© Siemens AG 2012

Flow Measurement

You can download all instructions, catalogs and certificates for SITRANS F free of charge at the following Internet address:
www.siemens.com/sitransf

© Siemens AG 2012

Overview

	Application	Description	Catalog page	Software for parameterization
SITRANS F M electromagnetic flowmeters - Pulsed DC magnetic flowmeter				
	Designed in robust IP67 polyamide enclosures for compact or remote mounting 19", back of panel and front of panel enclosure program	**Transmitter MAG 5000/6000** • Superior signal resolution for optimum turn down ratio • Comprehensively self-diagnostic, for error indication and logging • Multi-lingual display and keypad interface • Custody transfer approval: PTB K7.2, OIML R 117, OIML R 49 and MI-001	3/34	SIMATIC PDM
	Designed in robust die-cast aluminum enclosure for demanding applications and where explosion proof protection is necessary	**Transmitter MAG 6000 I/6000 I Ex de** • Remote and compact mounting with all sensors • Communication modules: HART, Modbus, PROFIBUS, FOUNDATION Fieldbus, Device net • Ex Approval: ATEX, IECEx, FM, UL, CSA • Multi-lingual display and touchpad keypad • Comprehensively self-diagnostic	3/46	SIMATIC PDM
	Designed for the general industry environment The obstructionless performance of this sensor is unaffected by the suspended solids, viscosity and temperature challenges.	**Flow sensor MAG 1100** • Metering tube DN 2 ... DN100 (1/12“ ... 4“) flangeless design. • Communication modules: HART, Modbus, PROFIBUS, FOUNDATION Fieldbus, Device net • Corrosion-resistant AISI 316 stainless steel housing. • Highly resistant liner (ceramic or PFA) and electrodes fitting most extreme process media. • Temperature rating up to 200 °C (390 °F) • Ex Approval: ATEX, FM	3/51	
	Specially designed for the food & beverage and pharmaceutical industry 	**Flow sensor MAG 1100 F** • AISI 316 stainless steel enclosure • Hygienic seal, 3A and EHEDG • Easy to clean • Supplied with connections according to your specification • Ex Approval: ATEX, FM	3/59	
	Designed for all water and waste water applications in water plants and industrial applications	**Flow sensor MAG 5100 W** • Metering tube DN 15 ... DN 1200 (DN 2000) (½"" ... 48" (78“)) • Hard Rubber or EPDM lining • Integral grounding electrodes as standard • Increased low flow accuracy for water leak detection • Drinking water approvals and custody transfer approvals , OIML R 49, MI-001 and PTB K7.2	3/93	

© Siemens AG 2012

	Application	Description	Catalog page	Software for parameterization
	The MAG 3100 series with its flexibility in the choice of liner, electrode and flange material allows the measurement of even the most extreme process media.	**Flow sensor MAG 3100** • For a wide range of pipe dimensions: DN 15 ... DN 2000 (½" ... 78") • Wide range of liner and electrode materials • High-temperature version for application with temperatures up to 180 °C (355 °F) • High-pressure solutions • Custody transfer approval: PTB, OIML R 117	3/70	
SITRANS F M electromagnetic flowmeters - High-power AC magnetic flowmeter				
	Designed for heavy-duty applications like pulp & paper stock over 3 %; heavy mining slurries and mining slurries with magnetic particles	**Transmitter TRANSMAG 2** • Magnetic flowmeter with a very strong pulsed AC magnetic field • PROFIBUS PA or HART communication • Comprehensive self-test function • Ex Approval: ATEX, IECEx, FM, UL, CSA	3/104	SIMATIC PDM
	Designed for heavy-duty applications-like pulp & paper stock over 3 %; heavy mining slurries and mining slurries with magnetic particles	**Flow sensor 911/E** • Metering tube: DN 15 ... DN 1000 (½" ... 40") • Metering tube liner: Hard Rubber, Linatex, Soft rubber. PTFE and Novolak • Integral smartPLUG for storing of calibration values • Multi-lingual display and touchpad keypad • Only remote version	3/104	
SITRANS F M electromagnetic flowmeters - Battery-operated magnetic water meter				
	Battery-operated electromagnetic water meter for water applications within abstraction, distribution network, revenue metering and irrigation	**Water meter MAG 8000** • Battery- and/or mains power operated water meter • Metering tube DN 25 ... DN 1200 (1" ... 48") • Remote and compact installation IP68/ NEMA 6P enclosure • Custody transfer approval: PTB K7.2, OIML R 49 and MI-001 • Drinking water approvals • Communication modules: GSM/GPRS, Modbus, Encoder	3/114	SIMATIC PDM and Flow Tool

© Siemens AG 2012

	Application	Description	Catalog page	Software for parameterization
SITRANS F C mass flowmeters				
 NEW	Designed for a variety of liquid and gas applications Measurement of mass flow, density, temperature and fraction	**Flowmeters FC430 (Dual tube design)** • DN 15, DN 25, DN 50 and DN 80 • Flow from 0.2 ... 181 000 kg/h (400 000 lb/h) - water • Pipe material: AISI 316L • Accuracy, typically: Flow: ≤ 0.1 %, Density: ≤ 0.005 g/cm³ • Liquid temp./pressure: -50 ... +200 °C (-58 ... + 392 °F)/up to 100 bar (1450 psi) • Approvals: ATEX, IECEx, cFMus, OIML R 117, SIL 2/3, EHEDG, 3A	3/151	
	Designed for accurate mass flow measurement of gases in high pressure applications	**Flow sensor FCS200** • DN 10, DN 15, DN 25 • Flow from 0 ... 30 000 kg/h • Pipe material: Hastelloy C22 • Accuracy: ± 0.5 % of rate • Process temperature: -40 ... +125 °C (-40 ... 257 °F) • Pressure: Up to 350 bar • Approvals: ATEX, IECEx, FM • Ex Approvals: ATEX, IECEx, FM • Custody transfer approval: PTB - OIML R139	3/205	
	Designed for a variety of liquid and gas applications	**Flow sensors MASS 2100 (Single tube design) and FC300** • DI 1.5, DI 3, DI 6, DI 15, DI 25, DI 40 and DN 4 • Flow from 0.1 ... 52 000 kg/h (114 640 lb/h) • Pipe material: Stainless steel AISI 316L/ 1.4435; Hastelloy C22/2.4602 • Accuracy, typically: - Flow: ≤ 0.1 % of flow rate - Density: ≤ 0.0005 g/cm³ • Liquid temp./pressure: -50 ... +180°C (-58 ... +356 °F) / Up to 410 bar (5946 psi) • Approved according to ATEX EEx ia IIC T3 ... T6	3/210, 3/214	

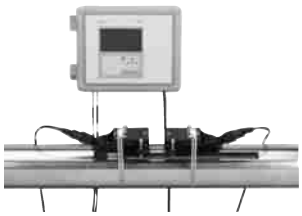
© Siemens AG 2012

	Application	Description	Catalog page	Software for parameterization
 	Measurement of liquids and gases. Measurement of mass flow, density, temperature and fraction e.g. °Brix or °Plato.	**Flow sensor MC2 (Dual tube design)** • Standard MC2 - DN 50, DN 65, DN 80, DN 100 and DN 150 - Flow from 0 ... 510 000 kg/h (112 400 lb/h) - Tube material: AISI 316Ti/1.4571 and Hastelloy C4/2.4610 • Hygienic MC2 - Approvals: EHEDG - DN 20, DN 25, DN 40, DN 50, DN 65 and DN 80 - Flow from 0 ... 113 600 kg/h (250 000 lb/h) - Tube material: AISI 316L/1.4435 - Connectors: DIN 11851, DIN 32676 and DIN 11864-2A • Accuracy: ≤ 0.15 % of rate • Density: ≤ 0.001 g/cm^3 • Liquid temp.: -50 ... +180 °C (-58 ... +356 °F) • Pressure: < 100 bar (1450 psi) • Approvals: ATEX EEx em [ib] IIC T2 ... T6	3/230	
	Measurement of liquids and gases Multiparameter transmitter for remote or compact mounting measuring mass flow, density, temperature and fraction e.g. °Brix and °Plato	**Transmitters MASS 6000 (IP67, 19", Ex d)** • Superior signal resolution for optimum-turn down ratio • Comprehensively self-diagnostic, for error indication and logging • Adaptive batch function • Multi-lingual display and keypad interface • Approvals: ATEX [EEx ia] IIC / EEx de [ia/ib] IIC T6 • Ex Approval: ATEX, IECEx,C-UL • Communication modules: HART, Modbus, PROFIBUS, FOUNDATION Fieldbus, Device net	3/183, 3/195	SIMATIC PDM
	Measurement of liquids and gases Multiparameter transmitter for remote or compact mounting measuring mass flow, density, temperature and fraction e.g. °Brix and °Plato	**Transmitters SIFLOW FC070 Standard and Ex CT** • Digital signal processing measuring 30 times a second. • 3 current, 2 freq. and 2 relay outputs • Adaptive batch function • SENSORPROM memory unit making it easy to start up the flowmeter. • Direct integration into SIMATIC S7 and SIMATIC PCS7 • automation systems • Ex approval: Ex Approval: ATEX, IECEx, FM • Custody transfer approval: PTB - OIML R139	3/201	SIMATIC PDM SIMATIC STEP 7 SIMATIC PCS 7

© Siemens AG 2012

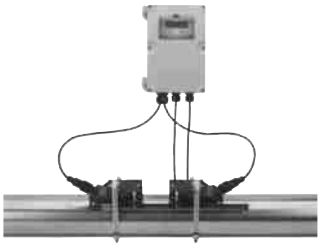
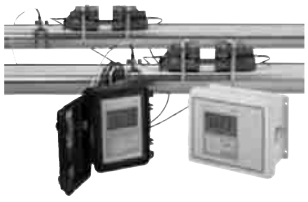
	Application	Description	Catalog page	Software for parameterization
SITRANS F US ultrasonic inline flowmeters				
	SITRANS FUS060 is a time based transmitter designed for ultrasonic flowmetering in pipes for the F US inline industry series up to DN 4000	**SITRANS FUS060 transmitter** • Die cast aluminum enclosure • EEx approved according to ATEX • HART communication + 1 analog output, 1 digital output for frequency or pulse and 1 relay output for alarms and flow direction • PROFIBUS PA communication with 1 digital output for frequency or pulse • Multi-functional output for process control • Easy menu based local operation with two-line display	3/252	SIMATIC PDM
	SITRANS FUS080 is a time based transmitter designed for ultrasonic flowmetering in pipes for the SONOKIT, FUS380 and FUE380 series up to DN 1200	**SITRANS FUS080 transmitter** • Battery or mains powered • Easy one-button operation • Bidirectional measuring • Modbus communication • Robust poyamide enclosure	3/259	SIMATIC PDM
	The main application for SONO 3300 ultrasonic flowmeters is to measure the volume flow of: • Water and treated waste water • Oil and liquefied gases • Hot water/cooling systems	**SONO 3300/FUS060** • ATEX-approved • DN 50 … DN 300 (2" … 12") steel pipes • PN 10 ... PN 40 or class 150 ... class 300 pressure rates • Flow 0.3 … 3200 m^3/h (1.3 ... 14 089 GPM) • No pressure drop • FUS060 transmitter for separate mounting • Signal cables from sensor to transducer are highly protected from aggressive environment by stainless steel pipes	3/265	SIMATIC PDM
	The main application for SONO 3100 ultrasonic flowmeters is to measure the volume flow of: • Water and treated waste water • Oil and liquefied gases • Liquid cryogenic application • District heating systems	**SONO 3100/FUS060** • DN 100 ... DN 1200 (4" ... 48") • Pipe in carbon or stainless steel • Transducers can be replaced under pressure • FUS060 transmitter for separate mounting • ATEX-approved • Measure of all liquids less than 350 Cst, conductive or non-conductive • No pressure drop • 4-track on request • Special material on request	3/272	SIMATIC PDM
	Installation of one, two or four transducer sets in existing concrete or steel pipes. Typically installed in pipes with large diameters or in hot/cold water applications	**SONOKIT** • FUS060 or FUS080 transmitter for separate mounting • DN 100 ... DN 4000 (4" ... 160") • Control and display unit • Temperature of medium: -20 ... +200 °C (-4 ... +395 °F) • Installation on empty pipes or pipes under pressure (hot-tap installation) • Standard 1-path or 2-path (4-path on request)	3/281	SIMATIC PDM

© Siemens AG 2012

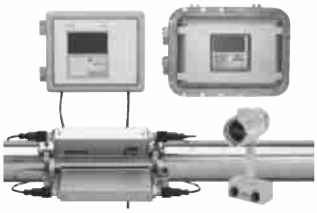
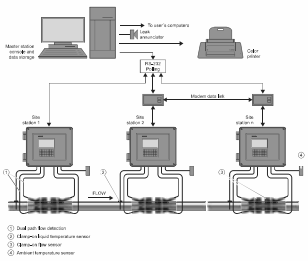
	Application	Description	Catalog page	Software for parameterization
	Battery or mains-powered ultrasonic flowmeter for use within water-based district heating, cooling systems and utility. The FUS380 can also be used for water irrigation systems. SITRANS FUS380/FUE380 are designed to work with the SITRANS FUE950 energy calculator.	**FUS380/FUE380** • *FUS380/FUE380:* DN 50 ... DN 1200 (2" ... 48") • *FUE380:* Approved for custody transfer according to EN 1434 Class 2, OIML R 75, MID and MI004 • *FUS380/FUE380:* Red brass or painted carbon steel flanges and metering tube. AISI transducers • Water temperatures 2 … 200 °C (35.6 ... 392 °F) • Battery or mains-powered	3/292, 3/297	SIMATIC PDM
	Universal thermal energy calculator for district heating and cooling applications.	**SITRANS FUE950** • Battery or mains-powered • 24 periods memory • 2 ports for plug-in modules as data output, extra input, M-Bus, RS 232/RS 485, current output • Complete set with temperature sensors and pockets • MID heating approval, PTB K7.2 cooling approval, MI004 type approval	3/307	
	Battery-operated ultrasonic retrofit flowmeter for water applications within irrigation. Installation of one or two transducer sets in existing PVC or concrete pipes.	**SITRANS FUS880** • Irrigation flowmeter FUS880 • Battery or mains-powered • DN 200 ... DN 1200 (8" ... 48") • Wetted transducer technology • Remote installation IP67	3/318	SIMATIC PDM
	Accessories and spare parts for older flowmeter systems type SITRANS F US SONOFLO	Spare parts for sensors and transmitters of older flowmeter type SONOFLO: E.g. transducer type SONO 3200, coaxial cables, SONO 3000 transmitter spare parts, SENSORPROM	3/323	
SITRANS F US ultrasonic clamp-on flowmeters				
	The thickness gauge can be used in any field application where there is a need for flow measurement. Including but not limited to: • Water and waste water • Energy measurement • Oil and gas industries	**Thickness gauge** The hand-held micro-processor controlled gauge is designed to measure the thickness of various metallic or non-metallic pipes. • Materials include steel, aluminum, titanium, plastics and ceramics • Measurements shown in millimeter or inches • Simple-to-read 4-digit LCD display • Weights 150 g (5.3 oz) • Battery operation for 250 h	3/341	
	Dedicated flowmeters are suitable for a wide variety of liquid applications, including those in the: • Water Industry • Wastewater Industry • HVAC Industry • Power Industry • Processing Industry	**SITRANS FUS1010 General purpose** • Suitable for virtually any liquid, even those with high aeration or suspended solids • Full range of safety approvals, I/O's and enclosure types available • Has wide applicability but not the special functions found in FUH1010, FUG1010 and FUE1010 meters • Hazardous area approvals: FM, CSA, ATEX	3/342	

© Siemens AG 2012

Product overview

	Application	Description	Catalog page	Software for parameterization
	Dedicated flowmeter is a basic option for many clean liquid applications in the: • Water Industry • Wastewater Industry • HVAC & Power Industries • Processing Industry	**SITRANS FST020 Basic** • Has FUS1010 system function but without the same I/O capability or safety approval ratings • This basic meter is intended for single liquid applications that do not require these features • Not available with hazardous area approvals • Unclassified, ordinary locatons approvals: UL, C-UL, CE and C-TICK	3/352	
	Portable flowmeters are suitable for a wide variety of liquid applications, including those in the: • Water Industry • Wastewater Industry • HVAC Industry • Power Industry • Processing Industry	**SITRANS FUP1010 Portable** • Basic function portable meter • Has all the capabilities of the FUS1010 meter but in a battery-powered, portable configuration • Ideal for high-accuracy flow survey applications • Not available with hazardous area approvals • Unclassified, ordinary location approvals: UL, C-UL, CE	3/356	
	The SITRANS FUP1010 check meter measures practically all conductive or non-conductive clean or moderately aerated liquids or liquids with suspended solids. This basic feature enables the perfomance check and verification of existing meters used in various water and wastewater applications such as: • Water Industry - Raw water - Potable water - Chemicals • Wastewater industry - Raw sewage - Effluent - Sludges - Mixed liquor - Chemicals	**SITRANS FUP1010 Portable Check metering kit** • Pipe sizes 25.4 mm ... 9.14 m (1“ ... 360“) • Current, voltage, frequency and RS 232 outputs • Optional current, voltage and temperature inputs • Zeromatic Path automatically sets zero • Bi-directional flow operation • 1 MByte data logger with both site and data logger storage	3/362	
	Portable and dedicated energy meters are ideal for thermal energy/ power applications: • Chilled & hot water submetering • Condenser water, potable water • Glycol and brine solution • Thermal storage	**SITRANS FUE1010 Energy** • Accurate absolute and differential temperature measurement with two matched 1000 Ω RTD elements installed on supply and return side of the heating or cooling system • Efficiency calculation (kW/ton, EER or COP) available in systems with optional analog input • Dedicated available with hazardous area approvals: FM, CSA • Portable available with unclassified/ ordinary locations approval: UL, C-UL, FM	3/364	

© Siemens AG 2012

	Application	Description	Catalog page	Software for parameterization
	The SITRANS FUE1010 check metering kit is a highly accurate clamp-on non-intrusive ultrasonic flow display computer for revenue grade thermal energy sub-metering and energy efficiency distribution monitoring, with a real-time coefficient of performance (COP) for HVAC systems. This kit is ideal for applications which include: • Chilled water sub-metering • Condenser water • Potable water • Ammonia and glycol • River and lake water • Lake source cooling	**SITRANS FUE1010 HVAC Check metering kit** • Pipe sizes 25,4 mm ... 9,14 m (1" ... 360") • Built-in energy/BTU mode • 4-wire 1000 Ω platinum RTDs for supply and return temperature measurements are precision matched to within 0,01 °C (0.02 °F) • Chiller efficiency analysis: accepts an independent analog input representing kW usage for calculation of the following functions which can be selected for data logging or output purposes: - Cooling load (kW/ton) - Coefficient of performance (COP) - Energy efficiency ratio (EER) • Current, voltage, frequency and RS 232 outputs • 1 MByte data logger with both site and data logger storage	3/372	
	Dedicated hydrocarbon flowmeters are ideal for crude oil, refined petroleum or liquefied gas. There are three application areas: • Viscosity compensated volumetric flowmeters • Standard volume (Net) mass flowmeters • Interface detectors/density meters	**SITRANS FUH1010 Oil** • Volumetric flowmeters output viscosity compensated gross volume to external RTU's or flow computers • Mass flowmeters output standard volume (net) mass flow, API, liquid identification, density, interface & pig detection • Interface Detectors are used for liquid identification and API density output, but do not output flow • Hazardous area approvals: FM, CSA, ATEX	3/374	
	• External pipeline damage (third party intrusion, explosions, corrosion, etc.) • Monitoring of product theft • Meet regulatory requirements for Safety • Safety protection against environmental & contamination issues • Operators can instantly view and entire map of the entire pipeline • No continuous operator monitoring is required. • Intelligent analysis process helps prevent false alarms. • Leak detection and location	**Leak Detection System (LDS)** The Leak Detection System (LDS) offers a complete software and hardware solution for liquid pipelines. The LDS uses customized variations of the FUH1010 and the FUS1010 ultrasonic clamp-on flowmeters. The software monitors all of the flowmeters and the pipeline segments in order to assist the operator with a quick and reliable system that detects and localizes the leakages in the pipeline.	3/381	
	Dedicated gas flowmeters are ideal for most natural and process gas industry applications, including: • Checkmetering • Allocation • Flow survey verification • Lost and unaccounted for (LAUF) gas analysis • Production	**SITRANS FUG1010 Gas** • Suitable for most gases (natural gas, oxygen, nitrogen, carbon monoxide, etc.) with typical minimum operating pressure of 10 bar g (145 psi g). • Standard volume or mass flow output for fixed gas compositions • Analog input for pressure and temperature compensation • Hazardous area approvals: FM, CSA, ATEX	3/383	

© Siemens AG 2012

	Application	Description	Catalog page	Software for parameterization
	The clamp-on SITRANS FUG1010 Gas Check Metering Kit is an all-inclusive solution developed especially for verifying the accuracy and performance of any brand or type of flowmeter. The kit is ideal for applications that include: • Check metering • Allocation • Flow survey verification • Lost and unaccounted for (LAUF) gas analysis • Production • Storage	**FUG1010 Check Metering Kit** • Pipe sizes 50 ... 1200 mm (2 ... 48") up to 15,7 mm (0.62") pipe wall thickness • Analog inputs for pressure and temperature • Internal AGA-8 table for fixed gas composition is available for standard volume computation • Upward compatibility and compliance with AGA-10 speed of sound measurement practice • Bi-directional flow operation	3/390	
	Ideal for applications within the liquid and gas hydrocarbon industry capable of providing custody transfer accuracy. Both versions are offered in pipe sizes ranging from 4“ ... 24“ (DN 100 ... DN 600) with flange ratings of ANSI Class 150/300/600 for liquid and 300/600 for gas.	**SITRANS FUT1010 Basic** • WideBeam technology allows for precision flow measurement by reducing the meter's sensitivity to changes in the medium's physical properties • TransLoc permanent mounting system ensures sealing and virtually no maintenance • High viscosity range (up to 2800 Cst) • Completely cavity free design which eliminates any signal degrading build-up or ports to clog • Large bi-directional flow range • Modbus RTU RS 232/485 output available. • Dynamic Reynolds number compensation	3/391	
SITRANS F X Vortex Flowmeter				
	Measurement of steam, gases and liquids in: • Chemical • HVAC/Power plants • Oil & Gas • Food & Beverage • Pharma	**SITRANS FX300** • Flange DN 15 … DN 300 (½" … 12") Sandwich DN 15 … DN 100 (½" … 4") • 2-wire device 4 ... 20 mA, with integrated temperature and pressure sensors for compensation • HART communication • Medium temp.: -40 ... +240 °C (-40 ... +464 °F) • Medium pressure: up to 100 bar (1450 psi) • Hazardous area approvals: FM, CSA, ATEX • Compact or remote mounted transmitter	3/409	

© Siemens AG 2012

	Application	Description	Catalog page	Software for parameterization
SITRANS F VA variable area meters				
	Measurement of flow of liquids and gases, also highly suitable for corrosive media, high temperatures and high pressures.	**FVA250** • All-metal variable area meter with various float materials • Connections: DN 15 ... DN 100 (½" ... 4") • Temperature of medium: -20 °C ... +300 °C (-4 ... +572 °F) • Optionally available with analog output or contacts	3/426	
SITRANS F O delta p - primary differential pressure devices				
	Measurement of flow with orifice plates and metering pipes for mounting between flanges, e.g. together with SITRANS P transmitters, DS III HART, DS III PROFIBUS PA and DS III FOUNDATION Fieldbus series.	• Nominal diameters DN 10 ... DN 1000 (0.4" ... 40") • Temperature of medium: -200 ... +500 °C (-328 ... +932 °F) for vapors, gases and liquids. SITRANS P transmitters • DS III HART series • DS III PROFIBUS PA series • DS III FOUNDATION Fieldbus series	3/434	
SITRANS F R liquid meters				
	**Rotary-piston meters** Industrial design for measurement of flowing liquids	• DN 15 ... DN 80 (½" ... 3") for industrial requirements • With the required registers and quantity-preset registers • Temperature of medium: -30 ... +300 °C (-22 ... +572 °F)	3/460	
	**Automatic batchmeter** Any quantity of liquid can be preselected and filled automatically.	• DN 25 ... DN 50 (1" ... 2") • Temperature of medium: -30 ... +300 °C (-22 ... +572 °F)	3/460	

© Siemens AG 2012

Criteria for selection of flowmeter

Overview

Criteria for selection of flowmeter

Each method for measuring flow has specific properties, and each flow measuring point is characterized by specific requirements. The table shown below compares the properties of the various measuring instruments and thus provides assistance in selection of the optimum device.

This section of the field device catalog includes the following instruments for measuring flow:

- Electromagnetic
- Coriolis mass flow
- Ultrasonic
- Vortex volumetric- and mass flow
- Variable area meter
- Orifice plate
- Rotary-piston meters and drum meters

Measuring principle		Electro-magnetic	Coriolis	Ultrasonic (inline)	Ultrasonic (clamp-on)	Vortex	Variable area meter	Orifice plate	Rotary-piston meter
Medium		Liquid (conductive)	Liquid or gas	Liquid	Liquid or gas	Steam/vapor, gases, liquid	Liquid or gas	Liquid, vapor, gas	Liquid
Nominal diameter		DN 2 … 2000 (0.08" … 78")	1.5…150 mm (0.06" … 6")	DN 50…4000 (2" … 160") optional down to DN 15 (½")	6.4 mm ... 9.14 m (0.25"...360")	DN 15 … 300 (½" … 12")	DN 10 … 100 (0.4" … 4") G½" … G3"	DN 10…1000 (0.4" … 40")	DN 15 … 80 (½" … 3")
Temperature range	°C (°F)	-40 … +200 (-40 … +392)	-50 … +180 (-58 … +356)	-200 ... +250 (-328 ... +482)	-40 ... +120 (-40 ... +248)	-40 ... +240 (-40 ... +464)	-20 … +300 (-4 … +572)	-200 … +500 (-328 … +932)	-30 … +300 (-22 … +572)
Max. pressure	bar (psi)	160 (2 320), optional higher	Up to 410 (Up to 5 950)	40 (580) optionally 160 (2 320)	Unlimited	100 (1 450)	40 (580)	315 (4 569)	63 (914)
Accuracy	%	± 0.2 or ± 0.4	± 0.1 or ± 0.15	± 0.5 … ± 2	0.5 ... 1.0 % of flow, for velocities greater than 0.3 m/s (1 ft/s)	± 0.75 … ± 1	± 2	± 0.5 … ± 2	± 0.2 … ± 0.5
Repeatability	%	0.1/0.2	0.05	0.25	0.15 % of flow, for velocities greater than 0.3 m/s (1 ft/s)	0.1	0.5	0.5	0.005
Dynamic response range		1:100	1:100	1:100	1:100	1:25	1:10	1:6	1:10
Start-of-scale value	m/s (ft/s)	0 (0)	0 (0)	0 (0)	0 (0)	0.4 (1.31) 2.0 (6.56)	0.2 (0.66)	Re > 500	0.3 (0.98)
Full-scale value					± 36/120			Re < 10^8	
• For liquids	m/s (ft/s)	0.25 … 10 (0.825 … 32.8)	10 (32.8)	10 (32.8)	± 12/40	10 (32.8)	3.5 (11.4)	3 (9.8)	3 (9.8)
• For steam/vapor, gases	m/s (ft/s)		Approx. 300 (1000)		± 12/40	80 (262.5)	60 (197)	50/25 (164/82)	
Measured values									
• Volume flow		•	•	•	•	•	•	•	•
• Sound velocity				•	•				
• Sound amplitude				•	•				
• Density			•		•				
• Mass flow			•	•	•	•			
• Bidirectional measurement		•	•	•	•			•	
Use									
• For custody transfer		•	•	•	•				•
• As batching system		•	•		•				•
• In viscosity range	mPa·s (cp)	0.1 … 100 000 (0.1 … 100 000)	0 ... 100 000 (0 ... 100 000)	0 ... 350 (0 ... 350)	0.5 ... 2800 (0.5 ... 2800)	0 … 10 (0 … 10)	0.5 … 100 (0.5 … 100)	0 … 10 (0 … 10)	0.3 … 350 000 (0.3 … 350 000)
Power supply		Mains or battery	Mains	Mains or battery	90... 240 V AC, 50...60 Hz, 15 VA or 9 ... 36 V DC, 10 W	2-wire	non	2-wire	non

© Siemens AG 2012

Communication solutions

Transmitter	HART	PROFIBUS PA	PROFIBUS DP	FOUNDATION Fieldbus H1	DeviceNet	Modbus RTU	GSM/GPRS
SITRANS F M MAG 5000	• 1) 2) 4)						
SITRANS F M MAG 6000	• 1) 2) 4) 5)	• 1) 5) 6) 7)	• 1) 5) 6) 7)	• 2) 4) 5)	• 5)	• 1) 5) 10)	
SITRANS F M MAG 5000/6000 CT[8)]							
SITRANS F M MAG 6000 I	• 1) 2) 4) 5)	• 1) 5) 6) 7)	• 1) 5) 6) 7)	• 2) 4) 5)	• 5)	• 1) 5) 10)	
SITRANS F M MAG 6000 I Ex de	• 1) 2) 4) 5)	• 1) 5) 6) 7)					
SITRANS F M TRANSMAG 2	• 1) 4)	• 1) 6)					
SITRANS F M MAG 8000						• 1) 3) 10) 11) 12)	• 14)
SITRANS F C FCT030	• 1) 2) 4) 8)						
SITRANS F C MASS 6000	• 1) 2) 4) 5)	• 1) 5) 6) 7)	• 1) 5) 6) 7)	• 2) 4) 5)	• 5)	• 1) 10)	
SITRANS F C MASS 6000 Ex d	• 1) 2) 4) 5)	• 1) 5) 6) 7)		• 2) 4) 5)	• 5)		
SIFLOW FC070			• 13)			• 1) 10) 11)	
SITRANS FUS060	• 1)	• 1) 6)					
SITRANS FUS080 (FUS380)						• 1) 5) 10) 11) 12)	
SITRANS FUE080 (FUE380)						• 1) 5) 8) 10) 11) 12)	
SITRANS FUS1010[9)]						• 9) 10) 11)	
SITRANS FX300	• 1)						
SITRANS P DS III Differential pressure and flow	• 1) 2)	• 1) 2) 7)		• 2)			

1) Supports SIMATIC PDM
2) Supports AMS
3) Supports Siemens Flow Tool
4) Supports HH275/375
5) Pluggable add-on modules
6) Profile 2
7) Profile 3
8) CT versions are not approved with communication modules.
9) All wall mount models
10) RS 485
11) RS 232
12) IrDA (Infrared)
13) Connected to ET200M PROFIBUS interface
14) Only with 7ME6810

© Siemens AG 2012

System information SITRANS F M electromagnetic flowmeters

Overview

SITRANS F M electromagnetic flowmeters are designed for measuring the flow of electrically conductive mediums.

The full SITRANS F M program consists of three different types of flowmeters making Siemens unique in that it covers all possible applications where electromagnetic flowmeters are a suitable match:

Modular pulsed DC flowmeters cover all ordinary applications within all industries. The wide variety of combinations and versions from the modular system means that ideal adaptation is possible to each measuring task and application.

SITRANS F M products

Battery-operated water meters (fully electronic) are the perfect match for drinking water applications like network distribution, revenue metering and irrigation where mains power is not available. In addition, it complies with the MID (EU) and OIML R 49 water meter standards and has the MCERTS certificate.

SITRANS F M MAG 8000

High-powered flowmeters are used for difficult applications where other flowmeters cannot stand up to the task. This flowmeter can handle liquids and heavy slurries in industries such as mining, cement and pulp and paper.

SITRANS F M 911/TRANSMAG 2

© Siemens AG 2012

Benefits

Greater flexibility

- Wide product program
- Compact or remote installation using the same transmitter and sensor
- USM II communication platform for easy integration with all systems

Easier commissioning of MAG 5000, 6000, 6000 I

All SITRANS F M pulsed DC electromagnetic flowmeters feature a unique SENSORPROM memory unit which stores sensor calibration data and transmitter settings for the lifetime of the product.

At commissioning the flowmeter commences measurement without any initial programming.

The factory settings matching the sensor size are stored in the SENSORPROM unit. Also customer specified settings are downloaded to the unit. Should the transmitter be replaced, the new transmitter will upload all previous settings and resume measurement without any need for reprogramming.

Further, the „fingerprint“ used in connection with the SITRANS F M Verificator is stored during the initial sensor calibration.

Easier service

Transmitter replacement requires no programming. SENSORPROM automatically updates all settings after initialization.

Room for growth

USM II the Universal Signal Module with "plug & play" simplicity, makes it easy to access and integrate the flow measurement with almost any system and bus-protocol and it ensures the flowmeter will be easy to upgrade to future communication/bus platforms.

Application

Electromagnetic flowmeters are suitable for measuring the flow of almost all electrically conductive liquids, pastes and slurries.

A prerequisite is that the medium must have a minimum conductivity of 5 µS/cm. The temperature, pressure, density and viscosity have no influence on the result.

The main applications of the electromagnetic flowmeters can be found in the following sectors:

- Water and waste water
- Chemical industries
- Pharmaceutical industries
- Food and beverage industry
- Mining, aggregates and cements industries
- Pulp and paper industry
- Steel industry
- Power; utility and chilled water industry

The wide variety of combinations and versions from the modular system means that ideal adaptation is possible to each measuring task.

© Siemens AG 2012

System information SITRANS F M electromagnetic flowmeters

Please see product selector on the Internet, because some constrains might be related to some of the features:
www.pia-selector.automation.siemens.com








	MAG 1100	MAG 1100 HT	MAG 1100 F	MAG 3100	MAG 3100 HT	MAG 3100 P	MAG 5100 W		911/E	MAG 8000/ MAG 8000 CT	MAG 8000 Irrigation
	7ME6110	7ME6120	7ME6140	7ME6310	7ME6320	7ME6340	7ME6520	7ME6580	7ME5610	7ME6810 7ME6820	7ME6880
Industry											
Water / waste water	XX			XX		X	XXX	XXX	X	XXX	XXX
Chemical	XXX	XXX	XX	XXX	XXX	XXX	X	X		X	
Pharmaceutical	XX	XX	XXX	XX	XX	XX	X	X		X	
Food and beverage	XX		XXX	X	X	X	X	X		X	
Mining, aggregates and cement	XX			XXX			X	X	XXX	X	
HPI	XX	X		XX	X	XX	X	X		X	
Other	XX	XX	XX	XX	XX	XX	XX	XX	XXX	X	
Design											
Compact	●		●	●	●	●	●	●		●	●
Remote	●	●	●	●	●	●	●	●	●	●	●
Constant field (DC)	●	●	●	●	●	●	●	●		●	●
Alternating field (AC)									●		
Battery-operated constant field (DC)										●	●
Size											
DN 2 (1/12“)	●										
DN 3 (1/8“)	●										
DN 6 (1/4“)	●										
DN 10 (3/8“)	●		●								
DN 15 (½“)	●	●	●	●	●	●	●		●		
DN 25 (1“)	●	●	●	●	●	●	●	●	●	●	
DN 32 (1¼“)			●								
DN 40 (1½“)	●	●	●	●	●	●	●	●	●	●	
DN 50 (2“)	●	●	●	●	●	●	●	●	●	●	●
DN 65 (2½“)	●	●	●	●	●	●	●	●	●	●	●
DN 80 (3“)	●	●	●	●	●	●	●	●	●	●	●
DN 100 (4“)	●	●	●	●	●	●	●	●	●	●	●
DN 125 (5“)				●	●	●	●	●	●	●	●
DN 150 (6“)				●	●	●	●	●	●	●	●
DN 200 (8“)				●	●	●	●	●	●	●	●
DN 250 (10“)				●	●	●	●	●	●	●	●
DN 300 (12“)				●	●	●	●	●	●	●	●
DN 400 (16“)				●			●	●	●	●	●
DN 450 (18“)				●			●	●	●	●	●
DN 500 (20“)				●			●	●	●	●	●
DN 600 (24“)				●			●	●	●	●	●
DN 700 (28“)				●			●	●	●	●	
DN 750 (30“)				●			●	●	●	●	
DN 800 (32“)				●			●	●	●	●	
DN 900 (36“)				●			●	●	●	●	
DN 1000 (40“)				●			●	●	●	●	
DN 1050 (42“)				●			●	●		●	
DN 1100 (44“)				●			●	●		●	
DN 1200 (48“)				●			●	●		●	
DN 1400 (54“)				●				●			
DN 1500 (60“)				●				●			
DN 1600 (66“)				●				●			
DN 1800 (72“)				●				●			
DN 2000 (78“)				●				●			

● = available, **X** = can be used, **XX** = often used, **XXX** = most often used

© Siemens AG 2012

Please see product selector on the Internet, because some constrains might be related to some of the features:
www.pia-selector.automation.siemens.com

									
	MAG 1100	**MAG 1100 HT**	**MAG 1100 F**	**MAG 3100**	**MAG 3100 HT**	**MAG 3100 P**	**MAG 5100 W**	**911/E**	**MAG 8000/ MAG 8000 CT**	**MAG 8000 Irrigation**
	7ME6110	**7ME6120**	**7ME6140**	**7ME6310**	**7ME6320**	**7ME6340**	**7ME6520**	**7ME6580**	**7ME5610**	**7ME6810 7ME6820**	**7ME6880**
Process connection											
Wafer design	●	●									
Sanitary process connections			●								
Flanges				●	●	●	●	●	●	●	●[4]
Flange norms											
EN 1092-1				●	●	●	●	●	●	●	●[4]
ANSI B 16.5 class 150				●	●	●	●	●	●	●	●[4]
ANSI B 16.5 class 300				●	●				●		
AWWA class D				●			●	●	●	●	
AS 2129				●	●						●[4]
AS 4087, PN 16				●	●		●	●		●	
AS 4087, PN 21				●	●						
AS 4087, PN 35				●	●						
JIS 10K				●	●[3]			●	●		
JIS 20K				●							
Pressure rating [1]											
PN 6				●				●			
PN 10				●	●	●	●	●	●	●	
PN 16	●		●	●	●	●	●	●	●	●	
PN 25				●	●				●		
PN 40	●	●	●	●	●	●	●	●	●	●	
PN 63				●							
PN 100				●							
Accuracy											
0.2 %	●	●	●	●	●	●	●	●		●	
0.4 %	●	●	●	●	●	●	●	●		●	
0.5 %									●		
0.8 %											●
Grounding electrodes, incl. [2]				●		●[5]	●	●	(●)	●	
Grounding rings premounted from factory											●

● = available
[1] Pressure may be limited by the liner material chosen
[2] Not for PTFE liner.
[3] On request
[4] Drilled pattern flange max. 7 bar (107 psi).
[5] Optional on PFA

© Siemens AG 2012

System information SITRANS F M electromagnetic flowmeters

Please see product selector on the Internet, because some constrains might be related to some of the features:
www.pia-selector.automation.siemens.com








	MAG 1100	MAG 1100 HT	MAG 1100 F	MAG 3100	MAG 3100 HT	MAG 3100 P	MAG 5100 W		911/E	MAG 8000/ MAG 8000 CT	MAG 8000 Irrigation
	7ME6110	7ME6120	7ME6140	7ME6310	7ME6320	7ME6340	7ME6520	7ME6580	7ME5610	7ME6810 7ME6820	7ME6880
Materials / temperature:											
Liner material / max . temperatures											
NBR Hard Rubber: 70 °C (158 °F)							●				
EPDM: 70 °C (158 °F)				●			●			●	
Soft rubber: 70 °C (158 °F)				●					●		
PTFE: 100 °C (212 °F)				●							
PTFE: 130 °C (266 °F)					●	●			●		
PTFE: 180 °C (356 °F)					●				(●)[1]		
Ebonite Hard Rubber: 95 °C (203 °F)				●				●[3]	●		●[3]
Linatex: 70 °C (158 °F)				●					●		
Ceramic: 150 °C (302 °F)	●		●								
Ceramic: 200 °C (392 °F)[2]		●									
PFA: 100 °C (212 °F)				●							
PFA: 150 °C (302 °F)	●		●		●	●					
Novolak: 130 °C (266 °F)									●		
Electrodes											
Stainless steel				●	●				●		●
Hastelloy C	●		●	●	●	●	●	●	●	●	
Platinum	●	●	●	●	●				●		
Titanium				●	●				●		
Tantalum				●	●				●		
Flange/housing material											
Carbon steel				●	●	●	●	●	●	●	●
Stainless steel / carbon steel				●	●				●		
Polished stainless steel	●	●	●	●	●						

● = available
[1] 150 °C (302 °F)
[2] Ex sensor: 180 °C (356 °F)
[3] 70 °C (158 °F)

© Siemens AG 2012

Please see product selector on the Internet, because some constrains might be related to some of the features:
www.pia-selector.automation.siemens.com








	MAG 1100	MAG 1100 HT	MAG 1100 F	MAG 3100	MAG 3100 HT	MAG 3100 P	MAG 5100 W		911/E	MAG 8000/ MAG 8000 CT	MAG 8000 Irrigation
	7ME6110	7ME6120	7ME6140	7ME6310	7ME6320	7ME6340	7ME6520	7ME6580	7ME5610	7ME6810 7ME6820	7ME6880
Approvals:											
Custody transfer											
Cold water - MI-001 (EU)							●			●	
Cold water approval - OIML R 49/OIML R 49 MAA										●7)	
Cold water pattern approval - OIML R 49 (Denmark)							●7)				
Cold water pattern approval PTB (Germany)	●7)		●7)	●7)		●7)					
Heat meter pattern approval - OIML R 75 (Denmark)	●7)	●7)		●7)	●7)	●7)					
Hot water pattern approval - PTB (Germany)	●7)	●7)	●7)	●7)	●7)	●7)					
Other media than water pattern approval - OIML R 117 (Denmark)	●7)		●7)	●7)		●7)					
Chilled water pattern approval PTB K 7.2							●7)			●7)	
Hazardous areas											
ATEX - 2 GD (Zone 1)	●	●	●	●	●	●					
IECEx Zone 1				●	●	●					
FM Class I, Div 1				●10)	●10)	●10)					
FM Class I, Zone 1				●	●	●					
FM Class I, Div 2/Zone 2	●	●	●	●	●	●	●	●			
CSA Class I, Zone 1				●	●	●					
CSA Class I, Div 2/Zone 2				●	●	●	●	●			
Hygienic											
EHEDG			●								
3A			●								
Drinking water											
WRAS (WRc) - (UK)				●			●4)	●		●	●
ANSI / NSF 61 (US)				●5)			●	●		●	●
ACS (FR) EPDM liner				●			●			●	
Belgaqua (B) EPDM liner				●			●			●	
DVGW-W270 (D) EPDM liner				●			●			●	
MCERTS (UK environmental)				●6)			●4)			●	
Other											
FM Fire Service (class number 1044)8)							●			●	
GOSS / GOST (Russia)	●	●	●	●	●	●	●			●	
CRN (Canada)	●1)		●1)	●	●		●				
VdS							●3)	●3)			
Other national appr., see internet9)	●	●	●	●	●	●	●	●	●	●	
Verificator compatible2)	●	●	●	●	●	●	●	●			

● = available
1) Only PFA liner.
2) Only for MAG 5000 and MAG 6000 transmitters.
3) Only valid for DN 50 to DN 300 (2" to 12")
4) EPDM liner
5) Only EPDM with Hastelloy electrodes
6) EPDM or PTFE liner with AISI 316 or Hastelloy electrodes.
7) For verification submit Product Variation Request
8) Sizes: DN 50, DN 80, DN 100, DN 150, DN 200, DN 250, and DN 300 (2", 3", 4", 6", 8", 10", and 12") with ANSI B16.5 Class 150 flanges
9) Including Annex F
10) Only DN 15 to DN 300 (½" to 12") with MAG 6000 I Ex de, compact mounted

© Siemens AG 2012

System information SITRANS F M electromagnetic flowmeters

Please see Product selector on the Internet, because some constrains might be related to some of the features:
www.pia-selector.automation.siemens.com







	MAG 5000	MAG 6000	MAG 6000 I	MAG 6000 I Ex de	MAG 6000 + Ex Safety barrier	TRANSMAG 2	MAG 8000/ MAG 8000 CT	MAG8000 Irrigation
	7ME6910	7ME6920	7ME6930	7ME6930	7ME6920	7ME5034	7ME6810 7ME6820	7ME6880
Industry								
Water / waste water	**XXX**	**XXX**	**XX**	**X**		**X**	**XXX**	**XXX**
Chemical	**X**	**XX**	**XX**	**XXX**	**X**		**X**	
Pharmaceutical	**X**	**XXX**	**XX**	**XXX**	**X**		**X**	
Food and beverage	**XX**	**XXX**	**XX**				**X**	
Mining, aggregates and cement	**XX**	**X**	**XX**	**X**		**XXX**	**X**	
HPI	**X**	**X**	**X**	**XX**			**X**	
Other	**XX**	**XX**	**XX**	**XX**		**XX**	**X**	
Design								
Compact	●	●	●	●			●	●
Remote	●	●	●	●	●	●	●	●
Constant field (DC)	●	●	●	●	●		●	●
Alternating field (AC)						●		
Battery-operated constant field (DC)							●	●
Enclosure transmitter								
Polyamide, IP67	●	●						
Die-cast aluminum			●	●		●		
Stainless steel		●					●[1]	●[1]
19" rack	●	●			●			
Back of panel	●	●			●			
Panel mounting	●	●			●			
IP67 wall mounting	●	●	●	●	●			
Accuracy								
0.2 %		●	●	●	●		●	
0.4 %	●						●	
0.5 %						●		
0.8 %								●
Communication								
HART	●	●	●	●	●	●		
PROFIBUS PA		●	●	●	●	●		
PROFIBUS DP		●	●		●			
FOUNDATION Fieldbus H1		●	●	●	●			
DeviceNet		●	●		●			
Modbus RTU/RS 485		●	●		●		●[2]	●[2]
Encoder interface module (Sensus protocol) for Itron 200WP radio							●	●
Batching		●	●	●	●			

● = available, **X** = can be used, **XX** = often used, **XXX** = most often used
[1] IP68 enclosure
[2] Modbus RTU also as serial RS 232

© Siemens AG 2012

Please see Product selector on the Internet, because some constrains might be related to some of the features:
www.pia-selector.automation.siemens.com






	MAG 5000	MAG 6000	MAG 6000 I	MAG 6000 I Ex de	MAG 6000 + Ex Safety barrier	TRANSMAG 2	MAG 8000/ MAG 8000 CT	MAG8000 Irrigation
	7ME6910	7ME6920	7ME6930	7ME6930	7ME6920	7ME5034	7ME6810 7ME6820	7ME6880
Power supply								
24 V	●[1]	●[1]	●	●			●[1) 2)]	●[1) 2)]
115 V - 230 V	●	●	●	●	●	●	●[2)]	●[2)]
Battery							●	
Approvals:								
Custody transfer								
Cold water - MI-001 (EU)	●	●					●	
Cold water pattern approval - OIML R 49 (Denmark)	●	●					●	
Cold water approval - OIML R 49/OIML R 49 MAA							●	
Cold water pattern approval PTB (Germany)	●	●						
Chilled water pattern approval PTB K 7.2	●	●					●	
Heat meter pattern approval - OIML R 75 (Denmark)		●						
Hot water pattern approval PTB (Germany)		●						
Other media than water pattern approval - OIML R 117 Denmark		●						
Hazardous areas								
ATEX - 2 GD (Zone 1)				●	(●)[3]			
IECEx Zone 1				●				
FM Class I, Div 1				●[4]				
FM Class I, Zone 1				●				
FM Class I, Div 2/Zone 2	●	●	●					
CSA Class I, Zone 1				●				
CSA Class I, Div 2/Zone 2	●	●	●					
UL / C-UL- general safety	●	●			●			
Other								
FM Fire Service (1044)	●	●					●	
C - tick (Australia)	●	●	●	●	●			
GOSS / GOST (Russia)	●						●	
VdS	●	●						
Other national approvals, see internet	●	●	●	●	●	●	●	●
Verificator compatible	●	●						

● = available
1) 12/24 V AC/DC
2) Main power with battery backup
3) Only sensor in hazardous area
4) Only with sensors sizes DN 15 to DN 300 (½" to 12") compact

For more national approvals please check our internet page
http://support.automation.siemens.com/WW/view/en/10806954/134200

© Siemens AG 2012

Practical examples of ordering

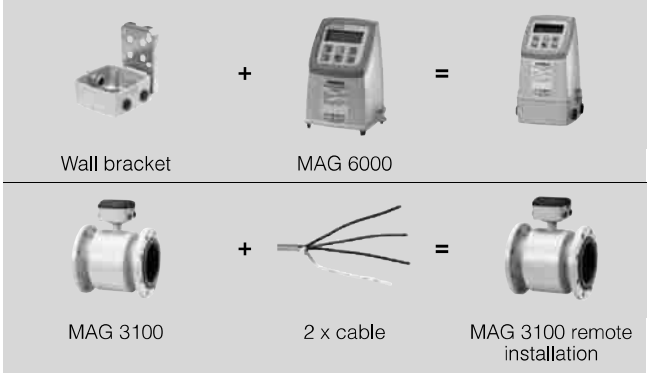
SITRANS F M compact installation

Example

Sensor	**7ME6310-3TC11-1JA1**
Pipe size	DN 100
Liner	Soft rubber
Electrodes	SS 316
Flanges	EN 1092-1, PN 16
Transmitter	**MAG 6000, Polyamide, 115 ... 230 V AC**
Accuracy	± 0.2 % ± 1 mm/s
Supply	230 V AC

Note:
MAG 5000/6000 transmitters and sensors are packed in separate boxes, the final assembly takes place during installation at the customer's place.

SITRANS F M remote installation



Example

Sensor	**7ME6310-3TC11-1AA1**
Pipe size	DN 100
Liner	Soft rubber
Electrodes	SS 316
Flanges	EN 1092-1, PN 16
Transmitter	**7ME6920-1AA10-0AA0**
Accuracy	± 0.2 % ± 1 mm/s
Supply	230 V AC
Wall mounting kit	**FDK:085U1018**
Cable kit with sensor cabel and electrode cable	**A5E01181647**

© Siemens AG 2012

Function

All electromagnetic flowmeters are based on Faraday's law of induction:

$U_M = B \cdot v \cdot d \cdot k$

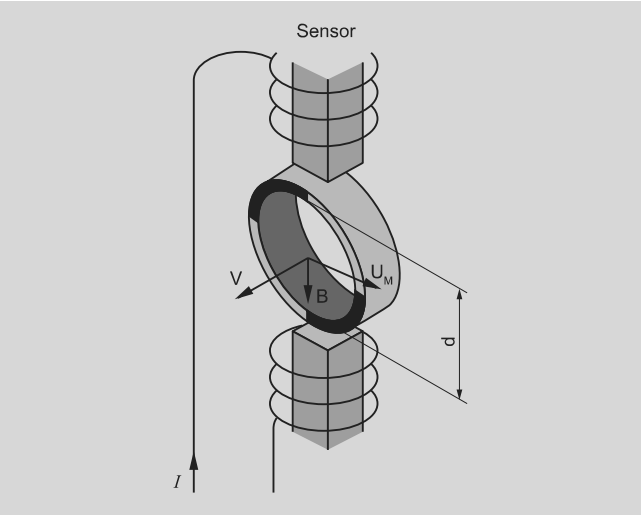
U_M = Measured voltage induced in the medium perpendicular to the magnetic field and the flow direction. The voltage is tapped at two point electrodes.

B = Magnetic flux density which permeates the flowing medium perpendicular to the flow direction.

v = flow velocity of medium

d = internal diameter of metering tube

k = proportionality factor or sensor constant



Function and measuring principle of electromagnetic measurement

An electromagnetic flowmeter generally consists of a magnetically non-conducting metering tube with an internal electrically non-conducting surface, magnet coils connected in series and mounted diametrically on the tube, and at least two electrodes which are inserted through the pipe wall and are in contact with the measured medium. The magnet field coils through which the current passes generate a pulsed electromagnetic field with the magnetic flux density B perpendicular to the pipe axis.

This magnetic field penetrates the magnetically non-conducting metering tube and the medium flowing through it, which must have a minimum electrical conductivity.

According to Faraday's law of induction, a voltage U_M is generated in an electrically conducting medium, and is proportional to the flow velocity v of the medium, the magnetic flux density B, and the distance between the electrodes d (internal diameter of pipe).

The signal voltage U_M is tapped by the electrodes which are in contact with the medium, and passed through the insulating pipe wall. The signal voltage U_M which is proportional to the flow velocity is converted by an associated transmitter into appropriate standard signals such as 4 to 20 mA.

SITRANS F M diagnostics

The diagnostic functions are all internal tools in the meter:

- Identification in clear text and error log
- Error categories: function; warning; permanent and fatal errors
- Transmitter self-check including all outputs and the accuracy
- Sensor check: coil and electrode circuit test
- Overflow
- Empty pipe: partial filling; low conductivity; electrode fouling

SITRANS F M Verificator (MAG 5000 and 6000)

The SITRANS F M Verificator is an external tool designed for MAG 5000 and MAG 6000 with MAG 1100, MAG 1100 F, MAG 3100, MAG 3100 P or MAG 5100 W sensors to verify the entire product, the installation and the application.

The goal is to improve operation, reduce downtime and maintain measurement accuracy as long as possible.

The SITRANS F M Verificator is highly advanced and carries out the complex verification and performance check of the entire flowmeter system, according to unique Siemens patented principles. The whole verification test is automated and easy to operate so there is no opportunity for human error or influence. The system is traceable to international standards and tested by WRc (Water Research Council).

SITRANS F M Verificator

- Stand alone Verificator to measure a number of selected parameters in the flow sensor and a transmitter which affects the integrity of the flow measurement
- Up to 20 measurements can be stored in the Verificator
- The Verificator can be connected via a serial cable to a PC enabling download of the data. A Windows program enables printing and management of verificator reports.

Verification - Steps

Verification of a SITRANS F M flowmeter consists of the following test routines:

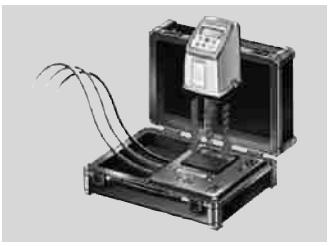
1. Transmitter test
2. Flowmeter and cable insulation test
3. Sensor magnetism test

© Siemens AG 2012

System information SITRANS F M electromagnetic flowmeters

1. Transmitter test

The transmitter test is the traditional way of on-site testing on the market and checks the complete electronic system from signal input to output.

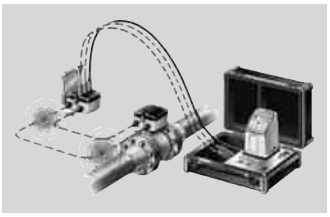


Transmitter test

Using the excitation power output, which is generated to drive the magnetic field of the sensor, the verificator simulates flow signal to the transmitter input. By measuring the transmitter outputs the verificator calculates its accuracy against defined values. Test includes:

- Excitation power to drive the magnetic field
- Signal function from signal input to output
- Signal processing – gain, offset and linearity
- Test of analogue and frequency output

2. Insulation test



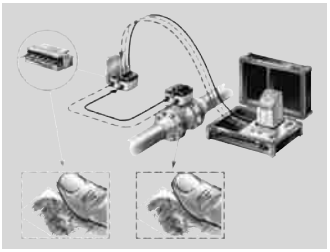
Flowmeter insulation test

The verification test of the flowmeter insulation is a „cross talk“ test of the entire flowmeter which ensures that the flow signal generated in the sensor is not affected by any external influences.

In the "cross-talk" test the verificator generates a high voltage disturbance within the coil circuit and then looks for any "cross-talk" induced in the flow signal circuit. By generating dynamic disturbances close-coupled to the flow signal, the flowmeter is tested for noise immunity to a maximum level:

- EMC influence on the flow signal
- Moisture in sensor, connection and terminal box
- Non-conductive deposit coating the electrodes within the sensor
- Missing or poor grounding, shielding and cable connection.

3. Sensor magnetism test



Sensor magnetism test

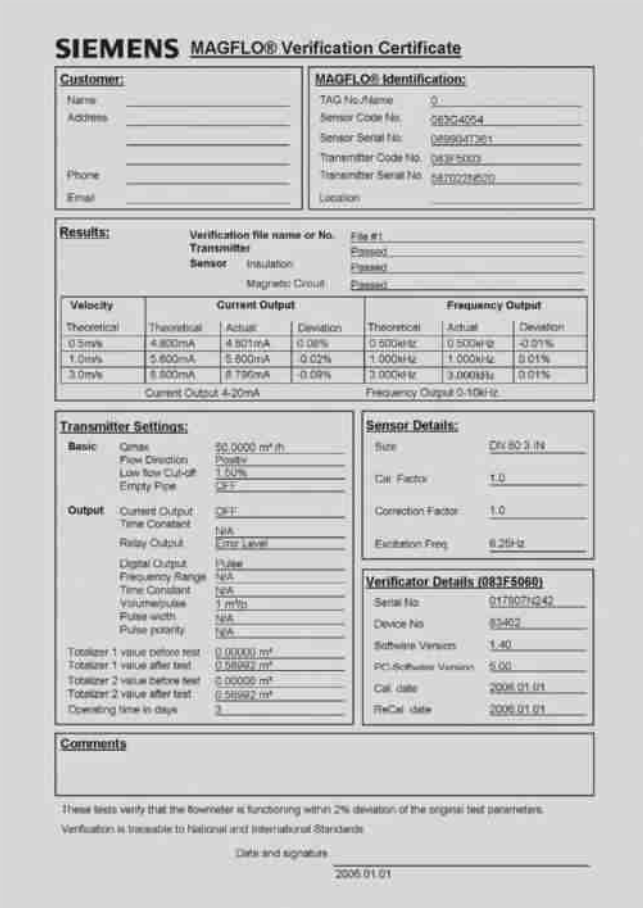
The verification of the sensor magnetism is a "boost" test of the magnetic field coil. The test ensures that the magnetism behaviour is like the first time, by comparing the current sensor magnetism with the "fingerprint" which was determined during initial calibration and stored in the SENSORPROM memory unit.
In the "boost" test the verificator changes the magnetic field in certain pattern and with high voltage to get quick stable magnetic condition. This unique test is fulfilled without any interference or compensation of surrounding temperature or interconnecting cabling.

- Changes in dynamic magnetic behaviour
- Magnetic influence inside and outside the sensor
- Missing or poor coil wire and cable connection

Certificate

The test certificate generated by a PC contains:

- Test result with passed or failed
- Installation specification
- Flowmeter specification and configuration
- Verificator specification with date of calibration ensuring traceability to international standards.



SIEMENS MAGFLO® Verification Certificate

Customer:
Name
Address
Phone
Email

MAGFLO® Identification:
TAG No./Name 0
Sensor Code No. 083G4054
Sensor Serial No. D899947361
Transmitter Code No. 083F5003
Transmitter Serial No. 54702218520
Location

Results:
Verification file name or No. File #1
Transmitter Passed
Sensor Insulation Passed
Magnetic Circuit Passed

Velocity	Current Output			Frequency Output		
Theoretical	Theoretical	Actual	Deviation	Theoretical	Actual	Deviation
0.5m/s	4.800mA	4.801mA	0.08%	0.500kHz	0.500kHz	-0.01%
1.0m/s	5.600mA	5.600mA	0.02%	1.000kHz	1.000kHz	0.01%
3.0m/s	8.800mA	8.796mA	-0.09%	3.000kHz	3.000kHz	0.01%

Current Output 4-20mA — Frequency Output 0-10kHz

Transmitter Settings:
Basic: Qmax 90.0000 m³/h; Flow Direction Positiv; Low flow Cut-off 1.50%; Empty Pipe OFF
Output: Current Output OFF; Time Constant N/A; Relay Output Error Level; Digital Output Pulse; Frequency Range N/A; Time Constant N/A; Volume/pulse 1 m³/p; Pulse width N/A; Pulse polarity N/A
Totalizer 1 value before test 0.00000 m³
Totalizer 1 value after test 0.58982 m³
Totalizer 2 value before test 0.00000 m³
Totalizer 2 value after test 0.58982 m³
Operating time in days 3

Sensor Details:
Size DN 80 3 IN
Cal. Factor 1.0
Correction Factor 1.0
Excitation Freq. 6.25Hz

Verificator Details (083F5060)
Serial No. 017807H242
Device No. 83402
Software Version 1.40
PC Software Version 5.00
Cal. date 2006.01.01
ReCal. date 2006.01.01

Comments

These tests verify that the flowmeter is functioning within 2% deviation of the original test parameters.
Verification is traceable to National and International Standards.
Date and signature
2006.01.01

Description	Order No.
SITRANS F M Verificator	
• 11 ... 30 V DC, 11 ... 24 V AC, 115 ... 230 V, 50 Hz	**FDK:083F5060**
• 11 ... 30 V DC, 11 ... 24 V AC, 115 ... 230 V, 60 Hz	**FDK:083F5061**

Note:
It is mandatory to have the Verificator returned to the factory once a year for check and re-verification.

© Siemens AG 2012

Technical specifications

Flowmeter Calibration and traceability

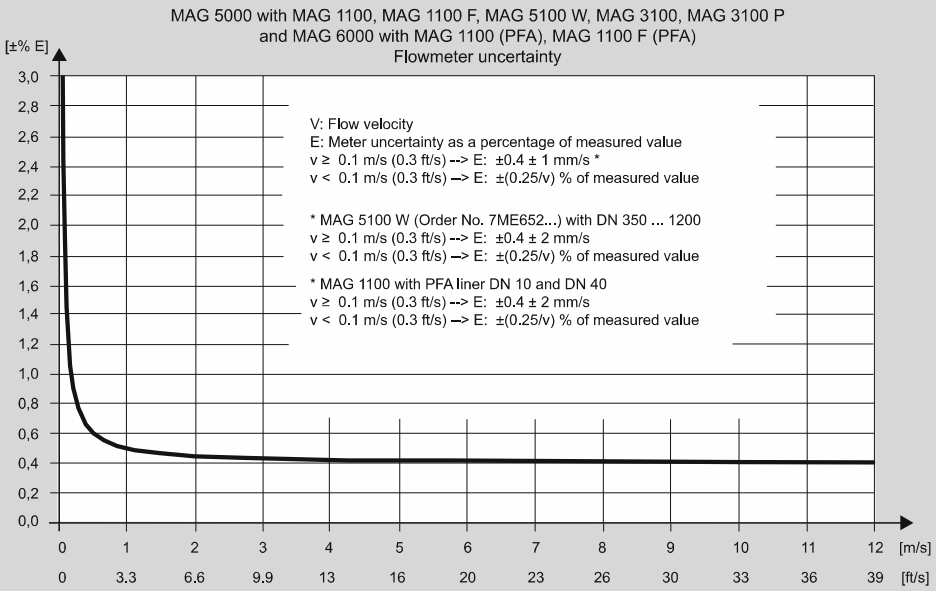
To ensure continuous accurate measurement, flowmeters must be calibrated. The calibration is conducted at Siemens flow facilities with traceable instruments referring directly to the physical unit of measurement according to the International System of Units (SI).

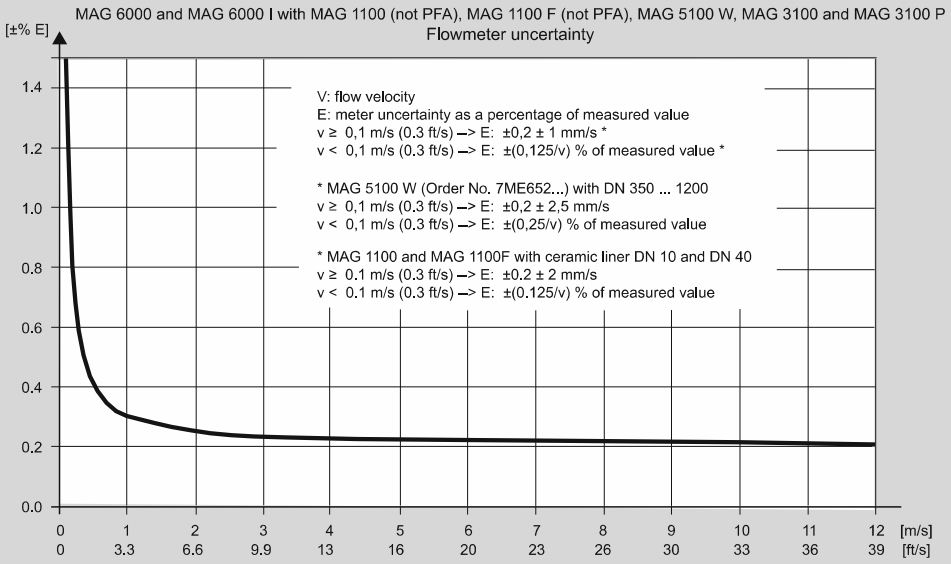
Therefore, the calibration certificate ensures recognition of the test results worldwide, including the US (NIST traceability).

Siemens offers accredited calibrations assured to ISO 17025 in the flow range from 0.0001 m^3/h to 10 000 m^3/h.
Siemens Flow Instruments accredited laboratories are recognized by ILAC MRA (International Laboratory Accreditation Corporation - Mutual Recognition Arrangement) ensuring international traceability and recognition of the test results worldwide.

A calibration certificate is shipped with every sensor and calibration data are stored in the SENSORPROM memory unit.

Flowmeter uncertainty





© Siemens AG 2012

System information SITRANS F M electromagnetic flowmeters

Reference conditions

Reference conditions (ISO 9104 and DIN EN 29104)	
Temperature medium	20 °C ± 10 K (68 °F ± 18 °F)
Temperature ambient	25 °C ± 10 K (77 °F ± 18 °F)
Supply voltage	U_n ± 1 %
Warming-up time	30 minutes
Incorporation in conductive pipe section	
• Inlet section	10 x DN (DN ≤ 1200/48") 5 x DN (DN > 1200/48")
• Outlet section	5 x DN (DN ≤ 1200/48") 3 x DN (DN > 1200/48")
Flow conditions	Developed flow profile
Additions in the event of deviations from reference conditions	
Current output	As pulse output (± 0.1 % of actual flow + 0.05 % FSO)
Effect of ambient temperature	
• Display / frequency / pulse output	< ± 0.003 %/K act.
• Current output	< ± 0.005 %/K act.
Effect of supply voltage	< 0.005 % of measuring value on 1% change
Repeatability	± 0.1 % of actual flow for v ≥ 0.5 m/s (1.5 ft/s) and conductivity > 10 µS/cm
Certificates	
• EN 10204 2.1	Certificate of conformity, stating that the delivered parts are made of the material quality that was ordered
• EN 10204 2.2	Test report certificate, a non batch specific material analysis of the ordered material
• EN 10204 3.1	Material analysis certificate, a batch specific analysis of the material issued by an independent inspector

© Siemens AG 2012

Technical specifications

General specifications	
PROFIBUS device profile	3.00 Class B
Certified	Yes, according to Profile for process control devices v3.00.
MS0 connections	1
MS1 connections	1
MS2 connections	2

Electrical specification DP

Physical layer specifications	
Applicable standard	EN 50170 vol. 2
Physical Layer (Transmission technology)	RS 485
Transmission speed	≤ 1.5 Mbits/s
Number of stations	Up to 32 per line segment, (maximum total of 126)
Cable specification (Type A)	
Cable design	Two-wire twisted pair
Shielding	CU shielding braid or shielding braid and shielding foil
Impedance	35 up to 165 Ω at frequencies from 3 ... 20 MHz
Cable capacity	< 30 pF per meter
Core diameter	> 0.34 mm², corresponds to AWG 22
Resistance	< 110 Ω per km
Signal attenuation	Max. 9 dB over total length of line section
Max. bus length	200 m at 1500 kbit/s, up to 1.2 km at 93.75 kbit/s. Extendable by repeaters

Electrical specification PA

Physical layer specifications	
Applicable standard	EN 50170
Physical Layer (Transmission technology)	IEC-61158-2
Transmission speed	31.25 Kbits/second
Number of stations	Up to 32 per line segment, (maximum total of 126)
Max. basic current [I_B]	14 mA
Fault current [I_{FDE}]	0 mA
Bus voltage	9 ... 32 V (non Ex)
Preferred cable specification (Type A)	
Cable design	Two-wire twisted pair
Conductor area (nominal)	0.8 mm² (AWG 18)
Loop resistance	44 Ω/km
Impedance	100 Ω ± 20 %
Wave attenuation at 39 kHz	3 dB/km
Capacitive asymmetry	2 nF/km
Bus termination	Passive line termination at both
Max. bus length	Up to 1.9 km. Extendable by repeaters

IS (Intrinsic Safety) data	
Required sensor electronics	Compact or remote mounted SITRANS F M MAG 6000 I Ex de
FISCO	Yes
Max. U_I	17.5 V
Max. I_I	380 mA
Max. P_I	5.32 V
Max. L_I	0 µH
Max. C_I	0 nF
FISCO cable requirements	
Loop resistance R_C	15 ... 150 Ω/km
Loop inductance L_C	0.4 ... 1 mH/km
Capacitance C_C	80 ... 200 nF/km
Max. Spur length in IIC and IIB	30 m
Max. Trunk length in IIC	1 km
Max. Trunk length in IIB	5 km

PROFIBUS parameter support

The following parameters are accessible using a MS0 relationship from a Class 1 Master.
MS0 specifies cyclic Data Exchange between a Master and a Slave.

Cyclic services:		
Input (Master view)	**Parameter**	**MAG 6000/MAG 6000 I**
	Mass flow	
	Volume flow	✓
	Temperature	
	Density	
	Fraction A[1)]	
	Fraction B[1)]	
	Pct Fraction A[1)]	
	Totalizer 1	✓
	Totalizer 2[2)]	✓
	Batch progress[2)]	✓
	Batch setpoint	✓
	Batch compensation	✓
	Batch status (running ...)	✓
Output (Master view)	Set Totalizer 1+2	✓
	Set Mode Totalizer 1+2	✓
	Batch control (start, stop ...)	✓
	Batch setpoint	✓
	Batch compensation	✓

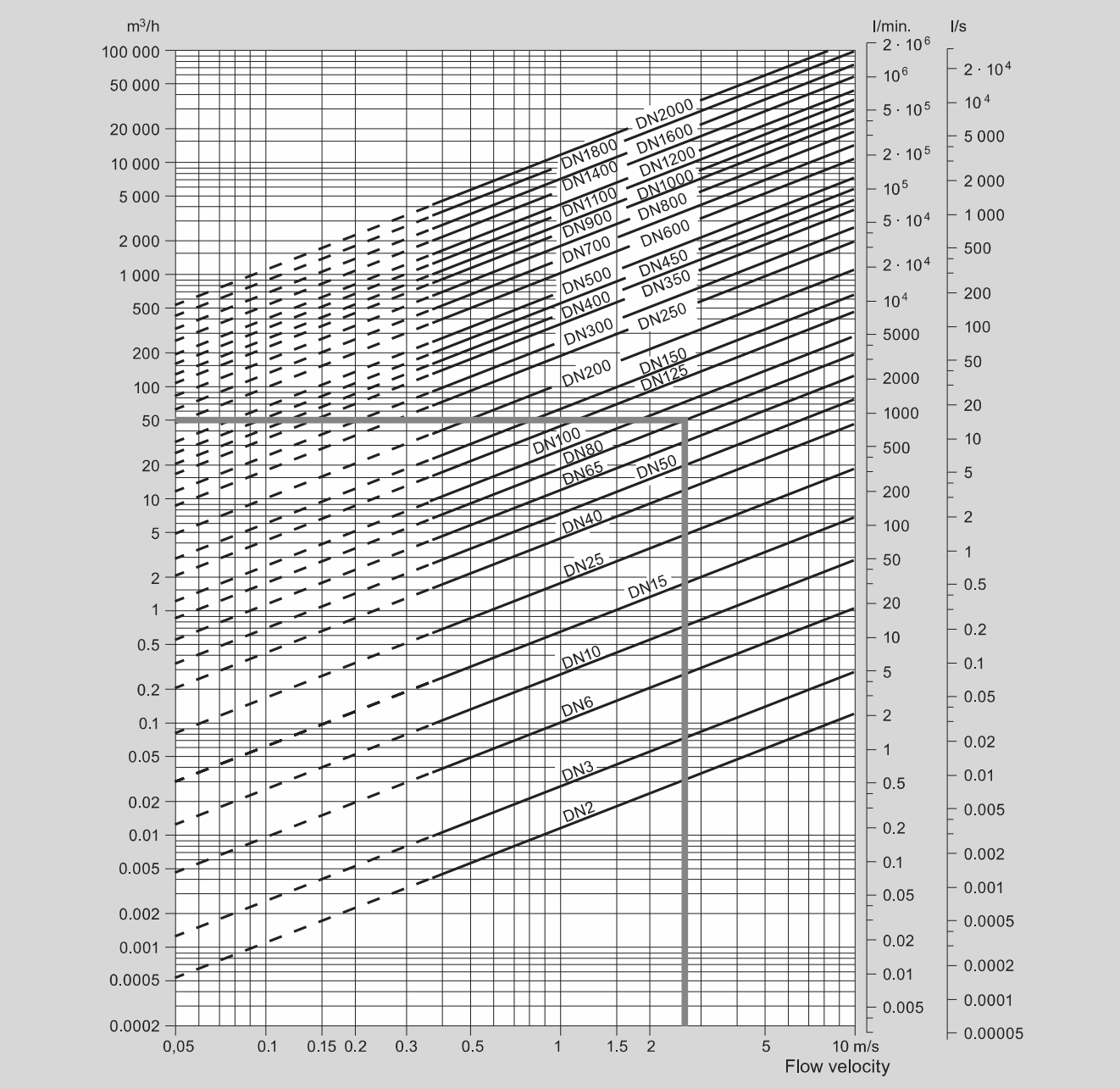
1) Requires a SENSORPROM containing valid fraction data.
2) Value returned is dependent on the BATCH function.
When ON, Batch progress is returned.
When OFF, TOTALIZER 2 is returned.

© Siemens AG 2012

System information SITRANS F M electromagnetic flowmeters

Selection of sensor

Metric



Sizing table (DN 2 … DN 2000)

The table shows the relationship between flow velocity v, flow quantity Q and sensor dimension DN.

Guidelines for selection of sensor

Min. measuring range: 0 to 0.25 m/s

Max. measuring range: 0 to 10 m/s

Normally the sensor size is selected so that the nominal flow velocity v lies within the measuring range 1 to 3 m/s.

Example:

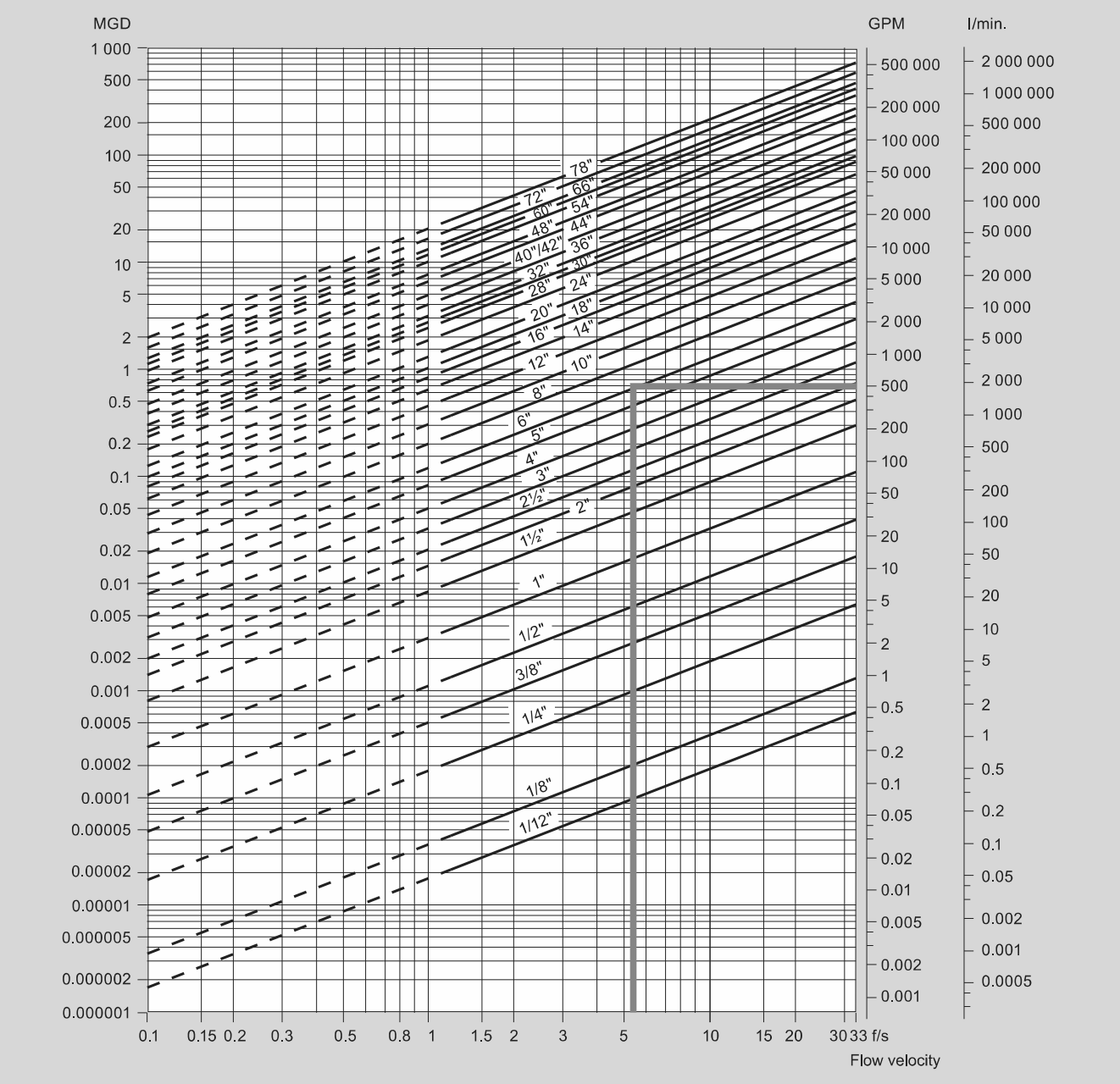
Flow quantity of 50 m^3/h and a sensor dimension of DN 80 gives a flow velocity of 2.7 m/s, which is within the recommended measuring range of 1 to 3 m/s.

Flow velocity calculation formula	Units
$v = 1273.24 \cdot Q / DN^2$ or	v : [m/s], Q : [l/s], DN : [mm]
$v = 353.68 \cdot Q / DN^2$	v : [m/s], Q : [m^3/h], DN : [mm]

Link to "Sizing program":
https://pia.khe.siemens.com/index.aspx?nr=11501

© Siemens AG 2012

Imperial



Sizing table ($^{1}/_{12}$" … 78")

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

Guidelines for selection of sensor

Min. measuring range: 0 to 0.8 ft/s

Max. measuring range: 0 to 33 ft/s

Normally the sensor size is selected so that the nominal flow velocity v lies within the measuring range 3 to 10 ft/s.

Example:

Flow quantity of 500 GPM and a sensor dimension of 6" gives a flow velocity of 5.6 ft/s, which is within the recommended measuring range of 3 to 10 ft/s.

Flow velocity calculation formula	Units
$v = 0.408 \cdot Q / (\text{Pipe I.D.})^2$ or	v : [ft/s], Q : [GPM], Pipe I.D. : [inch]
$v = 283.67 \cdot Q / (\text{Pipe I.D.})^2$	v : [ft/s], Q : [MGD], Pipe I.D. : [inch]

Link to "Sizing program":
https://pia.khe.siemens.com/index.aspx?nr=11501

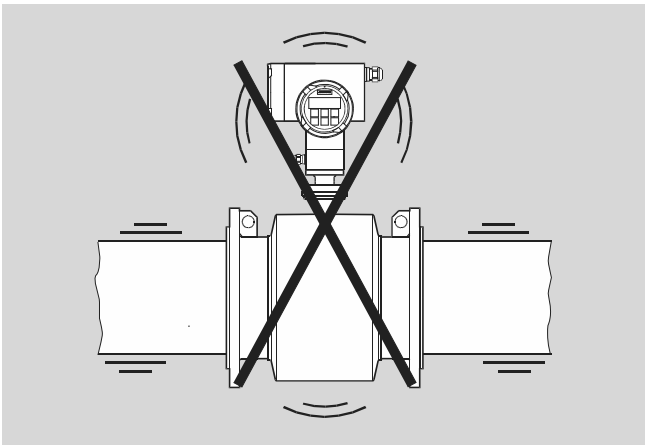
© Siemens AG 2012

Installation conditions

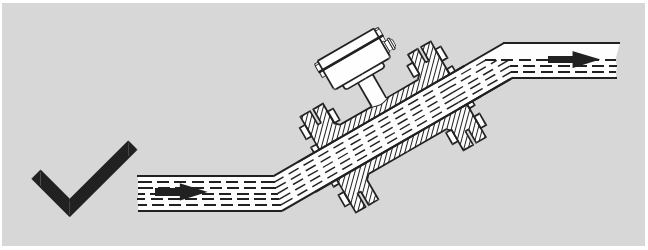
Vibrations

Strong vibrations should be avoided.

In applications with strong vibrations, remote mounting of the transmitter is recommended.



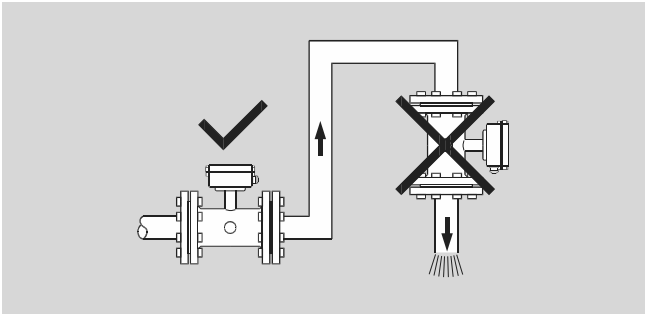
The sensor must always be completely filled with liquid.

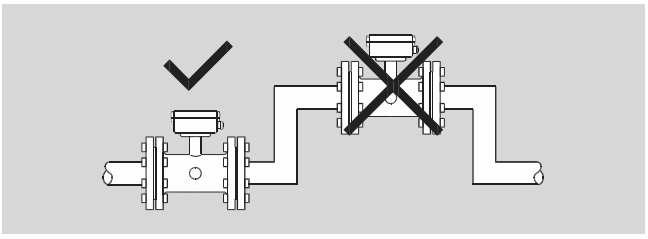


Install in pipelines which are always full

The sensor must always be completely filled with liquid. Therefore avoid:

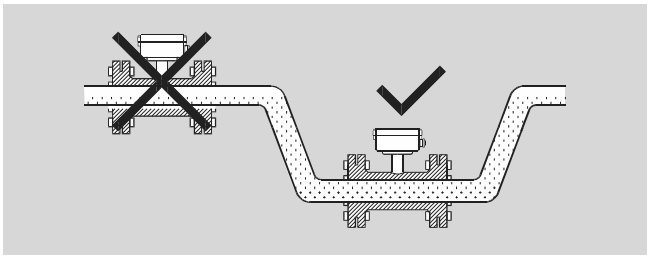
- Installation at the highest point in the pipe system
- Installation in vertical pipes with free outlet





Do not install in pipelines which can run empty

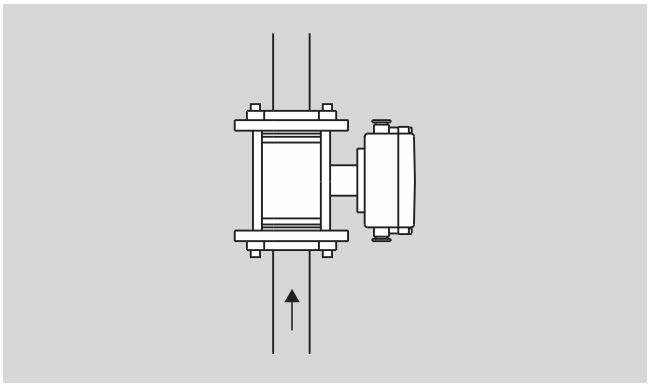
For partially filled pipes or pipes with downward flow and free outlet the flowmeter should be located in a U-Tube.



Install in U-tubes when pipe is partially filled

Installation in vertical pipes

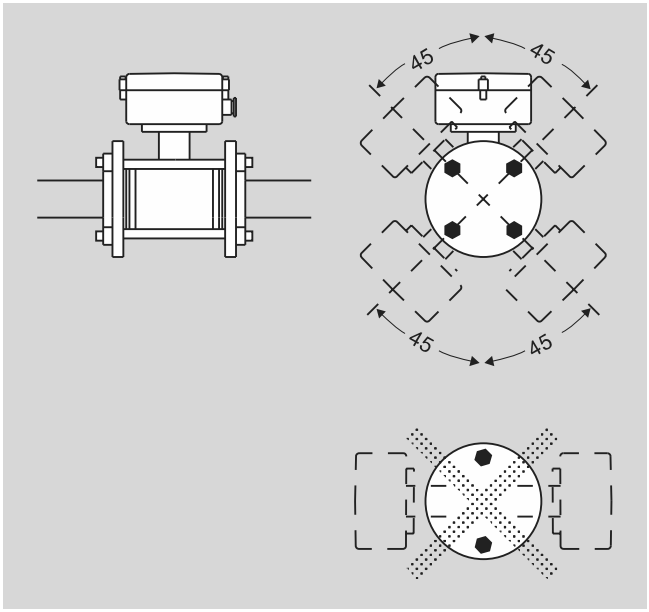
Recommended flow direction: upwards. This minimizes the effect on the measurement of any gas/air bubbles in the liquid.



Install in vertical pipes with upward flow direction

Installation in horizontal pipes

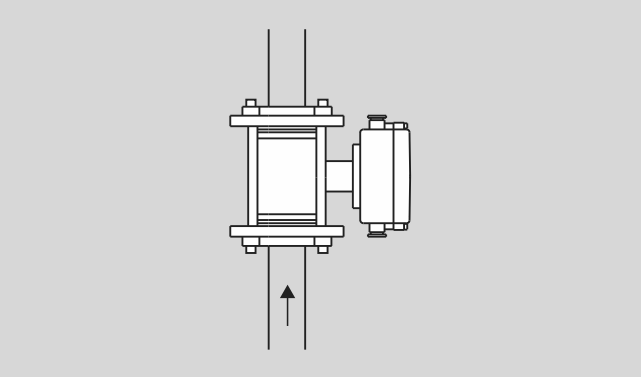
The sensor must be mounted as shown in the below figure. Do not mount the sensor as shown in the lower figure. This will position the electrodes at the top where there is possibility for air bubbles and at the bottom where there is possibility for mud, sludge, sand etc.



© Siemens AG 2012

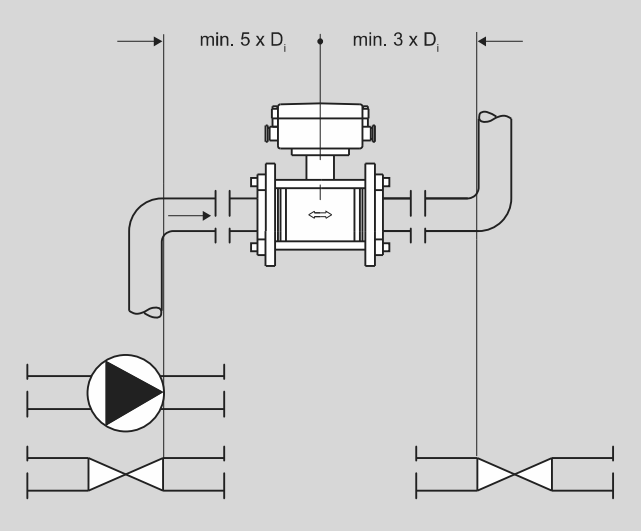
Measuring abrasive liquids and liquids containing particles

Recommended installation is in a vertical/inclined pipe to minimize the wear and deposits in the sensor.



Install in vertical pipelines with upward flow direction if measuring abrasive liquids

Inlet and outlet conditions



Installation between elbows, pumps and valves: standard inlet and outlet pipe sections

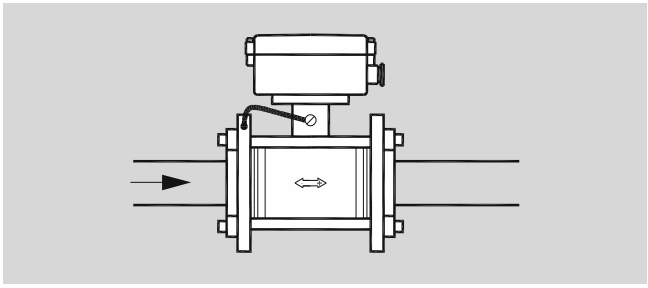
To achieve maximum accurate flow measurement it is essential to have straight length of inlet and outlet pipes and a certain distance between the flowmeter and pumps or valves.

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

Ambient temperature-Installation

Temperature changes can cause expansion or contraction in the pipe system. To avoid damage on the sensor use of proper gasket and torque should be ensured. For more information see sensor instruction.

Potential equalization

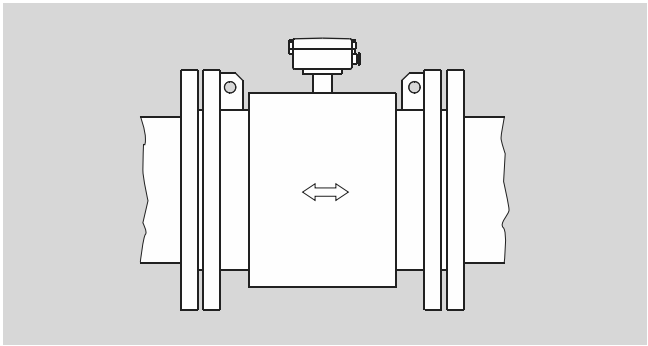


Potential equalization

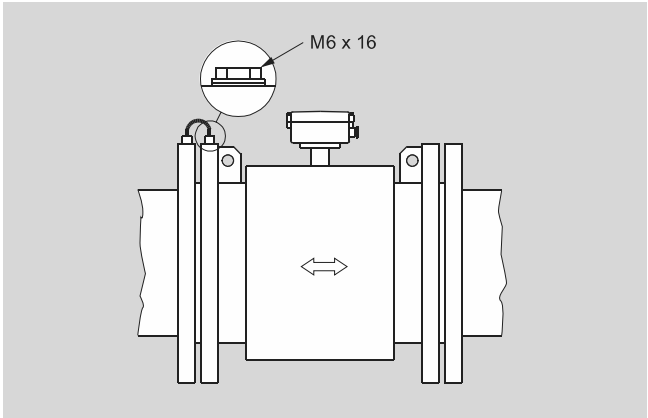
The electrical potential of the liquid must always be equal to the electrical potential of the sensor. This can be achieved in different ways depending on the application:

- Wire jumper between sensor and adjacent flange (MAG 1100, MAG 3100)
- Direct metallic contact between sensor and fittings (MAG 1100 F)
- Build-in grounding electrodes (MAG 3100, MAG 5100 W)
- Optional grounding/protection flanges/rings (MAG 1100, MAG 3100, MAG 8000)
- Optional graphite gaskets on MAG 1100 (standard for MAG 1100 High Temperature)
- MAG 8000 installed in plastic or coated pipes: two grounding rings to be used.

Grounding

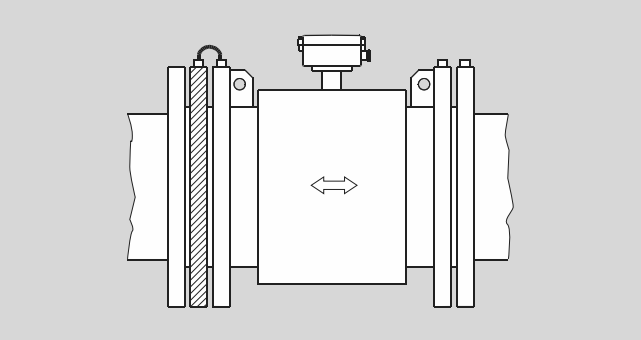


MAG 3100 (not PTFE), MAG 5100 W: with earthing electrodes in conductive and non-conductive pipes (no further action necessary)



MAG 1100, MAG 3100 (PTFE): without earthing electrodes in conductive pipes (MAG 1100 use graphite gasket)

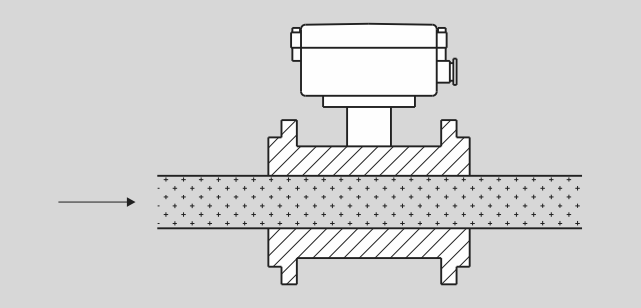
© Siemens AG 2012



Without earthing electrodes in non-conductive pipes use grounding ring (MAG 1100 use graphite gasket)

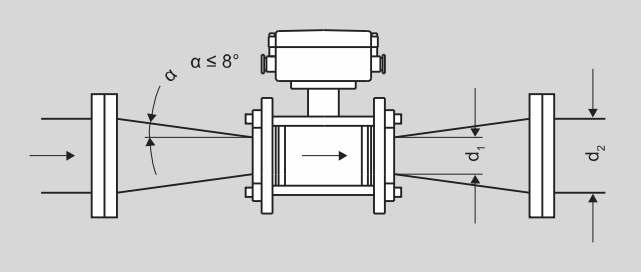
MAG 1100 F grounding via process connections. MAG 8000 grounding see MAG 8000 pages.

Vacuum



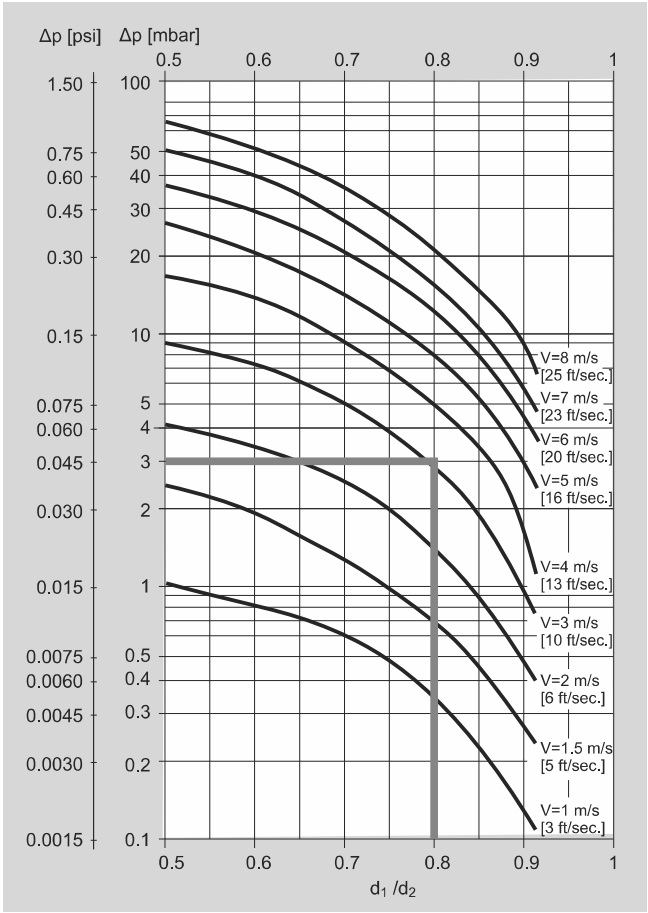
Avoid a vaccum in the measuring pipe, because this can damage certain liners.

Installation in large pipes



Reduction in nominal pipe diameter

The flowmeter can be installed between two reducers (e.g. DIN 28545). Assuming that at 8° the following pressure drop curve applies. The curves are applicable to water.

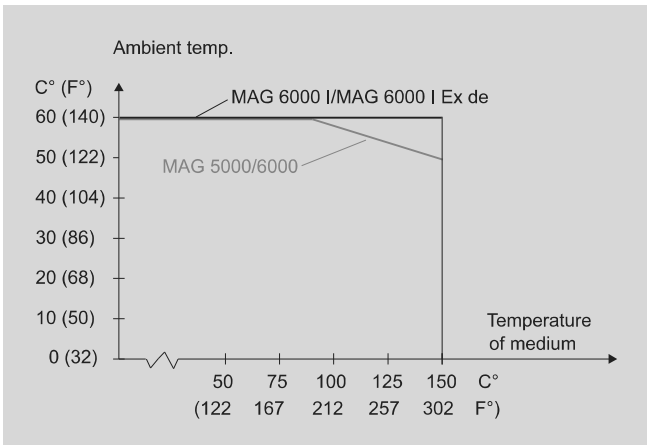


Pressure drop as function of diameter reduction between reducers

Example:

Flow velocity (v) of 3 m/s (10 ft/s) in a sensor with a diameter reduction DN 100 (4") to DN 80 (3") (d_1/d_2 = 0.8) gives a pressure drop of 2.9 mbar (0.04 psi).

Ambient temperature



Max. ambient temperature as a function of temperature of medium

The transmitter can be installed either compact or remote.

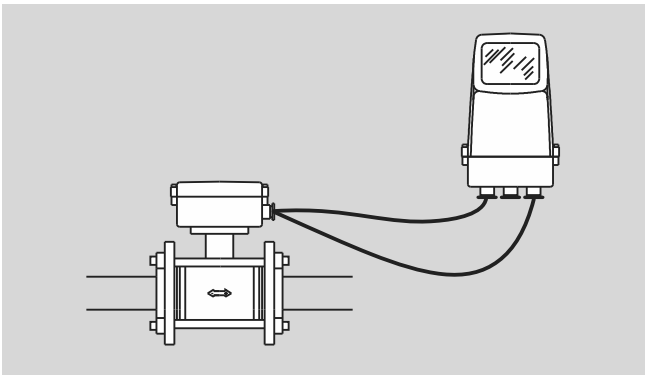
With compact installation the temperature of medium must be according to the graph.

© Siemens AG 2012

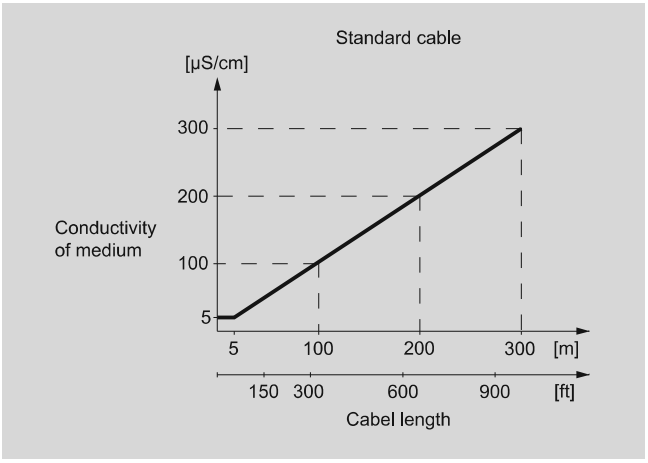
Sensor cables and conductivity of medium

Compact installation:

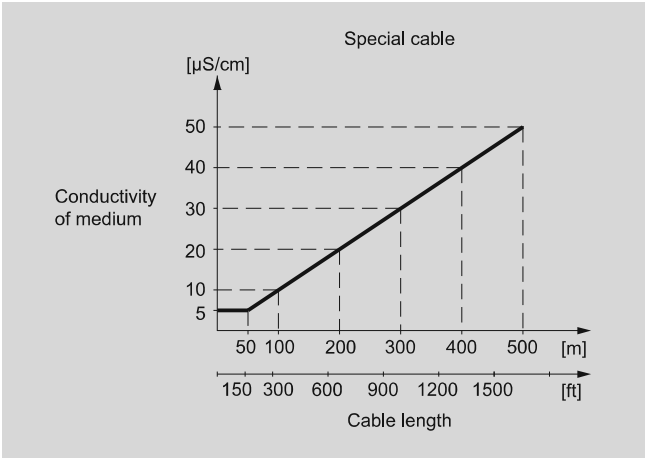
Liquids with an electrical conductivity ≥ 5 µS/cm.



Remote installation



Minimum conductivity of medium (using standard electrode cable)



Minimum conductivity of medium (using special electrode cable)

Note

For detection of empty pipe the minimum sensor conductivity must always be ≥ **20 µS/cm** and the maximum length of electrode cable when remotely mounted is 50 m (150 ft). Special shield cable must be used.

For **DN 2, DN 3** or for 19" safety barrier remote mounting in Ex applications special cable cannot be used, empty sensor cannot be detected and the conductivity must be ≥ **30 µS/cm**.

For remote mounted CT installations the maximum cable length is 200 m (600 ft).

© Siemens AG 2012

Transmitter MAG 5000/6000

Overview

Transmitter MAG 5000/6000 compact version (left) and 19“ insert version (right)

The MAG 5000 and 6000 are transmitters engineered for high performance, easy installation, commissioning and maintenance. The transmitters evaluate the signals from the SITRANS F M sensors type MAG 1100, MAG 1100 F, MAG 3100, MAG 3100 P and MAG 5100 W.

Transmitter types:

- MAG 5000: Max. measuring error ± 0.4 % ± 1 mm/s (incl. sensor)
- MAG 6000: Max. measuring error ± 0.2 % ± 1 mm/s (incl. sensor, see also sensor specifications) and with additional features such as: "plug & play" add-on bus modules; integrated batch functions.

Benefits

- Superior signal resolution for optimum turn down ratio
- Digital signal processing with many possibilities
- Automatic reading of SENSORPROM data for easy commissioning
- User configurable operation menu with password protection.
- 3 lines, 20 characters display in 11 languages.
- Flow rate in various units
- Totalizer for forward, reverse and net flow as well as additional information available
- Multiple functional outputs for process control, minimum configuration with analogue, pulse/frequency and relay output (status, flow direction, limits)
- Comprehensive self-diagnostic for error indication and error logging (see under SITRANS F M diagnostics)
- Batch control (MAG 6000 only)
- Custody transfer approval: PTB, OIML R 75, OIML R 117, OIML R 49, MI-001 and PTB K 7.2 for chilled water
- MAG 6000 with add-on bus modules for HART, FOUNDATION Fieldbus H1, DeviceNet, Modbus RTU/RS 485, PROFIBUS PA and DP

Application

The SITRANS F M flowmeters are suitable for measuring the flow of almost all electrically conductive liquids, pastes and slurries. The main applications can be found in:

- Water and waste water
- Chemical and pharmaceutical industries
- Food and beverage industries
- Power generation and utility

Design

The transmitter is designed as either IP67 NEMA 4X/6 enclosure for compact or wall mounting or 19" version as a 19” insert as a base to be used in:

- 19" rack systems
- Panel mounting IP20/NEMA 1 (prepared for IP65/NEMA 2 display side)
- Back of panel mounting IP20/NEMA 1
- Wall mounting IP66/NEMA 4X

Several options on 19” versions are available such as:

- Transmitters mounted in safe area for Ex ATEX approved flow sensors (incl. barriers)
- Transmitters with electrode cleaning unit on request

Function

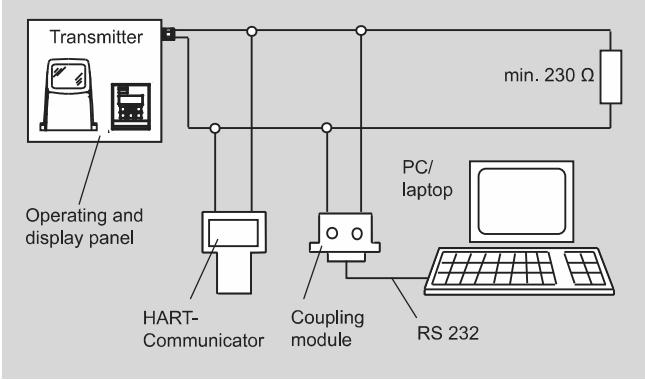
The MAG 5000/6000 are transmitters with a build-in alphanumeric display in several languages. The transmitters evaluate the signals from the associated electromagnetic sensors and also fulfil the task of a power supply unit which provides the magnet coils with a constant current.

Further information on connection, mode of operation and installation can be found in the data sheets for the sensors.

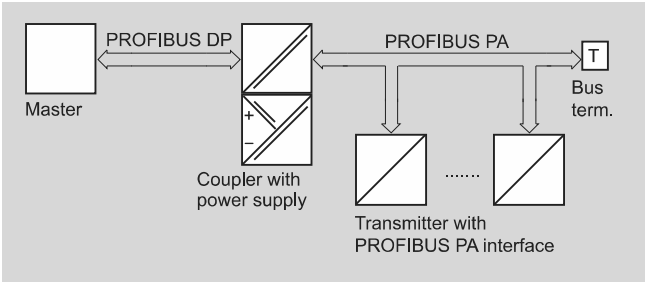
Displays and controls

Operation of the transmitter can be carried out using:

- Control and display unit
- HART communicator
- PC/laptop and SIMATIC PDM software via HART communication
- PC/laptop and SIMATIC PDM software using PROFIBUS or Modbus communication



HART communication



PROFIBUS PA communication

© Siemens AG 2012

Technical specifications

Mode of operation and design	
Measuring principle	Electromagnetic with pulsed constant field
Empty pipe	Detection of empty pipe (special cable required in remote mounted installation)
Excitation frequency	Depend on sensor size
Electrode input impedance	> 1 x 10^{14} Ω
Input	
Digital input	11 ... 30 V DC, R_i = 4.4 KΩ
• Activation time	50 ms
• Current	$I_{11\ V\ DC}$ = 2.5 mA, $I_{30\ V\ DC}$ = 7 mA
Output	
Current output	
• Signal range	0 ... 20 mA or 4 ... 20 mA
• Load	< 800 Ω
• Time constant	0.1 … 30 s, adjustable
Digital output	
• Frequency	0 ... 10 kHz, 50 % duty cycle (uni/bidirectional)
• Pulse (active)	24 V DC, 30 mA, 1 KΩ ≤ R_i ≤ 10 KΩ, short-circuit-protected (power supplied from flowmeter)
• Pulse (passive)	3 … 30 V DC, max. 110 mA, 200 Ω ≤ R_i ≤ 10 KΩ (powered from connected equipment)
• Time constant	0.1 … 30 s, adjustable
Relay output	
• Time constant	Changeover relay, same as current output
• Load	42 V AC/2 A, 24 V DC/1 A
Low flow cut off	0 ... 9.9 % of maximum flow
Galvanic isolation	All inputs and outputs are galvanically isolated.
Max. measuring error (incl. sensor and zero point)	
• MAG 5000	0.4 % ±1 mm/s
• MAG 6000	0.2 % ±1 mm/s
Rated operation conditions	
Ambient temperature	
• Operation	• Display version: -20 ... +60 °C (-4 ... +140 °F) • Blind version: -20 ... +60 °C (-4 ... +140 °F) • MI-001 version -25 ... +55 °C (-13 ... +131 °F) • Custody Transfer (CT) version -20 ... +50 °C (-4 ... +122 °F)
• Storage	-40 ... +70 °C (-40 ... +158 °F)
Mechanical load (vibration)	
Compact version	18 ... 1000 Hz, 3.17 g rms, sinusoidal in all directions to IEC 68-2-36
19" insert	1 ... 800 Hz, 1 g, sinusoidal in all directions to IEC 68-2-36
Degree of protection	
Compact version	IP67/NEMA 4X/6 to IEC 529 and DIN 40050 (1 mH_2O 30 min.)
19" insert	IP20/NEMA 1 to IEC 529 and DIN 40050
EMC performance	IEC/EN 61326-1 (all environments) IEC/EN 61326-2-5

Display and keypad	
Totalizer	Two eight-digit counters for forward, net or reverse flow
Display	Background illumination with alphanumeric text, 3 x 20 characters to indicate flow rate, totalized values, settings and faults; Reverse flow indicated by negative sign
Time constant	Time constant as current output time constant
Design	
Enclosure material	
• Compact version	Fiber glass reinforced polyamide; stainless steel AISI 316/1.4436 (IP65)
• 19" insert	Standard 19" insert of aluminum/steel (DIN 41494), width: 21 TE, height: 3 HE
• Back of panel	IP20/NEMA 1; Aluminum
• Panel mounting	IP20/NEMA 1 (prepared for IP65/NEMA 2 display side); ABS plastic
• Wall mounting	IP66/NEMA 4X; ABS plastic
Dimensions	
Compact version	See dimensional drawings
19" insert	See dimensional drawings
Weight	
Compact version	0.75 kg (2 lb)
19" insert	See dimensional drawings
Power supply	• 115 ... 230 V AC +10 % -15 %, 50 ... 60 Hz • 11 ... 30 V DC or 11 ... 24 V AC
Power consumption	• 230 V AC: 17 VA • 24 V AC : 9 VA, I_N = 380 mA, I_{ST} = 8 A (30 ms) • 12 V DC : 11 W, I_N = 920 mA, I_{ST} = 4 A (250 ms) I_{ST}= 4 A (250 ms): For solar panel please secure stable current supply
Certificates and approvals	CE, C-UL general purpose, C-tick; FM Class I, Div 2, CSA Class I, Div 2
Custody transfer approval (MAG 5000/6000 CT)	• Cold water: MI-001, PTB/OIML R 49 (pattern approval DE/DK) • Hot water: PTB and DANAK OIML R 75 (pattern approval DE/DK) (MAG 6000 CT) • Chilled water: PTB K 7.2 • Other media than water (milk, beer etc.): PTB and DANAK OIML R 117 (pattern approval DE/DK) (MAG 6000 CT)
Communication	
Standard	
• MAG 5000	Without serial communication or HART as option
• MAG 6000	Prepared for client-mounted add-on modules
Optional (MAG 6000 only)	HART, Modbus RTU/RS 485, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS PA, PROFIBUS DP as add-on modules
• MAG 5000/6000 CT	No communication moduls approved

© Siemens AG 2012

Transmitter MAG 5000/6000

Safety barrier (e/ia)

Application	**For use with MAG 5000/6000 19" and MAG 1100 Ex ATEX/MAG 3100 Ex ATEX**		
Ex approval	MAG 1100 Ex [EEx e ia] IIB ATEX		
	MAG 3100 Ex [EEx e ia] IIC ATEX		
Cable parameter	Group	Capacity in µF	Inductance in mH
Electrode	IIC	≤ 4.1	≤ 80
	IIB	≤ 45	≤ 87
	IIA	≤ 45	≤ 87
Ambient temperature			
• During operation	-20 ... +50 °C (-4 ... +122 °F)		
• During storage	-20 ... +70 °C (-4 ... +158 °F)		
Enclosure			
• Material	Standard 19" insert in aluminum/steel (DIN 41494)		
• Width	21 TE (4.75")		
• Height	3 HE (5.25")		
• Rating	IP20 / NEMA 1 to EN 60529		
• Mechanical load	1 g, 1 … 800 Hz sinusoidal in all directions to EN 60068-2-36		

Electrode cleaning unit for MAG 5000 or 6000 in 19" insert version

The purpose of electrode cleaning is to remove unwanted deposits on the electrodes in water applications by applying either a DC or AC voltage to the electrodes. AC cleaning is used in waste water applications to remove fatty deposits on the electrodes by warming up the electrode. DC cleaning is used in district heating applications to eliminate electrically conductive deposits.

Application for use with transmitters MAG 5000 and 6000 19" to clean the electrodes on sensors MAG 1100 or MAG 3100

- Not to be used with intrinsically safe Ex sensors
- Not to be used with sensors with Hastelloy and Tantalum electrodes

Available on request

© Siemens AG 2012

Selection and Ordering data

Transmitter MAG 5000

Description	Order No.	
Transmitter MAG 5000 Blind for compact and wall mounting; IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	◆ **7ME6910-1AA30-0AA0**	
• 115 ... 230 V AC, 50/60 Hz	◆ **7ME6910-1AA10-0AA0**	
Transmitter MAG 5000 Display for compact and wall mounting; IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	◆ **7ME6910-1AA30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	◆ **7ME6910-1AA10-1AA0**	
• 115 ... 230 V AC, 50/60 Hz, with HART	**7ME6910-1AA10-1BA0**	
Transmitter MAG 5000 CT for compact and wall mounting, approved for custody transfer (only with approval marks, no verification – only a complete flowmeter can be verified, i.e. sensor together with the transmitter); IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	◆ **7ME6910-1AA30-1AB0**	
• 115 ... 230 V AC, 50/60 Hz	◆ **7ME6910-1AA10-1AB0**	
Transmitter MAG 5000 for 19" rack and wall mounting		
• 11 ... 30 V DC/ 11 ... 24 V AC	**7ME6910-2CA30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6910-2CA10-1AA0**	

◆ Short lead time (details in PMD)

Transmitter MAG 6000

Description	Order No.	
Transmitter MAG 6000 Blind for compact and wall mounting; IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	◆ **7ME6920-1AA30-0AA0**	
• 115 ... 230 V AC, 50/60 Hz	◆ **7ME6920-1AA10-0AA0**	
Transmitter MAG 6000 for compact and wall mounting; IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	◆ **7ME6920-1AA30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	◆ **7ME6920-1AA10-1AA0**	
Transmitter MAG 6000 for compact and wall mounting; IP65/NEMA 4, stainless steel AISI 316/1.4436 (only for sensor with SS terminal box) (for remote installation order SS terminal box separately)		
• 11 ... 30 V DC/ 11 ... 24 V AC	**7ME6920-1QA30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6920-1QA10-1AA0**	
Transmitter MAG 6000 CT for compact and wall mounting, approved for custody transfer (no communication modules possible; only with approval marks, no verification – only a complete flowmeter can be verified, i.e. sensor together with the transmitter); IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	◆ **7ME6920-1AA30-1AB0**	
• 115 ... 230 V AC, 50/60 Hz	◆ **7ME6920-1AA10-1AB0**	
Transmitter MAG 6000 SV for compact and wall mounting; special excitation 44 Hz settings for Batch application DN ≤ 25/1" IP67/NEMA 4X/6, fibre glass reinforced polyamide		
11 ... 30 V DC/ 11 ... 24 V AC	**7ME6920-1AB30-1AA0**	
115 ... 230 V AC, 50/60 Hz	**7ME6920-1AB10-1AA0**	
Transmitter MAG 6000 for 19" rack and wall mounting		
• 11 ... 30 V DC/ 11 ... 24 V AC	◆ **7ME6920-2CA30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	◆ **7ME6920-2CA10-1AA0**	

© Siemens AG 2012

Transmitter MAG 5000/6000

Description	Order No.	
Transmitter MAG 6000 SV for 19" rack and wall mounting; special excitation 44 Hz settings for Batch application DN ≤ 25/1"		
• 11 ... 30 V DC/ 11 ... 24 V AC	**7ME6920-2CB30-1AA0**	
• 115 ... 230 V AC, 50/60 Hz	**7ME6920-2CB10-1AA0**	
MAG 6000 with IP66/NEMA 4X enclosure; 115 ... 230 V AC, 50/60 Hz; cable gland PG13.5	**7ME6920-2EA10-1AA0**	
MAG 6000 with safety barrier for Ex-approved sensors, complete mounted with IP66/NEMA 4X wall mounting enclosure, ATEX, 115 ... 230 V AC, 50/60 Hz; cable gland PG13.5		
• For ATEX 2G D sensors	**7ME6920-2MA11-1AA0**	
MAG 6000 SV, 19" insert, in IP66/NEMA 4X , ABS plastic enclosure, excitation frequency 44 Hz for Batch application DN ≤ 25/1"; cable gland PG13.5		
• 11 … 30 V DC, 11 … 24 V AC, 50/60 Hz	**7ME6920-2EB30-1AA0**	
• 115 … 230 V AC, 50/60 Hz	**7ME6920-2EB10-1AA0**	

◆ Short lead time (details in PMD)

Operating instructions for SITRANS F M MAG 5000/6000

Description	Order No.
For SITRANS F M MAG 5000/6000 IP67	
• English	**A5E02338368**
• German	**A5E02944982**
• Spanish	**A5E02944995**
• French	**A5E02944990**
For SITRANS F M MAG 5000/6000 19"	
• English	**A5E02082880**

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
http://www.siemens.com/flowdocumentation

Communication modules for MAG 6000

Description	Order No.	
HART (not for MAG 6000 I)	◆ **FDK:085U0226**	
Modbus RTU/RS 485	◆ **FDK:085U0234**	
PROFIBUS PA Profile 3	◆ **FDK:085U0236**	
PROFIBUS DP Profile 3	◆ **FDK:085U0237**	
DeviceNet	◆ **FDK:085U0229**	
FOUNDATION Fieldbus H1	◆ **A5E02054250**	

Operating instructions for SITRANS F add-on modules

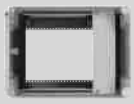
Description	Order No.
HART	
• English	**A5E03089708**
PROFIBUS PA/DP	
• English	**A5E00726137**
• German	**A5E01026429**
MODBUS	
• English	**A5E00753974**
• German	**A5E03089262**
• Spanish	**A5E03089278**
• French	**A5E03089265**
FOUNDATION Fieldbus	
• English	**A5E02318728**
• German	**A5E02488856**
• Spanish	**A5E02512177**
• French	**A5E02512169**
DeviceNet	
• English	**A5E03089720**

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

Accessories for MAG 5000 and MAG 6000

Description	Order No.	
Wall mounting unit for IP67/ NEMA 4X/6 version, wall bracket, terminal box in polyamide		
• 4 x M20 cable glands	◆ **FDK:085U1018**	
• 4 x ½" NPT cable glands	◆ **FDK:085U1053**	
Sun lid for MAG 5000/6000 transmitter (Frame and lid)	**A5E02328485**	
Cable for standard electrode or coil, 3 x 1.5 mm² / 18 gage with shield PVC; Temperature range: -30 ... +70 °C (-22 ... +158 °F)		
• 10 m (33 ft)	◆ **FDK:083F0121**	
• 20 m (65 ft)	◆ **FDK:083F0210**	
• 40 m (130 ft)	◆ **FDK:083F0211**	
• 60 m (200 ft)	◆ **FDK:083F0212**	
• 100 m (330 ft)	◆ **FDK:083F0213**	
• 150 m (500 ft)	**FDK:083F3052**	
• 200 m (650 ft)	**FDK:083F3053**	
• 500 m (1650 ft)	**FDK:083F3054**	

© Siemens AG 2012

Description	Order No.	
Electrode cable for empty pipe or low conductivity[1], double shielded, 3 x 0.25 mm². Temperature range : -30 ... +70 °C (-22 ... +158 °F)		
• 10 m (33 ft)	◆ **FDK:083F3020**	
• 20 m (65 ft)	◆ **FDK:083F3095**	
• 40 m (130 ft)	**FDK:083F3094**	
• 60 m (200 ft)	**FDK:083F3093**	
• 100 m (330 ft)	**FDK:083F3092**	
• 150 m (500 ft)	**FDK:083F3056**	
• 200 m (650 ft)	**FDK:083F3057**	
• 500 m (1650 ft)	**FDK:083F3058**	
Low-noise electrode coax cable for low conductivity and high vibration levels of cables, 3 x 0.13 mm²		
• 2 m (6.6 ft)	**A5E02272692**	
• 5 m (16.5 ft)	**A5E02272723**	
• 10 m (33 ft)	**A5E02272730**	
Cable kit with standard coil cable[1], 3 x 1.5 mm²/18 gage with shield PVC and electrode cable double shielded, 3 x 0.25 mm² Temperature range: -30 ... +70 °C (-22 ... +158 °F)		
• 5 m (16.5 ft)	◆ **A5E02296329**	
• 10 m (33 ft)	◆ **A5E01181647**	
• 15 m (49 ft)	◆ **A5E02296464**	
• 20 m (65 ft)	◆ **A5E01181656**	
• 25 m (82 ft)	◆ **A5E02296490**	
• 30 m (98 ft)	◆ **A5E02296494**	
• 40 m (130 ft)	◆ **A5E01181686**	
• 50 m (164 ft)	◆ **A5E02296498**	
• 60 m (200 ft)	**A5E01181689**	
• 100 m (330 ft)	**A5E01181691**	
• 150 m (500 ft)	**A5E01181699**	
• 200 m (650 ft)	**A5E01181703**	
• 500 m (1650 ft)	**A5E01181705**	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P (not for Ex sensors)	◆ **FDK:085U0220**	
19" safety barrier (21 TE) [EEx e ia] IIC for MAG 1100 Ex sensors and MAG 3100 Ex sensors, incl. back plate	**FDK:083F5034**	
Panel mounting enclosure for 19" insert (21 TE); IP65/NEMA 2 enclosure in ABS plastic for front panel mounting	**FDK:083F5030**	
Panel mounting enclosure for 19" insert (42 TE); IP65/NEMA 2 enclosure in ABS plastic for front panel mounting	**FDK:083F5031**	

Description	Order No.	
Back of panel mounting enclosure for 19" insert (21 TE); IP20/NEMA 1 enclosure in aluminum	**FDK:083F5032**	
Back of panel mounting enclosure for 19" insert (42 TE); IP20/NEMA 1 enclosure in aluminum	**FDK:083F5033**	
IP66/NEMA 4X, wall mounting enclosure for 19" inserts (without back plates). Use with PCB A5E02559813 or A5E02559814		
• 21 TE	**FDK:083F5037**	
• 42 TE	**FDK:083F5038**	
Front cover (7TE) for panel mounting enclosure	**FDK:083F4525**	
Sun shield for remote MAG 5000/6000 transmitters	**A5E01209496**	
Sun Shield for compact MAG 5000/6000 transmitters on MAG 3100 (DN 15 ... 2000 (½" ... 78") or MAG 5100 W (DN 150 ... 1200 (6" ... 48")	**A5E01209500**	

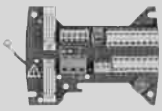
◆ Short lead time (details in PMD)

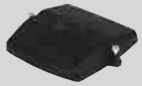
[1] Not for MAG 6000 with safety barrier

© Siemens AG 2012

Transmitter MAG 5000/6000

Spare parts

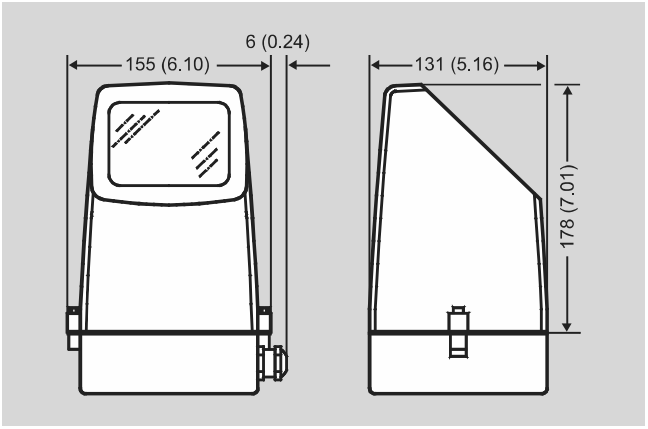
Description	Order No.	
Connection board (for polyamide terminalbox)		
• 12 ... 24 V	**A5E02559817**	
• 115 ... 230 V	**A5E02559816**	
Connection board (for stainless steel terminal-box)		
• 12 ... 24 V	**A5E02604280**	
• 115 ... 230 V	**A5E02604272**	
19" enclosure, 12 ... 24 V, 115 ... 230 V		
• Connection board for standard 19" transmitter	**A5E02559809**	
• Connection board for transmitter ia and safety barrier	**A5E02559810**	
• Connection board for transmitter ia/ib and safety barrier (only for sensors produced before October 2007)	**A5E02559811**	
• Connection board for transmitter and cleaning unit	**FDK:083F4123**	
SENSORPROM memory unit (Sensor code and serial numbers must be specified on order)		
• 2 kB (for MAG 5000/6000/ MAG 6000 I)	**FDK:085U1005**	
• 250 B (for MAG 2500/3000)	**FDK:085U1008**	
Display unit for MAG 5000/6000		
• Black neutral front	**FDK:085U1038**	
• Siemens front	**FDK:085U1039**	
Display unit for 19" versions	**FDK:085U3349**	

Description	Order No.	
Cable glands, for above cable, 4 pcs.		
• M20	**A5E00822490**	
• ½" NPT	**A5E00822501**	
Sealing screws for sensor/ transmitter, 2 pcs	**FDK:085U0221**	
Terminal box, in polyamide, inclusive lid		
• M20	**FDK:085U1050**	
• ½" NPT	**FDK:085U1052**	
Terminal box lid, in polyamide	**FDK:085U1003**	
Terminal box, in stainless steel, inclusive lid for MAG 6000 in stainless steel and for all Ex sensors		
• M20	**A5E00836867**	
• ½" NPT	**A5E00836868**	
Terminal box (3A) for MAG 1100 F in polyamide, inclusive lid		
• M20	**A5E00822478**	
• ½" NPT	**A5E00822479**	
Wall unit enclosure IP66, 12 ... 24 V, 115 ... 230 V		
• PCB for standard transmitter	**A5E02559813**	
• PCB for transmitter ia/e and safety barrier	**A5E02559814**	
• PCB for transmitter ia/ib and safety barrier (7ME6130, 7ME6150 and 7ME6330)	**A5E02559812**	
• PCB for transmitter and cleaning unit	**A5E02559815**	

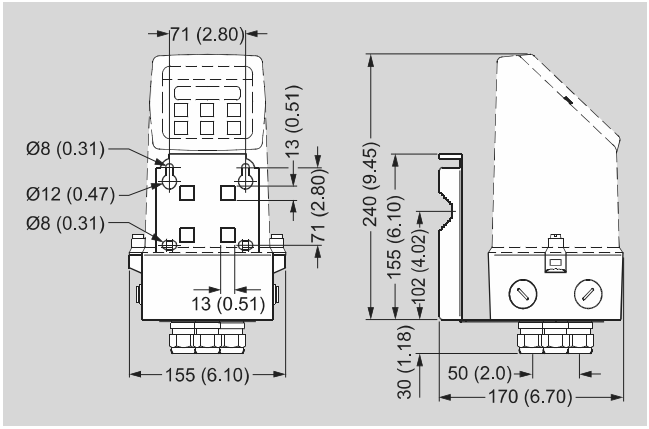
© Siemens AG 2012

Dimensional drawings

Transmitter IP67/NEMA 4X/6 compact polyamide

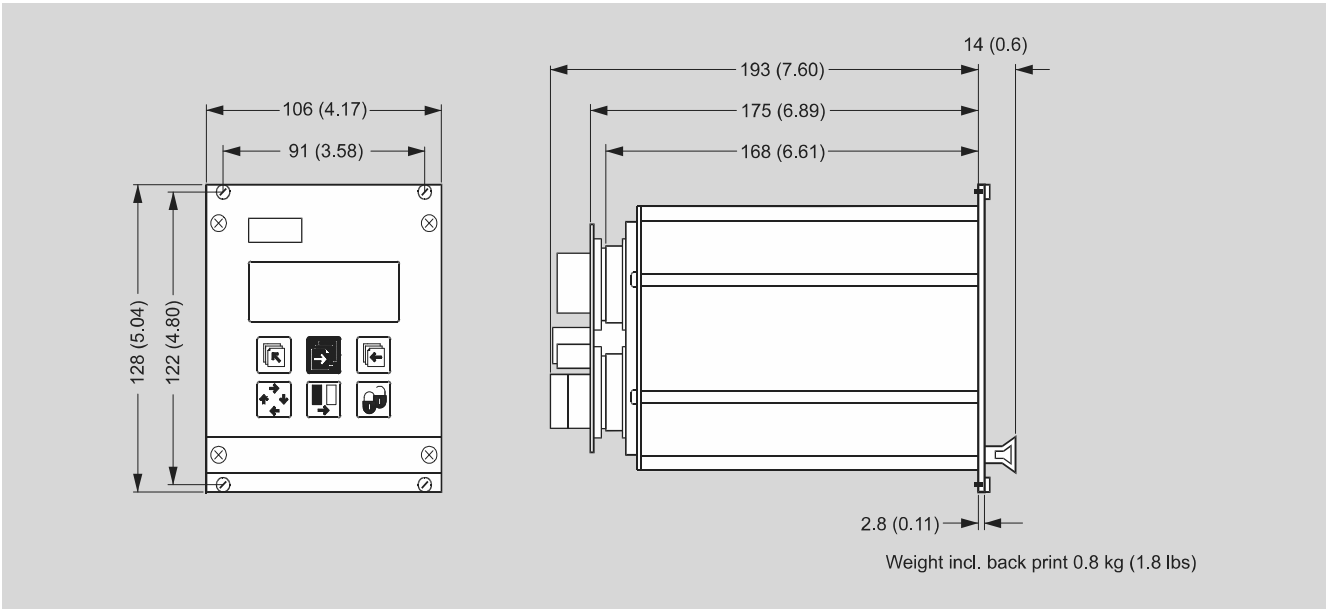


Transmitter compact mounted, dimensions in mm (inch)



Transmitter wall mounted, dimensions in mm (inch)

Transmitter, 19" IP20/NEMA 1 standard unit

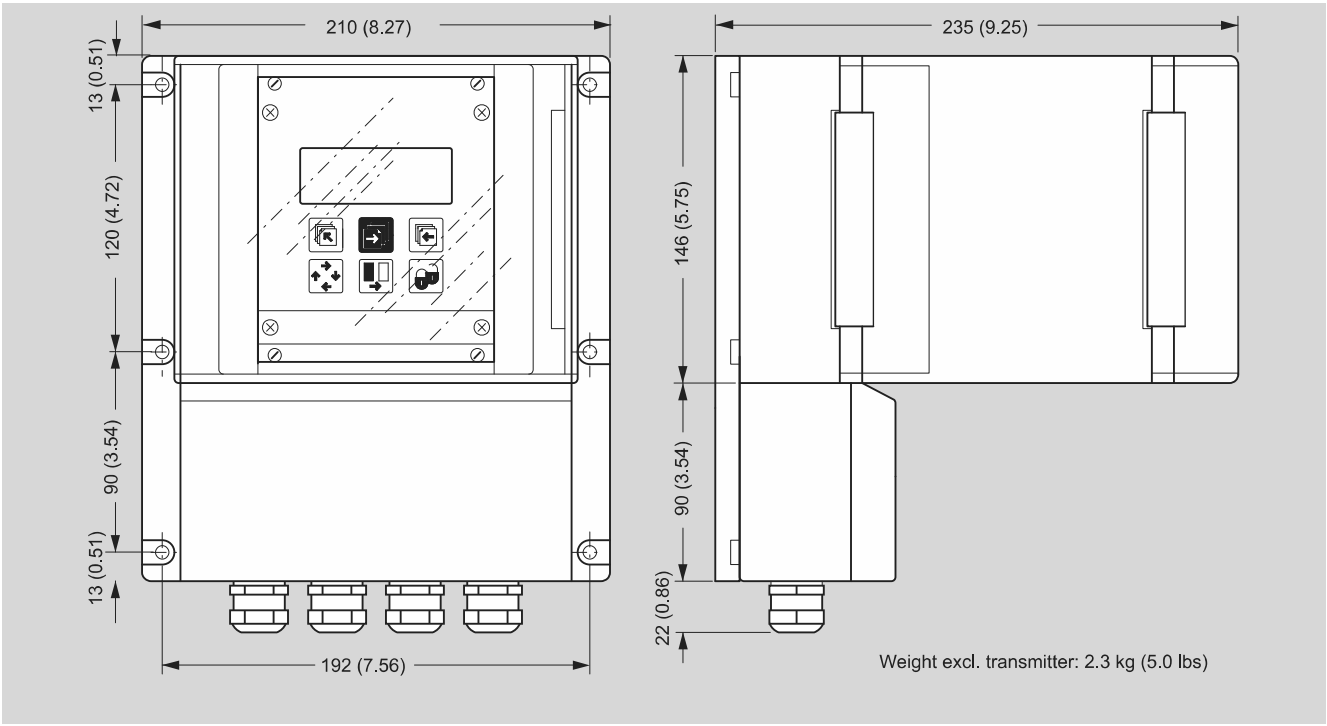


Dimensions in mm (inch)

© Siemens AG 2012

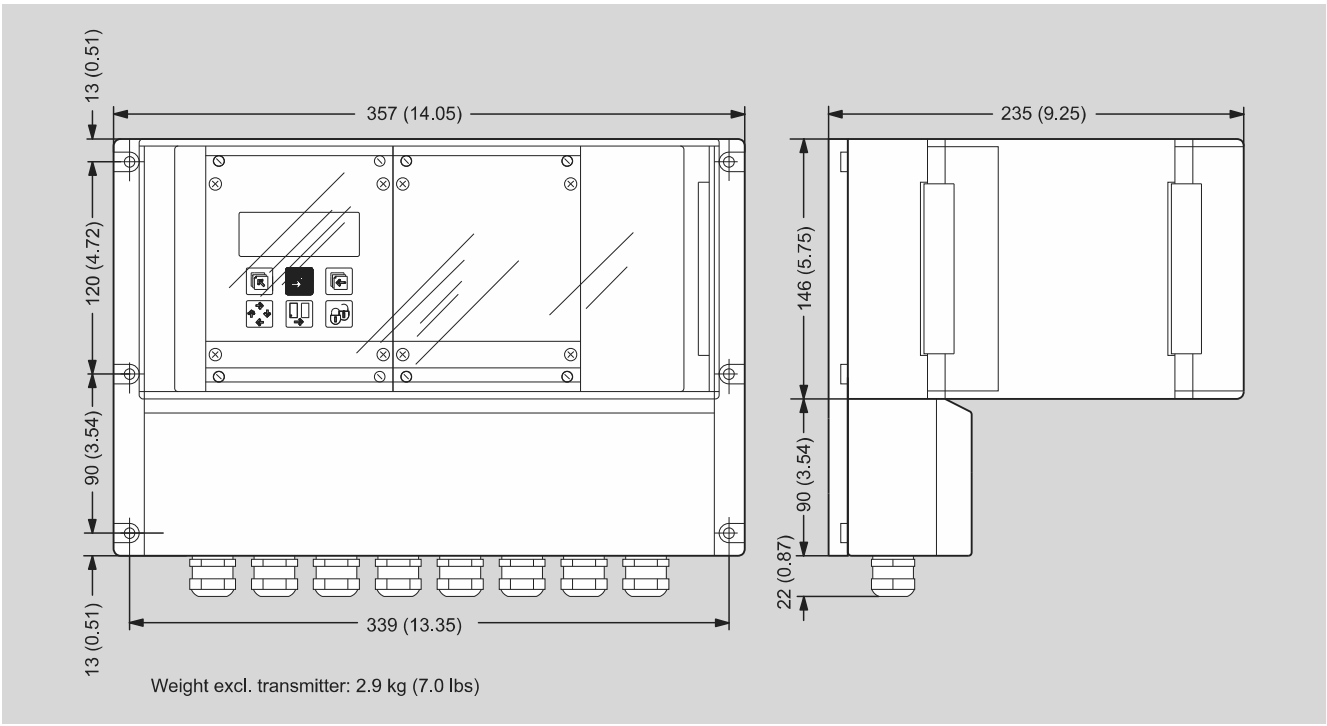
Transmitter MAG 5000/6000

Transmitter, wall mounting IP66/NEMA 4X, 21 TE



Dimensions in mm (inch)

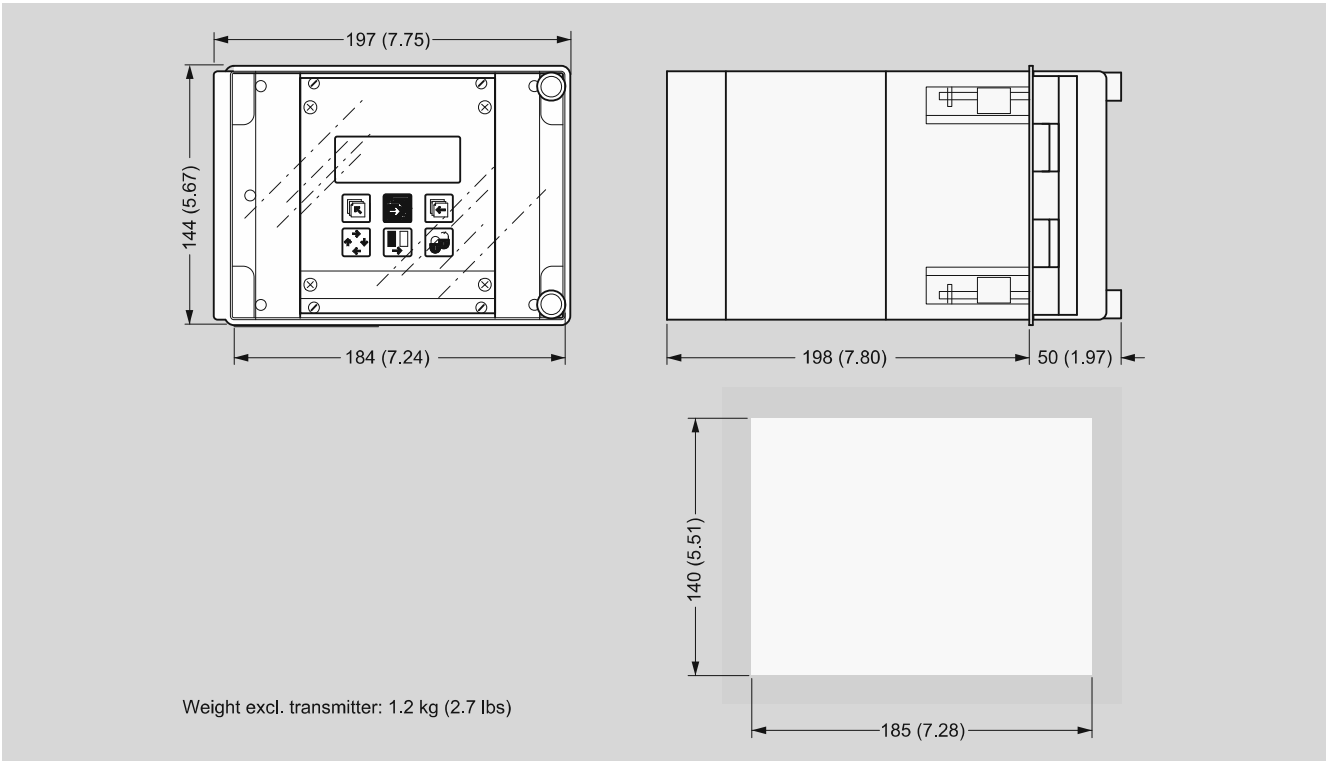
Transmitter, wall mounting IP66/NEMA 4X, 42 TE



Dimensions in mm (inch)

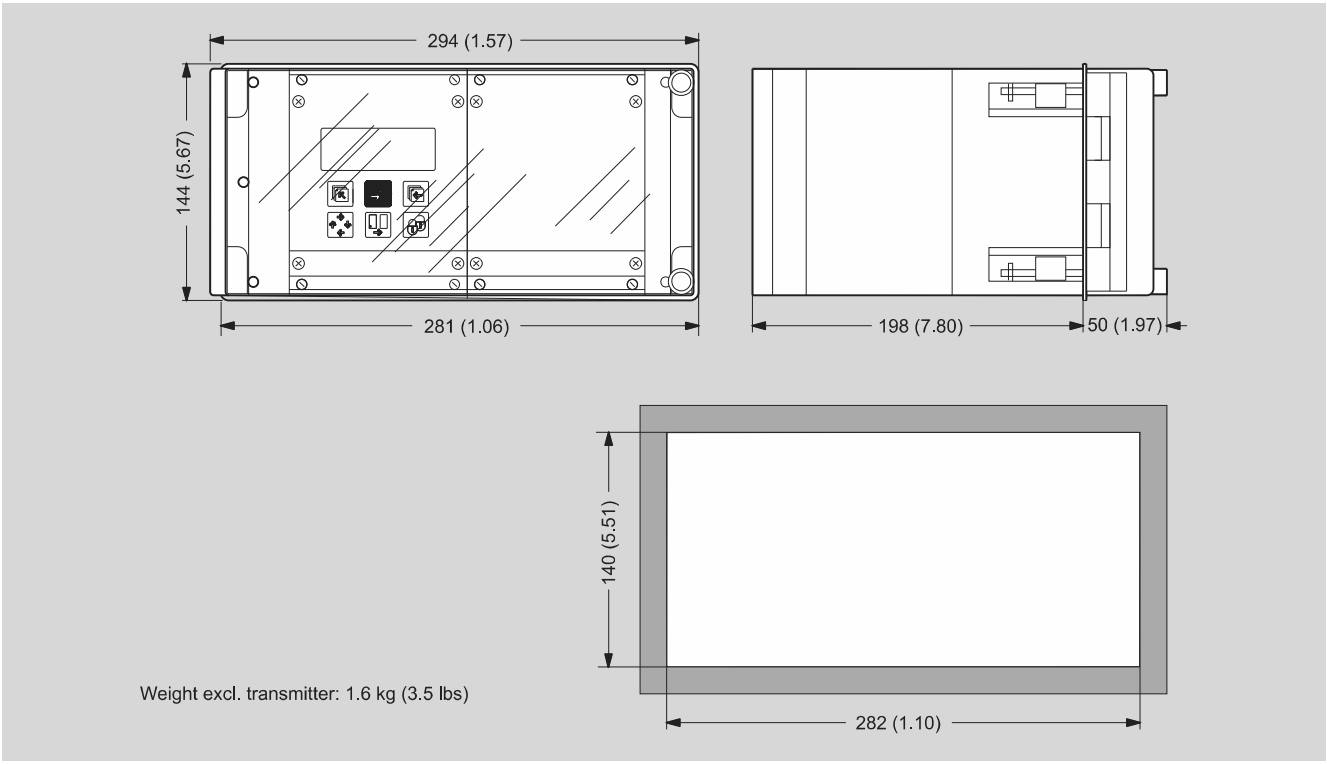
© Siemens AG 2012

Transmitter, panel front IP20/NEMA 1, 21 TE



Dimensions in mm (inch)

Transmitter, panel front IP20/NEMA 1, 42 TE

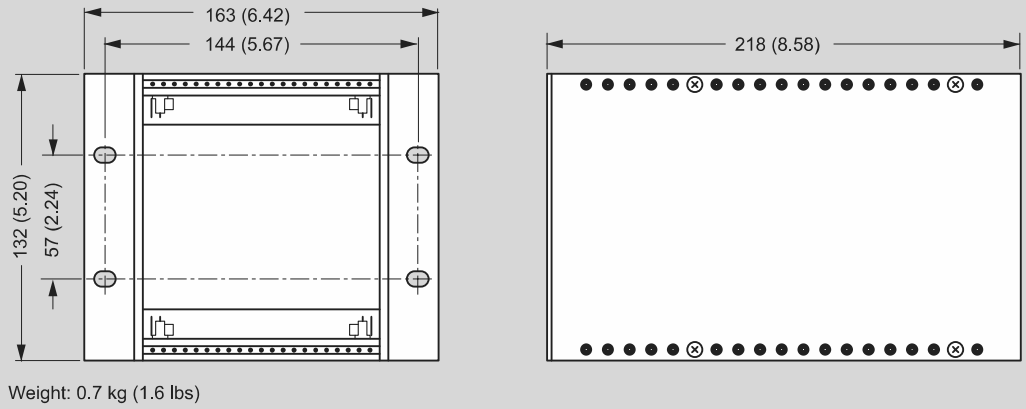


Dimensions in mm (inch)

© Siemens AG 2012

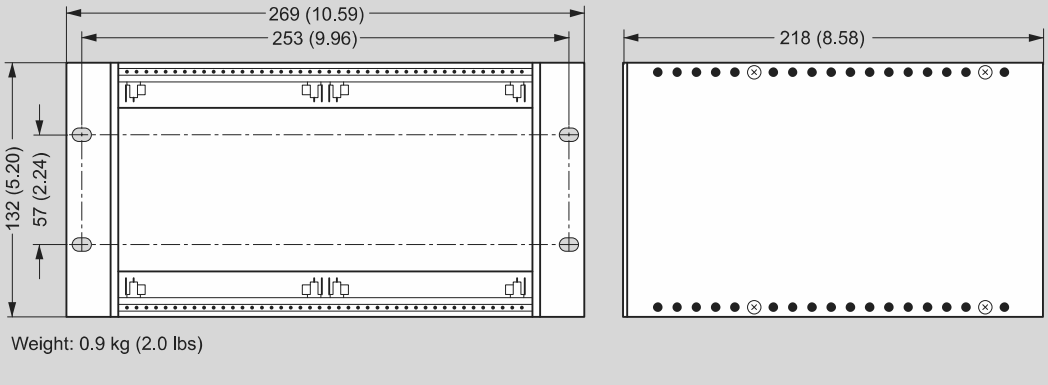
Transmitter MAG 5000/6000

Transmitter, back of panel IP20/NEMA 1, 21 TE



Dimensions in mm (inch)

Transmitter, back of panel IP20/NEMA 1, 42 TE



Dimensions in mm (inch)

© Siemens AG 2012

Schematics

Electrical connection

Grounding

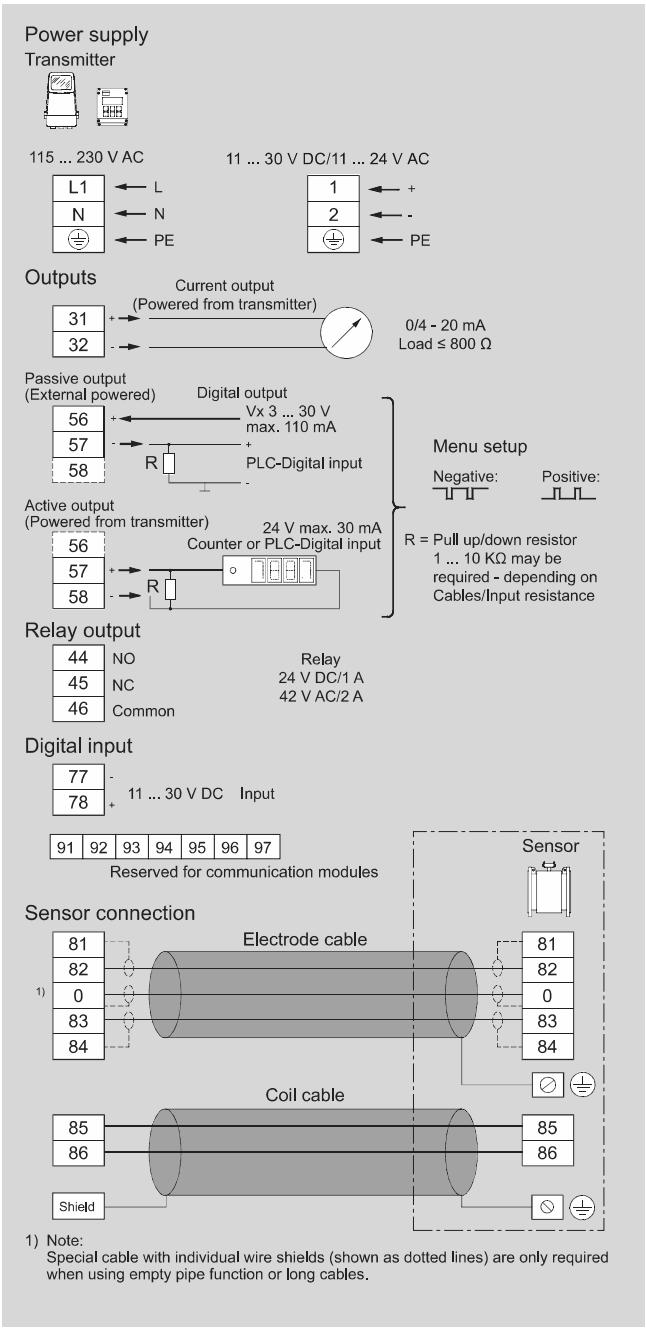
PE must be connected due to safety class 1 power supply.

Mechanical counters

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

Output cables

If the output cable length is long in noisy environment, we recommend to use shielded cable.



© Siemens AG 2012

Transmitter MAG 6000 I/6000 I Ex de

Overview

The SITRANS F M MAG 6000 I/MAG 6000 I Ex de transmitter is designed for the demands in the process industry. The robust die cast aluminum housing provides superb protection, even in the most harsh industrial environments. Full input and output functionality is given even in the Ex version.

Benefits

- Full range of Ex-rated flowmeters with intrinsically safe rated input and outputs
- For compact or remote installation
- HART, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS PA and DP, Modbus RTU/RS 485 add-on communication modules available
- Superior signal resolution for optimum turn down ratio
- Digital signal processing with many possibilities
- Automatic reading of SENSORPROM data for easy commissioning
- User configurable operation menu with password protection
  - 3 lines, 20 characters display in 11 languages
  - Flow rate in various units
  - Totalizer for forward, reverse and net flow as well as much more information available.
- Multiple functional outputs for process control, minimum configuration with analogue, pulse/frequency and relay output (status, flow direction, limits)
- Comprehensive self-diagnostic for error indication and error logging
- Batch control

Design

The transmitter is designed for either compact or remote installation in non-hazardous or hazardous areas (compact mounted transmitter to be ordered together with the sensors).

Function

The following functions are available:

- Flow rate
- 2 measuring ranges
- 2 totalizers
- Low flow cut-off
- Flow direction
- Error system
- Operating time
- Uni-/bidirectional flow
- Limit switches and pulse output
- Batch control

The MAG 6000 I/6000 I Ex de is a microprocessor-based transmitter with a build-in alphanumeric display in several languages. The transmitters evaluate the signals from the associated electromagnetic sensors and also fulfil the task of a power supply unit which provides the magnet coils with a constant current.

Further information on connection, mode of operation and installation can be found in the data sheets for the sensors.

Displays and keypads

Operation of the transmitter can be carried out using:

- Keypad and display unit
- HART communicator
- PC/laptop and SIMATIC PDM software via HART communication
- PC/laptop and SIMATIC PDM software using PROFIBUS or Modbus communication

Technical specifications

Mode of operation and design	
Measuring principle	Electromagnetic with pulsed constant field
Empty pipe	Detection of empty pipe (special cable required in remote mounted installation)
Excitation frequency	Depend on sensor size
Electrode input impedance	> 1 x 10^{14} Ω
Input	
Digital input	11 ... 30 V DC, Ri = 4.4 kΩ
• Activation time	50 ms
• Current	$I_{11\ V\ DC}$ = 2.5 mA, $I_{30\ V\ DC}$ = 7 mA
Output	
Current output	
• Signal range	4 ... 20 mA (active/ passive)
• Load	< 560 Ω
• Time constant	0.1 … 30 s, adjustable
Digital output	
• Frequency	0 … 10 kHz, 50 % duty cycle (uni-/bidirectional)
• Time constant	0.1 … 30 s, adjustable
• Pulse (passive)	3 … 30 V DC, max 110 mA (30 mA Ex version), 200 Ω ≤ Ri ≤ 10 kΩ (powered from connected equipment)
• Time constant	0.1 … 30 s, adjustable
Relay output	
• Time constant	Changeover relay, same as current output
• Load	42 V AC/2 A, 24 V DC/1 A
Low flow cut off	0 … 9.9 % of maximum flow
Galvanic isolation	All inputs and outputs are galvanic isolated
Max. measuring error	
MAG 6000 I/MAG 6000 I Ex de (incl. sensor)	± 0.2 % ± 1 mm/s

© Siemens AG 2012

Rated operation conditions	
Ambient temperature	
• Operation	
- MAG 6000 I	-20 … +60 °C (-4 … +140 °F)
- MAG 6000 I Ex	-20 … +60 °C (14 … 140 °F)
• Storage	-40 … +70 °C (-40 … +158 °F)
Mechanical load	18 ... 1000 Hz random in x, y, z, directions for 2 hours according to EN 60068-2-36 Transmitter: 1.14 grms
Degree of protection	IP67/NEMA 4X to IEC 529 and DIN 40050 (1 mH_2O 30 min.)
EMC performance	IEC/EN 61326-1 (all environments) IEC/EN 61326-2-5 Namur NE21
Display and keypad	
Totalizer	Two eight-digit counters for forward, net or reverse flow
Display	Background illumination with alphanumeric text, 3 x 20 characters to indicate flow rate, totalized values, settings and faults; Reverse flow indicated by negative sign
Keypad	Capacitive touch keypad with LED light for feedback indication
Time constant	Time constant as current output time constant
Design	
Enclosure material	Die cast aluminum, with corrosion resistant Basic Polyester power coating (min. 60 µm)
• Wall mounting	Wall mounting bracket enclosed for remote version
Dimensions	See dimensional drawings
Weight	See dimensional drawings
Power supply	• Standard transmitter: 18 ... 90 V DC; 115 ... 230 V AC; 50 ... 60 Hz • Ex transmitter: 18 ... 30 V DC • Ex transmitter: 115 ... 230 V AC; 50 ... 60 Hz
Power consumption	• 230 V AC: 20 VA • 24 V DC: 9.6 W, I_N = 0.4 A, I_{ST} = 1 A (3 ms)
Certificates and approvals	
MAG 6000 I	• CE • C-tick • FM Class I, Div 2 • FM Class I, Zone 2 • CSA Class I, Div 2 • CSA Class I, Zone 2
MAG 6000 I Ex	• IEC Ex de [ia] [ib] ia IIC T6 Gb Ex tDa 21 IP67 • ATEX II 2(1)(2) GD EEx de [ia] ia [ib] IIC T6 • FM Class I, Div 1[1)] • FM Class I, Zone 1 • CSA Class I, Zone 1

Cable entries	Remote installation
MAG 6000 I	2 x M25 (for supply/output) and 2 x M16 (for sensor connection) or 2 x ½" NPT (for supply/output) and 2 x M16 (for sensor connection)
MAG 6000 I Ex ATEX 2G D	2 x M20 (for supply/output) and 2 x M16 (for sensor connection)
Communication	
Standard versions	HART, Modbus RTU/RS 485, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS PA, PROFIBUS DP add-on modules
Ex versions	HART, PROFIBUS PA,

[1)] Applicable for: Compact mounted MAG 6000 I Ex de on MAG 3100 (sizes DN 15 ... DN 300 (½" ... 12"))

Selection and Ordering data	Order No.
SITRANS F M Transmitter MAG 6000 I/Ex de ◆	**7ME6930-**
Remote with standard wall mounting bracket, local display, die cast aluminum	**2BA■■-1■A■**
Supply voltage	
Standard transmitter: 115 ... 230 V AC, 50 ... 60 Hz; 18 ... 90 V DC	**2**
Ex transmitter: 18 ... 30 V DC	**4**
Ex transmitter: 115 ... 230 V AC, 50 ... 60 Hz	**5**
Ex approval	
Standard sensor: FM Class I, Div 2, CSA Class I, Div 2	**0**
Ex sensor: Hazardous area (ATEX 2 GD; FM Class 1, Zone 1; CSA Class 1, Zone 1)	**2**
Communication	
None	**A**
HART	**B**
PROFIBUS PA Profile 3	**F**
PROFIBUS DP Profile 3 (not for Ex version)	**G**
Modbus RTU/RS 485 (not for Ex version)	**E**
FOUNDATION Fieldbus H1 (not for Ex version)	**J**
Cable gland entries	
Metric	**0**
½" NPT	**2**

◆ Short lead time (details in PMD)

Selection and Ordering data	Order code
Further design	
Please add **"-Z"** to Order No. and specify Order code(s) and plain text.	
Tag name plate, stainless steel fixed with SS wire (add plain text)	**Y17**
Tag name plate, plastic (self adhesive)	**Y18**
Other, post-production requirements (add plain text)	**Y99**

Operating instructions for SITRANS F M MAG 6000 I

Description	Order No.
• English	**A5E02083319**
• German	**A5E02210835**
• French	**A5E02342413**

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
http://www.siemens.com/flowdocumentation

© Siemens AG 2012

Transmitter MAG 6000 I/6000 I Ex de

Communication modules for MAG 6000 I (All standard outputs can still be used)

Description		Order No.
HART (only for MAG 6000 I/Ex)	◆	**FDK:085U0321**
Modbus RTU/RS 485[1)]	◆	**FDK:085U0234**
PROFIBUS PA Profile 3	◆	**FDK:085U0236**
PROFIBUS DP Profile 3[1)]	◆	**FDK:085U0237**
DeviceNet[1)]	◆	**FDK:085U0229**
FOUNDATION Fieldbus H1[1)]	◆	**A5E02054250**

◆ Short lead time (details in PMD)

[1)] Not for Ex versions

Operating instructions for SITRANS F add-on modules

Description	Order No.
HART, English	**A5E03089708**
PROFIBUS PA/DP	
• English	**A5E00726137**
• German	**A5E01026429**
MODBUS	
• English	**A5E00753974**
• German	**A5E03089262**
• Spanish	**A5E03089278**
• French	**A5E03089265**
FOUNDATION Fieldbus	
• English	**A5E02318728**
• German	**A5E02488856**
• Spanish	**A5E02512177**
• French	**A5E02512169**
DeviceNet, English	**A5E03089720**

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

Accessories MAG 6000 I/MAG 6000 I Ex de

Description		Order No.
Cable for standard electrode or coil, 3 x 1.5 mm²/ 18 gage with shield PVC. Temperature range: -30 ... +70 °C (-22 ... +158 °F)		
• 10 m (33 ft)	◆	**FDK:083F0121**
• 20 m (65 ft)	◆	**FDK:083F0210**
• 40 m (130 ft)	◆	**FDK:083F0211**
• 60 m (200 ft)	◆	**FDK:083F0212**
• 100 m (330 ft)	◆	**FDK:083F0213**
• 150 m (500 ft)		**FDK:083F3052**
• 200 m (650 ft)		**FDK:083F3053**
• 500 m (1650 ft)		**FDK:083F3054**
Electrode cable for empty pipe or low conductivity, double shielded, 3 x 0.25 mm² Temperature range: -30 ... +70 °C (-22 ... +158 °F)		
• 10 m (33 ft)	◆	**FDK:083F3020**
• 20 m (65 ft)	◆	**FDK:083F3095**
• 40 m (130 ft)		**FDK:083F3094**
• 60 m (200 ft)		**FDK:083F3093**
• 100 m (330 ft)		**FDK:083F3092**
• 150 m (500 ft)		**FDK:083F3056**
• 200 m (650 ft)		**FDK:083F3057**
• 500 m (1650 ft)		**FDK:083F3058**

Cable kit with standard coil cable, 3 x 1.5 mm²/18 gage with shield PVC and electrode cable double shielded, 3 x 0.25 mm²		
• 5 m (16.5 ft)	◆	**A5E02296329**
• 10 m (33 ft)	◆	**A5E01181647**
• 15 m (49 ft)	◆	**A5E02296464**
• 20 m (65 ft)	◆	**A5E01181656**
• 25 m (82 ft)	◆	**A5E02296490**
• 30 m (98 ft)	◆	**A5E02296494**
• 40 m (130 ft)	◆	**A5E01181686**
• 50 m (164 ft)	◆	**A5E02296498**
• 60 m (200 ft)		**A5E01181689**
• 100 m (330 ft)		**A5E01181691**
• 150 m (500 ft)		**A5E01181699**
• 200 m (650 ft)		**A5E01181703**
• 500 m (1650 ft)		**A5E01181705**

Low noise electrode coax cable for low conductivity and high vibration levels of cables, 3 x 0.13 mm²		
• 2 m (6.6 ft)		**A5E02272692**
• 5 m (16.5 ft)		**A5E02272723**
• 10 m (33 ft)		**A5E02272730**

◆ Short lead time (details in PMD)

Spare parts

Description	Order No.
MAG 6000 I Display	**FDK:085U3122**
Accessory bag including cable gland inserts coil and electrode connectors	**FDK:085U3144**
Electronics cover with Ex glass plate. Die cast aluminum, with corrosion-resistant Basic Polyester powder coating (min. 60 µm).	**7ME5933-0AC01**
Cover for connection board incl. gasket (for remote version). Die cast aluminum, with corrosion-resistant Basic Polyester powder coating (min. 60 µm).	**7ME5933-0AC02**
Cover for mains supply/communication. Die cast aluminum, with corrosion-resistant Basic Polyester powder coating (min. 60 µm).	**7ME5933-0AC03**

© Siemens AG 2012

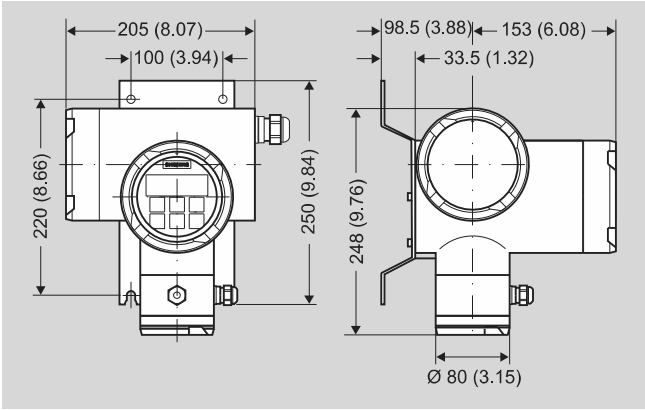
Description	Order No.	
Safety clamp	**7ME5933-0AC06**	
Standard wall mounting bracket. Steel EN10088-2-1.4404	**7ME5933-0AC04**	
Wall-/pipe mounting bracket kit, BI 2,5 DIN59382 X6Cr17	**7ME5933-0AC05**	

Complete spare part PCB unit

Description	Order No.	
MAG 6000 I PCBA (not for Ex)	**FDK:085U3123**	
MAG 6000 I Ex de, 18 ... 30 V DC Spare PCBA unit for use with Ex sensors with increased safety e (For Ex sensors: 7ME6110, 7ME6120, 7ME6140, 7ME6310, 7ME6320, 7ME6340) (For 7ME6330 > DN300)	**A5E01013340**	
MAG 6000 I Ex de 115 ... 230 V AC Spare PCBA unit for use with Ex sensors with increased safety e (For EX sensors: 7ME6110, 7ME6120, 7ME6140, 7ME6310, 7ME6320, 7ME6340) (For 7ME6330 > DN300)	**A5E01013127**	

Please use online Product selector to get latest updates.
Product selector link:
www.pia-selector.automation.siemens.com

Dimensional drawings

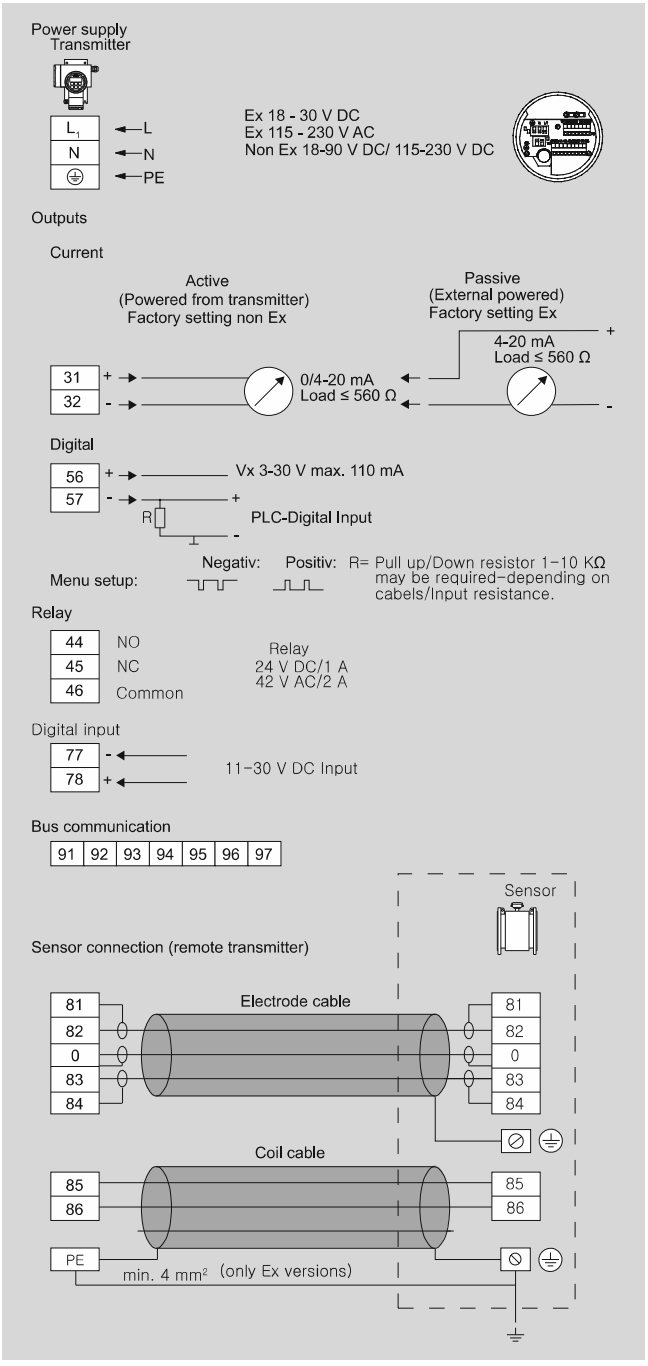


Dimensions in mm (inch), weight: 6 kg (13.5 lbs)

© Siemens AG 2012

Transmitter MAG 6000 I/6000 I Ex de

Schematics



© Siemens AG 2012

Overview

The SITRANS F M MAG 1100 is an electromagnetic flow sensor in a compact wafer design designed for flow applications in the process industry.

Benefits

- Sensor sizes: DN 2 to 100 (1/12" to 4")
- Compact wafer design meets EN 1092, DIN and ANSI flange standards
- Corrosion resistant AISI 316 stainless steel sensor housing
- Highly resistant liner and electrodes fitting most extreme process media
- Temperature rating up to 200 °C (392 °F)
- Hose proof IP67/NEMA 4X enclosure rating
- Designed that patented in-situ verification can be conducted. Using SENSORPROM fingerprints.

Application

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

- Process industry
- Chemical industry
- Pharmaceutical industry
- Water treatment like e.g. chemical dosing

Design

- Compact or remote mounting possible
- Easy "plug & play" field changeability of transmitter
- Simple on site upgrade to IP68/NEMA 6P terminal box
- Ex ATEX 2G D version
- FM Class I, Div 2

Mode of operation

The flow measuring principle is based on Faraday's law of electromagnetic induction according to which the sensor converts the flow into an electrical voltage proportional to the velocity of the flow.

Integration

The complete flowmeter consists of a flow sensor and an associated transmitter SITRANS F M MAG 5000, 6000 or 6000 I. The flexible communication concept USM II simplifies integration and update to a variety of fieldbus systems such as HART, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS DP and PA, Modbus RTU/RS 485.

© Siemens AG 2012

Flow sensor MAG 1100 and MAG 1100 HT

Technical specifications

Version	MAG 1100	MAG 1100 HT (High temperature)
Measuring principle	Electromagnetic induction	Electromagnetic induction
Excitation frequency (Mains supply: 50 Hz/60 Hz)	DN 2 ... 65 (1/12“ … 2½”): 12.5 Hz/15 Hz DN 80, 100 (3”, 4”): 6.25 Hz/7.5 Hz	DN 15 ... 50 (½“ … 2”): 12.5 Hz/15 Hz DN 80, 100 (3”, 4”): 6.25 Hz/7.5 Hz
Process connection		
Nominal size		
• MAG 1100 (Ceramic)	DN 2 … DN 100 (1/12" … 4")	DN 15 … DN 100 (½” … 4")
• MAG 1100 (PFA)	DN 10 … DN 100 (3/8" … 4")	
Mating flanges	EN 1092-1 (DIN 2501), ANSI B 16.5 class 150 and 300 or equivalent Option: DN 2 ... 10 (1/12” ... 3/8”): G½” / NPT ½” pipe connection adapters	EN 1092-1 (DIN 2501), ANSI B 16.5 class 150 and 300 or equivalent
Rated operating conditions		
Ambient conditions		
Ambient temperature[1]		
• Standard sensor	-40 … +100 °C (-40 … +212 °F)	-40 … +100 °C (-40 … +212 °F)
• Ex sensor	-20 … +60 °C (-4 … +140 °F)	-20 … +60 °C (-4 … +140 °F)
• Compact transmitter MAG 5000/6000[2]	-20 … +60 °C (-4 … +140 °F)	
• Compact transmitter MAG 6000 I	-20 … +60 °C (-4 … +140 °F)	
• Compact transmitter MAG 6000 I Ex de	-20 … +60 °C (-4 … 140 °F)	
Temperature of medium		
• MAG 1100 (Ceramic)	-20 … +150 °C (-4 … +302 °F)	-20 … +200 °C (-4 … +392 °F)
• MAG 1100 Ex (Ceramic)	-20 … +150 °C (-4 … +302 °F)	-20 … +180 °C (-4 … +356 °F)
• MAG 1100 (PFA)	-30 … +130 °C (-22 … +266 °F) Suitable for steam sterilization at 150 °C (302 °F)	
Temperature shock		
• MAG 1100 (Ceramic)		
- Duration ≤ 1 min, followed by 10 min rest	• DN 2, 3 (1/12”, 1/8”) No limitations • DN 6, 10, 15, 25: Max. ΔT ≤ 80 °C/min (¼”, 3/8”, ½”, 1”: Max. ΔT ≤ 144 °F/min) • DN 40, 50, 65: Max. ΔT ≤ 70 °C/min (1½”, 2”, 2½”: Max. ΔT ≤ 126 °F/min) • DN 80, 100: Max. ΔT ≤ 60 °C/min (3”, 4”: Max. ΔT ≤ 108 °F/min)	• DN 15, 25: Max. ΔT ≤ 80 °C/min (½”, 1”: Max. ΔT ≤ 144 °F/min) • DN 40, 50: Max. ΔT ≤ 70 °C/min (1½”, 2”: Max. ΔT ≤ 126 °F/min) • DN 80, 100: Max. ΔT ≤ 60 °C/min (3”, 4”: Max. ΔT ≤ 108 °F/min)
• MAG 1100 (PFA)	Max. ± 100 °C (212 °F) momentarily	
Operating pressure		
• MAG 1100 (Ceramic)	• DN 2 ... 65: 40 bar (1/12” … 2½”: 580 psi) • DN 80: 37.5 bar (3”: 540 psi) • DN 100: 30 bar (4”: 435 psi) Vacuum: 1 x 10^{-6} bar_{abs} (1.5 x 10^{-5} psi_{abs})	• DN 15 ... 50: 40 bar (½” … 2”: 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})
• MAG 1100 (PFA)	20 bar (290 psi) Vacuum: 0.02 bar_{abs} (0.3 psi_{abs}) DN 80 ... DN 100: CO_2 pressure max. 7 bar (101.5 psi)	
Mechanical load (vibration)	• 18 ... 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 mounted transmitter: 1.14 grms • For compact installation with the MAG 6000 I, transmitter to be supported to avoid tension on sensor part.	• 18 ... 1000 Hz random in x, y z, directions for 2 hours according to EN 60068-2-36 • Sensor: 3.17 grms
Enclosure rating (standard)	IP67 to EN 60529 (NEMA 4X), 1 mH_2O for 30 min	IP67 to EN 60529 (NEMA 4X), 1 mH_2O for 30 min
EMC	2004/108/EC	2004/108/EC

© Siemens AG 2012

Version	MAG 1100	MAG 1100 HT (High temperature)
Design		
Weight	See Dimensional drawings	See Dimensional drawings
Material		
• Enclosure		
- MAG 1100	Stainless steel AISI 316L/1.4404	Stainless steel AISI 316L/1.4404
• Terminal box		
- Standard	Fibre glass reinforced polyamide (not for Ex)	Stainless steel AISI 316/1.4436
- Option	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
• Gaskets		
- Standard	EPDM (max. 150 °C, PN 40 (max. 302 °F, 600 psi))	Graphite (max. 200 °C, PN 40 (max. 392 °F, 600 psi))
- Option	• Graphite (max. 200 °C, PN 40 (max. 392 °F, 600 psi)) • PTFE (max. 130 °C, PN 25 (max. 266 °F, 300 psi))	
• Pipe connection adapters: DN 2, 3, 6 and 10 (1/12“, 1/8“, ¼” and 3/8”)	• Stainless steel, AISI 316/1.4436 • Hastelloy C22/2.4602 • PVDF	
Liner		
• MAG 1100 (Ceramic)	• DN 2, 3 (1/12“, 1/8“): Zirconium oxide (ZrO_2) (ceramic) • DN 6 ... 100 (¼“ ... 4“): Aluminum oxide Al_2O_3	DN 15 ... 100 (½“ ... 4“): Aluminum oxide Al_2O_3
• MAG 1100 (PFA)	Reinforced PFA (not for Ex)	
Electrodes		
• MAG 1100 (Ceramic)	• DN10 ... 100 (3/8" ... 4") : Platinum with gold / Titanium brazing alloy • DN 2 ... 6 (1/12“ ... ¼”): Platinium	Platinum with gold / Titanium brazing alloy
• MAG 1100 (PFA)	• DN 10 ... 15 (3/8" ... ½"): Hastelloy C276/2.4819 • DN 25 ... 100 (1" ... 4"): Hastelloy C22/2.4602	
Cable entries	• 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
Certificates and approvals		
Calibration		
Standard production calibration, calibration report shipped with sensor	Zero-point, 2 x 25 %, 2 x 90 %	Zero-point, 2 x 25 %, 2 x 90 %
Conforms to	• PED – 97/23/EC[3] (Fluid group: Liquid of fluid group 1) • CRN (PFA)	• PED – 97/23/EC[3] • CRN (PFA)
Ex approvals		
MAG 1100 (Ceramic)		
• Ex sensor or Compact with MAG 6000 I Ex	ATEX 2G D sensor Ex de ia IIB T3 - T6	ATEX 2G D sensor Ex de ia IIB T3 - T6
• Sensor with/without MAG 5000/6000 /6000 I	FM Class I, Div 2	FM Class I, Div 2
MAG 1100 (PFA)		
• Sensor with/without MAG 5000/6000/6000 I	FM Class I, Div 2	
Custody transfer approval (MAG 5000/6000 CT)	• Cold water pattern approval PTB (Germany) • Hot water pattern approval PTB (Germany) • Heat meter pattern approval - OIML R 75 (Denmark) • Other media than water pattern approval- OIML R 117 (Ceramic liner) (Denmark)	• Hot water pattern approval PTB (Germany) • Heat meter pattern approval - OIML R 75 (Denmark)

1) Conditions are also dependent on liner characteristics

2) With compact transmitter MAG 5000 CT/6000 CT -20 ... +50 °C (-4 ... +122 °F)

3) For further information on the PED standard and requirements, see page 9/14.

For technical specification for transmitter - see transmitter pages.

© Siemens AG 2012

Flow sensor MAG 1100 and MAG 1100 HT

Selection and Ordering data		Order No.
Sensor SITRANS F M MAG 1100 EPDM gaskets included		7ME6110 - ■■A■0 - ■■■■
Diameter		
DN 2 (1/12“)	◆	1D
DN 3 (1/8“)	◆	1H
DN 6 (¼“)	◆	1M
DN 10 (3/8“)	◆	1R
DN 15 (½“)	◆	1V
DN 25 (1“)	◆	2D
DN 40 (1½“)	◆	2R
DN 50 (2“)	◆	2Y
DN 65 (2½“)	◆	3F
DN 80 (3“)	◆	3M
DN 100 (4“)	◆	3T
Liner material		
PFA - DN 10 ... 100 (3/8“ ... 4“) (not for Ex)	◆	1
Ceramic	◆	2
Electrode material		
Hastelloy C (only with PFA liner)	◆	1
Platinum (only with ceramic liner)	◆	2
Transmitter		
Standard sensor for remote transmitter (order transmitter separately)	◆	A
Ex sensor for remote transmitter (order transmitter separately)		B
MAG 6000 I, Aluminum 18 ... 90 V DC, 115 ... 230 V AC		C
MAG 6000 I, Aluminum 18 ... 30 V DC, Ex		D
MAG 6000 I, Aluminum 115 ... 230 V AC, Ex		E
MAG 6000 Polyamide, 11 ... 30 V DC/ 11 … 24 V AC	◆	H
MAG 6000, Polyamide, 115 ... 230 V AC	◆	J
MAG 5000, Polyamide, 11 ... 30 V DC/ 11 ... 24 V AC	◆	K
MAG 5000, Polyamide, 115 ... 230 V AC	◆	L
Communication		
No communication, add-on possible	◆	A
HART	◆	B
PROFIBUS PA Profile 3 (only MAG 6000/MAG 6000 I)	◆	F
PROFIBUS DP Profile 3 (not for Ex) (only MAG 6000/MAG 6000 I)	◆	G
Modbus RTU/RS 485 (not for Ex) (only MAG 6000/MAG 6000 I)	◆	E
FOUNDATION Fieldbus H1 (only MAG 6000/MAG 6000 I)	◆	J
Cable glands/terminal box		
Metric: Polyamide terminal box or 6000 I compact	◆	1
½" NPT: Polyamide terminal box or 6000 I compact	◆	2
Metric: SS terminal box (mandatory for stainless steel MAG 6000 transmitter)		3
½" NPT: SS terminal box (mandatory for stainless steel MAG 6000 transmitter)		4

◆ Short lead time (details in PMD)

Selection and Ordering data	Order code
Additional information	
Please add **“-Z“** to Order No. and specify Order code(s) and plain text.	
Customer-specific converter setup	**Y20**
Tag name plate, stainless steel fixed with SS wire (add plain text)	**Y17**
Tag name plate, plastic (self adhesive)	**Y18**
Factory certificate according to EN 10204-2.1	**C15**
Factory certificate according to EN 10204-2.2	**C14**
Sensor cables wired (specify cable order no.)	**Y40**
Sensor for remote transmitter's junction box potted to IP68 with wired cable (specify cable order no.) (not for Ex sensors)	**Y41**
Other postproduction requirements (add desired text)	**Y99**
Additional calibrations	
• Matched pair - (Standard production calibration where sensor and transmitter is calibrated together)	**On request**[1)]
• Customer-specified calibration up to 10 points	**On request**[1)]
• Customer-witnessed calibration Any of above calibration	**On request**[1)]

[1)] Ordering On request as dedicated information from the customer on the individual sensors is required. Please fill in the calibration form found on http://www.automation.siemens.com/mcms/automation/en/sensor-systems/process-instrumentation/Pages/Default.aspx and send together with the order. (Size dependent restriction on maximum flow rates may apply

Operating instructions for SITRANS F M MAG 1100

Description	Order No.
Handbook	
• English	**A5E02435647**

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
http://www.siemens.com/flowdocumentation

Accessories

Description		Order No.
Potting kit for terminal box of flow sensors for IP68/NEMA 6P (not for Ex sensors)	◆	**FDK:085U0220**

© Siemens AG 2012

Flow sensor MAG 1100 and MAG 1100 HT

Selection and Ordering data	Order No.
Sensor SITRANS F M	
MAG 1100 HT High Temperature	**7ME6120-**
Ceramic liner, Platinum electrode, Graphite gaskets included	**■■A20-2■A■**
Diameter	
DN 15 (½")	**1V**
DN 25 (1")	**2D**
DN 40 (1½")	**2R**
DN 50 (2")	**2Y**
DN 80 (3")	**3M**
DN 100 (4")	**3T**
Transmitter	
Standard sensor for remote transmitter (order transmitter separately)	**A**
Ex sensor for remote transmitter (order transmitter separately)	**B**
Cable glands/terminal box	
Metric: SS terminal box	**3**
½" NPT: SS terminal box	**4**

Selection and Ordering data	Order code
Additional information	
Please add **"-Z"** to Order No. and specify Order code(s) and plain text.	
Customer-specific converter setup	**Y20**
Tag name plate, stainless steel fixed with SS wire (add plain text)	**Y17**
Tag name plate, plastic (self adhesive)	**Y18**
Factory certificate according to EN 10204-2.1	**C15**
Factory certificate according to EN 10204-2.2	**C14**
Sensor cables wired (specify cable order no.)	**Y40**
Sensor for remote transmitter's junction box potted to IP68 with wired cable (specify cable order no.) (not for Ex sensors)	**Y41**
Other postproduction requirements (add desired text)	**Y99**
Additional calibrations	
• Matched pair - (Standard production calibration where sensor and transmitter is calibrated together)	**On request**[1)]
• Customer-specified calibration up to 10 points	**On request**[1)]
• Customer-witnessed calibration Any of above calibration	**On request**[1)]

[1)] Ordering On request as dedicated information from the customer on the individual sensors is required. Please fill in the calibration form found on pi.khe.siemens.de/index.aspx?Nr=17460 and send together with the order. (Size dependent restriction on maximum flow rates may apply

Operating instructions for SITRANS F M MAG 1100

Description	Order No.
Handbook	
• English	**A5E02435647**

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
http://www.siemens.com/flowdocumentation

MAG 5000/6000 transmitters and sensors are packed in separate boxes, the final assembly takes place during installation at the customer's place. MAG 6000 I/MAG 6000 I Ex ATEX 2G D transmitters and sensors are delivered compact mounted from factory. Communication module will be premounted in the transmitter.

Please use online Product selector to get latest updates.

Product selector link:
www.pia-selector.automation.siemens.com

Accessories

Description	Order No.	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P (not for Ex sensors)	◆ **FDK:085U0220**	

◆ Short lead time (details in PMD)

3

© Siemens AG 2012

Flow sensor MAG 1100 and MAG 1100 HT

Accessories for MAG 1100 sensor		Order No.
Pipe connection ½" external thread		
For DN 2 ... 10 (1/12" ... 3/8") sensor, material: SS 316 2 pipe connections, 2 EPDM gaskets, 12 pcs M4 x 12 screws		
• ½" G, ISO 7-1 tappered thread, SS 316	◆	**FDK:083G0080**
• ½" NPT thread, SS 316	◆	**FDK:083G4330**
For DN 2 ... 10 (1/12" ... 3/8") sensor, material: Hastelloy C 2 pipe connections, 2 PTFE gaskets, 12 pcs M4 x 14 screws		
• ½" G, ISO 7-1 tappered thread	◆	**FDK:083G4332**
• ½" NPT thread	◆	**FDK:083G4331**
For DN 2…10 (1/12"…3/8") sensor 2 PVDF pipe connections (Max. 70 °C, PN 8 bar/max 158 °F, 116 PSI), 1 grounding ring[1], 1 earthing wire, 3 PTFE gaskets, 6 pcs. M4 x 12 and 6 pcs. M4 x 20 screws		
• ½"G, ISO 7-1 tapered thread PVDF incl. grounding ring Hastelloy C22/2.4602		**A5E01018395**
• ½" NPT thread PVDF incl. grounding ring Hastelloy C22/2.4602		**A5E01018400**
EPDM gaskets		
Material: EPDM; each set includes: 2 EPDM gaskets, 1 earthing wire, 1 M6 screw, 1 nut, 1 washer, 1 bolt earthing plate		
• DN 2 ... 10 (1/12" ... 3/8")	◆	**FDK:083G3116**
• DN 15 (½")	◆	**FDK:083G3117**
• DN 25 (1")	◆	**FDK:083G3119**
• DN 40 (1½")	◆	**FDK:083G3121**
• DN 50 (2")	◆	**FDK:083G3122**
• DN 65 (2½")	◆	**FDK:083G3123**
• DN 80 (3")	◆	**FDK:083G3124**
• DN 100 (4")	◆	**FDK:083G3125**
PTFE gaskets		
Material: PTFE; each set includes: 2 gaskets, 2 earthing wires, 3 M6 screws (DN 2 ... DN 10: 12 pcs M4 x 14)		
• DN 2 ... 10 (1/12" ... 3/8")	◆	**FDK:083G0156**
• DN 15 (½")	◆	**FDK:083G0157**
• DN 25 (1")	◆	**FDK:083G0159**
• DN 40 (1½")	◆	**FDK:083G0161**
• DN 50 (2")		**FDK:083G0162**
• DN 65 (2½")		**FDK:083G0163**
• DN 80 (3")		**FDK:083G0164**
• DN 100 (4")		**FDK:083G0165**
Graphite gaskets		
Material: Graphite; conductive, each set includes: 2 gaskets (conductive (can also be used as grounding ring))		
• DN 2 ... 10 (1/12" ... 3/8")	◆	**FDK:083G0116**
• DN 15 (½")	◆	**FDK:083G0117**
• DN 25 (1")	◆	**FDK:083G0119**
• DN 40 (1½")	◆	**FDK:083G0121**
• DN 50 (2")		**FDK:083G0122**
• DN 65 (2½")		**FDK:083G0123**
• DN 80 (3")		**FDK:083G0124**
• DN 100 (4")		**FDK:083G0125**

Accessories for MAG 1100 sensor		Order No.
Grounding ring SS		
Material: AISI 316/1.4436; each set includes: 1 grounding ring[1], 3 PTFE gaskets, 1 earth wire, 1 M6 screw		
• DN 2 ... 10 (1/12" ... 3/8")		**FDK:083G0686**
• DN 15 (½")		**FDK:083G0687**
• DN 25 (1")		**FDK:083G0689**
• DN 40 (1½")		**FDK:083G0691**
• DN 50 (2")		**FDK:083G0692**
• DN 65 (2½")		**FDK:083G0693**
• DN 80 (3")		**FDK:083G0694**
• DN 100 (4")		**FDK:083G0695**
Grounding ring (Hastelloy C)		
Material: Hastelloy C22/2.4602; each set includes: 1 grounding ring[1], 3 PTFE gaskets, 1 earth wire, 1 M6 screw		
• DN 2 ... 10 (1/12" ... 3/8")	◆	**FDK:083G3256**
• DN 15 (½")		**FDK:083G3257**
• DN 25 (1")		**FDK:083G3259**
• DN 40 (1½")		**FDK:083G3261**
• DN 50 (2")		**FDK:083G3262**
• DN 65 (2½")		**FDK:083G3263**
• DN 80 (3")		**FDK:083G3264**
• DN 100 (4")		**FDK:083G3265**
Grounding ring (Tantalum)		
Material: Tantalum; each set includes: 1 grounding ring[1], 3 PTFE gaskets, 1 earth wire, 1 M6 screw		
• DN 2 ... 10 (1/12" ... 3/8")	◆	**A5E01181599**
• DN 15 (½")	◆	**A5E01181606**
• DN 25 (1")	◆	**A5E01181610**
• DN 40 (1½")	◆	**A5E01181613**
• DN 50 (2")		**A5E01181615**
• DN 65 (2½")		**A5E01181616**
• DN 80 (3")		**A5E01181619**
• DN 100 (4")		**A5E01181622**
Studs and nuts		
for DN 100 PN 25/40, 8 M20 studs, 16 M20 nuts		
Material: AISI 304/1.4305		
• DN 100 (4")		**FDK:083G0226**

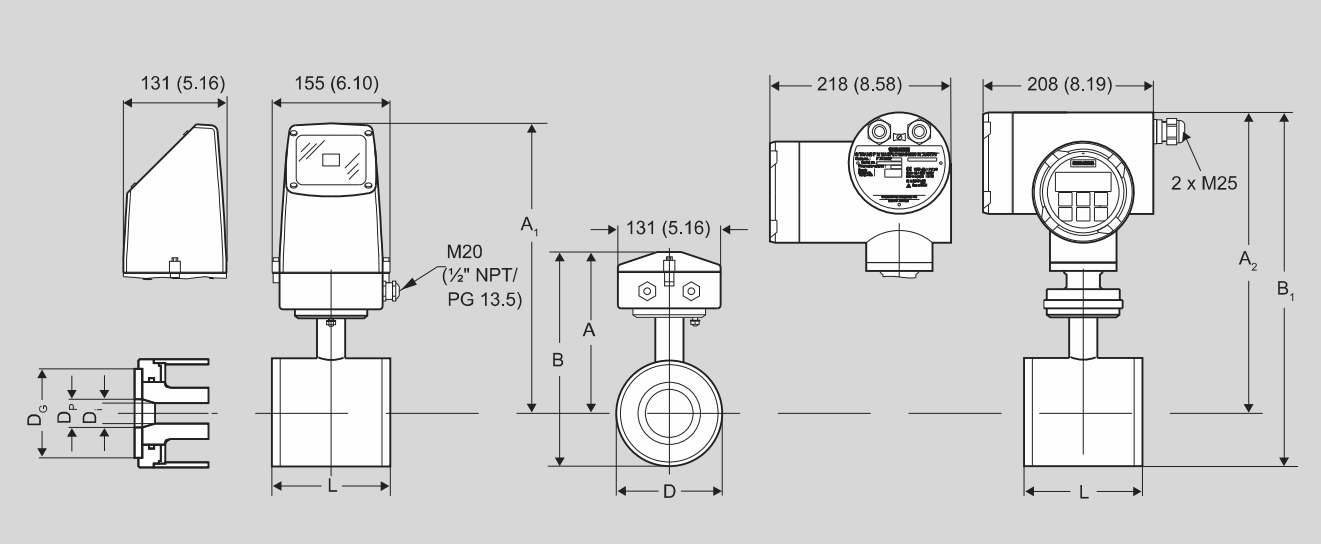
[1] Thickness of grounding ring is 2 mm (0.08 inch)

◆ Short lead time (details in PMD)

© Siemens AG 2012

Dimensional drawings

Sensor MAG 1100, compact/remote



Dimensions in mm (inch)

Important note: For compact installation with MAG 6000 I/Ex - transmitter to be supported to avoid tension on the sensor part

Size DN	$A^{1)}$ [mm]	$B^{1)}$ [mm]	$A_1/A_2{}^{3)}$ [mm]	B_1 [mm]	D [mm]	D_i [mm]	D_i (PFA) [mm]	D_P [mm]	D_G [mm]	Weight$^{2)}$ [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

Size [inch]	$A^{1)}$ [inch]	$B^{1)}$ [inch]	$A_1/A_2{}^{3)}$ [inch]	B_1 [inch]	D [inch]	D_i [inch]	D_i (PFA) [inch]	D_P [inch]	D_G [inch]	Weight$^{2)}$ [lbs]
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	4.9
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) 14.5 mm/0.571" shorter when the AISI terminal box is used (Ex or high temperature 200 °C (392 °F) version)
2) With transmitter MAG 5000 or MAG 6000 installed, weight is increased by approximately 0.8 kg (1.8 lb).
With MAG 6000 I weight is increased with 5.5 kg (12.1 lbs).
3) A_2 is 3 mm (0.12") shorter than A_1

© Siemens AG 2012

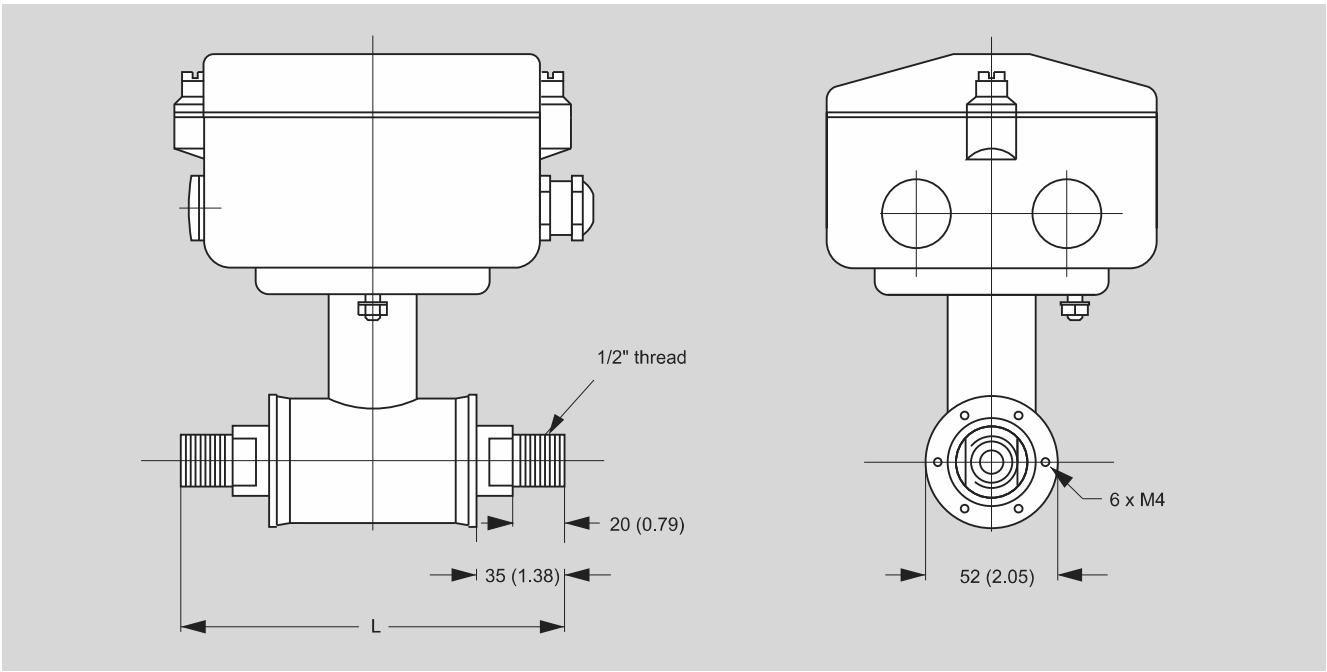
Flow sensor MAG 1100 and MAG 1100 HT

The total build-in length “L” [mm]/[inch] before assembling depends on the gasket selected

Size		EPDM		Graphite		PTFE (Teflon)		Without gasket		Earthing ring	
DN	inch	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
2 ... 10[1)]	1/12 ... 3/8	64	2.52	66	2.60	70	2.75	64	2.52	77	3.03
15	½	65	2.56	66	2.60	70	2.75	64	2.52	77	3.03
25	1	80	3.15	81	3.19	85	3.35	79	3.10	92	3.62
40	1½	95	3.74	96	3.78	100	3.94	94	3.70	107	4.21
50	2	105	4.13	106	4.17	110	4.33	104	4.05	117	4.61
65	2½	130	5.12	131	5.15	135	5.31	129	5.05	142	5.60
80	3	155	6.10	156	6.14	160	6.30	154	6.00	167	6.57
100	4	185	7.28	186	7.31	190	7.48	184	7.20	197	7.76

1) Mounting between two flanges

Sensor MAG 1100 DN 2 ... 10 (1/12“ ... 3/8“) with adapters



The MAG 1100 DN 2, 3, 6 and 10 (1/12“, 1/8“, ¼” and 3/8”) are prepared for assembly with the ½” pipe connections. Dimensions in mm (inch)

The length “L“ varies dependent on the gasket choice.

Without gasket		EPDM		Graphite		Teflon	
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
150	5.9	150	5.9	152	6.0	156	6.1

Important note:
For compact installation with the MAG 6000 I, transmitter to be supported to avoid tension on sensor part.

© Siemens AG 2012

Overview

The electromagnetic sensor SITRANS F M MAG 1100 F is designed to meet applications in the food and beverage industry.

Benefits

- Sensor sizes: DN 10 to DN 100 (3/8" to 4")
- AISI 316 stainless steel enclosure
- Sensor: Hygienic connection, 3A approval and EHEDG certified
- Sanitary design for CIP / SIP cleaning
- Conforms to FDA
- Easy commissioning, the SENSORPROM unit automatically updates settings
- Hose proof IP67/NEMA 4X enclosure rating
- Designed that patented in-situ verification can be conducted. Using SENSORPROM fingerprints

Application

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

- Food industry
- Beverage industry
- Pharmaceutical industry

Design

- Unique mechanical design with a wide range of customer specified sanitary connection
- Compact or remote mounting possible easy "plug & play" field changeable
- Simple on site upgrade to IP68/NEMA 6P terminal box
- Ex ATEX 2G D version for hazardous areas (ceramic liner)

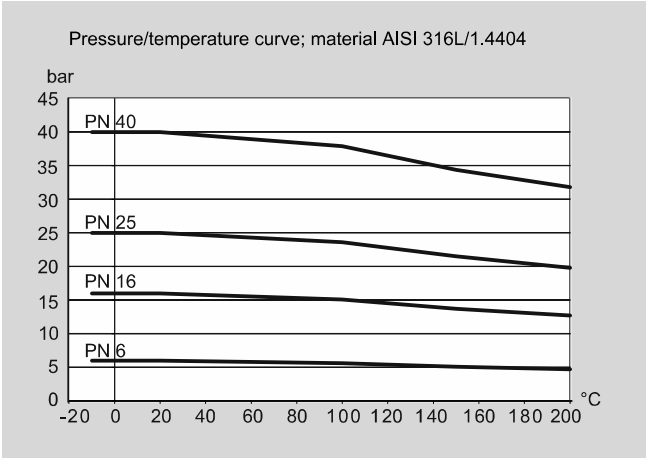
Mode of operation

The flow measuring principle is based on Faraday's law of electromagnetic induction according to which the sensor converts the flow into an electrical voltage proportional to the velocity of the flow.

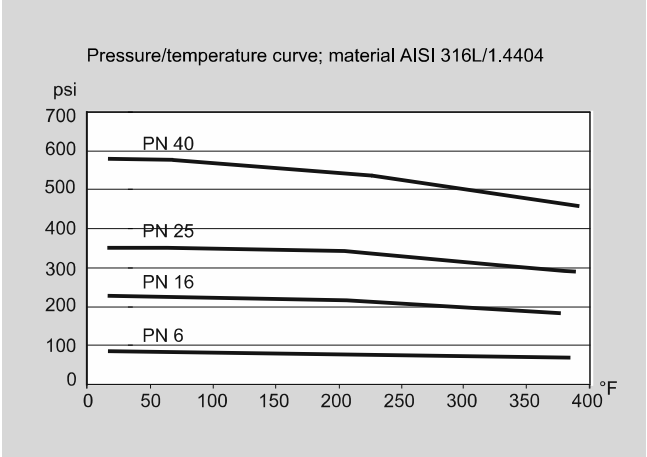
Integration

The complete flowmeter consists of a sensor and an associated transmitter SITRANS F M MAG 5000, 6000 and 6000 I. The flexible communication concept USM II simplifies integration and update to a variety of fieldbus systems such as PROFIBUS DP and PA, Modbus RTU/RS 485, HART, FOUNDATION Fieldbus H1, DeviceNet.

Pressure/temperature curve; material AISI 316L/1.4404



Pressure/temperature curve; material AISI 316L/1.4404



For further information on the PED standard and requirements, see page 9/14.

© Siemens AG 2012

Flow sensor MAG 1100 F

Technical specifications

Measuring principle	Electromagnetic induction
Excitation frequency (Mains supply: 50 Hz/60 Hz)	DN 10 ... 65 (¼" ... 2½"): 12.5 Hz/15 Hz DN 80 ... 100 (3", 4"): 6.25 Hz/7.5 Hz
Process connection	
Nominal size	DN 10 ... DN 100 (3/8" ... 4")
Process connection	Hygienic adapters available for: • Direct welding onto pipe • Clamp fitting • Threaded fitting
Rated operating conditions	
Ambient conditions	
Ambient temperature[1]	
• Sensor	-40 ... +100 °C (-40 ... +212 °F)
• Ex sensor	-20 ... +60 °C (-4 ... +140 °F)
• Compact transmitter MAG 5000/6000[2]	-20 ... +60 °C (-4 ... +140 °F)
• Transmitter MAG 6000 I	-20 ... +60 °C (-4 ... +140 °F)
• Compact transmitter MAG 6000 I Ex de	-20 ... +60 °C (-4 ... +140 °F)
Temperature of medium	
MAG 1100 F (Ceramic)	-20 ... +150 °C (-4 ... +302 °F) Suitable for steam sterilization
MAG 1100 F (PFA)	-30 ... +130 °C (-22 ... +266 °F) Suitable for steam steralization at 150 °C (302 °F)
Temperature shock	
MAG 1100 F	
• Duration ≤ 1 min, followed by 10 min rest	• DN 10, 15, 25: Max. ΔT ≤ 80 °C/min (3/8", ½", 1": Max. ΔT ≤ 144 °F/min) • DN 40, 50, 65: Max. ΔT ≤ 70 °C/min (1½", 2", 2½": Max. ΔT ≤ 126 °F/min) • DN 80, 100: Max. ΔT ≤ 60 °C/min (3", 4": Max. ΔT ≤ 108 °F/min)
MAG 1100 F (PFA)	Max. ± 100 °C (212 °F) momentarily
Operating pressure	
MAG 1100 F (Ceramic)	DN 10 ... 65: 40 bar (3/8" ... 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})
MAG 1100 F (PFA)	20 bar (290 psi) Vacuum: 0.02 bar_{abs} (0.3 psi_{abs}) DN 80 ... DN 100: CO_2 pressure max. 7 bar (101.5 psi)
Mechanical load (vibration)	18 ... 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 gr. Sensor with compact MAG 6000 I/MAG 6000 I Ex mounted transmitter: 1.14 grms For compact installation with the MAG 6000 I/MAG 6000 I Ex, transmitter to be supported to avoid tension on sensor part.
Enclosure rating	IP67 to EN 60529 (NEMA 4X), 1 mH_2O for 30 min
EMC	2004/108/EC

Design	
Weight	See Dimensional drawings
Material	
Enclosure	
• MAG 1100 F	Stainless steel AISI 316L/1.4404
Terminal box (remote version only)	
• Standard	Fibre glass reinforced polyamide
• Option	Stainless steel AISI 316/1.4436
• Ex ATEX (remote version only)	Stainless steel AISI 316/1.4436
Liner	
MAG 1100 F (Ceramic)	Aluminum oxide Al_2O_3 (ceramics)
MAG 1100 F (PFA)	Reinforced PFA (teflon) (not for Ex)
Electrodes	
MAG 1100 F (Ceramic)	Platinum with gold /Titanium brazing alloy
MAG 1100 F (PFA)	• DN 10 ... 15 (3/8" ... ½"): Hastelloy C276/2.4819 • DN 25 ... 100 (1" ... 4"): Hastelloy C22/2.4602
Cable entries	• 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)
Certificates and approvals	
Calibration	
• Standard Production calibration, calibration report shipped with sensor	Zero-point, 2 x 25 %, 2 x 90 %
MAG 1100 F (Ceramic)	3A (sensor with Polyamide terminal box and FKM/FPM or EPDM gaskets), transmitter not part of the approval
• Ex ATEX approvals for sensor or compact with MAG 6000 I Ex	ATEX 2G D sensor EEx d e ia IIB T3 - T6
• Sensor with/without MAG 5000/6000/6000 I	FM Class I, Div 2
MAG 1100 F (PFA)	3A (sensor with Polyamide terminal box with EPDM gasket), transmitter not part of the approval EHEDG certified (use EPDM gasket) (DN 25 ... 100 (1 ... 4"))
	FM Class I, Div 2
Conforms to	• PED – 97/23/EC[3] • CRN (PFA) • FDA
Custody transfer approvals (MAG 5000/6000 CT)	• Cold water pattern approval PTB (Germany) • Hot water pattern approval PTB (Germany) • Other media than water pattern approval- OIML R 117 (Ceramic liner)(Denmark)

1) Conditions are also dependent on liner characteristics.
2) With compact transmitter MAG 5000 CT/6000 CT -20 ... +50 °C (-4 ... +122 °F)
3) For further information on the PED standard and requirements, see page 9/14.

© Siemens AG 2012

Accessories

Weld-in adapter	
Adapter for welding onto dairy pipe	Tri-Weld, ISO 2037, DIN 11850, SMS 3008, BS 4825-1
• DN 10, 15, 25, 40, 50 and 65 (3/8", ½", 1", 1½", 2"and 2½")	PN 40 (600 psi)
• DN 80 and DN 100 (3" and 4")	PN 25 (350 psi)
Clamp adapter	Tri-Clamp, ISO 2852, DIN 32676, SMS 3016, BS 4825-3
DN 10, 15, 25, 40 and 50 (3/8", ½", 1", 1½", and 2")	PN 16 (200 psi)
DN 65, 80 and 100 (2½", 3" and 4")	PN 10 (150 psi)
Thread adapter	
DIN 11851	
• DN 10, 15, 25, and 40 (3/8", ½", 1", and 1½")	PN 40 (600 psi)
• DN 50, 65, 80 and 100 (2", 2½", 3" and 4")	PN 25 (350 psi)
ISO 2853, BS 4825-4	
• DN 10, 15, 25, 40, 50, 65 and 80 (3/8", ½", 1", 1½", 2", 2½ and 3")	PN 16 (200 psi)
SMS 1145	
• DN 25, 40, 50, 65 and 80 (1", 1½", 2", 2½" and 3")	PN 6 (80 psi)
Design	
Material	
Adapter	Stainless steel AISI 316/1.4436
Gasket	
• MAG 1100 F (Ceramic)	FKM/FPM with stainless steel insert (AISI 304/1.4301) (-20 ... +150 °C (-4 ... +302 °F))
	EPDM (-20 ... +150 °C (-4 ... +302 °F))
• MAG 1100 F (PFA)	EPDM (-20 ... +150 °C (-4 ... +302 °F))
	NBR (-20 ... +100 °C (-4 ... +212 °F))

Note:

When combined sensor and adapter, the operating pressure is the lower rated of the pair.

Selection and Ordering data		Order No.
Sensor SITRANS F M MAG 1100 F		7ME6140-
Diameter		
DN 10 (3/8")	◆	1R
DN 15 (½")	◆	1V
DN 25 (1")	◆	2D
DN 40 (1½")	◆	2R
DN 50 (2")	◆	2Y
DN 65 (2½")	◆	3F
DN 80 (3")	◆	3M
DN 100 (4")	◆	3T
Process connections		
No adaptors (specials see accessories)	◆	A
Weld in		
DIN 11850	◆	B
ISO 2037 (SMS 3008)	◆	C
BS 4825-1		D
Tri-Weld		E
Clamp type		
DIN 32676		G
ISO 2852 (SMS 3016)		H
BS 4825-3		J
Tri-Clamp		K
Threaded type		
DIN 11851		M
SMS 1145[1)]		N
Liner material		
PFA (not for Ex)	◆	1
Ceramic	◆	2
Gasket material[1)]		
EPDM flat gasket (FDA, 3A)	◆	0
FPM/FKM (FDA, 3A) (only with ceramic liner)	◆	2
EPDM-P gasket (only for PFA) (FDA, EHEDG certified, 3A)	◆	3
Electrode material		
Hastelloy C (only with PFA liner)	◆	1
Platinum (only with ceramic liner)	◆	2
Transmitter		
Standard sensor for remote transmitter (order transmitter separately), 3A	◆	A
Ex sensor for remote transmitter (order transmitter separately) 3A		B
MAG 6000 I, Alu.18 ... 90 V DC, 115 ... 230 V AC		C
MAG 6000 I, Aluminum 18 ... 30 V DC, Ex		D
MAG 6000 I, Aluminum 115 ... 230 V AC, Ex		E
MAG 6000, Polyamide, 11 ... 30 V DC/11 ... 24 V AC	◆	H
MAG 6000, Polyamide, 115 ... 230 V AC	◆	J
MAG 5000, Polyamide, 11 ... 30 V DC/ 11 ... 24 V AC	◆	K
MAG 5000, Polyamide, 115 ... 230 V AC	◆	L
Communication		
No communication, add-on possible	◆	A
HART	◆	B
PROFIBUS PA Profile 3 (only MAG 6000/MAG 6000 I)	◆	F
PROFIBUS DP Profile 3 (not for Ex) (only MAG 6000/MAG 6000 I)	◆	G
Modbus RTU/RS 485 (not for Ex) (only MAG 6000/MAG 6000 I)	◆	E
FOUNDATION Fieldbus H1 (only MAG 6000/MAG 6000 I)	◆	J

[1)] SMS 1145 standard is not approved by 3A

© Siemens AG 2012

Flow sensor MAG 1100 F

Selection and Ordering data	Order No.
Sensor SITRANS F M MAG 1100 F	**7ME6140 -** ■■■■■ - ■■■■
Cable glands/terminal box	
Metric: Polyamide terminal box or 6000 I compact ◆	1
½" NPT: Polyamide terminal box or 6000 I compact ◆	2
Metric: SS terminal box (mandatory for Stainless steel MAG 6000 Transmitter)	3
½" NPT: SS terminal box (mandatory for Stainless steel MAG 6000 Transmitter)	4

◆ Short lead time (details in PMD)

Selection and Ordering data	Order code
Additional information	
Please add **"-Z"** to Order No. and specify Order code(s) and plain text.	
Customer-specific converter setup	**Y20**
Tag name plate, stainless steel fixed with SS wire (add plain text)	**Y17**
Tag name plate, plastic (self adhesive)	**Y18**
Factory certificate according to EN 10204-2.1	**C15**
Factory certificate according to EN 10204-2.2	**C14**
Sensor cables wired (specify cable order no.)	**Y40**
Sensor for remote transmitter's junction box potted with wired cable (specify cable order no.) (not for Ex sensors)	**Y41**
Other postproduction requirements (add desired text)	**Y99**
Additional calibrations	
• Matched pair - (Standard production calibration where sensor and transmitter is calibrated together)	**On request**[1)]
• Customer-specified calibration up to 10 points	**On request**[1)]
• Customer-witnessed calibration Any of above calibration	**On request**[1)]

[1)] Ordering "On request" as dedicated information from the customer on the individual sensors is required. Please fill in the calibration form found on http://intranet.automation.siemens.com/w1/automation-technology-flow-measurement-18626.htm#content-19336&para1=Flow%20Measurement and send together with the order. (Size dependent restriction on maximum flow rates may apply

Operating instructions for SITRANS F M MAG 1100F

Description	Order No.
Handbook	
• English	**A5E02435647**

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
http://www.siemens.com/flowdocumentation

MAG 5000/6000 transmitters and sensors are packed in separate boxes, the final assembly takes place during installation at the customer's place. MAG 6000 I/MAG 6000 I Ex ATEX 2G D transmitters and sensors are delivered compact mounted from factory. Communication module will be pre-mounted in the transmitter.

Please use online Product selector to get latest updates.
Product selector link:
www.pia-selector.automation.siemens.com

Accessories

Description	Order No.	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P (not for Ex sensors) ◆	**FDK:085U0220**	

◆ Short lead time (details in PMD)

© Siemens AG 2012

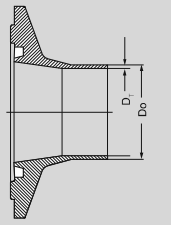
Accessories — Order No.

Weld-in connection fittings for MAG 1100 F with P gaskets for EHEDG

Only for sensors with PFA liner.

2 pcs. fittings
2 pcs. clamps (to join flow sensor and fitting)

DIN 11850



Adapter DN (mm)	D_o (mm)	D_T (mm)	Sensor DN (mm)		Order No.
10[2]	13	1.5	10	◆	**A5E02054630**
15[2]	19	1.5	15	◆	**A5E02054633**
20	23	1.5	15		**A5E02054634**
25	29	1.5	25	◆	**A5E02054635**
32	35	1.5	25		**A5E02054637**
40	41	1.5	40	◆	**A5E02054638**
50	53	1.5	50	◆	**A5E02054640**
65	70	2.0	65	◆	**A5E02054643**
80	85	2.0	80	◆	**A5E02054644**
100	104	2.0	100	◆	**A5E02054646**

ISO 2037 (SMS3008)

Adapter DN (mm)	D_o (mm)	D_T (mm)	Sensor DN (mm)		Order No.
12.7	12.7	1.0	10	◆	**A5E03727946**
17.2	17.2	1.0	15	◆	**A5E03728098**
25	25	1.6	25	◆	**A5E02196073**
33	33.7	1.6	25		**A5E02196074**
38	38	1.6	40	◆	**A5E02196075**
40	40	1.6	40	◆	**A5E02196076**
51	51	1.6	50	◆	**A5E02196077**
63.5	63.5	1.6	65	◆	**A5E02196078**
76.1	76.1	1.6	80	◆	**A5E02196080**
101.6	101.6	2.0	100		**A5E02196082**

Tri-Weld (BS 485-1)

Adapter DN (mm)	D_o (mm)	D_T (mm)	Sensor DN (mm)	Order No.
12.7	12.7	1.2	10	**A5E02199113**
19.05	19.05	1.2	15	**A5E02199114**
25.4	25.4	1.6	25	**A5E02199115**
38.1	38.1	1.6	40	**A5E02199116**
50.8	50.8	1.6	50	**A5E02199117**
63.5[1]	63.5	1.6	65	**A5E02199118**
76.2	76.2	1.6	80	**A5E02199119**
101.6[1]	101.6	2.0	100	**A5E02199120**

◆ Short lead time (details in PMD)

D_o: outer diameter

D_i: inner diameter

[1] For BS 4825-1 see ISO 2037

[2] Not EHEDG approved

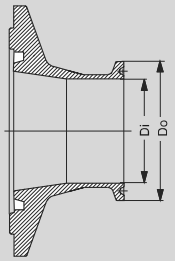
Accessories — Order No.

Clamp-type connection fittings for MAG 1100 F with P gaskets for EHEDG

Only for sensors with PFA liner.

2 pcs. fittings
2 pcs. clamps (to join flow sensor and fitting)

DIN 32676



Adapter DN (mm)	D_o (mm)	D_i (mm)	Sensor DN (mm)	Order No.
10	34	10	10	**A5E02211143**
15	34	16	15	**A5E02211144**
25	50.5	22.6	25	**A5E02211146**
40	50.5	38	40	**A5E02211147**
50	64	50	50	**A5E02211148**
65	91	66	65	**A5E02211151**
80	106	81	80	**A5E02211152**
100	119	100	100	**A5E02211153**

ISO 2852 (SMS 3016, BS 4825-3)

Adapter DN (mm)	D_o (mm)	D_i (mm)	Sensor DN (mm)	Order No.
25	50.5	22.6	25	**A5E02213581**
33.7	50.5	31.3	25	**A5E02213582**
38	50.5	35.6	40	**A5E02213583**
51	64	48.6	50	**A5E02213584**
63.5	77.5	60.3	65	**A5E02213585**
76.1	91	72.9	80	**A5E02213586**
101.6	119	97.6	100	**A5E02213587**

Tri-Clamp

Adapter DN (mm)	D_o (mm)	D_i (mm)	Sensor DN (mm)		Order No.
12.7	25.4	9.5	10		**A5E02213596**
19.05	25.4	15.85	15		**A5E02213597**
25.4	50.5	22.2	25		**A5E02213598**
38.1	50.5	34.9	40		**A5E02213599**
50.8	64	47.6	50	◆	**A5E02213600**
63.5	77.5	60.3	65		**A5E02213601**
76.2	91	73	80	◆	**A5E02213602**
101.6	119	97.6	100		**A5E02213603**

◆ Short lead time (details in PMD)

D_o: outer diameter

D_i: inner diameter

© Siemens AG 2012

Flow sensor MAG 1100 F

Accessories Order No.

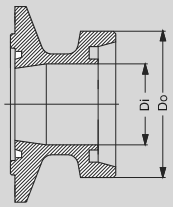
Threaded type connection fittings for MAG 1100 F with P gaskets for EHEDG

Only for sensors with PFA liner.

2 pcs. fittings
2 pcs. clamps (to join flow sensor and fitting)

DIN 11851

Adapter DN (mm)	D_o (mm)	D_i (mm)	Sensor DN (mm)		Order No.
10	28	10	10		**A5E02218293**
15	34	16	15		**A5E02218294**
20	44	20	15		**A5E02218295**
25	52	26	25	◆	**A5E02218296**
32	58	32	25		**A5E02218297**
40	65	38	40	◆	**A5E02218298**
50	78	50	50	◆	**A5E02218299**
65	95	66	65		**A5E02218300**
80	110	81	80		**A5E02218301**
100	130	100	100		**A5E02218302**



Accessories Order No.

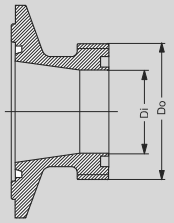
Threaded type connection fittings for MAG 1100 F with P gaskets for EHEDG

Only for sensors with PFA liner.

2 pcs. fittings
2 pcs. clamps (to join flow sensor and fitting)

SMS 1145[1)]

Adapter DN (mm)	D_o (mm)	D_i (mm)	Sensor DN (mm)	Order No.
25	40	22.6	25	**A5E02218310**
38	60	35.6	40	**A5E02218312**
51	70	48.6	50	**A5E02218313**
63.5	85	60.3	65	**A5E02218314**
76	98	72	65	**A5E02218315**



◆ Short lead time (details in PMD)

D_o: outer diameter

D_i: inner diameter

[1)] SMS 1145 standard is not approved by 3A

© Siemens AG 2012

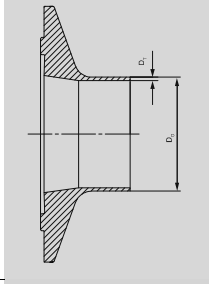
Accessories — Order No.

Weld in connection fittings for MAG 1100 F with flat gaskets for 3A

For sensors with ceramic and PFA liner.

2 pcs. fittings
2 pcs. clamps (to join flow sensor and fitting)

DIN 11850



Adapter DN (mm)	D_O (mm)	D_T (mm)	Sensor DN (mm)		Order No.
10	13	1.5	10	◆	FDK:083G2116
15	19	1.5	15	◆	FDK:083G2117
20	23	1.5	15		FDK:083G2118
25	29	1.5	25	◆	FDK:083G2119
32	35	1.5	25		FDK:083G2120
40	41	1.5	40	◆	FDK:083G2121
50	53	1.5	50	◆	FDK:083G2122
65	70	2.0	65	◆	FDK:083G2123
80	85	2.0	80	◆	FDK:083G2124
100	104	2.0	100	◆	FDK:083G2125

ISO 2037 (SMS3008)

Adapter DN (mm)	D_O (mm)	D_T (mm)	Sensor DN (mm)		Order No.
12.7	12.7	1.0	10	◆	A5E03720273
17.2	17.2	1.0	15	◆	FDK:083G2107
25	25.6	1.6	25	◆	FDK:083G2109
33.7	33.7	1.6	25		FDK:083G2100
38	38	1.6	40	◆	FDK:083G2111
40	40	1.6	40	◆	FDK:083G2101
51	51	1.6	50	◆	FDK:083G2112
63.5	63.5	1.6	65	◆	FDK:083G2113
76.1	71.1	1.6	80	◆	FDK:083G2114
101.6	101.6	2.0	100		FDK:083G2115
114.3	118.3	2.0	100		FDK:083G2105

Tri-Weld (BS 4825-1)

Adapter DN (mm)	D_O (mm)	D_T (mm)	Sensor DN (mm)	Order No.
12.7	12.7	1.2	10	FDK:083G2276
19.05	19.05	1.2	15	FDK:083G2277
25.4	25.4	1.6	25	FDK:083G2279
38	38.1	1.6	40	FDK:083G2281
50.8	50.8	1.6	50	FDK:083G2282
63.5[1)]	63.5	1.6	65	FDK:083G2283
76.2	76.2	1.6	80	FDK:083G2284
101.6[1)]	101.6	2.0	100	FDK:083G2285

◆ Short lead time (details in PMD)

D_O: outer diameter

D_i: inner diameter

1) For BS 4825-1 see ISO 2037

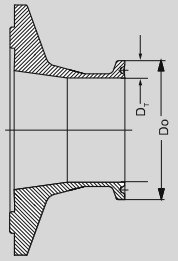
Accessories — Order No.

Clamp-type connection fittings for MAG 1100 F with flat gaskets for 3A

For sensors with ceramic and PFA liner.

2 pcs. fittings
2 pcs. clamps (to join flow sensor and fitting)

DIN 32676



Adapter DN (mm)	D_O (mm)	D_T (mm)	Sensor DN (mm)	Order No.
25	50.5	26	25	FDK:083G2179
40	50.5	38	40	FDK:083G2181
50	64	50	50	FDK:083G2182
65	91	66	65	FDK:083G2183
80	106	81	80	FDK:083G2184
100	119	100	100	FDK:083G2185

ISO 2852 (SMS 3016, BS 4825-3)

Adapter DN (mm)	D_O (mm)	D_T (mm)	Sensor DN (mm)	Order No.
25	50.5	22.6	25	FDK:083G2189
33.7	50.5	31.3	25	FDK:083G2190
38	50.5	35.6	40	FDK:083G2191
51	64	48.6	50	FDK:083G2192
63.5	77.5	60.3	65	FDK:083G2193
76.1	91	72.9	80	FDK:083G2194
101.6	119	97.6	100	FDK:083G2195

Tri-Clamp

Adapter DN (mm)	D_O (mm)	D_T (mm)	Sensor DN (mm)		Order No.
12.7	25.4	9.5	10		FDK:083G2286
19.05	25.4	15.85	15		FDK:083G2287
25.4	50.5	22.2	25		FDK:083G2289
38.1	50.5	34.9	40		FDK:083G2291
50.8	64	47.6	50	◆	FDK:083G2292
63.5	77.5	60.3	65		FDK:083G2294
76.2	91	73	80	◆	FDK:083G2294
101.6	119	97.6	100		FDK:083G2295

◆ Short lead time (details in PMD)

D_O: outer diameter

D_i: inner diameter

© Siemens AG 2012

Flow sensor MAG 1100 F

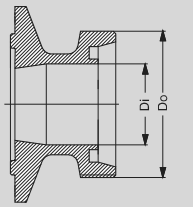
Accessories Order No.

Threaded type connection fittings for MAG 1100 F with flat gaskets for 3A

For sensors with ceramic and PFA liner.

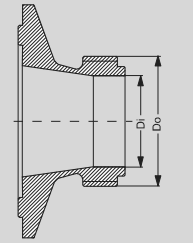
2 pcs. fittings
2 pcs. clamps (to join flow sensor and fitting)

DIN 11851



Adapter DN (mm)	D_o (mm)	D_i (mm)	Sensor DN (mm)		Order No.
10	28	10	10		**FDK:083G2156**
15	34	16	15		**FDK:083G2157**
20	44	20	15		**FDK:083G2158**
25	52	26	25	◆	**FDK:083G2159**
32	58	32	25		**FDK:083G2160**
40	65	38	40	◆	**FDK:083G2161**
50	78	50	50	◆	**FDK:083G2162**
65	95	66	65		**FDK:083G2163**
80	110	81	80		**FDK:083G2164**
100	130	100	100		**FDK:083G2165**

ISO 2853



Adapter DN (mm)	D_o (mm)	D_i (mm)	Sensor DN (mm)	Order No.
25	37	22.6	25	**FDK:083G2149**
38	51	35.6	40	**FDK:083G2151**
51	64	48.6	50	**FDK:083G2152**
63.5	78	60.3	65	**FDK:083G2153**
76.1	91	72.9	80	**FDK:083G2154**

BS 4825-4

Adapter DN (mm)	D_o (mm)	D_i (mm)	Sensor DN (mm)	Order No.
25.4	37	22.2	25	**A5E03732429**
38.1	51	34.9	40	**A5E03732431**
50.8	64	47.6	50	**A5E03732433**
63.5	78	60.3	65	**A5E03732434**
76.2	91	73	80	**A5E03732435**
101.6	126	97.6	100	**FDK:083G2145**

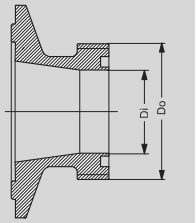
Accessories Order No.

Threaded type connection fittings for MAG 1100 F with flat gaskets for 3A

For sensors with ceramic and PFA liner.

2 pcs. fittings
2 pcs. clamps (to join flow sensor and fitting)

SMS 1145[1)]



Adapter DN (mm)	D_o (mm)	D_i (mm)	Sensor DN (mm)	Order No.
25	40	22.6	25	**FDK:083G2139**
38	60	35.6	40	**FDK:083G2141**
51	70	48.6	50	**FDK:083G2142**
63.5	85	60.3	65	**FDK:083G2143**
76	98	72	65	**FDK:083G2144**

◆ Short lead time (details in PMD)

D_o: outer diameter

D_i: inner diameter

[1)] SMS 1145 standard is not approved by 3A

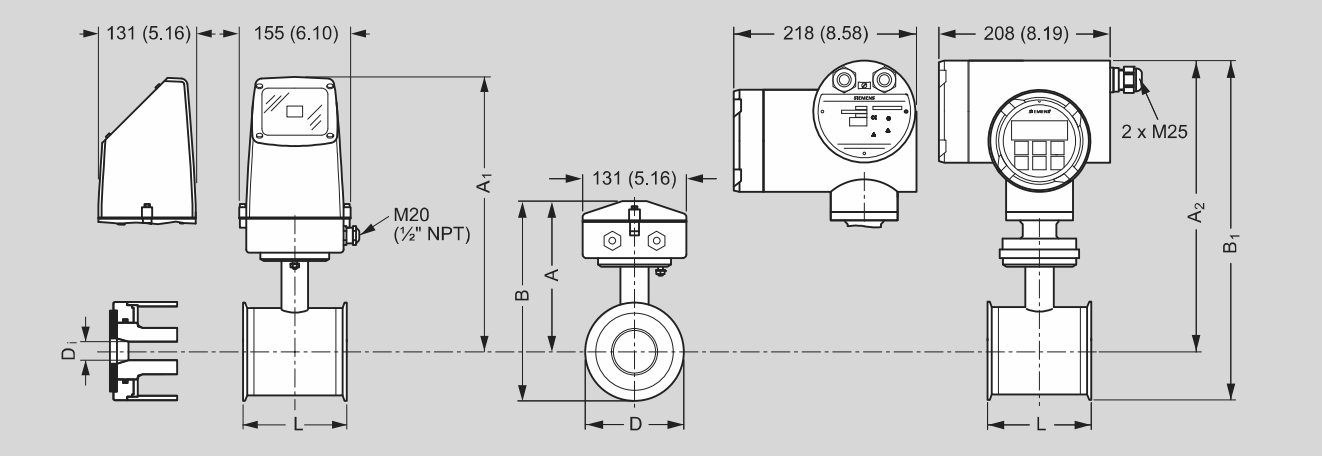
© Siemens AG 2012

Spare parts for MAG 1100 F	Order No.
Gaskets	
(2 pcs., between flow sensor and adapter)	
MAG 1100 F (PFA) - P gaskets	
Rubber: EPDM (FDA)	
• DN 10	**A5E02055286**
• DN 15	**A5E02055287**
• DN 25	**A5E02055290**
• DN 40	**A5E02055291**
• DN 50	**A5E02055292**
• DN 65	**A5E02055293**
• DN 80	**A5E02055295**
• DN 100	**A5E02055297**
MAG 1100 F (ceramic) - flat gaskets	
Rubber: FKM/FPM (FDA)	
• DN 10	**A5E00915707**
• DN 15	**A5E00915764**
• DN 25	**A5E00915771**
• DN 40	**A5E00915773**
• DN 50	**A5E00915775**
• DN 65	**A5E00915780**
• DN 80	**A5E00915782**
• DN 100	**A5E00915784**
MAG 1100 F (PFA) - flat gaskets	
Rubber: EPDM (FDA)	
• DN 10	**FDK:083G2206**
• DN 15	**FDK:083G2207**
• DN 25	**FDK:083G2209**
• DN 40	**FDK:083G2211**
• DN 50	**FDK:083G2212**
• DN 65	**FDK:083G2213**
• DN 80	**FDK:083G2214**
• DN 100	**FDK:083G2215**
Rubber: NBR	
• DN 10	**FDK:083G2216**
• DN 15	**FDK:083G2217**
• DN 25	**FDK:083G2219**
• DN 40	**FDK:083G2221**
• DN 50	**FDK:083G2222**
• DN 65	**FDK:083G2223**
• DN 80	**FDK:083G2224**
• DN 100	**FDK:083G2225**

© Siemens AG 2012

Dimensional drawings

Sensor MAG 1100 F compact/remote



Dimensions in mm (inch)

Important note:
For compact installation with MAG 6000 I/Ex - transmitter to be supported to avoid tension on the sensor part.

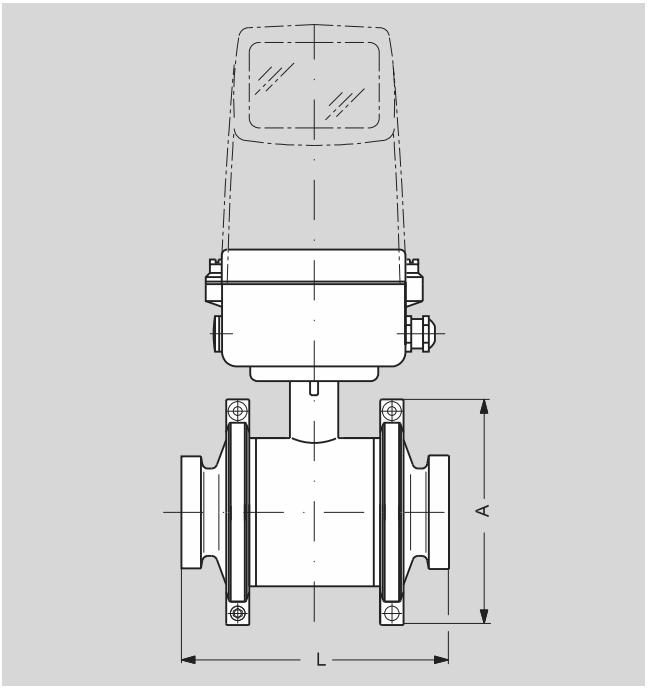
Size DN	L [mm]	A [mm]	A_1 [3] [mm]	B [2] [mm]	B_1 [mm]	D [mm]	D_i (Al_2O_3) [mm]	D_i PFA [mm]	Weight [1] [kg]
10	64	161	315	193.7	344.7	64.0	10	10	2.2
15	64	161	315	193.7	344.7	64.0	15	16	2.2
25	79	169	323	207.5	359.0	77.5	25	26	2.7
40	94	179	333	228.0	379.0	91.0	40	38	3.4
50	104	188	342	247.7	398.7	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

Size [inch]	L [inch]	A [inch]	A_1 [3] [inch]	B [2] [inch]	B_1 [inch]	D [inch]	D_i (Al_2O_3) [inch]	D_i PFA [inch]	Weight [1] [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	4.9
1½	3.70	7.05	13.11	8.98	14.92	3.58	1.57	1.50	7.5
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) With transmitter MAG 5000 or MAG 6000 compact, weight is increased by approximately 0.8 kg (1.8 lb)
With MAG 6000 I weight is increased with 5.5 kg (12.1 lbs)
2) 14.5 mm (0.571") shorter when the AISI terminal box is used (always Ex version)
3) A_2 is 3 mm (0.12") shorter than A_1

© Siemens AG 2012

Sensor MAG 1100 F compact/separate – build-in length



Size		A		L[1)]	
DN	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 build-in length "L" is independent of the adapter type selected.

© Siemens AG 2012

Flow sensor MAG 3100 and MAG 3100 HT

Overview

The SITRANS F M MAG 3100 is an electromagnetic flow sensor in a large variety that meets the demands of almost every flow application.

Benefits

- Wide range of sizes: DN 15 to DN 2000 (½" to 78")
- The flexible design is for all applications not covered by the standard industry-specific sensors: MAG 1100, MAG 1100 F, MAG 3100 P and MAG 5100 W
- Wide pressure range: PN 6 to PN 100
  ANSI Class 150 / 300, AS 2129 / AS 4087, JIS K10 and K20.
  On request up to 690 bar (10 000 psi)
- Wide range of electrode and liner material to fit even the most extreme process media
- Fully welded construction provides a ruggedness that suits the toughest applications and environments
- Easy commissioning, the SENSORPROM unit automatically updates settings.
- Designed to allow patented SITRANS F M in-situ verification using the SENSORPROM fingerprints.

Application

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

- Process industry
- Chemical industry
- Steel industry
- Mining
- Utility
- Power generation and distribution
- Oil and gas / HPI
- Water and waste water

Design

- Compact or remote mounting possible
- Easy "plug & play" field changeability of transmitter
- Ex ATEX and FM/CSA versions
- High temperature sensor for applications with temperatures up to 180 °C (356 °F)
- Approvals for PTB, OIML R 75 and OIML R 117
- Meets EEC directives: PED, 97/23/EC pressure directive for EN1092-1 flanges
- Build-in length according to ISO 13359, the standard includes sizes up to DN 400
- Onsite or factory upgrade to IP68/NEMA 6P of a standard sensor.

Mode of operation

The flow measuring principle is based on Faraday's law of electromagnetic induction according to which the sensor converts the flow into an electrical voltage proportional to the velocity of the flow.

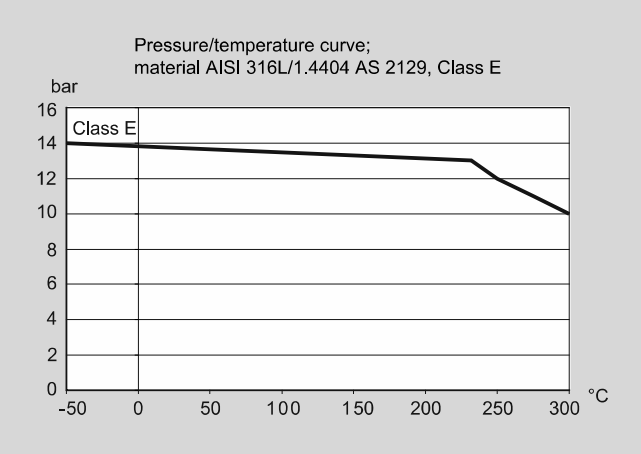
Integration

The complete flowmeter consists of a flow sensor and an associated transmitter MAG 5000, 6000 and 6000 I.

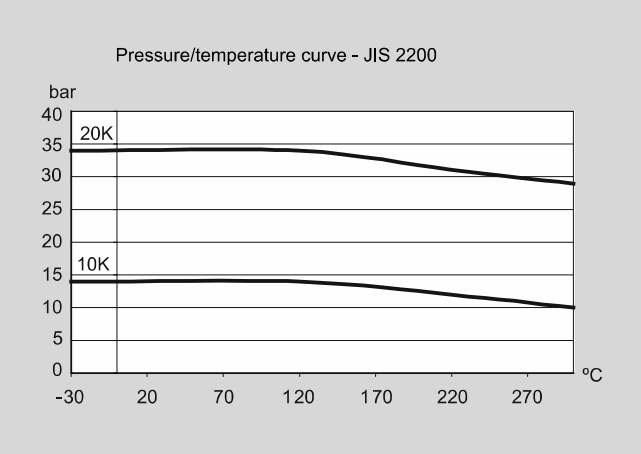
The flexible communication concept USM II simplifies integration and update to a variety of fieldbus systems such as HART, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS DP and PA, Modbus RTU/RS 485.

© Siemens AG 2012

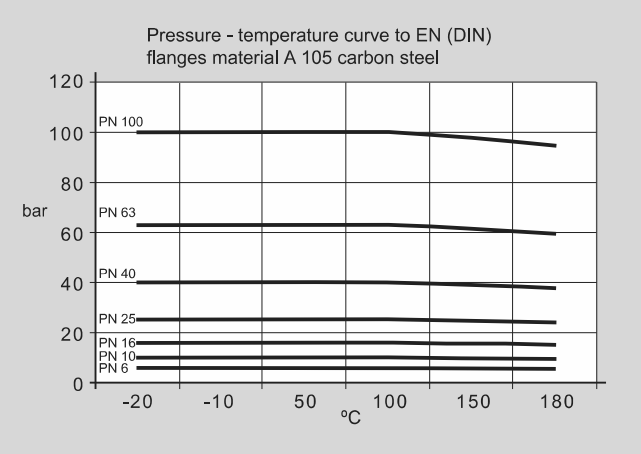
Pressure/temperature curve; material AISI 316L/1.4404 AS 2129, Class E



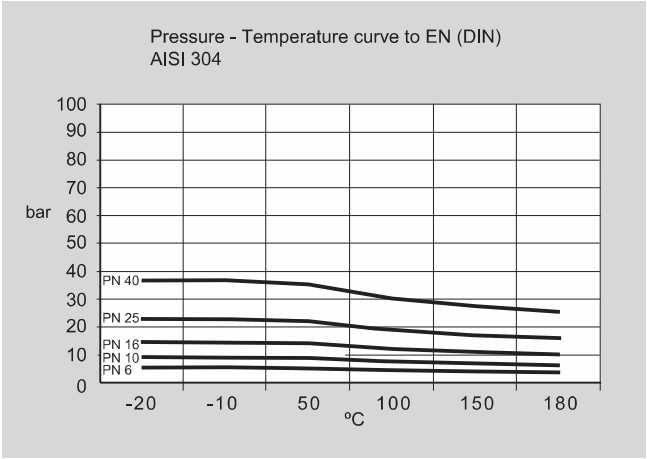
Pressure/temperature curve - JIS 2200



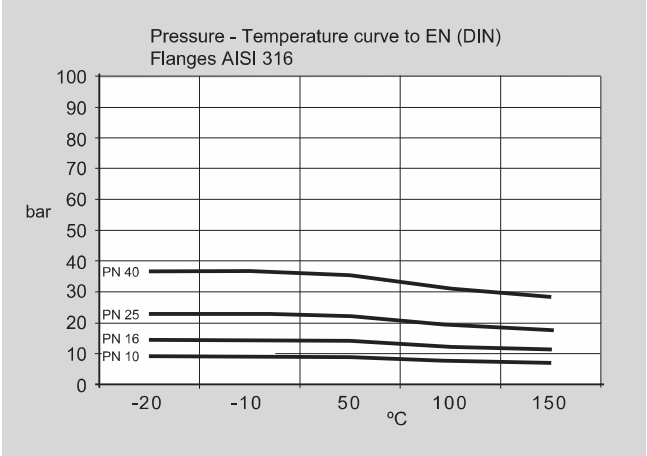
Pressure/temperature curve to EN (DIN) flanges, material A 105 carbon steel



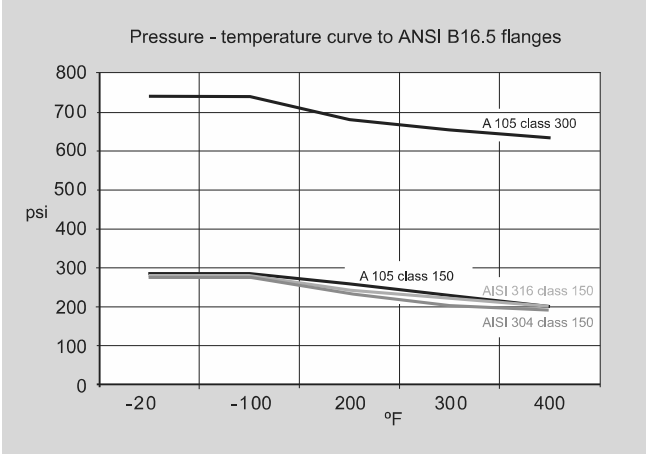
Pressure/temperature curve to EN (DIN) flanges AISI 304



Pressure/temperature curve to EN (DIN) flanges AISI 316



Pressure/temperature curve to ANSI B16.5 flanges



Note: The pressure-temperature curves only assist in the selection of a system. No responsibility is taken for the correctness of the information. For further information on the PED standard and requirements, see page 9/14.

© Siemens AG 2012

Flow sensor MAG 3100 and MAG 3100 HT

Technical specifications

Version	MAG 3100	MAG 3100 HT (High Temperature)
Product characteristic	Flexible product program	Flexible product program
Nominal size	DN 15 ... DN 2000 (½" ... 78")	DN 15 … DN 300 (½" ... 12")
Measuring principle	Electromagnetic induction	Electromagnetic induction
Excitation frequency (Mains supply: 50 Hz/60 Hz)	• DN 15 ... 65 (½" … 2½"): 12.5 Hz/15 Hz • DN 80 ... 150 (3" ... 6"): 6.25 Hz/7.5 Hz • DN 200 ... 1200 (8" ... 48"): 3.125 Hz/3.75 Hz • DN 1400 ... 2000 (54" ... 78"): 1.5625 Hz/1.875 Hz	• DN 15 ... 65 (½" … 2½"): 12.5 Hz/15 Hz • DN 80 ... 150 (3" ... 6"): 6.25 Hz/7.5 Hz • DN 200 ... 300 (8" ... 12"): 3.125 Hz/3.75 Hz
Process connection		
Flanges	EN 1092-1, raised face[1)] (EN 1092-1, DIN 2501 and BS 4504 have the same mating dimensions) • DN 65 ... 2000 (2½" … 78"): PN 6 (87 psi) • DN 200 ... 2000 (8" … 78"): PN 10 (145 psi) • DN 65 ... 2000 (2½" … 78"): PN 16 (232 psi) • DN 200 ... 600 (8" … 24"): PN 25 (362 psi) • DN 15 ... 600 (½" … 24"): PN 40 (580 psi) • DN 50 ... 300 (2" … 12"): PN 63 (913 psi) • DN 25 ... 300 (1" … 12"): PN 100 (1450 psi) ANSI B16.5 (~BS 1560), raised face • ½" ... 24": Class 150 (20 bar (290 psi)) • ½" ... 24": Class 300 (50 bar (725 psi)) AWWA C-207, flat face 28" ... 78": Class D (10 bar) AS 2129, raised face ½" ... 48": Table E AS 4087, raised face: • PN 16 (DN 50 ... 1200, 16 bar (232 psi)) • PN 21 (DN 50 ... 600, 21 bar (304 psi)) • PN 35 (DN 50 ... 600, 35 bar (508 psi)) JIS B 2220:2004 • K10 (1" ... 24") • K20 (1" ... 24") Other flanges and pressure ratings on request	EN 1092-1, raised face (EN 1092-1, DIN 2501 and BS 4504 have the same mating dimensions) • DN 15 ... 300 (½" … 12"): PN 40 (580 psi) • DN 65 ... 300 (2½" … 12"): PN 16 (232 psi) • DN 200 ... 300 (8" … 12"): PN 10 (145 psi) • DN 200 ... 300 (8" … 12"): PN 25 (362 psi) ANSI B16.5 (~BS 1560), raised face: • ½" ... 12": Class 150 (20 bar (290 psi)) • ½" ... 12": Class 300 (50 bar (725 psi)) AS 2129, raised face ½" ... 12": Table E Other flanges and pressure ratings on request
Rated operation conditions		
Ambient temperature (conditions also dependent on liner characteristiques)		
• Standard sensor	-40 … +100 °C (-40 … +212 °F)	-40 … +100 °C (-40 … +212 °F)
• Ex sensor	-20 … +60 °C (-4 … +140 °F)	for up to 150 °C (302 °F) temperature of medium: -20 … +60 °C (-4 … +140 °F) for 150 ... 180 °C (302 ... 356 °F) temperature of medium: -20 … +50 °C (-4 … +122 °F)
• With compact transmitter		
- MAG 5000/6000[2)]	-20 … +60 °C (-4 … +140 °F)	-20 … +60 °C (-4 … +140 °F)
- MAG 6000 I	-20 … +60 °C (-4 … +140 °F)	-20 … +60 °C (-4 … +140 °F)
- MAG 6000 I Ex de	-20 … +60 °C (-4 … +140 °F)	-20 … +60 °C (-4 … +140 °F)

© Siemens AG 2012

Version	MAG 3100	MAG 3100 HT (High Temperature)
Operating pressure [abs. bar] (maximum operating pressure decreases with increasing operating temperature and with stainless steel flanges)	• Soft rubber 0.01 ... 100 bar (0.15 ... 1450 psi) • EPDM 0.01 ... 40 bar (0.15 ... 580 psi) • Linatex 0.01 ... 40 bar (0.15 ... 580 psi) • Ebonite 0.01 ... 100 bar (0.15 ... 1450 psi) • PTFE - DN ≤ 300 (≤ 12"): 0.3 ... 50 bar (4 ... 725 psi) - 350 ≤ DN ≤ 600 (14" ≤ DN ≤ 24"): 0.3 ... 40 bar (4 ... 580 psi) • PFA - DN 15 ... 150 (½" … 6"): Vacuum 0.02 ... 50 bar (0.29 ... 725 psi)	• PTFE Teflon - DN 15 ... 300 (½" … 12") (130/180 °C (266 °F/356°F)): 0.3/0.6 ... 50 bar (4/8 ... 725 psi) (180 °C (356 °F) PTFE has factory mounted grounding SS rings type E and SS terminal box) • PFA - DN 15 ... 150 (½" … 6"): Vacuum 0.02 ... 50 bar (0.29 ... 725 psi)
Enclosure rating	IP67 to EN 60529/NEMA 4X/6, 1 mH_2O for 30 min Option: IP68 to EN 60529/NEMA 6P, 10 mH_2O cont. (not for Ex)	IP67 to EN 60529/NEMA 4X/6, 1 mH_2O for 30 min Option: IP68 to EN 60529/NEMA 6P,10 mH_2O cont. (not for Ex)
Pressure drop at 3 m/s	As straigth pipe	
Test pressure	1.5 x PN (where applicable)	
Mechanical load (vibration)	• 18 ... 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 mounted transmitter: 1.14 grms	• 18 ... 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 mounted transmitter: 1.14 grms
Temperature of medium	• Soft rubber 0 … +70 °C (32 … 158 °F) • EPDM -10 … +70 °C (14 … 158 °F) • Linatex (rubber) -40 … +70 °C (-40 … +158 °F) (for temperatures below -20 °C (-4 °F) AISI 304 or 316 flanges must be used) • Ebonite 0 … 95 °C (32 … 203 °F) • PTFE -20 … +100 °C (-4 … +212 °F) • PFA -20 … +100 °C (-4 … +212°F)	• PTFE -20 … +130 °C (-4 … +266 °F) • PTFE -20 … +180 °C (-4 ... +356 °F) Factory mounted grounding rings type E in SS and SS terminal box. Can only be used with remote transmitter. • PFA -20 … +150 °C (-4 … +300 °F)
EMC	2004/108/EC	2004/108/EC
Design		
Weight	See dimensional drawings	
Flange and housing material	Carbon steel ASTM A 105, with corrosion resistant two component epoxy coating (min. 150 µm) or Stainless steel AISI 304/1.4301 flanges and carbon steel housing, with corrosion resistant two component epoxy coating (min. 150 µm) or Stainless steel AISI 316L/1.4404 flanges and housing, polished	Carbon steel ASTM A 105, with corrosion resistant two component epoxy coating (min. 150 µm) or AISI 304/1.4301 flanges and carbon steel housing, with corrosion resistant two component epoxy coating (min. 150 µm) or AISI 316L/1.4404 flanges and housing, polished
Measuring pipe material	Stainless steel AISI 304/1.4301	AISI 304/1.4301
Electrode material	• Stainless steel AISI 316Ti/1.4571 • Hastelloy C276/2.4819 (PFA: Hastelloy C22/2.4602) • Platinum/Iridium • Titanium • Tantalum	• AISI 316Ti/1.4571 • Hastelloy C276/2.4819 (PFA: Hastelloy C22/2.4602) • Platinum/Iridium • Titanium • Tantalum
Grounding electrode material	• Soft rubber, EPDM, Linatex, Ebonite: available with measuring electrodes in stainless steel AISI 316Ti/1.4571 or Hastelloy • PTFE: none • PFA: optional in Hastelloy, Tantalum or Platinium	• PTFE: none • PFA: optional in Hastelloy, Tantalum or Platinium

© Siemens AG 2012

Flow sensor MAG 3100 and MAG 3100 HT

Version	MAG 3100	MAG 3100 HT (High Temperature)
Design (continued)		
Terminal box (remote version only)	• Standard fibre glass reinforced polyamide • Option Stainless steel AISI 316/1.4436 • Ex Stainless steel AISI 316/1.4436	• Standard fibre glass reinforced polyamide (max. 150 °C (302 °F)) • Stainless steel AISI 316/1.4436 • Ex Stainless steel AISI 316/1.4436
Cable entries	• 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 or 2 x ½" NPT (for supply/output) - MAG 6000 I Ex de: 2 x M25 or 2 x ½" NPT (for supply/output)	• Remote installation 2 x M20 or 2 x ½" NPT
Certificates and approvals		
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 %
Conforms to	PED (All EN1092-1 flanges conforms to PED) – 97/23/EC[3] CRN	PED (All EN1092-1 flanges conforms to PED) – 97/23/EC[3] CRN
Material certificate EN 10204 3.1	On request	On request
Ex approvals	Ex sensors • ATEX 2 GD DN 15 ... 300: EEx d e ia IIC T4 - T6 • DN 350 ... 2000: EEx e ia IIC T4 - T6 • IEC Ex de ia IIC T3-T6 • FM Class I, Div 1[4] • FM Class I, Zone 1 • CSA Class I, Zone 1 Standard sensors • FM Class I, Div 2/Zone 2 • CSA Class I, Div 2/Zone 2	Ex sensors • ATEX 2 GD DN 15 ... 300: EEx d e ia IIC T3 - T6 • IEC Ex de ia IIC T3-T6 • FM Class I, Div 1[4] • FM Class I, Zone 1 • CSA Class I, Zone 1 Standard sensors • FM Class I, Div 2/Zone 2 • CSA Class I, Div 2/Zone 2
Drinking water approvals	EPDM lining: • WRAS (WRc, BS690 cold water, GB) • NSF/ANSI Standard 61[5] (Cold water, US) • ACS listed (F) • DVGW W270 (D) • Belgaqua (B) • MCERTS (GB) (EPDM or PTFE lining with AISI 316 or Hastelloy electrodes)	
Custody transfer (CT) (≤ DN2000) (only together with MAG 5000/6000 CT), order as special	Cold water pattern approval - DANAK TS 22.36.001, PTB (Denmark and Germany) Heat meter pattern approval - OIML R 75 (Denmark) Hot water pattern approval - PTB (Germany) Other media than water - OIML R 117 (Denmark)	Heat meter pattern approval - OIML R 75 (Denmark) Hot water pattern approval - PTB (Germany)

Technical specification for transmitter - see transmitter pages.

1) PN 6-40: DN ≤ 600 type 01 (SORF); DN > 600 type 11 (WNRF); PN 63-100: type 11 (WNRF)

2) With compact transmitter MAG 5000 CT/6000 CT -20 ... +50 °C (-4 ... +122 °F).

3) For sizes larger than 600 mm (24") in PN 16 PED conformity is available as a cost-added option. The basic unit will carry the LVD (Low Voltage Directive) and EMC approval. 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:
a) Meters used in networks for the supply, distribution and discharge of water.
b) Meters used in pipelines for the conveyance of any fluid from offshore to onshore.
c) Meters used in the extraction of petroleum or gas, including christmas tree and manifold equipment.
d) Any meter mounted on a ship or mobile offshore platform. For further information on the PED standard and requirements see page 9/14.

4) Only with sensors sizes DN 15 ... 300 (½" ... 12") compact.

5) Including Annex F

© Siemens AG 2012

Selection and Ordering data	Order No.											
Sensor SITRANS F M MAG 3100	**7ME6310-**					-						
Diameter												
DN 15 (½“) (PTFE and PFA liner)	1	V										
DN 25 (1“)	2	D										
DN 40 (1½“)	2	R										
DN 50 (2“)	2	Y										
DN 65 (2½“)	3	F										
DN 80 (3“)	3	M										
DN 100 (4“)	3	T										
DN 125 (5“)	4	B										
DN 150 (6“)	4	H										
DN 200 (8“)	4	P										
DN 250 (10“)	4	V										
DN 300 (12“)	5	D										
DN 350 (14“)	5	K										
DN 400 (16“)	5	R										
DN 450 (18“)	5	Y										
DN 500 (20“)	6	F										
DN 600 (24“)	6	P										
DN 700 (28“)	6	Y										
DN 750 (30“) (AWWA and AS 2129 only)	7	D										
DN 800 (32“)	7	H										
DN 900 (36“)	7	M										
DN 1000 (40“)	7	R										
DN 1050 (42“) (AWWA only)	7	U										
DN 1100 (44“) (AWWA only)	7	V										
DN 1200 (48“)	8	B										
DN 1400 (54“)	8	F										
DN 1500 (60“)	8	K										
DN 1600 (66“)	8	P										
DN 1800 (72“)	8	T										
DN 2000 (78“)	8	Y										
Flange norm and pressure rating												
EN 1092-1												
PN 6 (DN 65 ... 2000 (2½“ ... 78“))			A									
PN 10 (DN 200 ... 2000 (8“ ... 78“))			B									
PN 16 (DN 65 ... 1200 (2½“ ... 48“))			C									
PN 16, non-PED (DN 700 ... 2000 (28“ ... 78“))			D									
PN 25 (DN 200 ... 600 (8“ ... 24“))			E									
PN 40 (DN 15 ... 600 (½“ ... 24“))			F									
PN 63 (DN 50 ... 300 (2“ ... 12“))			G									
PN 100 (DN 25 ... 300 (1“ ... 12“))			H									
ANSI B16.5												
Class 150 (½“ ... 24“)			J									
Class 300 (½“ ... 24“)			K									
AWWA C-207												
Class D (28“ ... 78“)			L									
AS												
2129, table E			M									
4087, PN 16 (DN 50 ... 1200 (2“ ... 48“)) (Not PTFE and PFA)			N									
4087, PN 21 (DN 50 ... 600 (2“ ... 24“)) (Not PTFE and PFA)			P									
4087, PN 35 (DN 50 ... 600 (2“ ... 24“)) (Not PTFE and PFA)			Q									
JIS B 2220:2004												
K10 (1" ... 24")			R									
K20 (1" ... 24")			S									

Selection and Ordering data	Order No.											
Sensor SITRANS F M MAG 3100	**7ME6310-**					-						
Flange material												
Carbon steel flanges ASTM A 105		1										
Stainless steel flanges, AISI 304/1.4301		2										
Stainless steel flanges and sensor body, AISI 316L/1.4404, polished		3										
Liner material												
Soft rubber		1										
EPDM		2										
PTFE (DN ≤ 300, PN ≤ 50 bar / ≤ 12“, PN ≤ 725 psi), PTFE (350 ≤ DN ≤ 600, PN ≤ 40 bar / 14“ ≤ DN ≤ 24“, PN ≤ 580 psi)		3										
Ebonite		4										
Linatex (PN ≤ 40 bar (580 psi) DN ≤ 600 (24“))		5										
PFA (DN 15 ... 150 (½" ... 6")) (PN ≤ 40 bar (580 psi))		7										
Electrode material (Grounding electrodes not for PTFE liner or Pressure PN 100)												
AISI 316Ti/1.4571 (not for PFA)			1									
Hastelloy C276/2.4819 (PFA liner: Hastelloy C22/2.4602)			2									
Platinum (DN ≤ 300 (12")) (not ebonite liner)			3									
Titanium (not PFA liner) (DN ≤ 600 (24"))			4									
Tantalum (DN ≤ 600 (24")) (not ebonite liner)			5									
Hastelloy C22/2.4602 incl. grounding electrodes (only PFA)			6									
Platinium incl. grounding electrodes (only PFA)			7									
Tantalum incl. grounding electrodes (only PFA)			8									
Transmitter with display												
Standard sensor for remote transmitter (Order transmitter separately)				A								
Ex sensor for remote transmitter (Order transmitter separately)				B								
MAG 6000 I, Alu.18 ... 90 V DC, 115 ... 230 V AC				C								
MAG 6000 I Alu. 18 ... 30 V DC, Ex				D								
MAG 6000 I Alu. 115 ... 230 V, Ex				E								
MAG 6000 Polyamide, 11… 30 V DC / 11…24 V AC				H								
MAG 6000, Polyamide, 115 ... 230 V AC				J								
MAG 5000, Polyamide, 11… 30 V DC / 11…24 V AC				K								
MAG 5000, Polyamide, 115 ... 230 V AC				L								
Communication												
No communication, add-on possible					A							
HART					B							
PROFIBUS PA Profile 3 (only MAG 6000/MAG 6000 I)					F							
PROFIBUS DP Profile 3 (not for Ex) (only MAG 6000/MAG 6000 I)					G							
Modbus RTU/RS 485 (not for Ex) (only MAG 6000/MAG 6000 I)					E							
FOUNDATION Fieldbus H1 (only MAG 6000/MAG 6000 I)					J							
Cable glands/terminal box												
Metric: Polyamide terminal box or 6000 I compact						1						
½" NPT: Polyamide terminal box or 6000 I compact						2						
Metric: SS terminal box (mandatory for stainless steel MAG 6000 Transmitter)						3						
½" NPT: SS terminal box (mandatory for stainless steel MAG 6000 Transmitter)						4						

◆ Short lead time (details in PMD)

© Siemens AG 2012

Flow sensor MAG 3100 and MAG 3100 HT

Selection and Ordering data	Order code
Additional information	
Please add **"-Z"** to Order No. and specify Order code(s) and plain text.	
Factory certificate according to EN 10204-2.2	**C14**
Factory certificate according to EN 10204-2.1	**C15**
Tag name plate, stainless steel fixed with SS wire (add plain text)	**Y17**
Tag name plate, plastic (self adhesive)	**Y18**
Customer-specific converter setup	**Y20**
Sensor cables wired (specify cable order no.)	**Y40**
Sensor for remote transmitter's junction box potted to IP68 with wired cable (specify cable order no.) (not for Ex)	**Y41**
Other postproduction requirements (add desired text)	**Y99**
Additional calibrations	
• Matched pair - (Standard production calibration where sensor and transmitter is calibrated together)	**On request**[1)]
• Accredited Siemens Flow Instruments matched pair Calibration acc. to ISO/IEC 17025: 2005	**On request**[1)]
• Customer-specified calibration up to 10 points	**On request**[1)]
• CT verification and authority seal according to: Cold water pattern approval - DANAK TS 22.36.001, PTB (Denmark and Germany)	**On request**[1)]
• Customer-witnessed calibration Any of above calibration	**On request**[1)]

[1)] Ordering On request as dedicated information from the customer on the individual sensors is required. Please fill in the calibration form found on pi.khe.siemens.de/index.aspx?Nr=17460 and send together with the order. (Size dependent restriction on maximum flow rates may apply)

Operating instructions for SITRANS F M MAG 3100

Description	Order No.
• English	**A5E03005599**
• German	**A5E03086288**
• Spanish	**A5E03086291**
• French	**A5E03086290**

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
http://www.siemens.com/flowdocumentation

Accessories

Description		Order No.	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P (not for Ex sensors)	◆	**FDK:085U0220**	

◆ Short lead time (details in PMD)

Please use online Product selector to get latest updates.

Product selector link:
www.pia-selector.automation.siemens.com

MAG 5000/6000 transmitters and sensors are packed in separate boxes, the final assembly takes place during installation at the customer's place. MAG 6000 I/MAG 6000 I ATEX 2G D transmitters and sensors are delivered compact mounted from factory.
Communication module will be pre-mounted in the transmitter.

© Siemens AG 2012

Selection and Ordering data	Order No.
Sensor SITRANS F M MAG 3100 HT (High Temperature)	**7ME6320 -** ■■■■■ - ■■■■
Diameter	
DN 15 (½“)	**1 V**
DN 25 (1“)	**2 D**
DN 40 (1½“)	**2 R**
DN 50 (2“)	**2 Y**
DN 65 (2½“)	**3 F**
DN 80 (3“)	**3 M**
DN 100 (4“)	**3 T**
DN 125 (5“)	**4 B**
DN 150 (6“)	**4 H**
DN 200 (8“)	**4 P**
DN 250 (10“)	**4 V**
DN 300 (12“)	**5 D**
Flange norm and pressure rating	
EN 1092-1	
PN 10 (DN 200 ... 300 (8“ ... 12“))	**B**
PN 16 (DN 65 ... 300 (2½“ ... 12“))	**C**
PN 25 (DN 200 ... 300 (8“ ... 12“))	**E**
PN 40 (DN 15 ... 300 (½“ ... 12“))	**F**
ANSI B16.5	
Class 150 (½“ ... 12“)	**J**
Class 300 (½“ ... 12“)	**K**
AS	
2129, table E	**M**
Flange material	
Carbon steel flanges ASTM A 105	**1**
Stainless steel flanges, AISI 304/1.4301	**2**
Stainless steel flanges and sensor body, AISI 316L/1.4404, polished	**3**
Liner material	
PTFE (130 °C (266 °F))	**2**
PTFE including type E protection rings AISI 316/1.4436 (180 °C (356 °F))	**3**
PFA (150 °C (302 °F)) (DN 15 ... 150 (½" ... 6"))	**7**
Electrode material	
AISI 316Ti/1.4571 (not for PFA)	**1**
Hastelloy C276/2.4819 (PFA liner: Hastelloy C22/2.4602)	**2**
Platinum	**3**
Titanium (not for PFA)	**4**
Tantalum	**5**
Hastelloy C22/2.4602 incl. grounding electrodes (only PFA)	**6**
Platinium incl. grounding electrodes (only PFA)	**7**
Tantalum incl grounding electrodes (only PFA)	**8**
Transmitter with display	
Standard sensor for remote transmitter (Order transmitter separately)	**A**
Ex sensor for remote transmitter (Order transmitter separately)	**B**
MAG 6000 I, Alu.18 ... 90 V DC, 115 ... 230 V AC	**C**
MAG 6000 I, Alu. 18 ... 30 V DC, Ex	**D**
MAG 6000 I, Alu. 115 ... 230 V AC, Ex	**E**
MAG 6000, Polyamide, 11 ... 30 V DC/ 11 ... 24 V AC	**H**
MAG 6000, Polyamide, 115 ... 230 V AC	**J**
MAG 5000, Polyamide, 11 ... 30 V DC/ 11 ... 24 V AC	**K**
MAG 5000, Polyamide, 115 ... 230 V AC	**L**

Selection and Ordering data	Order No.
Sensor SITRANS F M MAG 3100 HT (High Temperature)	**7ME6320 -** ■■■■■ - ■■■■
Communication	
No communication, add-on possible	**A**
HART	**B**
PROFIBUS PA Profile 3 (only MAG 6000/MAG 6000 I)	**F**
PROFIBUS DP Profile 3 (only MAG 6000/MAG 6000 I)	**G**
Modbus RTU/RS 485 (only MAG 6000/MAG 6000 I)	**E**
FOUNDATION Fieldbus H1 (only MAG 6000/MAG 6000 I)	**J**
Cable glands/terminal box	
Metric: Polyamide terminal box (PTFE 130 °C (266 °F)) or 6000 I compact	**1**
½" NPT: Polyamide terminal box (PTFE 130 °C (266 °F)) or 6000 I compact	**2**
Metric: SS terminal box (mandatory for Stainless steel MAG 6000 Transmitter)	**3**
½" NPT: SS terminal box (mandatory for Stainless steel MAG 6000 Transmitter)	**4**

Selection and Ordering data	Order code
Additional information	
Please add **“-Z“** to Order No. and specify Order code(s) and plain text.	
Factory certificate according to EN 10204-2.2	**C14**
Factory certificate according to EN 10204-2.1	**C15**
Customer-specific converter setup	**Y20**
Tag name made, stainless steel fixed with SS wire (add plain text)	**Y17**
Tag name plate, plastic (self adhesive)	**Y18**
Sensor cables wired (specify cable order no.)	**Y40**
Sensor for remote transmitter's junction box potted to IP68 with wired cable (specify cable order no.) (not for Ex)	**Y41**
Other postproduction requirements (add desired text)	**Y99**
Additional calibrations	
• Matched pair - (Standard production calibration where sensor and transmitter is calibrated together)	**On request[1)]**
• Accredited Siemens Flow Instruments matched pair Calibration acc. to ISO/IEC 17025: 2005	**On request[1)]**
• Customer-specified calibration up to 10 points	**On request[1)]**
• CT verification and authority seal according to: Cold water pattern approval - DANAK TS 22.36.001, PTB (Denmark and Germany)	**On request[1)]**
• Customer-witnessed calibration Any of above calibration	**On request[1)]**

[1)] Ordering On request as dedicated information from the customer on the individual sensors is required. Please fill in the calibration form found on pi.khe.siemens.de/index.aspx?Nr=17460 and send together with the order. (Size dependent restriction on maximum flow rates may apply)

© Siemens AG 2012

Flow sensor MAG 3100 and MAG 3100 HT

Selection and Ordering data

MAG 3100 and MAG 3100 HT[1] Type C Grounding and protection rings

1 pc. AISI 304 grounding and protection ring **type C** for all liners except PTFE and PFA

DN	PN 6 Order No.	PN 10 Order No.	PN 16 Order No.	PN 25 Order No.	PN 40 Order No.	AS 2129 Table E Order No.
DN 25					**FDK:083N8361**	**FDK:083N8361**
DN 40					**FDK:083N8362**	**FDK:083N8362**
DN 50					**FDK:083N8344**	**FDK:083N8344**
DN 65	**FDK:083N8345**		**FDK:083N8345**		**FDK:083N8345**	**FDK:083N8346**
DN 80	**FDK:083N8347**		**FDK:083N8347**		**FDK:083N8347**	**FDK:083N8347**
DN 100	**FDK:083N8070**		**FDK:083N8025**		**FDK:083N8025**	**FDK:083N8025**
DN 125	**FDK:083N8071**		**FDK:083N8071**		**FDK:083N8071**	**FDK:083N8071**
DN 150	**FDK:083N8072**		**FDK:083N8008**		**FDK:083N8008**	**FDK:083N8008**
DN 200	**FDK:083N8074**	**FDK:083N8011**	**FDK:083N8011**	**FDK:083N8011**	**FDK:083N8075**	**FDK:083N8011**
DN 250	**FDK:083N8078**	**FDK:083N8013**	**FDK:083N8013**	**FDK:083N8013**	**FDK:083N8079**	**FDK:083N8013**
DN 300	**FDK:083N8080**	**FDK:083N8012**	**FDK:083N8012**	**FDK:083N8081**	**FDK:083N8082**	**FDK:083N8012**
DN 350	**FDK:083N8083**	**FDK:083N8039**	**FDK:083N8039**	**FDK:083N8084**	**FDK:083N8085**	**FDK:083N8039**
DN 400	**FDK:083N8099**	**FDK:083N8100**	**FDK:083N8100**	**FDK:083N8101**	**FDK:083N8102**	**FDK:083N8100**
DN 450	**FDK:083N8103**	**FDK:083N8103**	**FDK:083N8104**	**FDK:083N8104**	**FDK:083N8105**	**FDK:083N8104**
DN 500	**FDK:083N8107**	**FDK:083N8107**	**FDK:083N8108**	**FDK:083N8108**	**FDK:083N8109**	**FDK:083N8108**
DN 600	**FDK:083N8111**	**FDK:083N8111**	**FDK:083N8112**	**FDK:083N8112**		**FDK:083N8113**
DN 700	**FDK:083N8300**	**FDK:083N8294**	**FDK:083N8294**			**FDK:083N8372**
DN 750						
DN 800	**FDK:083N8303**	**FDK:083N8304**	**FDK:083N8304**			**FDK:083N8373**
DN 900	**FDK:083N8306**	**FDK:083N8307**	**FDK:083N8307**			**FDK:083N8396**
DN 1000	**FDK:083N8309**	**FDK:083N8310**	**FDK:083N8310**			**FDK:083N8397**
DN 1100		**FDK:083N8367**	**FDK:083N8367**			**FDK:083N8367**
DN 1200	**FDK:083N8312**	**FDK:083N8313**	**FDK:083N8313**			**FDK:083N8398**
DN 1400	**FDK:083N8467**	**FDK:083N8468**	**FDK:083N8469**			
DN 1500	**FDK:083N8471**	**FDK:083N8472**	**FDK:083N8473**			
DN 1600	**FDK:083N8475**	**FDK:083N8476**	**FDK:083N8477**			
DN 1800	**FDK:083N8479**	**FDK:083N8480**	**FDK:083N8481**			
DN 2000	**FDK:083N8483**	**FDK:083N8484**	**FDK:083N8485**			

[1] Also for MAG 5100 W (7ME6520 > DN 300; and 7ME6580).

Size	ANSI Class 150 Order No.	Class 300 Order No.	JIS K10 Order No.	JIS K20 Order No.
1"	**FDK:083N8361**	**FDK:083N8361**	**FDK:083N8361**	**FDK:083N8361**
1½"	**FDK:083N8362**	**FDK:083N8362**	**FDK:083N8362**	**FDK:083N8362**
2"	**FDK:083N8344**	**FDK:083N8344**	**FDK:083N8344**	**FDK:083N8344**
2½"	**FDK:083N8345**	**FDK:083N8345**	**FDK:083N8345**	**FDK:083N8345**
3"	**FDK:083N8347**	**FDK:083N8347**	**FDK:083N8347**	**FDK:083N8347**
4"	**FDK:083N8025**	**FDK:083N8025**	**FDK:083N8070**	**FDK:083N8025**
5"	**FDK:083N8071**	**FDK:083N8071**	**FDK:083N8071**	**FDK:083N8071**
6"	**FDK:083N8008**	**FDK:083N8073**	**FDK:083N8008**	**FDK:083N8008**
8"	**FDK:083N8011**	**FDK:083N8076**	**FDK:083N8011**	**FDK:083N8011**
10"	**FDK:083N8013**	**FDK:083N8079**	**FDK:083N8013**	**FDK:083N8079**
12"	**FDK:083N8012**	**FDK:083N8082**	**FDK:083N8012**	**FDK:083N8081**
14"	**FDK:083N8039**	**FDK:083N8085**	**FDK:083N8083**	**FDK:083N8039**
16"	**FDK:083N8100**	**FDK:083N8102**	**FDK:083N8100**	**FDK:083N8101**
18"	**FDK:083N8104**	**FDK:083N8106**	**FDK:083N8103**	**FDK:083N8104**
20"	**FDK:083N8107**	**FDK:083N8110**	**FDK:083N8107**	**FDK:083N8108**
24"	**FDK:083N8113**	**FDK:083N8114**	**FDK:083N8111**	**FDK:083N8112**

Size	AWWA C-207 Order No.
28"	**FDK:083N8302**
30"	**FDK:083N8366**
32"	**FDK:083N8305**
36"	**FDK:083N8308**
40"	**FDK:083N8311**
42"	**FDK:083N8394**
44"	**FDK:083N8395**
48"	**FDK:083N8314**
54"	**FDK:083N8470**
60"	**FDK:083N8474**
66"	**FDK:083N8478**
72"	**FDK:083N8482**
78"	**FDK:083N8486**

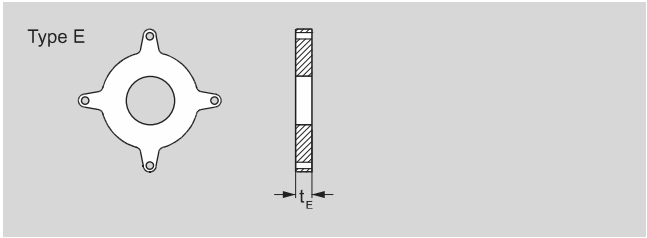
© Siemens AG 2012

Selection and Ordering data

MAG 3100 and 3100 HT Type E grounding and protection ring

1 pc. AISI 316 grounding and protection ring **type E** for PTFE liners

Note:
For MAG 3100 HT High temperature version 7ME6320... for PTFE 180 °C (356 °C) versions - grounding ring type E is included and factory mounted.



DN	PN 6 Order No.	PN 10 Order No.	PN 16 Order No.	PN 25 Order No.	PN 40 Order No.
DN 15					**FDK:083N8365**
DN 25					**FDK:083N8271**
DN 40					**FDK:083N8278**
DN 50					**FDK:083N8282**
DN 65	**FDK:083N8284**		**FDK:083N8285**		**FDK:083N8286**
DN 80	**FDK:083N8288**		**FDK:083N8289**		**FDK:083N8290**
DN 100	**FDK:083N8116**		**FDK:083N8117**		**FDK:083N8118**
DN 125	**FDK:083N8120**		**FDK:083N8121**		**FDK:083N8122**
DN 150	**FDK:083N8124**		**FDK:083N8125**		**FDK:083N8126**
DN 200	**FDK:083N8129**	**FDK:083N8130**	**FDK:083N8130**	**FDK:083N8131**	**FDK:083N8132**
DN 250	**FDK:083N8135**	**FDK:083N8136**	**FDK:083N8137**	**FDK:083N8138**	**FDK:083N8139**
DN 300	**FDK:083N8144**	**FDK:083N8144**	**FDK:083N8145**	**FDK:083N8146**	**FDK:083N8147**
DN 350	**FDK:083N8152**	**FDK:083N8153**	**FDK:083N8154**	**FDK:083N8155**	**FDK:083N8156**
DN 400	**FDK:083N8160**	**FDK:083N8161**	**FDK:083N8162**	**FDK:083N8163**	**FDK:083N8164**
DN 450	**FDK:083N8168**	**FDK:083N8169**	**FDK:083N8170**	**FDK:083N8171**	**FDK:083N8172**
DN 500	**FDK:083N8177**	**FDK:083N8178**	**FDK:083N8179**	**FDK:083N8180**	**FDK:083N8181**
DN 600	**FDK:083N8186**	**FDK:083N8187**	**FDK:083N8188**	**FDK:083N8189**	

Protection of PTFE liner use 2 pcs.
Earthing of PTFE lined flowmeter use 1 pc.

Size	ANSI			
	Class 150 Order No.	Class 300 Order No.	JIS K10 Order No.	JIS K20 Order No.
½"	**FDK:083N8365**	**FDK:083N8365**		
1"	**FDK:083N8272**	**FDK:083N8272**	**FDK:083N8271**	**FDK:083N8271**
1½"	**FDK:083N8279**	**FDK:083N8279**	**FDK:083N8278**	**FDK:083N8278**
2"	**FDK:083N8283**	**FDK:083N8283**	**FDK:083N8282**	**FDK:083N8282**
2½"	**FDK:083N8287**	**FDK:083N8287**	**FDK:083N8285**	**FDK:083N8285**
3"	**FDK:083N8291**	**FDK:083N8292**	**FDK:083N8288**	**FDK:083N8289**
4"	**FDK:083N8118**	**FDK:083N8119**	**FDK:083N8116**	**FDK:083N8117**
5"	**FDK:083N8122**	**FDK:083N8123**	**FDK:083N8121**	**FDK:083N8122**
6"	**FDK:083N8126**	**FDK:083N8127**	**FDK:083N8125**	**FDK:083N8126**
8"	**FDK:083N8370**	**FDK:083N8133**	**FDK:083N8130**	**FDK:083N8131**
10"	**FDK:083N8140**	**FDK:083N8141**	**FDK:083N8137**	**FDK:083N8139**
12"	**FDK:083N8148**	**FDK:083N8149**	**FDK:083N8144**	**FDK:083N8146**
14"	**FDK:083N8157**	**FDK:083N8158**	**FDK:083N8152**	**FDK:083N8154**
16"	**FDK:083N8165**	**FDK:083N8166**	**FDK:083N8161**	**FDK:083N8163**
18"	**FDK:083N8173**	**FDK:083N8174**	**FDK:083N8169**	**FDK:083N8171**
20"	**FDK:083N8182**	**FDK:083N8183**	**FDK:083N8178**	**FDK:083N8180**
24"	**FDK:083N8190**	**FDK:083N8191**	**FDK:083N8187**	**FDK:083N8189**

Protection of PTFE liner use 2 pcs.
Grounding of PTFE lined flowmeter use 1 pc.

AS2129, Table E DN	Order No.
DN 15	**FDK:083N8365**
DN 25	**FDK:083N8272**
DN 40	**FDK:083N8280**
DN 50	**FDK:083N8281**
DN 65	**FDK:083N8284**
DN 80	**FDK:083N8293**
DN 100	**FDK:083N8117**
DN 125	**FDK:083N8121**
DN 150	**FDK:083N8128**
DN 200	**FDK:083N8134**
DN 250	**FDK:083N8143**
DN 300	**FDK:083N8151**
DN 350	**FDK:083N8153**
DN 400	**FDK:083N8161**
DN 450	**FDK:083N8176**
DN 500	**FDK:083N8185**
DN 600	**FDK:083N8193**

Protection of PTFE liner use 2 pcs.
Grounding of PTFE lined flowmeter use 1 pcs.

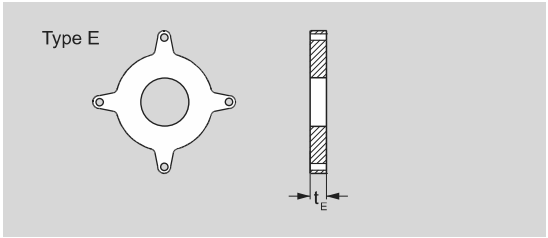
© Siemens AG 2012

Flow sensor MAG 3100 and MAG 3100 HT

Selection and Ordering data

MAG 3100 and MAG 3100 HT type E grounding and protecting ring

1 pc. Hastelloy C276 grounding and protection ring **type E** for PTFE liners

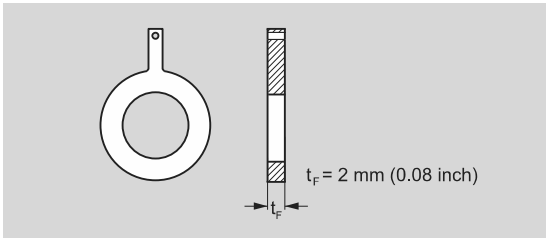


DN	PN 6	PN 16	PN 40	Size	ANSI Class 150	Class 300
	Order No.	Order No.	Order No.		Order No.	Order No.
DN 15			**FDK:083N8487**	½“	**FDK:083N8487**	**FDK:083N8487**
DN 25			**FDK:083N8488**	1“	**FDK:083N8489**	**FDK:083N8489**
DN 40			**FDK:083N8490**	1½“	**FDK:083N8491**	**FDK:083N8491**
DN 50			**FDK:083N8492**	2“	**FDK:083N8493**	**FDK:083N8493**
DN 65	**FDK:083N8494**	**FDK:083N8495**	**FDK:083N8496**	2½“	**FDK:083N8497**	**FDK:083N8497**
DN 80	**FDK:083N8498**	**FDK:083N8499**	**FDK:083N8500**	3“	**FDK:083N8501**	**FDK:083N8502**
DN 100	**FDK:083N8503**	**FDK:083N8504**	**FDK:083N8505**	4“	**FDK:083N8506**	**FDK:083N8507**

Selection and Ordering data

MAG 3100 and MAG 3100 HT[1] Grounding rings: Flat rings

1 pc. **AISI 316** grounding **flat ring** for all liners (PTFE max. 130 °C (266 °F))



DN	PN 10	PN 16	PN 40	Size	ANSI Class 150	Class 300
	Order No.	Order No.	Order No.		Order No.	Order No.
DN 15			**A5E01191969**	½“	**A5E01191968**	
DN 25			**A5E01150880**	1“	**A5E01150022**	**A5E01150378**
DN 40			**A5E01191952**	1½“	**A5E01191961**	
DN 50			**A5E01150918**	2“	**A5E01151121**	**A5E01151194**
DN 65		**A5E01191940**	**A5E01191954**	2½“	**A5E01191962**	
DN 80		**A5E01152876**	**A5E01152876**	3“	**A5E01152910**	**A5E01153422**
DN 100		**A5E01158875**	**A5E01159072**	4“	**A5E01159146**	**A5E01159628**
DN 125		**A5E01191941**	**A5E01191956**	5“	**A5E01191963**	
DN 150		**A5E01191943**	**A5E01191957**	6“	**A5E01191964**	
DN 200	**A5E01191951**	**A5E01191944**	**A5E01191958**	8“	**A5E01191965**	
DN 250	**A5E01191950**	**A5E01191946**	**A5E01191959**	10“	**A5E01191966**	
DN 300	**A5E01191949**	**A5E01191947**	**A5E01191960**	12“	**A5E01191967**	

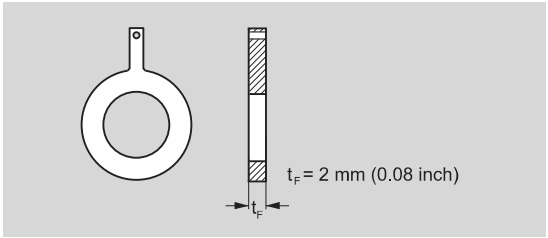
[1] Also for MAG 5100 W (7ME6520 DN 40 ... 300)

© Siemens AG 2012

Selection and Ordering data

MAG 3100 and MAG 3100 HT Grounding rings : Flat rings

1 pc. **Hastelloy** C276 grounding **flat ring** for all liners (PTFE max. 130 °C (266 °F))

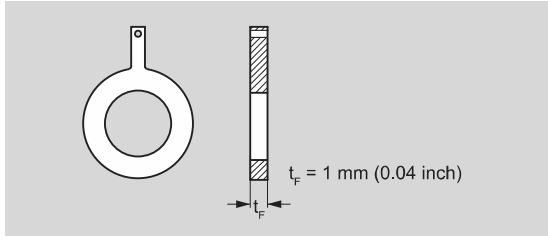


DN	PN 10	PN 16	PN 40	Size	ANSI Class 150	Class 300
	Order No.	Order No.	Order No.		Order No.	Order No.
DN 15			**A5E01191981**	½“	**A5E01191989**	
DN 25			**A5E01150882**	1“	**A5E01150028**	**A5E01150379**
DN 40			**A5E01191982**	1½“	**A5E01191990**	
DN 50			**A5E01150922**	2“	**A5E01151124**	**A5E01151197**
DN 65		**A5E01191971**	**A5E01191983**	2½“	**A5E01191991**	
DN 80		**A5E01152889**	**A5E01152889**	3“	**A5E01152913**	**A5E01153424**
DN 100		**A5E01158886**	**A5E01159074**	4“	**A5E01159150**	**A5E01159629**
DN 125		**A5E01191973**	**A5E01191984**	5“	**A5E01191992**	
DN 150		**A5E01191974**	**A5E01191985**	6“	**A5E01191993**	
DN 200	**A5E01191978**	**A5E01191975**	**A5E01191986**	8“	**A5E01191994**	
DN 250	**A5E01191979**	**A5E01191976**	**A5E01191987**	10“	**A5E01191995**	
DN 300	**A5E01191980**	**A5E01191977**	**A5E01191988**	12“	**A5E01191996**	

Selection and Ordering data

MAG 3100 and MAG 3100 HT Grounding rings : Flat rings

1 pc. **Tantalum** grounding **flat ring** for all liners (PTFE max. 130 °C (266 °F))



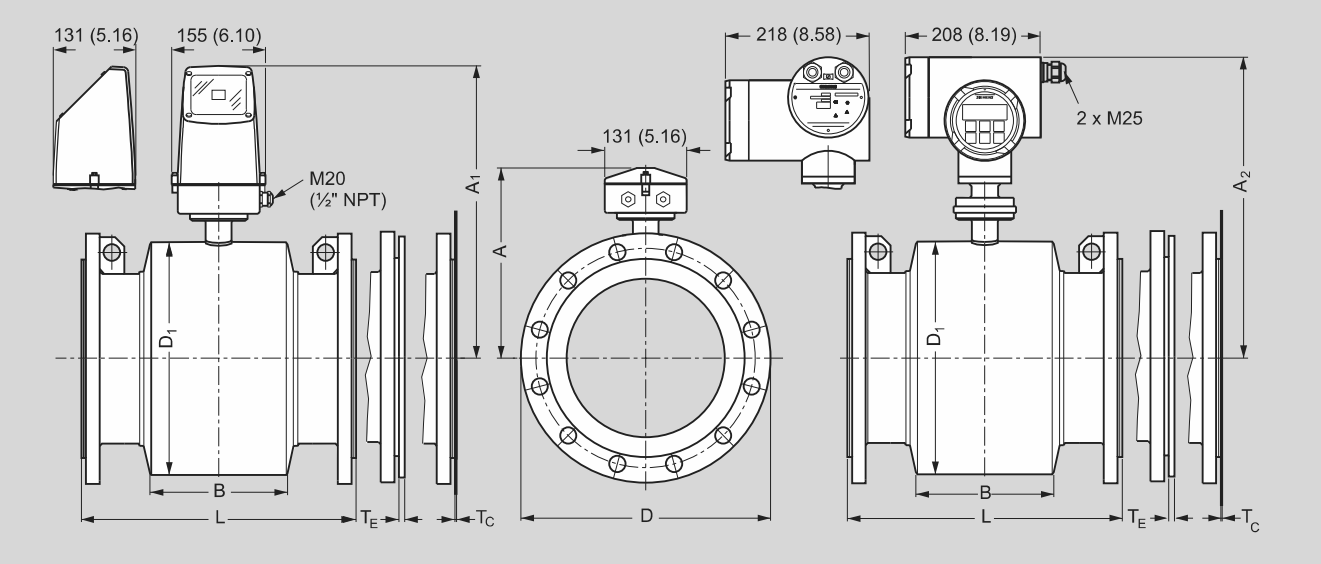
DN	PN 16	PN 40	Size	ANSI Class 150	Class 300
	Order No.	Order No.		Order No.	Order No.
DN 15		**A5E01192007**	½“	**A5E01192010**	
DN 25		**A5E01150883**	1“	**A5E01150030**	**A5E01150381**
DN 40		**A5E01192008**	1½“	**A5E01192011**	
DN 50		**A5E01150926**	2“	**A5E01151129**	**A5E01151199**
DN 65	**A5E01192005**	**A5E01192009**	2½“	**A5E01192012**	
DN 80	**A5E01152890**	**A5E01152890**	3“	**A5E01152916**	**A5E01153427**
DN 100	**A5E01158891**	**A5E01159076**	4“	**A5E01159156**	**A5E01159631**

© Siemens AG 2012

Flow sensor MAG 3100 and MAG 3100 HT

Dimensional drawings

MAG 3100 and MAG 3100 HT sensor with compact or remote transmitter



Dimensions in mm (inch)

Metric

DN	$A^{1)}$	$A_1{}^{2)}$	B	D_1	$L^{3)}$							
					EN 1092-1-201						ANSI 16.5	
					PN 6, 10	PN 16/ PN 16 non-PED	PN 25	PN 40	PN 63	PN 100	Class 150	Class 300
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
15	187	341	59	104	-	-	-	200	-	-	200	200
25	187	341	59	104	-	-	-	200	-	260	200	200
40	197	351	82	124	-	-	-	200	-	280	200	200
50	205	359	72	139	-	-	-	200	276	300	200	200
65	212	366	72	154	200	200/-	-	200	320	350	200	272
80	222	376	72	174	200	200/-	-	272[4)]	323	340	272[4)]	272[4)]
100	242	396	85	214	250	250/-	-	250	380	400	250	310
125	255	409	85	239	250	250/-	-	250	420	450	250	335
150	276	430	85	282	300	300/-	-	300	415	450	300	300
200	304	458	137	338	350	350/-	350	350	480	530	350	350
250	332	486	157	393	450	450/-	450	450	550	620	450	450
300	357	511	157	444	500	500/-	500	500	600	680	500	500
350	362	516	270	451	550	550/-	550	550	-	-	550	550
400	387	541	270	502	600	600/-	600	600	-	-	600	600
450	418	572	310	563	600	600/-	600	600	-	-	600	640
500	443	597	350	614	600	600/-	625	680	-	-	600	730
600	494	648	320	715	600	600/-	750	800	-	-	600	860
700	544	698	450	816	700	875/700	-	-	-	-	-	-
750	571	725	556	869	-	-/-	-	-	-	-	-	-
800	606	760	560	927	800	1000/800	-	-	-	-	-	-
900	653	807	630	1032	900	1125/900	-	-	-	-	-	-
1000	704	858	670	1136	1000	1250/1000	-	-	-	-	-	-
1050	704	858	670	1136	-	-/-	-	-	-	-	-	-
1100	755	904	770	1238	-	-/-	-	-	-	-	-	-
1200	810	964	792	1348	1200	1500/1200	-	-	-	-	-	-
1400	925	1079	1000	1675	1400	-/1400	-	-	-	-	-	-
1500	972	1126	1020	1672	1500	-/1500	-	-	-	-	-	-
1600	1025	1179	1130	1915	1600	-/1600	-	-	-	-	-	-
1800	1123	1277	1250	1974	1800	-/1800	-	-	-	-	-	-
2000	1223	1377	1375	2174	2000	-/2000	-	-	-	-	-	-

1) 14.5 mm shorter with AISI terminal box (Ex and high temperature version)
2) A_2 is 3 mm shorter than A_1
3) When earthing flanges are used, the thickness of the earthing flange must be added to the built-in length
4) Not according to ISO 123359

© Siemens AG 2012

DN	L[1]				T_C[2]	T_E[2]	T_F[2]	T_T[2]	Wgt.[3]
	AS 2129 E AS 4087 PN 16, 21, 35	AWWA C-207 Class D	JIS K10	JIS K20					
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
15	200	-	200	200	-	6	2	1	4
25	200	-	200	200	1.2	6	2	1	5
40	200	-	200	240	1.2	6	2	1	8
50	200	-	200	240	1.2	6	2	1	9
65	200	-	200	272	1.2	6	2	1	11
80	200[4]	-	200[8]	272[8]	1.2	6	2	1	12
100	250	-	250	310	1.2	6	2	1	16
125	250	-	250	335	1.2	6	2	-	19
150	300	-	300	300	1.2	6	2	-	27
200	350	-	350	350	1.2	8	2	-	40
250	450	-	450	450	1.2	8	2	-	60
300	500	-	500	500	1.6	8	2	-	80
350	550	-	550	550	1.6	8	-	-	110
400	600	-	600	600	1.6	10	-	-	125
450	600	-	600	640	1.6	10	-	-	175
500	600[5]	-	600	680	1.6	10	-	-	200
600	600[6]	-	600	800	1.6	10	-	-	287
700	700[7]	700	-	-	2.0	-	-	-	330
750	750[7]	750	-	-	2.0	-	-	-	360
800	800[7]	800	-	-	2.0	-	-	-	450
900	900[7]	900	-	-	2.0	-	-	-	530
1000	1000[7]	1000	-	-	2.0	-	-	-	660
1050	-	1050	-	-	2.0	-	-	-	660
1100	1100[7]	1100	-	-	2.0	-	-	-	1140
1200	1200[7]	1200	-	-	2.0	-	-	-	1180
1400	-	1400	-	-	2.0	-	-	-	1600
1500	-	1500	-	-	3.0	-	-	-	2460
1600	-	1600	-	-	3.0	-	-	-	2525
1800	-	1800	-	-	3.0	-	-	-	2930
2000	-	2000	-	-	3.0	-	-	-	3665

1) When earthing flanges are used, the thickness of the earthing flange must be added to the built-in length
2) T_C = Type C grounding ring, T_E = Type E grounding ring (Included and factory mounted on high temperature 180 °C PTFE sensor), T_F = Flat type grounding rings
3) Weights are approx. (for PN 16) without transmitter
4) PN 35 DN 80 = 272 mm (not according to ISO 13359)
5) PN 35 DN 500 = 680 mm
6) PN 35 DN 600 = 750 mm
7) Not AS 4087 PN 21 or PN 35
8) Not according to ISO 13359

- not available

D = Outside diameter of flange, see flange tables

© Siemens AG 2012

Flow sensor MAG 3100 and MAG 3100 HT

MAG 3100 and MAG 3100 HT sensor with compact or remote transmitter

Imperial

Size	A[1]	A_1[2]	B	D_1	L[3]							
					EN 1092-1-201						ANSI 16.5	
					PN 6, 10	PN 16/ PN 16 non PED	PN 25	PN 40	PN 63	PN 100	Class 150	Class 300
[in.]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]
½	7.36	13.31	2.32	4.09	-	-	-	7.87	-	-	7.87	7.87
1	7.36	13.31	2.32	4.09	-	-	-	7.87	-	10.24	7.87	7.87
1½	7.76	13.70	3.23	4.88	-	-	-	7.87	-	11.02	7.87	7.87
2	8.07	14.01	2.83	5.47	-	-	-	7.87	10.87	11.81	7.87	7.87
2½	8.35	14.29	2.83	6.06	7.87	7.87/-	-	7.87	12.60	13.78	7.87	10.71
3	8.74	14.69	2.83	6.85	7.87	7.87/-	-	10.71[4]	12.72	13.39	10.71[4]	10.71[4]
4	9.53	15.47	3.35	8.43	9.84	9.84/-	-	9.84	14.96	-	9.84	12.20
5	10.04	15.98	3.35	9.41	9.84	9.84/-	-	9.84	16.54	-	9.84	13.10
6	10.87	16.81	5.39	11.10	11.81	11.81/-	-	11.81	16.34	-	11.81	11.81
8	11.97	17.91	5.39	13.31	13.78	13.78/-	13.78	13.78	18.90	-	13.78	13.78
10	13.07	19.02	6.18	15.47	17.72	17.72/-	17.72	17.72	-	-	17.72	17.72
12	14.05	20.00	6.18	17.48	19.69	19.69/-	19.69	19.69	-	-	19.69	19.69
14	14.25	20.20	10.63	17.76	21.65	21.65/-	21.65	21.65	-	-	21.65	21.65
16	15.24	21.18	10.63	19.76	23.62	23.62/-	23.62	23.62	-	-	23.62	23.62
18	16.45	22.40	12.20	22.16	23.62	23.62/-	23.62	23.62	-	-	23.62	23.62
20	17.44	23.39	13.78	24.17	23.62	23.62/-	24.61	26.77	-	-	23.62	28.70
24	19.45	25.39	12.59	28.15	23.62	23.62/-	29.53	31.50	-	-	23.62	33.80
28	21.42	27.36	17.72	32.13	27.56	34.45/27.56	-	-	-	-	-	-
30	22.48	28.43	21.89	34.21	-	-/-	-	-	-	-	-	-
32	23.86	29.80	22.05	36.50	31.50	39.37/31.50	-	-	-	-	-	-
36	25.71	31.65	24.80	40.63	35.43	44.29/35.43	-	-	-	-	-	-
40	27.72	35.67	26.38	44.72	39.37	49.21/39.37	-	-	-	-	-	-
42	27.72	35.67	26.38	44.72	-	-/-	-	-	-	-	-	-
44	29.72	35.67	30.31	48.74	-	-/-	-	-	-	-	-	-
48	31.89	37.83	31.18	53.07	47.24	59.06/47.24	-	-	-	-	-	-
54	36.42	42.36	39.37	65.94	55.12	-/55.12	-	-	-	-	-	-
60	38.27	44.21	40.15	65.83	59.06	59.06/59.06	-	-	-	-	-	-
66	40.35	46.30	44.49	75.39	62.99	-/62.99	-	-	-	-	-	-
72	44.21	50.16	49.21	77.72	70.87	-/70.87	-	-	-	-	-	-
78	48.15	54.09	54.13	85.59	78.74	-/78.74	-	-	-	-	-	-

1) 0.571 inch shorter with AISI terminal box (Ex and high temperature version)
2) A_2 is 0.06 inch shorter than A_1
3) When earthing flanges are used, the thickness of the earthing flange must be added to the built-in length
4) Not according to ISO 123359

© Siemens AG 2012

Size	L[1]				T_C[2]	T_E[2]	T_F[2]	T_T[2]	Weight[3]
	AS 2129 E AS 4087 PN 16, 21, 35	AWWA C-207 Class D	JIS K10	JIS K20					
[in.]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[lb]
½	7.87	-	7.87	7.87	-	0.24	0.08	0.04	9
1	7.87	-	7.87	7.87	0.05	0.24	0.08	0.04	11
1½	7.87	-	7.87	9.44	0.05	0.24	0.08	0.04	17
2	7.87	-	7.87	9.44	0.05	0.24	0.08	0.04	20
2½	7.87	-	7.87	10.70	0.05	0.24	0.08	0.04	24
3	7.87[4]	-	7.87[8]	10.70[8]	0.05	0.24	0.08	0.04	26
4	9.84	-	9.84	12.20	0.05	0.24	0.08	0.04	35
5	9.84	-	9.84	13.18	0.05	0.24	0.08	-	42
6	11.81	-	11.81	11.81	0.05	0.24	0.08	-	60
8	13.78	-	13.77	13.77	0.05	0.31	0.08	-	88
10	17.72	-	17.71	17.71	0.05	0.31	0.08	-	132
12	19.69	-	19.68	19.68	0.06	0.31	0.08	-	176
14	21.65	-	21.65	21.65	0.06	0.31	-	-	242
16	23.62	-	23.62	23.62	0.06	0.39	-	-	275
18	23.62	-	23.62	25.19	0.06	0.39	-	-	385
20	23.62[5]	-	23.62	26.77	0.06	0.39	-	-	440
24	23.62[6]	-	23.62	31.49	0.06	0.39	-	-	633
28	27.56[7]	27.56	-	-	0.08	-	-	-	728
30	29.53[7]	29.52	-	-	0.08	-	-	-	794
32	31.50[7]	31.50	-	-	0.08	-	-	-	992
36	35.43[7]	35.43	-	-	0.08	-	-	-	1168
40	39.37[7]	39.37	-	-	0.08	-	-	-	1455
42	-	39.37	-	-	0.08	-	-	-	1455
44	43.31[7]	43.31	-	-	0.08	-	-	-	2513
48	47.24[7]	47.24	-	-	0.08	-	-	-	2601
54	-	55.12	-	-	0.12	-	-	-	3528
60	-	59.06	-	-	0.12	-	-	-	5423
66	-	63.00	-	-	0.12	-	-	-	5566
72	-	70.87	-	-	0.12	-	-	-	6460
78	-	78.74	-	-	0.12	-	-	-	8080

1) When earthing flanges are used, the thickness of the earthing flange must be added to the built-in length
2) T_C = Type C grounding ring, T_E = Type E grounding ring (Included and factory mounted on high temperature 356 °F PTFE sensor), T_F = Flat type grounding rings
3) Weights are for ANSI 150 without transmitter
4) PN 35 DN 80 = 10.70 inch
5) PN 35 DN 500 = 26.77 inch
6) PN 35 DN 600 = 29.53 inch
7) Not AS 4087 PN 21 or PN 35
8) Not according to ISO 13359

- not available

D = Outside diameter of flange, see flange tables

© Siemens AG 2012

Flow sensor MAG 3100 P

Overview

The SITRANS F M MAG 3100 P is designed to meet the most common specifications within chemical and process industries.

Benefits

- DN 15 to DN 300 (½" to 12")
- Short lead time
- Most used flowmeter in the chemical and process industries with PTFE/PFA liner and Hastelloy electrodes
- Excellent chemical resistance
- Full scope of global approvals for hazardous areas:
  - ATEX, FM, CSA, IEcEx
  - 24 V and 115/230 V Ex compact and remote
  - intrinsically safe ia analog output
- Comprehensive self-diagnostic for error indication and error logging
- Fully welded construction provides a ruggedness that suits the toughest applications and environments
- Easy commissioning, the SENSORPROM unit automatically updates settings.

Application

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

- Chemical industry
- Process industry
- Pulp and paper
- Industrial waste water

Design

- Compact or remote mounting possible
- Easy "plug & play" field changeability of transmitter
- High temperature sensor for applications with temperatures up to 150 °C (302 °F)
- Meets EEC directives: PED, 97/23/EC pressure directive for EN1092-1 flanges, and CRN
- Build-in length according to ISO 13359
- Onsite or factory upgrade to IP68/NEMA 6P of a standard sensor.

Mode of operation

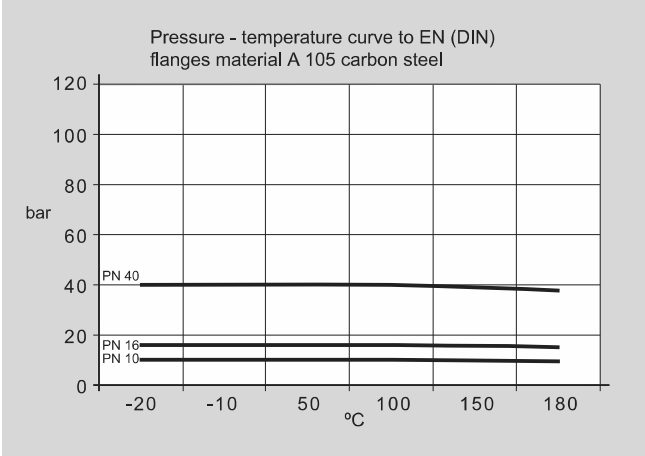
The flow measuring principle is based on Faraday's law of electromagnetic induction according to which the sensor converts the flow into an electrical voltage proportional to the velocity of the flow.

Integration

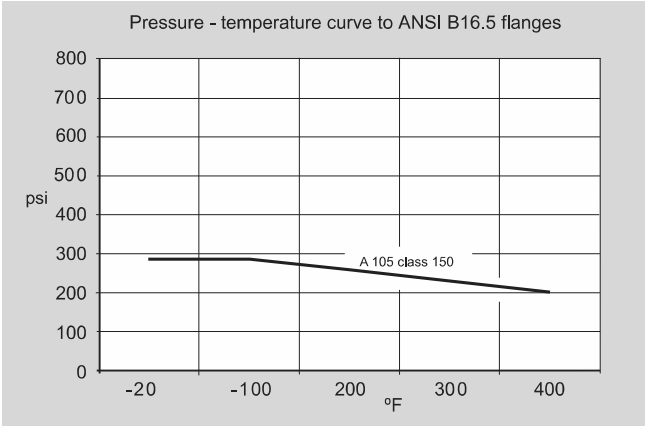
The complete flowmeter consists of a flow sensor and an associated transmitter MAG 5000, 6000 and 6000 I.

The flexible communication concept USM II simplifies integration and update to a variety of fieldbus systems such as HART, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS DP and PA, Modbus RTU/RS 485.

Pressure/temperature curve to EN (DIN) flanges, material A 105 carbon steel



Pressure/temperature curve to ANSI B16.5 flanges



Note: The pressure-temperature curves only assist in the selection of a system. No responsibility is taken for the correctness of the information. For further information on the PED standard and requirements, see page 9/14.

© Siemens AG 2012

Technical specifications

Product characteristic	Chemical and process industry-oriented (short lead time)
Nominal size	• PTFE: DN 15 ... 300 (½“ … 12”) • PFA: DN 15 ... 150 (½“ … 6”)
Measuring principle	Electromagnetic induction
Excitation frequency (Mains supply: 50 Hz/60 Hz)	• DN 15 ... 65 (½“ … 2½”): 12.5 Hz/15 Hz • DN 80 ... 150 (3” ... 6”): 6.25 Hz/7.5 Hz • DN 200 ... 300 (8” ... 12”): 3.125 Hz/3.75 Hz
Process connection	
Flanges	EN 1092-1, raised face[1] (EN 1092-1, DIN 2501 and BS 4504 have the same mating dimensions) • DN 15 ... 50 (½“ … 2”): PN 40 (580 psi) • DN 65 ... 300 (2½“ … 12”): PN 16 (232 psi) • DN 200 ... 300 (8“ … 12“): PN 10 (145 psi) ANSI B16.5 (~BS 1560), raised face • ½” ... 12”: Class 150 (20 bar (290 psi))
Rated operation conditions	
Ambient temperature (conditions also dependent on liner characteristiques)	
• Standard sensor	-40 … +100 °C (-40 … +212 °F)
• Ex sensor	-20 … +60 °C (-4 … +140 °F)
• With compact transmitter	
- MAG 5000/6000[2]	-20 … +60 °C (-4 … +140 °F)
- MAG 6000 I	-20 … +60 °C (-4 … +140 °F)
- MAG 6000 I Ex de	-20 … +60 °C (-4 … +140 °F)
Operating pressure [abs. bar] (maximum operating pressure decreases with increasing operating temperature and with stainless steel flanges)	• PTFE Teflon - DN 15 ... 300 (½“ … 12”) : 0.3 ... 40 bar (4 ... 580 psi) • PFA - DN 15 ... 150 (½“ … 6”): Vacuum 0.02 ... 50 bar (0.29 ... 725 psi)
Enclosure rating	IP67 to EN 60529/NEMA 4X/6, 1 mH_2O for 30 min Option: IP68 to EN 60529/NEMA 6P, 10 mH_2O cont. (not for Ex)
Pressure drop at 3 m/s	As straigth pipe
Test pressure	1.5 x PN (where applicable)
Mechanical load (vibration)	• 18 ... 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 mounted transmitter: 1.14 grms
Temperature of medium	• PTFE -20 … +130 °C (-4 … +266 °F) • PFA -20 … +150 °C (-4 … +302 °F)
EMC	2004/108/EC

Design	
Weight	See dimensional drawings
Flange and housing material	Carbon steel ASTM A 105, with corrosion resistant two component epoxy coating (min. 150 µm)
Measuring pipe material	AISI 304/1.4301
Electrode material	PTFE: Hastelloy C276/2.4819 PFA: Hastelloy C22/2.4602
Grounding electrode material	PTFE: No grounding electrodes PFA: Hastelloy
Terminal box (remote version only)	• Standard fibre glass reinforced polyamide • Option Stainless steel AISI 316/1.4436 • Ex sensor: Stainless steel AISI 316/1.4436
Cable entries	• 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 or 2 x ½" NPT (for supply/output) - MAG 6000 I Ex de: 2 x M25 or 2 x ½" NPT (for supply/output)
Certificates and approvals	
Calibration	
Standard production calibration, calibration report shipped with sensor	Zero-point, 2 x 25 % and 2 x 90 %
Conforms to	PED (All EN1092-1 flanges conforms to PED) – 97/23/EC[3] CRN
Material certificate EN 10204 3.1	On request
Ex approvals	Ex sensor • ATEX 2G D: DN 15 ... 300: EEx de ia IIC T3 - T6 • IEC Ex de ia IIC T3-T6 • FM Class I, Div 1 (compact only) • FM Class I, Zone 1 • CSA Class I, Zone 1 Standard sensor • FM Class I, Div 2/Zone 2 • CSA Class I, Div 2/Zone 2
Custody transfer (CT) (only together with MAG 5000/6000 CT), order as special	Heat meter pattern approval - OIML R 75 (Denmark) Hot water pattern approval - PTB (Germany) Other media than water - OIML R 117 (Denmark)

1) DN ≤ 600 type 01 (SORF); DN > 600 type 11 (WNRF)
2) With compact transmitter MAG 5000 CT/6000 CT -20 ... +50 °C (-4 ... +122 °F)
3) For further information on the PED standard and requirements, see page 9/14.

© Siemens AG 2012

Flow sensor MAG 3100 P

Selection and Ordering data		Order No.
Sensor SITRANS F M MAG 3100 P (Short delivery time)		7ME6340 - ■■■■ - ■■■■
Diameter		
DN 15 (½“)	◆	1 V
DN 25 (1“)	◆	2 D
DN 40 (1½“)	◆	2 R
DN 50 (2“)	◆	2 Y
DN 65 (2½“)	◆	3 F
DN 80 (3“)	◆	3 M
DN 100 (4“)	◆	3 T
DN 125 (5“)	◆	4 B
DN 150 (6“)	◆	4 H
DN 200 (8“)	◆	4 P
DN 250 (10“)	◆	4 V
DN 300 (12“)	◆	5 D
Flange norm and pressure rating		
EN 1092-1		
PN 10 (DN 200 ... 300 (8“ ... 12“))	◆	B
PN 16 (DN 65 ... 300 (2½“ ... 12“))	◆	C
PN 40 (DN 15 ... 50 (½“ ... 2“)	◆	F
ANSI B16.5		
Class 150 (½“ ... 12“)	◆	J
Flange material		
Carbon steel flanges ASTM A 105	◆	1
Liner material		
PTFE (130 °C (266 °F))	◆	3
PFA (150 °C (302 °F)) (DN 15 ... 150 (½" ... 6"))	◆	7
Electrode material		
Hastelloy C	◆	2
Hastelloy C incl. grounding electrode, (only PFA)		6
Transmitter		
Standard sensor for remote transmitter (Order transmitter separately)	◆	A
Ex sensor for remote transmitter (Order transmitter separately)	◆	B
MAG 6000 I, Aluminum, 18 ... 90 V DC, 115 ... 230 V AC	◆	C
MAG 6000 I, Aluminum, 18 ... 30 V DC, Ex	◆	D
MAG 6000 I, Aluminum, 115 ... 230 V AC, Ex	◆	E
MAG 6000, Polyamide, 11 ... 30 V DC/11 ... 24 V AC	◆	H
MAG 6000, Polyamide, 115 ... 230 V AC	◆	J
MAG 5000, Polyamide, 11 ... 30 V DC/11 ... 24 V AC	◆	K
MAG 5000, Polyamide, 115 ... 230 V AC	◆	L
Communication		
No communication, add-on possible	◆	A
HART	◆	B
PROFIBUS PA Profile 3 (only MAG 6000/MAG 6000 I)	◆	F
PROFIBUS DP Profile 3 (not for Ex) (only MAG 6000/MAG 6000 I)	◆	G
Modbus RTU/RS 485 (not for Ex) (only MAG 6000/MAG 6000 I)	◆	E
FOUNDATION Fieldbus H1 (only MAG 6000/MAG 6000 I)	◆	J
Cable glands/terminal box		
Metric: Polyamide terminal box or 6000 I compact	◆	1
½" NPT: Polyamide terminal box or 6000 I compact	◆	2
Metric SS terminal box (mandatory for stainless steel MAG 6000 transmitter)		3
½" NPT SS terminal box (mandatory for stainless steel MAG 6000 transmitter)		4

Selection and Ordering data	Order code
Additional information	
Please add **“-Z“** to Order No. and specify Order code(s) and plain text.	
Factory certificate according to EN 10204-2.2	**C14**
Factory certificate according to EN 10204-2.1	**C15**
Tag name plate, stainless steel fixed with SS wire (add plain text)	**Y17**
Tag name plate, plastic (self adhesive)	**Y18**
Customer-specific converter setup	**Y20**
Power cable wired (specify cable order no.)	**Y40**
Sensor for remote transmitter's junction box IP68 with wired cable (specify cable order no.) (not for ATEX)	**Y41**
Other postproduction requirements (add desired text)	**Y99**
Additional calibrations	
• Matched pair - (Standard production calibration where sensor and transmitter is calibrated together)	**On request**[1)]
• Accredited Siemens Flow Instruments matched pair Calibration acc. to ISO/IEC 17025: 2005	**On request**[1)]
• Customer-specified calibration up to 10 points	**On request**[1)]
• CT verification and authority seal according to: PTB (Denmark and Germany)	**On request**[1)]
• Customer-witnessed calibration Any of above calibration	**On request**[1)]

[1)] Ordering On request as dedicated information from the customer on the individual sensors is required. Please fill in the calibration form found on pi.khe.siemens.de/index.aspx?Nr=17460 and send together with the order. (Size dependent restriction on maximum flow rates may apply)

Operating instructions for SITRANS F M MAG 3100 P

Description	Order No.
• English	**A5E03005599**
• German	**A5E03086288**
• Spanish	**A5E03086291**
• French	**A5E03086290**

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
http://www.siemens.com/flowdocumentation

MAG 5000/6000 transmitters and sensors are packed in separate boxes, the final assembly takes place during installation at the customer's place. MAG 6000 I/MAG 6000 I ATEX 2G D transmitters and sensors are delivered compact mounted from factory.
Communication module will be pre-mounted in the transmitter.

Accessories

Description		Order No.
Potting kit for terminal box of flow sensors for IP68/NEMA 6P (not for Ex sensors)	◆	**FDK:085U0220**

◆ Short lead time (details in PMD)

Please use online Product selector to get latest updates.

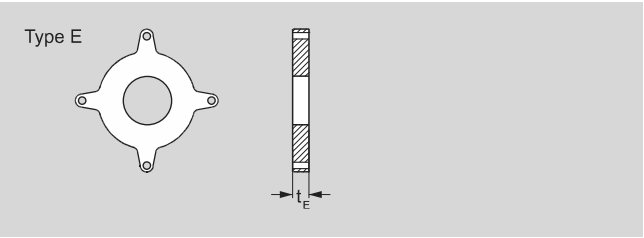
Product selector link:
www.pia-selector.automation.siemens.com

© Siemens AG 2012

Selection and Ordering data

MAG 3100 P Type E grounding and protection ring

1 pc. **AISI 316** grounding and protection rings **type E** for PTFE liners



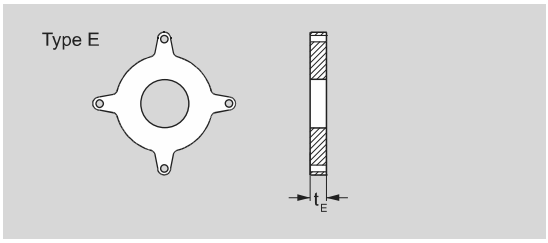
DN	PN 10 Order No.	PN 16 Order No.	PN 40 Order No.	ANSI[1)]	Class 150 Order No.
DN 15			**FDK:083N8365**	½“	**FDK:083N8365**
DN 25			**FDK:083N8271**	1“	**FDK:083N8272**
DN 40			**FDK:083N8278**	1½“	**FDK:083N8279**
DN 50			**FDK:083N8282**	2“	**FDK:083N8283**
DN 65		**FDK:083N8285**		2½“	**FDK:083N8287**
DN 80		**FDK:083N8289**		3“	**FDK:083N8291**
DN 100		**FDK:083N8117**		4“	**FDK:083N8118**
DN 125		**FDK:083N8121**		5“	**FDK:083N8122**
DN 150		**FDK:083N8125**		6“	**FDK:083N8126**
DN 200	**FDK:083N8130**	**FDK:083N8130**		8“	**FDK:083N8370**
DN 250	**FDK:083N8136**	**FDK:083N8137**		10“	**FDK:083N8140**
DN 300	**FDK:083N8144**	**FDK:083N8145**		12“	**FDK:083N8148**

Protection of PTFE liner use 2 pcs.
Earthing of PTFE lined flowmeter use 1 pc.

Selection and Ordering data

MAG 3100 P type E grounding and protecting ring

1 pc. **Hastelloy C276** grounding and protection ring **type E** for PTFE liners



DN	PN 16 Order No.	PN 40 Order No.	Size	ANSI[1)] Class 150 Order No.
DN 15		**FDK:083N8487**	½“	**FDK:083N8487**
DN 25		**FDK:083N8488**	1“	**FDK:083N8489**
DN 40		**FDK:083N8490**	1½“	**FDK:083N8491**
DN 50		**FDK:083N8492**	2“	**FDK:083N8493**
DN 65	**FDK:083N8495**		2½“	**FDK:083N8497**
DN 80	**FDK:083N8499**		3“	**FDK:083N8501**
DN 100	**FDK:083N8504**		4“	**FDK:083N8506**

1) For dimensions of MAG 3100 P see table on page 3/91

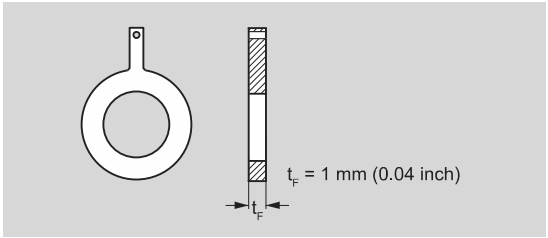
© Siemens AG 2012

Flow sensor MAG 3100 P

Selection and Ordering data

MAG 3100 P Grounding rings: Flat rings

1 pc. **AISI 316** grounding **flat ring** for all liners

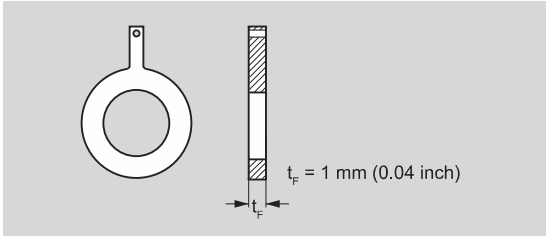


DN	PN 10	PN 16	PN 40	Size	ANSI[1] Class 150
	Order No.	Order No.	Order No.		Order No.
DN 15			**A5E01191969**	½“	**A5E01191968**
DN 25			**A5E01150880**	1“	**A5E01150022**
DN 40			**A5E01191952**	1½“	**A5E01191961**
DN 50			**A5E01150918**	2“	**A5E01151121**
DN 65		**A5E01191940**		2½“	**A5E01191962**
DN 80		**A5E01152876**		3“	**A5E01152910**
DN 100		**A5E01158875**		4“	**A5E01159146**
DN 125		**A5E01191941**		5“	**A5E01191963**
DN 150		**A5E01191943**		6“	**A5E01191964**
DN 200	**A5E01191951**	**A5E01191944**		8“	**A5E01191965**
DN 250	**A5E01191950**	**A5E01191946**		10“	**A5E01191966**
DN 300	**A5E01191949**	**A5E01191947**		12“	**A5E01191967**

Selection and Ordering data

MAG 3100 P Grounding rings : Flat rings

1 pc. **Hastelloy** C276 grounding **flat ring**



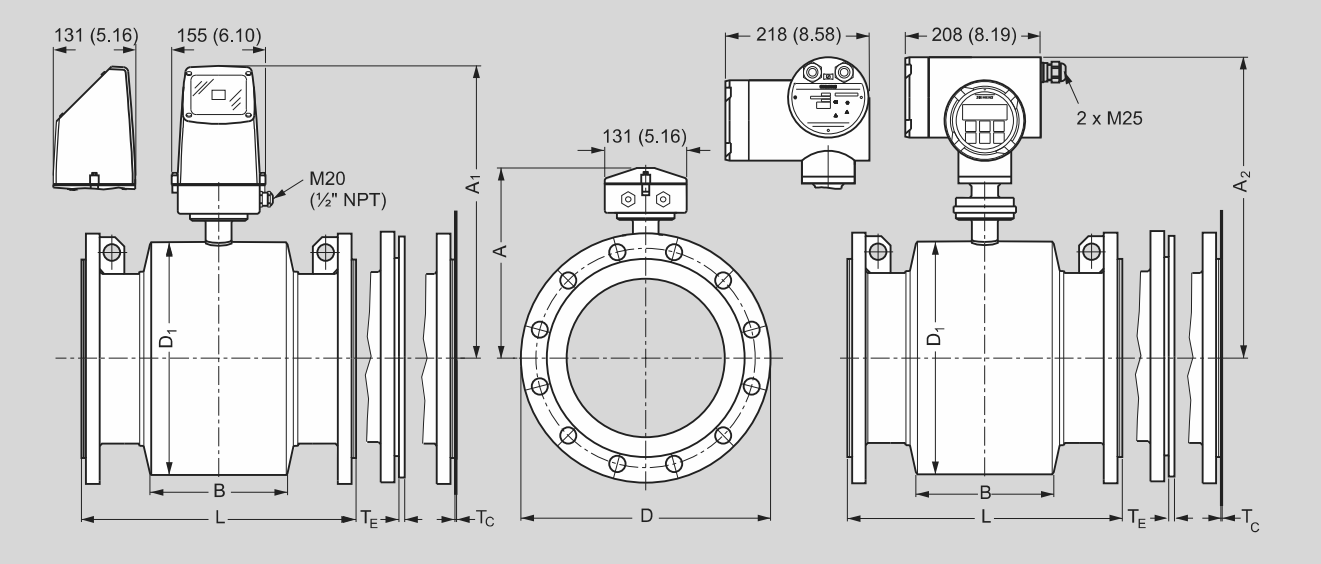
DN	PN 10	PN 16	PN 40	Size	ANSI[1] Class 150
	Order No.	Order No.	Order No.		Order No.
DN 15			**A5E01191981**	½“	**A5E01191989**
DN 25			**A5E01150882**	1“	**A5E01150028**
DN 40			**A5E01191982**	1½“	**A5E01191990**
DN 50			**A5E01150922**	2“	**A5E01151124**
DN 65		**A5E01191971**	**A5E01191983**	2½“	**A5E01191991**
DN 80		**A5E01152889**	**A5E01152889**	3“	**A5E01152913**
DN 100		**A5E01158886**	**A5E01159074**	4“	**A5E01159150**
DN 125		**A5E01191973**	**A5E01191984**	5“	**A5E01191992**
DN 150		**A5E01191974**	**A5E01191985**	6“	**A5E01191993**
DN 200	**A5E01191978**	**A5E01191975**	**A5E01191986**	8“	**A5E01191994**
DN 250	**A5E01191979**	**A5E01191976**	**A5E01191987**	10“	**A5E01191995**
DN 300	**A5E01191980**	**A5E01191977**	**A5E01191988**	12“	**A5E01191996**

[1] For dimensions of MAG 3100 P see table on page 3/91

© Siemens AG 2012

Dimensional drawings

MAG 3100 P sensor with compact or remote transmitter



Dimensions in mm (inch)

Metric

DN	A[1]	A_1/A_2[5]	B	D_1	L[2] EN 1092-1-201 PN 10	L[2] EN 1092-1-201 PN 16	L[2] EN 1092-1-201 PN 40	L[2] ANSI 16.5 Class 150	T_E[3]	T_F[3]	Wgt.[4]
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
15	187	341	59	104	-	-	200	200	6	2	4
25	187	341	59	104	-	-	200	200	6	2	5
40	197	351	82	124	-	-	200	200	6	2	8
50	205	359	72	139	-	-	200	200	6	2	9
65	212	369	72	154	200	200/-	200	200	6	2	11
80	222	376	72	174	200	200/-	272[6]	272[6]	6	2	12
100	242	396	85	214	250	250/-	250	250	6	2	16
125	255	409	85	239	250	250/-	250	250	6	2	19
150	276	500	85	282	300	300/-	300	300	6	2	27
200	304	458	137	338	350	350/-	350	350	8	2	40
250	332	486	157	393	450	450/-	450	450	8	2	60
300	357	511	157	444	500	500/-	500	500	8	2	80

1) 14.5 mm shorter with AISI terminal box (Ex and high temperature version)
2) When earthing flanges are used, the thickness of the earthing flange must be added to the built-in length
3) T_E = Type E grounding ring (Included and factory mounted on high temperature 180 °C PTFE sensor),
T_F = Flat type grounding rings
4) Weights are approx. (for PN 16) without transmitter
5) A_2 is 3 mm shorter than A_1
6) Not according to ISO 13359

- not available

D = Outside diameter of flange, see flange tables

© Siemens AG 2012

Flow sensor MAG 3100 P

MAG 3100 P sensor with compact or remote transmitter

Imperial

Size	A[1]	A_1/A_2[5]	B	D_1	L[2]				T_C[3]	T_E[3]	T_F[3]	Wgt.[4]
					EN 1092-1-201			ANSI 16.5				
					PN 10	PN 16	PN 40	Class 150				
[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[lb]
½	7.36	13.4	2.32	4.09	-	-	7.87	7.87	-	0.24	0.08	9
1	7.36	13.4	2.32	4.09	-	-	7.87	7.87	0.05	0.24	0.08	11
1½	7.76	13.8	3.23	4.88	-	-	7.87	7.87	0.05	0.24	0.08	17
2	8.07	14.1	2.83	5.47	-	-	7.87	7.87	0.05	0.24	0.08	20
2½	8.35	14.4	2.83	6.06	7.87	7.87/-	7.87	7.87	0.05	0.24	0.08	24
3	8.74	14.8	2.83	6.85	7.87	7.87/-	10.71[6]	10.71[6]	0.05	0.24	0.08	26
4	9.53	15.6	3.35	8.43	9.84	9.84/-	9.84	9.84	0.05	0.24	0.08	35
5	10.04	16.1	3.35	9.41	9.84	9.84/-	9.84	9.84	0.05	0.24	0.08	42
6	10.87	16.9	5.39	11.10	11.81	11.81/-	11.81	11.81	0.05	0.24	0.08	60
8	11.97	18.0	5.39	13.31	13.78	13.78/-	13.78	13.78	0.05	0.31	0.08	88
10	13.07	19.1	6.18	15.47	17.72	17.72/-	17.72	17.72	0.05	0.31	0.08	132
12	14.05	20.1	6.18	17.48	19.69	19.69/-	19.69	19.69	0.06	0.31	0.08	176

1) 0.571 inch shorter with AISI terminal box (Ex and high temperature version)
2) When earthing flanges are used, the thickness of the earthing flange must be added to the built-in length
3) T_C = Type C grounding ring, T_E = Type E grounding ring (Included and factory mounted on high temperature 356 °F PTFE sensor), T_F = Flat type grounding rings
4) Weights are for ANSI 150 without transmitter
5) A_2 is 0.06 inch shorter than A_1
6) Not according to ISO 13359

- not available

D = Outside diameter of flange, see flange tables

© Siemens AG 2012

Overview

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

Benefits

- DN 15 to DN 1200 / 2000 (½" to 48"/78")
- Stock program of MAG 5100 W secures short delivery time
- Connection flanges EN 1092-1 (DIN 2501), ANSI, AWWA, AS and JIS.
- NBR Hard Rubber and Ebonite Hard Rubber liner for all water applications
- EPDM liner with drinking water approvals
- Hastelloy integrated grounding and measuring electrodes
- Increased low flow accuracy for water leak detection, due to coned liner design (Order No. 7ME6520, DN 15 to 300 mm (½" to 12")).
- Drinking water approvals
- Suitable for direct burial and constant flooding
- Custody transfer approvals
- Build-in length according to ISO 13359; the standard includes sizes up to DN 400.
- Easy commissioning, SENSORPROM unit automatically uploads calibration values and settings.
- Designed so patented in-situ verification can be conducted. Using SENSORPROM fingerprint.
- Custody Transfer option for water billing, with type approval after OIML R 49 and verified according to MI-001
  - pattern approval OIML R 49 (Denmark, Germany)
  - conforms to ISO 4064 and EN 14154 for mechanical flowmeters
  - PTB K7.2
- FM Fire Service Meter (Class Number 1044) for automatic fire protection systems
- Meets EEC directives: PED, 97/23/EC pressure directive for EN1092-1 flanges
- Simple onsite or factory upgrade to IP68/NEMA 6P of a standard sensor
- MCERTS approval for UK environmental market

Application

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

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

Mode of operation

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

Integration

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

The flexible communication concept USM II simplifies integration and update to a variety of fieldbus systems, e.g. HART, DeviceNet, PROFIBUS DP and PA, FOUNDATION Fieldbus H1, Modbus RTU/RS 485.

© Siemens AG 2012

Flow sensor MAG 5100 W

Technical specifications

Product characteristic	MAG 5100 W (7ME6520) Mainly for the European market EPDM or NBR lining	MAG 5100 W (7ME6580) Mainly for the non-European market Ebonite lining
Design and nominal size	Coned sensor: DN 15 ... 300 (½" ... 12") Full bore sensor: DN 350 ... 1200 (14" ... 48")	Full bore sensor: DN 25 ... 2000 (1" ... 78")
Measuring principle	Electromagnetic induction	Electromagnetic induction
Excitation frequency (Mains supply: 50/60 Hz)	DN 15 ... 65 (½" ... 2½"): 12.5 Hz/15 Hz DN 80 ... 150 (3" ... 6"): 6.25 Hz/7.5 Hz DN 200 ... 300 (8" ... 12"): 3.125 Hz/3.75 Hz DN 350 ... 1200 (14" ... 48"): 1.5625 Hz/1.875 Hz	DN 25 ... 65 (1" ... 2½"): 12.5 Hz/15 Hz DN 80 ... 150 (3" ... 6"): 6.25 Hz/7.5 Hz DN 200 ... 1200 (8" ... 48"): 3.125 Hz/3.75 Hz DN 1400 ... 2000 (54" ... 78"): 1.5625 Hz/1.875 Hz
Process connection		
Flanges[6]		
• EN 1092-1	PN 10 (145 psi) : DN 200 ... 300 (8" ... 12") Flat face PN 10 (145 psi): DN 350 ... 1200 (14" ... 48") Raised face[1] PN 16 (232 psi): DN 50 ... 300 (2" ... 12") Flat face[2] PN 16 (232 psi): DN 350 ... 1200 (14" ... 48") Raised face PN 40 (580 psi): DN 15 ... 40 (½" ... 1½") Flat face	Raised face[2] (EN 1092-1, DIN 2501 and BS 4504 have the same mating dimensions) PN 6 (87 psi): DN 1400 ... 2000 (54" ... 78") PN 10 (145 psi): DN 200 ... 2000 (8" ... 78") PN 16 (232 psi): DN 65 ... 600 (2½" ... 24") PN 40 (580 psi): DN 25 ... 50 (1" ... 2")
• ANSI B16.5	Class 150: ½" ... 12" flat face; 14" ... 24" raised face	Class 150: 1" ... 24"; raised face
• AWWA C-207	Class D: 28" ... 48", flat face	Class D: 28" ... 78", flat face
• AS4087	PN 16 (DN 50 ... 1200), (2" ... 48") 16 bar (232 psi)	PN 16 (DN 50 ... 1200), (2" ... 48") 16 bar (232 psi)
• JIS B 2220:2004	-	K10 (1" ... 24")
Rated Operation conditions		
Ambient temperature		
• Sensor	-40 ... +70 °C (-40 ... +158 °F)	-20 ... +70 °C (-4 ... +158 °F)
• With compact transmitter MAG 5000/6000[3]	-20 ... +60 °C (-4 ... +140 °F)	-20 ... +60 °C (-4 ... +140 °F)
Operating pressure (Abs) [abs. bar] (Maximum operating pressure depending on flange standard, decreases with increasing operating temperature)	DN 15 ... 40 (½" ... 1½"): 0.01 ... 40 bar (0.15 ... 580 psi) DN 50 ... 300 (2" ... 12"): 0.03 ... 20 bar (0.44 ... 290 psi) DN 350 ... 1200 (14" ... 48"): 0.01 ... 16 bar (0.15 ... 232 psi)	DN 25 ... 50 (1" ... 2"): 0.01 ... 40 bar (0.15 ... 580 psi) DN 65 ... 1200 (2½" ... 48"): 0.01 ... 16 bar (0.15 ... 232 psi) DN 1400 ... 2000 (54" ... 78"): 0.01 ... 10 bar (0.15 ... 145 psi)
Enclosure rating		
• Standard	IP67 to EN 60529/NEMA 4X/6 (1 mH_2O for 30 min)	IP67 to EN 60529/NEMA 4X/6 (1 mH_2O for 30 min)
• Option	IP68 to EN 60529/NEMA 6P (10 mH_2O continuously)	IP68 to EN 60529/NEMA 6P (10 mH_2O continuously)
Pressure drop	DN 15 and 25 (½" and 1"): Max. 20 mbar (0.29 psi) at 1 m/s (3 ft/s). DN 40 ... 300 (1½" ... 12"): Max 25 mbar (0.36 psi) at 3 m/s (10 ft/s) DN 350 ... 1200 (14" ... 48"): Insignificant	Insignificant
Test pressure	1.5 x PN (where applicable) FM Fire Service: 2 x PN	1.5 x PN (where applicable)
Mechanical load (vibration)	18 ... 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 mounted transmitter: 1.14 grms	18 ... 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 mounted transmitter: 1.14 grms

© Siemens AG 2012

Product characteristic	Mainly for the European market (7ME6520) EPDM or NBR lining	Mainly for the non-European market (7ME6580) Ebonite lining
Medium conditions		
Temperature of medium		
• NBR	-10 ... +70 °C (14 ... 158 °F)	-
• EPDM	-10 ... +70 °C (14 ... 158 °F)	-
• EPDM/NBR (MI-001)	0.1 ... 30 °C (32 ... 76 °F)	-
• Ebonite	-	-10 ... +70 °C (14 ... 158 °F)
EMC	2004/108/EC	2004/108/EC
Design		
Material		
• Housing and flanges	Carbon steel, with corrosion-resistant two-component epoxy coating (min. 150 µm) Corrosivity category C4, according to ISO 12944-2	Carbon steel ASTM A 105, with corrosion-resistant two-component epoxy coating (min. 150 µm) Corrosivity category C4, according to ISO 12944-2
• Measuring pipe	Stainless steel AISI 304/1.4301	Stainless steel AISI 304/1.4301
• Electrode	Hastelloy C	Hastelloy C
• Grounding electrode	Hastelloy C	Hastelloy C
• Terminal box	Fibre glass reinforced polyamide	Fibre glass reinforced polyamide
Certificates and approvals		
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 %
Custody Transfer (only together with MAG 6000 CT)	OIML R 49 pattern approval cold water (Denmark and Germany): DN 50 ... 300 (2“ ... 12“) MI-001 cold water (EU): DN 50 ... 300 (2“ ... 12“) PTB K7.2: Chilled water energy metering DN 50-300 (order as special) Certificate number: 22 76.10 02	
Drinking water approvals	EPDM liner: NSF/ANSI Standard 61[5] (Cold water, US) WRAS (WRc, BS6920 cold water, GB) ACS (F), DVGW W270 (D) Belgaqua (B)	NSF/ANSI Standard 61[5] (Cold water, US) WRAS (WRc, BS6920 cold water, GB)
Other approvals	MCERTS PED conforming: All EN1092-1 flanges and ANSI Class 150 (< DN 300 (<12“)) – 97/23/EC[4] CRN (DN 50 - DN 1200 (2" ... 48")) CSA Class I, Div 2 FM Class I, Div 2 FM Fire Service Approval according to class 1044[7] VdS: Extinguishing systems DN 50 ... 300	PED conforming: All EN1092-1 flanges (≤ DN 600 (≤ 24") – 97/23/EC[4] CRN CSA Class I, Div 2 FM Class I, Div 2

1) Type 01 (SORF)

2) DN ≤ 600 type 01 (SORF); DN > 600 type 11

3) With compact transmitter MAG 5000 CT/6000 CT -20 ... +50 °C (-4 ... +122 °F); with compact MI-001 approved transmitter -25 ... +55 °C (-13 ... +131 °F)

4) For sizes larger than 600 mm (24“) in PN 16 PED conformity is available as a cost-added option. The basic unit will carry the LVD (Low Voltage Directive) and EMC approval. All products sold outside of EU and EFTA are excluded from the directive, also products sold into certain market sectors are excluded. These include:
a) Meters used in networks for the supply, distribution and discharge of water.
b) Meters used in pipelines for the conveyance of any fluid from offshore to onshore.
c) Meters used in the extraction of petroleum or gas, including Christmas tree and manifold equipment.
d) Any meter mounted on a ship or mobile offshore platform. For further information on the PED standard and requirements see page 9/14.

5) Including Annex F

6) DN 750, DN 1050 and DN 1100 (30", 42" and 44") not available with EN 1092-1 (PN 10 and PN 16) and AS4087 flanges

7) DN 50, DN 80, DN 100, DN 150, DN 200, DN 250, and DN 300 (2", 3", 4", 6", 8", 10", and 12") with ANSI B16.5 Class 150 flanges

© Siemens AG 2012

Flow sensor MAG 5100 W

MAG 5100 W (7ME6520) with MAG 6000 CT (Revenue program) MI-001

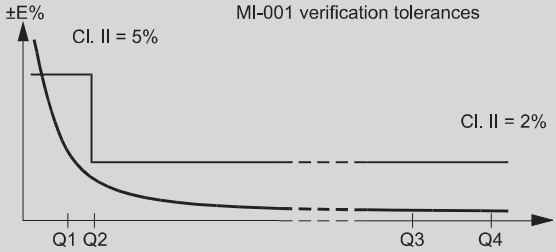
MAG 5100 W CT program is type approved according to international water meter standard OIML R 49. Since the first November 2006 the MI-001 water meter directive is in force, which means that all water meters can be sold across the EU borders if the water meters contain a MI-001 label.

The MAG 5100 W MI-001 verified and labeled products are a Class II approval according to Directive 2004/22/EC of the European Parliament and Council of March 31, 2004 on measuring instruments (MID), Annex MI-001 in the sizes from DN 50 to DN 300 (Order No. 7ME6520).

The MID certification is obtained as a modul B + D module approval according to the above mentioned directive.

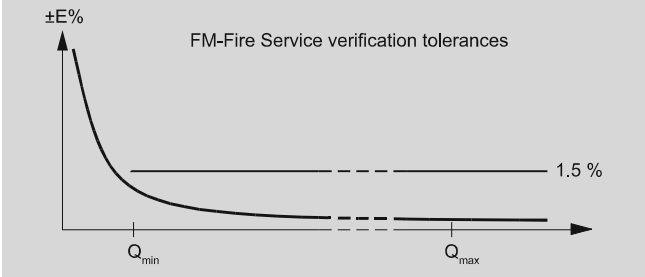
Module B : Type approval according to OIML R 49

Module D : Quality insurance approval of production



MAG 5100 W (7ME6520) with MAG 5000/MAG 6000 or MAG 6000 CT for Fire Service applications

MAG 5100 W (7ME6520) is FM Fire Service approved for automatic fire protection systems. The approval is applicable for the sizes DN 50, DN 80, DN 100, DN 150, DN 200, DN 250 and DN 300 (2", 3", 4", 6", 8", 10" and 12") with ANSI B16.5 Class 150 flanges. The FM Fire Service approved product can be ordered via the Z-options P20, P21 and P22.



© Siemens AG 2012

MAG 5100 W (7ME6520) MI-001 verified and labeled products at a given Q3 and Q3/Q4 = 1.25 and Q2/Q1 = 1.6 measuring ranges see table below:

Order code: P11	**DN 50 (2“)**	**DN 65 (2½“)**	**DN 80 (3“)**	**DN 100 (4“)**	**DN 125 (5“)**	**DN 150 (6“)**	**DN 200 (8“)**	**DN 250 (10“)**	**DN 300 (12“)**
„R“ Q3/Q1	25	25	25	25	25	25	25	25	25
Q4 [m^3/h]	20	31.25	50	78.75	125	200	312.5	500	787.5
Q3 [m^3/h]	**16**	**25**	**40**	**63**	**100**	**160**	**250**	**400**	**630**
Q2 [m^3/h]	1.02	1.6	2.6	4.03	6.4	10.24	16	25.6	40.32
Q1 [m^3/h]	0.64	1.00	1.60	2.52	4.0	6.4	10.0	16.0	25.2

Order code: P12	**DN 50 (2“)**	**DN 65 (2½“)**	**DN 80 (3“)**	**DN 100 (4“)**	**DN 125 (5“)**	**DN 150 (6“)**	**DN 200 (8“)**	**DN 250 (10“)**	**DN 300 (12“)**
„R“ Q3/Q1	63	63	63	63	63	63	63	63	63
Q4 [m^3/h]	20	31.25	50	78.75	125	200	312.5	500	787.5
Q3 [m^3/h]	**16**	**25**	**40**	**63**	**100**	**160**	**250**	**400**	**630**
Q2 [m^3/h]	0.41	0.63	1.02	1.6	2.54	4.06	6.35	10.2	16.0
Q1 [m^3/h]	0.25	0.40	0.63	1.00	1.59	2.54	3.97	6.35	10.0

Order code: P13	**DN 50 (2“)**	**DN 65 (2½“)**	**DN 80 (3“)**	**DN 100 (4“)**	**DN 125 (5“)**	**DN 150 (6“)**	**DN 200 (8“)**	**DN 250 (10“)**	**DN 300 (12“)**
„R“ Q3/Q1	80	80	80	80	80	80	80	80	80
Q4 [m^3/h]	20	31.25	50	78.75	125	200	312.5	500	787.5
Q3 [m^3/h]	**16**	**25**	**40**	**63**	**100**	**160**	**250**	**400**	**630**
Q2 [m^3/h]	0.32	0.50	0.80	1.20	2.00	3.20	5.0	8.0	12.6
Q1 [m^3/h]	0.20	0.31	0.50	0.75	1.25	2.00	3.13	5.0	7.90

Order code: P16	**DN 50 (2“)**	**DN 65 (2½“)**	**DN 80 (3“)**	**DN 100 (4“)**	**DN 125 (5“)**	**DN 150 (6“)**	**DN 200 (8“)**	**DN 250 (10“)**	**DN 300 (12“)**
„R“ Q3/Q1	160	160	160	160	160	160	160	160	160
Q4 [m^3/h]	50	78.75	125	200	312.5	500	787.5	1250	2000
Q3 [m^3/h]	**40**	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1600**
Q2 [m^3/h]	0.40	0.63	1.00	1.60	2.50	4.00	6.3	10.0	16.0
Q1 [m^3/h]	0.25	0.39	0.63	1.00	1.56	2.50	3.94	6.3	10.0

Order code: P17	**DN 50 (2“)**	**DN 65 (2½“)**	**DN 80 (3“)**	**DN 100 (4“)**	**DN 125 (5“)**	**DN 150 (6“)**	**DN 200 (8“)**	**DN 250 (10“)**	**DN 300 (12“)**
„R“ Q3/Q1	200	200	200	200	200	200	200	200	200
Q4 [m^3/h]	50	78.75	125	200	312.5	500	787.5	1250	2000
Q3 [m^3/h]	**40**	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1600**
Q2 [m^3/h]	0.32	0.50	0.80	1.28	2.00	3.20	5.0	8.0	12.8
Q1 [m^3/h]	0.20	0.32	0.50	0.80	1.25	2.00	3.15	5.0	8.0

Order code: P18	**DN 50 (2“)**	**DN 65 (2½“)**	**DN 80 (3“)**	**DN 100 (4“)**	**DN 125 (5“)**	**DN 150 (6“)**	**DN 200 (8“)**	**DN 250 (10“)**	**DN 300 (12“)**
„R“ Q3/Q1	250	250	250	250	250	250	250	250	250
Q4 [m^3/h]	50	78.75	125	200	312.5	500	787.5	1250	2000
Q3 [m^3/h]	**40**	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1600**
Q2 [m^3/h]	0.26	0.40	0.64	1.02	1.60	2.56	4.0	6.4	10.24
Q1 [m^3/h]	0.16	0.25	0.40	0.64	1.00	1.60	2.52	4.0	6.4

The Label is placed on the side of the encapsulation. An example of the product label is shown below:

OIML R 49/MI-001 approvals valid for:

- DN 50 to 300 mm (2" to 12")
- Horizontal installation
- Compact or remote with max. 3 m cable
- Power supply 115/230 V AC

Other restrictions may apply (see certificate).

Special OIML / MI-001 settings:

- Unit: m^3
- Qmax: Q3
- CutOff: 0.1 %
- Digital output: Frequency

For other factory settings, see Operating Instructions.

© Siemens AG 2012

Flow sensor MAG 5100 W

Selection and Ordering data		Order No.
Sensor SITRANS F M MAG 5100 W		**7ME6520-**
Hastelloy electrodes, carbon steel flanges, EU water markets and low flow applications		■■■1■-2■■■
Diameter		
DN 15 (½")	◆	1V
DN 25 (1")	◆	2D
DN 40 (1½")	◆	2R
DN 50 (2")	◆	2Y
DN 65 (2½")	◆	3F
DN 80 (3")	◆	3M
DN 100 (4")	◆	3T
DN 125 (5")	◆	4B
DN 150 (6")	◆	4H
DN 200 (8")	◆	4P
DN 250 (10")	◆	4V
DN 300 (12")	◆	5D
DN 350 (14")	◆	5K
DN 400 (16")	◆	5R
DN 450 (18")	◆	5Y
DN 500 (20")	◆	6F
DN 600 (24")	◆	6P
DN 700 (28")	◆	6Y
DN 750 (30")		7D
DN 800 (32")		7H
DN 900 (36")		7M
DN 1000 (40")		7R
(42")		7U
(44")		7V
DN 1200 (48")		8B
Flange norm and pressure rating		
to EN 1092-1		
PN 10 (DN 200 ... 1200/8" ... 48")	◆	B
PN 16 (DN 50 ... 1200/2" ... 48")	◆	C
PN 16, non PED (DN 700 ... 1200/28" ... 48")		D
PN 40 (DN 15 ... 40/½" ... 1½")	◆	F
to ANSI B16.5		
class 150 (½" ... 24")	◆	J
to AWWA C-207		
Class D (28" ... 48")		L
to AS 4087		
PN 16 (DN 50 ... 1200/2" ... 48")		N
Liner material		
EPDM	◆	2
NBR Hard Rubber	◆	3
Transmitter		
Sensor for remote transmitter (Order transmitter separately)	◆	A
MAG 6000 I, Aluminum, 18 ... 90 V DC, 115 ... 230 V AC	◆	C
MAG 6000, Polyamid, 11 ... 30 V DC/11 ... 24V AC	◆	H
MAG 6000, Polyamid, 115 ... 230 V AC	◆	J
MAG 5000, Polyamid, 11 ... 30 V DC/11 ... 24V AC	◆	K
MAG 5000, Polyamid, 115 ... 230 V AC	◆	L
MAG 6000 CT, Polyamid, 115 ... 230 V AC	◆	M

Selection and Ordering data		Order No.
Sensor SITRANS F M MAG 5100 W		**7ME6520-**
Hastelloy electrodes, carbon steel flanges, EU water markets and low flow applications		■■■1■-2■■■
Communication		
None	◆	A
HART	◆	B
PROFIBUS PA Profile 3 (only MAG 6000/MAG 6000 I)	◆	F
PROFIBUS DP Profile 3 (only MAG 6000/MAG 6000 I)	◆	G
Modbus RTU/RS 485 (only MAG 6000/MAG 6000 I)	◆	E
FOUNDATION Fieldbus H1 (only MAG 6000/ MAG 6000 I)	◆	J
Cable glands/terminal box		
Metric/Polyamid terminal box or 6000 I compact	◆	1
½" NPT/Polyamid terminal box or 6000 I compact	◆	2

◆ Short lead time (details in PMD)

© Siemens AG 2012

Selection and Ordering data	Order code
Additional information	
Please add **"-Z"** to Order No. and specify Order code(s) and plain text.	
Factory certificate according to EN 10204-2.2	**C14**
Factory certificate according to EN 10204-2.1	**C15**
Approval/Verification[2] (MI-001 : DN 50-300 compact, EN 1092-1 PN10 and PN16 flanges with MAG 6000 CT)[3]	
• Without verification according to OIML R 49	**P10**
• MI-001 Q3/Q1 = 25	**P11**
• MI-001 Q3/Q1 = 63	**P12**
• MI-001 Q3/Q1 = 80	**P13**
• MI-001 Q3/Q1 = 160	**P16**
• MI-001 Q3/Q1 = 200	**P17**
• MI-001 Q3/Q1 = 250	**P18**
FM Fire Service Approval (with ANSI B16.5 Class 150 flanges)	
• DN 50, DN 80 and DN 100 (2", 3" and 4")	**P20**
• DN 150 and DN 200 (6" and 8")	**P21**
• DN 250 and DN 300 (10" and 12")	**P22**
Tag name plate, stainless steel fixed with SS wire (add plain text)	**Y17**
Tag name plate, plastic (self-adhesive)	**Y18**
Customer-specific converter setup	**Y20**
Sensor cables wired (specify cable order no.)	**Y40**
Sensor for remote transmitter's junction box potted to IP68 with wired cable (specify cable order no.)	**Y41**
Other postproduction requirements (add desired text)	**Y99**
Additional Calibrations	
Matched pair - (Standard production calibration where sensor and transmitter are calibrated together)	**On request**[1]
Accredited Siemens Flow Instruments matched pair Calibration acc. to ISO/IEC 17025:2005	**On request**[1]
Customer-specified calibration up to 10 points	**On request**[1]
Customer-witnessed calibration Any of above calibration	**On request**[1]

[1] Ordering On request as dedicated information from the customer on the individual sensors is required. Please fill in the calibration form found on pi.khe.siemens.de/index.aspx?Nr=17460 and send together with the order. (Size dependent restriction on maximum flow rates may apply)

[2] For more details and references of the ranges please see the tables on page 3/97.

[3] For remote version submit Product Variation Request.

Operating instructions for SITRANS F M MAG 5100 W

Description	Order No.
• English	**A5E03063678**
• German	**A5E03376527**
• Spanish	**A5E00376529**
• French	**A5E03376521**
• Chinese	**A5E03376501**

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
http://www.siemens.com/flowdocumentation

Accessories

Description	Order No.	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P (not for Ex sensors)	◆ **FDK:085U0220**	

◆ Short lead time (details in PMD)

MAG 5000/6000 transmitters and sensors are packed in separate boxes, the final assembly takes place during installation at the customer's place. MAG 6000 I transmitters and sensors are delivered compact mounted from factory.
Communication module will be pre-mounted in the transmitter.

Please use online Product selector to get latest updates.

Product selector link:
www.pia-selector.automation.siemens.com

© Siemens AG 2012

Flow sensor MAG 5100 W

Selection and Ordering data		Order No.
Sensor SITRANS F M MAG 5100 W		**7ME6580-**
Hastelloy electrodes, carbon steel flanges, Non EU water markets		■■■■■-■■■■
Diameter		
DN 25 (1")	◆	2D
DN 40 (1½")	◆	2R
DN 50 (2")	◆	2Y
DN 65 (2½")	◆	3F
DN 80 (3")	◆	3M
DN 100 (4")	◆	3T
DN 125 (5")	◆	4B
DN 150 (6")	◆	4H
DN 200 (8")	◆	4P
DN 250 (10")	◆	4V
DN 300 (12")	◆	5D
DN 350 (14")	◆	5K
DN 400 (16")	◆	5R
DN 450 (18")	◆	5Y
DN 500 (20")		6F
DN 600 (24")		6P
DN 700 (28")		6Y
DN 750 (30")		7D
DN 800 (32")		7H
DN 900 (36")		7M
DN 1000 (40")		7R
(42")		7U
(44")		7V
DN 1200 (48")		8B
DN 1400 (54")		8F
DN 1500 (60")		8K
DN 1600 (66")		8P
DN 1800 (72")		8T
DN 2000 (78")		8Y
Flange norm and pressure rating		
to EN 1092-1		
PN 6 (DN 1400 ... 2000 (54" ... 78"))		A
PN 10 (DN 200 ... 2000 (8" ... 78"))	◆	B
PN 16 (DN 65 ... 600 (2½" ... 24"))	◆	C
PN 16, non-PED (DN 700 ... 2000 (28" ... 78"))		D
PN 40 (DN 25 ... 50 (1" ... 2"))	◆	F
to ANSI B16.5		
class 150 (1" ... 24")		J
to AWWA C-207		
Class D (28" ... 78")		L
to AS 4087		
PN 16 (DN 50 ... 1200 (2" ... 48"))		N
to JIS		
B 2220:2004 K10 (1" ... 24")		R
Flange material		
Carbon steel flanges ASTM A 105		1
Liner material		
Ebonite Hard Rubber		4
Electrode material		
Hastelloy		2

Selection and Ordering data		Order No.
Sensor SITRANS F M MAG 5100 W		**7ME6580-**
Hastelloy electrodes, carbon steel flanges, Non EU water markets		■■■■■-■■■■
Transmitter with display		
Sensor for remote transmitter (Order transmitter separately)	◆	A
MAG 6000, Polyamid, 11 ... 30 V DC/11 ... 24V AC	◆	H
MAG 6000, Polyamid, 115 ... 230 V AC	◆	J
MAG 5000, Polyamid, 11 ... 30 V DC/11 ... 24V AC	◆	K
MAG 5000, Polyamid, 115 ... 230 V AC	◆	L
Communication		
No communication, add-on possible	◆	A
HART	◆	B
PROFIBUS PA Profile 3 (only MAG 6000)	◆	F
PROFIBUS DP Profile 3 (only MAG 6000)	◆	G
Modbus RTU/RS 485 (only MAG 6000)	◆	E
FOUNDATION Fieldbus H1 (only MAG 6000)	◆	J
Cable glands/terminal box		
Metric	◆	1
½" NPT	◆	2

Selection and Ordering data	Order code
Additional information	
Please add **"-Z"** to Order No. and specify Order code(s) and plain text.	
Factory certificate according to EN 10204-2.2	**C14**
Factory certificate according to EN 10204-2.1	**C15**
Tag name plate, stainless steel fixed with SS wire	**Y17**
Tag name plate, plastic (self-adhesive)	**Y18**
Customer-specific converter setup	**Y20**
Sensor cables wired (specify cable order no.)	**Y40**
Sensor for remote transmitter's junction box potted to IP68 with wired cable (specify cable order no.)	**Y41**
Other postproduction requirements (add desired text)	**Y99**

Operating instructions for SITRANS F M MAG 5100 W

Description	Order No.
• German	**A5E03376527**
• English	**A5E03063678**
• French	**A5E03376521**
• Spanish	**A5E03376529**
• Chinese	**A5E03376501**

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
http://www.siemens.com/flowdocumentation

Accessories

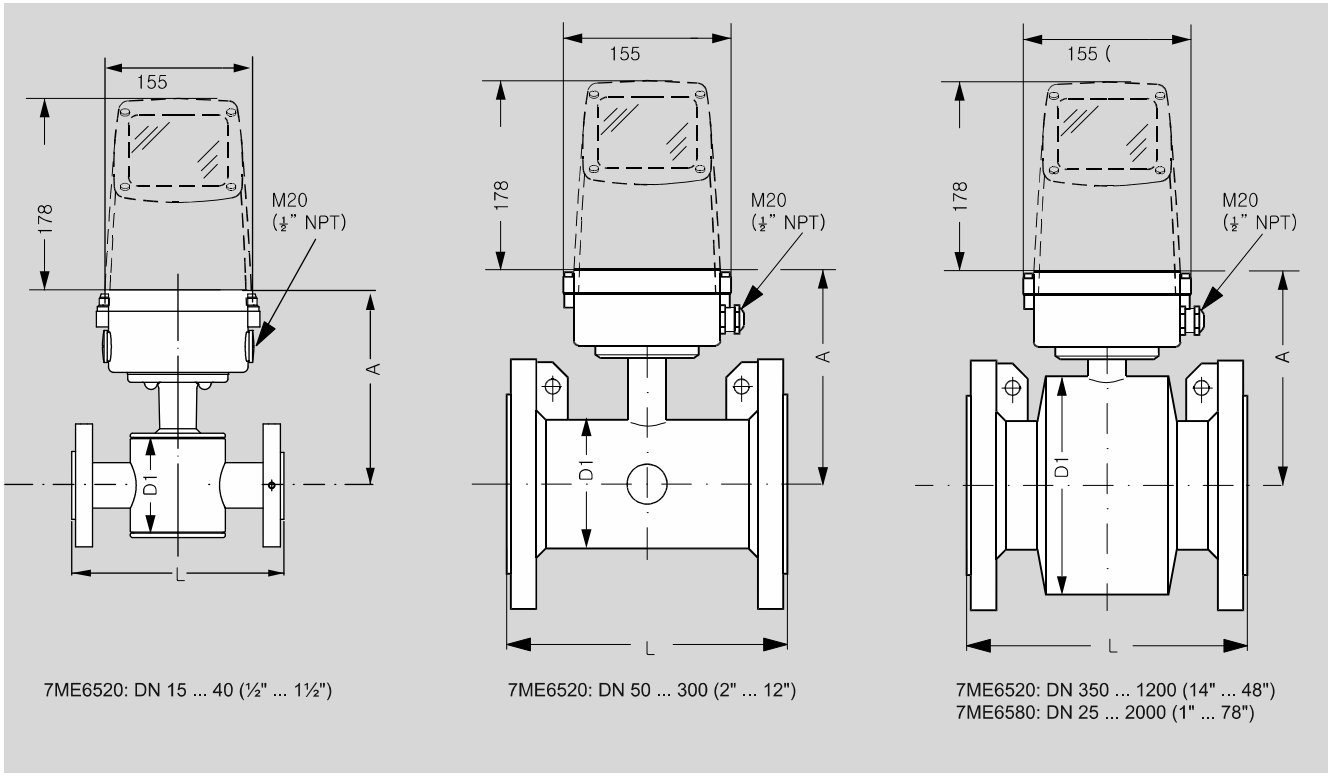
Description		Order No.
Potting kit for terminal box of flow sensors for IP68/NEMA 6P (not for Ex sensors)	◆	**FDK:085U0220**

◆ Short lead time (details in PMD)

MAG 5000/6000 transmitters and sensors are packed in separate boxes, the final assembly takes place during installation at the customer's place.
Communication module will be pre-mounted in the transmitter.
Please use online Product selector to get latest updates.
Product selector link: www.pia-selector.automation.siemens.com

© Siemens AG 2012

Dimensional drawings



7ME6520: DN 15 ... 40 (½" ... 1½")

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

7ME6520: DN 350 ... 1200 (14" ... 48")
7ME6580: DN 25 ... 2000 (1" ... 78")

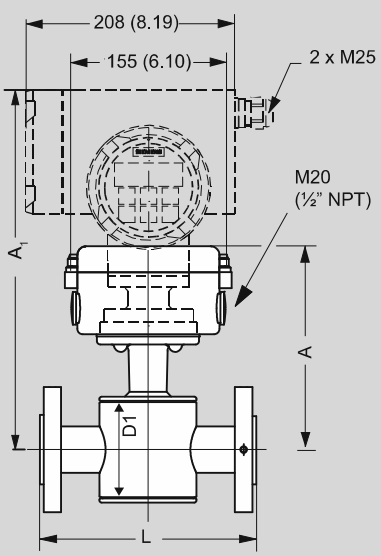
		7ME6520 NBR or EPDM liner				7ME6580 Ebonite liner					
Nominal size		A		D1		A		D1		L	
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
15	½	177	7.0	77	3.0	-	-	104	4.09	200	7.9
25	1	187	7.4	96	3.8	187	7.4	104	4.09	200	7.9
40	1½	202	8.0	127	5.0	197	7.8	124	4.88	200	7.9
50	2	188	7.4	76	3.0	205	8.1	139	5.47	200	7.9
65	2½	194	7.6	89	3.5	212	8.3	154	6.06	200	7.9
80	3	200	7.9	102	4.0	222	8.7	174	6.85	200	7.9
100	4	207	8.1	114	4.5	242	9.5	214	8.43	250	9.8
125	5	217	8.5	140	5.5	255	10.0	239	9.41	250	9.8
150	6	232	9.1	168	6.6	276	10.9	282	11.1	300	11.8
200	8	257	10.1	219	8.6	304	12.0	338	13.31	350	13.8
250	10	284	11.2	273	10.8	332	13.1	393	15.47	450	17.7
300	12	310	12.2	324	12.8	357	14.1	444	17.76	500	19.7
350	14	382	15.0	451	17.8	362	14.3	502	19.76	550	21.7
400	16	407	16.0	502	19.8	387	15.2	563	22.16	600	23.6
450	18	438	17.2	563	22.2	418	16.5	614	24.17	600	23.6
500	20	463	18.2	614	24.2	443	17.4	715	28.15	600	23.6
600	24	514	20.2	715	28.2	494	19.4	816	32.13	600	23.6
700	28	564	22.2	816	32.1	544	21.4	869	34.21	700	27.6
750	30	591	23.3	869	34.2	571	22.5	927	36.5	750	29.5
800	32	616	24.3	927	36.5	606	23.9	1032	40.63	800	31.5
900	36	663	26.1	1032	40.6	653	25.7	1136	44.72	900	35.4
1000	40	714	28.1	1136	44.7	704	27.7	1136	44.72	1000	39.4
	42	714	28.1	1136	44.7	704	27.7	1238	48.74	1000	39.4
	44	765	30.1	1238	48.7	755	29.7	1348	53.07	1100	43.3
1200	48	820	32.3	1348	53.1	810	31.9	1675	65.94	1200	47.2
1400	54	-	-	-	-	925	36.4	1672	65.83	1400	55.1
1500	60	-	-	-	-	972	38.2	1915	75.39	1500	59.1
1600	66	-	-	-	-	1025	40.4	1974	77.72	1600	63
1800	72	-	-	-	-	1123	44.2	2174	85.59	1800	70.9
2000	78	-	-	-	-	1223	48.1	-	-	2000	78.7

- not available

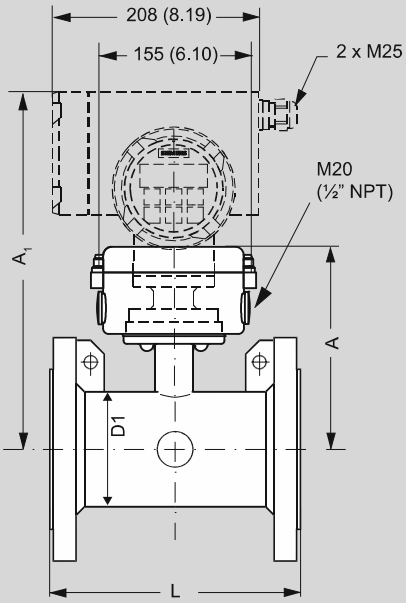
© Siemens AG 2012

Flow sensor MAG 5100 W

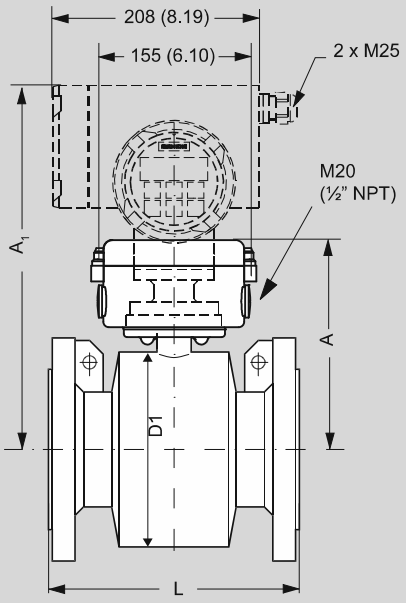
MAG 5100 W/6000 I Compact



7ME6520: DN 15 ... 40 (½" ... 1½")



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



7ME6520: DN 350 ... 2000 (14" ... 78")
7ME6580: DN 25 ... 2000 (1" ... 78")

		7ME6520 NBR or EPDM liner						7ME6580 Ebonite liner							
Nominal size		A		A1		D1		A		A1		D1		L	
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
15	½	177	7.0	331	13.0	77	3.0	-	-	341	13.4	104	4.09	200	7.9
25	1	187	7.4	341	13.4	96	3.8	187	7.4	351	13.8	104	4.09	200	7.9
40	1½	202	8.0	356	14.0	127	5.0	197	7.8	359	14.1	124	4.88	200	7.9
50	2	188	7.4	342	13.5	76	3.0	205	8.1	366	14.4	139	5.47	200	7.9
65	2½	194	7.6	348	13.7	89	3.5	212	8.3	376	14.8	154	6.06	200	7.9
80	3	200	7.9	354	14.0	102	4.0	222	8.7	396	15.6	174	6.85	200	7.9
100	4	207	8.1	361	14.2	114	4.5	242	9.5	409	16.1	214	8.43	250	9.8
125	5	217	8.5	371	14.6	140	5.5	255	10.0	430	16.9	239	9.41	250	9.8
150	6	232	9.1	386	15.2	168	6.6	276	10.9	458	18.0	282	11.1	300	11.8
200	8	257	10.1	411	16.2	219	8.6	304	12.0	486	19.1	338	13.31	350	13.8
250	10	284	11.2	438	17.2	273	10.8	332	13.1	511	20.1	393	15.47	450	17.7
300	12	310	12.2	464	18.3	324	12.8	357	14.1	516	20.3	444	17.76	500	19.7
350	14	382	15.0	536	21.1	451	17.8	362	14.3	541	21.3	502	19.76	550	21.7
400	16	407	16.0	561	22.1	502	19.8	387	15.2	572	22.5	563	22.16	600	23.6
450	18	438	17.2	592	23.3	563	22.2	418	16.5	597	23.5	614	24.17	600	23.6
500	20	463	18.2	617	24.3	614	24.2	443	17.4	648	25.5	715	28.15	600	23.6
600	24	514	20.2	668	26.3	715	28.2	494	19.4	698	27.5	816	32.13	600	23.6
700	28	564	22.2	718	28.3	816	32.1	544	21.4	725	28.5	869	34.21	700	27.6
750	30	591	23.3	745	29.3	869	34.2	571	22.5	760	29.9	927	36.5	750	29.5
800	32	616	24.3	770	30.3	927	36.5	606	23.9	807	31,8	1032	40.63	800	31.5
900	36	663	26.1	817	32.2	1032	40.6	653	25.7	858	33.8	1136	44.72	900	35.4
1000	40	714	28.1	868	34.2	1136	44.7	704	27.7	858	33.8	1136	44.72	1000	39.4
	42	714	28.1	868	34.2	1136	44.7	704	27.7	904	35.6	1238	48.74	1000	39.4
	44	765	30.1	919	36.2	1238	48.7	755	29.7	964	38.0	1348	53.07	1100	43.3
1200	48	820	32.3	974	38.3	1348	53.1	810	31.9	1079	42.5	1675	65.94	1200	47.2
1400	54	-	-	-	-	-	-	925	36.4	1126	44.3	1672	65.83	1400	55.1
1500	60	-	-	-	-	-	-	972	38.2	1179	46.4	1915	75.39	1500	59.1
1600	66	-	-	-	-	-	-	1025	40.4	1277	50.3	1974	77.72	1600	63.0
1800	72	-	-	-	-	-	-	1123	44.2	1377	54.2	2174	85.59	1800	70.9
2000	78	-	-	-	-	-	-	1223	48.1	-	-	-	-	2000	78.7

- not available

© Siemens AG 2012

Weight

		7ME6520 NBR or EPDM liner										7ME6580 Ebonite liner	
Nominal size		**PN 10**		**PN 16**		**PN 40**		**Class 150/AWWA**		**AS**		**PN 16**	
[mm]	**[inch]**	**[kg]**	**[lbs]**	**[kg]**	**[lbs]**	**[kg]**	**[lbs]**	**[kg]**	**[lbs]**	**[kg]**	**[lbs]**	**[kg]**	**[lbs]**
15	½	-	-	-	-	4	9	4	9	4	9	5	11
25	1	-	-	-	-	6	12	5	11	4	9	5	11
40	1½	-	-	-	-	8	18	7	15	7	15	8	17
50	2	-	-	9	20	-	-	8	20	9	20	9	20
65	2½	-	-	10.7	24	-	-	11	24	10.7	24	11	24
80	3	-	-	11.6	26	-	-	13	28	11.6	26	12	26
100	4	-	-	15.2	33	-	-	19	41	15.2	33	16	35
125	5	-	-	20.4	45	-	-	24	52	-	-	19	42
150	6	-	-	26	57	-	-	29	64	26	57	27	60
200	8	48	106	48	106	-	-	56	124	48	106	40	88
250	10	64	141	69	152	-	-	79	174	69	152	60	132
300	12	76	167	86	189	-	-	110	243	86	189	80	176
350	14	104	229	125	274	-	-	139	307	115	254	110	242
400	16	119	263	143	314	-	-	159	351	125	277	125	275
450	18	136	299	173	381	-	-	182	400	141	311	175	385
500	20	163	359	223	491	-	-	225	495	189	418	200	440
600	24	236	519	338	744	-	-	320	704	301	664	287	633
700	28	270	595	314	692	-	-	273	602	320	704	330	728
750	30	-	-	-	-	-	-	329	725	-	-	360	794
800	32	346	763	396	873	-	-	365	804	428	944	450	992
900	36	432	951	474	1043	-	-	495	1089	619	1362	530	1168
1000	40	513	1130	600	1321	-	-	583	1282	636	1399	660	1455
	42	-	-	-	-	-	-	687	1512	-	-	-	-
	44	-	-	-	-	-	-	763	1680	-	-	1140	2513
1200	48	643	1415	885	1948	-	-	861	1896	813	1789	1180	2601
1400	54	1592	3510	-	-	-	-	-	-	-	-	1600	3528
1500	60	-	-	-	-	-	-	-	-	-	-	2460	5423
1600	66	2110	4652	-	-	-	-	-	-	-	-	2525	5566
1800	72	2560	5644	-	-	-	-	-	-	-	-	2930	6460
2000	78	3640	8025	-	-	-	-	-	-	-	-	3665	8080

- not available

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

© Siemens AG 2012

Transmitter TRANSMAG 2 with sensor 911/E

Overview

SITRANS F M TRANSMAG 2 with the SITRANS FM 911/E sensor is a pulsed alternating field magnetic flowmeter where the magnetic field strength is much higher than conventional DC pulsed magnetic flowmeters.

Benefits

- Wide range of sizes DN 15 to DN 1000 (½" to 40")
- Broad range of liner and electrode materials for extreme process medias
- Fully welded construction provides a ruggedness that suits the toughest applications and environments.
- Automatic reading of SmartPLUG for easy commissioning
- Simple menu operation with two-line display
- Comprehensiv self-diagnostic with selfmonitoring and internal simulation

Application

The main applications of the SITRANS F M transmitter TRANSMAG 2 can be found in the following sectors:

- Pulp and Paper industry
- Mining industry

The patented pulse alternating field technology is ideal for difficult applications like:

- High concentrated paper stock > 3 %
- Heavy mining slurries
- Mining slurries with magnetic particles.
- Low conductive medias ≥1 µS/cm (0.1 µS/cm depending on medium)

Design

- Available for remote mounting
- PROFIBUS PA (profile 2.0) / HART communication
- Analog output and digital outputs for pulses, device status, limits, flow direction, frequency output

Mode of operation

The flow measuring principle is based on Faraday's law of electromagnetic induction according to which the sensor converts the flow into an electrical voltage proportional to the velocity of the flow.

Function

The TRANSMAG 2 is a microprocessor-based transmitter with a build-in alphanumeric display in several languages. The transmitters evaluate the signals from the associated electromagnetic sensors and also fulfil the task of a power supply unit which provides the magnet coils with a constant current.

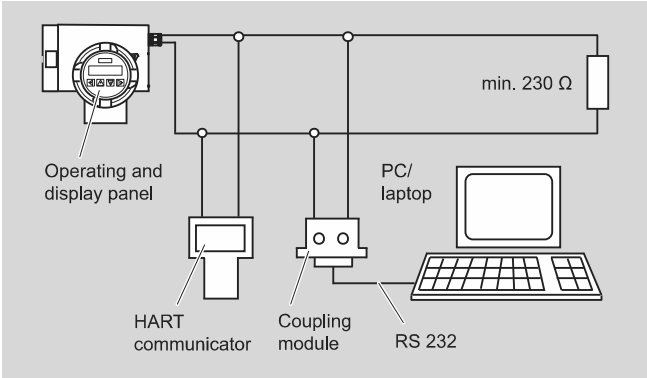
The magnetic flux density in the sensor is additionally monitored by reference coils.

Further information on connection, mode of operation and installation can be found in the data sheets for the sensors.

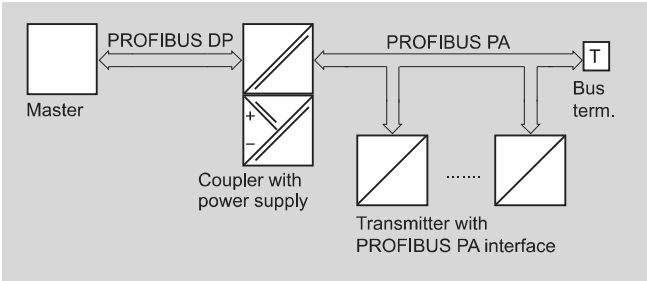
Displays and keypad

Operation of the transmitter can be carried out using:

- Keypad and display unit
- HART communicator
- PC/laptop and SIMATIC PDM software via HART communication
- PC/laptop and SIMATIC PDM software using PROFIBUS PA communication



HART communication



PROFIBUS PA communication

© Siemens AG 2012

Technical specifications

Transmitter TRANSMAG 2	
Mode of operation and design	
Measuring principle	Electromagnetic with pulsed alternating field (PAC)
Magnetic field excitation	Automatic power supply synchronization
- 50 Hz AC power supply	Bipolar (16.7 Hz) Bipolar with prepulse (10 Hz) Unipolar (8.33 Hz)
- 60 Hz AC power supply	Bipolar (20 Hz) Bipolar with prepulse (12 Hz) Unipolar (10 Hz)
Accuracy under reference conditions	
Measuring tolerance of pulse output	
• With v > 0.25 m/s (0.82 ft/s)	≤ ± 0.5 % of measured value ± 1.2 mm/s (0.05 inch/s)
• With v < 0.25 m/s (0.82 ft/s)	± 2.5 mm/s (0.1 inch/s)
Measuring tolerance of analog output	As pulse output plus ± 0.1 % conversion error ± 20 µA
Repeatability	0.2 % of measured value
Reference conditions	
• Process temperature	25 °C ± 5 °C (77 °F ± 9 °F)
• Ambient temperature	25 °C ± 5 °C (77 °F ± 9 °F)
• Warm-up time	Min. 30 min
• Installation conditions	Inlet pipe section ≥ 10 x DN Outlet pipe section ≥ 5 x DN Installed centered in pipe
• Medium	Water without gaseous or solid components
Calibration	
Standard production calibration, calibration report shipped with sensor	Zero-point, 2 x 25 % and 2 x 90 %
Outputs	
Electrical isolation	Outputs electrically isolated from one another and from the power supply, max. 60 V permissible against PE/equipotential bonding
Current output	0/4 ... 20 mA (7ME5034-0…. or 7ME5034-2….)
• Signal	
- Upper limit	0/4 … 20 mA, selectable
- Failure	20 … 22.5 mA, optional 3.6; 20 or 24 mA
• Load	
- Output	max. 600 Ω, max. load voltage 15 V DC
- For HART communication	≥ 250 Ω
Communication	Via analog output with PC coupling module or HART communicator
• Protocol	HART, version 5.1
Digital output	
Signal	
• Output	Configurable as active or passive signals
- Active signal	24 V DC, ≤ 24 mA, R_i = 170 Ω
- Passive signal	Open collector, max. 30 V DC, 200 mA
Output configuration	
• Pulse	
- Pulse significance	≤ 5000 pulses/s
- Pulse width	≥ 0.1 ms
• Limit frequency	≤ 10000 Hz
• Limits	Limits for flow and quantity, flow direction, alarm
Digital output 2 (relay)	
(only 7ME5034-0….)	
Relay	NC or NO function
• Rating	Max. 5 W, max. 50 V AC/DC, max. 200 mA
• Output configuration	Limits for flow and quantity, flow direction, alarm
Digital input (optional to digital output 2)	
(only 7ME5034-2….)	
• Input function configurable as high-active or low-active	Set measured value or counter to zero
• Signal voltage	Max. 30 V DC, R_i = 3 kΩ: High level: +11 ... +30 V DC Low level: -30 ... +5 V DC
For PROFIBUS devices	
PROFIBUS PA (for PROFIBUS-devices 7ME5034-1….)	
• Communication	Layer 1 and 2 according to PROFIBUS PA Transmission according to IEC 1158-2 Layer 7 (protocol layer) according to PROFIBUS PA and DP V1 (EN 50170) Device class B, device profile 2.0 Max. 4 simultaneous C2 connections
• Bus voltage	9 ... 32 V DC permissible
• Current consumption from bus	10 mA; limited to ≤ 15 mA in event of fault by electrical current limitation
Rated operating conditions	
Installation conditions	See also sensor
Ambient temperature	
• Operation	-20 ... +60 °C (-4 ... +140 °F)
• Display module	0 ... 50 °C (32 ... 122 °F)
Storage	-25 ... +80 °C (-13 ... +176 °F)
Degree of protection	IP67/NEMA 4X
Electromagnetic compatibility (EMC)	
• Emitted interference	To IEC/EN 61326 for use in industrial areas
• Noise immunity	To IEC/EN 61326 for use in industrial areas

© Siemens AG 2012

Transmitter TRANSMAG 2 with sensor 911/E

Medium conditions	
• Process temperature	-20 ... +150 °C (-4 ... 302 °F) depending on the liner
Minimum conductivity of medium	
• With SITRANS F M 911/E sensors	≥ 1 µS/cm (0.1 µS/cm depending on medium)
Design	
Weight of transmitter	4.4 kg (9.7 lb)
Remote version	Transmitter must be connected to sensor using shielded cable
Maximum cable length	100 m (328 ft)
Housing	Die-cast aluminum, painted
Displays and keypad	
General display	LCD, backlid, two lines with 16 characters each
Multi-display for	Flow, totalizer, flow velocity
Keypad	4 keys for entering parameters
Power supply	
corresponding to rating plate	
• AC supply	100 ... 250 V AC ± 15 %, 47 ... 63 Hz
• Power consumption	Approx. 120 ... 630 VA, depending on sensor
Line fuse	100 ... 230 V AC: T1.6A
Magnet current fuse	F5A/250 V

Sensor cables between sensor and transmitter

The signal voltage proportional to the flow and present at the electrodes of the EMF is only a few µV to mV. Superimposed on this are electrochemical interferences resulting from the contact between the electrodes and liquid, and which can be up to several Volt. Also frequently superimposed are line frequency interferences, interferences resulting from vibrations on the pipelines or signal cables, as well as strong magnetic fields in the vicinity. Sufficient shielding must therefore be provided, as well as fixed routing of the signal cables (electrode and magnet current cable) in the case of remote versions. This also applies to devices with integral preamplifier (smartPLUG). The cable length between the sensor and transmitter must not exceed 100 m (328 ft).

Attention must also be paid to the cable routing. Signal cables must be routed free of vibration, and protected against strong magnetic and stray fields. In case of doubt, the sensor cables must be routed in earthed steel conduit.

Selection and Ordering data	Order No.
SITRANS F M electromagnetic transmitter TRANSMAG 2 for alternating field, remote version, 110 ... 230 V AC	**7ME5034-■AA■1-■AA0**
Output/communication	
4 ... 20 mA with HART protocol	**0**
PROFIBUS PA connection	**1**
4 ... 20 mA with HART protocol, digital input	**2**
Operator display and keypad	
Without	**0**
With	**1**
Cable glands	
M20/M16 x 1.5	**1**
½" NPT	**2**

Selection and Ordering data	Order code
Additional information	
Please add **"-Z"** to Order No. and specify Order code(s) and plain text.	
Strengthened mounting bracket for wall and pipeline installation	**A02**
Measuring range, specify in plain text: Y01: 0 to ... m^3/h	**Y01**
Pulse significance, specify in plain text: Y02: 0 to ... pulses/l	**Y02**
Setting of digital outputs, specify in plain text: Y03: Setting of digital outputs: ...	**Y03**
Measuring-point number (max. 8 characters), specify in plain text: Y15:	**Y15**
Measuring-point description (max. 16 characters), specify in plain text: Y16:	**Y16**
Stainless steel tag plate	**Y17**
Other post-production requirements (add plain text)	**Y99**

Operating instructions for SITRANS F M TRANSMAG 2

Description	Order No.
• English	**A5E00102775**
• German	**A5E00192774**
• Spanish	**A5E00135276**
• French	**A5E00135275**

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
http://www.siemens.com/flowdocumentation

© Siemens AG 2012

Accessories

Description	Order No.	
Standard wall mounting bracket. Steel EN10088-2-1.4404	**7ME5933-0AC04**	
Special wall-/pipe mounting bracket kit. BI 2,5 DIN59382 X6Cr17	**7ME5933-0AC05**	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P (not for Ex sensors)	**FDK:085U0220**	

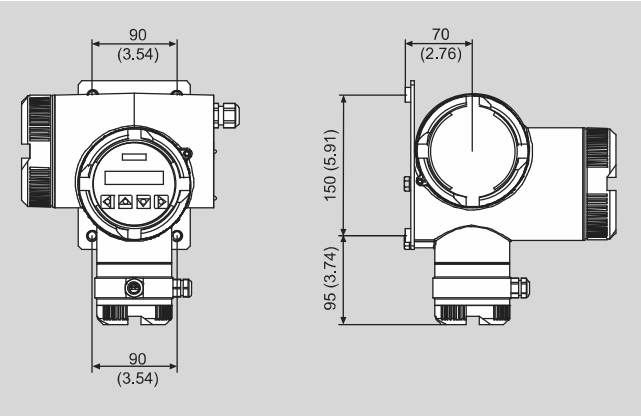
Spare parts

Description	Order No.	
Operating/Display module	**7ME5933-0AC00**	
Electronics cover with glass plate (non Ex). Die cast aluminum, with corrosion-resistant Basic Polyester powder coating (min. 60 µm)	**7ME5933-0AC01**	
Cover for sensor cable and gasket. Die cast aluminum, with corrosion-resistant Basic Polyester powder coating (min. 60 µm)	**7ME5933-0AC02**	
Cover for mains supply/communication. Die cast aluminum, with corrosion-resistant Basic Polyester powder coating (min. 60 µm)	**7ME5933-0AC03**	
Safety clamp for electronic cover with glass plate (7ME5933-0AC01)	**7ME5933-0AC06**	
M20 cable gland set for power and output connection, gray PA plastic, 2 pcs. • cables Ø 6 ... 12 mm (0.24" ... 0.47") • -40 ... +100 °C (-40 ... +212 °F)	**A5E02246350**	
1/2" NPT cable gland set for power and output connection, gray PA plastic, 2 pcs. • cables Ø 6 ... 12 mm (0.24" ... 0.47") • -40 ... +100 °C (-40 ... +212 °F)	**A5E02246396**	
M16 x 1.5 cable gland set for sensor connection, brass chrome, 2 pcs. and 2 pcs. blind • cables Ø 5 ... 9 mm (0.20" ... 0.35") • -20 ... +105°C (-4 ... +221 °F)	**A5E02246369**	

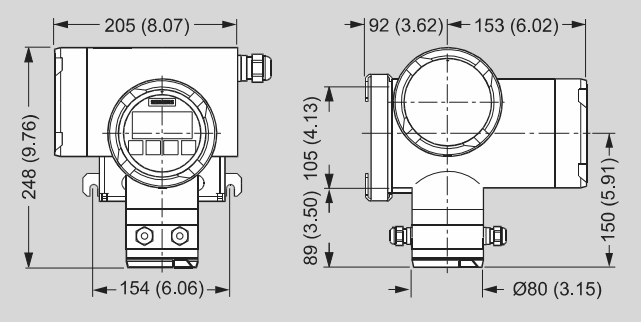
© Siemens AG 2012

Transmitter TRANSMAG 2 with sensor 911/E

Dimensional drawings

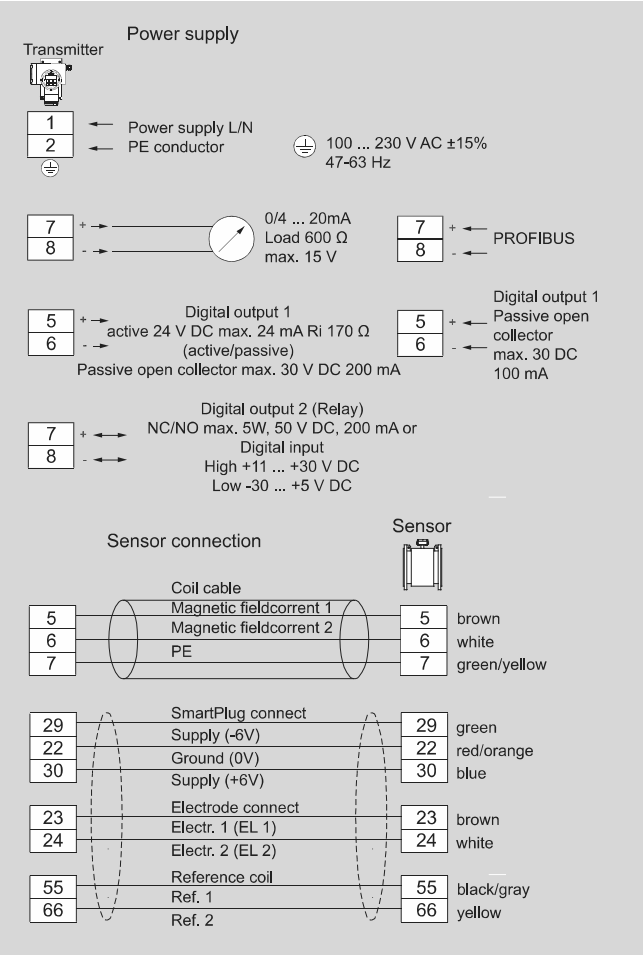


SITRANS F M transmitter TRANSMAG 2 with wall mounting bracket, dimensions in mm (inch)



SITRANS F M transmitter TRANSMAG 2 with wall and pipeline mounting bracket, dimensions in mm (inch)

Schematics

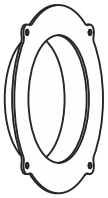


SITRANS F M transmitter TRANSMAG 2, connection diagram

© Siemens AG 2012

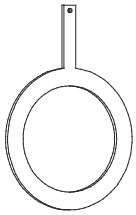
911/E sensor	
Process connection	
Nominal diameters	DN 15 ... 1000 (½" ... 40")
Metering tube connections	EN 1092-1, ANSI B16.5, others on request
Rated operating conditions	
Installation conditions	See system information
• Soft rubber liner	0 ... 70 °C (32 ... 158 °F)
• Hard rubber liner	0 ... 90 °C (32 ... 194 °F) Option: 100 °C (212 °F)
• PTFE liner	• -20 ... +150 °C (-4 ... +302 °F) at 25 bar (363 psi) • -20 ... +100 °C (-4 ... +212 °F) at 40 bar (580 psi)
• Linatex (rubber) liner	-40 ... +70 °C (-40 ... +158 °F) (for temperatures below -20 °C (-4 °F) AISI 316L/1.4404 flanges must be used)
• Novolak liner	130 °C (266 °F) at 40 bar (580 psi)
Degree of protection	IP67/NEMA 4X Optional IP68/NEMA 6
Medium conditions	
Maximum flow velocity	12 m/s (39.4 ft/s)
Full scale value of flow velocity	0.15 ... 12 m/s (0.49 ... 39.4 ft/s)
Design	
Weight	See dimensional drawings
Flange and housing material	Mild steel (1.0460/1.0570, with corrosion resistant two component epoxy coating (min. 150 µm) or AISI 316Ti/1.4571 flanges and carbon steel housing, with corrosion-resistant two-component epoxy coating (min. 150 µm)
Measuring pipe material	Stainless steel AISI 316Ti/1.4571
Electrode material	• AISI 316Ti/1.4571 • PTFE: Hastelloy C276/2.4819 • Platinum head • Titanium • Tantalum
Grounding electrode material	Defined via the order code

Protection rings for liners



Function	To protect the edges of liners from abrasion (e.g. gravel, sand etc.). Used mainly with soft rubber liners and for PTFE liners at high temperatures from 100 to 150 °C (212 to 302 °F).
Contact with medium	Yes, please always check resistance to measured medium.
Material	Stainless steel AISI 316Ti/1.4571, optionally Hastelloy C276/2.4819
Material thickness	The overall length of the sensor is increased by • 6 mm for DN 15 to DN 150 (0.24" for ½" to 6") or • 10 mm for DN 200 to DN 600 (0.4" for 8" to 24")
Standard	No, optional for PTFE and soft rubber liners. They are required for PTFE liners of PN 16 (MWP 232 psi) or more instead of protection washers, and must be ordered separately.
Order No.	**7ME5912-....**

Earthing washers



Function	Electrical reference and earthing of the medium. Required if the pipelines are not electrically conducting or are lined (plastic pipelines, concrete pipelines etc.). All earthing rings must be connected to the earthing screw present on the sensor.
Contact with medium	Yes, please always check resistance to measured medium.
Material	Stainless steel AISI 316Ti/1.4571 or Hastelloy C4/2.4610
Material thickness	The overall length of the sensor is increased by 2 mm (0.08") per earthing ring.
Standard	No, only optional. Required between the medium and sensor for equipotential bonding between non-conducting pipelines or lined pipelines.
Order No.	**7ME5902-....**

Important:

The rings must be ordered together with the sensor.
In case of replacement please include the sensor MLFB code on the order.

© Siemens AG 2012

Transmitter TRANSMAG 2 with sensor 911/E

Notes on pressure equipment directive

The devices are designed for liquids of danger group "Gases of fluid group 1". The categories differ according to the version, and are listed in the table below.

The minimum temperature is defined at -10 °C (14 °F) for the flange materials C22.8 (1.0460).
The minimum temperature is defined at -20 °C (-4 °F) for the flange material 1.4571/316Ti. For further information on the PED standard and requirements, see page 9/14.

Classification according to pressure equipment directive (PED 97/23/EC)					
Nominal diameter		**Nominal pressure**		**Permissible media**	**Category**
DN	**(inch)**	**PN**	**(MWP psi)**		
15 ... 25	(½" ... 1")	40	(580)	Gases fluid group 1 and liquids fluid group 1	Article 3.3
200 ... 300	(8" ... 12")	10	(145)	Gases fluid group 1 and liquids fluid group 1	II
65 ... 250	(2½" ... 10")	16	(232)	Gases fluid group 1 and liquids fluid group 1	II
40 ... 100	(1½" ... 4")	40	(580)	Gases fluid group 1 and liquids fluid group 1	II
350 ... 1000	(14" ... 40")	10	(145)	Gases fluid group 1 and liquids fluid group 1	III
300 ... 1000	(12" ... 40")	16	(232)	Gases fluid group 1 and liquids fluid group 1	III
200 ... 600	(8" ... 24")	25	(363)	Gases fluid group 1 and liquids fluid group 1	III
125 ... 600	(5" ... 24")	40	(580)	Gases fluid group 1 and liquids fluid group 1	III

© Siemens AG 2012

Selection and Ordering data	Order No.
Flowsensor SITRANS F M 911/E	**7ME5610 -** ■■■■■ - ■AA■
Nominal diameter	
DN 15 (½")	1V
DN 25 (1")	2D
DN 40 (1½")	2R
DN 50 (2")	2Y
DN 65 (2½")	3F
DN 80 (3")	3M
DN 100 (4")	3T
DN 125 (5")	4B
DN 150 (6")	4H
DN 200 (8")	4P
DN 250 (10")	4V
DN 300 (12")	5D
DN 350 (14")	5K
DN 400 (16")	5R
DN 450 (18")	5Y
DN 500 (20")	6F
DN 600 (24")	6P
DN 700 (28")	6Y
DN 750 (30")	7D
DN 800 (32")	7H
DN 900 (36")	7M
DN 1000 (40")	7R
Flange norm and pressure rating	
EN 1092-1, PN 10 (DN 200 ... 1000 (8" ... 40"))	B
EN 1092-1, PN 16 (DN 65 ... 1000 (2½" ... 40"))	C
EN 1092-1, PN 25 (DN 200 ... 600 (8" ... 24"))	E
EN 1092-1, PN 40 (DN 15 ... 600 (½" ... 24"))	F
ANSI B16.5, Class 150 (½" ... 24"), max 19.6 bar (285 psi) at 20 °C (68 °F)	J
ANSI B16.5, Class 300 (½" ... 24"), max 51.1 bar (741 psi) at 20 °C (68 °F)	K
AWWA C-207 Class D (28" ... 40")	L
JIS 10 K (½" ... 24")	R
Flange material	
Mid steel flanges 1.0460/1.0570	1
Stainless steel flanges, AISI 316L/1.4404	3
Liner material	
Soft rubber	1
PTFE (without protection washers)	3
Hardrubber	4
Linatex	5
Novolak (sealing material FFKM)	6
Electrode material	
AISI 316Ti/1.4571	1
Hastelloy C276/2.4819	2
Platinum head with shaft AISI 316Ti/1.4571	3
Titanium	4
Tantalum	5
Cable glands/terminal box	
Metric: Polyamide terminal box	1
½" NPT: Polyamide terminal box	2

Selection and Ordering data	Order Code
Additional information	
Please add **"-Z"** to Order No. and specify Order code(s) and plain text.	
Two earthing (grounding) electrodes made of stainless steel AISI 316Ti/1.4571	**A02**
Two earthing (grounding) electrodes made of Hastelloy C276/2.4819	**A04**
Two earthing (grounding) electrodes made of Platinum head	**A05**
Two earthing (grounding) electrodes made of Titanum	**A06**
Two earthing (grounding) electrodes made of Tantalum	**A07**
Factory certificate to EN 10204-2.2	**C14**
Acceptance test B to DIN 50049, section 3.1 and EN 10204	**C16**
Tag name plate, stainless steel, add plain text	**Y17**
Other postproduction requirements, add plain text	**Y99**

Selection and Ordering data	Order No.	Order code
SITRANS F M TRANSMAG 2 and sensor 911/E	**7ME5930 -**	
Cable	5■A00 - 0AA0	■■■
Cable kit for sensor 911/E with alternating field, Magnet current cable 3 x 1.0 mm^2 (3 x 0.0016 $inch^2$), electrode/reference cable 7 x 0.5 mm^2 (7 x 0.0008 $inch^2$) with shield PVC		
• Length: 5 m (16.4 ft)	B	
• Length: 10 m (32.8 ft)	C	
• Length: 20 m (65.6 ft)	D	
• Length: 30 m (98.4 ft)	E	
• Specify other length: in plain text	Z	J1Y

© Siemens AG 2012

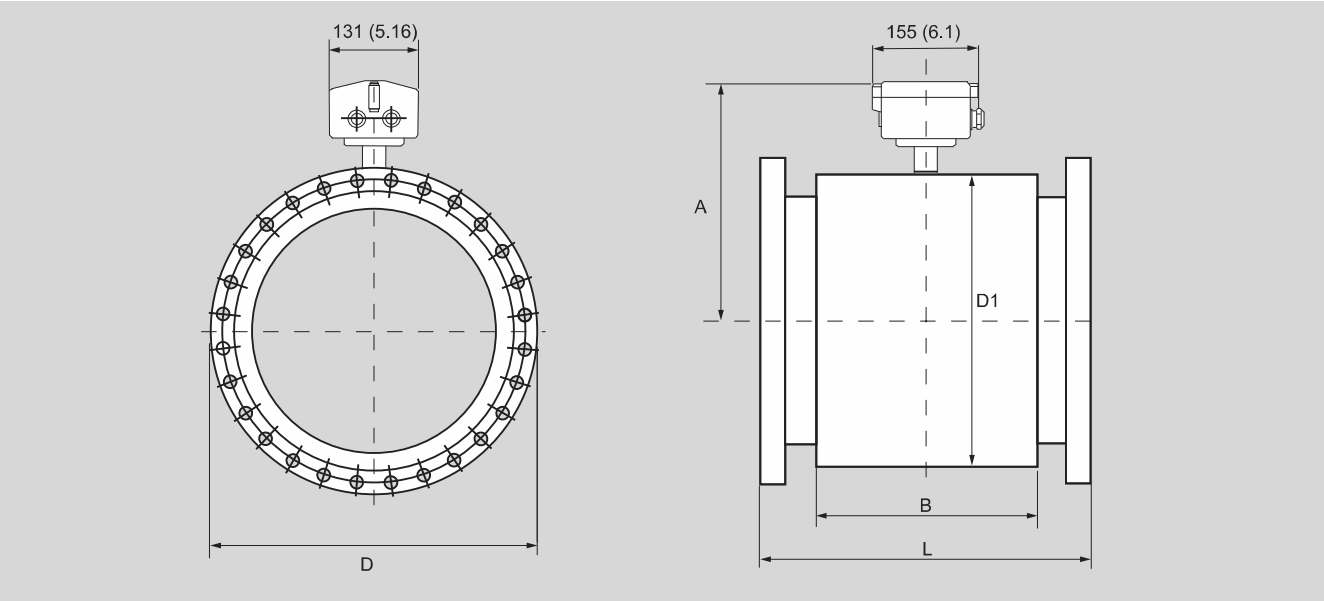
Transmitter TRANSMAG 2 with sensor 911/E

Selection and Ordering data	Order No.	Order code
SITRANS F M electromagnetic flowmeter		
Protection rings for flow sensor 911E (per pair)	7ME5912-	
Liner		
Hard rubber/soft rubber		1
Novolak		7
PTFE		0
Nominal diameter		
for PTFE, mat. no. 1.4571/316 Ti		
DN 15 (½")		A A
DN 20 (¾")		B A
DN 25 (1")		C A
DN 32 (1¼")		D A
DN 40 (1½")		E A
DN 50 (2")		F A
DN 65 (2½")		G A
DN 80 (3")		H A
DN 100 (4")		J A
DN 125 (5")		K A
DN 150 (6")		L A
DN 200 (8")		M A
DN 250 (10")		N A
DN 300 (12")		P A
Other nominal diameters: specify in plain text		Z A J 1 Y
for Hard/Soft rubber, Novolak, mat. no. 1.471/316 Ti		
DN 15 (½")		A B
DN 20 (¾")		B B
DN 25 (1")		C B
DN 32 (1¼")		D B
DN 40 (1½")		E B
DN 50 (2")		F B
DN 65 (2½")		G B
DN 80 (3")		H B
DN 100 (4")		J B
DN 125 (5")		K B
DN 150 (6")		L B
DN 200 (8")		M B
DN 250 (10")		N B
DN 300 (12")		P B
Other nominal diameters: specify in plain text		Z B J 1 Y
Flange design		
Flange to DIN		1
Flange to ANSI		2
Flange to JIS		3

Selection and Ordering data	Order No.	Order code
SITRANS F M electromagnetic flowmeter		
Earthing rings for flow sensor 911E (per unit)	7ME5902-	
Liner		
Hard rubber/soft rubber		1
Novolak		7
PTFE		0
Nominal diameter		
Mat. no. 1.4571/316 Ti		
DN 15 (½")		A A
DN 20 (¾")		B A
DN 25 (1")		C A
DN 32 (1¼")		D A
DN 40 (1½")		E A
DN 50 (2")		F A
DN 65 (2½")		G A
DN 80 (3")		H A
DN 100 (4")		J A
DN 125 (5")		K A
DN 150 (6")		L A
DN 200 (8")		M A
DN 250 (10")		N A
DN 300 (12")		P A
DN 350 (14")		Q A
DN 400 (16")		R A
DN 500 (20")		S A
DN 600 (24")		T A
DN 700 (28")		U A
DN 800 (32")		V A
DN 900 (36")		W A
DN 1000 (40")		X A
Other nominal diam.: specify in plain text		Z A J 1 Y
Material Hastelloy C4/2.4610		
DN 15 (½")		A B
DN 20 (¾")		B B
DN 25 (1")		C B
DN 32 (1¼")		D B
DN 40 (1½")		E B
DN 50 (2")		F B
DN 65 (2½")		G B
DN 80 (3")		H B
DN 100 (4")		J B
DN 125 (5")		K B
DN 150 (6")		L B
DN 200 (8")		M B
DN 250 (10")		N B
DN 300 (12")		P B
DN 350 (14")		Q B
DN 400 (16")		R B
DN 500 (20")		S B
DN 600 (24")		T B
Other nominal diam.: specify in plain text		Z B J 1 Y
Flange design		
Flange to DIN		1
Flange to ANSI		2
Flange to JIS		3

© Siemens AG 2012

Dimensional drawings



SITRANS F M flow sensor 911/E, remote version, dimensions in mm (inches)

Build-in length 911/E [in mm and inches]

Nominal diameter	DN 15 ½“	DN 25 1“	DN 40 1 ½“	DN 50 2“	DN 65 2 ½“	DN 80 3“	DN 100 4“	DN 125 5“	DN 150 6“	DN 200 8“	DN 250 10“
Build-in length L[1)]											
Hard rubber version Linatex/soft rubber version	270 (10.63)				330 (12.99)	340 (13.39)		370 (14.57)		410 (16.14)	470 (18.50)
PTFE-liner without protection rings	270 (10.63)				330 (12.99)	340 (13.39)		370 (14.57)		410 (16.14)	470 (18.50)
Novolak-version	-			275 (10.83)	325 (12.79)	335 (13.19)	333 (13.11)	362 (14.25)		401 (15.79)	460 (18.11)
Dimensions of sensor housing											
Housing width B	170 (6.69)									240 (9.45)	
Height A	206 (8.11)		222 (8.74)	229 (9.02)	262 (10.32)		274 (10.79)	286 (11.26)	299 (11.78)	334 (13.15)	258 (14.10)
Housing diameter D_1	135 (5.35)		167 (6.58)	182 (7.17)	247 (9.73)		272 (10.71)	296 (11.65)	322 (12.68)	392 (15.43)	440 (17.32)
Weight of PN16 version in kg (MWP 232 psi version in lb) approx.	8.0 (17.64)	8.5 (18.74)	11.5 (25.35)	25.0 (55.12)	26 (57.32)	27 (59.53)	28 (61.73)	34 (74.95)	38 (83.78)	68 (149.9)	81 (178.6)

Nominal diameter	DN 300 12“	DN 350 14“	DN 400 16“	DN 450 18“	DN 500 20“	DN 600 24“	DN 700 28“	DN 750 30“	DN 800 32“	DN 900 36“	DN 1000 40“
Build-in length L[1)]											
Hard rubber version Linatex/soft rubber version	500 (19.68)	550 (21.65)	600 (23.62)	650 (25.59)	650 (25.59)	780 (30.71)	910 (35.83)		1040 (40.95)	1170 (46.06)	1300 (51.18)
PTFE-liner without protection rings	500 (19.68)	550 (21.65)	600 (23.62)	660 (25.98)	650 (25.59)	780 (30.71)	-				
Novolak-version	489 (19.25)	538 (21.18)	592 (23.31)	638 (25.12)	638 (25.12)	772 (30.39)	903 (35.55)		1033 (40.63)	1163 (45.79)	1293 (50.91)
Dimensions of sensor housing											
Housing width B	240 (9.45)	225 (8.86)	250 (9.84)	270 (10.63)	300 (11.81)	360 (14.17)	420 (16.54)		500 (19.69)	560 (22.05)	620 (24.41)
Height A	383 (15.08)	375 (14.76)	400 (15.75)	433 (17.05)	453 (17.84)	505 (19.88)	558 (21.97)	590 (23.23)	608 (23.94)	658 (25.91)	713 (28.07)
Housing diameter D_1	490 (19.29)	474 (18.66)	524 (20.63)	591 (23.26)	629 (24.76)	734 (28.90)	839 (33.03)	904 (35.59)	939 (36.97)	1039 (40.91)	1150 (45.28)
Weight of PN10 Version in kg (MWP 145 psi version in lb) approx.	95 (209.4)	118 (260.2)	161 (354.9)	185 (407.9)	233 (513.7)	401 (884.1)	420 (925.9)	450 (992.1)	500 (1102.3)	560 (1234.6)	620 (1366.9)

[1)] Tolerance for build-in lenght: L + 0.0 mm (0.00 inches) /- 4.0 mm (-0.157 inches).
With protection rings for > DN25 + 6.0 mm, > DN200 + 10.0 mm (> 1” + 0.236 inches. > 8” + 0.394 inches)

© Siemens AG 2012

Battery-operated water meter MAG 8000

Overview

MAG 8000 is a comprehensive meter which intelligent information and high performance measurement as well as the easy to install concept take cost of ownership and customer service to a new level for water meter.

Benefits

Easy to install

- Compact or remote solution with factory mounted cable and customer setting from factory
- IP68/NEMA 6P enclosure. Sensor can be buried
- Flexible power supply - internal or external battery pack or mains power supply with battery back-up possibilities
- Superior measurement
- Down to 0.2 % maximum uncertainty
- OIML R 49 type approval
- PTB K7.2
- FM Fire Service Approval
- Bi-directional measurement

Long lasting performance/Low cost of Ownership

- Verification according to Directive 2004/22/EC of the European Parliament and Council of March 31, 2004 on measuring instruments (MID), Annex MI-001
- No moving parts means less wear and tear
- Up to 6 to 10 years maintenance-free operation in typical revenue application
- Robust construction build for the application

Intelligent information, easy to access

- Advanced information on site
- Data logger
- Advanced statistics and diagnostics
- Add-on communication modules

Application

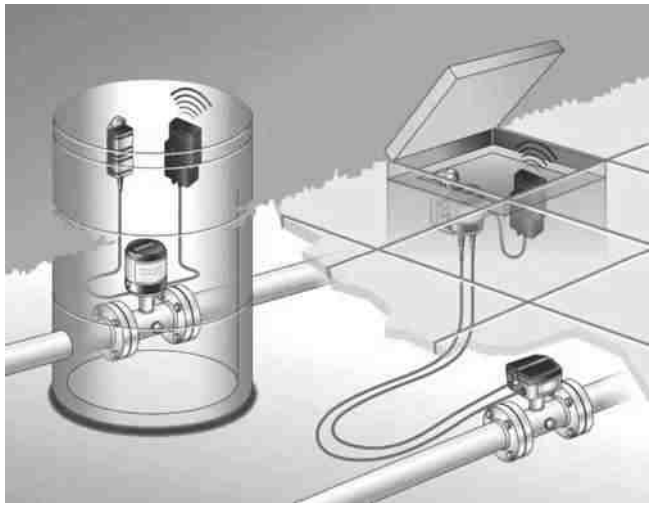
The following MAG 8000 versions are available as stand-alone water meters:

- MAG 8000 (7ME6810) for abstraction and distribution network
- MAG 8000 CT (7ME6820) for revenue and bulk metering
- MAG 8000 (7ME6880) for irrigation

Design

MAG 8000 is designed to minimize power consumption.
The product program consists of

- Basic and advanced version
- Sensor sizes from DN 25 to 1200 (1" to 48")
- Compact and remote installation in IP68/NEMA 6P enclosure and factory-mounted cable
- SIMATIC PDM and Flow Tool PC configuration softwares



Modbus/Encoder module

© Siemens AG 2012

GSM/GPRS communication module

PC-IrDA connection

MAG 8000 GSM/GPRS Wireless Communication Module

The MAG 8000 GSM/GPRS wireless communication module provides the latest mobile technology using a Quad Band (850/900/1800/1900 MHz) module.

The GSM/GPRS module logs data from the MAG 8000 memory and from the two analog inputs (one 4 to 20 mA not powered by the module and one 5 V ratiometric powered by the module) and storage in the internal memory and later transmit it into a system or PC via email or SMS.

An additional synchronization function secures the initial collection time of the data independent of the sample rate used (minimum collection time: 1 per minute).

The package of information retrieved via the csv file includes:

- Time stamp
- Flow rate
- Tot 1
- Tot 2
- Tot 3
- Analog 1 (mA)
- Analog 2 (V)
- Battery lifetime
- Alarm list (as decimal format)

The GPRS technology makes it possible to send a higher amount of data via email. The data is secured using a POP 3 server configuration avoiding encryptions that require additional software. The configuration of the module is performed via SMS commands that allow you to define the users, email accounts, transmission settings, collection, etc.

The GSM/GPRS module is a compact built-in solution which can be installed in the existing MAG 8000 with SW version 3.02 and higher.

The battery lifetime will depend on signal strength and especially on the number of transmissions. Therefore we recommend an optimal setting of transmission once a day (see page 3/120). The module also includes the same power management algorithm that secures a very good calculation of the remaining battery lifetime.

The OPC server specifically designed for the MAG 8000 GSM/GPRS module is offered free of charge. With this value-added package, the opportunity for measurement data collection and further processing/analyzing for system integration and automation is offered.

© Siemens AG 2012

Battery-operated water meter MAG 8000

Function

MAG 8000 is a microprocessor-based water meter with graphical display and key for optimum customer operation and information on site. The transmitter drives the magnetic field in the sensor, evaluates the flow signal from the sensor and calculates the volume passing through. It delivers the required information via the integrated pulse output or communication interfaces as part of a system solution. Its intelligent functionality, information and diagnostics ensure optimum meter performance and information to optimize water supply and billing.

MAG 8000 can be ordered as a Basic or an Advanced version.

Features / Version	MAG 8000 Basic/ MAG 8000 Irrigation	MAG 8000 Advanced
Measuring frequency in battery power mode (Manually selected)	1/15, 1/30 or 1/60 Hz	from 6.25 to 1/60 Hz depending of sensor size
Output MAG 8000	2 FW/RV/AI/CA (max. 50 Hz pulse rate)	2 FW/RV/AI/CA (max. 100 Hz pulse rate)
Communication	Add-on	Add-on
Data logger	Yes	Yes
Insulation test	No	Yes
Leakage detection	No	Yes
Meter utilization	No	Yes
Statistics	No	Yes
Tariff	No	Yes
Settle date (Revenue)	No	Yes

Some information is accessible via the display whereas all information is accessible via the IrDA communication interface with the PDM software. Data and parameters are registered in a EEPROM. They can all be read, but changing the information demands a software password or a hardware key attached to the printed circuit board.

The SIMATIC PDM tool gives the possibility of testing and verifying the flowmeter on site and creating a printed "Qualification Certificate" with all specific data that define the quality status of the measurement.

The Qualification Certificate consists of two pages with information about the actual status of the sensor:

Part 1 provides general settings, sensor and battery info, totalizer values and pulse output settings.

Part 2 provides detailed information about electronic and sensor functionality and a main parameter list for evaluating the functionality of the MAG 8000 water meter.

© Siemens AG 2012

Technical specifications

Transmitter	
Installation	Compact (integral) Remote with factory-mounted cable 5, 10, 20 or 30 m (16.4, 32.8, 65.6 or 98.4 ft)
Enclosure	Stainl. steel top housing (AISI 316) and coated brass bottom. Remote wall mount bracket in stainless steel (AISI 304).
Cable entries	2 x M20 (one gland for one cable of size 6 … 8 mm (0.02 ... 0.026 ft) is included in the standard delivery)
Display	Display with 8 digits for main information. Index, menu and status symbols for dedicated information
Resolution	Totalized information can be displayed with 1, 2 or 3 decimals or automatic adjustment (default)
Flow unit	
Europe	Volume in m^3 and flow rate in m^3/h
US	Volume in Gallon and flow rate in GPM
Australia	Volume in Ml and flow rate as Ml/d
Optional display units	Volume: m^3 x 100, l x 100, G x 100, G x 1000, MG, CF x 100, CF x 1000, AF, Al, kl Flow: m^3/min, m^3/d, l/s, l/min, GPS, GPH, GPD, MGD, CFS, CFM, CFH
Digital output	2 passive outputs (MOS), individual galvanically isolated Maximum load ± 35 V DC, 50 mA short circuit protected
Output A function	Programmable as pulse volume – forward – reverse – forward/net – reverse/net
Output B function	Programmable as pulse volume (like output A), alarm
Output	Max. pulse rate of 50 Hz (only Basic version) and 100 Hz (only Advanced version), pulse width of 5, 10, 50, 100, 500 ms
Communication	IrDA: Standard integrated infrared communication interface with Modbus RTU protocol
Add-on modules	• RS 232 serial interface with Modbus RTU (Rx/Tx/GND), point to point with max. 15 m cable • RS 485 serial interface with Modbus RTU (+/-/GND), multidrop with up to 32 devices with max. 1000 m cable • Encoder interface module (for Itron 200WP) "Sensus protocol" • GSM/GPRS module with or without analog input cable
Power supply	Auto detection of power source with display symbol for operation power.
Internal battery pack	1 D-Cell 3.6 V/16.5 Ah 2 D-Cell 3.6 V/33 Ah
External battery pack	4 D-Cell 3.6 V/66 Ah

Mains power supply	• 12 ... 24 V AC/DC (10 … 32 V) 2 VA • 115 ... 230 V AC (85 … 264 V) 2 VA Both mains power supply systems are upgradable for battery backup via internal D-Cell (3.6 V 16.5 Ah) or external battery pack.
Cable	3 m (9.8 ft) for external connection to mains supply (without cable plug)

© Siemens AG 2012

Battery-operated water meter MAG 8000

Features	
Application identification	Tag number up to 15 characters
Time and date	Real time clock
Totalizer	
MAG 8000	3 totalizer: Configurable to Forward, Reverse and Bidirectional netflow 1 totalizer (following totalizer 1 setting) resetable via display key
Measurement	
Low flow cut-off	0.05 % of Q3 free adjustable
Empty pipe detection	Symbolised in display
Data logger	Logging of 26 records: selectable as daily, weekly or monthly logging
Alarm	Active alarm is indicated on the display
Data protection	All data stored in an EEPROM. Totalizers 1 and 2 are backed up every 10 min, statistic every hour and power consumption and temperature measurement every 4 hour. Password protection of all parameters and hardware protection of calibration and revenue parameters.
Battery power management	Optimal battery information on remaining capacity. Calculated capacity includes all consuming elements and available battery capacity is adjusted related to change in ambient temperature. Numbers of power-ups Date and time registered for first and last time power alarm.
Diagnostic	
Continuous self test including	Coil current to drive the magnetic field Signal input circuit Data calculation, handling and storing
Alarm statistics and logging for fault analyzing	Electrode impedance to check actual media contact Flow simulation to check pulse and communication signal chain for correct scaling Number of sensor measurements (excitations) Transmitter temperature (battery capacity calculation) Low impedance alarm for change in media Flow alarm when defined high flow exceeds Verification mode for fast measure performance check
Insulation test (only Advanced version)	Test of signal immunity against disturbance and bad installation. Test interval is selectable and measurement is interrupted during the test period of 4 min.
Leakage detection (only Advanced version)	Monitoring the lowest flow or volume during selected time window within 24 hours. Leakage is detected over a selectable period where monitored value exceed the possible leakage level. Min and max values are stored with date registration. Last store value visible on the display.
Meter Utilization (only Advanced version)	6 registers for monitoring total time the meter has operated in different flow intervals. Registered intervals are free selectable as % of Q_n (Q3)
Tariff (only Advanced version)	6 tariff registers count the volume delivered within the selected tariff windows, based on time of day or flow rates or a combination. Tariff can also be used for consumption profile where consumption is related to different time intervals or flow rates. Tariff values visible on the display.
Settling date (only Advanced version)	On a predefined date the totalizer 1 index value is stored. Old values are stored to show the latest two totalized 1 index values. Settling values visible on the display.
Statistic (only Advanced version)	Min. flow rate with time and date registration Max. flow rate with time and date registration Min. daily consumption with date registration Max. daily consumption with date registration Latest 7 days total and daily consumption Actual month consumption Latest month consumption
PC Configuration Software PDM	• Meter configuration – online and offline mode • Own parameter settings • Parameter documentation • Print and export of data and parameters PDM 6.0 Service Pack 2 – Basic and Online version

© Siemens AG 2012

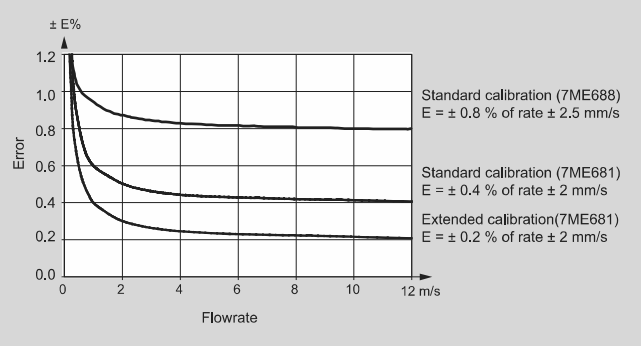
MAG 8000 water meter uncertainty

To ensure continuous accurate measurement, flowmeters must be calibrated. The calibration is conducted at Siemens flow facilities with traceable instruments referring directly to the physical unit of measurement according to the International System of Units (SI).

Therefore, the calibration certificate ensures recognition of the test results worldwide, including the US (NIST traceability).

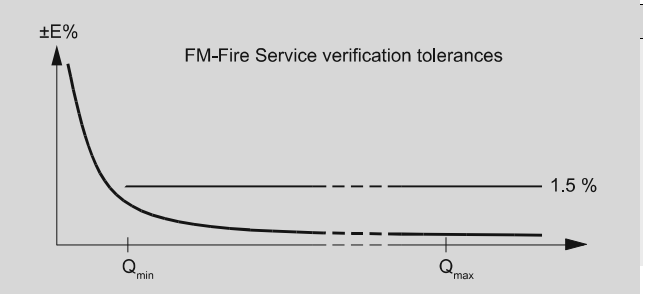
Siemens offers accredited calibrations assured to ISO 17025 in the flow range from 0.0001 m^3/h to 10 000 m^3/h.
Siemens Flow Instruments accredited laboratories are recognized by ILAC MRA (International Laboratory Accreditation Corporation - Mutual Recognition Arrangement) ensuring international traceability and recognition of the test results worldwide.

The selected calibration determines the accuracy of the meter. A standard calibration results in max. ± 0.4 % uncertainty and an extended calibration ± 0.2 % (for MAG 8000 irrigation ± 0.8 %). A calibration certificate follows every sensor and calibration data are stored in the meter unit.



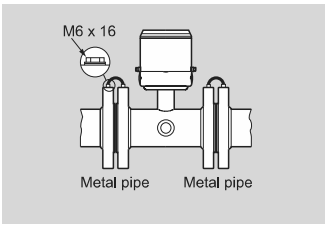
MAG 8000 (7ME6810) for Fire Service applications

MAG 8000 (7ME6810) is FM Fire Service approved for automatic fire protection systems according to the Fire Service Meters Standard, Class Number 1044. The approval is applicable for the sizes DN 50, DN 80, DN 100, DN 150, DN 200, DN 250, and DN 300 (2", 3", 4", 6", 8", 10", and 12") with ANSI B16.5 Class 150 flanges. The FM Fire Service approved product can be ordered via the Z-options P20, P21 and P22.



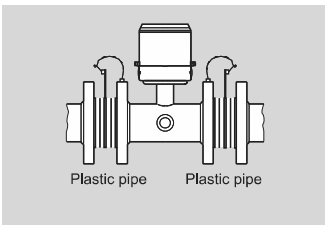
Grounding

The sensor body must be grounded using grounding straps and/or grounding rings to protect the flow signal against stray electrical noise. This ensures that the noise is carried through the sensor body and a noise-free measuring area within the sensor body. For MAG 8000 Irrigation grounding rings on both sides are factory-mounted.



Metal pipes

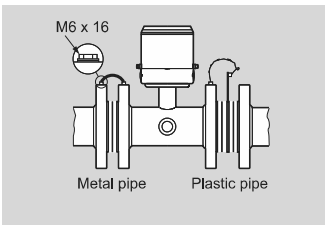
On metal pipes, connect the straps to both flanges.



Plastic pipes

On plastic pipes and lined metal pipes, optional grounding rings must be used at both ends.

Grounding rings has to be ordered separately see „Grounding ring kit“



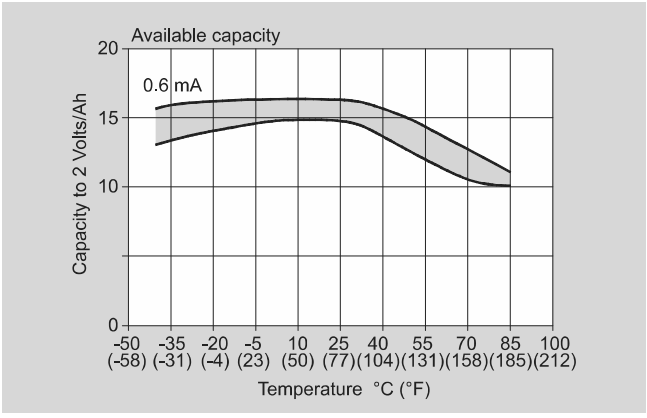
Combination of metal and plastic pipes

A combination of metal and plastic requires straps for metal pipe and grounding rings for plastic pipe.

Battery operation time and calculation

The battery operation time depends on the connected battery pack as well as the operation condition of the meter.

MAG 8000 calculates the remaining capacity every 4 hours and includes all consuming elements. Calculation compensates for temperature influence on battery capacity.



The graphic shows the effect from other temperatures.
A variation in temperature from 15 °C to 55 °C (59 to 131 °F) reduces the capacity by 17 % from 15 Ah to 12.5 Ah.

At typical revenue scenario of expected battery operation time can be seen in the table below.

The measurement for calculating the rest capacity of the battery life time is only completed if the system has no active fatal faults or the empty pipe is active. Maximum battery specification is 10 years operation.

© Siemens AG 2012

Battery-operated water meter MAG 8000

Scenario - Revenue application	
Output A	Pulse rate max. 10 Hz
Output B	Alarm or call-up
Meter dialog	1 hour per month
Add-com	None
Temperature	• 5 % at 0 °C (32 °F) • 80 % at 15 °C (59 °F) • 15 % at 50 °C (122 °F)

Battery lifetime (subject to the assumptions mentioned above)

MAG 8000 for abstraction and distribution network applications (7ME6810) and MAG 8000 CT for revenue and bulk metering (7ME6820)								
Excitation frequency (24 h operation)		**1/60 Hz**	**1/30 Hz**	**1/15 Hz**	**1/5 Hz**	**1.5625 Hz**	**3.125 Hz**	**6.25 Hz**
2 D-Cell battery 33 Ah Internal battery pack	DN 25 ... 200 (1" ... 8")	8 years	8 years	6 years	40 months	8 months	4 months	2 months
	DN 250 … 600 (10" ... 24")	8 years	6 years	4 years	20 months	4 months	2 months	N/A
	DN 700 ... 1 200 (28" ... 48")	6 years	4 years	2 years	1 year	2 months	N/A	N/A
4 D-Cell battery 66 Ah External battery pack	DN 25 ... 200 (1" ... 8")	N/A	10 years	10 years	80 months	16 months	8 months	4 months
	DN 250 ... 600 (10" ... 24")	N/A	10 years	10 years	40 months	8 months	4 months	N/A
	DN 700 ... 1 200 (28" ... 48")	10 years	8 years	4 years	2 years	4 months	N/A	N/A

MAG 8000 for irrigation applications (7ME6880)							
Excitation frequency (24 h operation)		**1/60 Hz**	**1/30 Hz**	**1/15 Hz**	**1/5 Hz**	**1.5625 Hz**	**3.125 Hz**
1 D-Cell battery	DN 50 ... 600 (2" ... 24")	52 months	40 months	25 months	12 months	2 months	1 months
2 D-Cell battery 33 Ah Internal battery pack	DN 50 … 600 (2" ... 24")	8 years	80 months	50 months	24 months	4 months	2 months
4 D-Cell battery 66 Ah Internal battery pack	DN 50 ... 600 (2" ... 24")	10 years	10 years	8 years	48 months	8 months	4 months

MAG 8000 GSM/GPRS battery lifetime scenario Transmission once a day and MAG 8000 factory settings	
2 D-Cell battery 33 Ah Internal battery pack	3 years
4 D-Cell battery 66 Ah Internal battery pack	7 years

External battery pack can be used as battery backup for mains power supply (if two cable entries is one cable gland are needed, order cable glands with two entries, see accessories on page 3/137).

Serial RS 232/RS 485 add-on communication modules are designed for mains powered systems as the battery operation time will be reduced. At 1 hour communication per month (all meter data collected 2 times per day) and the module is connected, the operation time is reduced to:

- RS 232 at low excitation frequency to 10 % and at high excitation frequency to 80 % of calculated operation time
- RS 485 at low excitation frequency to 50 % and at high excitation frequency to 90 % of calculated operation time

© Siemens AG 2012

MAG 8000 for abstraction and distribution network applications (7ME6810)

Overview

Benefits

Easy to install

- Compact or remote solution with factory mounted cable and customer setting from factory
- IP68/NEMA 6P enclosure. Sensor can be buried.
- Flexible power supply - internal or external battery pack or mains power supply with battery back-up possibilities

Long-term stability/Low cost of ownership

- No moving parts in a robust construction means less wear and tear
- Basic and advanced transmitter versions with different optional add-on communication modules fulfil various customer requirements for high cost efficiency
- Up to 0.2 % maximum uncertainty
- Bi-directional measurement with an outstanding low flow performance
- Up to 10 years maintenance-free operation in typical applications

Intelligent information, easy to access

- Advanced information on site
- Advanced statistics and diagnostics
- Optional high-performance GSM/GPRS module offers an efficient solution for remote measurement and monitor via wireless communication.

Technical specifications

Meter	
Accuracy	Standard calibration: ± 0.4 % of rate ± 2 mm/s Extended calibration DN 50 ... DN 300 (2" ... 12"): ± 0.2 % of rate ± 2 mm/s
Media conductivity	Clean water > 20 µs/cm
Temperature	
Ambient	-20 ... +60 °C (-4 ... +140 °F)
Media	0 ... 70 °C (32 ... 158 °F)
Storage	-40 ... +70 °C (-40 ... +158 °F)
Enclosure rating	IP68/NEMA 6P; Cable glands mounted requires Sylgard potting kit to remain IP68/NEMA 6P, otherwise IP67/NEMA 4 is obtained; Factory-mounted cable provides IP68/NEMA 6P
Certificates and approvals	
Calibration (standard)	2 x 25 % and 2 x 90 %
Drinking water approvals	• NSF/ANSI Standard 61[1] (cold water) USA • WRAS (BS 6920 cold water) UK • ACS Listed France • DVGW W270 Germany • Belgaqua (B) • MCERTS (GB)
Fire Service Approvals	FM Fire Service Meter (Class Number 1044)
Conformity	• PED: 97/23EC[2] For pressure/temperature curves see MAG 3100 on page 3/71. EMC: IEC/EN 61000-6-3, IEC/EN 61000-6-2
Sensor version	DN 25 … 1200 (1" … 48")
Measuring principle	Electromagnetic induction
Excitation frequency	
Basic version	
• Battery-powered	DN 25 ... 150 (1" ... 6"): 1/15 Hz DN 200 … 600 (8" … 24"): 1/30 Hz DN 700 ... 1200 (28" ... 48"): 1/60 Hz
• Mains-powered	DN 25 ... 150 (1" ... 6"): 6.25 Hz DN 200 … 600 (8" … 24"): 3.125 Hz DN 700 ... 1200 (28" ... 48"): 1.5625 Hz
Advanced version	
• Battery-powered	DN 25 ... 150 (1" ... 6"): 1/15 Hz (adjustable up to 6.25 Hz; reduced battery lifetime) DN 200 … 600 (8" … 24"): 1/30 Hz (adjustable up to 3.125 Hz; reduced battery lifetime) DN 700 ... 1200 (28" ... 48"): 1/60 Hz (adjustable up to 1.5625 Hz; reduced battery lifetime)
• Mains-powered	DN 25 ... 150 (1" ... 6"): 6.25 Hz DN 200 … 600 (8" … 24"): 3.125 Hz DN 700 ... 1200 (28" ... 48"): 1.5625 Hz

© Siemens AG 2012

MAG 8000 for abstraction and distribution network applications (7ME6810)

Flanges	
EN 1092-1 (DIN 2501)	DN 25 and DN 40 (1" and 1½"): PN 40 (580 psi) DN 50 … 150 (2" … 6"): PN 16 (232 psi) DN 200 … 1200 (8" … 48"): PN 10 or PN 16 (145 psi or 232 psi)
ANSI 16.5 Class 150	1" … 24": 20 bar (290 psi)
AWWA C-207	28" … 48": PN 10 (145 psi)
AS 4087	DN 50 … 1200 (2" … 48"): PN 16 (232 psi)
Liner	EPDM
Electrode and grounding electrodes	Hastelloy C276/2.4819
Grounding straps	Grounding straps are premounted from the factory on each side of the sensor.

1) Including Annex F

2) For further information on the PED standard and requirements see page 9/14.

© Siemens AG 2012

Selection and Ordering data	Order No.
SITRANS F M MAG 8000 water meter	**7ME6810 -**
Diameter	
DN 25 (1“)	2D
DN 40 (1½“)	2R
DN 50 (2“)	2Y
DN 65 (2½“)	3F
DN 80 (3“)	3M
DN 100 (4“)	3T
DN 125 (5“)	4B
DN 150 (6“)	4H
DN 200 (8“)	4P
DN 250 (10“)	4V
DN 300 (12“)	5D
DN 350 (14“)	5K
DN 400 (16“)	5R
DN 450 (18“)	5Y
DN 500 (20“)	6F
DN 600 (24“)	6P
DN 700 (28“)[1]	6Y
DN 750 (30“)[1]	7D
DN 800 (32“)[1]	7H
DN 900 (36“)[1]	7M
DN 1000 (40“)[1]	7R
DN 1050 (42“)[1]	7U
DN 1100 (44“)[1]	7V
DN 1200 (48“)[1]	8B
Flange norm and pressure rating	
EN 1092-1	
PN 10 (DN 200 ... 1200 (8" ... 48"))	B
PN 16 (DN 50 ... 1200 (2" ... 48"))	C
PN 16 non-PED (DN 700 .... 1200 (28"... 48"))	D
PN 40 (DN 25 ... 40 (1" ... 1½"))	F
ANSI B16.5	
Class 150	J
AWWA C-207	
Class D (28" ... 48")	L
AS4087	
PN 16 (DN 50 ... 1200 (2" ... 48"))	N
Sensor version	
EPDM liner and Hastelloy electrodes	3
Calibration	
Standard ± 0.4 % of rate ± 2 mm/s	1
Extended ± 0.2 % of rate ± 2 mm/s DN 25... 300 (1" ... 12")	2
Region version	
Europe (m^3, m^3/h, 50 Hz)	1
USA (Gallon, GPM, 60 Hz)	2
Australia (Ml, Ml/d, 50 Hz)	3
Transmitter type and installation	
Basic version integral on sensor	A
Basic version remote, cable mounted on sensor with IP68/NEMA 6P plugs:	
• 5 m (16.4 ft)	B
• 10 m (32.8 ft)	C
• 20 m (65.6 ft)	D
• 30 m (98.4 ft)	E
Advanced version integral on sensor	K
Advanced version remote, cable mounted on sensor with IP68/NEMA 6P plugs:	
• 5 m (16.4 ft)	L
• 10 m (32.8 ft)	M
• 20 m (65.6 ft)	N
• 30 m (98.4 ft)	P

Selection and Ordering data	Order No.
SITRANS F M MAG 8000 water meter	**7ME6810 -**
Communication interface	
No additional "add-on" communication module installed	A
Serial RS 485 with Modbus RTU (Terminated as end device)	B
Serial RS 232 with Modbus RTU	C
GSM/GPRS communication module with remote antenna; 5 m (16.4 ft) cable	S
GSM/GPRS communication module with analog inputs and remote antenna; 5 m (16.4 ft) cable	T
Power supply	
Internal battery (no battery included)	0
Internal battery pack installed[2]	1
Power cable (1.5 m (4.9 ft)) with IP68/NEMA 6P plugs for external battery (no battery included)	2
12/24 V AC/DC power supply with battery backup and 3 m (9.8 ft) power cable for external connection (no battery included)	3
115 ... 230 V AC power supply with battery backup and 3 m (9.8 ft) power cable for external connection (no battery included)	4

1) The Diameter DN 700 (28") to DN 1200 (48") is only available as remote transmitter type installation.

2) Lithium batteries are subject to special transportation regulations according to United Nations "Regulation of Dangerous Goods, UN 3090 and UN 3091". Special transport documentation is required to observe these regulations. This may influence both transport time and costs.

Operating instructions for SITRANS F M MAG 8000

Description	Order No.
• English	**A5E03071515**
• German	**A5E00740986**
• Spanish	**A5E00741031**
• French	**A5E00741021**

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
http://www.siemens.com/flowdocumentation

Operating instructions for MAG 8000 GSM/GPRS communication module

Description	Order No.
• English	**A5E03644134**

© Siemens AG 2012

MAG 8000 for abstraction and distribution network applications (7ME6810)

Selection and Ordering data	Order code
Additional information	
Please add **"-Z"** to Order No. and specify Order code(s) and plain text.	
Flow unit	
l/s	**L00**
MGD	**L01**
CFS	**L02**
l/min	**L03**
m^3/min	**L04**
GPM	**L05**
CFM	**L06**
l/h	**L07**
m^3/h	**L08**
GPH	**L09**
CFH	**L10**
GPS	**L11**
Ml/d	**L12**
m^3/d	**L13**
GPD	**L14**
Totalizer Volume calculation (default totalizer 1= forward and totalizer 2 = reverse)	
Totalizer 1 = RV, reverse flow	**L20**
Totalizer 1 = NET, net flow	**L22**
Totalizer 2 = FW, forward flow	**L30**
Totalizer 2 = NET, net flow	**L31**
Volume unit	
m^3	**L40**
Ml	**L41**
G	**L42**
AF	**L43**
l x 100	**L44**
m^3 x 100	**L45**
G x 100	**L46**
CF x 100	**L47**
MG	**L48**
G x 1000	**L49**
CF x 1000	**L50**
Al	**L51**
kl	**L52**
Pulse set up (default pulse A= forward and pulse B = Alarm)	
A function = RV, reverse flow	**L62**
A function = FWnet, forward net flow	**L63**
A function = RVnet, reverse net flow	**L64**
A function = Off	**L65**
Volume per pulse A = x 0.0001	**L70**
Volume per pulse A = x 0.001	**L71**
Volume per pulse A = x 0.01	**L72**
Volume per pulse A = x 0.1	**L73**
Volume per pulse A = x 1	**L74**
B function = FW, forward flow	**L80**
B function = RV, verse flow	**L81**
B function = FWnet, forward net flow	**L82**
B function = RVnet, reverse net flow	**L83**
B function = Alarm	**L84**
B function = Call up	**L85**
Volume per pulse B = x 0.0001	**L90**
Volume per pulse B = x 0.001	**L91**
Volume per pulse B = x 0.01	**L92**
Volume per pulse B = x 0.1	**L93**
Volume per pulse B = x 1	**L94**

Selection and Ordering data	Order code
Additional information	
Please add **"-Z"** to Order No. and specify Order code(s) and plain text.	
Data logger set up (default month logging)	
DataloggerInterval = Daily	**M31**
DataloggerInterval = Weekly	**M32**
Factory mounted cables	
5 m (16.4 ft) pulse cable A+B	**M81**
5 m (16.4 ft) communication cable RS 232/RS 485 terminated as end device	**M82**
20 m (65.6 ft) pulse cable A+B	**M84**
20 m (65.6 ft) communication cable RS 232/RS 485 terminated as end device	**M85**
Cello 2 channel, input cable 3 m (9.84 ft) with Brad Harrison micro-change 3 way connector	**M87**
Cello 2 channel, input cable 5 m (16.4 ft) with MIL-C-26482 spec. connectors	**M89**
SOFREL data logger cable 2 m with connector for SOFREL GSM module	**M92**
FM Fire Service Approval (with ANSI B16.5 Class 150 flanges)	
DN 50, DN 80 and DN 100 (2", 3" and 4")	**P20**
DN 150 and DN 200 (6" and 8")	**P21**
DN 250 and DN 300 (10" and 12")	**P22**

© Siemens AG 2012

Overview

Benefits

Approvals

- MI-001, OIML R 49/OIML R 49 MAA
- PTB K7.2
- FM Fire Service

Easy to install

- Compact or remote solution with factory mounted cable and customer setting from factory
- IP68/NEMA 6P enclosure. Sensor can be buried
- Flexible power supply - internal or external battery pack or mains power supply with battery back-up possibilities

Long-term stability/Low cost of ownership

- No moving parts in a robust construction means less wear and tear
- Basic and advanced transmitter versions with different optional add-on communication modules fulfil various customer requirements for high cost efficiency
- Bi-directional measurement with an outstanding low flow performance
- Up to 10 years maintenance-free operation in typical applications
- Insignificant pressure drop

Intelligent information, easy to access

- Advanced information on site
- Advanced statistics and diagnostics
- Connectable to common AMR systems

Technical specifications

Meter	
Accuracy	OIML R 49/OIML R 49 MAA for DN 50 ... DN 300 (2" ... 12"), Class I and II with turn down up to Q3/Q1 = 400 at Q2/Q1 =1.6 MI-001 verification for DN 50 … DN 400 (2" ... 16"), Class II with turn down ratio Q3/Q1 = 250, Q3/Q1 = 200 or Q3/Q1 = 160 at Q2/Q1 = 1.6 FM Fire Service for DN 50, DN 80, DN 100, DN 150, DN 200, DN 250, and DN 300 (2", 3", 4", 6", 8", 10", and 12") ± 1,5% (Q_{min} to Q_{max})
Media conductivity	Clean water > 20 µs/cm
Temperature	
Ambient	-20 ... +60 °C (-4 ... +140 °F) MI-001: -25 ... +55 °C (-13 ... +131 °F)
Media	0.1 ... 50 °C (32 ... 122 °F)
Storage	-40 ... +70 °C (-22 ... +158 °F)
Enclosure rating	IP68/NEMA 6P Cable glands mounted requires Sylgard potting kit to remain IP68/NEMA 6P, otherwise IP67/NEMA 4 is obtained; Factory-mounted cable provides IP68/NEMA 6P
Certificates and approvals	
Calibration (standard)	2 x 25 % and 2 x 90 %
Drinking water approvals	• NSF/ANSI Standard 61[1] (cold water) USA • WRAS (BS 6920 cold water) UK • ACS Listed France • DVGW W270 Germany • Belgaqua (B) • MCERTS (GB)
Fire Service approval	FM Fire Service (1044)
Custody transfer approval	• OIML R 49 and OIML R 49 MAA approval (DN 50 ... DN 300 (2" ... 12")) • MI-001 approval (DN 50 ... DN 400 (2" ... 16")) (Number: DK-0200-MI-001-002 and DK-0200-MI-001-011)
Conformity	• CEN EN 14154, ISO 4064 • PED: 97/23/EC[2] For pressure/temperature curves, see MAG 3100 on page 3/71. • EMC: IEC/EN 61000-6-3, IEC/EN 61000-6-2
Sensor version	DN 50 ... 600 (2" ... 24")
Measuring principle	Electromagnetic induction
Excitation frequency	
Basic version	
• Battery-powered	DN 50 ... 150 (2" ... 6"): 1/15 Hz DN 200 … 600 (8" … 24"): 1/30 Hz
• Mains-powered	DN 50 ... 150 (2" ... 6"): 6.25 Hz DN 200 … 600 (8" … 24"): 3.125 Hz
Advanced version	
• Battery-powered	DN 50 ... 150 (2" ... 6"): 1/15 Hz (adjustable up to 6.25 Hz; reduced battery lifetime) DN 200 … 600 (8" … 24"): 1/30 Hz (adjustable up to 3.125 Hz; reduced battery lifetime)
• Mains-powered	DN 50 ... 150 (2" ... 6"): 6.25 Hz DN 200 … 600 (8" … 24"): 3.125 Hz

© Siemens AG 2012

MAG 8000 CT for revenue and bulk metering (7ME6820)

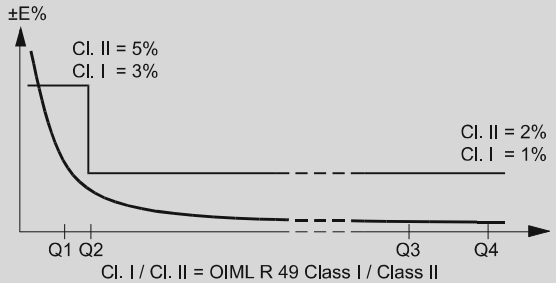
Flanges	
EN 1092-1 (DIN 2501)	DN 50 … 150 (2" … 6"): PN 16 (232 psi) DN 200 … 300 (8" … 12"): PN 10 or PN 16 (145 psi or 232 psi) up to DN 600 (24") in preparation
ANSI 16.5 Class 150	2" … 12": 20 bar (290 psi) up to DN 600 (24") in preparation
AWWA C-207	28" … 48": PN 10 (145 psi)
AS 4087	DN 50 … 300 (2" … 12"): PN 16 (232 psi) up to DN 600 (24") in preparation
Liner	EPDM
Electrode and grounding electrodes	Hastelloy C276/2.4819
Grounding straps	Grounding straps are premounted from the factory on each side of the sensor

1) Including Annex F

2) For further information on the PED standard and requirements see page 9/14.

MAG 8000 CT (Revenue program) water meter type approval

MAG 8000 CT program is type approved and verified according to international water meter standard OIML R 49. The Custody Transfer program is approved as Class I and Class II, for the sensor program from DN 50 to DN 300, at different Q3 and Q3/Q1. Q2/Q1 = 1.6 and follows OIML R 49 specification.



Cl. I / Cl. II = OIML R 49 Class I / Class II

OIML R 49/2006-DK2-10.01 Revision 1 approval specification for Class I (1 %)[1)]

Size	50 (2“)	65 (2½“)	80 (3“)	100 (4“)	125 (5“)	150 (6“)	200 (8“)	250 (10“)	300 (12“)
„R“ Q3/Q1	250	250	250	250	250	250	250	250	125
Q1 [m^3/h]	0.25	0.40	0.63	1.00	160	2.50	4.00	6.40	12.8
Q2 [m^3/h]	0.40	0.64	1.00	1.60	2.60	4.00	6.40	10.24	20.48
Q3 [m^3/h]	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1600**	**1600**
Q4 [m^3/h]	78.75	125	200	312.5	500	787.5	1250	2000	2000

OIML R 49/2006-DK2-10.01 Revision 1 approval specification for Class II (2 %)[1)]

Size	50 (2“)	65 (2½“)	80 (3“)	100 (4“)	125 (5“)	150 (6“)	200 (8“)	250 (10“)	300 (12“)
„R“ Q3/Q1	400	400	400	400	400	400	400	400	200
Q1 [m^3/h]	0.16	0.25	0.40	0.63	1.00	1.60	2.50	4.00	10.00
Q2 [m^3/h]	0.25	0.40	0.63	1.00	1.60	2.50	4.00	6.40	16.00
Q3 [m^3/h]	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1600**	**1600**
Q4 [m^3/h]	78.75	125	200	312.5	500	787.5	1250	2000	2000

1) The product will be delivered according to requested specifications, which may deviate from the specifications of the approval frame described in tables below.

© Siemens AG 2012

MAG 8000 CT (Revenue program) MI-001

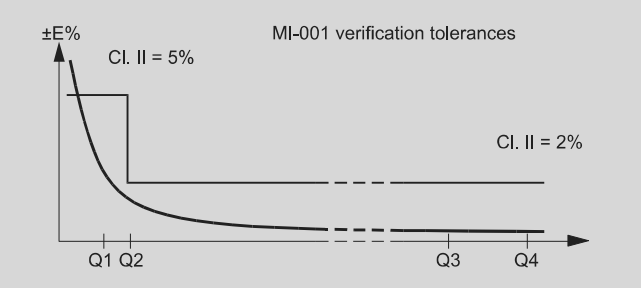
MAG 8000 CT program is type approved according to international water meter standard OIML R 49. Since the first November 2006 the MI-001 water meter directive is in force, which means that all water meters can be sold across the EU borders if the water meters contain a MI-001 label.

The MAG 8000 CT MI-001 verified and labeled products are a Class II aproval according to Directive 2004/22/EC of the European Parliament and Council of March 31, 2004 on measuring instruments (MID), Annex MI-001 in the sizes from DN 50 to DN 400.

The MID certification is obtained as a B + D module approval according to the above mentioned directive.

Module B : Type approval according to OIML R 49

Module D : Quality insurance approval of production



MAG 8000 CT MI-001 verified and labeled products at a given Q3 and Q4/Q3 = 1.25 and Q2/Q1 = 1.6 measuring ranges see below table:

7ME6820-xxxx1	**DN 50 (2“)**	**DN 65 (2½“)**	**DN 80 (3“)**	**DN 100 (4“)**	**DN 125 (5“)**	**DN 150 (6“)**	**DN 200 (8“)**	**DN 250 (10“)**	**DN 300 (12“)**	**DN 350 (14“)**	**DN 400 (16“)**
„R“ Q3/Q1	25	25	25	25	25	25	25	25	25	25	25
Q4 [m^3/h]	20	31.25	50	78.75	125	200	312.5	500	750	1250	1250
Q3 [m^3/h]	**16**	**25**	**40**	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1000**
Q2 [m^3/h]	0.96	1.60	2.60	4.03	6.40	10.24	16	25.60	38.4	64	64
Q1 [m^3/h]	0.60	1	1.60	2.52	4	6.40	10	16	24	40	40

7ME6820-xxxx2	**DN 50 (2“)**	**DN 65 (2½“)**	**DN 80 (3“)**	**DN 100 (4“)**	**DN 125 (5“)**	**DN 150 (6“)**	**DN 200 (8“)**	**DN 250 (10“)**	**DN 300 (12“)**	**DN 350 (14“)**	**DN 400 (16“)**
„R“ Q3/Q1	63	63	63	63	63	63	63	63	63	63	63
Q4 [m^3/h]	20	31.25	50	78.75	125	200	312.5	500	750	1250	1250
Q3 [m^3/h]	**16**	**25**	**40**	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1000**
Q2 [m^3/h]	0.41	0.63	1.02	1.60	2.54	4.06	6.35	10.16	16	25.4	25.4
Q1 [m^3/h]	0.25	0.40	0.63	1	1.59	2.54	3.97	6.35	10	15.9	15.9

7ME6820-xxxx3	**DN 50 (2“)**	**DN 65 (2½“)**	**DN 80 (3“)**	**DN 100 (4“)**	**DN 125 (5“)**	**DN 150 (6“)**	**DN 200 (8“)**	**DN 250 (10“)**	**DN 300 (12“)**	**DN 350 (14“)**	**DN 400 (16“)**
„R“ Q3/Q1	80	80	80	80	80	80	80	80	80	80	80
Q4 [m^3/h]	20	31.25	50	78.75	125	200	312.5	500	750	1250	1250
Q3 [m^3/h]	**16**	**25**	**40**	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1000**
Q2 [m^3/h]	0.32	0.50	0.80	1.20	2	3.20	5	8	12.6	20	20
Q1 [m^3/h]	0.20	0.31	0.50	0.75	1.25	2	3.13	5	7.88	12.5	12.5

7ME6820-xxxx4	**DN 50 (2“)**	**DN 65 (2½“)**	**DN 80 (3“)**	**DN 100 (4“)**	**DN 125 (5“)**	**DN 150 (6“)**	**DN 200 (8“)**	**DN 250 (10“)**	**DN 300 (12“)**	**DN 350 (14“)**	**DN 400 (16“)**
„R“ Q3/Q1	160	160	160	160	160	160	160	160	160	160	160
Q4 [m^3/h]	50	78.75	125	200	312.5	500	787.5	1250	2000	2000	2000
Q3 [m^3/h]	**40**	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1600**	**1600**	**1600**
Q2 [m^3/h]	0.40	0.63	1	1.60	2.50	4	6.30	10	16	16	16
Q1 [m^3/h]	0.25	0.39	0.63	1	1.56	2.50	3.94	6.25	10	10	10

7ME6820-xxxx5	**DN 50 (2“)**	**DN 65 (2½“)**	**DN 80 (3“)**	**DN 100 (4“)**	**DN 125 (5“)**	**DN 150 (6“)**	**DN 200 (8“)**	**DN 250 (10“)**	**DN 300 (12“)**	**DN 350 (14“)**	**DN 400 (16“)**
„R“ Q3/Q1	200	200	200	200	200	200	200	200	200	200	-
Q4 [m^3/h]	50	78.75	125	200	312.5	500	787.5	1250	2000	2000	-
Q3 [m^3/h]	**40**	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1600**	**1600**	**-**
Q2 [m^3/h]	0.32	0.50	0.80	1.28	2	3.20	5.04	8	12.80	12.80	-
Q1 [m^3/h]	0.20	0.32	0.50	0.80	1.25	2	3.15	5	8	8	-

© Siemens AG 2012

MAG 8000 CT for revenue and bulk metering (7ME6820)

7ME6820-xxxx6	DN 50 (2“)	DN 65 (2½“)	DN 80 (3“)	DN 100 (4“)	DN 125 (5“)	DN 150 (6“)	DN 200 (8“)	DN 250 (10“)	DN 300 (12“)	DN 350 (14“)	DN 400 (16“)
„R“ Q3/Q1	250	250	250	250	250	250	250	250	250	-	-
Q4 [m^3/h]	50	78.75	125	200	312.5	500	787.5	1250	2000	-	-
Q3 [m^3/h]	**40**	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1600**	**-**	**-**
Q2 [m^3/h]	0.26	0.40	0.64	1.02	1.60	2.56	4	6.40	10.24	-	-
Q1 [m^3/h]	0.16	0.25	0.40	0.64	1	1.60	2.52	4	6.40	-	-

The Label is placed on the side of the encapsulation.
An example of the product label is shown below:

Installation conditions

Please refer to “System information SITRANS F M electromagnetic flowmeters”.

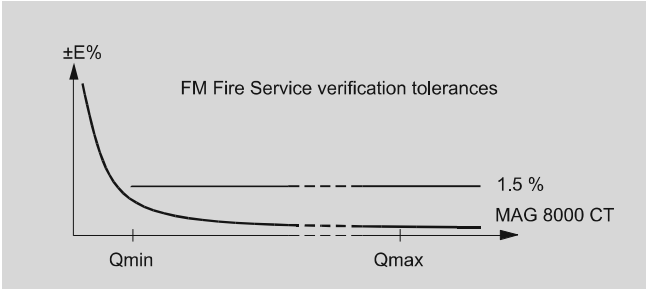
Battery operation time and calculation

The battery operation time depends on the connected battery pack as well as the operation condition of the meter.

MAG 8000 calculates the remaining capacity every 4 hours and includes all consuming elements. Calculation compensates for temperature influence on battery capacity (drawing).

MAG 8000 CT (7ME6820) for Fire Service applications

MAG 8000 CT (7ME6820) is FM Fire Service approved for automatic fire protection systems according to the Fire Service Meters Standard, Class Number 1044. The approval is applicable for the sizes DN 50, DN 80, DN 100, DN 150, DN 200, DN 250, and DN 300 (2", 3", 4", 6", 8", 10", and 12") with ANSI B16.5 Class 150 flanges. The FM Fire Service approved product can be ordered via the Z-options P20, P21 and P22.



© Siemens AG 2012

Selection and Ordering data	Order No.
SITRANS F M	
MAG 8000 CT water meter with EPDM liner and Hastelloy electrodes	7ME6820-
	■■■0■-■■■■
Diameter	
DN 50 (2")	2Y
DN 65 (2½")	3F
DN 80 (3")	3M
DN 100 (4")	3T
DN 125 (5")	4B
DN 150 (6")	4H
DN 200 (8")	4P
DN 250 (10")	4V
DN 300 (12")	5D
DN 350 (14")	5K
DN 400 (16")	5R
DN 450 (18")[1]	5Y
DN 500 (20")[1]	6F
DN 600 (24")[1]	6P
Flange norm and pressure rating	
EN 1092-1	
PN 16	C
ANSI B16.5	
Class 150	J
AS4087	
PN 16	N
Approval/Verification[3]	
Without verification according to OIML R 49[4]	0
MI-001 Q3/Q1 = 25	1
MI-001 Q3/Q1 = 63	2
MI-001 Q3/Q1 = 80	3
MI-001 Q3/Q1 = 160	4
MI-001 Q3/Q1 = 200	5
MI-001 Q3/Q1 = 250	6
Without verification calibrated to OIML R 49-Class II (Q3/Q1 = 100)	7
Without verification calibrated to OIML R 49-Class II (Q3/Q1 = 250)	8
Region version	
Europe (m^3, m^3/h, 50 Hz)	1
USA (m^3, m^3/h, 60 Hz)	2
Transmitter type and installation	
Basic version integral on sensor	A
Basic version remote, 5 m (16.4 ft) mounted cable on sensor with IP68/NEMA 6P plugs	B
Do - 10 m (32.8 ft)	C
Do - 20 m (65.6 ft)	D
Do - 30 m (98.4 ft)	E
Advanced version integral on sensor	K
Advanced version remote, 5 m mounted cable on sensor with IP68/NEMA 6P plugs	L
Do - 10 m (32.8 ft)	M
Do - 20 m (65.6 ft)	N
Do - 30 m (98.4 ft)	P

Selection and Ordering data	Order No.
SITRANS F M	
MAG 8000 CT water meter with EPDM liner and Hastelloy electrodes	7ME6820-
	■■■0■-■■■■
Communication interface	
No additional "add-on" communication module installed	A
Serial RS 485 with Modbus RTU (Terminated as end device)	B
Serial RS 232 with Modbus RTU	C
Encoder interface for ITRON 200WP radio with "Sensus" protocol"	D
Power supply	
Internal battery (no battery included)	0
Internal battery pack installed[2]	1
Power cable (1.5 m (4.9 ft)) with IP68/NEMA 6P plugs for external battery (no battery included)	2
12/24 V AC/DC power supply with battery backup and 3 m (9.8 ft) power cable for external connection (no battery included)	3
115 ... 230 V AC power supply with battery backup and 3 m (9.8 ft) power cable for external connection. (no battery included)	4

1) Under preparation.

2) Lithium batteries are subject to special transportation regulations according to United Nations "Regulation of Dangerous Goods, UN 3090 and UN 3091". Special transport documentation is required to observe these regulations. This may influence both transport time and costs.

3) For more details and references of the ranges please see the tables on pages 3/126 to 3/128.

4) Standard calibration or according to FM Fire Service requirements if P20, P21 or P22 is selected as Z option.

Operating instructions for SITRANS F M MAG 8000

Description	Order No.
• English	**A5E03071515**
• German	**A5E00740986**
• Spanish	**A5E00741031**
• French	**A5E00741021**

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
http://www.siemens.com/flowdocumentation

Operating instructions for MAG 8000 GSM/GPRS communication module

Description	Order No.
• English	**A5E03644134**

© Siemens AG 2012

MAG 8000 CT for revenue and bulk metering (7ME6820)

Selection and Ordering data	Order code
Additional information	
Please add **"-Z"** to Order No. and specify Order code(s) and plain text.	
Totalizer Volume calculation (default totalizer 1= forward and totalizer 2 = reverse)	
Totalizer 1 = RV, reverse flow	**L20**
Totalizer 1 = NET, net flow	**L22**
Totalizer 2 = FW, forward flow	**L30**
Totalizer 2 = NET, net flow	**L31**
Pulse set up (default pulse A= forward and pulse B = Alarm)	
A function = RV, reverse flow	**L62**
A function = FWnet, forward net flow	**L63**
A function = RVnet, reverse net flow	**L64**
A function = Off	**L65**
Volume per pulse A = x 0.001	**L71**
Volume per pulse A = x 0.01	**L72**
Volume per pulse A = x 0.1	**L73**
Volume per pulse A = x 1	**L74**
B function = FW, forward flow	**L80**
B function = RV, reverse flow	**L81**
B function = FWnet, forward net flow	**L82**
B function = RVnet, reverse net flow	**L83**
B function = Alarm	**L84**
B function = Call up	**L85**
Volume per pulse B = x 0.001	**L91**
Volume per pulse B = x 0.01	**L92**
Volume per pulse B = x 0.1	**L93**
Volume per pulse B = x 1	**L94**
Data logger set up (default month logging)	
DataloggerInterval = Daily	**M31**
DataloggerInterval = Weekly	**M32**
Factory mounted cables	
5 m (16.4 ft) pulse cable A+B	**M81**
5 m (16.4 ft) communication cable RS 232/RS 485 terminated as end device	**M82**
20 m (65.6 ft) pulse cable A+B	**M84**
20 m (65.6 ft) communication cable RS 232/RS 485 terminated as end device	**M85**
Cello 2 channel, input cable 3 m (9.84 ft) with Brad Harrison micro-change 3 way connector	**M87**
Cello 2 channel, input cable 5 m (16.4 ft) with MIL-C-26482 spec. connectors	**M89**
5 ft. Encoder interface cable with connector for ITRON 200WP radio	**M91**
25 ft. Encoder interface cable with connector for ITRON 200WP radio	**M90**
SOFREL data logger cable 2 m with connector for SOFREL GSM module	**M92**
FM Fire Service Approval (with ANSI B16.5 Class 150 flanges)	
DN 50, DN 80 and DN 100 (2", 3" and 4")	**P20**
DN 150 and DN 200 (6" and 8")	**P21**
DN 250 and DN 300 (10" and 12")	**P22**

© Siemens AG 2012

Overview

Benefits

- IP68/NEMA 6P rating with tamper proof
- Flexible power supply - internal or external battery pack or mains power supply with battery back-up possibilities
- No moving parts in a robust construction means less wear and tear
- Up to 8 years maintenance-free operation in typical application
- Connectable to AMR systems

Technical specifications

Meter	
Accuracy	± 0.8 % ± 2.5 mm/s
Media conductivity	Clean water > 20 µs/cm
Temperature	
Ambient	-20 ... +60 °C (-4 ... +140 °F)
Media	0 ... 70 °C (32 ... 158 °F)
Storage	-40 ... +70 °C (-40 ... +158 °F)
Enclosure rating	IP68/NEMA 6P rating Cable glands mounted requires Sylgard potting kit to remain IP68/NEMA 6P, otherwise IP67/NEMA 4 is obtained; Factory-mounted cable provides IP68/NEMA 6P rating
Approvals	
Drinking water approvals	• ANSI/NSF 61[1] (cold water) USA • WRAS (BS 6920 cold water) UK
Custody transfer approval	NMI10 Australia (under preparation)
Conformity	IEC/EN 61000-6-3, IEC/EN 61000-6-2
Flanges	
Drilled to:	
• EN 1092-1 (DIN 2501) PN 10	DN 50 ... 600 (2" ... 24") (max. pressure 7 bar (101.5 psi))
• ANSI 16.5 Class 150	2" ... 24" (max. pressure 7 bar (101.5 psi))
• AS 2091-1 Table D	DN 50 ... 600 (2" ... 24") (max. pressure 7 bar (101.5 psi))
Excitation frequency	
Battery-powered	DN 50 … 600 (2" … 24"): 1/15 Hz
Mains-powered	DN 50 … 600 (2" … 24"): 3.125 Hz
Liner	Ebonite
Electrodes	Stainless steel

[1] Including Annex F

© Siemens AG 2012

MAG 8000 for irrigation applications (7ME6880)

Selection and Ordering data	Order No.
SITRANS F M MAG 8000 water meter including factory-mounted grounding rings	**7ME6880-**
	■■■■0-■■■■
Diameter	
DN 50 (2“)	2Y
DN 65 (2½“)	3F
DN 80 (3“)	3M
DN 100 (4“)	3T
DN 125 (5“)	4B
DN 150 (6“)	4H
DN 200 (8“)	4P
DN 250 (10“)	4V
DN 300 (12“)	5D
DN 350 (14“)	5K
DN 400 (16“)	5R
DN 450 (18“)	5Y
DN 500 (20“)	6F
DN 600 (24“)	6P
Flange norm and pressure rating	
EN 1092-1 drilled pattern PN 10/max. 7 bar (101 psi)	B
ANSI B16.5 drilled pattern Cl 150/max. 7 bar (101 psi)	J
AS2129 drilled pattern table D/max. 7 bar (101 psi)	M
Sensor version	
Ebonite liner and stainless steel electrodes	4
Region version	
Europe (m^3, m^3/h, 50 Hz)	1
USA (Gallon, GPM, 60 Hz)	2
Australia (Ml, Ml/d, 50 Hz)	3
Transmitter type and installation	
Basic version integral on sensor	A
Basic version remote, 2 m (6.56 ft) mounted cable on sensor with IP68/NEMA 6P plugs	T
Do - 5 m (16.4 ft)	B
Do - 10 m (32.8 ft)	C

Selection and Ordering data	Order No.
SITRANS F M MAG 8000 water meter including factory-mounted grounding rings	**7ME6880-**
	■■■■0-■■■■
Communication interface	
No additional "add-on" communication module installed	A
Serial RS 485 with Modbus RTU (Terminated as end device)	B
Serial RS 232 with Modbus RTU	C
Encoder inferface	D
Power supply	
Internal battery (no battery included)	0
Internal battery pack installed 2 D-cell[1)]	1
Power cable (1.5 m (4.9 ft)) with IP68/NEMA 6P plugs for external battery (no battery included)	2
12/24 V AC/DC power supply with battery backup and 3 m (9.8 ft) power cable for external connection (no battery included)	3
115 ... 230 V AC power supply with battery backup and 3 m (9.8 ft) power cable for external connection (no battery included)	4
Internal battery pack installed 1 D-cell[1)]	5

[1)] Lithium batteries are subject to special transportation regulations according to United Nations "Regulation of Dangerous Goods, UN 3090 and UN 3091". Special transport documentation is required to observe these regulations. This may influence both transport time and costs.

Operating instructions for SITRANS F M MAG 8000

Description	Order No.
• English	**A5E03071515**
• German	**A5E00740986**
• Spanish	**A5E00741031**
• French	**A5E00741021**

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
http://www.siemens.com/flowdocumentation

© Siemens AG 2012

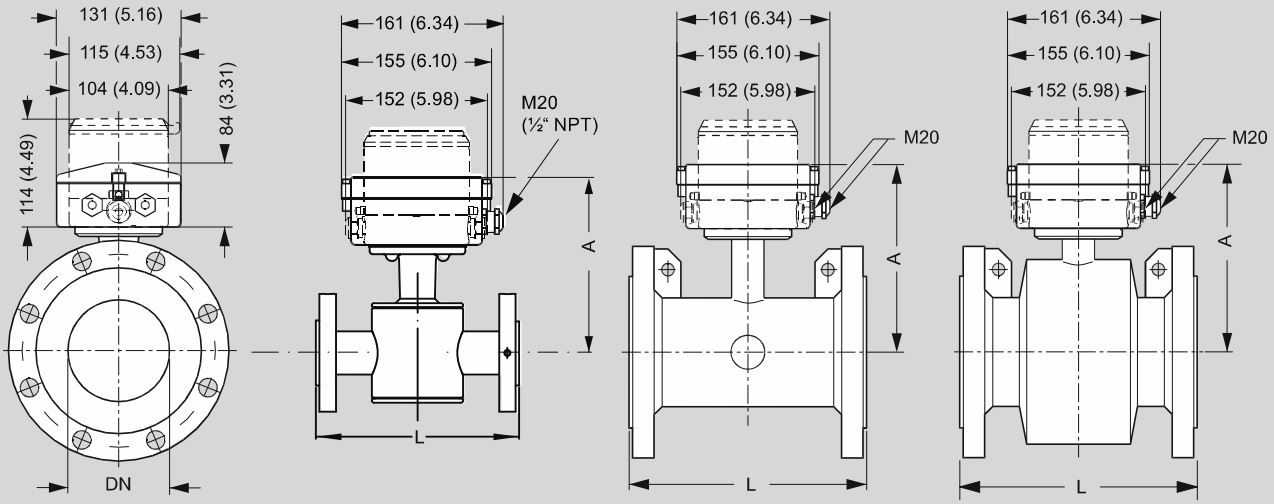
Selection and Ordering data	Order code
Additional information	
Please add **"-Z"** to Order No. and specify Order code(s) and plain text.	
Flow unit	
l/s	**L00**
MGD	**L01**
CFS	**L02**
l/min	**L03**
m^3/min	**L04**
GPM	**L05**
CFM	**L06**
l/h	**L07**
m^3/h	**L08**
GPH	**L09**
CFH	**L10**
GPS	**L11**
Ml/d	**L12**
m^3/d	**L13**
GPD	**L14**
Totalizer Volume calculation (default totalizer 1= forward and totalizer 2 = reverse)	
Totalizer 1 = RV, reverse flow	**L20**
Totalizer 1 = NET, net flow	**L22**
Totalizer 2 = FW, forward flow	**L30**
Totalizer 2 = NET, net flow	**L31**
Volume unit	
m^3	**L40**
Ml	**L41**
G	**L42**
AF	**L43**
l x 100	**L44**
m^3 x 100	**L45**
G x 100	**L46**
CF x 100	**L47**
MG	**L48**
G x 1000	**L49**
CF x 1000	**L50**
Al	**L51**
kl	**L52**
Pulse set up (default pulse A= forward and pulse B = Alarm)	
A function = RV, reverse flow	**L62**
A function = FWnet, forward net flow	**L63**
A function = RVnet, reverse net flow	**L64**
A function = Off	**L65**
Volume per pulse A = x 0.0001	**L70**
Volume per pulse A = x 0.001	**L71**
Volume per pulse A = x 0.01	**L72**
Volume per pulse A = x 0.1	**L73**
Volume per pulse A = x 1	**L74**
B function = FW, forward flow	**L80**
B function = RV, verse flow	**L81**
B function = FWnet, forward net flow	**L82**
B function = RVnet, reverse net flow	**L83**
B function = Alarm	**L84**
B function = Call up	**L85**
Volume per pulse B = x 0.0001	**L90**
Volume per pulse B = x 0.001	**L91**
Volume per pulse B = x 0.01	**L92**
Volume per pulse B = x 0.1	**L93**
Volume per pulse B = x 1	**L94**

Selection and Ordering data	Order code
Additional information	
Please add **"-Z"** to Order No. and specify Order code(s) and plain text.	
Data logger set up (default month logging)	
DataloggerInterval = Daily	**M31**
DataloggerInterval = Weekly	**M32**
Factory mounted cables	
5 m (16.4 ft) pulse cable A+B	**M81**
5 m (16.4 ft) communication cable RS 232/RS 485 terminated as end device	**M82**
20 m (65.6 ft) pulse cable A+B	**M84**
20 m (65.6 ft) communication cable RS 232/RS 485 terminated as end device	**M85**
Cello 2 channel, input cable 3 m (9.84 ft) with Brad Harrison micro-change 3 way connector	**M87**
Cello 2 channel, input cable 5 m (16.4 ft) with MIL-C-26482 spec. connectors	**M89**
5 ft Encoder interface cable with connector for ITRON 200WP radio	**M91**
25 ft Encoder interface cable with connector for ITRON 200WP radio	**M90**
SOFREL data logger cable 2 m with connector for SOFREL GSM module	**M92**

© Siemens AG 2012

Battery-operated water meter MAG 8000

Dimensional drawings



7ME6810/7ME6820

7ME6880

DN 25 and 40 (1" and 1½")

N/A

DN 50 ... 300 (2" ... 12")

N/A

DN 350 ... 1200 (14" ... 48")

DN 50 ... 600 (2" ... 24")
For DN 50 ... 300:
Add 7 mm (0.28") to length (L)
For DN 350 ... 600:
Add 8 mm (0.31") to length (L)

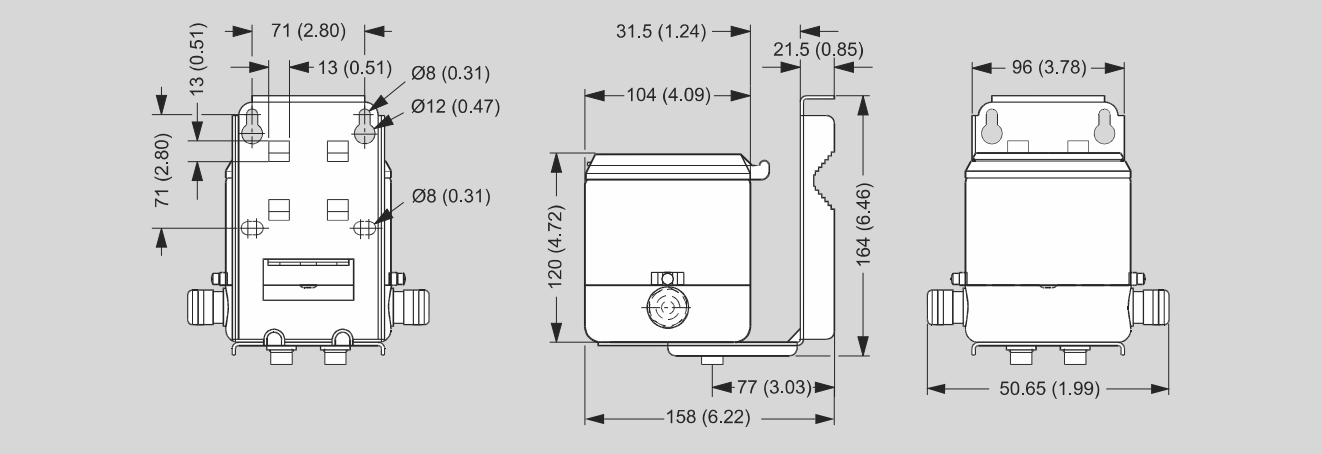
Dimensions in mm (inch)

Nominal DN size	A	L, lenghts						Weight[1]	
	EPDM (7ME6810 and 7ME6820)	EN 1092-1 PN 10	EN 1092-1 PN 16/ PN 16 non-PED	EN 1092-1 PN 40	ANSI 16.5 Class 150	AS 4087 PN 16	AWWA C-207 Class D		
mm (inch)	mm (inch)	mm	mm	mm	inch	mm	mm	kg	lbs
25 (1)	194 (7.7)	-	-	200	7.9	200	-	6	13
40 (1½)	204 (8.1)	-	-	200	7.9	200	-	9	20
50 (2)	195 (7.7)	-	200	-	7.9	200	-	11	25
65 (2½)	201 (8)	-	200	-	7.9	200	-	13	29
80 (3)	207 (8.2)	-	200	-	7.9	200	-	15	34
100 (4)	214 (8.5)	-	250	-	9.8	250	-	17	38
125 (5)	224 (8.9)	-	250	-	9.8	250	-	22	50
150 (6)	239 (9.5)	-	300	-	11.8	300	-	28	63
200 (8)	264 (10.5)	350	350	-	13.8	350	-	50	113
250 (10)	291 (11.5)	450	450	-	17.7	450	-	71	160
300 (12)	317 (12.6)	500	500	-	19.7	500	-	88	198
350 (14)	369 (14.6)	550	550	-	21.7	550	-	127	279
400 (16)	394 (15.6)	600	600	-	23.6	600	-	145	318
450 (18)	425 (16.8)	600	600	-	23.6	600	-	175	384
500 (20)	450 (17.8)	600	600	-	26.8	600	-	225	494
600 (24)	501 (19.8)	600	600	-	32.3	600	-	340	747
700 (28)	544 (21.4)	700	875/700	-	N/A	N/A	700	316	694
750 (30)	571 (22.5)	N/A	N/A	-	N/A	N/A	750	N/A	N/A
800 (32)	606 (23.9)	800	1000/800	-	N/A	N/A	800	398	1045
900 (36)	653 (25.7)	900	1125/900	-	N/A	N/A	900	476	1045
1000 (40)	704 (27.7)	1000	1250/1000	-	N/A	N/A	1000	602	1322
1050 (42)	704 (27.7)	N/A	N/A	-	N/A	N/A	1050	N/A	N/A
1100 (44)	755 (29.7)	N/A	N/A	-	N/A	N/A	1100	N/A	N/A
1200 (48)	810 (31.9)	1200	1500/1200	-	N/A	N/A	1200	887	1996

[1] For remote version the sensor weight is reduced with 2 kg (4.5 lb)

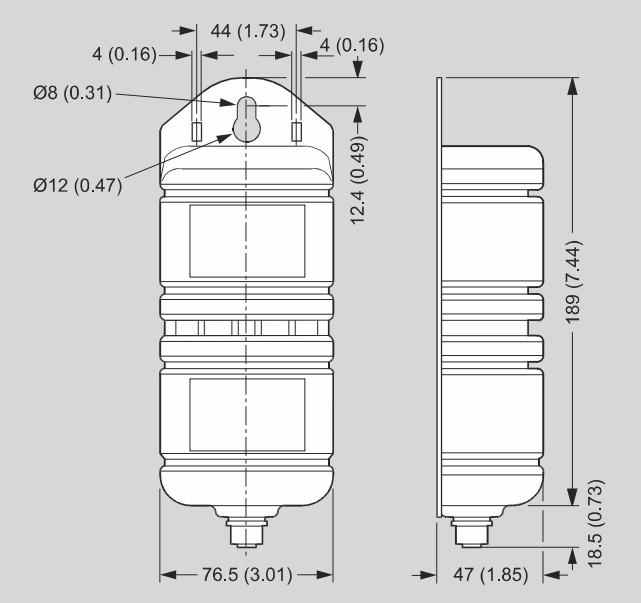
© Siemens AG 2012

Remote version



Dimensions in mm (inch), weight 3.5 kg (8 lbs)

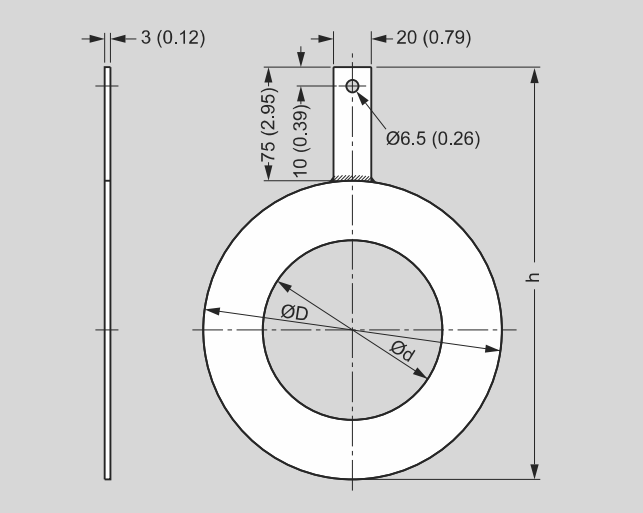
External battery pack



Dimensions in mm (inch), weight 2.0 kg (4.5 lbs)

Battery pack has to be mounted in upwards position to ensure maximum battery capacity.

Grounding rings



Dimensions in mm (inch) for grounding rings MAG 8000 with EPDM lining (7ME6810 and 7ME6820) DN 25 to DN 300

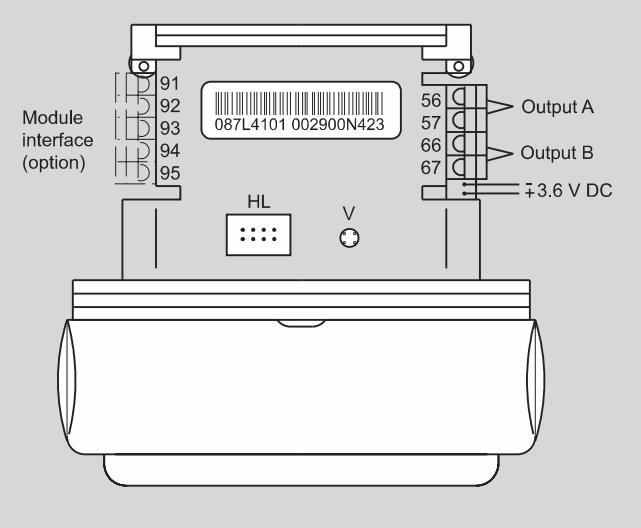
Dimension	Internal diameter (d)	Outside diameter (D)	h
DN 25	27	68	143
DN 40	38	88	163
DN 50	52	100	175
DN 65	64	120	195
DN 80	79	133	208
DN 100	95	158	233
DN 125	115	188	263
DN 150	145	216	336
DN 200	193	268	343
DN 250	246	324	399
DN 300	295	374	449

© Siemens AG 2012

Battery-operated water meter MAG 8000

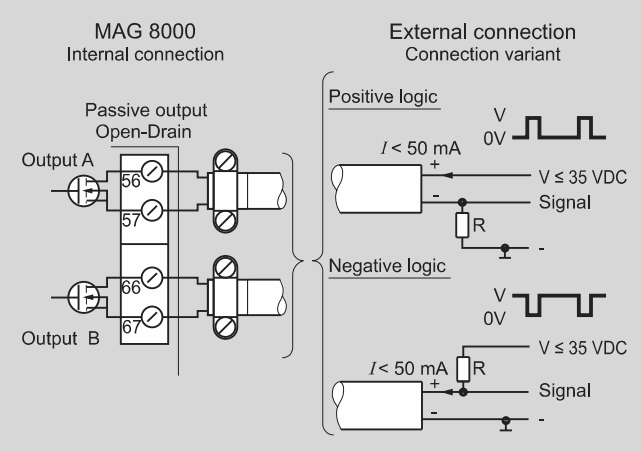
Schematics

Electrical installation and pulse output – Connection diagram



HL = Hardware lock key connection
V = Push button for verification mode

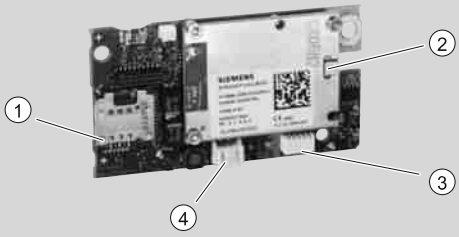
Pulse wire connection



The pulse output can be configured as volume, alarm or call-up. The output can be connected as positive or negative logic.
R = pull up/down is selected in relation to the Vx power supply and with a max. current I of 50 mA.

Use shielded cable to avoid EMC problems. Make sure the shield is correctly mounted under the cable clamp (no pig tail).

Electrical installation of GSM/GPRS module

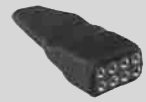


1 SIM card slot
2 GSM/GPRS antenna connector
3 Analog inputs inlet
4 Rechargeable battery inlet

© Siemens AG 2012

Accessories

Description	Order No.	
PC Flow Tool on CD (Download for free from www.siemens.com/flow)	◆ **FDK:087L6001**	
IrDA infrared interface adapter with USB for data acquisition with 1.2 m (3.9 ft) cable	◆ **FDK:087L4163**	
Battery backup for mains power supply, 1 pc. D-cell (3.6 V, 16.5 Ah)[1]	◆ **A5E03354392**	
Rechargeable Lithium battery for MAG 8000 GSM/GPRS communication module	◆ **A5E03436686**	
Internal battery pack, one set of 2 D-cell (3.6 V 33 Ah) and accessories for replacement[1]. Order cable FDK:087L4152 separately.	◆ **FDK:087L4150**	
External battery pack IP68/NEMA 6P with connector, 4 D-cell (3.6 V 66 Ah)[1]	◆ **FDK:087L4151**	
Mains power supply 12 ... 24 V AC/DC with battery backup and 3 m (9.8 ft) power cable for external connection (no battery included) Temperature range: Fixed laying: -40 ... +90 °C (-40 ... +194 °F) Flexible application: -30 ... +80 °C (-22 ... +176 °F)	**FDK:087L4210**	
Mains power supply 115 ... 230 V AC with battery backup up and 3 m (9.8 ft) power cable for external connection (no battery included)	◆ **FDK:087L4211**	
RS 232 add-on module, point to point communication interface with Modbus RTU protocol	**FDK:087L4212**	
RS 485 add-on module, multidrop communication interface with Modbus RTU protocol	◆ **FDK:087L4213**	
Encoder interface module, with "Sensus" protocol for ITRON 200WP and 100W radio, only for use with 7ME6820 and 7ME6880 routes	**A5E02475650**	
MAG 8000 GSM/GPRS communication module. Rechargeable battery, antenna and analog cable input must be ordered separately	**A5E03412758**	

Description	Order No.	
One cable entry 6 ... 8 mm (0.24 ... 0.31 ") M20 brass glands package (1 pc)	**FDK:087L4196**	
One cable entry 2 ... 5 mm (0.08 ... 0.20 ") M12 brass glands with M20 reduction. Package of 10 pcs	**FDK:087L4154**	
One cable entry 6 ... 8 mm (0.24 ... 0.31 ") M20 brass glands package (10 pcs)	**FDK:087L4155**	
One cable entry 8 ... 11 mm (0.31 ... 0.43 ") M20 brass glands package (10 pcs)	**FDK:087L4156**	
One cable entry 11 ... 15 mm (0.43 ... 0.59 ") M20 brass glands package (10 pcs)	**FDK:087L4157**	
Two cable entries 3.5 ... 5 mm (0.14 ... 0.20 ") M20 brass glands package (10 pcs)	**FDK:087L4158**	
Two cable entries 5.5 ... 7.5 mm (0.22 ... 0.30 "), M20 brass glands package (10 pcs)	**FDK:087L4159**	
High gain antenna for MAG 8000 GSM/GPRS (PVC, IP 68, cable length 5 m (16.4 ft), with SMA male connector (type RG 58) and internal SMA to SMP female cable adapter)	◆ **A5E03436689**	
Analog input cable for MAG 8000 GSM/GPRS (3 m (9.8 ft) cable with M12 connector A-Coding female 5 pins)	**A5E03436698**	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P (not for Ex sensors)	◆ **FDK:085U0220**	
MAG 8000 Hardware key to access protected parameters	**FDK:087L4165**	
MAG 8000 demo - training unit pack operating on Alkaline batteries. Transmitter with Flow tool CD, IrDA interface adapter and hardware key (No dangerous goods limitations)	**FDK:087L4080**	
Alkaline battery for MAG 8000 demo transmitter (3 V 13 Ah) (No dangerous goods limitations)	**FDK:087L4142**	

◆ Short lead time (details in PMD)

[1] Lithium batteries are subject to special transportation regulations according to United Nations "Regulation of Dangerous Goods, UN 3090 and UN 3091". Special transport documentation is required to observe these regulations. This may influence both transport time and costs.

© Siemens AG 2012

Battery-operated water meter MAG 8000

When MAG 8000 (7ME6810 and 7ME6820) is installed in PVC or coated pipelines, grounding rings must be installed additionally.

Grounding rings, type C must be used for the 7ME6810 and 7ME6820 routes (sizes > DN 300). Please see grounding rings in the section MAG 3100 Grounding rings and be aware that the mentioned MLFB codes include only 1 grounding ring. Grounding rings DN 25 to DN 300 in stainless steel are packed in pairs and sold as a "grounding ring kit".

Dimension	Order No.	
DN 25	◆ **A5E01002946**	
DN 40	◆ **A5E01002947**	
DN 50	◆ **A5E01002948**	
DN 65	◆ **A5E01002950**	
DN 80	◆ **A5E01002952**	
DN 100	◆ **A5E01002953**	
DN 125	◆ **A5E01002954**	
DN 150	◆ **A5E01002955**	
DN 200	◆ **A5E01002957**	
DN 250	◆ **A5E01002958**	
DN 300	◆ **A5E01002962**	

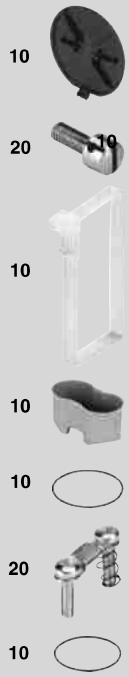
◆ Short lead time (details in PMD)

Spare parts

Description	Order No.	
MAG 8000 transmitter compact replacement kit[1]. No battery included. System number specified by ordering.	**FDK:087L4166**	
MAG 8000 transmitter remote replacement kit[1]. System number specified by ordering.	**FDK:087L4202**	
MAG 8000 (Advanced version) transmitter compact replacement kit[1]. No battery included. No system number required.	**FDK:087L4203**	
MAG 8000 (Advanced version) transmitter remote replacement kit[1]. No battery included. No system number required.	**FDK:087L4204**	

Description	Order No.	
MAG 8000 (Basic version) transmitter PCB replacement kit[1]. No system number required.	**A5E01171569**	
MAG 8000 (Advanced version) transmitter PCB replacement kit[1]. No system number required.	**FDK:087L4168**	
MAG 8000 (Advanced/Basic versions) transmitter PCB replacement kit[1]. System number specified by ordering.	**A5E03636168**	
Enclosure top including plastic lid, screws and blank product label	**FDK:087L4167**	
Power cable (1.5 m (4.9 ft)) with IP68/NEMA 6P plugs for external battery (no battery included); PE jacket, ambient temperature: -20 ... +60 °C (-4 ... +140 °F)	**FDK:087L4152**	
5 ft. Encoder interface cable with IP68/NEMA 6P plugs included, for ITRON 200WP and 100W radio; 22 AWG stranded TC conductors, polypropylene insulation, twisted pair, overall Beldfoil shield, 22 AWG stranded TC drain wire, PVC jacket	**A5E02551263**	
25 ft. Encoder interface cable with IP68/NEMA 6P plugs included, for ITRON 200WP radio; 22 AWG stranded TC conductors, polypropylene insulation, twisted pair, overall Beldfoil shield, 22 AWG stranded TC drain wire, PVC jacket	**A5E02551182**	

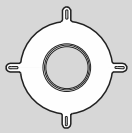
© Siemens AG 2012

Description	Order No.	
Service tool kit package with various component for service and replacement.	**FDK:087L4162**	
Remote cable set 5 m (16.4 ft) with IP68/NEMA 6P plugs - PG 13.5[2]	**FDK:087L4108**	
Remote cable set 5 m (16.4 ft) with IP68/NEMA 6P plugs - M20	**A5E00862482**	
Remote cable set 10 m (32.8 ft) with IP68/NEMA 6P plugs - PG 13.5[2]	**FDK:087L4109**	
Remote cable set 10 m (32.8 ft) with IP68/NEMA 6P plugs - M20	**A5E00862487**	
Remote cable set 20 m (65.6 ft) with IP68/NEMA 6P plugs - PG 13.5[2]	**FDK:087L4110**	
Remote cable set 20 m (65.6 ft) with IP68/NEMA 6P plugs - M20	**A5E00862492**	
Remote cable set 30 m (98.4 ft) with IP68/NEMA 6P plugs - PG 13.5[2]	**FDK:087L4111**	
Remote cable set 30 m (98.4 ft) with IP68/NEMA 6P plugs - M20	**A5E00862497**	

[1] Not applicable to Custody Transfer (CT) verified systems without re-verification

[2] For sensors produced before October 2007.

MAG 8000 (7ME6880) grounding ring service kit, consisting of 2 pcs. grounding rings, screws and gaskets

Dimension		Order No.	
DN 50	2"	**A5E03082907**	
DN 65	2½"	**A5E03082908**	
DN 80	3"	**A5E03082909**	
DN 100	4"	**A5E03082910**	
DN 125	5"	**A5E03082911**	
DN 150	6"	**A5E03082912**	
DN 200	8"	**A5E03082913**	
DN 250	10"	**A5E03082914**	
DN 300	12"	**A5E03082915**	
DN 350	14"	**A5E03082916**	
DN 400	16"	**A5E03082917**	
DN 450	18"	**A5E03082918**	
DN 500	20"	**A5E03082919**	
DN 600	24"	**A5E03082920**	