

Overview



The SITRANS F M MAGFLO MAG 5100 W is an electromagnetic flow sensor designed to meet ground water, drinking water, waste water, sewage or sludge applications.

Benefits

- DN 25 to DN 1200 (1" to 48")
- Connection flanges EN 1092-1 (DIN 2501), ANSI, AWWA and AS.
- NBR Hard Rubber liner for all water applications
- Drinking water EPDM liner with approvals
- Hastelloy integrated grounding and measuring electrodes
- Increased low flow accuracy for water leak detection, due to coned liner design.
- Drinking water approvals
- Suitable for direct burial and constant flooding
- Build-in length according to ISO 13359 - Please note new build-in length from DN 500 to DN 1200
- Easy commissioning, SENSORPROM unit 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 and ultra filtration)
- Industrial water applications

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

- Highly resistant to a wide range of chemicals
 - OIML R49 and PTB approved
 - conforms to ISO 4064 and EN 14154
 - MI 001 Custody Transfer approval for billing from 1th November 2006
- Meets EEC directives: PED, 97/23/EC pressure directive for EN1092-1 flanges
- Simple onsite or factory upgrade to IP68 / NEMA 6P of a standard sensor.

Integration

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

The flexible communication concept USM II simplifies integration and update to a variety of fieldbus systems, e.g. HART, PROFIBUS DP & PA, MODBUS RTU/RS485.

SITRANS F flowmeters

SITRANS F M

MAGFLO MAG 5100 W

Technical specifications

| Design | Full bore sensor | Coned bore sensor | Full bore sensor |
|--|---|---|--|
| Nominal size | DN 25 ... 40 (1" ... 1½") | DN 50 ... 300 (2" ... 12") | DN 350 ... 1200 (14" ... 48") |
| Measuring principle | Electromagnetic induction | | |
| Excitation frequency | 12.5 Hz | <ul style="list-style-type: none"> • 50 ... 65 mm (2" ... 2½"): 12.5 Hz • 80 ... 150 mm (3" ... 6"): 6.25 Hz • 200 ... 300 mm (8" ... 12"): 3.125 Hz | <ul style="list-style-type: none"> DN 350 ... 450 (14" ... 18"): 3.125 Hz DN 500 ... 1200 (20" ... 48"): 1.5625 Hz |
| Process connection | | | |
| Flanges | | | |
| <ul style="list-style-type: none"> • EN 1092-1 - Standard | PN 40 (580 psi) | <ul style="list-style-type: none"> • 50 ... 150 mm: PN 16 (2" ... 6": 230 psi) • 200 ... 300 mm: PN 10 (8" ... 12": 145 psi) | PN 10 (145 psi) |
| <ul style="list-style-type: none"> - Option | -- | <ul style="list-style-type: none"> • 200 ... 300 mm: PN 16 (8" ... 12": 230 psi) | PN 16 (230 psi) |
| <ul style="list-style-type: none"> • ANSI B16.5 | Class 150 lb | Class 150 lb ~20 bar (290 psi) | -- |
| <ul style="list-style-type: none"> • AWWA C-207 | -- | -- | 28" ... 48": Class D |
| <ul style="list-style-type: none"> • AS4087 | PN 16 (230 psi) DN 50 ... 1200 (2" ... 48"), 14 bar (232 psi) | | |
| Rated Operation conditions | | | |
| Ambient temperature | | | |
| <ul style="list-style-type: none"> • Sensor | -40 ... +70 °C (-40 ... +158 °F) | | |
| <ul style="list-style-type: none"> • With compact transmitter MAG 5000/6000 | -20 ... +50 °C (-4 ... +122 °F) | | |
| <ul style="list-style-type: none"> • With compact transmitter MAG 6000 I | -20 ... +60 °C (-4 ... +140 °F) | | |
| Operating pressure | 0.01 ... 40 bar (0.15 ... 580 psi) | 0.03 ... 20 bar (0.44 ... 290 psi) | 0.01 ... 16 bar (0.15 ... 232 psi) |
| Enclosure rating | | | |
| <ul style="list-style-type: none"> • Standard | IP67 to EN 60529 / NEMA 4X/6 (1 mH ₂ O for 30 minutes) | | |
| <ul style="list-style-type: none"> • Option | IP68 to EN 60529 / NEMA 6P (10 mH ₂ O continuously) | | |
| Pressure drop at 3 m/s (10 ft/s) | As straight pipe | Max. 25 mbar (0.36 psi) | As straight pipe |
| Medium conditions | | | |
| Temperature of medium | | | |
| <ul style="list-style-type: none"> • NBR | -5 ... +70 °C (23 ... +158 °F) | | |
| <ul style="list-style-type: none"> • EDPM | -5 ... +70 °C (23 ... +158 °F) | | |
| EMC | 89/336 EEC | | |
| Design | | | |
| Weight | See dimensional drawings | | |
| Material | | | |
| <ul style="list-style-type: none"> • Housing and flanges | Carbon steel ASTM A105 | | |
| <ul style="list-style-type: none"> • Measuring pipe | AISI 304 (1.4301) | | |
| <ul style="list-style-type: none"> • Liner | NBR Hard Rubber/EPDM | | |
| <ul style="list-style-type: none"> • Electrodes | Hastelloy C276 | | |
| <ul style="list-style-type: none"> • Grounding electrodes standard | Hastelloy C276 | | |
| Certificates and approvals | | | |
| Drinking water approvals | | | |
| <ul style="list-style-type: none"> • EPDM | NSF61 (Cold water, US) WRAS (WRc, BS6920 cold water, GB) ACS listed (F) KTW D1 & D2, DVGW W270 (D) | | |
| Approvals | PED – 97/23 EC ¹⁾ FM Class 1 div 2 | | |

¹⁾ For sizes larger than 600 mm (24") PED conformity is available as a cost added option. The basic unit will carry the LVD (Low Voltage Directive) and EMC approval.

The effect of temperature on working pressure MAG 5100 W

Pressure in bar (psi)

Sizes 25 mm, 40 mm and > 300 mm (1", 1½" and > 12")

| Flange spec. | Flange rating | Temperature | |
|----------------------|---------------|-----------------|---------------------------------|
| | | ≤ 20 °C (68 °F) | 50 °C (122 °F) / 70 °C (158 °F) |
| EN 1092-1 | PN 10 | 10.0 (145) | 9.7 (141) |
| | PN 16 | 16.0 (232) | 15.5 (225) |
| | PN 40 | 40.0 (580) | 38.7 (561) |
| ANSI B16.5 | 150 lbs | 19.7 (286) | 19.3 (280) |
| AWWA C-207 | Class D | 10.3 (150) | 10.3 (150) |
| AS4087 ¹⁾ | PN 16 | 16 bar (235) | 16 bar (235) |

Size 50 mm to 300 mm (2" to 12")

| | | | |
|------------|---------|------------|------------|
| EN 1092-1 | PN 10 | 10.0 (145) | 10.0 (145) |
| | PN 16 | 16.0 (232) | 16.0 (232) |
| ANSI B16.5 | 150 lbs | 19.7 (286) | 19.7 (286) |

¹⁾ Sizes bigger than DN 300

SITRANS F flowmeters

SITRANS F M

MAGFLO MAG 5100 W

| Selection and Ordering data | Order No. |
|--|-----------------------|
| SITRANS F M Flowsensor MAGFLO MAG 5100 W | 7 ME 6 5 2 0 - |
| Hastelloy electrodes, carbon steel flanges | 1 - 2 |
| Diameter | |
| DN 25 (1") | ▶ 2 D |
| DN 40 (1½") | ▶ 2 R |
| DN 50 (2") | ▶ 2 Y |
| DN 65 (2½") | ▶ 3 F |
| DN 80 (3") | ▶ 3 M |
| DN 100 (4") | ▶ 3 T |
| DN 125 (5") | ▶ 4 B |
| DN 150 (6") | ▶ 4 H |
| DN 200 (8") | ▶ 4 P |
| DN 250 (10") | ▶ 4 V |
| DN 300 (12") | ▶ 5 D |
| DN 350 (14") | ▶ 5 K |
| DN 400 (16") | ▶ 5 R |
| DN 450 (18") | ▶ 5 Y |
| New short build-in lengths | |
| DN 500 (20") | ▶ 6 F |
| DN 600 (24") | ▶ 6 P |
| DN 700 (28") | ▶ 6 Y |
| DN 750 (30") | ▶ 7 D |
| DN 800 (32") | ▶ 7 H |
| DN 900 (36") | ▶ 7 M |
| DN 1000 (40") | ▶ 7 R |
| 42" | ▶ 7 U |
| 44" | ▶ 7 V |
| DN 1200 (48") | ▶ 8 B |
| Flange norm and pressure rating | |
| <u>to EN 1092-1</u> | |
| PN 10 (DN 200 ... 1200/8" ... 48") | ▶ B |
| PN 16 (DN 50 ... 1200/2" ... 48") | ▶ C |
| PN 16, non PED (DN 700 ... 1200/28" ... 48") | ▶ D |
| PN 40 (DN 25 ... 40/1" ... 1½") | ▶ F |
| <u>to ANSI B16.5</u> | |
| class 150 (1" ... 24") | ▶ J |
| <u>to AWWA C-207</u> | |
| Class D (28" ... 1200") | ▶ L |
| <u>to AS 4087</u> | |
| PN 16 | ▶ N |
| Liner material | |
| EPDM | ▶ 2 |
| Hard Rubber | ▶ 3 |
| Transmitter | |
| No transmitter (can be ordered separately) | ▶ A |
| MAG 6000 I, 18 ... 90 V DC; 115 ... 230 V AC, 50 ... 60 Hz | ▶ C |
| Communication | |
| None | ▶ 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 |
| ▶ 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 |

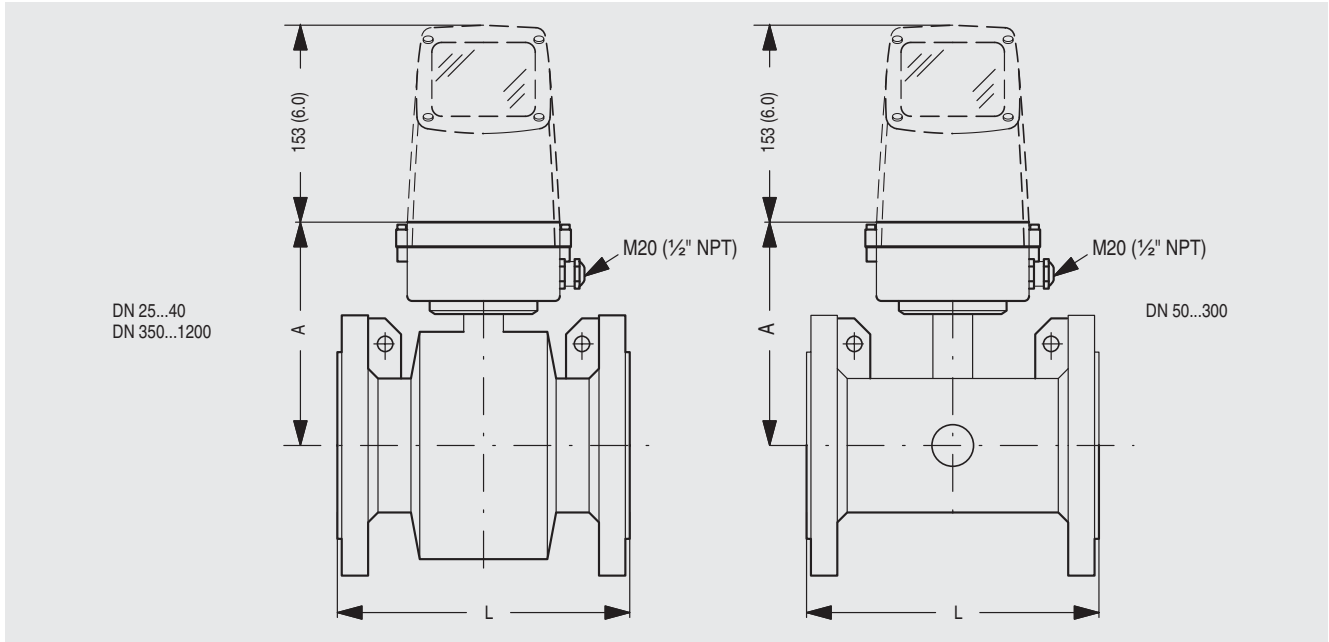
| Description | Order No. | Symbol |
|---|---------------------|--------|
| Potting kit for terminal box of MAGFLO sensors for IP68/NEMA 6P | FDK-085U0220 | |

Please use online Product selector to get latest updates.

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

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

Dimensional drawings



| Nominal size | | A | | L | | | | | | | | | |
|--------------|--------|------|--------|-------|--------|-------|--------|-------|--------|------------------|--------|------|--------|
| | | | | PN 10 | | PN 16 | | PN 40 | | Class 150 / AWWA | | AS | |
| [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] |
| 25 | 1 | 187 | 7.4 | - | - | - | - | 200 | 7.9 | 200 | 7.9 | 200 | 7.87 |
| 40 | 1½ | 197 | 7.8 | - | - | - | - | 200 | 7.9 | 200 | 7.9 | 200 | 7.87 |
| 50 | 2 | 188 | 7.4 | - | - | 200 | 7.9 | - | - | 200 | 7.9 | 200 | 7.87 |
| 65 | 2½ | 194 | 7.6 | - | - | 200 | 7.9 | - | - | 200 | 7.9 | 200 | 7.87 |
| 80 | 3 | 200 | 7.9 | - | - | 200 | 7.9 | - | - | 200 | 7.9 | 200 | 7.87 |
| 100 | 4 | 207 | 8.1 | - | - | 250 | 9.8 | - | - | 250 | 9.8 | 250 | 9.84 |
| 125 | 5 | 217 | 8.5 | - | - | 250 | 9.8 | - | - | 250 | 9.8 | 250 | 9.84 |
| 150 | 6 | 232 | 9.1 | - | - | 300 | 11.8 | - | - | 300 | 11.8 | 300 | 11.81 |
| 200 | 8 | 257 | 10.1 | 350 | 13.8 | 350 | 13.8 | - | - | 350 | 13.8 | 350 | 13.78 |
| 250 | 10 | 284 | 11.2 | 450 | 17.7 | 450 | 17.7 | - | - | 450 | 17.7 | 450 | 17.72 |
| 300 | 12 | 310 | 12.2 | 500 | 19.7 | 500 | 19.7 | - | - | 500 | 19.7 | 500 | 19.69 |
| 350 | 14 | 382 | 15.0 | 550 | 21.7 | 550 | 21.7 | - | - | 550 | 21.7 | 550 | 21.65 |
| 400 | 16 | 407 | 16.0 | 600 | 23.6 | 600 | 23.6 | - | - | 600 | 23.6 | 600 | 23.62 |
| 450 | 18 | 438 | 17.2 | 600 | 23.6 | 600 | 23.6 | - | - | 600 | 23.6 | 600 | 23.62 |
| 500 | 20 | 463 | 18.2 | 600 | 23.6 | 600 | 23.6 | - | - | 600 | 23.6 | 600 | 23.6 |
| 600 | 24 | 514 | 20.2 | 600 | 23.6 | 600 | 23.6 | - | - | 600 | 23.6 | 600 | 23.6 |
| 700 | 28 | 564 | 22.2 | 700 | 27.6 | 700 | 27.6 | - | - | 700 | 27.6 | 700 | 27.6 |
| 750 | 30 | 591 | 23.3 | - | - | - | - | - | - | 750 | 29.5 | 750 | - |
| 800 | 32 | 616 | 24.3 | 800 | 31.5 | 800 | 31.5 | - | - | 800 | 31.5 | 800 | 31.5 |
| 900 | 36 | 663 | 26.1 | 900 | 35.4 | 900 | 35.4 | - | - | 900 | 35.4 | 900 | 35.4 |
| 1000 | 40 | 714 | 28.1 | 1000 | 39.4 | 1000 | 39.4 | - | - | 1000 | 39.4 | 1000 | 39.4 |
| | 42 | 714 | 28.1 | - | - | - | - | - | - | 1000 | 39.4 | - | - |
| | 44 | 765 | 30.1 | - | - | - | - | - | - | 1100 | 43.3 | - | - |
| 1200 | 48 | 820 | 32.3 | 1200 | 47.2 | 1200 | 47.2 | - | - | 1200 | 47.2 | 1200 | 47.2 |

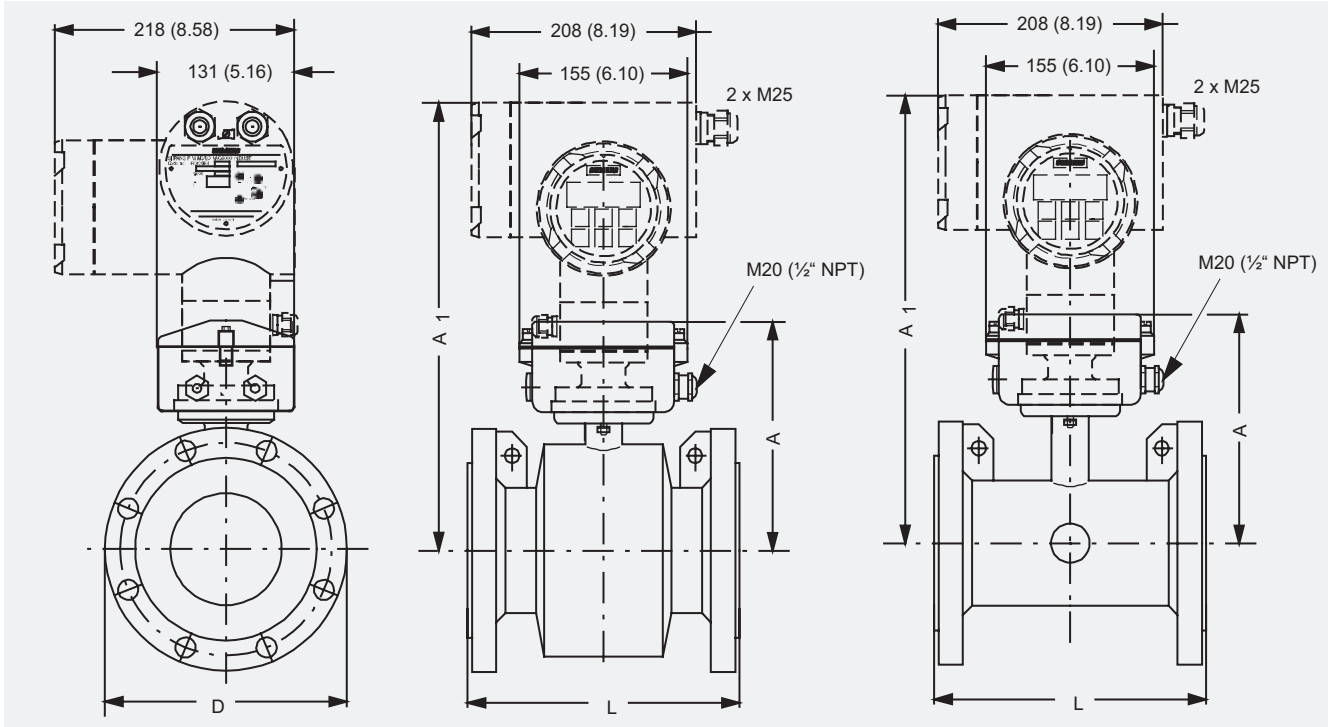
- not available

SITRANS F flowmeters

SITRANS F M

MAGFLO MAG 5100 W

MAG 3100 / 6000 I Compact



| Nominal size | | A | | A ₁ | | L | | | | | | | | | |
|--------------|--------|------|--------|----------------|--------|-------|--------|-------|--------|-------|--------|----------------|--------|------|--------|
| | | | | | | PN 10 | | PN 16 | | PN 40 | | Class 150/AWWA | | AS | |
| [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] |
| 25 | 1 | 187 | 7.4 | 340 | 13.4 | - | - | - | - | 200 | 7.9 | 200 | 7.9 | 200 | 7.87 |
| 40 | 1½ | 197 | 7.8 | 350 | 13.8 | - | - | - | - | 200 | 7.9 | 200 | 7.9 | 200 | 7.87 |
| 50 | 2 | 188 | 7.4 | 341 | 13.4 | - | - | 200 | 7.9 | - | - | 200 | 7.9 | 200 | 7.87 |
| 65 | 2½ | 194 | 7.6 | 347 | 13.7 | - | - | 200 | 7.9 | - | - | 200 | 7.9 | 200 | 7.87 |
| 80 | 3 | 200 | 7.9 | 353 | 13.9 | - | - | 200 | 7.9 | - | - | 200 | 7.9 | 200 | 7.87 |
| 100 | 4 | 207 | 8.1 | 360 | 14.2 | - | - | 250 | 9.8 | - | - | 250 | 9.8 | 250 | 9.84 |
| 125 | 5 | 217 | 8.5 | 370 | 14.6 | - | - | 250 | 9.8 | - | - | 250 | 9.8 | 250 | 9.84 |
| 150 | 6 | 232 | 9.1 | 385 | 15.2 | - | - | 300 | 11.8 | - | - | 300 | 11.8 | 300 | 11.81 |
| 200 | 8 | 257 | 10.1 | 410 | 16.1 | 350 | 13.8 | 350 | 13.8 | - | - | 350 | 13.8 | 350 | 13.78 |
| 250 | 10 | 284 | 11.2 | 437 | 17.2 | 450 | 17.7 | 450 | 17.7 | - | - | 450 | 17.7 | 450 | 17.72 |
| 300 | 12 | 310 | 12.2 | 463 | 18.2 | 500 | 19.7 | 500 | 19.7 | - | - | 500 | 19.7 | 500 | 19.69 |
| 350 | 14 | 382 | 15.0 | 535 | 21.1 | 550 | 21.7 | 550 | 21.7 | - | - | 550 | 21.7 | 550 | 21.65 |
| 400 | 16 | 407 | 16.0 | 560 | 22.1 | 600 | 23.6 | 600 | 23.6 | - | - | 600 | 23.6 | 600 | 23.62 |
| 450 | 18 | 438 | 17.2 | 591 | 23.3 | 600 | 23.6 | 600 | 23.6 | - | - | 600 | 23.6 | 600 | 23.62 |
| 500 | 20 | 463 | 18.2 | 616 | 24.3 | 600 | 23.6 | 600 | 23.6 | - | - | 600 | 23.6 | 600 | 23.6 |
| 600 | 24 | 514 | 20.2 | 667 | 26.3 | 600 | 23.6 | 600 | 23.6 | - | - | 600 | 23.6 | 600 | 23.6 |
| 700 | 28 | 564 | 22.2 | 717 | 28.2 | 700 | 27.6 | 700 | 27.6 | - | - | 700 | 27.6 | 700 | 27.6 |
| 750 | 30 | 591 | 23.3 | 744 | 29.3 | - | - | - | - | - | - | 750 | 29.5 | 750 | - |
| 800 | 32 | 616 | 24.3 | 779 | 30.7 | 800 | 31.5 | 800 | 31.5 | - | - | 800 | 31.5 | 800 | 31.5 |
| 900 | 36 | 663 | 26.1 | 826 | 32.5 | 900 | 35.4 | 900 | 35.4 | - | - | 900 | 35.4 | 900 | 35.4 |
| 1000 | 40 | 714 | 28.1 | 877 | 34.5 | 1000 | 39.4 | 1000 | 39.4 | - | - | 1000 | 39.4 | 1000 | 39.4 |
| | 42 | 714 | 28.1 | 877 | 34.5 | - | - | - | - | - | - | 1000 | 39.4 | - | - |
| | 44 | 765 | 30.1 | 928 | 36.5 | - | - | - | - | - | - | 1100 | 43.3 | - | - |
| 1200 | 48 | 820 | 32.3 | 983 | 38.7 | 1200 | 47.2 | 1200 | 47.2 | - | - | 1200 | 47.2 | 1200 | 47.2 |

- not available

Weight

| Nominal size | | PN 10 | | PN 16 | | PN 40 | | Class 150/AWWA | | AS | |
|--------------|--------|-------|-------|-------|-------|-------|-------|----------------|-------|------|-------|
| [mm] | [inch] | [kg] | [lbs] | [kg] | [lbs] | [kg] | [lbs] | [kg] | [lbs] | [kg] | [lbs] |
| 25 | 1 | - | - | - | - | 4 | 9 | 4 | 9 | 4 | 9 |
| 40 | 1½ | - | - | - | - | 7 | 15 | 6 | 13 | 7 | 15 |
| 50 | 2 | - | - | 9 | 20 | - | - | 8 | 20 | 9 | 20 |
| 65 | 2½ | - | - | 10.7 | 24 | - | - | 11 | 24 | 10.7 | 24 |
| 80 | 3 | - | - | 11.6 | 26 | - | - | 13 | 28 | 11.6 | 26 |
| 100 | 4 | - | - | 15.2 | 33 | - | - | 19 | 41 | 15.2 | 33 |
| 125 | 5 | - | - | 20.4 | 45 | - | - | 24 | 52 | 20.4 | 45 |
| 150 | 6 | - | - | 26 | 57 | - | - | 29 | 64 | 26 | 57 |
| 200 | 8 | 48 | 106 | 48 | 106 | - | - | 56 | 124 | 48 | 106 |
| 250 | 10 | 64 | 141 | 69 | 152 | - | - | 79 | 174 | 69 | 152 |
| 300 | 12 | 76 | 167 | 86 | 189 | - | - | 110 | 243 | 86 | 189 |
| 350 | 14 | 104 | 229 | 125 | 274 | - | - | 139 | 307 | 115 | 254 |
| 400 | 16 | 119 | 263 | 143 | 314 | - | - | 159 | 351 | 125 | 277 |
| 450 | 18 | 136 | 299 | 173 | 381 | - | - | 182 | 400 | 141 | 311 |
| 500 | 20 | 163 | 359 | 223 | 491 | - | - | 225 | 495 | 189 | 418 |
| 600 | 24 | 236 | 519 | 338 | 744 | - | - | 320 | 704 | 301 | 664 |
| 700 | 28 | 270 | 595 | 314 | 692 | - | - | 273 | 602 | 320 | 704 |
| 750 | 30 | - | - | - | - | - | - | 329 | 725 | - | - |
| 800 | 32 | 346 | 763 | 396 | 873 | - | - | 365 | 804 | 428 | 944 |
| 900 | 36 | 432 | 951 | 474 | 1043 | - | - | 495 | 1089 | 619 | 1362 |
| 1000 | 40 | 513 | 1130 | 600 | 1321 | - | - | 583 | 1282 | 636 | 1399 |
| | 42 | - | - | - | - | - | - | 687 | 1512 | - | - |
| | 44 | - | - | - | - | - | - | 763 | 1680 | - | - |
| 1200 | 48 | 643 | 1415 | 885 | 1948 | - | - | 861 | 1896 | 813 | 1789 |

- not available

With transmitter MAG 5000 and MAG 6000 compact, weight is increased by approximately 0.8 kg (1.8 lbs),
with MAG 6000 I, weight is increased by 5.5 kg (12.1 lb).