

Flow Measurement

SITRANS F M

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 2014/32/EU of the European Parliament and Council of 26 February, 2014 on measuring instruments, Annex VI Thermal Energy Meters (MI-004)
- No moving parts means less wear and tear
- Up to 6 to 10 years maintenance-free operation in typical revenue application
- Robust construction built for the application

Intelligent information, easy to access

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

Application

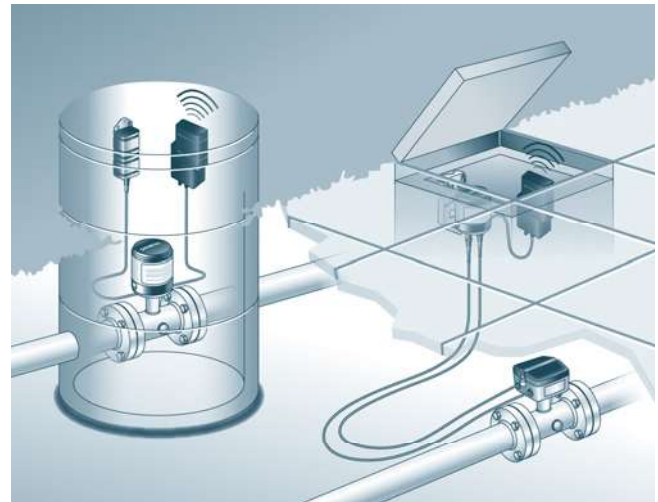
The following MAG 8000 versions are available as stand-alone water meters:

- 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



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 3/121). 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.

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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⁾	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

¹⁾ Excitation frequency settings with mains power supply, see technical specifications for each version

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.



SIMATIC PDM

Details about the SIMATIC PDM tool can be found in chapter "Communication and Software" (see page 8/9).

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 MI and flow rate as MI/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, BBL42 Flow: m ³ /min, m ³ /d, l/s, l/min, GPS, GPH, GPD, MGD, CFS, CFM, CFH, BBL42/s, BBL42/min, BBL42/h, BBL42/d
Digital output	2 passive outputs (MOS), individual galvanically isolated Maximum load ± 35 V DC, 50 mA short circuit protected Programmable as pulse volume – forward – reverse – forward/net – reverse/net
Output A function	Programmable as pulse volume (like output A), alarm
Output B function	Max. pulse rate of 50 Hz (only Basic version) and 100 Hz (only Advanced version), pulse width of 5, 10, 50, 100, 500 ms
Output	
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
External battery pack	2 D-Cell 3.6 V/33 Ah 4 D-Cell 3.6 V/66 Ah

Mains power supply

Cable

- 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.
3 m (9.8 ft) for external connection to mains supply (without cable plug)

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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	
• 7ME6810	0.05 % of Qmax (adjustable)
• 7ME6820	0.25 % of Q3
• 7ME6880	1 % of Qmax (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

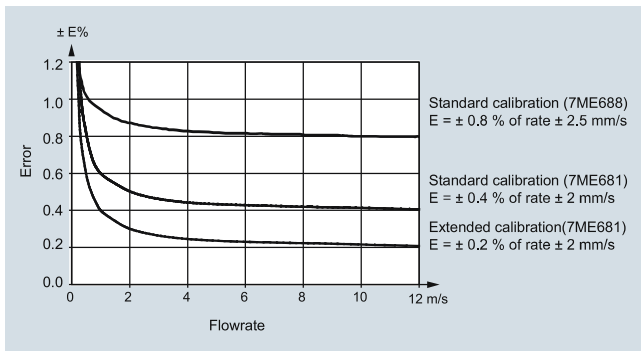
MAG 8000 water meter uncertainty

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).

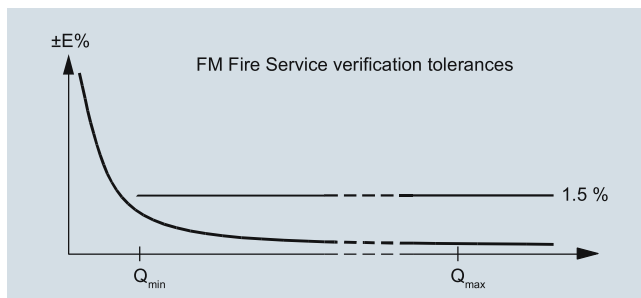
Siemens offers accredited calibrations assured to ISO 17025 in the flow range from 0.0001 m³/h to 10 000 m³/h. Siemens Flow Instruments accredited laboratories are recognized by ILAC MRA (International Laboratory Accreditation Corporation - Mutual Recognition Arrangement) ensuring international traceability and recognition of the test results worldwide.

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



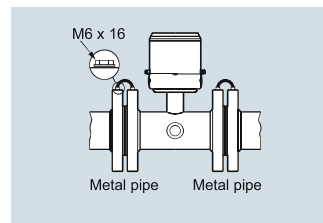
MAG 8000 (7ME6810) for Fire Service applications

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



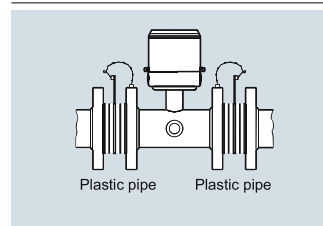
Grounding

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

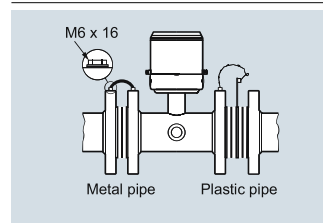
On metal pipes, connect the straps to both flanges.



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“



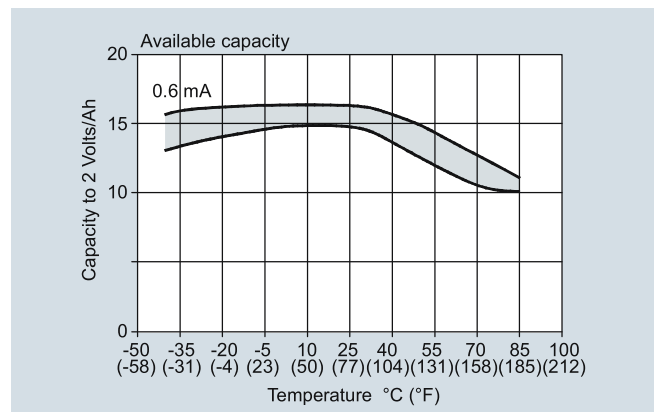
Combination of metal and plastic pipes

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.

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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	8 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 Internal battery pack	DN 25 ... 600 (1" ... 24")	52 months	40 months	25 months	12 months	2 months	1 month
	DN 700 ... 1 200 (28" ... 48")	3 years	2 years	1 years	6 months	1 month	N/A
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
	DN 700 ... 1 200 (28" ... 48")	6 years	4 years	2 years	1 year	2 months	N/A
4 D-Cell battery 66 Ah External battery pack	DN 50 ... 600 (2" ... 24")	10 years	10 years	8 years	48 months	8 months	4 months
	DN 700 ... 1 200 (28" ... 48")	10 years	8 years	4 years	2 years	4 months	N/A

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 External battery pack	7 years

External battery pack can be used as battery backup for mains power supply (if two cable entries in one cable gland are needed, order cable glands with two entries, see accessories on page 3/139).

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:
 - low excitation frequency: 10 % of calculated operation time
 - high excitation frequency: 80 % of calculated operation time
- RS 485:
 - low excitation frequency: 50 % of calculated operation time
 - high excitation frequency: 90 % of calculated operation time

Overview

Benefits
Easy to install

- Compact or remote solution with factory mounted cable
- 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
Low flow cut-off (default)	0.05 %
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	
Remote sensor	IP68 to EN 60529/NEMA 6P, 10 mH ₂ O cont.
Compact version	IP68 to EN 60529/NEMA 6P, 3 mH ₂ O for six months
Certificates and approvals	
Calibration	
• Standard calibration	2 x 25 % and 2 x 90 % (default)
• Special calibration	5-point calibration: 20 %, 40 %, 60 %, 80 %, 100 % of factory Q _{max} 10-point calibration: ascending and descending at 20 %, 40 %, 60 %, 80 %, 100 % of factory Q _{max} Matched-pair calibration: default, 5-point, 10-point
Material certificate EN 10204-3.1	Available when ordering together with meter ¹⁾
Drinking water approvals	• NSF/ANSI Standard 61²⁾ (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) ³⁾
Conformity	• PED: 97/23EC⁴⁾ For pressure/temperature curves see MAG 3100 on page 3/70. • EMC: IEC/EN 61326
Sensor version	DN 25 ... 1200 (1" ... 48")
Sensor material	Carbon steel ASTM A 105, with corrosion resistant two-component epoxy coating (150 µm/300 µm) Corrosivity category C4, according to ISO 12944-2
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

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

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
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⁾ Has to be ordered with the meter. It is not possible to order the certificate afterwards.

²⁾ Including Annex G

³⁾ Not for sensors with 300 µm coating.

⁴⁾ For further information on the PED standard and requirements see page 9/6.

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

Selection and Ordering data		Article No.	Selection and Ordering data		Article No.
SITRANS F M MAG 8000 water meter		7 ME 6 8 1 0 -	SITRANS F M MAG 8000 water meter		7 ME 6 8 1 0 -
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			Advanced version, remote cables mounted on sensor with IP68/NEMA 6P plugs: • 5 m (16.4 ft) • 10 m (32.8 ft) • 20 m (65.6 ft) • 30 m (98.4 ft)		
Diameter			Communication interface		
DN 25 (1")	2 D		No additional "add-on" communication module installed		A
DN 40 (1½")	2 R		Serial RS 485 with Modbus RTU (Terminated as end device)		B
DN 50 (2")	2 Y		Serial RS 232 with Modbus RTU		C
DN 65 (2½")	3 F		Encoder interface with Sensus protocol		D
DN 80 (3")	3 M		GSM/GPRS communication module with remote antenna; 5 m (16.4 ft) cable		S
DN 100 (4")	3 T		GSM/GPRS communication module with analog inputs and remote antenna; 5 m (16.4 ft) cable		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") ¹⁾	6 Y				
DN 750 (30") ¹⁾	7 D				
DN 800 (32") ¹⁾	7 H				
DN 900 (36") ¹⁾	7 M				
DN 1000 (40") ¹⁾	7 R				
DN 1050 (42") ¹⁾	7 U				
DN 1100 (44") ¹⁾	7 V				
DN 1200 (48") ¹⁾	8 B				
Flange norm and pressure rating			Power supply		
EN 1092-1			Internal battery (no battery included)		0
PN 10 (DN 200 ... 1200 (8" ... 48"))	B		Internal battery pack installed ²⁾		1
PN 16 (DN 50 ... 1200 (2" ... 48"))	C		Power cable (1.5 m (4.9 ft)) with IP68/NEMA 6P plugs for external battery (no battery included)		2
PN 16 non-PED (DN 700 ... 1200 (28" ... 48"))	D		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
PN 40 (DN 25 ... 40 (1" ... 1½"))	F		115 ... 230 V AC power supply with battery backup and 3 m (9.8 ft) power cable for external connection (no battery included)		4
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, 150 µm coating	3				
EPDM liner and Hastelloy electrodes, 300 µm coating	4				
Calibration					
Standard ± 0.4 % of rate ± 2 mm/s	1				
Extended ± 0.2 % of rate ± 2 mm/s DN 50... 300 (2" ... 12")	2				
Region version					
Europe (m³, m³/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 cables 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 cables mounted on sensor with IP68/NEMA 6P plugs:

- 5 m (16.4 ft)
- 10 m (32.8 ft)
- 20 m (65.6 ft)
- 30 m (98.4 ft)

Communication interface

No additional "add-on" communication module installed

Serial RS 485 with Modbus RTU (Terminated as end device)

Serial RS 232 with Modbus RTU

Encoder interface with Sensus protocol

GSM/GPRS communication module with remote antenna; 5 m (16.4 ft) cable

GSM/GPRS communication module with analog inputs and remote antenna; 5 m (16.4 ft) cable

Power supply

Internal battery (no battery included)

Internal battery pack installed²⁾

Power cable (1.5 m (4.9 ft)) with IP68/NEMA 6P plugs for external battery (no battery included)

12/24 V AC/DC power supply with battery backup and 3 m (9.8 ft) power cable for external connection (no battery included)

115 ... 230 V AC power supply with battery backup and 3 m (9.8 ft) power cable for external connection (no battery included)

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.

• We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.

Operating instructions for SITRANS F M MAG 8000

Description	Article No.
• English	A5E03071515
• German	A5E00740986

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

All literature is available to download for free, in a range of languages, at www.siemens.com/processinstrumentation/documentation

Operating instructions for MAG 8000 GSM/GPRS communication module

Description	Article No.
• English	A5E03644134

Flow Measurement

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

Selection and Ordering data	Order code	Selection and Ordering data	Order code
Additional information		Additional information	
Please add “-Z” to Article No. and specify Order code(s) and plain text.		Please add “-Z” to Article No. and specify Order code(s) and plain text.	
Certificate			
Material certificate according to EN 10204-3.1	C12¹⁾	G x 100	L46
		CF x 100	L47
		MG	L48
		G x 1000	L49
		CF x 1000	L50
		AI	L51
		kl	L52
		BBL42 (US oil barrel, 1 barrel = 42 US gallons)	L54
Special calibration		Pulse set up	
5-point calibration for DN 15 ... DN 200 ²⁾	D01	(default pulse A = forward and pulse B = Alarm, pulse width = 50 ms)	
5-point calibration for DN 250 ... DN 600 ²⁾	D02	A function = RV, reverse flow	L62
5-point calibration for DN 700 ... DN 1200 ²⁾	D03	A function = FWnet, forward net flow	L63
10-point calibration for DN 15 ... DN 200 ³⁾	D06	A function = RVnet, reverse net flow	L64
10-point calibration for DN 250 ... DN 600 ³⁾	D07	A function = Off	L65
10-point calibration for DN 700 ... DN 1200 ³⁾	D08	Volume per pulse A = x 0.0001 ⁴⁾	L70
Default (2 x 25 % and 2 x 90 %) match-pair calibration for DN 15 ... DN 200	D11	Volume per pulse A = x 0.001 ⁴⁾	L71
Default (2 x 25 % and 2 x 90 %) match-pair calibration for DN 250 ... DN 600	D12	Volume per pulse A = x 0.01 ⁴⁾	L72
Default (2 x 25 % and 2 x 90 %) match-pair calibration for DN 700 ... DN 1200	D13	Volume per pulse A = x 0.1 ⁴⁾	L73
5-point, matched-pair calibration for DN 15 ... DN 200 ²⁾	D15	Volume per pulse A = x 1 ⁴⁾	L74
5-point, matched-pair calibration for DN 250 ... DN 600 ²⁾	D16	B function = FW, forward flow	L80
5-point, matched-pair calibration for DN 700 ... DN 1200 ²⁾	D17	B function = RV, reverse flow	L81
10-point, matched-pair calibration for DN 15 ... DN 200 ³⁾	D18	B function = FWnet, forward net flow	L82
10-point, matched-pair calibration for DN 250 ... DN 600 ³⁾	D19	B function = RVnet, reverse net flow	L83
10-point, matched-pair calibration for DN 700 ... DN 1200 ³⁾	D20	B function = Alarm	L84
		B function = Call up	L85
Flow unit		Volume per pulse B = x 0.0001 ⁴⁾	L90
l/s	L00	Volume per pulse B = x 0.001 ⁴⁾	L91
MGD	L01	Volume per pulse B = x 0.01 ⁴⁾	L92
CFS	L02	Volume per pulse B = x 0.1 ⁴⁾	L93
l/min	L03	Volume per pulse B = x 1 ⁴⁾	L94
m ³ /min	L04		
GPM	L05	Data logger set up (default month logging)	
CFM	L06	DataloggerInterval = Daily	M31
l/h	L07	DataloggerInterval = Weekly	M32
m ³ /h	L08		
GPH	L09	Factory mounted cables	
CFH	L10	5 m (16.4 ft) pulse cable A+B	M81
GPS	L11	5 m (16.4 ft) communication cable RS 232/RS 485 terminated as end device	M82
MI/d	L12	20 m (65.6 ft) pulse cable A+B	M84
m ³ /d	L13	20 m (65.6 ft) communication cable RS 232/RS 485 terminated as end device	M85
GPD	L14	Cello 2 channel, input cable 3 m (9.84 ft) with Brad Harrison micro-change 3 way connector	M87
BBL42/s	L15	Cello 2 channel, input cable 5 m (16.4 ft) with MIL-C-26482 spec. connectors	M89
BBL42/min	L16	Encoder interface cable with connector for ITRON 200WP radio, length 25 ft	M90
BBL42/h	L17	Encoder interface cable with connector for ITRON 200WP radio, length 5 ft	M91
BBL42/d	L18	SOFREL data logger cable 2 m with connector for SOFREL GSM module	M92
Totalizer		FM Fire Service Approval	
Volume calculation (default totalizer 1= forward and totalizer 2 = reverse)		(with ANSI B16.5 Class 150 flanges)	
Totalizer 1 = RV, reverse flow	L20	DN 50, DN 80 and DN 100 (2", 3" and 4")	P20
Totalizer 1 = NET, net flow	L22	DN 150 and DN 200 (6" and 8")	P21
Totalizer 2 = FW, forward flow	L30	DN 250 and DN 300 (10" and 12")	P22
Totalizer 2 = NET, net flow	L31		
Volume unit			
m ³	L40		
MI	L41		
G	L42		
AF	L43		
l x 100	L44		
m ³ x 100	L45		

1) Under preparation

2) 20 %, 40 %, 60 %, 80 %, 100 % of factory Q_{max}3) Ascending and descending at 20 %, 40 %, 60 %, 80 %, 100 % of factory Q_{max}

4) Pulse width = 10 ms