Type C grounding ring

3) Weights are for ANSI 150 without transmitter

D = Outside diameter of flange, see flange tables

- Means not available

Selection and Ordering data

Order No.

Flow sensors MAGFLO MAG 3100 W for connection to MAGFLO transmitters MAG 5000, MAG 6000 and MAG 6000 I remote version

DN 25 ... 1200, EN Flanges (DIN 2501)

Neoprene liner

DN	Flow Rate Factory Set (m ³ /h)	Flow Rate Q _{max} (m ³ /h)	PN	
DN 25	5	17.7	40	FDK:083Z8000
DN 40	12	45	40	FDK:083Z8001
DN 50	20	70	40	FDK:083Z8002
DN 65	30	119	16	FDK:083Z8003
DN 80	50	180	16	FDK:083Z8004
DN 100	120	282	16	FDK:083Z8005
DN 125	180	441	16	FDK:083Z8053
DN 150	250	636	16	FDK:083Z8007
DN 200	400	1130	10	FDK:083Z8008
			16	FDK:083Z8208
DN 250	700	1767	10	FDK:083Z8009
			16	FDK:083Z8209
DN 300	1000	2544	10	FDK:083Z8010
			16	FDK:083Z8210
DN 350	1200	3463	10	FDK:083Z8058
			16	FDK:083Z8059
DN 400	1800	4523	10	FDK:083Z8062
			16	FDK:083Z8063
DN 450	2000	5725	10	FDK:083Z8068
			16	FDK:083Z8069
DN 500	3000	7068	10	FDK:083Z8014
			16	FDK:083Z8214
DN 600	4000	10178	10	FDK:083Z8015
			16	FDK:083Z8215
DN 700	5000	13584	10	FDK:083Z8016
			16 ¹⁾	FDK:083Z8242
			16	FDK:083Z8222
DN 800	7000	18095	10	FDK:083Z8017
			16 ¹⁾	FDK:083Z8243
			16	FDK:083Z8223
DN 900	9000	22902	10	FDK:083Z8018
			16 ¹⁾	FDK:083Z8244
			16	FDK:083Z8224
DN 1000	12000	28274	10	FDK:083Z8019
			16 ¹⁾	FDK:083Z8245
			16	FDK:083Z8225
DN 1200	15000	40715	10	FDK:083Z8021
			16 ¹⁾	FDK:083Z8246
			16	FDK:083Z8226

¹⁾ Not according to European Pressure Equipment Directive (PED) 97/23 ECs

Selection and Ordering data

Order No.

Flow sensors MAGFLO MAG 3100 W for connection to MAGFLO transmitters MAG 5000, MAG 6000 and MAG 6000 I remote version

DN 25 ... 1200, EN Flanges (DIN 2501)

EPDM liner

DN	Flow Rate Factory Set (m ³ /h)	Flow Rate Q _{max} (m ³ /h)	PN	
DN 25	5	17.7	40	FDK:083Z8100
DN 40	12	45	40	FDK:083Z8101
DN 50	20	70	40	FDK:083Z8102
DN 65	30	119	16	FDK:083Z8103
DN 80	50	180	16	FDK:083Z8104
DN 100	120	282	16	FDK:083Z8105
DN 125	180	441	16	FDK:083Z8055
DN 150	250	636	16	FDK:083Z8107
DN 200	400	1130	10	FDK:083Z8108
			16	FDK:083Z8308
DN 250	700	1767	10	FDK:083Z8109
			16	FDK:083Z8309
DN 300	1000	2544	10	FDK:083Z8110
			16	FDK:083Z8310
DN 350	1200	3463	10	FDK:083Z8060
			16	FDK:083Z8061
DN 400	1800	4523	10	FDK:083Z8065
			16	FDK:083Z8066
DN 450	2000	5725	10	FDK:083Z8070
			16	FDK:083Z8071
DN 500	3000	7068	10	FDK:083Z8114
			16	FDK:083Z8314
DN 600	4000	10178	10	FDK:083Z8115
			16	FDK:083Z8315
DN 700	5000	13584	10	FDK:083Z8116
			16 ¹⁾	FDK:083Z8342
			16	FDK:083Z8322
DN 800	7000	18095	10	FDK:083Z8117
			16 ¹⁾	FDK:083Z8343
			16	FDK:083Z8323
DN 900	9000	22902	10	FDK:083Z8118
			16 ¹⁾	FDK:083Z8344
			16	FDK:083Z8324
DN 1000	12000	28274	10	FDK:083Z8119
			16 ¹⁾	FDK:083Z8345
			16	FDK:083Z8325
DN 1200	15000	40715	10	FDK:083Z8121
			16 ¹⁾	FDK:083Z8346
			16	FDK:083Z8326

¹⁾ Not according to European Pressure Equipment Directive (PED) 97/23 ECs

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Order No.

Flow sensors MAGFLO MAG 3100 W for connection to MAGFLO transmitters MAG 5000, MAG 6000 and MAG 6000 I remote version

Neoprene, Flange type ANSI 150

Normal size (inch)	Flow Rate Factory Set (USgpm)	Flow Rate Q_{max} (m ³ /h)	Flow Rate Q_{max} (USgpm)	Flow Rate Q_{max} (m ³ /h)	Order No.
1	25	5	78	18	FDK:083Z8600
1½	60	12	198	45	FDK:083Z8601
2	100	20	308	70	FDK:083Z8602
2½	160	30	524	119	FDK:083Z8603
3	250	50	793	180	FDK:083Z8604
4	400	120	1242	282	FDK:083Z8051
5	600	180	1942	441	FDK:083Z8054
6	900	250	2800	636	FDK:083Z8056
8	1500	400	4975	1130	FDK:083Z8608
10	2500	700	7780	1767	FDK:083Z8609
12	3500	1000	11201	2544	FDK:083Z8610
14	4500	1200	15247	3463	FDK:083Z8611
16	6000	1800	19914	4523	FDK:083Z8064
18	7500	2000	25206	5725	FDK:083Z8613
20	9500	3000	31119	7068	FDK:083Z8614
24	13500	4000	44812	10178	FDK:083Z8615

Neoprene, Flange type AWWA-D

Normal size (inch)	Flow Rate Factory Set (USgpm)	Flow Rate Q_{max} (m ³ /h)	Flow Rate Q_{max} (USgpm)	Flow Rate Q_{max} (m ³ /h)	Order No.
28	18500	5000	60997	13854	FDK:083Z8616
30	21000	6000	70023	15904	FDK:083Z8622
32	24000	7000	79669	18095	FDK:083Z8617
36	30000	9000	100834	22902	FDK:083Z8618
40	37000	12000	124486	28274	FDK:083Z8619
48	53000	15000	179261	40715	FDK:083Z8621

Selection and Ordering data

Order No.

Flow sensors MAGFLO MAG 3100 W for connection to MAGFLO transmitters MAG 5000, MAG 6000 and MAG 6000 I remote version

EPDM, Flange type ANSI 150

Normal size (inch)	Flow Rate Factory Set (USgpm)	Flow Rate Q_{max} (m ³ /h)	Flow Rate Q_{max} (USgpm)	Flow Rate Q_{max} (m ³ /h)	Order No.
1	25	5	78	18	FDK:083Z8650
1½	60	12	198	45	FDK:083Z8651
2	100	20	308	70	FDK:083Z8652
2½	160	30	524	119	FDK:083Z8653
3	250	50	793	180	FDK:083Z8654
4	400	120	1242	282	FDK:083Z8052
5	600	180	1942	441	FDK:083Z8656
6	900	250	2800	636	FDK:083Z8057
8	1500	400	4975	1130	FDK:083Z8658
10	2500	700	7780	1767	FDK:083Z8659
12	3500	1000	11201	2544	FDK:083Z8660
14	4500	1200	15247	3463	FDK:083Z8661
16	6000	1800	19914	4523	FDK:083Z8067
18	7500	2000	25206	5725	FDK:083Z8663
20	9500	3000	31119	7068	FDK:083Z8664
24	13500	4000	44812	10178	FDK:083Z8665

EPDM, Flange type AWWA-D

Normal size (inch)	Flow Rate Factory Set (USgpm)	Flow Rate Q_{max} (m ³ /h)	Flow Rate Q_{max} (USgpm)	Flow Rate Q_{max} (m ³ /h)	Order No.
28	18500	5000	60997	13854	FDK:083Z8666
30	21000	6000	70023	15904	FDK:083Z8672
32	24000	7000	79669	18095	FDK:083Z8667
36	30000	9000	100834	22902	FDK:083Z8668
40	37000	12000	124486	28274	FDK:083Z8669
42	37000	12000	124486	28274	FDK:083Z8673
48	53000	15000	179261	40715	FDK:083Z8671

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