SIEMENS

SITRANS F

Electromagnetic flowmeters SITRANS FM MAG1100/1100F

Operating Instructions

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7ME611 (MAG 1100)
7ME612 (MAG 1100 HT)
7ME614 (MAG 1100 F)

10/2025
A5E03433301-AH

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified persons are those who, because of their training and experience, are familiar with the installation, assembly, commissioning, operation, decommissioning and disassembly of the product and can recognize risks and avoid possible hazards.

Proper use of Siemens products

Note the following:

⚠ WARNING

Siemens products may only be used for the application described in the catalog and the associated usage information. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens Aktiengesellschaft. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Document order number: A5E03433301
Ⓟ 10/2025 Subject to change

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Introduction

1

1.1 Purpose of this documentation

These instructions contain all information required to commission and use the device. Read the instructions carefully prior to installation and commissioning. In order to use the device correctly, first review its principle of operation.

The instructions are aimed at persons mechanically installing, connecting and commissioning the device, as well as service and maintenance engineers.

1.2 Document history

The following table shows major changes in the documentation compared to the previous edition.

Edition	Remarks
10/2025	Certification update
04/2022	Electrical connection correction
07/2021	Removal of mentions of EHEDG certification
12/2019	Nameplate correction
08/2018	Corrections to dimensions and weight
01/2018	The Operating Instructions now includes MAG 1100 F Updated introduction
05/2016	Updated connecting/remote installation Updated dimension-dependent factory settings Updated coil resistance table
02/2011	First edition The Operating Instructions replaces: • MAG 1100 part of SITRANS F M HANDBOOK (A5E02435647) • SITRANS F M MAG 1100 DN 2- DN 100 • SITRANS F M MAG 1100 DN 2- DN 3

Use the device in accordance with the information on the nameplate and in the Technical specifications (Page 53).

1.3 Industrial use note

⚠ CAUTION

Use of equipment in a domestic environment

This equipment is not intended for use in residential environments and might not provide adequate protection to radio reception in such environments.

1.4 Checking the consignment

1. Check the packaging and the delivered items for visible damages.
2. Report any claims for damages immediately to the shipping company.
3. Retain damaged parts for clarification.
4. Check the scope of delivery by comparing your order to the shipping documents for correctness and completeness.

⚠ WARNING

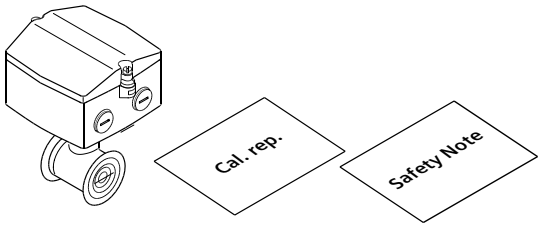
Using a damaged or incomplete device

Risk of explosion in hazardous areas.

- Do not use damaged or incomplete devices.

1.5 Items supplied

- SITRANS FM MAG 1100/1100 F
- Calibration report
- Safety Note



1.6 Cybersecurity information

Siemens provides products and solutions with industrial cybersecurity functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial cybersecurity measures that may be implemented, please visit
https://www.siemens.com/cybersecurity-industry.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Cybersecurity RSS Feed under
https://new.siemens.com/cert.

1.7 Transportation and storage

To guarantee sufficient protection during transport and storage, observe the following:

- Keep the original packaging for subsequent transportation.
- Devices/replacement parts should be returned in their original packaging.
- If the original packaging is no longer available, ensure that all shipments are properly packaged to provide sufficient protection during transport. Siemens cannot assume liability for any costs associated with transportation damages.

NOTICE
Insufficient protection during storage The packaging only provides limited protection against moisture and infiltration. • Provide additional packaging as necessary.

Special conditions for storage and transportation of the device are listed in Technical specifications (Page 53).

1.8 Notes on warranty

The contents of this manual shall not become part of or modify any prior or existing agreement, commitment or legal relationship. The sales contract contains all obligations on the part of Siemens as well as the complete and solely applicable warranty conditions. Any statements regarding device versions described in the manual do not create new warranties or modify the existing warranty.

The content reflects the technical status at the time of publishing. Siemens reserves the right to make technical changes in the course of further development.

Safety notes

2

This device left the factory in good working condition. In order to maintain this status and to ensure safe operation of the device, observe these instructions and all the specifications relevant to safety.

Observe the information and symbols on the device. Do not remove any information or symbols from the device. Always keep the information and symbols in a completely legible state.

⚠ CAUTION
Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance. Only qualified personnel should install or operate this instrument.

Note

Alterations to the product, including opening or improper modifications of the product are not permitted.

If this requirement is not observed, the CE mark and the manufacturer's warranty will expire.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

2.1 Warning symbols on the device

Symbol	Explanation
	Consult operating instructions

2.2 Laws and directives

Observe the safety rules, provisions and laws applicable in your country during connection, assembly and operation. These include, for example:

- National Electrical Code (NEC - NFPA 70) (USA)
- Canadian Electrical Code (CEC - CSA C22.1) (Canada)

Further provisions for hazardous area applications are for example:

- IEC 60079-14 (international)
- EN 60079-14 (EU and UK)

Instrument safety standards

The device has been tested at the factory, based on the safety requirements. In order to maintain this condition over the expected life of the device the requirements described in these Operating Instructions must be observed.

NOTICE
Material compatibility Siemens Flow Instruments can provide assistance with the selection of wetted sensor parts. However, the full responsibility for the selection rests with the customer and Siemens Flow Instruments can take no responsibility for any failure due to material incompatibility.

2.3 Conformity with European directives

The product described in this document is in conformity with the relevant harmonization legislation, and its amendments, of the European Union.

Electromagnetic compatibility directive EMC 2014/30/EU	Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to electromagnetic compatibility
Low voltage directive LVD 2014/35/EU	Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits
Explosive atmospheres directive ATEX 2014/34/EU	Directive of the European Parliament and the Council on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres
Pressure equipment directive PED 2014/68/EU	Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment

The applicable directives can be found in the EU Declaration of Conformity of the specific device.

PED directive

Pressure Equipment Directive" (PED) is mandatory for all pressure equipment sold within the EU and EFTA.

Siemens Flow Instruments products comply with PED as stated in the following table.

Table 2-1 MAG 1100 and MAG 1100 HT PED compliance

Flange	MAG 1100		MAG 1100 HT	MAG 1100 F	
mm	Ceramic	PFA	Ceramic	Ceramic	PFA
2	EXC.PED	N/A	N/A	N/A	N/A
3	EXC.PED	N/A	N/A	N/A	N/A
6	EXC.PED	N/A	N/A	N/A	N/A
10	EXC.PED	EXC.PED	N/A	EXC.PED	EXC.PED
15	EXC.PED	EXC.PED	EXC.PED	EXC.PED	EXC.PED
25	EXC.PED	EXC.PED	EXC.PED	EXC.PED	EXC.PED
40	PED	EXC.PED	PED	PED	EXC.PED
50	PED	PED	PED	PED	PED
65	PED	PED	PED	PED	PED
80	PED	PED	PED	PED	PED
100	PED	PED	PED	PED	PED

Siemens Flow Instruments products confirms to PED by following the tables below.

EXC. PED = Excluded from PED under SEP or LVD

PED= Product covered by PED

N/A= Size/pressure outside of PED scope or not available in the size range

CAUTION

All products sold outside of EU and EFTA are excluded from the Pressure Equipment directive, also products sold into certain market sectors are excluded. These include

1. Meters used in networks for the supply, distribution and discharge of water.
2. Meters used in pipelines for the conveyance of any fluid from offshore to onshore.
3. Meters used in the extraction of petroleum or gas, including christmas tree and manifold equipment.
4. Any meter mounted on a ship or mobile offshore platform.

WARNING

Improper device modifications

Risk to personnel, system, and environment can result from modifications to the device, particularly in hazardous areas.

- Only carry out modifications that are described in the instructions for the device. Failure to observe this requirement cancels the manufacturer's warranty and the product approvals. Do not operate the device after unauthorized modifications.

2.4 Use in hazardous areas

Qualified personnel for hazardous area applications

Persons who install, connect, commission, operate, and service the device in a hazardous area must have the following specific qualifications:

- They are authorized, trained or instructed in operating and maintaining devices and systems according to the safety regulations for electrical circuits, high pressures, aggressive, and hazardous media.
- They are authorized, trained, or instructed in carrying out work on electrical circuits in hazardous areas.
- They are trained or instructed in maintenance and use of appropriate safety equipment according to the pertinent safety regulations.

⚠ WARNING

Use in hazardous area

Risk of explosion.

- Only use equipment that is approved for use in the intended hazardous area and labeled accordingly.
- Do not use devices that have been operated outside the conditions specified for hazardous areas. If you have used the device outside the conditions for hazardous areas, make all Ex markings unrecognizable on the nameplate.

⚠ WARNING

Equipment used in hazardous areas

Equipment used in hazardous areas must be Ex-approved for the region of installation and marked accordingly. It is required that the special conditions for safe use provided in the manual and in the Ex certificate are followed!

⚠ WARNING

Loss of safety of device with type of protection "Intrinsic safety Ex i"

If the device or its components have already been operated in non-intrinsically safe circuits or the electrical specifications have not been observed, the safety of the device is no longer ensured for use in hazardous areas. There is a risk of explosion.

- Connect the device with type of protection "Intrinsic safety" solely to an intrinsically safe circuit.
- Observe the specifications for the electrical data on the certificate and/or in Technical specifications (Page 53).

WARNING

Use interface sealing gasket in dust explosion hazardous area

When the equipment is installed in dust explosion hazardous area the cable entry devices shall be fitted with interface sealing gaskets.

WARNING

Non-flammable processes only

All approvals are based on non-flammable processes only!

Risk of explosion.

Ensure that there is no explosive or flammable gas inside the pipe during process or maintenance.

See also

Certificates (http://www.siemens.com/processinstrumentation/certificates)

WARNING

Potential equalization

In operation, the output is earthed through the conductive medium being measured and therefore potential equalization is necessary throughout the hazardous area.

The apparatus housing shall be connected to the potential equalizing conductor in the hazardous area.

CAUTION

Damage from electrostatic discharge (ESD)

Some components in the device (such as communication cards, or memory cards) are sensitive to electrostatic discharge and could be damaged. Be sure to handle such components in a manner that avoids any potential damage due to ESD.

WARNING

Opening device in energized state

Risk of explosion in hazardous areas

- Only open the device in a de-energized state.
- Check prior to commissioning that the cover, cover locks, and cable inlets are assembled in accordance with the directives.

NOTICE

Direct sunlight

Damage to device.

The device can overheat or materials become brittle due to UV exposure.

- Protect the device from direct sunlight.
- Make sure that the maximum permissible ambient temperature is not exceeded. Refer to the information in Rated operating conditions (Page 54).

⚠ WARNING

Laying of cables

Risk of explosion in hazardous areas.

Cable for use in hazardous areas must satisfy the requirements for having a proof voltage of at least 500 V AC applied between the conductor/ground, conductor/shield and shield/ground.

Connect the devices that are operated in hazardous areas as per the stipulations applicable in the country of operation.

⚠ WARNING

With intrinsically safe circuits, use only certified meters appropriate for the transmitter.

If a non-conforming supply unit is used, the "fail-safe" type of protection will no longer be effective and the approval certification will be invalid.

⚠ WARNING

Compact mounted versions

For intrinsically safe data for Ex sensor MAG1100 compact mounted with Ex transmitter MAG6000I, refer to the Operating Instructions of Ex transmitter MAG6000I or to certificate number Sira 07ATEX3181X, available here: Sira certificate (https://support.industry.siemens.com/cs/ww/en/view/43032182).

Description

3

3.1 Applications

The pulsed DC-powered magnetic flowmeters are suitable for measuring the flow of almost all electrically conductive liquids, pastes, and slurries with max. 40% solids.

The main applications can be found in the following sectors:

- Water and waste water
- Chemical and pharmaceutical industries
- Food & beverage industry
- Mining and cements industries
- Pulp and paper industry
- Steel industry
- Power generation; utility and chilled water industry

3.2 System components

The SITRANS FM flowmeter system includes:

- Transmitter (types: SITRANS FM MAG5000/6000 or MAG6000I)
- Sensor (types: SITRANS FM MAG1100/1100F, MAG3100/3100P or MAG5100W)
- Communication module (optional) (types: HART, PROFIBUS PA/DP, MODBUS RTU RS 485, Foundation Fieldbus H1, Devicenet)
- SENSORPROM memory unit

Communication solutions

The SITRANS FM range of add-on modules, presently including HART, Foundation Fieldbus. MODBUS RTU RS 485, PROFIBUS PA / DP and Devicenet, are all applicable with the SITRANS FM MAG 6000 transmitter.

3.3 Design

The SITRANS FM MAG1100 is an electromagnetic flow sensor in a compact wafer design designed for flow applications in the process industry.



MAG 1100



MAG 5000



MAG 6000I

Sensor housing and flanges are designed in carbon steel (ASTM A 105) and terminal box in fibre glass reinforced polyamide or optionally in stainless steel (AISI 316). Measuring pipe is made of stainless steel (AISI 304) while liners and electrodes are available in various materials, making the sensor highly resistant to a wide range of chemicals.

The present range of liner types includes:

- PFA
- Ceramic
- EPDM

Electrodes are available in:

- Hastelloy C22/2.4602
- AISI 316 / 1.4571
- Platinum / platinium with gold/Titanium brazing alloy

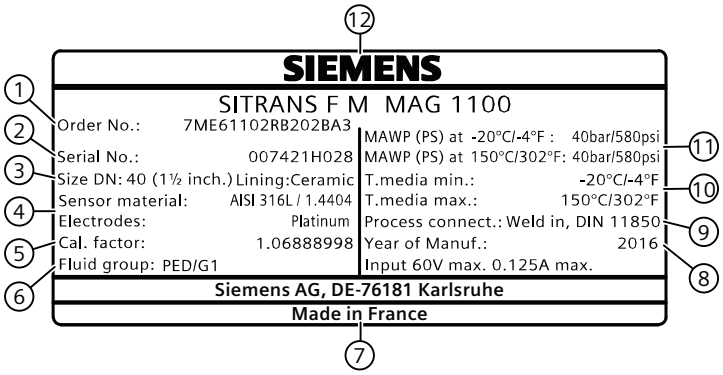
The sensors carry a wide range of approvals, see Technical specifications (Page 53).

3.4 Nameplate layout

Inspection

1. Check for mechanical damage due to possible improper handling during shipment. All claims for damage are to be made promptly to the shipper.
2. Make sure the scope of delivery, and the information on the type plate correspond to the ordering information

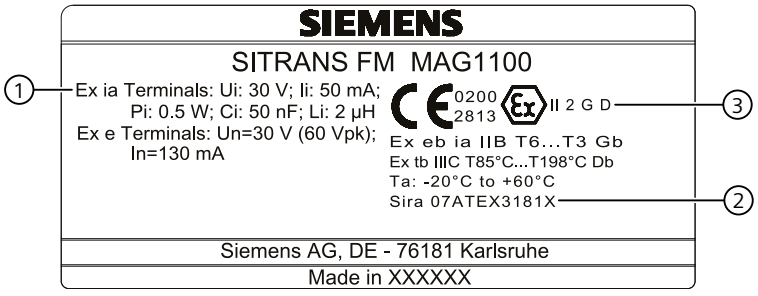
Sensor identification nameplate



①	Order number	⑦	Place of manufacture
②	Serial number (S/N)	⑧	Year of manufacture
③	Size and liner type	⑨	Process connection
④	Sensor and electrode material	⑩	Minimum/maximum media temperature
⑤	Calibration factor	⑪	Maximum allowable working pressure (MAWP)
⑥	Fluid group	⑫	Manufacturer

Figure 3-1 Example of product nameplate

Sensor specification nameplate

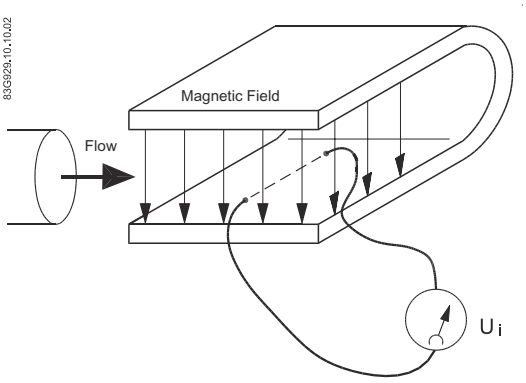


① Intrinsical safety data
② Certificate number
③ Marking for hazardous area

Figure 3-2 Example of specification nameplate

3.5 Theory of operation

The flow measuring principle is based on Faraday's law of electromagnetic induction.



U_i = When an electrical conductor of length L is moved at velocity v, perpendicular to the lines of flux through a magnetic field of strength B, the voltage U_i is induced at the ends of the conductor

U_i = L x B x v

- U_i = Induced voltage
- L = Conductor length = Inner pipe diameter = k_1
- B = Magnetic field strength = k_2
- v = Velocity of conductor (media)
- k = k_1 x k_2

U_i = k x v, the electrode signal is directly proportional to the fluid velocity

Operating principle

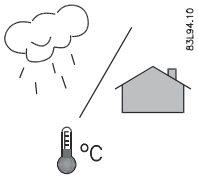
The transmitter generates a pulsating magnetizing current that drives the coils in the sensor. The current is permanently monitored and corrected. Errors or cable faults are registered by the self-monitoring circuit.

The input circuit amplifies the flow-proportional induced voltage signal from the electrodes. The input impedance is extremely high: $>10^{14}$ Ω which allows flow measurements on fluids with conductivities as low as 5 µS/cm. Measuring errors due to cable capacitance are eliminated due to active cable screening.

The digital signal processor converts the analog flow signal to a digital signal and suppresses electrode noise through a digital filter. Inaccuracies in the transmitter as a result of long-term drift and temperature drift are monitored and continuously compensated for via the self-monitoring circuit. The analog to digital conversion takes place in an ultra low noise ASIC with 23 bit signal resolution. This has eliminated the need for range switching. The dynamic range of the transmitter is therefore unsurpassed with a turn down ratio of minimum 3000:1.

Installing/Mounting

4



SITRANS F flowmeters with minimum IP67/Type 4X enclosure rating are suitable for indoor and outdoor installations.

- Make sure that pressure and temperature specifications indicated on the device nameplate / label will not be exceeded.

⚠ WARNING

Installation in hazardous location

Special requirements apply to the location and interconnection of sensor and transmitter.
See Use in hazardous areas (Page 14)

4.1 Installation safety precautions

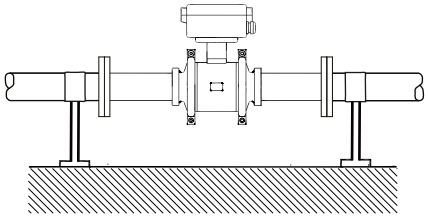
⚠ WARNING

High pressure hazard

In applications with working pressures/media that can be dangerous to people, surroundings, equipment or others in case of pipe fracture, we recommend that special precautions such as special placement, shielding or installation of a pressure guard or a safety valve are taken when the flowmeter is mounted.

Note

Install the sensor in well-supported pipelines in order to support the weight of the flowmeter.



Vibrations

Avoid strong vibrations.

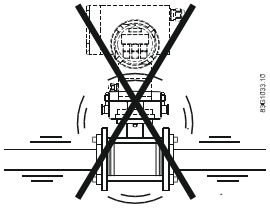


Figure 4-1 Avoid vibrations

⚠ CAUTION

In applications with strong vibrations, Siemens recommends remote mounting of the transmitter!

4.2 Determining a location

Note

The sensor must always be completely filled with liquid.

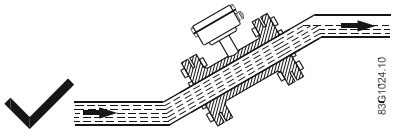


Figure 4-2 Correct installation with filled pipes

- Avoid the following installations
  - Installation at the highest point in the pipe system
  - Installation in vertical pipes with free outlet

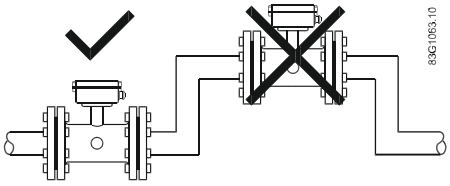


Figure 4-3 Wrong installation at high point

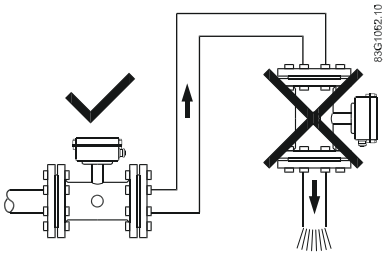
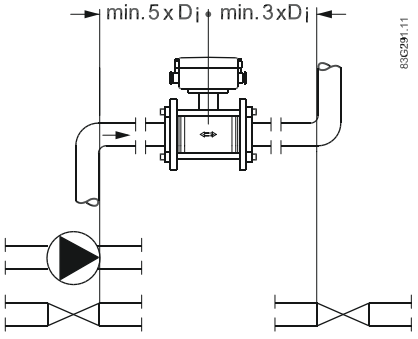


Figure 4-4 Correct installation at low point before outlet

Inlet and outlet conditions

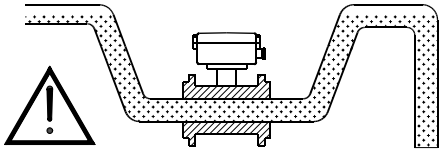
To achieve accurate flow measurement it is essential to have straight lengths of inlet and outlet pipes and a certain distance to pumps and valves.

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



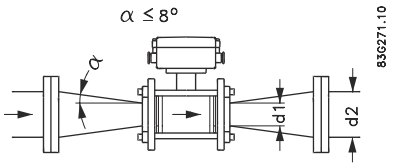
Installation in partially filled pipes

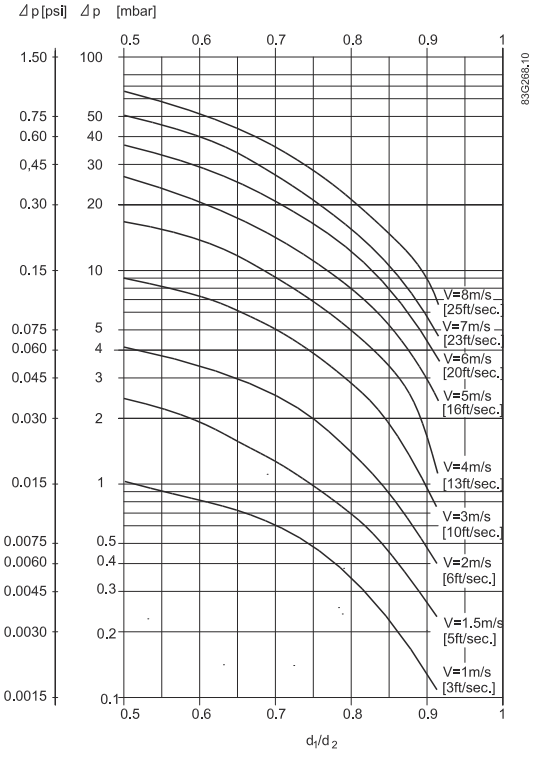
For partially filled pipes or pipes with downward flow and free outlet the flowmeter should be located in a U-tube.



Installation in large pipes

The flowmeter can be installed between two reducers (for example DIN 28545). At α ≤ 8° the following pressure drop curves apply. The curves are applicable to water.





Example:

A flow of 3 m/s (v) in a sensor with a diameter reduction from DN 100 to DN 80 ($d_1/d_2 = 0.8$) gives a pressure drop of 2.9 mbar.

4.3 Orienting the sensor

Flow direction

The calibrated flow direction is marked by the arrow on the sensor. Flow in this direction is indicated as positive by default. The accuracy of the sensor does not change with reverse flow.

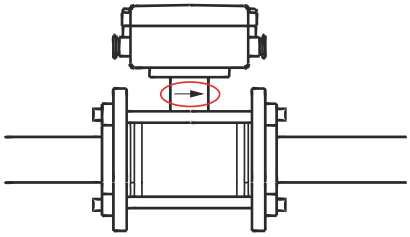


Figure 4-5 Flow direction indicator

Orientation

The sensor operates in all orientations, but Siemens has the following recommendations:

- Vertical installation with an upwards flow

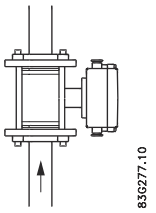


Figure 4-6 Vertical orientation, upwards flow

NOTICE
Abrasive liquids / liquids containing solid particles
A vertical installation minimizes wear and deposits in the sensor

Note

Gas/air bubbles in the liquid

A vertical installation minimizes any negative effect of gas/air bubbles in the liquid

- Horizontal installation, terminal box upwards or downwards

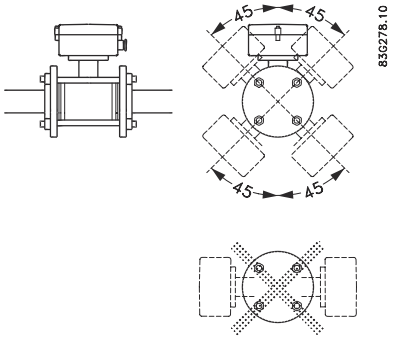


Figure 4-7 Horizontal installation, various terminal box positions

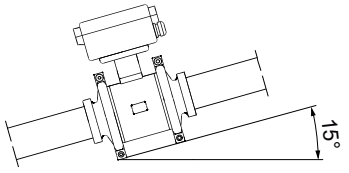
NOTICE
Do NOT mount the sensor with the terminal box sideways
This will position the electrodes at the top where there is possibility for air bubbles and at the bottom where there is possibility for mud, sludge, sand etc.

Note

Empty pipe detection

For applications with empty pipe detection, the sensor can be tilted 45°, as shown above.

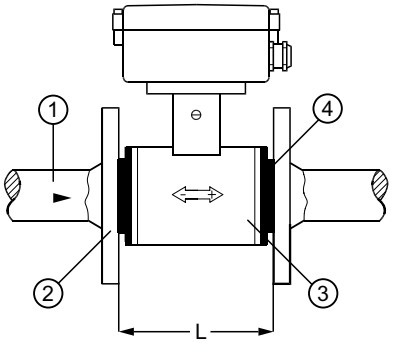
- Self-draining installation, minimum incline of 15° to the horizontal plane



4.4 Mounting MAG 1100/1100 HT

- Install the sensor in rigid pipelines in order to support the weight of the meter.
- Center the connecting pipelines axially in order to avoid turbulent flow profiles.
- Use proper gaskets according to liner type

Remove liner protectors before installing the flow meter



1. Existing pipe
2. Flange
3. Sensor
4. Gaskets
5. Sensor length incl. gaskets

Tightening

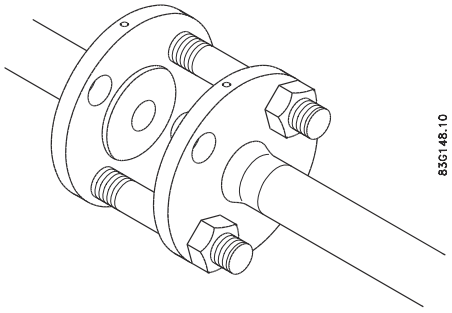
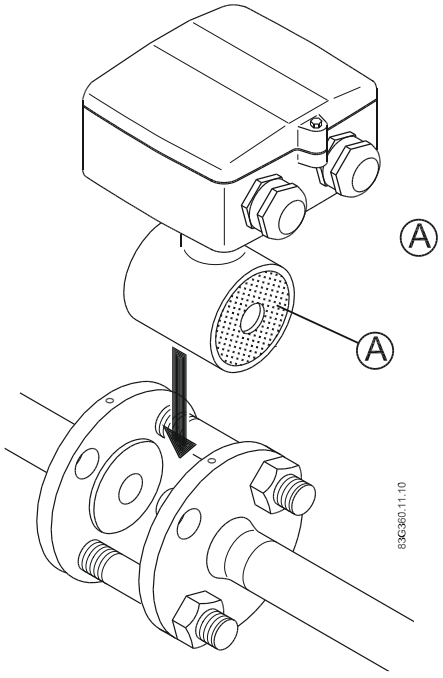
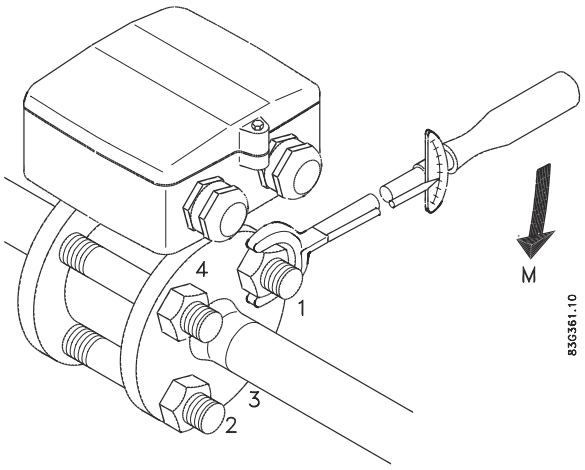


Figure 4-8 First place three stay-bolts to locate the sensor

These should be tightened gently, making sure that each gasket fits exactly into its recess at either end of the sensor



The remaining flange bolts can now be inserted and tightened using about 25% of the actual tightening torque, see table below.



The bolts must be tightened using up to 50% of the max. tightening torque for the pipe dimensions stated. The max. tightening torque for different size pipes is given in the table.

The bolts must now be cross-tightened in the sequence shown, using up to 100% torque.

DN	$M_A[N_m]$
2	13
3	13
6	13
10	13
15	16
25	30
40	54
50	90
65	90
80	90
100	115

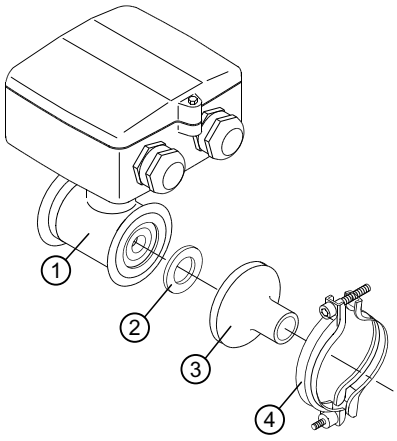
10 Nm - 1 kpm

NOTICE
Do not use sharp objects to remove the blanks as this can damage the liner!

4.5 Mounting MAG 1100 F

The MAG 1100 F sensor has an integrated clamp connection and is designed for installation between two adapters, which are supplied separately. The adapters are available for a variety of standards according to: ISO, DIN, SMS, BS and DS, for direct welding into dairy pipes or with clamp- or threaded fittings.

At assembly, a gasket is located in the recess in the face of the adapter, and the adapter is then fastened to the MAG 1100 F sensor with a clamp ring.



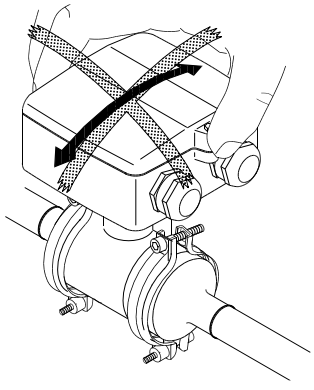
① Sensor
② Gasket
③ Process connection adapter
④ Clamp ring

Note

In order to meet the 3A Sanitary Standard the sensor must be installed as a remote unit.

Note

To obtain optimum accuracy and hygenic conditions, it is important that the sensor and the pipes are correctly aligned around their centerline, fittings must be perpendicular to the pipeline and upstream pipelines must be straight without curves.



NOTICE

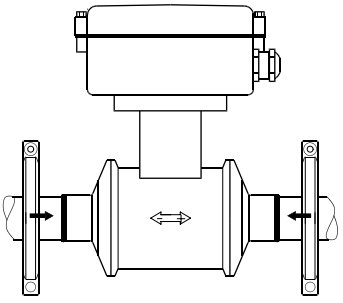
Damage to the liner

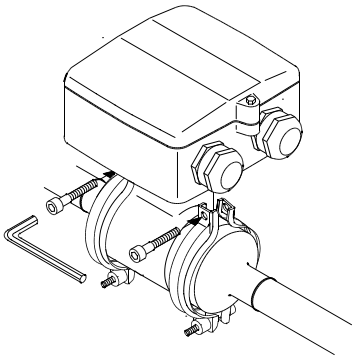
Turning the sensor around the adapter centre line after the clamp rings have been fastened will damage the liner. The sensor may therefore only be turned when the clamp rings have either been removed or completely loosened.

4.5.1 Mounting with a welding type adapter

To mount a MAG 1100 F with welding type adapters, follow these steps:

1. Cut a piece out of the pipeline equal to the built-in length “L”.
2. Assemble the sensor and the adapters with the clamp rings. Leave the gaskets off.
3. Mount the sensor and stitch weld the adapters to the pipe.
4. Remove the clamp rings and dismount the sensor.
5. Ensure that the adapters are firmly welded to the pipe.
6. Remount the sensor with gaskets and clamp rings.

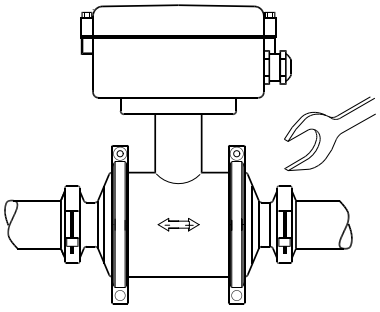


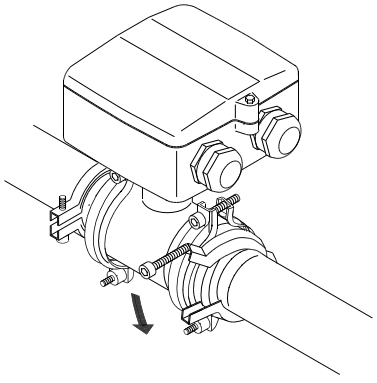


4.5.2 Mounting with a clamp type adapter

To mount a MAG 1100 F with clamp type adapters, follow these steps:

1. Prepare the pipeline with a suitable fitting.
2. Assemble the sensor and adapters together with the gaskets.
3. Place the clamp rings around the clamp connections between the adapters and pipeline.
4. Close and tighten the clamp rings.

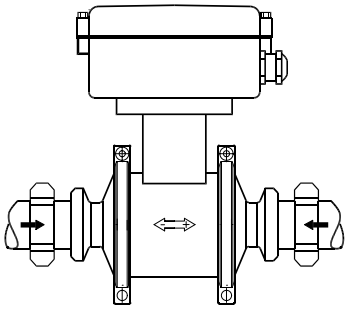


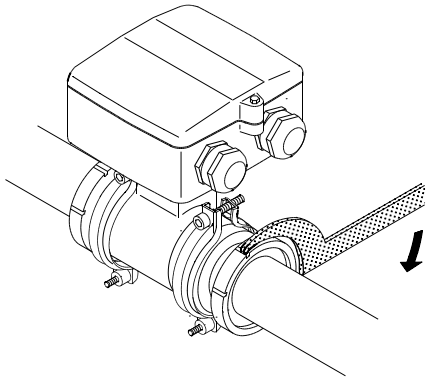


4.5.3 Mounting with a threaded type adapter

To mount a MAG 1100 F with threaded type adapters, follow these steps:

1. Prepare the pipeline with a suitable fitting.
2. Assemble the sensor and adapters together with the gaskets.
3. Tighten the threaded connectors by using a C-spanner.





4.6 Torques values

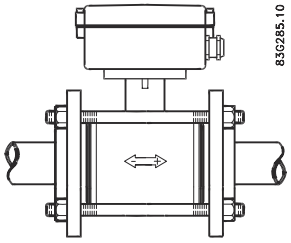
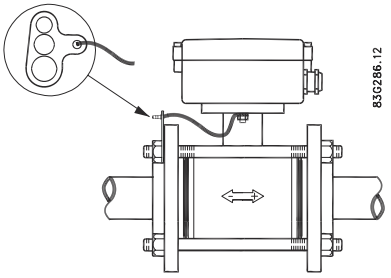
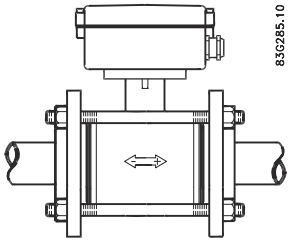
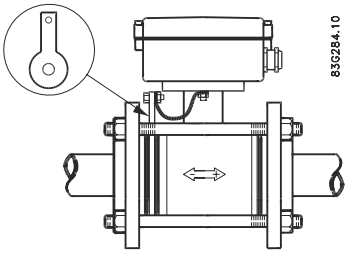
Note

Torque values are calculated on the basis of use of gaskets.

DN **mm/inch**	**Nm**
2 / $^{1}/_{12}$	13
3 / $^{1}/_{8}$	13
6 / $^{1}/_{4}$	13
10 / $^{3}/_{8}$	13
15 / $^{1}/_{2}$	16
25 / 1	30
40 / 1 $^{1}/_{2}$	54
50 / 2	90
65 / 2 $^{1}/_{2}$	90
80 / 3	90
100 / 4	115

4.7 Potential equalization

To obtain optimum results from the measuring system, the sensor must have the same electrical potential as the liquid being measured.

	Graphite	EPDM or PTFE gaskets
Electrically conductive piping	 Potential equalization with electrically graphite gaskets	 Potential equalization using earth strap supplied
Electrically non-conductive piping	 Potential equalization with electrically conductive graphite gaskets	 Potential equalization using separate potential equalization ring **NOTE** For bidirectional flow use two grounding rings

NOTICE
For sizes DN 2-10 with Hastelloy or stainless steel adaptors potential equalization is done ensured through adaptors

Cathodic protection

Special attention must be paid to systems with cathodic protection

- Isolate the sensor from cathodic protected pipes using insulated bolts.
- Use bypass cable between the mating flanges.

Note

Remote mounted sensor versions

If the above is not acceptable, remote mounted sensors can alternatively be connected as follows:

- Connect coil current cable shield at sensor end via a 1.5 µF condensator
- Make sure that electrode cable shield is not connected at both ends

⚠ WARNING

Use in hazardous area!

Cathodic pipe protection is not allowed in hazardous areas

Connecting

5

The following contains a short description of how to connect a remote mounted sensor to transmitter types:

- SITRANS FM MAG5000/6000 (standard versions)
- SITRANS FM MAG6000I Ex

For more information, for example about wiring of power supply and outputs, refer to the operating instructions for the respective transmitters.

Before connecting

- Check that the serial numbers on the sensor and the SENSORPROM® unit are identical.

5.1 General safety requirements

⚠ WARNING

The pertinent regulations must be observed for electrical installation.

- Never install the device with the mains voltage switched on!
- Danger of electric shock!
- The electrodes and magnetic current line may only be connected when the device is not connected to the power supply.
- If the housing is under voltage (power supply), the cover may be unscrewed by qualified personnel only.

⚠ WARNING

Mains supply from building installation Class II

A switch or circuit breaker (max. 15 A) must be installed in close proximity to the equipment and within easy reach of the operator. It must be marked as the disconnecting device for the equipment.

Note

Hazardous area applications

Special requirements apply to the location and interconnection of sensor and transmitter. See Use in hazardous areas (Page 14).

⚠ WARNING

Terminal box

Before opening the terminal box check that:

- No explosion hazard exists
- All connection leads are potential free

⚠ WARNING

Grounding

The mains protective earth wire must be connected to the PE terminal in accordance with the diagram (class 1 power supply)

Mechanical counters

When mounting a mechanical counter to terminals 57 and 58 (active output), a 1000 µF capacitor must be connected to terminals 56 and 58. Capacitor + is connected to terminal 56 and capacitor - to terminal 58.

Output cables

If long cables are used in electrically noisy environments, it is recommended to use screened cables.

Electrode cables

Dotted connections are only to be made when using special electrode cables.

⚠ WARNING

National requirements

Observe country-specific installation directives for field wiring.

Cable specifications

- Only use cables with at least the same degree of protection as the sensor to install the sensor.
- The line length from the cable gland to the terminals must be kept as short as possible. Line loops in the terminal box must be avoided.
- To guarantee the degree of protection, use cables with the required specifications.

⚠ WARNING

Protective conductor terminal

The required cable is min. AWG16 or 1.5 mm^2 Cu.

⚠ WARNING

Wire insulation

For field wiring installation: Ensure that the national requirements of the country in which the flowmeters are installed is met.

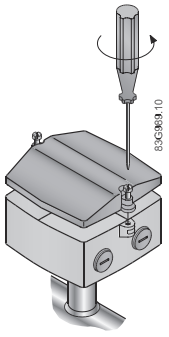
5.2 Remote installation

Note

Remote installation only

The following applies to remote installation of MAG5000/6000 or MAG6000I.

1. Unscrew and remove terminal box lid.



2. Mount the two terminal blocks as shown and insert electrode cable plug ① (terminals 82, 0 and 83) and coil cable plug ② (terminals 85 and 86).
   Terminals electrode cable: 82, 0 and 83
   Terminals special electrode cable: 84, 83, 0, 82 and 81
   Terminals coil cable: 85; 86

   Note

   Special electrode cable

   Special electrode cable must be connected to terminals 84, 83, 0, 82 and 81.

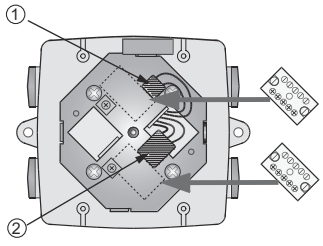
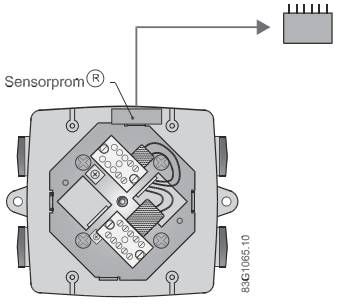


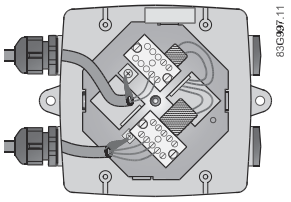
Figure 5-1 Terminal box without blocks

3. Remove SENSORPROM® unit from sensor and mount it on connection plate in transmitter, see relevant transmitter operating instructions.



4. Fit the ½" NPT or M20 cable glands for supply and output cables.

5. Fit and connect electrode and coil cables as shown below.



Power supply

Transmitter



115 to 230 V AC

L1 ← L
N ← N
⏚ ← PE

11 to 30 V DC/11 to 24 V AC

1 ← +
2 ← -
⏚ ← PE

Outputs

Current output
(Powered from transmitter)

31 +
32 -

0/4 - 20 mA
Load ≤ 800 Ω

Passive output
(External powered)

Digital output

56 +
57 -
58

Vx 3 to 30 V
max. 110 mA
R
PLC-Digital input

Active output
(Powered from transmitter)

56
57 +
58 -
R

24 V max. 30 mA
Counter or PLC-Digital input

Menu setup

Negative: ⊓⊔⊓

Positive: ⊔⊓⊔

R = Pull up/down resistor
1 to 10 KΩ may be
required - depending on
Cables/Input resistance

Relay output

44 NO
45 NC
46 Common

Relay
24 V DC/1A
42 V AC/2A

Digital input

77 +
78 -

11 to 30 V DC Input

91 92 93 94 95 96 97

Reserved for communication modules

Sensor connection
(remote transmitttter)

Sensor

81
82
1) 0
83
84

Electrode cable
Brown
Black
Blue

81
82
0
83
84

Coil cable
Blue
Brown

85
86

85
86

min. 4 mm² (only for Ex versions)

From transmitter enclosure to the external grounding point of the sensor

1) Note:
Special cable with individual wire shields (shown as dotted lines) are only required when using empty pipe function or long cables.

⚠ CAUTION

Unscreened cable ends

Keep unscreened cable ends as short as possible.

⚠ CAUTION

Prevent interference

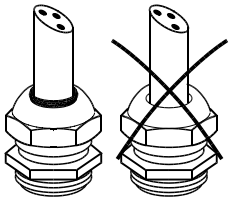
Separate electrode and coil cables to prevent interference.

⚠ WARNING

Use in hazardous area

Connect mains protective earth to the PE terminal in accordance with the above diagram in order to obtain potential equalization.

6. Tighten cable glands well to obtain optimum sealing. The cable entry gasket must obtain firm contact with the cable.

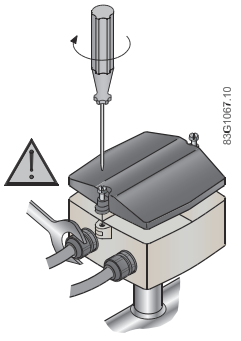


7. Remount terminal box lid.

Note

Tightening torque

Tighten the bolts with 0.5 Nm.



5.3 Installation check

The meter is now ready to go into normal operation - for commissioning and setting of parameters refer to the relevant transmitter manual.

Before commissioning it must be checked that:

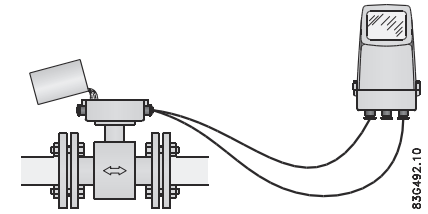
- The device has been installed and connected in accordance with the guidelines provided previous in this chapter and in Installing/Mounting (Page 21).

5.4 Potting

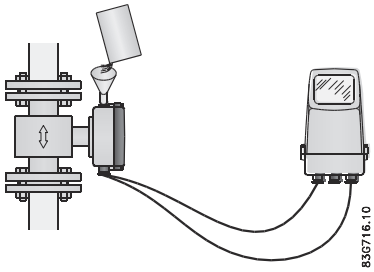
The sensor can be potted with silicon dielectric gel (non-toxic, transparent and self-healing gel)

NOTICE
Electrical connections Do **not** pot meter before electrical connections have been made.

- Mix the two components of the potting kit well and pour into terminal box.
- Let cure for approximately 24 hours at approximately 25°C (77°F). Curing time increases by 100% per -10°C (-18°F).



Horizontal orientation



Vertical orientation

Note

Gel can be penetrated with test instruments or be removed in case of cable replacement.

Service and maintenance

6

6.1 Maintenance

The device is maintenance-free. However, a periodic inspection according to pertinent directives and regulations must be carried out.

An inspection can include check of:

- Ambient conditions
- Seal integrity of the process connections, cable entries, and cover screws
- Reliability of power supply, lightning protection, and grounds

Note

Siemens defines flow sensors as non-repairable products.

⚠ WARNING

Impermissible repair and maintenance of the device

- Repair and maintenance must be carried out by Siemens authorized personnel only.

6.2 Ordering of spare parts and accessories

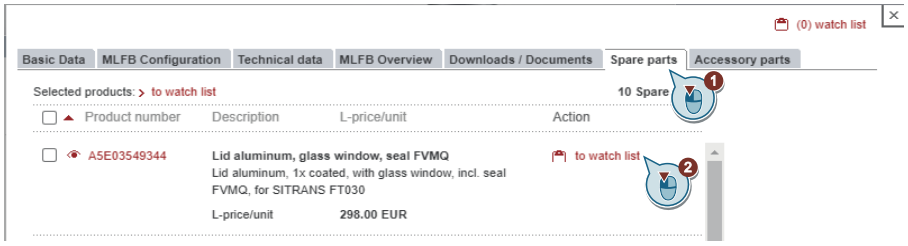
Condition

- You have a Siemens Industry Mall account.

Procedure

1. Open the Process instrumentation catalog (https://www.siemens.com/processinstrumentation/catalogs).
2. Select the desired language.
3. To find spare parts for your device, do one of the following:
   - Enter the complete order number of your device (e.g. 7ME4633-4KA51-8DC3-Z A05+B11+E06+F11) into the "Product number" field and click "Go".
   - Enter the serial number of your device (e.g. N1KXXXXXXX) in the "Serial number" field and click "Go".
   - If you do not know the product or serial number, search for your device under "Product family".

4. Navigate to the "Spare parts" and "Accessory parts" tab.
   You see the list of spare parts and accessories available for your device.



5. Select a spare part or an accessory and add it to your watch list.
   The watch list opens.
6. Click "Add to cart of Industry Mall".



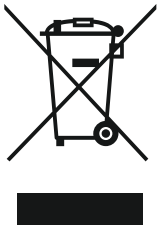
   The Siemens Industry Mall opens and you can order your spare part and your accessories.

To return a product to Siemens, see Returns to Siemens (www.siemens.com/returns-to-siemens).

Contact your Siemens representative to clarify if a product is repairable, and how to return it. They can also help with quick repair processing, a repair cost estimate, or a repair report/ cause of failure report.

NOTICE
Decontamination The product may have to be decontaminated before it is returned. Your Siemens contact person will let you know for which products this is required.

6.3 Disposal



Devices described in this manual should be recycled. They may not be disposed of in the municipal waste disposal services according to the Directive 2012/19/EC on waste electronic and electrical equipment (WEEE).

Devices can be returned to the supplier within the EC and UK, or to a locally approved disposal service for eco-friendly recycling. Observe the specific regulations valid in your country.

Further information about devices containing batteries can be found at: Information about battery / product return (WEEE) (https://support.industry.siemens.com/cs/document/109479891/)

NOTICE
Data misuse resulting from non-secure deletion of data Incomplete or non-secure deletion of data from data memories can result in data misuse by third parties. For this reason, ensure secure deletion of data from all storage media used before disposing of the product.

Troubleshooting

7

7.1 Improving the application

The first step in the troubleshooting procedure is to check for some easily resolved problems.

Check that:

- Sensor and SENSORPROM unit correspond (serial numbers)
- The sensor is properly installed.
- The sensor is located in a vibration-free position. Vibrations can disturb the sensor and therefore cause measurement error.
- The sensor is filled with liquid and liquid only. Air or gas bubbles in the liquid cause instability and can result in measurement errors.

Note

The liquid must be homogeneous in order to achieve high-accuracy measurements. If the liquid contains solid particles of greater density than the liquid, then these solids can precipitate, especially at low flow rates, which will cause instability in the sensor and lead to measurement errors.

Resolving problems

1. Make sure that the serial numbers on the sensor and the SENSORPROM® unit are identical.
2. Make sure that the sensor is installed as described in the installation chapter (Page 21) of the sensor Operating Instructions.
3. Flush the pipe systems and the sensor for several minutes at maximum flow rate to remove any air bubbles which may be present.

7.2 Sensor check

Requirement

To check the SITRANS FM sensors the following test instruments will be required:

- Digital Meter/Multimeter
- Ohmmeter "Megger"
- (Moving Coil Meter)

Sensor check

Remove the transmitter from the sensor or remote position before making the following checks.

Coil resistance check

- Measure the coil resistance between connection numbers 85 and 86 using a digital meter. Resistance should be within range stated in Coil resistance table (Page 82).

A low reading may indicate moisture within the coil housing or shorted coil turns.

A high reading would indicate an open circuit coil.

Note

In case of deviation from nominal coil values, the sensor is damaged and must be replaced

Coil insulation check

⚠ WARNING

Potential hazard!

Only carry out a coil insulation check in non-hazardous area!

- Megger between connection number 85 and the sensor body.
  The resistance should be above 20 MΩ.

A low megger reading would indicate the coil insulation is breaking down. This is usually due to fluid ingress into the coil housing.

Sensors with an insulation resistance down to 1 MΩ may still work satisfactorily but this is not guaranteed.

Electrode resistance check

- Measure the electrode resistance between connections 82 and 0 with a moving coil meter. With a sensor full of fluid the resistance should be between 5 kΩ and 50 kΩ.
  If the sensor is empty the resistance will be infinite.
- Repeat the resistance measurements between connections 83 and 0.
  The results should be the same.

If the resistance is low there may be a short on the electrodes or wiring (in the case of a remote mounted transmitter). Alternatively there may be water ingress or moisture in the terminal box.

If the resistance is high and the pipe is completely full of fluid check the following:

1. Fluid is electrically conductive.
2. Electrodes are not coated with grease or any deposit.
3. Electrode circuit is not open.

4. Remote mounted transmitter has a 3 core cable with an overall shield continuously from sensor to transmitter, including junction boxes and terminal rails inside panels.
5. Shield is connected to 0 or to earth terminal (PE) on sensor.

Note

Sensors removed from line

For sensors removed from line with dry bore, use megger between terminal 82 and compression plate, and 83 and compression plate to show any water ingress behind electrodes or within enclosure.

See also

Coil resistance (Page 82)

7.3 Fluctuating process values

Question

Why do the displayed process values fluctuate when the electrode cable is moved?

Answer

There are several causes of the fluctuating process values:

- Deposits on electrodes
  - Clean the electrodes.
- Defect electrode cable
  - Replace the cable
- Incorrect cable connection
  - Connect the electrode cable (82, 83, 0 and shield) according to the instructions in Connecting (Page 37)

Note

Vibrating environments

It is recommended to use special low noise cables for sensor sizes DN 2 and DN 3 installed in vibrating environments.

Technical specifications

8

8.1 Process connections

Table 8-1 Process connections

Version	MAG1100	MAG1100HT	MAG1100F
Nominal size			
- Ceramic	- DN 2 to 100 (1/12" to 4")	- DN 15 to 100 (½" to 4")	- DN 10 to 100 (3/8" to 4")
- PFA	- DN 10 to 100 (3/8" to 4")		- DN 10 to 100 (3/8" to 4")
Mating flanges			
EN 1092-1 (DIN 2501), ANSI B 16.5 class 150 and 300 or equivalent	- DN 2 to 100 (1/12" to 4") (Ceramic) - DN 10 to 100 (3/8" to 4") (PFA) Option: DN 2 to 10 (1/12" to 3/8"): G½" / NPT ½" pipe connection adapters	- DN 15 to 100 (½" to 4")	
Weld in			
DIN 11850			- DN 10 to 100 (3/8" to 4")
ISO 2037 (SMS 3008)			- DN 10 to 100 (3/8" to 4")
Tri-Weld/BS 4825-1			- DN 10 to 100 (3/8" to 4")
Clamp type			
DIN 32676			- DN 10 to 100 (3/8" to 4")
ISO 2852 (SMS 3016)			- DN 25 to 100 (1" to 4")
Tri-Clamp/BS 4825-3			- DN 10 to 100 (3/8" to 4")
Threaded type			
DIN 11851			- DN 10 to 100 (3/8" to 4")
SMS 1145			- DN 25 to 65 (1" to 2½")

8.2 Rated operating conditions

Table 8-2 Ambient temperatures[1]

Version	MAG1100	MAG1100HT	MAG1100F
Standard Sensor	-20 to +100 °C (-4 to +212 °F)	-20 to +100 °C (-4 to +212 °F)	-20 to +100 °C (-4 to +212 °F)
Ex Sensor	-20 to +60 °C (-4 to +140 °F)	-20 to +60 °C (-4 to +140 °F)	-20 to +60 °C (-4 to +140 °F)
With compact transmitter			
MAG 5000/6000	-20 to +60 °C (-4 to +140 °F)		-20 to +60 °C (-4 to +140 °F)
MAG 6000 I [2)]	-20 to +60 °C (-4 to +140 °F)		-20 to +60 °C (-4 to +140 °F)
MAG 6000 I Ex de [2)]	-20 to +60 °C (-4 to +140 °F)		-20 to +60 °C (-4 to +140 °F)

1) Conditions also dependent on liner characteristics

2) With HART communication the max. ambient temperature is 50 °C (122 °F)

Table 8-3 Media temperature

Version	MAG1100	MAG1100HT	MAG1100F
Ceramic	-20 to +150 °C (-4 to +302 °F) *MAG 1100 Ex* -20 to +150 °C (-4 to +302 °F)	-20 to +200 °C (-4 to +392 °F) *MAG 1100 Ex* -20 to +180 °C (-4 to +356 °F)	-20 to +150 °C (-4 to +302 °F) *MAG 1100 Ex* -20 to +150 °C (-4 to +302 °F)
PFA	-30 to +130 °C (-22 to +266 °F) Suitable for steam sterilization at 150 °C (302 °F)		-30 to +130 °C (-22 to +266 °F) Suitable for steam sterilization at 150 °C (302 °F)

8.3 Temperature shock

Table 8-4 Temperature shock

Version	MAG1100	MAG1100HT	MAG1100F
Ceramic Duration ≤ 1 min, followed by 10 min rest	DN 2 and 3 (1/12 " and 3/8"): No limitations DN 6, 10, 15 and 25: Max ΔT ≤ 80 °C/min (1/4", 3/8", ½" and 1": Max ΔT ≤ 144 °F/min) DN 40, 50 and 65: Max ΔT ≤ 70 °C/min (1½", 2", and 2½": Max ΔT ≤ 126 °F/min) DN 80 and 100: Max ΔT ≤ 60 °C/min (3" and 4": Max ΔT ≤ 108 °F/min)	DN 15 and 25: Max ΔT ≤ 80 °C/min (½" and 1": Max ΔT ≤ 144 °F/min) DN 40 and 50: Max ΔT ≤ 70 °C/min (1½" and 2": Max ΔT ≤ 126 °F/min) DN 80 and 100: Max ΔT ≤ 60 °C/min (3" and 4": Max ΔT ≤ 108 °F/min)	DN 10, 15 and 25: Max. ΔT ≤ 80 °C/min (3/8", ½" and 1": Max. ΔT ≤ 144 °F/min) DN 40, 50 and 65: Max. ΔT ≤ 70 °C/min (1½", 2" and 2½": Max. ΔT ≤ 126 °F/min) DN 80 and 100: Max. ΔT ≤ 60 °C/min (3", 4": Max. ΔT ≤ 108 °F/min)
PFA	Max. ±100 °C (210 °F) momentarily		Max. ± 100 °C (212 °F) momentarily

Table 8-5 Operating pressure

Version	MAG1100	MAG1100HT	MAG1100F
Ceramic	• DN 2 to 65: 40 bar (1/12" to 2½":: 580 psi) • DN 80: 37.5 bar (3": 540 psi) • DN 100: 30 bar (4": 435 psi) Vacuum 1 x 10^{-6} bar_{abs} (1.5 x 10^{-5} psi_{abs})	• DN 2 to 65: 40 bar (1/12" to 2½": 580 psi) • DN 80: 37.5 bar (3": 540 psi) • DN 100: 30 bar (4": 435 psi) Vacuum 1 x 10^{-6} bar_{abs} (1.5 x 10^{-5} psi_{abs})	• DN 10 ... 65: 40 bar (3/8" to 2½":: 580 psi) • DN 80: 25 bar (3": 363 psi) • DN 100: 25 bar (4": 363 psi) Vacuum 1 x 10^{-6} bar_{abs} (1.5 x 10^{-5} psi_{abs})
PFA	20 bar to (290 psi) Vacuum 0.02 bar_{abs} (0.3 psi_{abs}) DN 80 to 100: CO_2 pressure max. 7 bar (101.5 psi)		20 bar to (290 psi) Vacuum 0.02 bar_{abs} (0.3 psi_{abs}) DN 80 to 100: CO_2 pressure max. 7 bar (101.5 psi)

Table 8-6 Mechanical load/Vibration

Version	MAG1100	MAG1100HT	MAG1100F
	• 18 to 1000 Hz random in x, y, z, directions for 2 hours according to EN 60068-2-36 • Sensor: 3.17 grms • Sensor with compact MAG 5000/ 6000 mounted transmitter: 3.17 grms • Sensor with compact MAG 6000 I/ 6000 I Ex de mounted transmitter: 1.14 grms • For compact installation with the MAG 6000 I, transmitter to be supported to avoid tension on sensor part	• 18 to 1000 Hz random in x, y, z, directions for 2 hours according to EN 60068-2-36 • Sensor: 3.17 grms	• 18 to 1000 Hz random in x, y, z, directions for 2 hours according to EN 60068-2-36 • Sensor: 3.17 grms • Sensor with compact MAG 5000/ 6000 mounted transmitter: 3.17 grms • Sensor with compact MAG 6000 I/ 6000 I Ex de mounted transmitter: 1.14 grms • For compact installation with the MAG 6000 I, transmitter to be supported to avoid tension on sensor part

Table 8-7 Enclosure rating degree of protection

Version	MAG1100	MAG1100HT	MAG1100F
EMC	IP67 to EN 60529 (Type 4X), 1 mH_2O for 30 min 2014/30/EU	IP67 to EN 60529 (Type 4X), 1 mH_2O for 30 min 2014/30/EU	IP67 to EN 60529 (Type 4X), 1 mH_2O for 30 min 2014/30/EU

8.4 Design

Table 8-8 Design

Version	MAG1100	MAG1100HT	MAG1100F
Material			
• Enclosure – MAG 1100	Stainless steel AISI 316L (1.4404)	Stainless steel AISI 316L (1.4404)	Stainless steel AISI 316L (1.4404)
• Terminal box – Standard – Option	Fibre glass reinforced polyamide (not for Ex) Stainless steel AISI 316 (1.4436)	Stainless steel AISI 316 (1.4436)	Fibre glass reinforced polyamide (not for Ex) Stainless steel AISI 316 (1.4436)
• Fixing studs	Stainless steel AISI 304 (1.4301), Number and size to EN 1092-1:2001	Stainless steel AISI 304 (1.4301), Number and size to EN 1092-1:2001	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))	Graphite (max. 200 °C, PN 40 (max. 390 °F, 600 psi))	**For ceramic:** FKM/FPM with stainless steel insert (AISI 304/1.4301) (-20 ... +150 °C (-4 ... +302 °F)) EPDM (-20 ... +150 °C (-4 ... +302 °F))
- Option	Graphite (max. 200 °C, PN 40 (max. 390 °F, 600 psi)) PTFE (max. 130 °C, PN 25 (max. 270 °F, 300 psi))		**For PFA:** EPDM (-20 to +150 °C (-4 to +302 °F)) NBR (-20 to +100 °C (-4 to +212 °F))
• Pipe connection adapters: DN 2, 3, 6 and 10 (1/12", 1/8", ¼" and 3/8")	• Stainless steel • Hastelloy • PVDF		

8.5 Liner

Table 8-9 Liner

Version	MAG1100	MAG1100HT	MAG1100F
Ceramic	DN 2 and 3 (1/12" and 1/8"): Zirconium oxide (ZrO_2) (ceramic) DN 6 to 100 (¼" to 4"): Aluminum oxide Al_2O_3	DN 15 to 100 (½" to 4"): Aluminum oxide Al_2O_3	Aluminum oxide Al_2O_3
PFA	Reinforced PFA (not for Ex)		Reinforced PFA (not for Ex)

8.6 Electrodes

Table 8-10 Electrodes

Version	MAG1100	MAG1100HT	MAG1100F
Ceramic	DN 10 to 100 (3/8" to 4") : Platinum with gold / Titanium brazing alloy DN 2 to 6 (1/12" to ¼"): Platinium	Platinum with gold / Titanium brazing alloy	Platinum with gold / Titanium brazing alloy
PFA	DN 10 to 100 (3/8" to 4"): Hastelloy C22/2.4602		DN 10 to 100 (3/8" to 4"): Hastelloy C22/2.4602

8.7 Certificates and approvals

Table 8-11 Certificates and approvals

Version	MAG1100	MAG1100HT	MAG1100F
Calibration Standard production calibration, calibration report shipped with sensor	Zero-point, 2 x 25 % and 2 x 90 %	Zero-point, 2 x 25 % and 2 x 90 %	Zero-point, 2 x 25 % and 2 x 90 %
Conforms to	PED - 2014/68/EU and CRN (PFA)	PED - 2014/68/EU and CRN (PFA)	PED - 2014/68/EU
Hygenic • MAG1100F (Ceramic)			• 3A (remote version with Polyamide terminal box)
• MAG1100F (PFA)			• 3A (remote version with Polyamide terminal box) • Hygienic EC 1935:2004 European food contact material

8.7.1 Hazardous area approvals and certificates

The device is approved for use in hazardous areas and has the approvals listed below. Special conditions for safe installation and operation specified by each approval authority are included in the relevant certificate.

Remote version

Nonincendive (NI)		
United States		
FM APPROVED	FM18US0060X	Class I Division 2 Groups A, B, C, D T6...T3 Ta : -20°C to +60°C
Canada / United States		
C SP® US	CSA10CA2317288X	Class I Division 2 Groups A, B, C, D T6...T3 Ta : -20°C to +60°C

Increased safety (Ex e), intrinsic safety (Ex i) and Protection by Enclosure (Ex t)		
European Uninon		
Ex	Sira 07ATEX3181X	Ex II 2 G D Ex eb ia IIB T6...T3 Gb Ex tb IIIC T85°C...T198°C Db

Compact version with SITRANS FM MAG6000I / MAG5000 / MAG6000 transmitter

Nonincendive (NI)		
United States		
FM APPROVED	FM18US0060X	Class I Division 2 Groups A, B, C, D T5...T3 Ta : -20°C to +60°C
Canada / United States		
C SP® US	CSA10CA2317288X	Class I Division 2 Groups A, B, C, D T5...T3 Ta : -20°C to +60°C

Compact version with SITRANS FM MAG6000I transmitter

Increased safety (Ex e), intrinsic safety (Ex i) and Protection by Enclosure (Ex t)		
European Uninon		
Ex	Sira 07ATEX3181X	Ex II 2 (1) G D Ex db[1] eb[2] ia[2] [ia IIC Ga] IIB T6...T3 Gb Ex tb [ia Da] IIIC T85°C...T198°C Db Ta : -20°C +60°C

[1] When transmitter supply/data chamber is "Ex db", then "db" is included in the Ex marking string.
[2] When transmitter supply/data chamber is "Ex eb ia", then "eb ia" is included in the Ex marking string.

8.7.2 Electrical specifications

Remote version

Connection	Electrical parameters
Terminals 85 & 86 Supply	Un = 30V (60 Vpk) ; In = 130 mA

Connection	Electrical parameters
Terminals 0, 81, 82, 83 & 84 Sensor electrode	U_i : 30 V ; I_i : 50 mA ; P_i : 0.5 W ; C_i : 50 nF ; L_i : 2 µH

Compact version with SITRANS FM MAG6000I transmitter

Note

Electrical parameters listed in the table below are specified in the Operating Instructions and in the certificates of the SITRANS FM MAG6000I transmitter.

Connection	Electrical parameters	
	18...30 V DC	**115...230 V AC**
Terminals L & N **Supply**	U_n = 20...27 V DC U_m = 30 V DC 9 W	U_n = 115...230 V AC U_m = 253 V AC 8 W (25 VA)
	Intrinsic safety electrical parameters "Ex ia"	
Terminals 31 & 32 **Current Output (I-OUT)**	Passive mode configuration (I-OUT PASSIVE) U_i : 30 V ; I_i : 100 mA ; P_i : 1.2 W ; C_i : 18.82 nF ; L_i : 36 µH Active mode configuration (I-OUT ACTIVE) U_o : 30 V ; I_o : 87.8 mA ; P_o : 0.66 W	
	IIB C_o : 557.6 nF L_o : 18.41 mH	IIC C_o : 63.6 nF L_o : 4.57 mH
Terminals 44, 45 & 46 **Relay Output**	U_i : 30 V ; I_i : 200 mA ; P_i : 1.2 W ; C_i : 3.6 nF ; L_i : 0	
Terminals 56 & 57 **Frequency/pulse output**	U_i : 28 V ; I_i : 100 mA ; P_i : 1.2 W ; C_i : 14.4 nF ; L_i : 36 µH	
Terminals 77 & 78 **Digital input**	U_i : 30 V ; P_i : 1.2 W ; C_i : 2.4 nF ; L_i : 0	
Terminals 95 & 96 **Foundation Fieldbus/Profibus (FISCO)**	U_i : 17.5 V ; I_i : 380 mA ; P_i : 5.32 W ; C_i : 0 ; L_i : 0	
Terminals 91, 92, 93, 94 & 97	No connection permitted	

8.7.3 Temperature specifications for use in hazardous areas

The maximum allowable process fluid temperatures with respect to the marked temperature class and maximum surface temperature for the device in the following maximum ambient temperature are:

Remote and compact version

Ambient temperature	Maximum process temperature	Temperature class	
		Gas	Dust
-20°C to +60°C	67°C	T6 (85°C)	T85°C
	82°C	T5 (100°C)	T100°C
	117°C	T4 (135°C)	T135°C
	150°C	T3 (200°C)	T168°C
-20°C to +50°C	180°C	T3 (200°C)	T198°C

8.7.4 Specific conditions of use

Specific conditions of use

In general, it is required that:

- EN/IEC 60079-14 is considered for installation in hazardous areas.
- Appropriate cable connectors are used.
- Minimum 4 mm^2 cable is to be used for potential equalization.
- Sensor is connected to the potential equalization throughout the hazardous area.
- The device is not opened when energized and when an explosive atmosphere is present.
- Sensor must be fitted with certified cable glands and/or blanking elements with a compatible mode of protection appropriate for the intended use and correctly installed.
- Live maintenance is not permitted on intrinsically safe circuits housed inside the terminal box.

Further information and instructions, including special conditions for safe installation and operation as specified by each approval authority, can be found in the relevant certificates available on the product page for SITRANS FM MAG1100.

Specific conditions of use FM

- Non-flammable processes only.
- The equipment shall not be installed where there is direct exposure to sunlight.

Specific conditions of use ATEX

- The surface temperature of the equipment depends on the temperature of the process fluid see Temperature specifications for use in hazardous areas (Page 60).
- In operation, the output is earthed through the conductive medium being measured and therefore potential equalisation is necessary throughout the hazardous area. The apparatus housing shall be connected to the potential equalising conductor in the hazardous area.

Increased safety "Ex e" conditions

For remote version, field wiring connections to terminals 85 and 86 shall comply with the following:

- The wire conductors shall have a cross-sectional area as follows:
  - Solid conductor: 0.5 to 4 mm^2
  - Stranded conductor: 1.5 to 4 mm^2
  - Flexible conductor: 0.5 to 4 mm^2
- No more than one single or multiple strand wire conductor shall normally be connected to each of the terminals. If multiple conductors are required, these shall be joined in a suitable manner, e.g. two conductors into a single insulated crimped boot lace ferrule.
- The stripping length is 8 mm. The insulation on the wire conductors shall extend to within 1 mm of the metal of the terminal throat.
- The terminal screws shall be tightened down with a torque between 0.5 Nm and 0.7 Nm.

For compact version, field wiring connections to supply terminals 'L' and 'N' housed inside the supply/data chamber shall comply with the following**:**

- The wire conductors shall have a cross-sectional area as follows:
  - Solid conductor: 0.5 to 4 mm^2
  - Stranded conductor: 1.5 to 4 mm^2
  - Flexible conductor: 0.5 to 4 mm^2
- No more than one single or multiple strand wire conductor shall normally be connected to each of the terminals. If multiple conductors are required, these shall be joined in a suitable manner, e.g. two conductors into a single insulated crimped boot lace ferrule.
- The stripping length is 8 mm. The insulation on the wire conductors shall extend to within 1 mm of the metal of the terminal throat.
- The terminal screws shall be tightened down with a torque between 0.5 Nm and 0.7 Nm.

Live maintenance is not permitted.

Flameproof "Ex d" conditions

- The flameproof joints are not intended to be repaired.
- If the transmitter is supplied with previously certified flameproof cable entry devices it shall be verified that the selection and installation satisfy the local relevant installation code of practice.

Dust ignition protection by enclosure "Ex t" conditions

For remote version, when the equipment is installed in dust explosion hazardous area the cable entry devices shall be fitted with interface sealing gasket.

Under certain extreme circumstances, the non-metallic coating may generate an ignition-capable level of electrostatic charge. Therefore, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. In addition, the equipment shall only be cleaned with a damp cloth.

Intrinsically safe "Ex i" conditions

- For compact version, the equipment can be supplied with its current output (terminals 31 and 32) configured in either active mode (I-OUT ACTIVE) or passive mode (I-OUT PASSIVE), the configured mode of any particular transmitter being marked on a label fitted to the inside of the mains supply/data interface terminal chamber lid. The user shall refer to this label to determine the configured mode of a particular transmitter to determine which one of the two sets of parameters specified for the current output is applicable. The mode of a transmitter is not user configurable.
- For compact version, the equipment shall only be connected (terminals L1 and N) to a supply circuit that has a maximum prospective short circuit current of 35 A a.c. or less.
- For compact version, the equipment internal circuits at the following terminals are not capable of withstanding a 500 V r.m.s. a.c. test to earth as required by clause 6.3.12 of EN/IEC 60079-11:2011. This must be taken into account in any equipment installation:
  - Terminals 77 and 78 – Digital input
  - Terminals 95 and 96 – Foundation Fieldbus/Profibus (FISCO)

8.8 Cable entries

Table 8-12 Cable entries

Version	MAG1100	MAG1100HT	MAG1100F
	• Remote installation 2 x M20 or 2 x ½" NPT • Compact installation – MAG 5000/MAG 6000: 4 x M20 or 4 x ½" NPT – MAG 6000 I: 2 x M25 (for supply/output) – MAG 6000 I Ex de: 2 x M25 (for supply/output)	Remote installation 2 x M20 or 2 x ½" NPT	• Remote installation 2 x M20 or 2 x ½" NPT • Compact installation – MAG 5000/MAG 6000: 4 x M20 or 4 x ½" NPT – MAG 6000 I: 2 x M25 (for supply/output) – MAG 6000 I Ex de: 2 x M25 (for supply/output)

8.9 Cable data

Description

Cable for standard electrode or coil	
Electrode cable, double shielded	
Cable kit with standard coil cable and electrode cable double shielded (also available as low noise cable)	

Standard applications

Table 8-13 Technical data, standard application cables

		Coil cable	Standard electrode cable
Basic data	No. of conductors	2	3
	Min. sqr. area	0.5 mm^2	0.2 mm^2
	Shield	Yes	Yes
	Max. capacitance	N/A	350 pF/m
Max. cable loop resistance	Media temperature:		
	< 100 °C (212 °F)	40 Ω	N/A
	> 200 °C (392 °F)	6 Ω	N/A
Cable glands on sensor and transmitter	M20x1.5 gland - Cable ø 6 to 12 mm (0.24 to 0.47 inches)		
	½ NPT gland - cable ø 6 to 12 mm (0.24 to 0.47 inches)		

Special applications, for example low conductivity or electrical noise

Table 8-14 Technical data, special application cables

		Coil cable	Special electrode cable
Basic data	No. of conductors	3	3
	Sqr. area	1.5 mm^2	0.25 mm^2
	Shield	Yes	Double
	Color code	Brown, blue, black	Brown, blue, black
	Outside color	Grey	Grey
	Ext. diameter	7.8 mm	8.1 mm
	Conductor	Flexible CU	Flexible CU
	Isolation material	PVC	PVC
Ambient temperature	Flexible installation	-5 to +70°C (23 to 158°F)	-5 to +70°C (23 to 158°F)
	Non-flexible installation	-30 to +70°C (-22 to 158°F)	-30 to +70°C (-22 to 158°F)

		Coil cable	Special electrode cable
Cable parameter	Capacity	161.50 pF/m	N/A
	Inductance	0.583 µH/m	N/A
	L/R	43.83 þH/Ω	N/A

8.10 Pressure / temperature range

The following diagrams and tables show the maximum allowable working pressure at various working temperatures. For maximum allowable working pressure (MAWP) at 20 °C and at maximum working temperature, see the nameplate on the device.

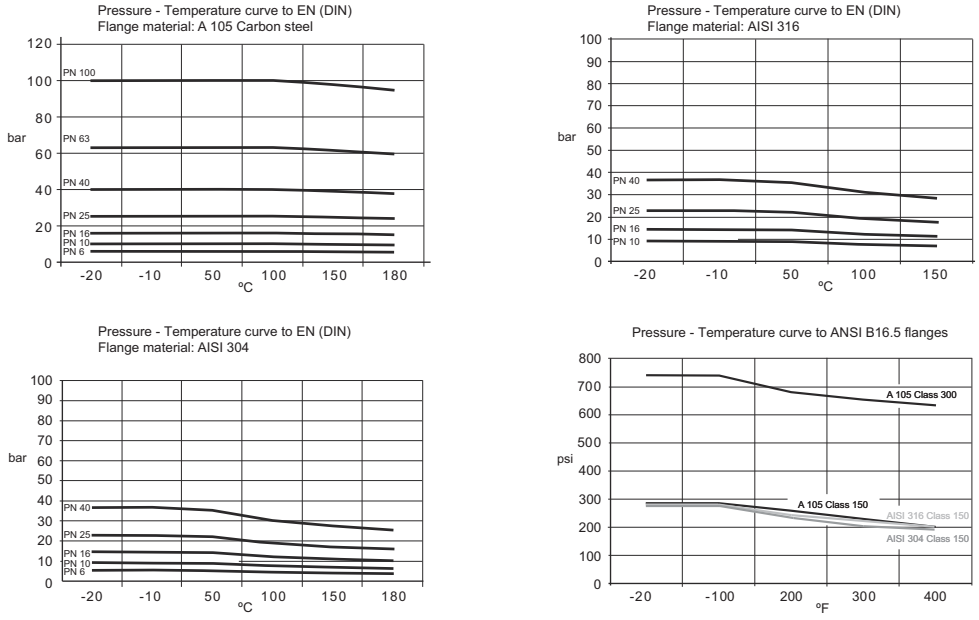


Table 8-15 Metric measures (pressure in bar) - Sizes 25 mm, 40 mm and >300 mm

Flange specifications	Flange rating	Temperature (°C)			
		-5	10	50	90
EN 1092-1	PN 10	10.0	10.0	9.7	9.4
	PN 16	16.0	16.0	15.5	15.1
	PN 40	40.0	40.0	38.7	37.7
ANSI B16.5	150 lb	19.7	19.7	19.3	18.0
AWWA C-207	Class D	10.3	10.3	10.3	10.3

Table 8-16 Imperial measures (pressure in psi) - Sizes 1", 1½" and >12"

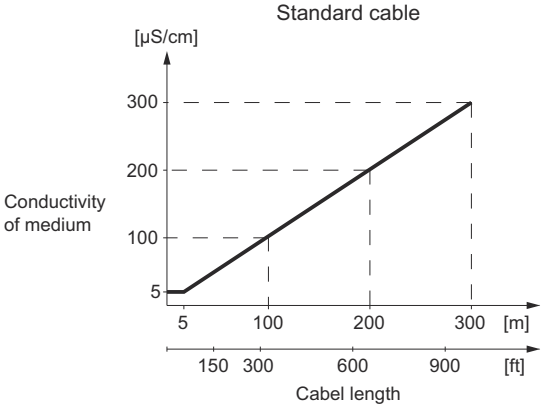
Flange specifications	Flange rating	Temperature (°F)			
		23	50	120	200
EN 1092-1	PN 10	145	145	141	136
	PN 16	232	232	225	219
	PN 40	580	580	561	547
ANSI B16.5	150 lb	286	286	280	261
AWWA C-207	Class D	150	150	150	150l

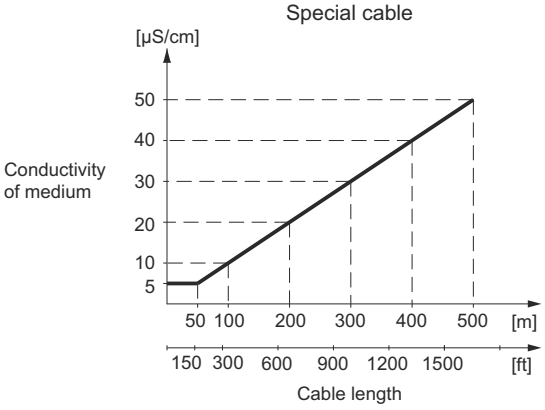
8.11 Process fluid conductivity

Compact installation

Liquids with an electrical conductivity ≥ 5 µS/cm.

Remote installation





⚠ WARNING

Empty pipe detection

The installation has to fulfill the following limitations for usage of the empty pipe detection function:

- media conductivity ≥ 20 µS/cm
- length of cable at remote installation ≤ 50 (150 ft)
- special shield cable must be used

Note for SITRANS FM MAG1100 sizes DN 2 and DN 3:

- empty pipe detection is not available
- media conductivity ≥ 30 µS/cm

Note for SITRANS FM MAG5000/6000 CT (FW 3.03):

- empty pipe detection is not available

Dimension drawings

9

9.1 Dimensions and weight

MAG 1100

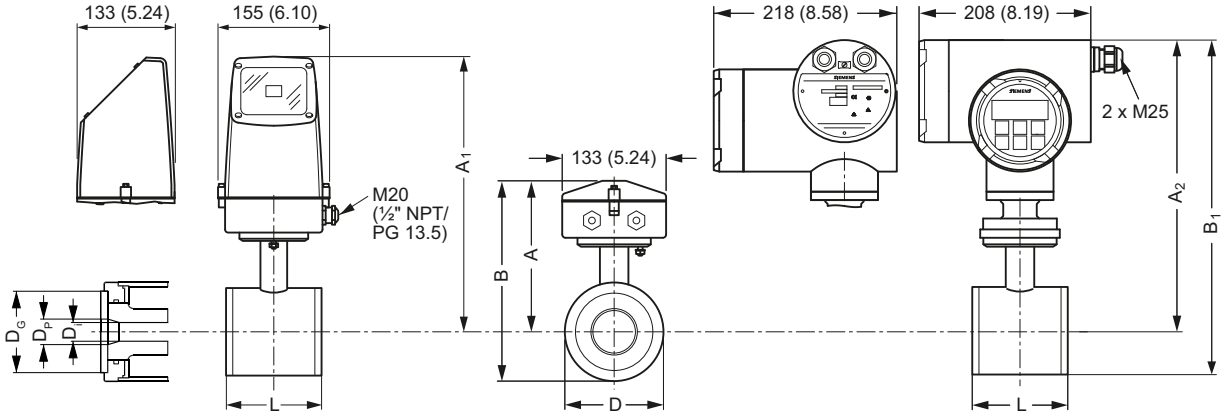


Table 9-1 Dimensions in mm

Nominal size DN	A[1)]	B[1)]	A_1/A_2[2)]	B_1	D	D_i	D_i (PFA)	D_p	D_G	Weight[3)]
DN	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
2	161	186	315	340	48.7	2		17.3	34	2.2
3	161	186	315	340	48.7	3		17.3	34	2.2
6	161	186	315	340	48.7	6		17.3	34	2.2
10	161	186	315	340	48.7	10	10	13.6	34	2.2
15	161	186	315	340	48.7	15	16	17.3	40	2.2
25	169	201	323	354	63.5	25	26	28.5	56	2.7
40	179	221	333	375	84.0	40	38	43.4	75	3.4
50	188	239	342	393	101.6	50	50	54.5	90	4.2
65	198	258	351	412	120.9	65	66	68.0	112	5.5
80	204	270	357	424	133.0	80	81	82.5	124	7.0
100	217	296	370	450	159.0	100	100	107.1	150	10.0

1) 14.5 mm shorter when the stainless steel terminal box is used (Ex or high temperature 200 °C (392 °F) version)

2) A2 is 3 mm shorter than A1

3) With transmitter MAG 5000 or MAG 6000 installed, weight is increased by approximately 0.8 kg. With MAG 6000 I weight is increased by 5.5 kg.

Table 9-2 Dimensions in inch

Nominal size DN	**A[1)]**	**B[1)]**	**A_1/A_2[2)]**	**B_1**	**D**	**Di**	**D_i (PFA)**	**D_P**	**D_G**	**Weight[3)]**
inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	lb
1/12	6.34	7.33	12.40	13.39	1.92	0.08		0.68	1.34	4.8
1/8	6.34	7.33	12.40	13.39	1.92	0.12		0.68	1.34	4.8
¼	6.34	7.33	12.40	13.39	1.92	0.24		0.68	1.34	4.8
3/8	6.34	7.33	12.40	13.39	1.92	0.39	0.39	0.53	1.34	4.8
½	6.34	7.33	12.40	13.39	1.92	0.59	0.63	0.68	1.57	4.8
1	6.66	7.92	12.72	13.94	2.50	0.98	1.02	1.12	2.20	5.9
1½	7.05	8.70	13.11	14.76	3.31	1.57	1.50	1.71	2.95	7.5
2	7.40	9.41	13.47	15.47	4.00	1.97	1.97	2.15	3.54	9.2
2½	7.80	10.16	13.82	16.22	4.76	2.56	2.60	2.68	4.41	12
3	8.03	10.63	14.06	16.70	5.24	3.15	3.19	3.25	4.88	15
4	8.54	11.65	14.57	17.72	6.26	3.94	3.94	4.22	5.91	22

1) 0.57 inch shorter when the stainless steel terminal box is used (Ex or high temperature 200 °C (392 °F) version)

2) A2 is 0.12 inch shorter than A1

3) With transmitter MAG 5000 or MAG 6000 installed, weight is increased by approximately (1.8 lb). With MAG 6000 I weight is increased by 12.1 lb.

Table 9-3 MAG 1100 built-in length

Nominal size DN		**L[1)]**									
		EN 1092-1-201									
		EPDM		**Graphite**		**PTFE (Teflon)**		**Without gasket**		**Grounding ring**	
DN	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
2...10[1)]	1/12... 3/8[1)]	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) When earthing flanges are used, the thickness of the earthing flange must be added to the built-in length

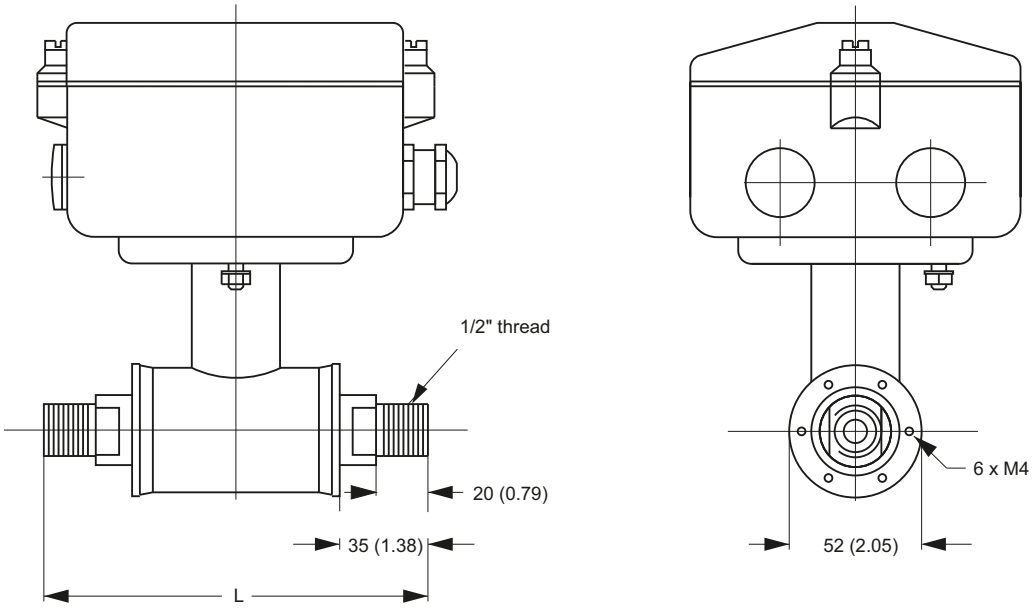


Figure 9-1 MAG 1100 with adapters

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. Dimensions in mm (inch) The length "L" varies dependent on the gasket choice.

Stainless steel and Hastelloy pipe connections								**PVDF pipe connections**	
Without gasket		EPDM		Graphite		PTFE		PTFE	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
150	5.9	150	5.9	152	6.0	156	6.1	133	5.2

9.2 Built-in length for MAG 1100 F

MAG 1100 F

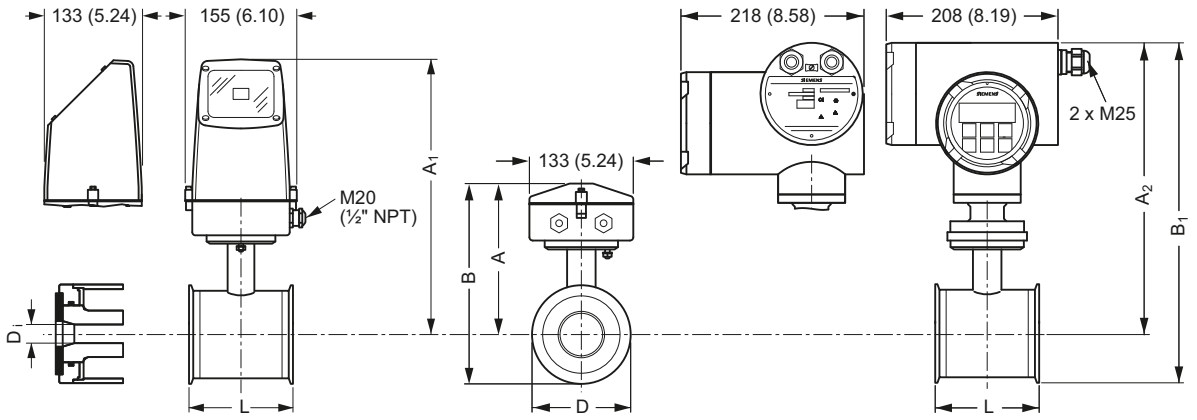


Table 9-4 Dimensions in mm

Nominal size DN	L	A	A_1/A_2 [1]	B [2]	B_1	D	D_i (Al_2O_3)	D_i (PFA)	Weight [3]
mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
10	64	161	315	193.7	344.7	64.0	10	10	2.2
15	64	161	315	193.7	344.7	64.0	15	16	2.2
25	79	169	323	207.5	359.0	77.5	25	26	2.7
40	94	179	333	228.0	379.0	91.0	40	38	3.4
50	104	188	342	247.7	398.7	119.0	50	50	4.2
65	131	197.5	351	262.6	413.6	130.0	65	66	5.5
80	156	204	357	281.0	432.0	155.0	80	81	7.0
100	186	217	370	308.0	459.0	183.0	100	100	10.0

1) A2 is 3 mm shorter than A1

2) 14.5 mm shorter when the stainless steel terminal box is used (Ex or high temperature 200 °C (392 °F) version)

3) With transmitter MAG 5000 or MAG 6000 installed, weight is increased by approximately 0.8 kg. With MAG 6000 I weight is increased by 5.5 kg.

Table 9-5 Dimensions in inch

Nominal size DN	L	A	A_1/A_2 [1]	B [2]	B_1	D	D_i (Al_2O_3)	D_i (PFA)	Weight [3]
inch	inch	inch	inch	inch	inch	inch	inch	inch	lb
3/8	2.52	6.34	12.40	7.62	13.57	2.52	0.39	0.39	4.8
½	2.52	6.34	12.40	7.62	13.57	2.52	0.59	0.63	4.8
1	3.11	6.66	12.72	8.17	14.13	3.05	0.98	1.02	5.9
1½	3.70	7.05	13.11	8.98	14.92	3.58	1.57	1.50	7.5

Nominal size DN	L	A	A_1/A_2[1]	B[2]	B_1	D	D_i (Al_2O_3)	D_i (PFA)	Weight[3]
2	4.09	7.40	13.47	9.75	15.70	4.68	1.97	1.97	9.2
2½	5.16	7.78	13.82	10.34	16.28	5.12	2.56	2.60	12.0
3	6.14	8.03	14.06	11.06	17.01	6.10	3.15	3.19	15.0
4	7.32	8.54	14.57	12.13	18.07	7.20	3.94	3.94	22.0

1) A2 is 0.12 inch shorter than A1

2) 0.57 inch shorter when the stainless steel terminal box is used (Ex or high temperature 200 °C (392 °F) version)

3) With transmitter MAG 5000 or MAG 6000 installed, weight is increased by approximately (1.8 lb). With MAG 6000 I weight is increased by 12.1 lb.

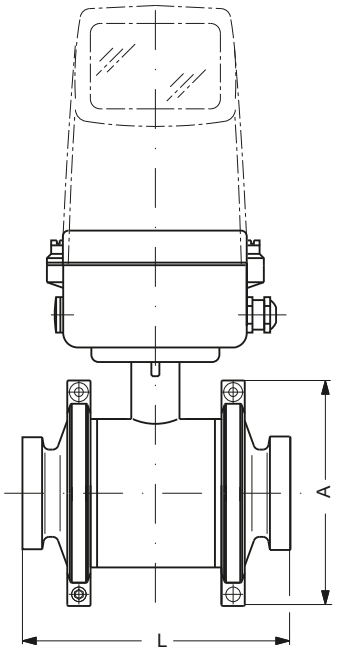


Table 9-6 MAG 1100 F built-in length

Nominal size DN		A		L[1]	
mm	inch	mm	inch	mm	inch
10	3/8	99	3.90	146	5.75
15	½	99	3.90	146	5.75
25	1	113	4.45	161	6.34
40	1½	126	4.96	176	6.93
50	2	154	6.06	186	7.32
65	2½	165	6.50	223	8.78
80	3	200	7.87	258	10.16
100	4	225	8.86	288	11.34

1) The total built-in length "L" is independent of the adapter type selected.

9.3 Accessories for MAG 1100 F

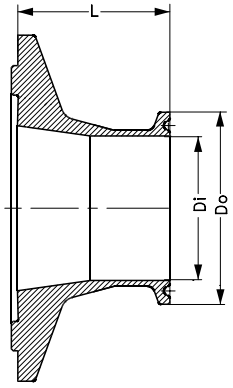


Table 9-7 Weld-in types

Adapter	Sensor	L	Weld-in type					
			DIN 11850		ISO 2037 (SMS 3008)		BS 4825-1 (Tri-Weld)	
DN	DN		Di	Do	Di	Do	Di	Do
mm	mm	mm	mm	mm	mm	mm	mm	mm
10	10	40	10.0	13.0	10.0	13.0	9.4	12.7
15	15	40	16.0	19.0	16.0	19.0	-	-
15.9	15	40	-	-	-	-	15.75	19.05
20	15	40	-	-	20.0	23.0	-	-
25	25	40	-	-	22.6	25.6	22.1	25.4
25	25	40	26.0	29.0	-	-	-	-
28	25	40	-	-	25.6	28.6	-	-
32	25	40	-	-	-	-	-	-
32	25	40	32.0	35.0	-	-	-	-
38	40	40	-	-	35.6	38.6	34.8	38.1
40	40	40	-	-	37.6	40.6	-	-
40	40	40	38.0	41.0	-	-	-	-
50	50	40	-	-	48.6	51.6	47.5	50.8
50	50	40	50.0	53.0	-	-	-	-
63.5	65	45	-	-	60.3	64.1	60.2[1)]	63.5[1)]
65	65	45	66.0	70.0	-	-	-	-
76	65	45	-	-	-	-	-	-
76.1	80	50	-	-	72.9	76.7	72.9	76.2
80	80	50	81.0	85.0	-	-	-	-
100	100	50	100	104	-	-	-	-
101.6	100	50	-	-	97.6	102.5	97.38[1)]	101.6[1)]
114.3	100	50	-	-	110.3	115.6	-	-

Table 9-8 Weld-in types

Adapter	Sensor	L	Weld-in type					
			DIN 11850		ISO 2037 (SMS 3008)		BS 4825-1 (Tri-Weld)	
DN	DN		Di	Do	Di	Do	Di	Do
mm	mm	mm	mm	mm	mm	mm	mm	mm
10	10	40	10.0	34.0	10.0	34.0	10.0	34.0
15	15	40	16.0	34.0	16.0	34.0	10.0	34.0
25	25	40	-	-	-	-	22.6	50.5
25	25	40	26.0	50.5	26.0	-	-	-
33.7	25	40	-	-	31.3	50.5	-	-
38	40	40	-	-	35.6	38.6	35.6	50.5
40	40	40	38.0	50.0	-	-	-	-
50	50	40	50.0	64.0	-	-	-	-
51	50	40	-	-	48.6	64.0	48.6	64.0
63.5	65	45	-	-	60.3	77.5	60.3[1)]	77.5[1)]
65	65	45	66.0	91.0	-	-	-	-
76.1	80	50	-	-	72.9	91.0	72.9	91.0
80	80	50	81.0	85.0	-	-	-	-
100	100	50	100	119.9	-	-	-	-
101.6	100	50	-	-	97.6	119.0	97.6[1)]	119.0

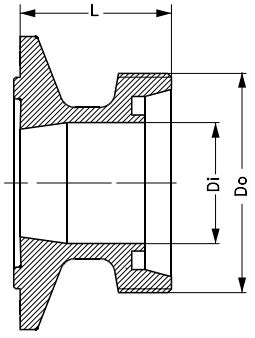


Table 9-9 Threaded type DIN 11851

Adapter	Sensor	L	Threaded type	
			DIN 11851[1)]	
DN	DN		Di	Do
mm	mm	mm	mm	mm
10	10	40	10.0	28.0
15	15	40	16.0	34.0
20	15	40	20.0	44.0
25	25	40	26.0	52.0
32	25	40	32.0	58.0
40	40	40	38.0	65.0

Adapter	Sensor	L	Threaded type	
			DIN 11851[1)]	
DN	DN		Di	Do
50	50	40	50.0	78.0
65	65	45	66.0	95.0
80	80	50	81.0	110.0
100	100	50	100.0	130.0

1) Only 3A used with self centering gaskets

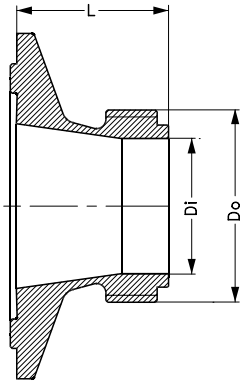


Table 9-10 Threaded type ISO 2853/BS 4825-4

Adapter	Sensor	L	Threaded type			
			ISO 2853[1)]		BS 4825-4[1)]	
DN	DN		Di	Do	Di	Do
mm	mm	mm	mm	mm	mm	mm
25	25	40	22.6	37.0	22.6	37.0
38	40	40	35.6	51.0	35.6	51.0
51	50	40	48.6	64.0	48.6	64.0
63.5	65	45	60.3	78.0	60.3	78.0
76.1	80	50	72.9	91.0	72.9	91.0
101.6	100	50	-	-	97.6	126.0
101.6	100	50	97.6	118.0	-	-

1) Not suitable for 3A approval

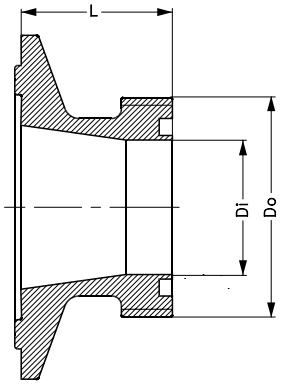


Table 9-11 Threaded type SMS 1145

Adapter	**Sensor**	**L**	**Threaded type**	
			SMS 1145[1)]	
DN	**DN**		**Di**	**Do**
mm	mm	mm	mm	mm
25	25	40	22.6	40.0
38	40	40	35.6	60.0
51	50	40	48.6	70.0
63.5	65	45	60.3	85.0
76	65	45	72.0	98.0

1) Not suitable for 3A approval

Product documentation and support

A

A.1 Product documentation

Process instrumentation product documentation is available in the following formats:

- Certificates (http://www.siemens.com/processinstrumentation/certificates)
- Downloads (firmware, EDDs, software) (http://www.siemens.com/processinstrumentation/downloads)
- Catalog and catalog sheets (http://www.siemens.com/processinstrumentation/catalogs)
- Manuals (http://www.siemens.com/processinstrumentation/documentation)
  You have the option to display or download the manual.
  - "Display": Open the manual. Different format options may be available.
  - "Download": Download the manual. Different format options may be available.

You can also find manuals on the Mobile app at Industry Online Support (https://support.industry.siemens.com/cs/ww/en/sc/2067). Download the app to your mobile device and scan the device ID link.

ID Link

The ID Link is a globally unique identifier, according to IEC 61406-1. The ID Link can be found as a QR code on products and is marked by a black frame with a triangle in the bottom right corner.

The ID Link displays the digital nameplate of the product.

The following image shows an example of an ID Link.



1. Scan the ID Link on your device with a mobile device.
2. Follow the prompt on your mobile device to access the ID Link.
   The ID Link page displays.

General product documentation

To access content such as manuals, technical data, certificates, and downloads, click “General product documentation”.

Specific product documentation

1. To access specific product documentation via PIA Mobile, click “S/N-Specific product documentation”.
   The PIA Mobile screen displays.
2. To display serial number-specific product information, including technical specifications, spare parts, calibration data, or factory certificates, if available, log in to PIA Mobile or register.

PIA Life Cycle Portal

Entering a serial number

1. Open the PIA Life Cycle Portal (https://www.pia-portal.automation.siemens.com).
2. Select the desired language.
3. Log in or sign up.
4. Enter the serial number of your device and click "go".
   The product documentation and certificates relevant for your device display and can be downloaded.

A.2 Technical support

Technical support

If this documentation does not completely answer your technical questions, you can enter a Support Request (http://www.siemens.com/automation/support-request).

For help creating a support request, view this video here (www.siemens.com/opensr).

Additional information on our technical support can be found at Technical Support (http://www.siemens.com/automation/csi/service).

Service & support on the Internet

In addition to our technical support, Siemens offers comprehensive online services at service & support (http://www.siemens.com/automation/serviceandsupport).

Contact

If you have further questions about the device, contact your local Siemens representative, by doing the following:

1. Visit Contact at Siemens (http://www.automation.siemens.com/partner).
2. Select "All Products and Branches" > "Products & Services" > "Industrial automation".
3. Choose either "Process analytics" or "Process instrumentation", depending on your product.

4. Select the product category ("Pressure measurement", for example), then select your product.
5. Click "Search".
   The contacts for your product in all regions display.

Contact address for business unit:
Siemens AG
Digital Industries
Process Automation
Östliche Rheinbrückenstr. 50
76187 Karlsruhe, Germany

Appendix

B

B.1 Factory settings

Dimension-dependent factory settings

Table B-1 50 Hz version

DN		Qmax			Unit	Volume/ pulse	Pulse unit	Totalizer unit
mm	Inch	Fac. settings	Min.	Max.				
2	1/12	**30**	3.9	113	l/h	0.1	ml	ml
3	1/8	**70**	6.3	254	l/h	0.1	ml	ml
6	¼	**300**	25.4	1017	l/h	1	l	l
10	3/8	**900**	70.6	2827	l/h	1	l	l
15	½	**2000**	159	6361	l/h	1	l	l
25	1	**5000**	441	17671	l/h	10	l	l
40	1½	**12**	1.1	45	m^3/h	10	l	l
50	2	**20**	1.7	70	m^3/h	10	l	l
65	2½	**30**	2.9	119	m^3/h	100	l	l
80	3	**50**	4.5	180	m^3/h	100	l	l
100	4	**120**	7	282	m^3/h	100	l	l

Table B-2 60 Hz version

DN		Qmax			Unit	Volume/ pulse	Pulse unit	Totalizer unit
mm	Inch	Fac. settings	Min.	Max.				
2	1/12	0.13	0.01717	0.68	US GPM	1	US G	US G
3	1/8	0.31	0.02801	1.12	US GPM	1	US G	US G
6	¼	1.3	0.11	4.4	US GPM	1	US G	US G
10	3/8	4	0.31	12.4	US GPM	1	US G	US G
15	½	9	0.7	28.0	US GPM	1	US G	US G
25	1	**22**	1.9	77.8	US GPM	1	US G	US G
40	1½	**52**	4.9	199.1	US GPM	1	US G	US G
50	2	**88**	7.7	311.2	US GPM	1	US G	US G
65	2½	**132**	13.1	525.9	US GPM	1	US G	US G
80	3	**220**	19.9	796.7	US GPM	1	US G	US MG
100	4	**528**	31.1	1244.8	US GPM	1	US G	US MG

Dimension-dependent batch and pulse output settings

Table B-3 50 Hz version

DN		Qmax	
mm	**Inch**	**Min.**	**Max.**
2	1/12	-	-
3	1/8	-	-
6	¼	-	-
10	3/8	-	-
15	½	-	-
25	1	**409 µl**	**10.7 m³**
40	1½	**1.05 ml**	**27.5 m³**
50	2	**1.46 ml**	**42.9 m³**
65	2½	**2.31 ml**	**72.5 m³**
80	3	**3.71 ml**	**110 m³**
100	4	**5.79 ml**	**172 m³**

Table B-4 60 Hz version

DN		Qmax	
mm	**Inch**	**Min.**	**Max.**
2	1/12	0.00000095	25
3	1/8	0.00000156	41
6	¼	0.00000622	163
10	3/8	0.00001729	453
15	½	0.0000389	1019
25	1	0.000108	2833
40	1½	0.000277	7252
50	2	0.000433	11331
65	2½	0.000730	19149
80	3	0.00111	29007
100	4	0.00173	45325

B.2 Coil resistance

Table B-5 Coil resistance [Ω]

		MAG 1100, MAG 1100F	
DN	Inch	Resistance	Tolerance
2	1/12	104	+/– 5
3	1/8	104	+/– 5
6	1/4	99	+/– 17

		MAG 1100, MAG 1100F	
10	3/8	99	+/– 17
15[1)]	1/2	91	+/– 9
25	1	91	+/– 17
40	1 1/2	91	+/– 9
50	2	91	+/– 9
65	2 1/2	99	+/– 17
80	3	91	+/– 17

[1)] On MAG 1100 DN 15 produced as from May 1999 the coil resistance must be 86 ohm, +8/–4 ohm.

Note

Reference values

- All resistance values are at 20 °C
- The resistance changes proportionally 0.4% / °C

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