



Model MAGFLO® Sensor Model MAG 1100, MAG 1100 Food and MAG 3100, MAG 5100 W, Signal Converter Model MAG 6000 and MAG 5000

Description

MAGFLO® electromagnetic flowmeters employ Faraday's Law to measure the volumetric flow rate of conductive liquids. Spirax Sarco offers a wide variety of electromagnetic flowmeters. In addition to standard meters for typical applications, we have specialized meters, like our sanitary MAG 1100 FOOD—for application-specific flow measurement.



Features

| | |
|---|--|
| 6000 signal converter (electronics) | - 0.20% accuracy |
| | - Compact and practical design |
| | - User-friendly design |
| | - SENSORPROM™ Technology |
| | - Bidirectional measurement |
| | - Self-diagnostic |
| | - Backlit display |
| | - Communication protocols available |
| | - Empty Pipe Detection |
| | - Low Flow Cut-off |
| - Batch Control Function | |
| - Electrode Cleaning available | |
| 5000 same features as 6000 except | - 0.4% accuracy |
| | - No Batch Control Function |
| 1100 sensor | - Universal sensor |
| | - High liquid temperature |
| | - Food version |
| | - 3A and FDA approved |
| | - Steam CIP cleanable |
| | - Sanitary Design |
| | - Tri-clamp connections |
| | - Line sizes |
| | - Standard: ½" to 4" |
| | - High temperature: ½" to 4" |
| - Food: ¾" to 4" | |
| - Flangeless Connection | |
| 3100 sensor | - Line Sizes: ½" to 78" |
| | - Several Liner and Electrode Materials Available |
| | - NEMA 6 (Accidental Submersible) |
| | - Flange Connection |
| 5100 W | - DN 15 to DN 1200/2000 (½" to 48"/80") |
| | - Connection flanges EN 1092-1 (DIN 2501), ANSI, AWWA and AS. |
| | - NBR for all water and wastewater applications |
| | - Drinking water EPDM liner with approvals |
| | - Integrated Hastelloy grounding and measuring electrodes |
| | - Increased low flow accuracy for water leak detection, due to coned liner design. |
| | - Drinking water approvals per NSF61 using EPDM liner |
| | - Suitable for direct burial and constant flooding with Submersible Kit Option |
| | - Build-in length according to ISO 13359 |
| | - Easy commissioning, SENSORPROM unit automatically uploads calibration values and settings. |
| - Unique external, in-situ verification via third-party and ISO traceable calibration for up to 20 meters using built-in SENSORPROM fingerprint data. | |
| - No upstream or downstream straight run requirements when used with MAG 6000 electronics with up to 0.8% accuracy. | |

Applications

MAGFLO® electromagnetic flowmeters offer important advantages such as no pressure drop, no moving parts, high accuracy, and a wide variety of materials of construction. They have been successfully used in many industries including food, beverage, pharmaceutical, chemical, power, heat, pulp & paper, steel and water treatment. No maintenance, low cost of ownership, and high reliability make MAGFLO® the flowmeter of choice for many flow measurement applications.

Performance Specifications

| MAG 6000 signal converter | |
|-------------------------------------|---|
| Accuracy | Better than $\pm 0.20\%$ of rate |
| Compact and practical design | The NEMA 6 signal converter can be installed either integrally on the sensor or remote on a wall or pipe. Front and back panel NEMA 4x converters are also available as an option. |
| User-friendly design | Alphanumeric display Electronic unit and display can be rotated for easy viewing. |
| SENSORPROM™ technology | Easy to start-up - sensor data is downloaded from the SENSORPROM™ located in the terminal box to the signal converter. After power failure or converter replacement, all settings are automatically downloaded from the SENSORPROM™ to the MAG 6000 –no need for reprogramming. |
| Self-diagnostic | Operating malfunctions are indicated in the display and error relay are activated. The last 10 errors are stored in Error Pending and Error Log. |
| Backlit display | |
| Hart protocol available | |
| Electrode cleaning | Converter can control an optional external electrode cleaning unit—output and display values are maintained during cleaning when Rack-type converter is selected and housed in an enclosure. |
| Bidirectional | Flow can be measured in both forward and reverse directions using a relay output to indicate direction changes. |
| Empty-pipe cut-off | If the sensor is drained, the converter automatically suppresses the input and indicates zero flow. |
| Batch function | |

| MAG 5000 signal converter | |
|-------------------------------------|--|
| Accuracy | $\pm 0.4\%$ of rate |
| Compact and practical design | The NEMA 6 signal converter can be installed either integrally on the sensor or remote on a wall or pipe. Front and back panel NEMA 4x converters are also available as an option. |
| User-friendly design | Alphanumeric display Electronic unit and display can be rotated for easy viewing. |
| SENSORPROM™ technology | Easy to start up—sensor data is downloaded from the SENSORPROM™ located in the terminal box to the signal converter. After power failure or converter replacement, all settings are automatically downloaded from the SENSORPROM™ to the MAG 5000—no need for reprogramming. |
| Bidirectional | Flow can be measured in both directions with two internal totalizers. |
| Self-diagnostic | Operating malfunctions are indicated in the display and error relay are activated. The last 10 errors are stored in Error Pending and Error Log. |
| Backlit display | |
| HART protocol available | |

| MAG 1100 sensor (standard, high temp and food) | |
|--|--|
| Universal sensor | Ceramic Liner with platinum electrodes |
| High liquid temperature | Standard 302 °F (150 °C), optional 390 °F (199 °C) |
| Withstands rigorous cleaning | External construction in stainless steel, and enclosure meets NEMA 6 (accidental submersible), and can be steam cleaned. |
| Food version | <ul style="list-style-type: none"> - 3A and FDA approved - Steam CIP cleanable - Withstands Rigorous Cleaning: - External construction in stainless steel. - Enclosure meets NEMA 6 (accidental submersible). - Sanitary Design: <p>The electrodes are fused into the ceramic liner –no crevices where bacteria can grow</p> <ul style="list-style-type: none"> - Tri-clamp connections |
| Line sizes | <ul style="list-style-type: none"> - Standard: ½" to 4" (DN8 to DN100) - High temperature: ½" to 4" (DN15 to DN100) - Food: ¾" to 4" (DN10 to DN100) |
| MAG 3100 sensor | |
| Line sizes: | ½" to 80" (DN15 to DN2000) |
| Several liner and electrode materials available | See following pages for selection |
| Nema 6 (accidental submersible) | Can easily be upgraded to NEMA 6P with optional submergence kit after 6P (continuously submersible to 30 ft (9.1 m) of water) |
| Fully welded sensor construction | |
| Flange version | ANSI Class 150, 300 or AWWA class D (28" and above) |
| MAG 5100W | |
| | <ul style="list-style-type: none"> - DN 15 to DN 1200/2000 (½" to 48"/80") - Connection flanges EN 1092-1 (DIN 2501), ANSI, AWWA and AS. - NBR for all water and wastewater applications - Drinking water EPDM liner with approvals - Integrated Hastelloy grounding and measuring electrodes - Increased low flow accuracy for water leak detection, due to coned liner design. - Drinking water approvals per NSF61 using EPDM liner - Suitable for direct burial and constant flooding with Submersible Kit Option - Build-in length according to ISO 13359 - Easy commissioning, SENSORPROM unit automatically uploads calibration values and settings. - Unique external, in-situ verification via third-party and ISO traceable calibration for up to 20 meters (65.61 ft) using built-in SENSORPROM fingerprint data. - No upstream or downstream straight run requirements when used with MAG 6000 electronics with up to 0.8% accuracy. |

Specifications - Sensor MAG 1100 Ceramic and MAG 1100 PFA



| Type | | MAG 1100 Ceramic | MAG 1100 PFA Flangeless sensor (Wafer) |
|--|--------------------------|---|--|
| Nominal size | | 1/4", 3/8", 1/2", 1", 1 1/2", 2", 3", 4" (DN8, DN10, DN15, DN25, DN40, DN50, DN80, DN100) | 3/8", 1/2", 1", 1 1/2", 2", 3", 4" (DN10, DN15, DN25, DN40, DN50, DN80, DN100) |
| Operating pressure | | 1/4"-2 1/2": 600 psi (41.4 bar), 3": 560 psi (38.6 bar), 4": 450 psi (31.0 bar) | 300 psi (20 bar) |
| | Vacuum | 1.5 × 10 ⁻⁵ psi | 0.3 psi |
| Temperature of medium | PFA | | -20 °F to +265 °F (-29 °C to +129 °C) |
| | Ceramic | 0 °F to +300 °F (-17 °C to +149 °C) | |
| | High temperature version | 0 °F to +400 °F (-17 °C to 204 °F) | Suitable for steam sterilization at 300 °F (149 °C) |
| Temperature shock (Ceramic liner) | | (Duration > 1 min.): 1/4", 3/8", 1/2", 1": Max. ΔT 60 °F/min. 1 1/2", 2", 2 1/2": Max. ΔT 50 °F/min. 3", 4": Max. ΔT 40 °F/min. | Max. ±210 °F momentarily |
| | | (Duration 1 min., followed by 10 min. rest): 1/4", 3/8", 1/2", 1": Max. ΔT 175 °F (16 °C/min) 1 1/2", 2", 2 1/2": Max. ΔT 160 °F (10 °C/min) 3", 4": Max. ΔT 140 °F (4.4 °C/min) | |
| Ambient temperature | | Remote mount signal converter: -40 °F to +210 °F (-40 °C to +98.9 °C) | |
| | | Integral mount signal converter: -5 °F to +120 °F (-20.6 °C to +48.9 °C) | |
| Liner | | Aluminum oxide Al ₂ O ₃ (ceramics) | Reinforced PFA (Teflon) |
| Electrodes | | Platinum with gold/titanium brazing alloy | Hastelloy C-276 |
| Enclosure | | Stainless steel AISI 316L (1.4404) | Stainless steel AISI 316 (1.4436) |
| Terminal box (Remote installation only) | Standard | Fiberglass-reinforced polyamide | Fiberglass-reinforced polyamide |
| | High temp. | Stainless steel AISI 316 (1.4436) | Stainless steel AISI 316L (1.4404) |
| Studs & nuts | | Stainless steel AISI 304 (1.4301) | |
| | | Number and size to DIN 2501 | |
| Mating flanges | | DIN 2501 (150-600 psi) (10 - 41 bar), ANSI B16.5, class 150 and 300 or equivalent | |
| Gaskets | Option | 1/4" and 3/8": 1/2" NPT threaded adaptor | |
| | Standard | EPDM (max. 300 °F, 600 psi) (148.9 °C, 41 bar) | |
| | Option | Graphite (max. 390 °F, 600 psi) (198.9 °C, 41 bar) | |
| | Option | PTFE (max. 210 °F, 300 psi) (98.9 °C, 20 bar) | |
| Cable entries | | | 4 pcs. 1/2" NPT |
| Enclosure rating | Standard | NEMA 4X / 6 (3 ft. (0.91 m) submersion for 30 min) | |
| | Option | NEMA 6P (30 ft. (9.1 m) continuous submersion) | |
| Mechanical load (vibration) | | 18-1000 Hz random, 3.17 G rms in all directions to EN 60068-2-36 | |
| Test pressure | | 1200 psi (82 bar) (2 × nominal) | 600 psi (41 bar) (2 × nominal) |
| Ex approvals | | | |
| Excitation frequency programmable | | 1/4" - 2 1/2": 15 Hz | 3/8" - 2 1/2": 15 Hz |
| | | 3", 4": 7.5 Hz | 3", 4": 7.5 Hz |

Specifications - Sensor MAG 1100 FOOD



| | | |
|-----------------------------|----------|--|
| | | MAG 1100 FOOD |
| Type | | Hygienic sensor |
| Nominal size | | 3/8", 1/2", 1", 1 1/2", 2", 3", 4" (DN10, DN15, DN25, DN40, DN50, DN80, DN100) |
| Process connection | | Hygienic adapters available for: Direct welding in Clamp fitting Threaded fitting |
| Operating pressure | | 3/8"-2 1/2": 600 psi (41.4 bar), 3": 560 psi (38.6 bar), 4": 450 psi (31.0 bar) |
| | Vacuum | 1.5 × 10 ⁻⁵ psi |
| Temperature of medium | | 0 °F to +300 °F (-18 °C to +149 °C) |
| | | Suitable for steam sterilization |
| Temperature shock | | (Duration > 1 min.): 3/8", 1/2", 1", 1 1/2", 2", 2 1/2", 3", 4" (DN10, DN15, DN25, DN40, DN50, DN65 DN80, DN100) Max. ΔT 60 °F/min. (16 °C/min) Max. ΔT 50 °F/min. (10 °C/min) Max. ΔT 40 °F/min. (4.4 °C/min) |
| | | (Duration 1 min., followed by 10 min. rest): 3/8", 1/2", 1", 1 1/2", 2", 2 1/2", 3", 4" (DN10, DN15, DN25, DN40, DN50, DN65 DN80, DN100) Max. ΔT 175 °F (79.4 °C) Max. ΔT 160 °F (71.1 °C) Max. ΔT 140 °F (60 °C) |
| Ambient temperature | | Remote mount signal converter: -40 °F to +210 °F (-40 °C to +98.9 °C) |
| | | Integral mount signal converter: -5 °F to +120 °F (-20.6 °C to +48.9 °C) |
| Liner | | Aluminum oxide Al ₂ O ₃ (ceramic) |
| Electrodes | | Platinum with gold/titanium brazing alloy |
| Enclosure | | Stainless steel AISI 316L (1.4404) |
| Terminal box | Standard | Fiberglass-reinforced polyamide |
| (Remote installation only) | Option | Stainless steel AISI 316 (1.4436) |
| Cable entries | | 4 pcs. 1/2" NPT |
| Enclosure rating | Standard | NEMA 4X / 6 (3 ft. (0.91 m) submersion for 30 min) |
| | Option | NEMA 6P (30 ft. (9.1 m) continuous submersion) |
| Mechanical load (vibration) | | 18-1000 Hz random, 3.17 G rms in all directions, to EN 60068-2-36 |
| Test pressure | | 1200 psi (82 bar) (2 × nominal) |
| Approvals | | 3A, EHEDG |
| Excitation frequency | | 3/8" - 2 1/2" (DN10-DN65): 15 Hz |
| | | 3"-4" (DN80-DN100): 7.5 Hz |

Specifications - Sensor MAG 1100 FOOD PFA



| | | MAG 1100 FOOD PFA |
|--|----------------------------------|---|
| Type | | Hygienic sensor |
| Nominal size | | 3/8", 1/2", 1", 1 1/2", 2", 3", 4" (DN10, DN15, DN25, DN40, DN50, DN80, DN100) |
| Process connection | | Hygienic adapters available for: Direct welding in, Clamp fitting, Threaded fitting |
| Operating pressure | | 300 psi (20 bar) |
| | Vacuum | 0.3 psi (0.02 bar) |
| Temperature of medium | | -20 °F to +270 °F (-29 °C to +132 °C) |
| | | Suitable for steam sterilization at 300 °F (149 °C) |
| Temperature shock | | Max. ± 212 °F (100 °C) momentarily |
| Ambient temperature | Remote mount signal converter: | -40 °F to +210 °F (-40 °C to +98.9 °C) |
| | Integral mount signal converter: | -5 °F to +120 °F (-20.6 °C to +48.9 °C) |
| Liner | | Reinforced PFA (Teflon) |
| Electrodes | | Hastelloy C-276 |
| Enclosure | | Stainless steel AISI 316L (1.4404) |
| Terminal box (Remote installation only) | Standard | Fiberglass-reinforced polyamide |
| | Option | Stainless steel AISI 316 (1.4436) |
| Cable entries | | 4 pcs. 1/2" NPT |
| Enclosure rating | Standard | NEMA 4X / 6 (3 ft. (0.91 m) submersion for 30 min) |
| | Option | NEMA 6P (30 ft. (9.1 m) continuous submersion) |
| Mechanical load (vibration) | | 18-1000 Hz random, 3.17 G rms in all directions, to EN 60068-2-36 |
| Test pressure | | 600 psi (41 bar) (2 × nominal) |
| Approvals | | 3A |
| Excitation frequency | | 3/8" - 2 1/2" (DN10-DN65): 15 Hz |
| | | 3"-4" (DN80-DN100) : 7.5 Hz |

Accessories : MAG 1100 FOOD

| Adapters | Stainless steel AISI 316 | Pressure |
|--|---------------------------------------|---|
| Pipe connection/ Operating pressure | Adapter for direct welding into pipe: | 3/8", 1/2", 1", 1 1/2", 2", 3" (DN10, DN15, DN25, DN40, DN50, DN80) 600 psi (41 bar) |
| | | 4" (DN100) 350 psi (24 bar) |
| | Clamp adapter: | 3/8", 1/2", 1", 1 1/2", (DN10, DN15, DN25, DN40, DN50) 200 psi (13 bar) |
| | | 2 1/2", 3", 4" (DN65, DN80, DN100) 150 psi (10 bar) |
| Thread adapter: | DIN 11851: | 3/8", 1/2", 1", 1 1/2", (DN10, DN15, DN25, DN40) 600 psi (41 bar) |
| | | 2", 2 1/2", 3", 4" (DN50, DN65, DN80, DN100) 350 psi (24 bar) |
| | ISO 2853, SS 3351, BS 4825-4: | 1", 1 1/2", 2", 3", 4" (DN10, DN15, DN25, DN40, DN50, DN80, DN100) 200 psi (13 bar) |
| | SMS 1145: | 1", 1 1/2", 2", 2 1/2", 3" (DN10, DN15, DN25, DN40, DN50, DN65, DN80) 80 psi (5 bar) |
| Gasket | Standard | EPDM (ethylene, propylene rubber) (-5 °F to 300 °F) (-20.6 °C to 148.9 °C) |
| | Option | NBR (nitrile butadiene rubber) (-5 °F to 210 °F) (-20.6 °C to 98.9 °C) |
| Material | | Stainless steel AISI 304, ISO 2852 |

Note: It is always a system so please state system max. pressure and not MAG 1100 or adapter.

Specifications - Sensor MAG 3100



| | | |
|---|--|--|
| Type | Sensor with flanges | |
| Nominal Size | ½" to 80" (DN8 to DN2000) | |
| Measuring Range | Adjustable from 0-0.8 ft/s (0-0.24 m/s) to 0-33 ft/s (0-10.1 m/s) | |
| Coil Current | Pulsating DC with one of the following frequencies: 7.5 Hz or 15 Hz depending on sensor size | |
| Process Temperature (Pressure ≤ 580 psi) | Neoprene: 32 °F to 158 °F (0 °C to 70 °C) | Linatex Rubber: -40 °F to 160 °F (-40 °C to 71.1 °C) |
| | PTFE®: -5 °F to 266 °F (-20.6 °C to 103 °C)** | Ebonite: 32 °F to 200 °F (0 °C to 93.3 °C) |
| | High Temp PTFE: 0 °F to 355 °F (-17.8 °C to 179.4 °C) | EPDM: -15 °F to 158 °F (-26.1 °C to 98.9 °C) |
| Ambient Temperature | Remote Signal Converter | -40 °F to 210 °F (-40 °C to 98.9 °C) |
| | Integral Signal Converter | -40 °F to 120 °F (-40 °C to 48.9 °C) |
| Pipe Connection | | |
| Standard | ½" to 24" (DN8 to DN600) ANSI B 16.5 Class 150; 28" to 80" (DN700 to DN2000) AWWA C-207 Class D (150 psi) (10 bar) | |
| Option | ½" to 24" (DN8 to DN600) ANSI B 16.5 Class 300 Others on request | |
| Process Vacuum | Maximum process vacuum depends on liner material: | |
| | Neoprene, Ebonite, EPDM, Natural rubber: 7.25 psi a (0.5 bar a) | |
| Liner | | |
| Standard | Neoprene | |
| Option | Teflon®, Natural rubber, EPDM, Ebonite | |
| Electrodes | | |
| Standard | Stainless steel 316 Ti | |
| Option | Hastelloy C276, Platinum, Titanium, Monel, Tantalum | |

Specifications - Sensor MAG 3100 (continued on next page)

Specifications - Sensor MAG 3100 (continued)

Enclosure

| | |
|-----------------------|---|
| Standard | Carbon steel, corrosion-resistant two-component coating |
| Option | Stainless steel AISI 316 |
| Measuring Pipe | Stainless steel AISI 304 |

Enclosure Rating

| | |
|-----------------|---|
| Standard | NEMA 6 accidental submersible (tested to 3 ft (0.91 m) of water for 30 mins) |
| Option | NEMA 6 submersible, tested to 30 ft (9.1 m) of water (no time limit if kit is being used) |
| | NEMA 6P submersible |

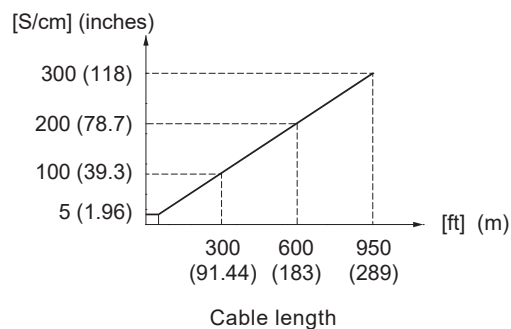
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|----------------------|---------------------------------|
| Cable Entries | 2 Pg ½" NPT –2 others available |
|----------------------|---------------------------------|

| | |
|--|--|
| Mechanical Load Design Pressure | 3 G, 1-800 Hz sinusoidal in all directions |
| | 1.5 x flange rating |

Conductivity

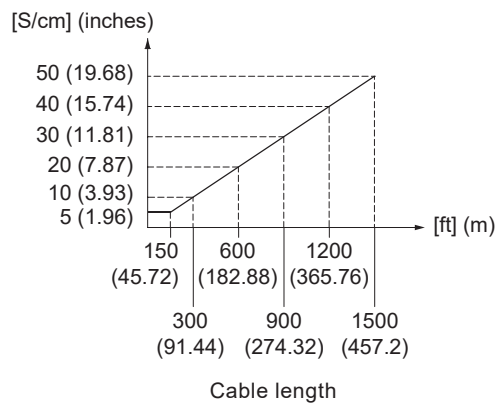
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|-----------------------------|---|
| Compact installation | Liquids with an electric conductivity $\geq 5 \mu\text{s/cm}$ |
| | For a conductivity between 1 and $5 \mu\text{s/cm}$, the accuracy may degrade to $\pm 0.5\%$ of actual flow. |

Standard cable



Remote installation

Standard cable



Note: For detection of empty sensor the min. conductivity must always be $\geq 20 \mu\text{s/cm}$ and the max. length of electrode cable when remote mounted is 150 ft (45.7 m). Special cable must be used.

* -5 to 120 °F (-20.6° o 48.9 °C) with signal converter mounted on sensor

** Each temperature class assumes a maximum ambient temperature of 105 °F (40.6 °C).

MAG 3100 Liner Selection Guide

| Liner | Applications |
|----------|--|
| Neoprene | General purpose, sewage, drinking water and district heating |
| EPDM | Drinking water, sea water |
| PTFE | Agressive chemicals, paper and pulp, high temperature applications |
| Linatex® | Abrasive media and mining slurries |
| Ebonite | Drinking water, high pressure applications and district heating |

Electrode Selection Guide

| Electrodes | Applications |
|--------------------------------|--|
| AISI 316 Ti | General purpose, water, sewage and district heating |
| Hastelloy C-276 | Good chemical properties, sea water |
| Titanium | Chlorine, chlorite, nitric and chromic acids Textile bleaching industry |
| Tantalum | Almost any acid solution |
| Platinum and platinum/irridium | The ultimate electrode material Unaffected by most liquids |

Specifications - MAG 5100 W

Technical specifications

| Design | Full bore sensor | Coned bore sensor | Full bore sensor |
|----------------------|----------------------------|---|--|
| Nominal size | DN15 ... DN40 (½" ... 1½") | DN 50 ... 300 (2" ... 12") | DN 350 ... 1200 (14" ... 48") |
| Measuring principle | Electromagnetic induction | | |
| Excitation frequency | 15 Hz | 50 ... 65 mm (2" ... 2½"): 15 Hz 80 ... 150 mm (3" ... 6"): 7.5 Hz 200 ... 300 mm (8" ... 12"): 3.75 Hz | DN350 ... 2000 (14" ... 80"): 1.875 Hz |

Process connection

| Flanges | Raised Face | | |
|------------|--|---|--|
| EN 1092-1 | PN 40 (580 psi) | 50 ... 300 mm: PN 16 (2" ... 12": 230 psi) (232 bar) 200 ... 300 mm: PN 10 (8" ... 12": 145 psi) | PN 10 (145 psi) PN 16 (230 psi) |
| ANSI B16.5 | Class 150 lb | Class 150 lb ~20 bar (290 psi) | Class 150 lb, 14" ... 24 (356...610 mm) |
| AWWA C-207 | -- | -- | 28" ... 48" (711...1219 mm): Class D |
| AS4087 | PN16 (232 psi) DN50 ... DN300 (2" ... 12") Raised Face; DN350 ... DN2000 (14" ... 80") Raised Face | | |

Rated Operation conditions

Ambient temperature

| | | | |
|---|---------------------------------------|---------------------------------------|--|
| Sensor | -40 ... +70 °C (-40 ... +158 °F) | | |
| With compact transmitter MAG 5000/6000 | -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) DN350 ... DN1200 (14"...48"); 0.01 ... 10 bar (0.15 ... 145 psi) DN1400 ... DN2000 (56"...80") |

Enclosure rating

| | | | |
|----------------------------------|--|-------------------------|------------------|
| Standard | IP67 to EN 60529/NEMA 4X/6 (1 mH2O for 30 minutes) | | |
| Option | IP68 to EN 60529/NEMA 6P (10 mH2O continuously) | | |
| Pressure drop at 3 m/s (10 ft/s) | Max 20 mbar (0.29 psi) | Max. 25 mbar (0.36 psi) | As straight pipe |
| Medium conditions | | | |

Temperature of medium

| | | | |
|------|------------------------------------|-------------------|------------------|
| NBR | -10 ... +70 °C (14 ... +158 °F) | | |
| EPDM | -10 ... +70 °C (14 ... +158 °F) | | |
| EMC | 2014/30/EU | | |
| | Full bore sensor | Coned bore sensor | Full bore sensor |

Specifications - MAG 5100 W (continued)

Design

| | |
|---------------|--------------------------|
| Weight | See dimensional drawings |
|---------------|--------------------------|

Material

| | |
|--------------------------------------|---|
| Housing and flanges | Carbon Steel ASTM A 105, with corrosion-resistant coating of category C4 or C5 according to ISO 12994-2 |
| Terminal box | Standard fibreglass reinforced polyamide |
| Electrodes | Hastelloy C276 |
| Grounding electrodes standard | Hastelloy C276 |

Certificates and approvals

| | |
|---|---|
| Custody Transfer, order as special Approvals | MI-001 cold water (EU): DN50 ... DN1200 (2" ... 48"); Kiwa water approval (NL): DN50 ... DN1200 (2" ... 48"); Chilled water pattern approval PTB K 7.2: DN15 ... DN1200 (Germany) |
| Approvals | PED - 2014/68/EU; CRN; FM - Class I Div. 2 Groups A, B, C, D; FM - Class I Zone 2 Groups IIC |

1) For sizes larger than 600 mm (24") in PN16 (232 psi) PED conformity is available as a cost added option. The basic unit will carry the LVD (Low Voltage Directive) and EMC approval.

Specifications - MAG 6000 Signal Converter: 0.2%



| | | | |
|-------------------------------|--|---|----------|
| Functions | Display flowrate, 2 totalizers, low flow cut-off, empty pipe cut-off, flow direction, error system, operating time uni/bidirectional flow, limit switches, pulse output, control for cleaning unit (With Rack-Style Unit), batch | | |
| Current Output | Current | 0-20 mA or 4-20 mA | |
| | Load | < 800 Ω | |
| | Time Constant | 0.1-30 s adjustable | |
| Frequency/Pulse Output | Short-circuit-protected | | |
| Frequency | 0-10 kHz, 50% duty cycle | | |
| Pulse Width | 50 ms, 500 ms, 5 ms, 50 ms, 100 ms, 500 ms, 1 s, 5 s | | |
| Time Constant | 0.1-30 s adjustable | | |
| Active | 24 Vdc | | |
| | | ≤ 1 Hz | ≤ 10 kHz |
| | Min. R _{load} | 150 Ω | 1 KΩ |
| | Max. R _{load} | ≤ 10 KΩ | ≤ 10 KΩ |
| Passive | 3-30 Vdc | | |
| | | U = 3 V | U = 30 V |
| | Min. R _{load} | 10 Ω | 225 Ω |
| | Max. R _{load} | ≤ 10 KΩ | ≤ 10 KΩ |
| Relay | Switch relay to indicate flow direction or fault | | |
| Load | Max.: 42 V/ 2 A, 24 Vd.c./1 A | | |
| Time Constant | Flow direction: 5 s; Fault: 1 s | | |
| Digital input | 11-30 V d.c., Ri = 4.4 KΩ (reset Totalizer, Force Output and Batch Control) | | |
| Activation time | 50 m/sec | | |
| Current | 11 V d.c. = 2.5 mA, 130 V d.c. = 7 mA | | |
| Galvanic Isolation | All inputs and outputs are galvanically isolated | | |
| Cut-off | Low-flow | 0–9.9% of maximum flow | |
| | Empty Pipe | Detection of empty pipe. (special electrode cable required) | |
| Counter | Two internal eight-digit counters for forward, net or reverse flow source | | |



Specifications - MAG 5000 Signal Converter: 0.4% accuracy



| | |
|-------------------------------|--|
| Functions | Display flowrate, 2 totalizers, low flow cut-off, empty pipe cut-off, flow direction, error system, operating time, uni/bidirectional flow, limit switches, pulse output |
| Current Output | |
| Current | 0-20 mA or 4-20 mA |
| Load | < 800 Ω |
| Time Constant | 0.1-30 s adjustable |
| Frequency/Pulse Output | Short-circuit-protected |
| Frequency | 0-10 kHz, 50% duty cycle |
| Pulse Width | 50 ms, 500 ms, 5 ms, 50 ms, 100 ms, 500 ms, 1 s, 5 s |
| Time Constant | 0.1-30 s adjustable |
| Active | 24 Vdc supplied by the signal converter 0-2 Hz: load: 125 Ω to 100 KΩ 0-10 kHz: load: 125 Ω to 100 KΩ |
| Passive | External supply of 5-50 Vdc (max. current: 200 mA) 0-10 kHz: load: 125 Ω to 10 KΩ |
| Relay | Switch relay to indicate flow direction or fault |
| Load | Max.: 42 V/2A, 24 Vd.c./1A |
| Time Constant | Flow Direction: 5 s; Fault: 1 s |
| Digital input | 11-30 V d.c., Ri = 4.4 KΩ (reset Totalizer, Force Output) |
| Activation time | 50 msec |
| Current | 11 V d.c. = 2.5 mA, 30 V d.c. = 7 mA |
| Galvanic Isolation | All inputs and outputs are galvanically isolated |
| Cut-off | |
| Low-flow | 0–9.9% of maximum flow |
| Empty Pipe | Detection of empty pipe (special electrode cable required) |
| Counter | Two internal eight-digit counters for forward, net or reverse flow source |



Specifications - MAG 6000 Signal Converter: 0.2%



| | |
|---|--|
| Electrode Cleaning | For process liquids which can leave insulating deposits on the sensor's electrodes, or leave conductive deposits on the inside of the sensor. Electrode cleaning requires a special 19" rack converter cleaning unit. |
| Display | Backlit alphanumeric text, 3 x 20 characters to indicate flow, volume, settings and faults. Reverse flow indicated by negative sign. |
| Zero Point Adjustment | Automatic |
| Input Impedance | > 1 x 10 ¹⁴ Ω |
| Excitation Frequency | Pulsating DC current with one of the following frequencies: 1½ Hz, 3¼ Hz, 7.5 Hz, 15 Hz, or 30 Hz |
| Ambient Temperature | During operation -5 °F to 120 °F (-20.6 °C to 48.9 °C) During storage -40 °F to 160 °F (-40 °C to 71.1 °C) (RH max. 95%) |
| Supply Voltage | |
| AC | 115/230 Vac. +10% to -15%, 50-60 Hz, 9 VA |
| DC | 11-30 Vdc/11-24 Vac, 9 W |
| Integral/Remote | Can be mounted integrally on sensor, or remote on pipe or wall |
|  Material | Fiberglass-reinforced polyamide or optional stainless steel |
| Rating | NEMA 6, accidental submersible (3ft (0.91 m) of water for 30 min.) |
| Mechanical Load | 3.17 G, 18-1000 Hz random in all directions |
| 19" insert | Insert fits in a 19" rack or wall, front, back panel unit |
|  Material | Standard 19" insert of Aluminum/steel |
| Rating | 19" Insert and back panel mount: NEMA 1 Front panel and wall mount unit: NEMA 4X |
| Mechanical Load | 115/230 Vac version: 1 G, 1-800 Hz sinusoidal in all directions 24 Vdc version: 1 G, 1-800 Hz sinusoidal in all directions |
| Communication | |
| Standard | Prepared for client mounted add-on modules |
| Optional | HART® as add on module |

Specifications - MAG 5000 Signal Converter: 0.4% accuracy



| | |
|---|--|
| Electrode Cleaning | N/A |
| Display | Backlit alphanumeric text, 3 x 20 characters to indicate flow, volume, settings and faults. Reverse flow indicated by negative sign. |
| Zero Point Adjustment | Automatic |
| Input Impedance | $> 1 \times 10^{14} \Omega$ |
| Excitation Frequency | Pulsating DC current at a frequency of 3¾ Hz |
| Ambient Temperature | During operation -5 °F to 120 °F (-20.6 °C to 48.9 °C) During storage -40 °F to 160 °F (-40 °C to 71.1 °C) (RH max. 95%) |
| Supply Voltage | |
| AC | 115/230 Vac +10% to -15%, 50-60 Hz, 9 VA |
| DC | 11-30 Vdc/11-24 Vac 9 W |
| Integral/Remote | Can be mounted integrally on sensor, or remote on pipe or wall |
|  Material | Fiberglass-reinforced polyamide or optional stainless steel |
| Rating | NEMA 6, accidental submersible (3 ft (0.91 m) of water for 30 min.) |
| Mechanical Load | 3.17 G, 18–1000 Hz random in all directions |
| 19" insert | Insert fits in a 19" rack or wall, front, back panel unit |
|  Material | Standard 19" insert of Aluminum/steel |
| Rating | 19" Insert and back panel mount: NEMA 1 Front panel and wall mount enclosure unit: NEMA 4X |
| Mechanical Load | 115/230 Vac version: 1 G, 1-800 Hz sinusoidal in all directions 24 Vdc version: 1 G, 1-800 Hz sinusoidal in all directions |
| Communication | |
| Standard | Without serial communication |
| Optional | HART® (available with VAC options only as a factory installed option) |

MAGFLO® Cleaning Unit

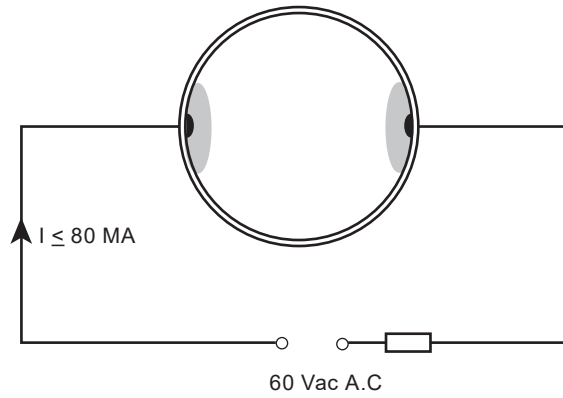


| | |
|----------------------------|---|
| Application | For use with MAG 6000 19" insert to clean the electrodes on MAG 1100 and MAG 3100. |
| Cleaning Voltage | |
| AC | cleaning: 60 Vac. |
| DC | cleaning: 30 Vdc. |
| Cleaning Period | 60 sec + 60 sec. recovery period |
| Relay | Switch relay indicating cleaning in progress |
| Load: | 42 V/2A |
| Indicator Lamps | LEDs: "ON" and "CLEANING" |
| Supply Voltage | |
| AC | 115/230 Vac +10% to -15%, 50-60 Hz, 7 VA cleaning, 5 VA stand by |
| DC | 18-30 Vdc, 17 W cleaning, 3 W stand by |
| Ambient Temperature | During operation: -5 °F to 120 °F (-20.6 °C to 48.9 °C) During storage: -5 °F to 160 °F (-20.6 °C to 71.1 °C) |
| 19" insert | 19" insert for MAG 6000 in either a front, back or wall mount unit Enclosure material: Standard 19" insert in Aluminum/steel Enclosure rating: NEMA 1; if front or wall mount kit is used: NEMA 4X Mechanical load: 1 G, 1-800 Hz sinusoidal in all directions |

MAG 6000 can be mounted with the Cleaning Unit. The electronic package can be mounted in either a wall, front, or back panel unit.

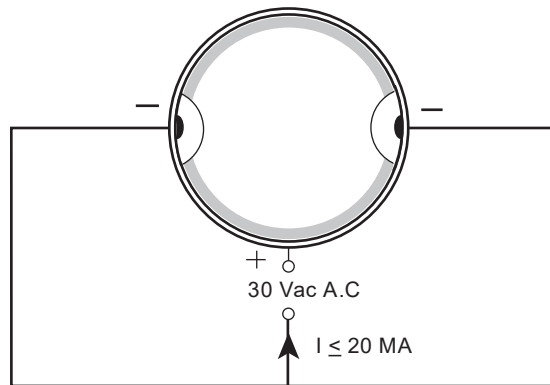
AC Cleaning

AC Cleaning is used to remove greasy deposits on the electrodes caused from measurement of waste water flows from Meat Processor or water containing oil, grease, or fat residues. During cleaning, heat is generated on the electrode surface, softening the greasy particles. This causes gas bubbles which remove the deposits from the electrode surface.



DC Cleaning

DC cleaning is used to remove conductive deposits from the meter pipe. When measuring district heating water flows, conductive magnetite deposits can accumulate. If the water's conductivity is below approx. $250 \mu\text{S/cm}$, these deposits can short the electrode signal and cause measuring error. This cleaning method involves electrolysis in which the electron flow leads the deposited particles away from the area around the electrodes.



Sensor size selection guide

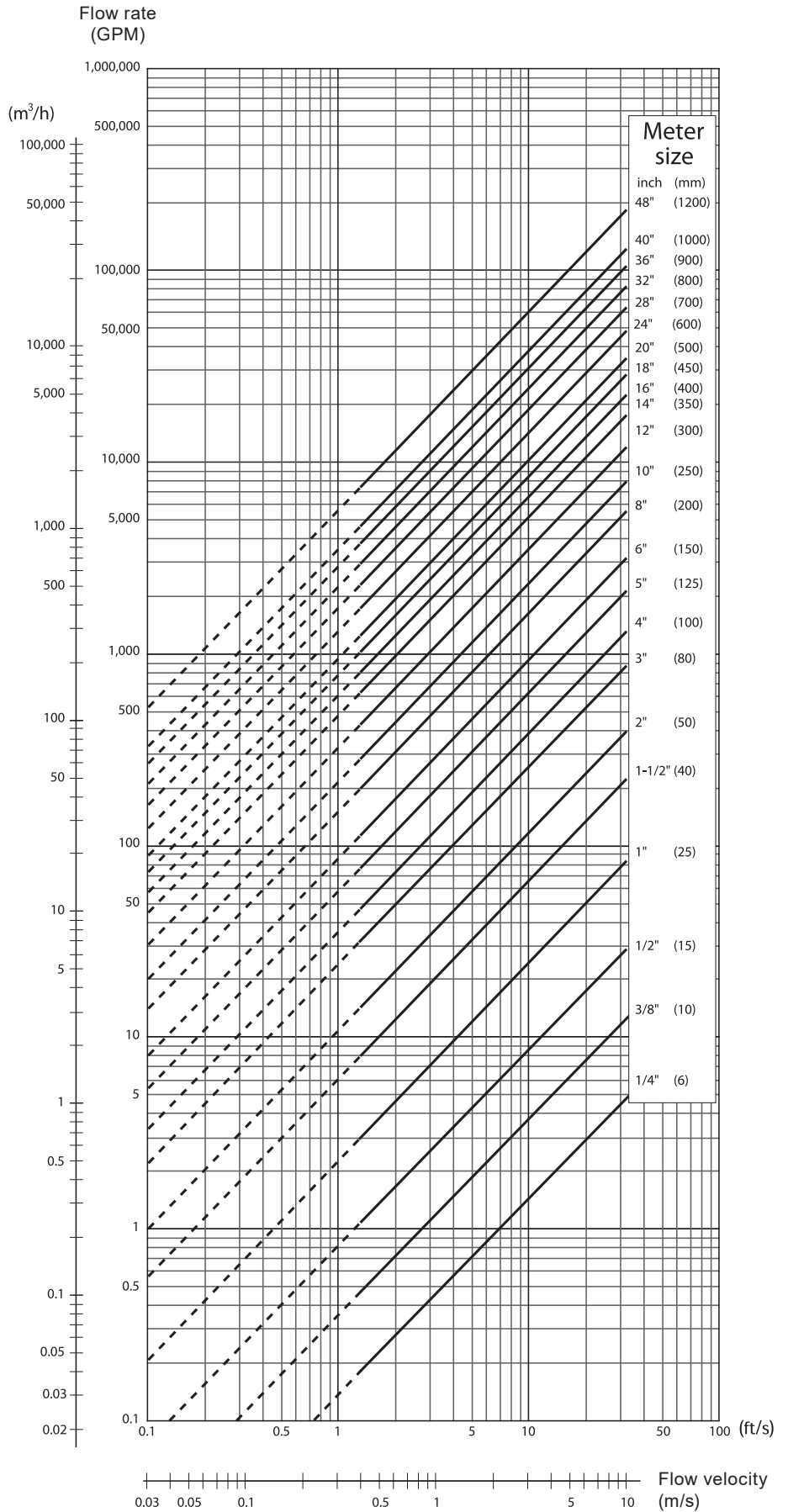
The table shows the relationship between flow velocity V, flow quantity Q, and sensor size.

Guidelines for selection of sensor

Min. measuring range:
0-0.8 ft/s (0-0.24 m/s)

Max. measuring range:
0-33 ft/s (0-10.1 m/s)

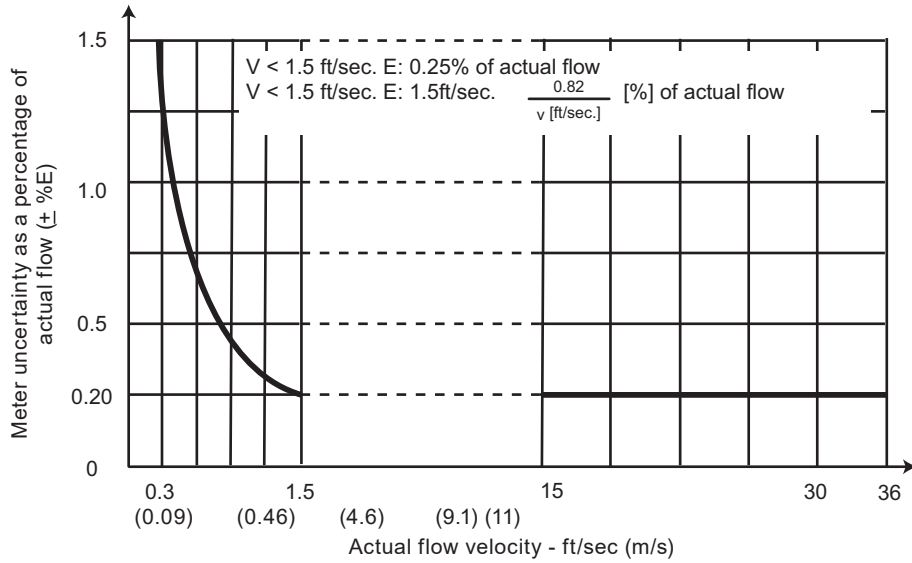
Normally the sensor is selected with a nominal flow in the measuring range of 3 to 20 ft/s. (0.91 to 6.1 m/s)



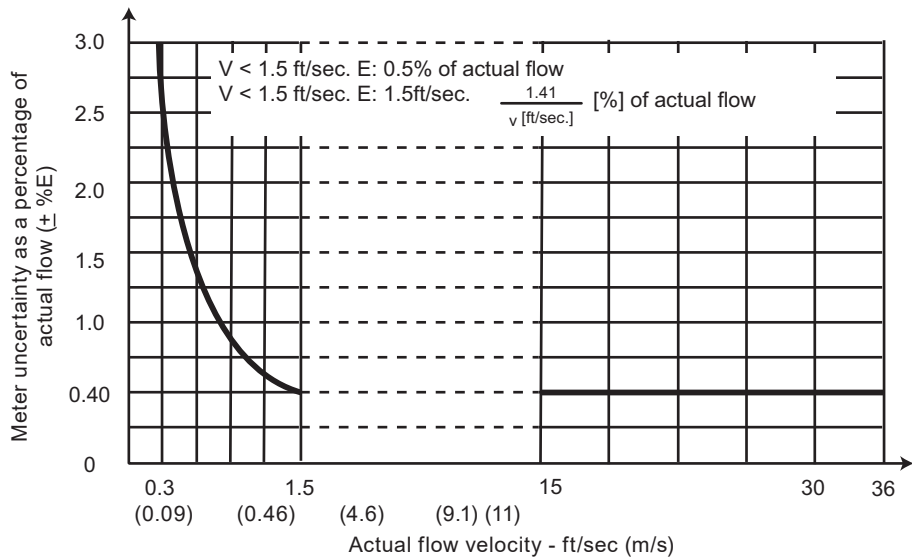
Accuracy

Meter uncertainty under reference conditions (display/frequency/pulse output)

MAG 6000



MAG 5000



Reference Conditions (ISO/DP9104)

| | |
|---|--|
| Temperature of medium | 68 °F \pm 4 °F (20 °C \pm 1.5 °C) |
| Ambient temperature | 68 °F \pm 4 °F (20 °C \pm 1.5 °C) |
| Supply voltage | Un \pm 1% |
| Warm-up time | 30 min |
| Incorporation in pipe section in accordance with reference conditions (ISO) | Inlet section 10 x DN |
| | Outlet section 5 x DN |
| | Sensor optimally grounded and centered |
| Flow conditions | Fully developed flow profile |
| | For further information contact Spirax Sarco |

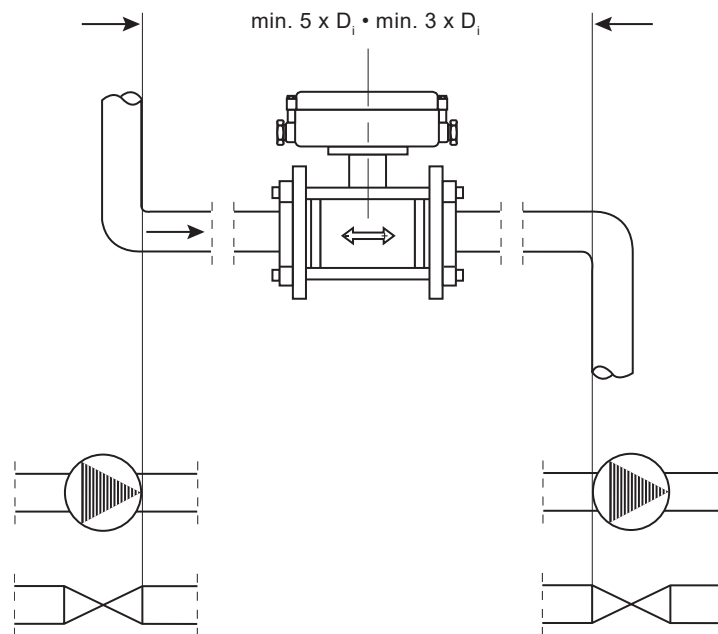
Other Accuracy Statements

| | |
|--------------------------------------|---|
| Current output | Pulse output: $\pm(0.1\%$ of actual flow $+0.05\%$ FSO) |
| Effect of ambient temperature | Display/frequency/pulse output: $< \pm 0.003\%$ /Kelvin |
| | Current output: $< \pm 0.005\%$ /Kelvin |
| Effect of supply voltage | $< 0.005\%$ of measuring value on 1% change |
| Repeatability | $\pm 0.1\%$ of actual flow for $V \geq 1.5$ ft/s (0.46 m/s) |

Inlet and outlet conditions

For accurate flow measurement, it is essential to have sufficient straight run of inlet and outlet pipes, and a certain minimum distance between pumps and valves.

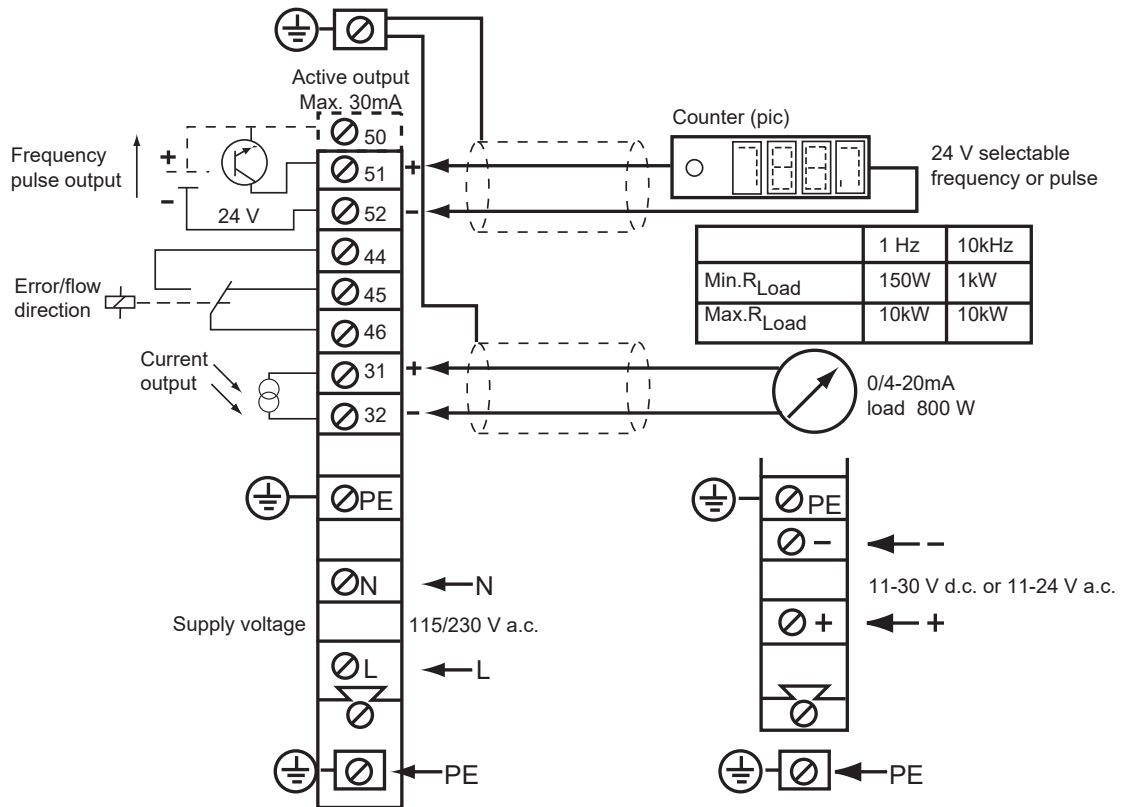
It is also important to center the flowmeter in relation to the pipe flanges and gaskets.



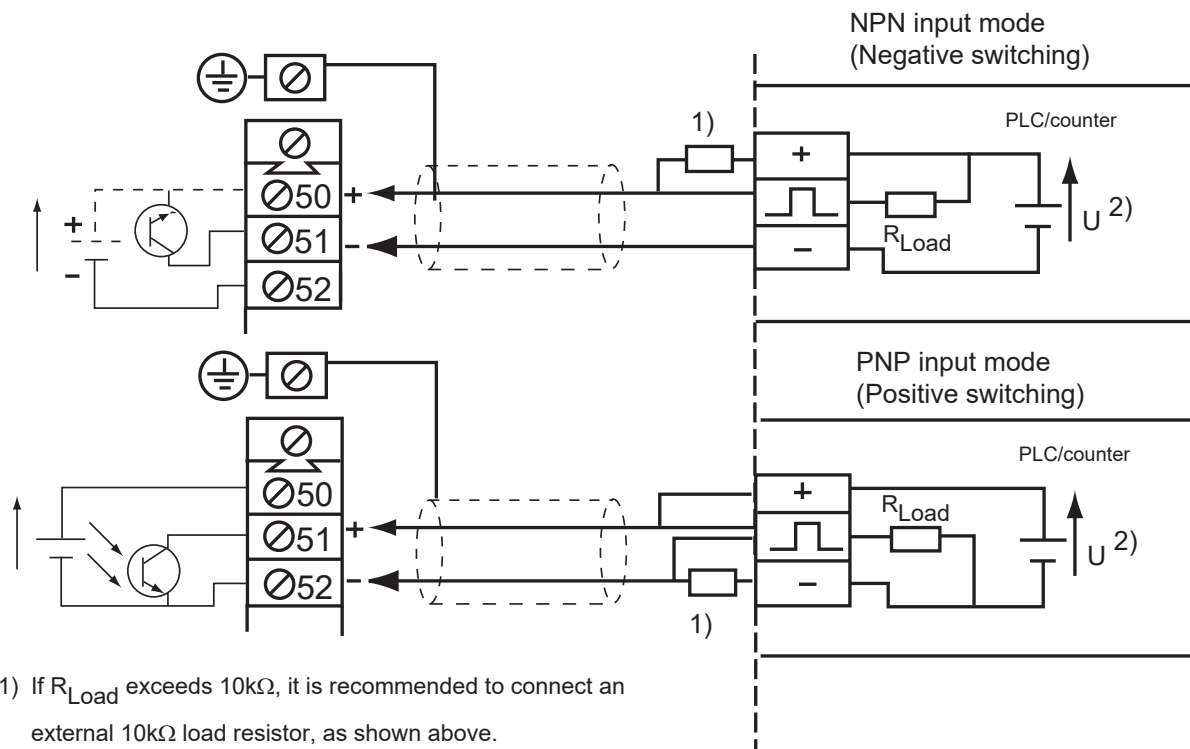
Additional distance may be required following pumped or valved applications to return to the rated accuracy of the converter

Electrical connection mag 6000 and mag 5000

Signal converter MAG 6000 and MAG 5000 integrally mounted on sensor



Connection of electromechanical counter (active output), current output, power supply.



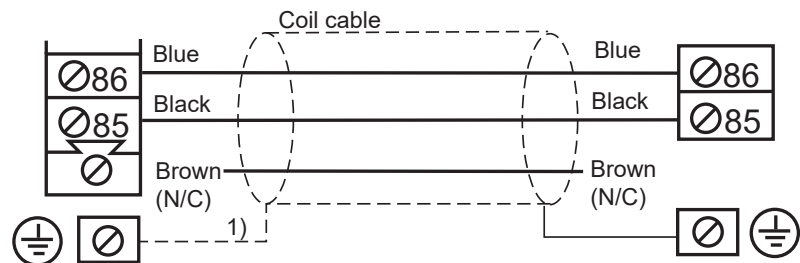
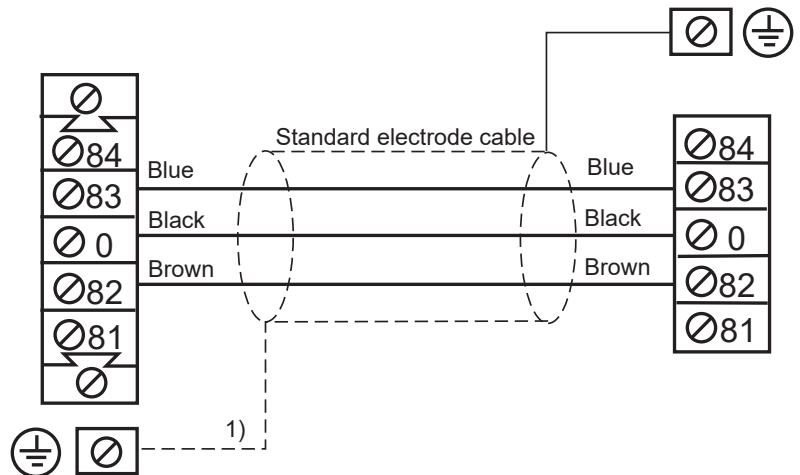
| | *U=3V | *U=30V |
|-----------------|------------------|------------------|
| Min. R_{Load} | $10\ \Omega$ | $225\ \Omega$ |
| Max. R_{Load} | $\leq 10k\Omega$ | $\leq 10k\Omega$ |

2) U= 3-30 V d.c.

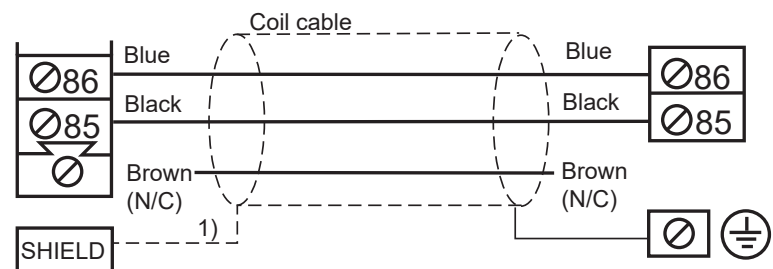
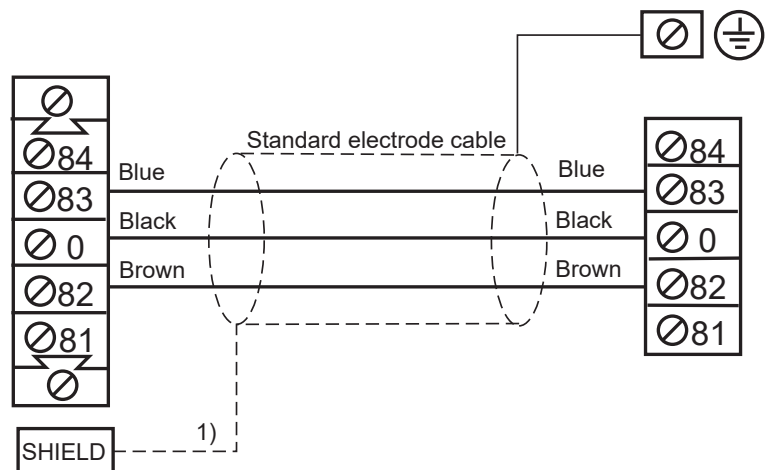
Other pulse-frequency output connection options using passive mode.

**Signal converter mag 6000 and mag 5000 remote mounted on sensor
(other connections as shown previously)**

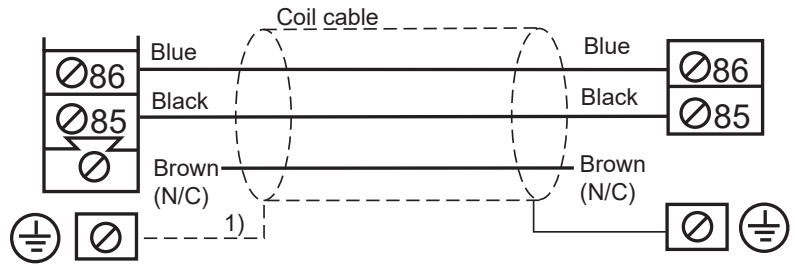
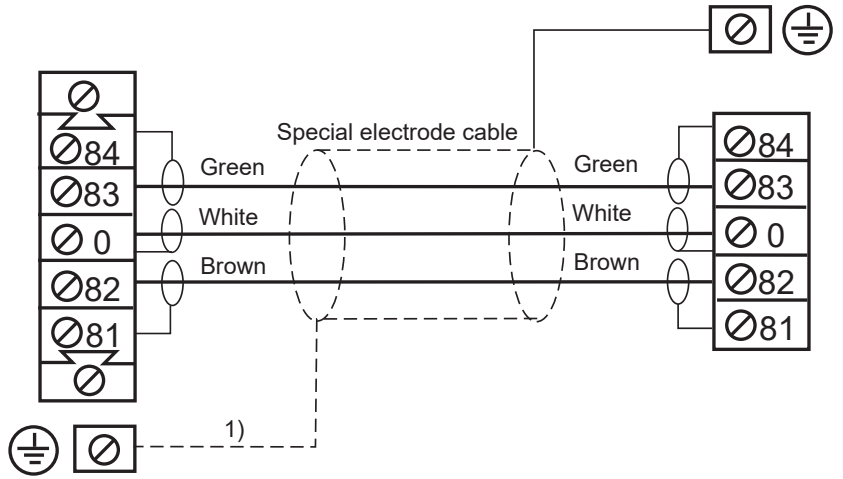
Signal converter remote mounted using a standard electrode cable.



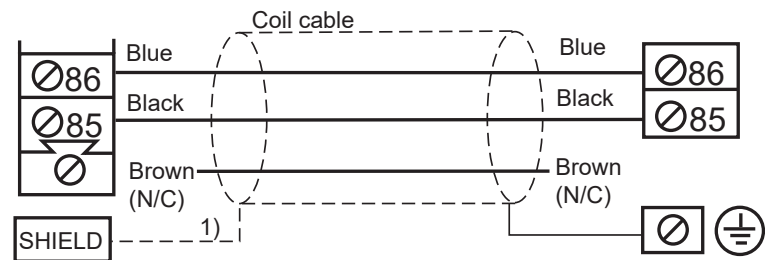
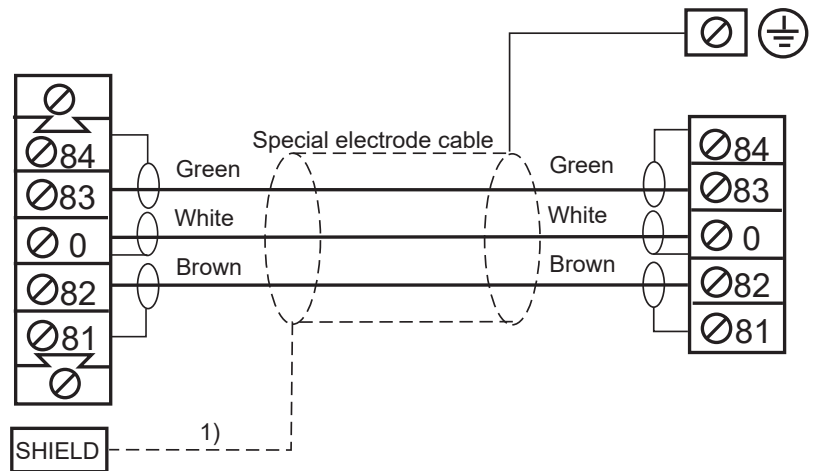
MAG 6000 NEMA 6 version with special electrode cable for empty pipe detection.



MAG 6000 NEMA 6 version with special electrode cable for empty pipe detection.



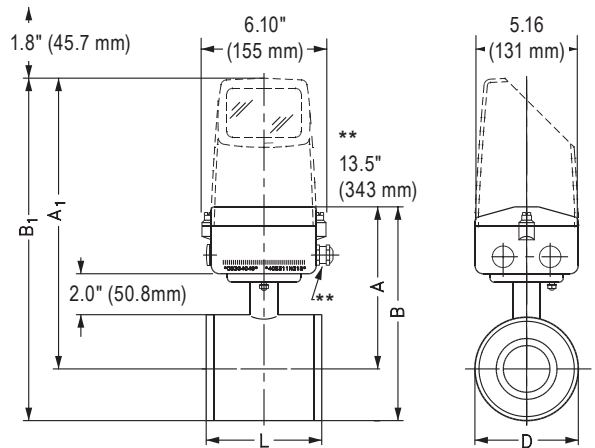
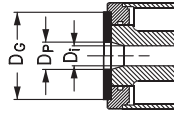
19* insert remote mounted using special electrode cable. empty pipe detection.



1) EMC immunity: In areas with severe electrical interference, the shield on the electrode and coil cables must be grounded at both ends.

Dimensions/weights (approximate) inches (mm) and lbs (kg)

Sensor MAG 1100 Standard and high temperature MAG 1100, integral/remote



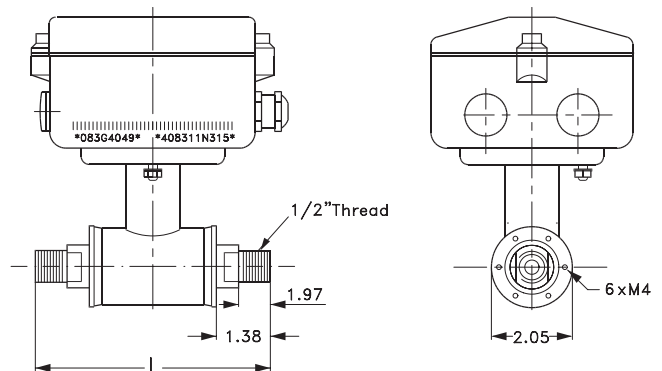
Grounding ring required for all applications, except when using the NPT adaptor, not shown

| Size | A1 | B1 | A1 | B1 | D | Di (Al ₂ O ₃) | Dp | DG | Weight kg (lbs) | The total built-in length "L", depends on the gasket selected. | | | | |
|-------|----------------|-----------------|-----------------|-----------------|-----------------|---|----------------|----------------|-----------------------|--|---------------|------------------|-------------------|------------------|
| | | | | | | | | | | EPDM | Graphite | PTFE (Teflon) | Without gasket | Earthing Ring |
| .25" | 6.14" (156) | 7.13" (181) | 12.16" (309) | 13.15" (334) | 1.90" (48) | 0.24" (6) | 0.68" (17) | 1.34" (34) | 2.1 (4.8) | 2.52 (64) | 2.60 (66) | 2.75 (70) | 2.52 (64) | 3.03 (77) |
| .375" | 6.14" (156) | 7.13" (181) | 12.16" (309) | 13.15" (334) | 1.90" (48) | 0.39" (10) | 0.68" (17) | 1.34" (34) | | 2.52 (64) | 2.60 (66) | 2.75 (70) | 2.52 (64) | 3.03 (77) |
| .5" | 6.14" (156) | 7.13" (181) | 12.16" (309) | 13.15" (334) | 1.90" (48) | 0.59" (15) | 0.68" (17) | 1.57" (40) | | 2.56 (65) | 2.60 (66) | 2.75 (70) | 2.52 (64) | 3.03 (77) |
| 1" | 6.46" (164) | 7.72" (196) | 12.48" (317) | 13.74" (349) | 2.50" (63.5) | 0.98" (25) | 1.12" (28) | 2.20" (56) | 2.2 (4.9) | 3.15 (80) | 3.19 (81) | 3.35 (85) | 3.10 (79) | 3.62 (92) |
| 1.5" | 6.93" (176) | 8.58" (218) | 12.95" (329) | 14.61" (371) | 3.31" (84) | 1.57" (40) | 1.71" (43) | 2.95" (75) | 3.4 (7.5) | 3.74 (95) | 3.78 (96) | 3.94 (100) | 3.70 (94) | 4.21 (107) |
| 2" | 7.24" (184) | 9.25" (235) | 13.27" (337) | 15.27" (388) | 4.00" (102) | 1.97" (50) | 2.15" (55) | 3.54" (90) | 4.2 (9.2) | 4.13 (105) | 4.17 (106) | 4.33 (110) | 4.05 (103) | 4.61 (117) |
| 2.5" | 7.64" (194) | 10.00" (254) | 13.66" (347) | 16.02" (407) | 4.72" (120) | 2.56" (65) | 2.68" (68) | 4.41" (112) | 5.4 (12) | 5.12 (130) | 5.15 (131) | 5.31 (135) | 5.05 (128) | 5.59 (142) |
| 3" | 7.87" (200) | 10.47" (266) | 13.90" (353) | 16.50" (419) | 5.24" (133) | 3.15" (80) | 3.25" (83) | 4.88" (124) | 6.8 (15) | 6.10 (155) | 6.14 (156) | 6.30 (160) | 6.00 (152) | 6.57 (167) |
| 4" | 8.39" (213) | 11.50" (292) | 14.41" (366) | 17.52" (445) | 6.26" (159) | 3.94" (100) | 4.22" (107) | 5.91" (150) | 10 (22) | 7.28 (185) | 7.31 (186) | 7.48 (190) | 7.20 (183) | 7.76 (197) |

¹ 0.5" shorter when the AISI terminal box is used. (High temperature version 390 °F (198.9 °C)).
² With signal converter MAG 5000 or MAG 6000 installed, weight is increased by approx. 1.8 lbs (0.82 kg).

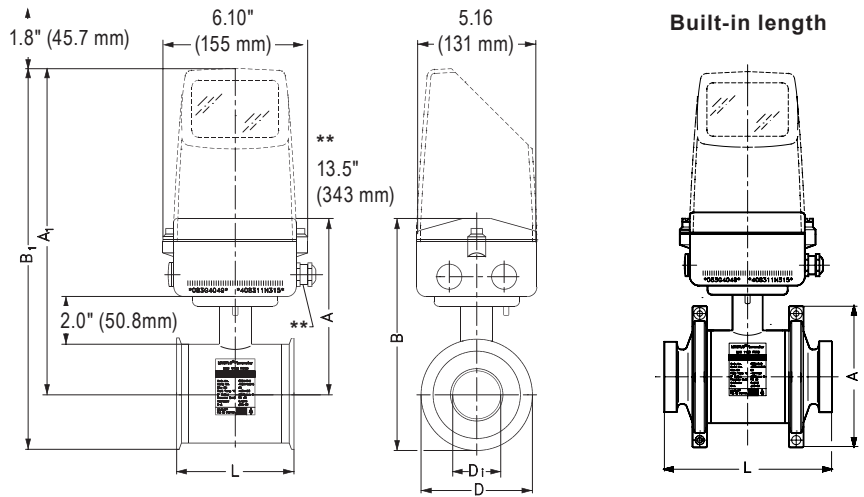
The MAG 1100 ¼" and ⅜" can be assembled with a ½" NPT SS fitting instead of wafer mount, which removes the need for grounding rings.

| | Without gasket | EPDM | Graphite | Teflon |
|---|------------------|------------------|------------------|---------------|
| L | 5.9" (150 mm) | 5.9" (150 mm) | 6.0" (152 mm) | 6.1" (155) |



Dimensions/weights (approximate) inches (mm) and lbs (kg)

Sensor MAG 1100 food



| Sensor Size | L | A | B | A1 | B1 | D | Weight * |
|-------------|-----------------|----------------|-----------------|----------------|----------------|-----------------|-------------------|
| .375" | 2.60" (66.0) | 5.63" (143) | 6.89" (175) | 11.8" (300) | 13.1" (333) | 2.52" (64.0) | 4.8" (2.18 kg) |
| .5" | 2.60" (66.0) | 5.63" (143) | 6.89" (175) | 11.8" (300) | 13.1" (333) | 2.52" (64.0) | 4.8" (2.18 kg) |
| 1 | 3.19" (81.0) | 5.94" (151) | 7.48" (190) | 12.1" (307) | 13.6" (345) | 3.05" (77) | 4.9" (2.22 kg) |
| 1.5" | 3.78" (96.0) | 6.34" (161) | 8.15" (207) | 12.5" (318) | 14.3" (363) | 3.58" (91) | 7.5" (3.40 kg) |
| 2 | 4.17" (106) | 6.69" (170) | 9.06" (230) | 12.8" (325) | 15.2" (386) | 4.69" (119) | 9.2" (4.17 kg) |
| 2.5" | 5.24" (133) | 7.01" (178) | 9.57" (243) | 13.2" (335) | 15.7" (399) | 5.12" (130) | 12" (5.44 kg) |
| 3 | 6.22" (158) | 7.32" (186) | 10.40" (264) | 13.5" (343) | 16.6" (422) | 6.10" (155) | 15" (6.80 kg) |
| 4 | 7.40" (188) | 8.43" (214) | 12.04" (306) | 14.6" (371) | 18.2" (462) | 7.20" (183) | 22" (9.98 kg) |

| Sensor Size | A | L ** |
|-------------|----------------|-----------------|
| .375 | 3.90" (99) | 5.75" (146) |
| .5 | 3.90" (99) | 5.75" (146) |
| 1 | 4.45" (113) | 6.34" (161) |
| 1.5 | 4.96" (126) | 6.93" (176) |
| 2 | 6.06" (154) | 7.32" (186) |
| 2.5 | 6.50" (165) | 8.78" (223) |
| 3 | 7.87" (200) | 10.5" (267) |
| 4 | 8.86" (225) | 11.34" (288) |

* With signal converter MAG 5000 or MAG 6000 installed weight is increased by approx. 4.4 lbs (2 kgs).

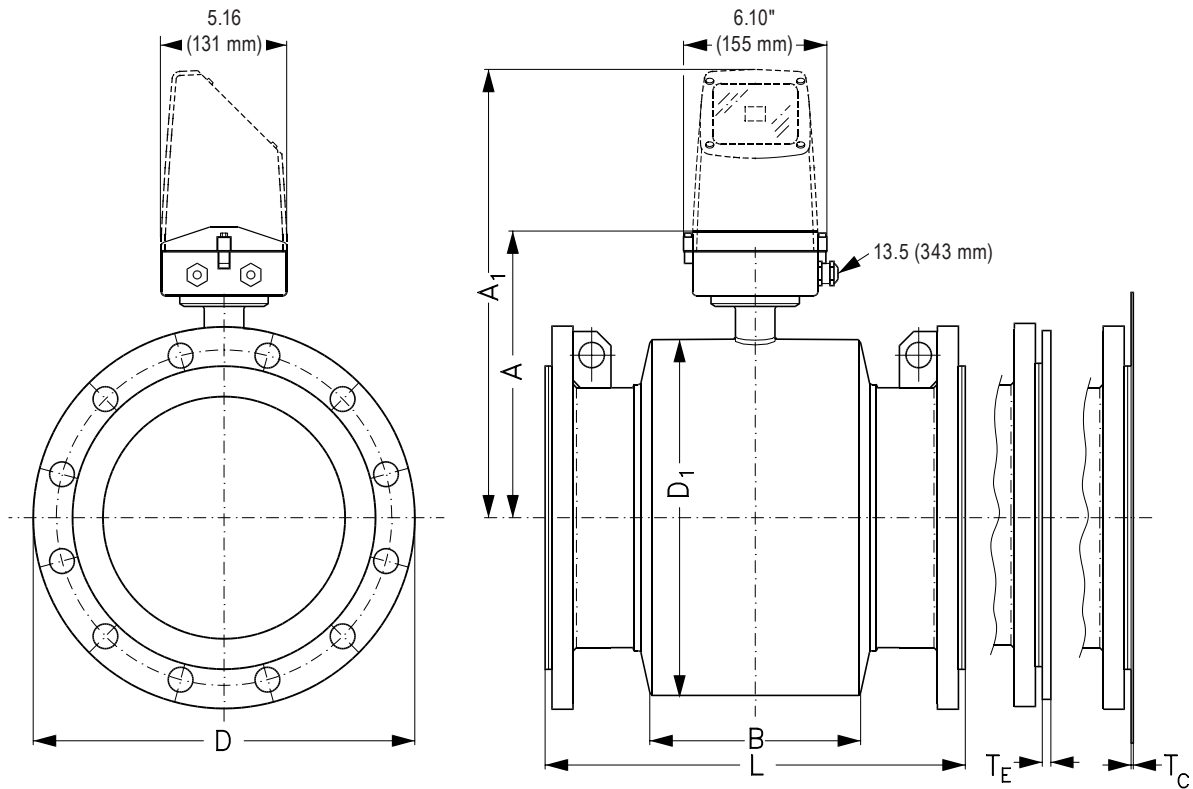
** The total built-in length "L" is independent of the adapter type selected

Accessories

| Sensor Size | Tri-Clover® | | Tri-Clamp® | |
|-------------|-------------|-------------|-------------|-------------|
| | Di | Do | Di | Do |
| .5 | 0.53 (13.5) | 0.63 (16.0) | | |
| 1 | | | 0.89 (22.6) | 2 (50.8) |
| 1.5 | 1.40 (35.6) | 1.52 (38.6) | 1.4 (35.6) | 2 (50.8) |
| 2 | 1.91 (48.5) | 2.03 (51.6) | 1.91 (48.5) | 2.52 (64.0) |
| 2.5 | 2.37 (60.2) | 2.52 (64.0) | 2.37 (60.2) | 3.05 (77.5) |
| 3 | 2.87 (72.9) | 3.02 (76.7) | 2.87 (72.9) | 3.58 (90.9) |
| 4 | 3.85 (97.8) | 4.04 (103) | 3.85 (97.8) | 4.69 (119) |

Dimensions/weights (approximate) inches (mm) and lbs (kg)

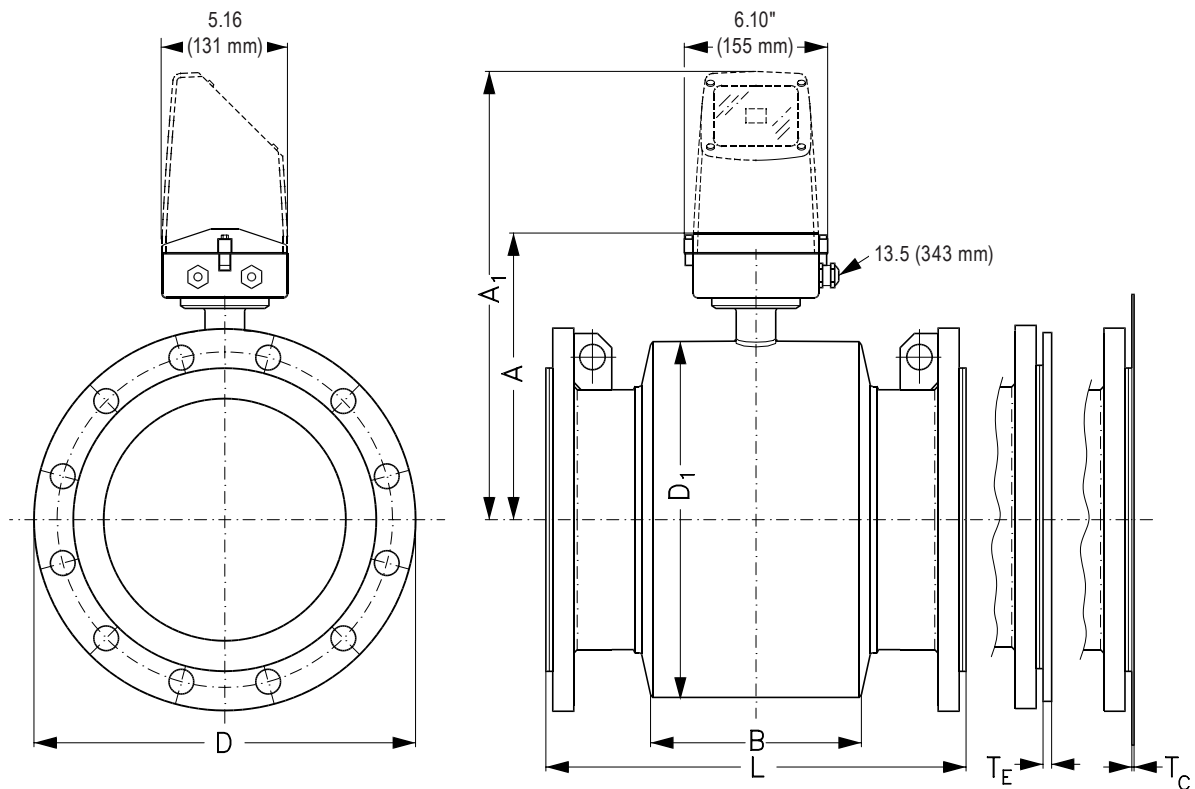
Sensor MAG 3100



| Size | A ¹ | A ₁ | B | D ₁ | L ² | | | T _c ³ | T _E ³ | Weight ⁴ lbs (kg) |
|------|----------------|----------------|--------------|----------------|----------------|--------------|--------------------------|-----------------------------|-----------------------------|------------------------------------|
| | | | | | ANSI 16.5 | | AWWA C-207 Class D | | | |
| | | | | | Class 150 | Class 300 | | | | |
| .5" | 7.36" (187) | 13.31" (338) | 2.32" (104) | 4.09" (104) | 7.87" (200) | 7.87" (200) | | 0.24" (6.10) | 11 (5.00) | |
| 1" | 7.36" (187) | 13.31" (338) | 2.32" (104) | 4.09" (104) | 7.87" (200) | 7.87" (200) | | 0.05" (1.27) | 13 (5.90) | |
| 1.5" | 7.76" (197) | 13.70" (348) | 3.23" (82.0) | 4.88" (124) | 7.87" (200) | 7.87" (200) | | 0.05" (1.27) | 17 (7.71) | |
| 2" | 8.07" (205) | 14.01" (356) | 2.83" (71.9) | 5.47" (139) | 7.87" (200) | 7.87" (200) | | 0.05" (1.27) | 28 (12.7) | |
| 2.5" | 8.35" (212) | 14.29" (363) | 2.83" (71.9) | 6.06" (154) | 7.87" (200) | 10.71" (272) | | 0.05" (1.27) | 30 (13.6) | |
| 3" | 8.74" (222) | 14.69" (373) | 2.83" (71.9) | 6.85" (174) | 10.71" (272) | 10.71" (272) | | 0.05" (1.27) | 33 (15.0) | |
| 4" | 9.53" (242) | 15.47" (393) | 3.35" (85.1) | 8.43" (214) | 9.84" (250) | 12.20" (310) | | 0.05" (1.27) | 44 (20.0) | |
| 5" | 10.04" (255) | 15.98" (406) | 3.35" (85.1) | 9.41" (239) | 9.84" (250) | 13.10" (333) | | 0.05" (1.27) | 55 (24.9) | |
| 6" | 10.87" (276) | 16.81" (427) | 5.39" (137) | 11.10" (282) | 11.81" (300) | 11.81" (300) | | 0.05" (1.27) | 66 (29.9) | |
| 8" | 11.97" (304) | 17.91" (455) | 5.39" (137) | 13.31" (338) | 13.78" (350) | 13.78" (350) | | 0.05" (1.27) | 110 (49.9) | |
| 10" | 13.07" (332) | 19.02" (483) | 5.39" (137) | 15.47" (393) | 17.72" (450) | 17.72" (450) | | 0.05" (1.27) | 155 (70.3) | |
| 12" | 14.05" (357) | 20.00" (508) | 5.39" (137) | 17.48" (444) | 19.69" (500) | 19.69" (500) | | 0.06" (1.52) | 176 (79.8) | |
| 14" | 14.25" (362) | 20.20" (513) | 10.63" (270) | 17.76" (451) | 21.65" (550) | 21.65" (550) | | 0.06" (1.52) | 242 (108) | |
| 16" | 15.24" (387) | 21.18" (538) | 10.63" (270) | 19.76" (502) | 23.62" (600) | 23.62" (600) | | 0.06" (1.52) | 275 (125) | |
| 18" | 16.45" (418) | 22.40" (569) | 12.20" (310) | 22.16" (563) | 23.62" (600) | 25.20" (640) | | 0.06" (1.52) | 385 (175) | |
| 20" | 17.44" (443) | 23.39" (594) | 13.78" (350) | 24.17" (614) | 26.77" (680) | 28.70" (729) | | 0.06" (1.52) | 440 (200) | |
| 24" | 19.45" (494) | 25.39" (645) | 16.93" (430) | 28.15" (715) | 32.28" (820) | 33.80" (859) | | 0.06" (1.52) | 660 (299) | |

Dimensions/weights (approximate) inches (mm) and lbs (kg)

Sensor MAG 3100 (continued)



| Size | A ¹ | A ₁ | B | D ₁ | L ² | | T _C ³ | T _E ³ | Weight ⁴ lbs (kg) |
|------|----------------|----------------|---------------|----------------|------------------------|--------------------------|-----------------------------|-----------------------------|------------------------------------|
| | | | | | ANSI 16.5 Class 150 | AWWA C-207 Class D | | | |
| 28" | 21.42" (544) | 27.36" (695) | 19.69" (500) | 32.13" (816) | | 34.5" (876.3) | 0.08" (2.03) | | 770 (349) |
| 30" | 22.48" (571) | 28.43" (722) | 21.89" (556) | 34.21" (869) | | 36.9" (937) | 0.08" (2.03) | | 880 (399) |
| 32" | 23.86" (606) | 29.80" (757) | 22.05" (560) | 36.50" (927) | | 39.4" (1001) | 0.08" (2.03) | | 1045 (474) |
| 36" | 25.71" (653) | 31.65" (804) | 24.80" (630) | 40.63" (1032) | | 44.3" (1125) | 0.08" (2.03) | | 1233 (559) |
| 40" | 27.72" (704) | 35.67" (906) | 26.38" (670) | 44.72" (1136) | | 49.2" (1250) | 0.08" (2.03) | | 1541 (699) |
| 44" | 29.72" (755) | 35.67" (906) | 30.31" (770) | 48.74" (1238) | | | 0.08" (2.03) | | |
| 48" | 31.89" (810) | 37.83" (961) | 31.18" (792) | 53.07" (1348) | | 59.1" (1501) | 0.08" (2.03) | | 2751 (1248) |
| 56" | 36.42" (925) | 42.36" (1076) | 39.37" (1000) | 65.94" (1675) | | 68.9" (1750) | 0.12" (3.05) | | 3211 (1456) |
| 60" | 38.27" (972) | 44.21" (1123) | 40.15" (1020) | 65.83" (1672) | | 73.8" (1875) | 0.12" (3.05) | | 3731 (1692) |
| 64" | 40.35" (1025) | 46.30" (1176) | 44.49" (1130) | 75.39" (1915) | | 78.7" (1999) | 0.12" (3.05) | | 4257 (1931) |
| 72" | 44.21" (1123) | 50.16" (1274) | 49.21" (1250) | 77.72" (1974) | | 88.5" (2248) | 0.12" (3.05) | | 5291 (2400) |
| 78" | 48.15" (1223) | 54.09" (1374) | 54.13" (1375) | 85.59" (2174) | | 98.4" (2499) | 0.12" (3.05) | | 7492 (3398) |

¹ 0.5" shorter with AISI terminal box (Ex and high temperature)

² When earthing flanges are used the thickness of the earthing flange must be added to the built-in length

³ TC = Type C grounding ring, TE = Type E grounding ring

⁴ Weights are approx and for ANSI 150 without signal converter.

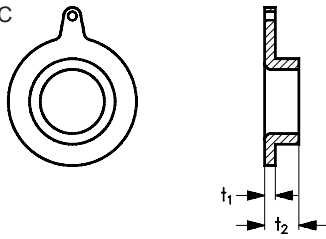
D = Outside diameter of flange, see flange tables

Dimensions/weights (approximate) inches (mm) and lbs (kg)

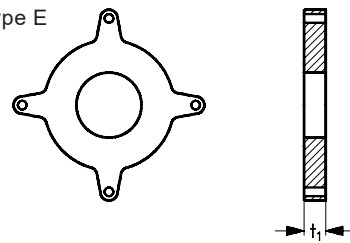
Sensor MAG 3100 (continued)

Earthing/protection flange

Type C



Type E



| Size | t ₁ | t ₂ | Weight lbs (kg) |
|------------|-----------------|----------------|----------------------------|
| 1" to 10" | 0.05" (1.27) | 0.6" (15.2) | 0.07-0.9 (0.03-0.41) |
| 12" to 24" | 0.06" (1.52) | 0.8" (20.3) | 1.3-5.7 (0.59 - 2.59) |
| 28" to 48" | 0.08" (2.03) | 1.0" (25.4) | 6.6-11.0 (3.0 - 5.0) |
| 56" to 80" | 0.12" (3.05) | 1.6" (40.6) | 20.0-35.0 (9.07 - 15.9) |

| Size | t ₁ | Weight lbs (kg) |
|------------|----------------|---------------------------|
| .5" | 0.2 (5.1) | 0.15 (0.07) |
| 1" to 6" | 0.2 (5.1) | 0.7-3.0 (0.32 - 1.4) |
| 8" to 14" | 0.3 (7.6) | 3.7-9.0 (1.7 - 4.1) |
| 16" to 24" | 0.4 (10) | 14.0-28.0 (6.4 - 12.7) |

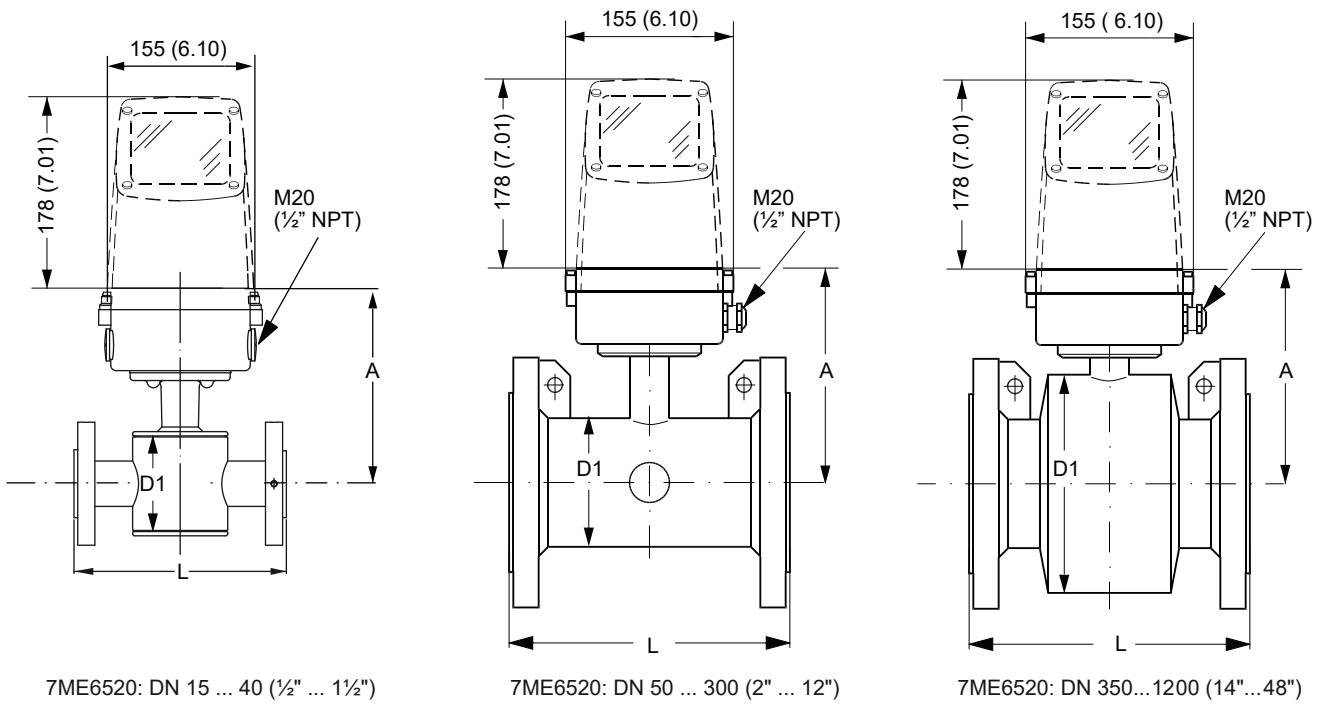
Type C flanges for liners of neoprene, EPDM, linatex® and ebonite.

Type E flanges for liners of PTFE.

MAG 3100 high temperature (PTFE) is always equipped with 2 pcs. type E grounding flanges.

Dimensions/weights (approximate) inches (mm) and lbs (kg)

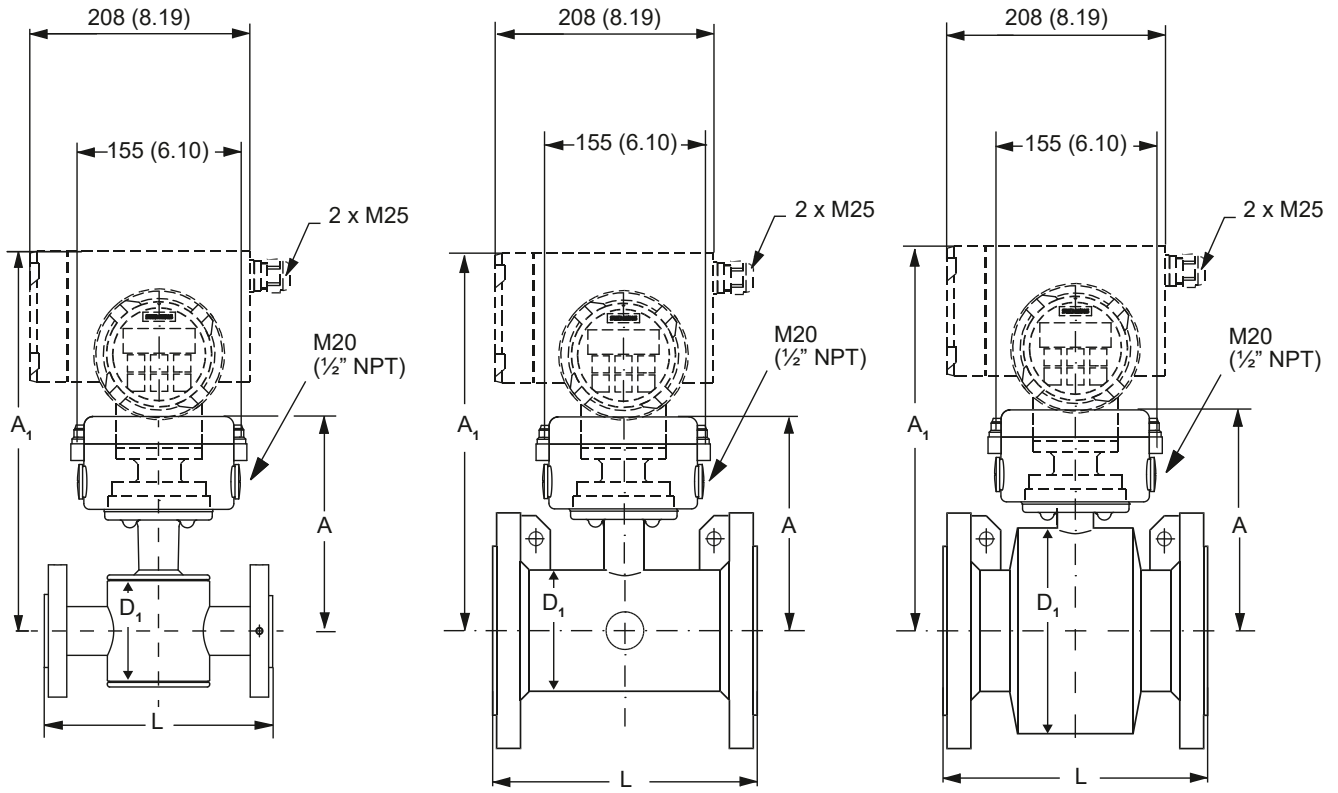
Sensor MAG 5100 W



| Nominal Size | | A | | A1 | | L | | | | | | | | Weight | | | |
|--------------|--------|------|--------|------|--------|-------|--------|-------|--------|-------|--------|------------------|--------|--------|--------|------|-------|
| | | | | | | 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) | [kg] | [lbs] |
| 12.7 | ½ | 177 | 7.0 | 331 | 13.0 | | | | | 200 | 7.9 | 200 | 7.9 | | | 4 | 9 |
| 25.4 | 1 | 187 | 7.4 | 341 | 13.4 | | | | | 200 | 7.9 | 200 | 7.9 | | | 5 | 11 |
| 38.1 | 1½ | 202 | 8.0 | 356 | 14.0 | | | | | 200 | 7.9 | 200 | 7.9 | | | 7 | 15 |
| 50.8 | 2 | 188 | 7.4 | 342 | 13.5 | | | 200 | 7.9 | | | 200 | 7.9 | 200 | 7.87 | 8 | 18 |
| 63.5 | 2½ | 194 | 7.6 | 348 | 13.7 | | | 200 | 7.9 | | | 200 | 7.9 | 200 | 7.87 | 11 | 24 |
| 76.2 | 3 | 200 | 7.9 | 354 | 13.9 | | | 200 | 7.9 | | | 200 | 7.9 | 200 | 7.87 | 13 | 29 |
| 102 | 4 | 207 | 8.1 | 361 | 14.2 | | | 250 | 9.8 | | | 250 | 9.8 | 250 | 9.84 | 19 | 42 |
| 127 | 5 | 217 | 8.5 | 371 | 14.6 | | | 250 | 9.8 | | | 250 | 9.8 | 250 | 9.84 | 24 | 53 |
| 152 | 6 | 232 | 9.1 | 386 | 15.2 | | | 300 | 11.8 | | | 300 | 11.8 | 300 | 11.81 | 29 | 64 |
| 203 | 8 | 257 | 10.1 | 411 | 16.2 | 350 | 13.8 | 350 | 13.8 | | | 350 | 13.8 | 350 | 13.78 | 56 | 123 |
| 254 | 10 | 284 | 11.2 | 438 | 17.2 | 450 | 17.7 | 450 | 17.7 | | | 450 | 17.7 | 450 | 17.72 | 79 | 174 |
| 305 | 12 | 310 | 12.2 | 464 | 18.3 | 500 | 19.7 | 500 | 19.7 | | | 500 | 19.7 | 500 | 19.69 | 110 | 243 |
| 356 | 14 | 382 | 15 | 536 | 21.1 | 550 | 21.7 | 550 | 21.7 | | | 550 | 21.7 | 550 | 21.65 | 139 | 306 |
| 406 | 16 | 407 | 16 | 561 | 22.1 | 600 | 23.6 | 600 | 23.6 | | | 600 | 23.6 | 600 | 23.62 | 159 | 351 |
| 457 | 18 | 438 | 17.2 | 592 | 23.3 | 600 | 23.6 | 600 | 23.6 | | | 600 | 23.6 | 600 | 23.62 | 182 | 401 |

Dimensions/weights (approximate) inches (mm) and lbs (kg)

MAG 5100 W/6000 I Compact



7ME6520: DN 15 ... 40 (1/2" ... 1 1/2")

7ME6520: DN 50 ... 300 (2" ... 12")

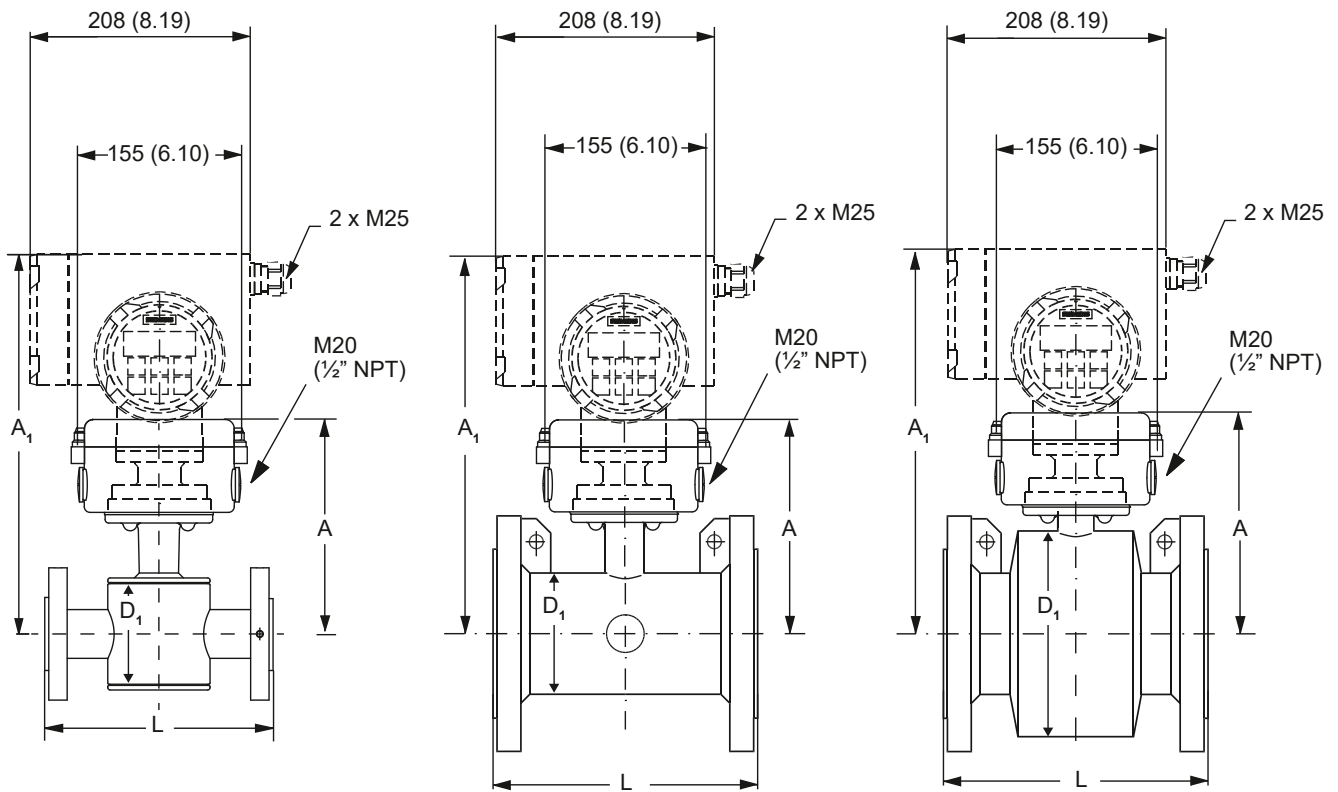
7ME6520: DN 350 ... 2000 (14" ... 80")

| Nominal Size | | A | | A1 | | L | | | | | | | | | | Weight | |
|--------------|--------|------|--------|------|--------|-------|--------|-------|--------|-------|--------|------------------|--------|------|--------|--------|-------|
| | | | | | | 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) | [kg] | [lbs] |
| 508 | 20 | 462 | 18.2 | 617 | 24.3 | 599 | 23.6 | 599 | 23.6 | | | 599 | 23.6 | 600 | 23.6 | 225 | 496 |
| 610 | 24 | 513 | 20.2 | 668 | 26.3 | 599 | 23.6 | 599 | 23.6 | | | 599 | 23.6 | 600 | 23.6 | 320 | 705 |
| 711 | 28 | 564 | 22.2 | 718 | 28.3 | 700 | 27.6 | 700 | 27.6 | | | 700 | 27.6 | 700 | 27.6 | 273 | 602 |
| 762 | 30 | 592 | 23.3 | 745 | 29.3 | | | | | | | 750 | 29.5 | 750 | 29.5 | 329 | 725 |
| 813 | 32 | 617 | 24.3 | 770 | 30.3 | 800 | 31.5 | 800 | 31.5 | | | 800 | 31.5 | 800 | 31.5 | 365 | 804 |
| 914 | 36 | 663 | 26.1 | 817 | 32.2 | 900 | 35.4 | 900 | 35.4 | | | 900 | 35.4 | 900 | 35.4 | 495 | 1089 |

- not available

Dimensions/weights (approximate) inches (mm) and lbs (kg) (continued)

MAG 5100 W/6000 I Compact



7ME6520: DN 15 ... 40 (1/2" ... 1 1/2")

7ME6520: DN 50 ... 300 (2" ... 12")

7ME6520: DN 350 ... 2000 (14" ... 80")

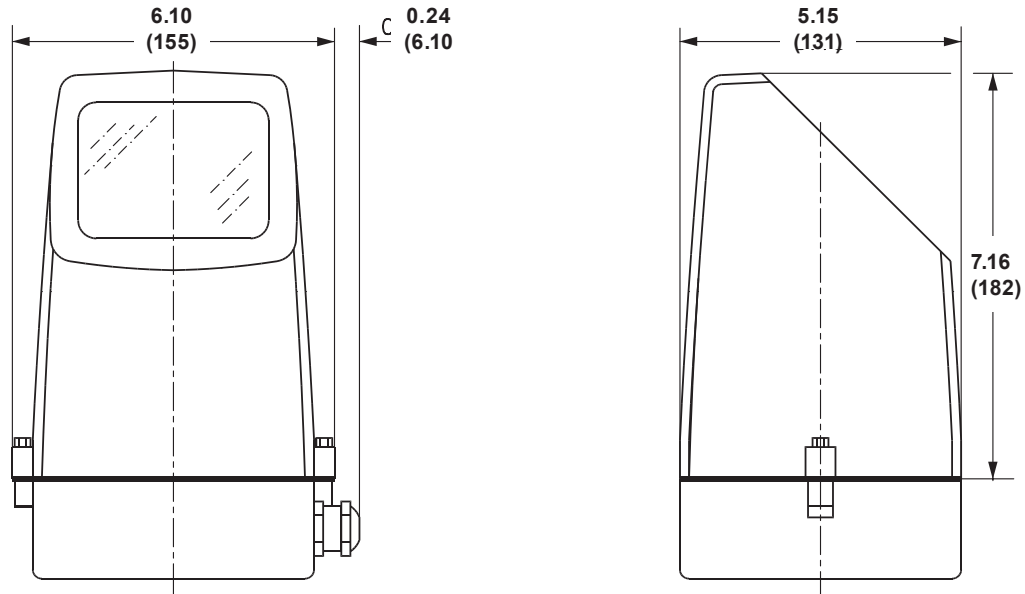
| Nominal Size | | A | | A1 | | L | | | | | | | | | | Weight | |
|--------------|--------|------|--------|------|--------|-------|--------|-------|--------|-------|--------|------------------|--------|------|--------|--------|-------|
| | | | | | | PN 10 | | PN 16 | | PN 40 | | Class 150 / AWWA | | AS | | | |
| (mm) | (inch) | (mm) | (inch) | (mm) | (inch) | (mm) | (inch) | (mm) | (inch) | (mm) | (inch) | (mm) | (inch) | (mm) | (inch) | [kg] | [lbs] |
| 1016 | 40 | 714 | 28.1 | 869 | 34.2 | 1000 | 39.4 | 1000 | 39.4 | | | 1000 | 39.4 | 1000 | 39.4 | 583 | 1285 |
| 1067 | 42 | 714 | 28.1 | 869 | 34.2 | | | | | | | 1000 | 39.4 | | | 687 | 1515 |
| 1118 | 44 | 765 | 30.1 | 919 | 36.2 | | | | | | | 1100 | 43.3 | | | 763 | 1682 |
| 1219 | 48 | 820 | 32.3 | 973 | 38.3 | 1200 | 47.2 | 1200 | 47.2 | | | 1200 | 47.2 | 1200 | 47.2 | 861 | 1898 |
| 1372 | 54 | 925 | 36.4 | 1080 | 42.5 | | | | | | | 1400 | 55.1 | 1400 | 55.1 | 1600 | 3527 |
| 1524 | 60 | 972 | 38.2 | 1125 | 44.3 | | | | | | | 1500 | 59.1 | 1500 | 59.1 | 2460 | 5423 |
| 1676 | 66 | 1025 | 40.4 | 1179 | 46.4 | | | | | | | 1600 | 63.0 | 1600 | 63.0 | 2525 | 5567 |
| 1829 | 72 | 1123 | 44.2 | 1278 | 50.3 | | | | | | | 1800 | 70.9 | 1800 | 70.9 | 2930 | 6460 |
| 1981 | 78 | 1223 | 48.1 | 1377 | 54.2 | | | | | | | 2000 | 78.7 | 2000 | 78.7 | 3665 | 8080 |

- not available

Dimensions/weights (approximate) inches (mm) and lbs (kg)

Signal converter compact polyamid—standard

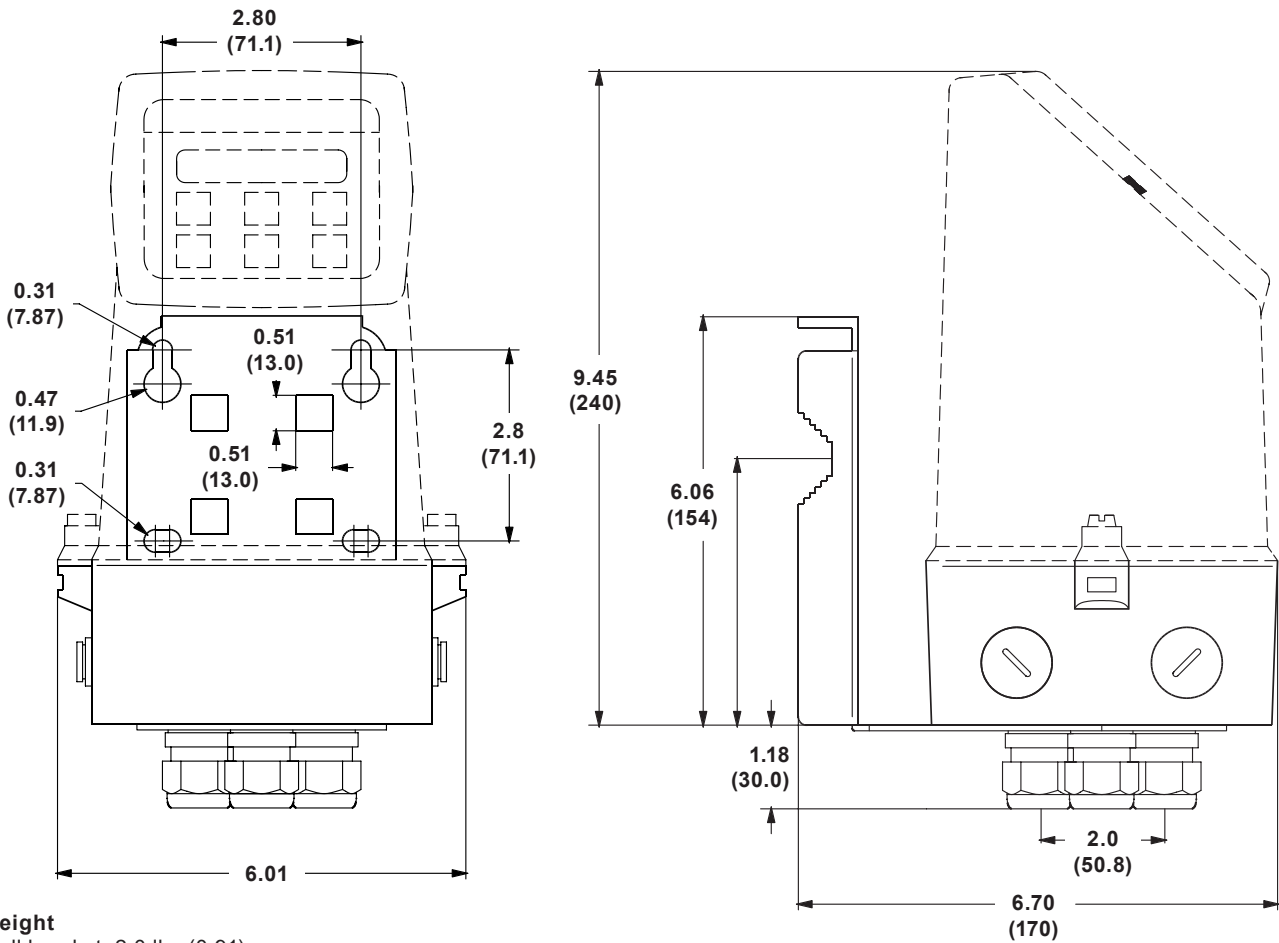
Signal converter installed in compact mode



Weight

MAG 6000 and MAG 5000: 1.65 lbs (0.75)

Signal converter installed remote

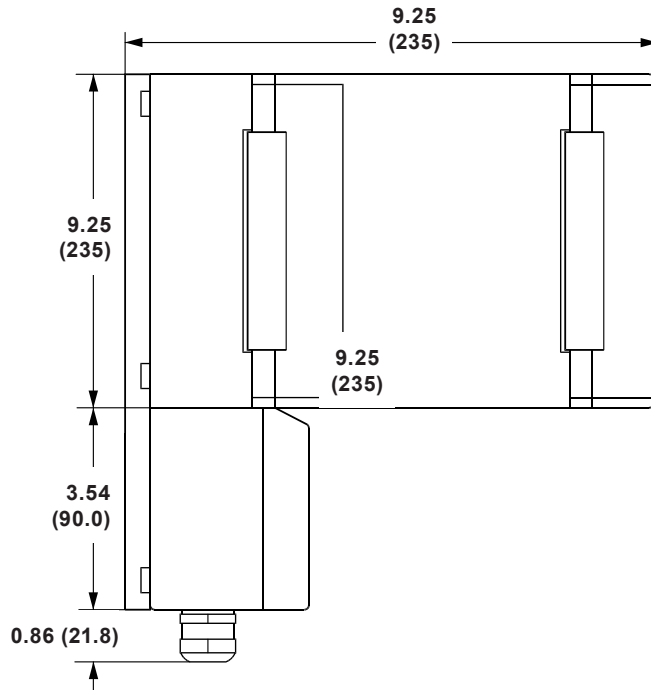
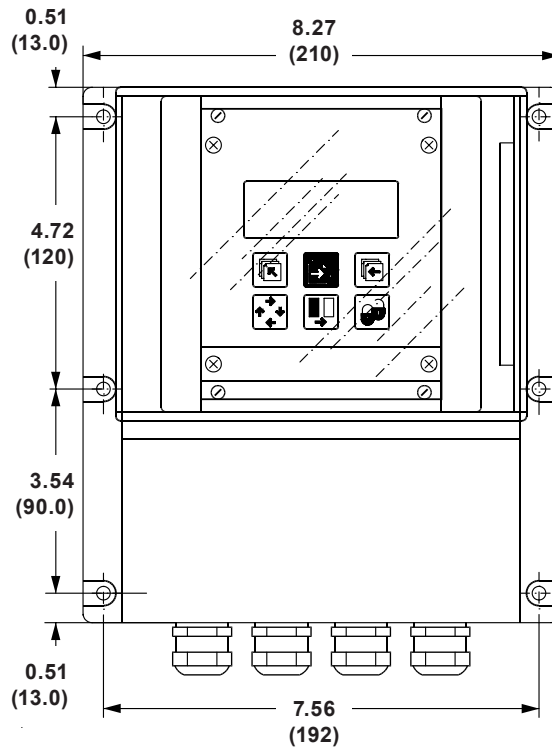


Weight

Wall bracket: 2.0 lbs (0.91)

Dimensions/weights (approximate) inches (mm) and lbs (kg)

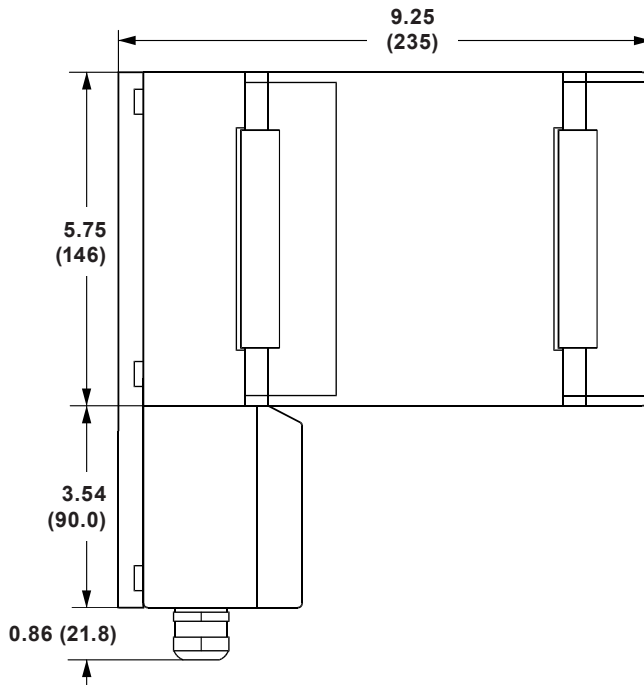
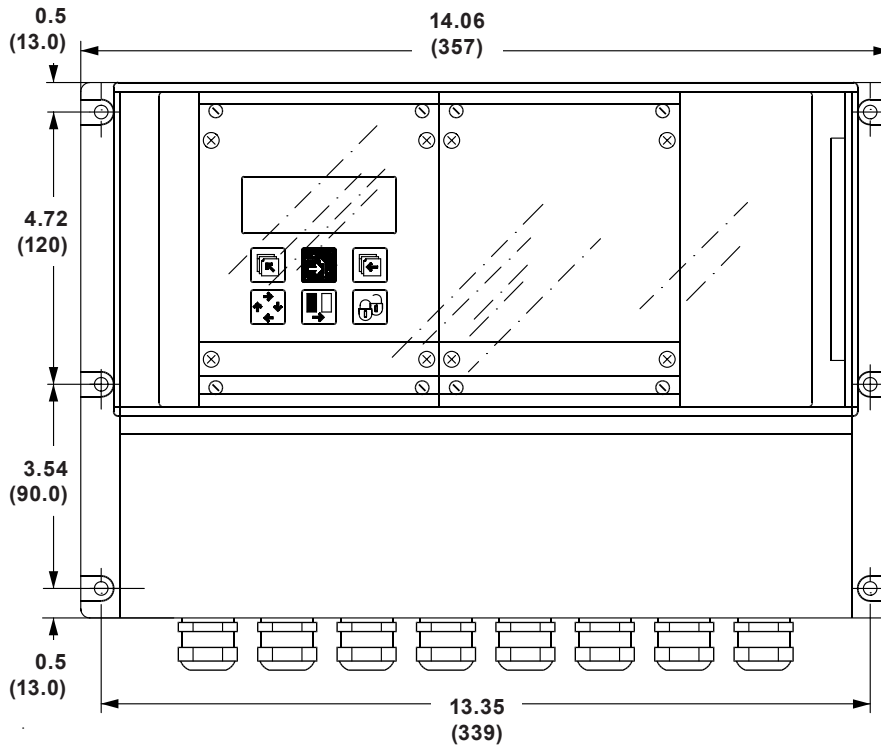
Wall mounting box 21 TE (for optional 19" insert signal converter)



Weight excl. signal converter
7.56 lbs (3.43)

Dimensions/weights (approximate) inches (mm) and lbs (kg)

Wall mounting box 42 TE (for optional 19" insert signal converter and electrode cleaning unit)



Weight excl. signal converter
6.4 lbs (2.90)