

Flow Measurement

SITRANS FM (electromagnetic)

Flow sensors

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

Overview



3

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 3G/UMTS module offers an efficient solution for remote measurement and monitor via wireless networks.

Great Oriental Corporation Co., Ltd.
www.gotautomations.com

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

Technical specifications

Meter	
Accuracy	Standard calibration: ± 0.4% ± 2 mm/s Extended calibration DN 50 ... DN 300 (2" ... 12"): ± 0.2 % of rate ± 2 mm/s
Low flow cut-off (default)	15 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	
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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • PED: 2014/68/EU⁴⁾ • EMC: IEC/EN 61326
Sensor version	DN 25 ... 1200 (1" ... 48")
Sensor material	Carbon steel ASTM A 105, with corrosion resistant coating of category C4 or C5 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

Meter	
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) DN 350 ... DN 600 (14" ... 24"); PN25 or PN40 (362 psi or 580 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 PED standard and requirements see Pressure Equipment Directive in Appendix (chapter 10).

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Selection and ordering data

Article No.

SITRANS F M MAG 8000 water meter

7ME6810-

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Diameter

DN 25 (1")
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 350 (14")
DN 400 (16")
DN 450 (18")
DN 500 (20")
DN 600 (24")
DN 700 (28")¹⁾
DN 750 (30")¹⁾
DN 800 (32")¹⁾
DN 900 (36")¹⁾
DN 1000 (40")¹⁾
DN 1050 (42")¹⁾
DN 1100 (44")¹⁾
DN 1200 (48")¹⁾

2 D
2 R
2 Y
3 F
3 M
3 T
4 B
4 H
4 P
4 V
5 D
5 K
5 R
5 Y
6 F
6 P
6 Y
7 D
7 H
7 M
7 R
7 U
7 V
8 B

Flange norm and pressure rating

EN 1092-1

PN 10 (DN 200 ... 1200 (8" ... 48"))
PN 16 (DN 50 ... 1200 (2" ... 48"))
PN 16, non-PED (DN 700 ... 1200 (28" ... 48"))
PN 25 (DN 350 ... 600 (12" ... 24"))
PN 40 (DN 25 ... 50 (1" ... 1½"), DN 350 ... 600 (12" ... 24"))

B
C
D
E
F

ANSI B16.5

Class 150
AWWA C-207
Class D (28" ... 48")

J
L

AS 4087

PN 16 (DN 50 ... 1200 (2" ... 48"))

N

Sensor version

EPDM liner and Hastelloy electrodes, corrosion-resistant coating of category C4
EPDM liner and Hastelloy electrodes, 300 µm corrosion-resistant coating of category C5

3
4

Calibration

Standard ± 0.4 % of rate ± 2 mm/s
Extended ± 0.2 % of rate ± 2 mm/s DN 50 ... 300 (2" ... 12")
NMI M 10 (2.5%) without verification

1
2
3

Article No.

SITRANS F M MAG 8000 water meter

7ME6810-

Region version

Europe (m3, m3/h, 50 Hz)
USA (Gallon, GPM, 60 Hz)
Australia (MI, MI/d, 50 Hz)

1
2
3

Transmitter type and installation

Basic version integral or sensor
Basic 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)
Advanced version integral on sensor
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)

A
B
C
D
E
K
L
M
N
P

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
3G/UMTS communication module with remote antenna; 5 m (16.4 ft) cable
3G/UMTS communication module with analog inputs and remote antenna; 5 m (16.4 ft) cable

A
B
C
D
S
T

Power supply

Internal battery (no battery included)
Internal battery pack installed¹⁾
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)

0
1
2
3
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.

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

Selection and ordering data	Order code	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		Volume unit
Inspection certificate 3.1 (EN 10204) - pressure test	C01	m ³
Material certificate according to EN 10204-3.1 ¹⁾	C12	MI
Special calibration		G
5-point calibration for DN 15 ... DN 200 ²⁾	D01	AF
5-point calibration for DN 250 ... DN 600 ²⁾	D02	I x 100
5-point calibration for DN 700 ... DN 1200 ²⁾	D03	m ³ x 100
10-point calibration for DN 15 ... DN 200 ³⁾	D06	G x 100
10-point calibration for DN 250 ... DN 600 ³⁾	D07	CF x 100
10-point calibration for DN 700 ... DN 1200 ³⁾	D08	MG
Default (2 x 25 % and 2 x 90 %) match-pair calibration for DN 15 ... DN 200	D11	G x 1000
Default (2 x 25 % and 2 x 90 %) match-pair calibration for DN 250 ... DN 600	D12	CF x 1000
Default (2 x 25 % and 2 x 90 %) match-pair calibration for DN 700 ... DN 1200	D13	AI
5-point, matched-pair calibration for DN 15 ... DN 200 ²⁾	D15	kl
5-point, matched-pair calibration for DN 250 ... DN 600 ²⁾	D16	BBL42 (US oil barrel, 1 barrel = 42 US gallons)
5-point, matched-pair calibration for DN 700 ... DN 1200 ²⁾	D17	Volume unit = AF, amount per pulse A = 1 US Gallon ⁵⁾
10-point, matched-pair calibration for DN 15 ... DN 200 ³⁾	D18	Volume unit = AI, amount per pulse A = 1 US Gallon ⁵⁾
10-point, matched-pair calibration for DN 250 ... DN 600 ³⁾	D19	Volume unit = CFx100, amount per pulse A = 1 US Gallon ⁵⁾
10-point, matched-pair calibration for DN 700 ... DN 1200 ³⁾	D20	Volume unit = BBL42, amount per pulse A = 1 US Gallon ⁵⁾
Flow unit		Pulse set up
l/s	L00	(default pulse A = forward and pulse B = Alarm, pulse width = 50 ms)
MGD	L01	A function = RV, reverse flow
CFS	L02	A function = FWnet, forward net flow
l/min	L03	A function = RVnet, reverse net flow
m ³ /min	L04	A function = Off
GPM	L05	Volume per pulse A = x 0.0001 ⁴⁾
CFM	L06	Volume per pulse A = x 0.001 ⁴⁾
l/h	L07	Volume per pulse A = x 0.01 ⁴⁾
m ³ /h	L08	Volume per pulse A = x 0.1 ⁴⁾
GPH	L09	Volume per pulse A = x 1 ⁴⁾
CFH	L10	Pulse A pulse width 5 ms (volume per pulse x 1)
GPS	L11	Pulse A pulse width 10 ms (volume per pulse x 1)
MI/d	L12	Pulse A pulse width 50 ms (volume per pulse x 1)
m ³ /d	L13	Pulse A pulse width 100 ms (volume per pulse x 1)
GPD	L14	Pulse A pulse width 500 ms (volume per pulse x 1)
BBL42/s	L15	B function = FW, forward flow
BBL42/min	L16	B function = RV, reverse flow
BBL42/h	L17	B function = FWnet, forward net flow
BBL42/d	L18	B function = RVnet, reverse net flow
Totalizer		B function = Alarm
Volume calculation (default totalizer 1= forward and totalizer 2 = reverse)		B function = Call up
Totalizer 1 = RV, reverse flow	L20	Volume per pulse B = x 0.0001 ⁴⁾
Totalizer 1 = NET, net flow	L22	Volume per pulse B = x 0.001 ⁴⁾
Totalizer 2 = FW, forward flow	L30	Volume per pulse B = x 0.01 ⁴⁾
Totalizer 2 = NET, net flow	L31	Volume per pulse B = x 0.1 ⁴⁾
		Volume per pulse B = x 1 ⁴⁾

Flow Measurement

SITRANS FM (electromagnetic)

Flow sensors

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

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Selection and ordering data	Order code
Additional information	
Please add "-Z" to Article No. and specify Order code(s) and plain text.	
Device operation	
Only operator menu activated	M11
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
Encoder interface cable with connector for ITRON 200WP radio, length 25 ft	M90
Encoder interface cable with connector for ITRON 200WP radio, length 5 ft	M91
SOFREL cable 2 m for LS42 data logger	M92
Adaptors for conduit installation	M94
SOFREL cable 2 m for LS-Flow data logger	M97
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
Region/customer specific labels	
KCC label (South Korea)	W28
DIN 43863 label ¹⁾	H21
DIN 43863 label with SWM mark ¹⁾	H22
ADDC label	H23
Region specific settings	
Low flow cutoff = 5 mm/s	M20
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 ⁵⁾ Pulse width = 5 ms ⁶⁾ Siemens warrants the measurement accuracy down to a flow velocity of 15 mm/s. For a flow velocity below 15 mm/s, we don't warrant the measurement accuracy	

Operating instructions for SITRANS F M MAG 8000

Description	Article No.
• English	A5E03071515
• German	A5E00740986

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

Operating instructions for MAG 8000 3G/UMTS communication module

Description	Article No.
• English	A5E03644134

Overview



Benefits

Approvals

- MI-001, OIML R 49/OIML R 49 MAA
- 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

Flow Measurement

SITRANS FM (electromagnetic)

Flow sensors

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

Technical specifications

Meter	
Accuracy	OIML R 49/OIML R 49 MAA accuracy class I for DN 50, DN 350 ... DN 600 accuracy class II for DN 50 ... DN 600 MI-001 verification for DN 50 ... DN 600 (2" ... 24"), with Q3/Q1 = 315 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})
Low flow cut-off (default)	15 mm/s
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	
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)	2 × 25 % and 2 × 90 %
Material certificate EN 10204-3.1	Available when ordering together with meter ¹⁾
Drinking water approvals	<ul style="list-style-type: none"> • 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 approval	FM Fire Service (1044) ³⁾
Custody transfer approval	<ul style="list-style-type: none"> • OIML R 49 and OIML R 49 MAA approval • MI-001 approval (DK-0200-MI001-011)
Conformity	<ul style="list-style-type: none"> • CEN EN 14154, ISO 4064 • PED: 2014/68/EU⁴⁾ <p>For pressure/temperature curves see MAG 3100 on page 3/67</p> <ul style="list-style-type: none"> • EMC: IEC/EN 61326 • CRN (DN 50 ... DN 1200 (2" ... 48"))

Meter	
Sensor version	DN 50 ... 600 (2" ... 24")
Sensor material	Carbon steel ASTM A 105, with corrosion resistant coating of category C4 or C5 according to ISO 12944-2
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
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) 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 m coating.

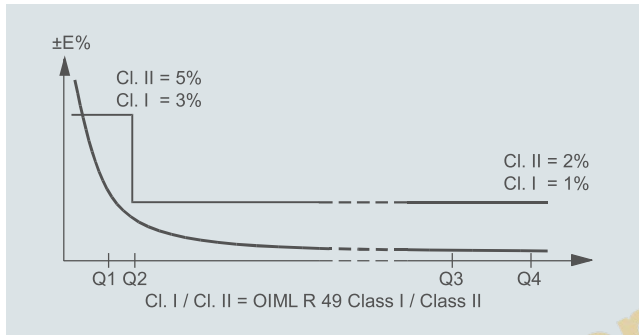
4) For further information on the PED standard and requirements see Pressure Equipment Directive in Appendix (chapter 10).

Technical specifications (continued)

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 1 (DN 50, DN 350 ... DN 600) and Class 2 (DN 50 ... DN 600), at different Q3 and Q3/Q1, according to OIML R 49:2013 specification.



OIML R 49:2013 specification for Class 1¹⁾

7ME6820	DN 50 (2")	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
R (Q3/Q1)	200	125	125	125	125	125
Q4 [m ³ /h]	78.75	3125	5000	5000	7875	7875
Q3 [m³/h]	63	2500	4000	4000	6300	6300
Q2 [m ³ /h]	0.5	32	51.2	51.2	80.64	80.64
Q1 [m ³ /h]	0.32	20	32	32	50.4	50.4

OIML R 49:2013 specification for Class 2¹⁾

7ME6820	Horizontal installation													
	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")	DN 450 (18")	DN 500 (20")	DN 600 (24")
R (Q3/Q1)	315	315	315	315	315	315	315	315	315	200	200	200	200	200
Q4 [m ³ /h]	78.75	125	200	312.5	500	787.5	1250	2000	2000	3125	5000	5000	7875	7875
Q3 [m³/h]	63	100	160	250	400	630	1000	1600	1600	2500	4000	4000	6300	6300
Q2 [m ³ /h]	0.32	0.51	0.81	1.27	2.03	3.2	5.08	8.13	8.13	20	32	32	50.4	50.4
Q1 [m ³ /h]	0.2	0.32	0.51	0.79	1.27	2	3.18	5.08	5.08	12.5	20	20	31.5	31.5

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

Flow Measurement

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Flow sensors

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

Technical specifications (continued)

MAG 8000 CT (Revenue program) MI-001

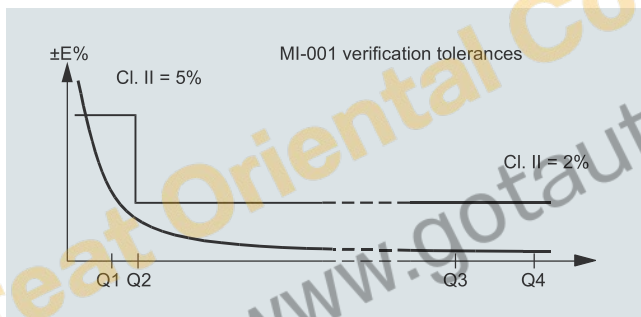
MAG 8000 CT program is type approved according to international water meter standard OIML R 49. Since the first November 2006 the MI-001 water meter directive is in force, which means that all water meters can be sold across the EU borders if the water meters contain a MI-001 label.

The MAG 8000 CT MI-001 verified and labeled products are a Class II approval according to Directive 2014/32/EU of the European Parliament and Council of 26 February, 2014 on measuring instruments, Annex III Water meters (MI-001) in the sizes from DN 50 to DN 600.

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:

Horizontal installation														
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")	DN 450 (18")	DN 500 (20")	DN 600 (24")
R (Q3/Q1)	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Q4 [m³/h]	20	31.25	50	78.75	125	200	312.5	500	787.5	787.5	1250	2000	3125	5000
Q3 [m³/h]	16	25	40	63	100	160	250	400	630	630	1000	1600	2500	4000
Q2 [m³/h]	0.64	1	1.6	2.52	4	6.4	10	16	25.2	25.2	40	64	100	160
Q1 [m³/h]	0.4	0.63	1	1.58	2.5	4	6.25	10	15.75	15.75	25	40	62.5	100

Horizontal installation														
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")	DN 450 (18")	DN 500 (20")	DN 600 (24")
R (Q3/Q1)	63	63	63	63	63	63	63	63	63	63	63	63	63	63
Q4 [m³/h]	20	31.25	50	79	125	200	312.5	500	788	1250	2000	3125	5000	7875
Q3 [m³/h]	16	25	40	63	100	160	250	400	630	1000	1600	2500	4000	6300
Q2 [m³/h]	0.41	0.64	1.02	1.6	2.54	4.06	6.35	10.16	16	25.4	40.63	63.49	101.59	160
Q1 [m³/h]	0.25	0.4	0.64	1	1.59	2.54	3.97	6.35	10	15.88	25.4	39.68	63.49	100

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

Technical specifications (continued)

Horizontal installation														
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")	DN 450 (18")	DN 500 (20")	DN 600 (24")
R (Q3/Q1)	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Q4 [m³/h]	31.25	50	79	125	200	312.5	500	788	1250	2000	3125	3125	5000	7875
Q3 [m³/h]	25	40	63	100	160	250	400	630	1000	1600	2500	2500	4000	6300
Q2 [m³/h]	0.5	0.8	1.26	2	3.2	5	8	12.6	20	32	50	50	80	126
Q1 [m³/h]	0.31	0.5	0.79	1.25	2	3.13	5	7.88	12.5	20	31.25	31.25	50	78.75

Horizontal installation														
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")	DN 450 (18")	DN 500 (20")	DN 600 (24")
R (Q3/Q1)	160	160	160	160	160	160	160	160	160	160	160	160	160	160
Q4 [m³/h]	50	79	125	200	312.5	500	788	1250	2000	3125	5000	5000	7875	7875
Q3 [m³/h]	40	63	100	160	250	400	630	1000	1600	2500	4000	4000	6300	6300
Q2 [m³/h]	0.4	0.63	1	1.6	2.5	4	6.3	10	16	25	40	40	63	63
Q1 [m³/h]	0.25	0.39	0.63	1	1.56	2.5	3.94	6.25	10	15.63	25	25	39.38	39.38

Horizontal installation									
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")
R (Q3/Q1)	200	200	200	200	200	200	200	200	200
Q4 [m³/h]	78.75	125	200	312.5	500	787.5	1250	2000	2000
Q3 [m³/h]	63	100	160	250	400	630	1000	1600	1600
Q2 [m³/h]	0.5	0.8	1.28	2	3.2	5.04	8	12.8	12.8
Q1 [m³/h]	0.32	0.5	0.8	1.25	2	3.15	5	8	8

Horizontal installation									
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")
R (Q3/Q1)	250	250	250	250	250	250	250	250	250
Q4 [m³/h]	78.75	125	200	312.5	500	787.5	1250	2000	2000
Q3 [m³/h]	63	100	160	250	400	630	1000	1600	1600
Q2 [m³/h]	0.4	0.64	1.02	1.6	2.56	4.03	6.4	10.24	10.24
Q1 [m³/h]	0.25	0.40	0.64	1	1.6	2.52	4	6.4	6.4

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

SIEMENS			
SITRANS F M MAG 8000 CT			
Order No.:	7ME68205RJ031AA1	MAWP (PS) at 0.1°C/32°F (TS):	16bar/232psi
Serial No.:	888888H88	MAWP (PS) at 50°C/122°F (TS):	16bar/232psi
Size DN: 400 (16 inch.)	Lining: EPDM	T. media min.:	0.1°C/32°F
Sensor material:	ASTM A 105	T. media max.:	50°C/122°F
Meter orientation	Horizontal (H)	Process connection:	ANSI Class 150
Enclosure:	E2, M1 IP68/NEMA 6P	Year of Manuf.: 2020	
Cal Factor: 8.88888888	Fluid group: PED/L2	SW/HW V.:	3.11/15 Tamb.: -25°C to 55°C
Supply	Lithium battery inside	Q3: 1600 m³/h	Q3/Q1: 80
Certification No.:	DK-0200-MI001-011 U3D3	CE	M20 0200
Siemens AG, DE-76181 Karlsruhe			
Made in France			

Installation conditions

Please refer to "System information SITRANS FM electromagnetic flowmeters".

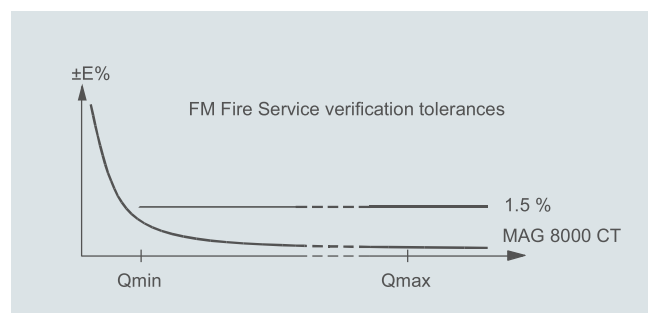
Battery operation time and calculation

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 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.



Flow Measurement

SITRANS FM (electromagnetic)

Flow sensors

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

Selection and ordering data

SITRANS FM

MAG 8000 CT water meter with EPDM liner and Hastelloy electrodes

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Diameter

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")
 DN 450 (18")
 DN 500 (20")
 DN 600 (24")

Article No.

7ME6820-

2 Y
 3 F
 3 M
 3 T
 4 B
 4 H
 4 P
 4 V
 5 D
 5 K
 5 R
 5 Y
 6 F
 6 P

Flange norm and pressure rating

EN 1092-1
 PN 10
 PN 16
 ANSI B16.5
 Class 150
 AS4087
 PN 16

B
 C
 J
 N

Sensor version

EPDM liner and Hastelloy electrodes, corrosion-resistant coating of category C4
 EPDM liner and Hastelloy electrodes, 300 µm corrosion-resistant coating of category C5

0
 4

Approval/Verification²⁾

Without verification according to OIML R 49³⁾
 MI-001 Q3/Q1 = 40
 MI-001 Q3/Q1 = 63
 MI-001 Q3/Q1 = 80
 MI-001 Q3/Q1 = 160
 MI-001 Q3/Q1 = 200
 MI-001 Q3/Q1 = 250
 Without verification calibrated to OIML R 49-Class II (Q3/Q1 = 100)
 Without verification calibrated to OIML R 49-Class II (Q3/Q1 = 250)

0
 1
 2
 3
 4
 5
 6
 7
 8

Region version

Europe (m³, m³/h, 50 Hz)
 USA (m³, m³/h, 60 Hz)

1
 2

Article No.

7ME6820-

A
 B
 C
 D
 E
 K
 L
 M
 N
 P

SITRANS FM

MAG 8000 CT water meter with EPDM liner and Hastelloy electrodes

Transmitter type and installation

Basic version integral on sensor
 Basic 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)
 Advanced version integral on sensor
 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 for ITRON 200WP radio with "Sensus" protocol"
 3G/UMTS communication module with remote antenna; 5 m (16.4 ft) cable
 3G/UMTS communication module with analog inputs and remote antenna; 5 m (16.4 ft) cable

A
 B
 C
 D
 S
 T

Power supply

Internal battery (no battery included)
 Internal battery pack installed¹⁾
 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)

0
 1
 2
 3
 4

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.

²⁾ For more details and references of the ranges please see the tables on the previous pages.

³⁾ Standard calibration or according to FM Fire Service requirements if P20, P21 or P22 is selected as Z option.

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

Selection and ordering data

Order code

Additional information

Please add "-Z" to Article No. and specify Order code(s) and plain text.

Inspection certificate 3.1 (EN 10204) - pressure test

C01

Material certificate according to EN 10204-3.1¹⁾

C12

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, pulse width = 50 ms)

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 = $x \cdot 0.001^{2)}$

L71

Volume per pulse A = $x \cdot 0.01^{2)}$

L72

Volume per pulse A = $x \cdot 0.1^{2)}$

L73

Volume per pulse A = $x \cdot 1^{2)}$

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 = $x \cdot 0.001^{2)}$

L91

Volume per pulse B = $x \cdot 0.01^{2)}$

L92

Volume per pulse B = $x \cdot 0.1^{2)}$

L93

Volume per pulse B = $x \cdot 1^{2)}$

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 cable 2 m for LS42 data logger

M92

SOFREL cable 2 m for LS-Flow data logger

M97

Additional information

Please add "-Z" to Article No. and specify Order code(s) and plain text.

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

Region/customer specific label

KCC label (South Korea)

W28

FP2E label (France)

H20

DIN 43863 label¹⁾

H21

DIN 43863 label with SWM mark¹⁾

H22

ADDC label

H23

¹⁾ Under preparation

²⁾ Pulse width = 10 ms

Operating instructions for SITRANS F M MAG 8000

Description

Article No.

• English

A5E03071515

• German

A5E00740986

All literature is available to download for free, in a range of languages, at

<http://www.siemens.com/processinstrumentation/documentation>

Operating instructions for MAG 8000 3G/UMTS communication module

Description

Article No.

• English

A5E03644134

Flow Measurement

SITRANS FM (electromagnetic)

Flow sensors

MAG 8000 3G/UMTS Wireless Communication Module

Overview



3G/UMTS communication module



PC-IrDA connection

MAG 8000 3G/UMTS Wireless Communication Module

The 3G/UMTS wireless communication module is a compact built-in solution which can be installed in the existing MAG 8000 with SW version 3.02 and higher, supporting HSDPA cat. 8/HSUPA Cat.6 at 5 UMTS bands, with the ability to fall back to GSM/GPRS network in case there is no 3G signal.

The 3G/UMTS module collects comprehensive measurement data from MAG 8000 at an interval down to 1 minute, allows for data transmission via numerous protocols including SMS, email via SMTP, email via SMTPS (TLS/SSL-based encryption), FTP, and FTPS (TLS/SSL-based encryption, implicit), with a customer configurable transmission interval (down to 1 hour). This provides customers with the flexibility to receive data via email, FTP or text message for the monitoring and control systems anywhere in the world.

TLS/SSL based data encryption provides a high level information security to protect customers data privacy.

The 3G/UMTS module offers

- Remote Qualification Certificate feature to enable the offsite diagnostic and audit on devices installed anywhere in the world
- 2-channel analog input measurement for external ratiometric pressure transmitter, transmission together with flow measurement (2-in-1 solution)
- 4-20 mA alarm signal detection and realtime SMS alarm for tamper protection and flooding situations
- Real-time clock synchronization with internet NTP server, ensuring that all measurement data is accurately time-stamped
- Data transmission at customer-specified points in time, allowing for synchronization of information from multiple MAG 8000 devices

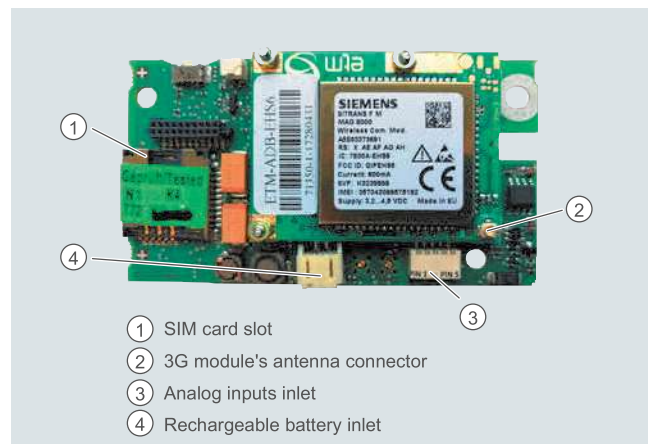
The OPC server specifically designed for the MAG 8000 3G/UMTS module is offered free of charge. With this value-added package, the opportunity for measurement data collection and further processing/analyzing for system integration and automation is offered.

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)

Circuit diagrams

Electrical installation of 3G/UMTS module



Selection and ordering data

Accessories

Description	Article No.		Description	Article No.	
PC Flow Tool on CD (Download for free from www.usa.siemens.com/flow)	FDK:087L6001		One cable entry 2 ... 5 mm (0.08 ... 0.20 ") M12 brass glands with M20 reduction ²⁾ . Package of 10 pcs, for 3G/UMTS module antenna cable, power cable of external battery pack, encoder card cable.	FDK:087L4154	
IrDA infrared interface adapter with USB for data acquisition with 1.2 m (3.9 ft) cable	FDK:087L4163		One cable entry 6 ... 8 mm (0.24 ... 0.31 ") M20 brass glands pack- age ²⁾ (10 pcs), for pulse output cable or MODBUS cable, Cello cable or mains power supply	FDK:087L4155	
Battery backup for mains power supply, 1 pc. D-cell (3.6 V, 16.5 Ah) ¹⁾	A5E03354392		One cable entry 8 ... 11 mm (0.31 ... 0.43 ") M20 brass glands package ²⁾ (10 pcs), for SOFREL cable	FDK:087L4156	
Rechargeable Lithium battery for MAG 8000 3G/UMTS communi- cation module ¹⁾	A5E03436686		One cable entry 11 ... 15 mm (0.43 ... 0.59 ") M20 brass glands package ²⁾ (10 pcs)	FDK:087L4157	
Internal battery pack, one set of 2 D-cell (3.6 V, 33 Ah) and accesso- ries for replacement ¹⁾ incl. NBR O-ring	FDK:087L4150		Two cable entries 3.5 ... 5 mm (0.14 ... 0.20 ") M20 brass glands package ²⁾ (10 pcs)	FDK:087L4158	
External battery pack IP68/ NEMA 6P with connector, 4 D-cell (3.6 V, 66 Ah) ¹⁾ . Order cable FDK:087L4152 separately.	FDK:087L4151		Two cable entries 5.5 ... 7.5 mm (0.22 ... 0.30 ") M20 brass glands package ²⁾ (10 pcs)	FDK:087L4159	
Mains power supply 12 ... 24 V AC/DC (average power consumption during line ≤ 0.1 VA) with battery backup and 3 m (9.8 ft) power cable for exter- nal connection (backup battery not included) Temperature range: Fixed laying: -40 ... +90 °C (-40 ... +194 °F) Flexible application: -30 ... +80 °C (-22 ... +176 °F)	FDK:087L4210		High gain antenna for MAG 8000 3G/UMTS (PVC, IP68, cable length 5 m (16.4 ft), with SMA male connector (type RG 58) and internal antenna adaptor cable, and single entry cable gland)	A5E40957990	
Mains power supply 115 ... 230 V AC, 50/60 Hz, with battery backup up and 3 m (9.8 ft) power cable for external connection (backup battery not included)	FDK:087L4211		Analog input cable for MAG 8000 3G/UMTS (2.5 m (8.2 ft) cable with M12 connector (IP67) A-Coding female 5 pins, and two-entry cable gland)	A5E03436698	
RS 232 add-on module, point to point communication interface with Modbus RTU protocol	FDK:087L4212		Potting kit for terminal box of flow sensors for IP68/NEMA 6P	FDK:085U0220	
RS 485 add-on module, multidrop communication interface with Modbus RTU protocol	FDK:087L4213		MAG 8000 Hardware key to access protected parameters	FDK:087L4165	
Encoder interface module, with "Sensus" protocol for ITRON 200WP and 100W radio	A5E02475650		MAG 8000 demo - training unit pack operating on Alkaline batter- ies. Transmitter with Flow tool CD, IrDA interface adapter and hard- ware key (No dangerous goods limitations)	FDK:087L4080	
MAG 8000 3G/UMTS module. Rechargeable battery, antenna and analog cable input must be ordered separately	A5E41011589		Antenna adaptor cable for 3G/UMTS module (2 pieces)	A5E41896494	