

## 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.

### Technical specifications

Meter	
<b>Accuracy</b>	Standard calibration: ± 0.4% ± 2 mm/s  Extended calibration DN 50 ... DN 300 (2" ... 12"): ± 0.2 % of rate ± 2 mm/s
<b>Low flow cut-off (default)</b>	15 mm/s
<b>Media conductivity</b>	Clean water > 20 µs/cm
<b>Temperature</b>	
Ambient	-20 ... +60 °C (-4 ... +140 °F)
Media	0 ... 70 °C (32 ... 158 °F)
Storage	-40 ... +70 °C (-40 ... +158 °F)
<b>Enclosure rating</b>	
Remote sensor	IP68 to EN 60529/NEMA 6P, 10 mH <sub>2</sub> O cont.
Compact version	IP68 to EN 60529/NEMA 6P, 3 mH <sub>2</sub> O for six months
<b>Certificates and approvals</b>	
Calibration	
• Standard calibration	2 x 25 % and 2 x 90 % (default)
• Special calibration	5-point calibration: 20 %, 40 %, 60 %, 80 %, 100 % of factory Q <sub>max</sub>  10-point calibration: ascending and descending at 20 %, 40 %, 60 %, 80 %, 100 % of factory Q <sub>max</sub>  Matched-pair calibration: default, 5-point, 10-point
Material certificate EN 10204-3.1	Available when ordering together with meter <sup>1)</sup>
Drinking water approvals	<ul style="list-style-type: none"> <li>• NSF/ANSI Standard 61<sup>2)</sup> (cold water) USA</li> <li>• WRAS (BS 6920 cold water) UK</li> <li>• ACS Listed France</li> <li>• DVGW W270 Germany</li> <li>• Belgaqua (B)</li> <li>• MCERTS (GB)</li> </ul>
Fire Service Approvals	FM Fire Service Meter (Class Number 1044) <sup>3)</sup>
Conformity	<ul style="list-style-type: none"> <li>• PED: 2014/68/EU<sup>4)</sup></li> <li>• EMC: IEC/EN 61326</li> </ul>
<b>Sensor version</b>	DN 25 ... 1200 (1" ... 48")
<b>Sensor material</b>	Carbon steel ASTM A 105, with corrosion resistant coating of category C4 or C5 according to ISO 12944-2
<b>Measuring principle</b>	Electromagnetic induction
<b>Excitation frequency</b>	
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	
<b>Advanced version</b>	
• 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
<b>Flanges</b>	
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)
<b>Liner</b>	EPDM
<b>Electrode and grounding electrodes</b>	Hastelloy C276/2.4819
<b>Grounding straps</b>	Grounding straps are premounted from the factory on each side of the sensor.

<sup>1)</sup> Has to be ordered with the meter. It is not possible to order the certificate afterwards.

<sup>2)</sup> Including Annex G

<sup>3)</sup> Not for sensors with 300 µm coating.

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

## Flow Measurement

SITRANS FM (electromagnetic)  
Flow sensors

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

3

#### Selection and ordering data

SITRANS F M MAG 8000 water meter

Article No.

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")<sup>1)</sup>  
DN 750 (30")<sup>1)</sup>  
DN 800 (32")<sup>1)</sup>  
DN 900 (36")<sup>1)</sup>  
DN 1000 (40")<sup>1)</sup>  
DN 1050 (42")<sup>1)</sup>  
DN 1100 (44")<sup>1)</sup>  
DN 1200 (48")<sup>1)</sup>

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  
J  
L  
N

##### ANSI B16.5

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

##### AS 4087

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

#### 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 (ML, ML/d, 50 Hz)

1  
2  
3

#### Transmitter type and installation

Basic version integral or sensor

A

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)

B  
C  
D  
E  
K

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)

L  
M  
N  
P

#### 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 with Sensus protocol

D

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

S

3G/UMTS 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<sup>1)</sup>

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

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

<sup>2)</sup> 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	
<b>Additional information</b>		<b>Additional information</b>	
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.	
<b>Certificate</b>		<b>Volume unit</b>	
Inspection certificate 3.1 (EN 10204) - pressure test	<b>C01</b>	m <sup>3</sup>	<b>L40</b>
Material certificate according to EN 10204-3.1 <sup>1)</sup>	<b>C12</b>	MI	<b>L41</b>
<b>Special calibration</b>		G	<b>L42</b>
5-point calibration for DN 15 ... DN 200 <sup>2)</sup>	<b>D01</b>	AF	<b>L43</b>
5-point calibration for DN 250 ... DN 600 <sup>2)</sup>	<b>D02</b>	l x 100	<b>L44</b>
5-point calibration for DN 700 ... DN 1200 <sup>2)</sup>	<b>D03</b>	m <sup>3</sup> x 100	<b>L45</b>
10-point calibration for DN 15 ... DN 200 <sup>3)</sup>	<b>D06</b>	G x 100	<b>L46</b>
10-point calibration for DN 250 ... DN 600 <sup>3)</sup>	<b>D07</b>	CF x 100	<b>L47</b>
10-point calibration for DN 700 ... DN 1200 <sup>3)</sup>	<b>D08</b>	MG	<b>L48</b>
Default (2 x 25 % and 2 x 90 %) match-pair calibration for DN 15 ... DN 200	<b>D11</b>	G x 1000	<b>L49</b>
Default (2 x 25 % and 2 x 90 %) match-pair calibration for DN 250 ... DN 600	<b>D12</b>	CF x 1000	<b>L50</b>
Default (2 x 25 % and 2 x 90 %) match-pair calibration for DN 700 ... DN 1200	<b>D13</b>	AI	<b>L51</b>
5-point, matched-pair calibration for DN 15 ... DN 200 <sup>2)</sup>	<b>D15</b>	kl	<b>L52</b>
5-point, matched-pair calibration for DN 250 ... DN 600 <sup>2)</sup>	<b>D16</b>	BBL42 (US oil barrel, 1 barrel = 42 US gallons)	<b>L54</b>
5-point, matched-pair calibration for DN 700 ... DN 1200 <sup>2)</sup>	<b>D17</b>	Volume unit = AF, amount per pulse A = 1 US Gallon <sup>5)</sup>	<b>L55</b>
10-point, matched-pair calibration for DN 15 ... DN 200 <sup>3)</sup>	<b>D18</b>	Volume unit = AI, amount per pulse A = 1 US Gallon <sup>5)</sup>	<b>L56</b>
10-point, matched-pair calibration for DN 250 ... DN 600 <sup>3)</sup>	<b>D19</b>	Volume unit = CFx100, amount per pulse A = 1 US Gallon <sup>5)</sup>	<b>L57</b>
10-point, matched-pair calibration for DN 700 ... DN 1200 <sup>3)</sup>	<b>D20</b>	Volume unit = BBL42, amount per pulse A = 1 US Gallon <sup>5)</sup>	<b>L58</b>
<b>Flow unit</b>		<b>Pulse set up</b>	
l/s	<b>L00</b>	(default pulse A = forward and pulse B = Alarm, pulse width = 50 ms)	
MGD	<b>L01</b>	A function = RV, reverse flow	<b>L62</b>
CFS	<b>L02</b>	A function = FWnet, forward net flow	<b>L63</b>
l/min	<b>L03</b>	A function = RVnet, reverse net flow	<b>L64</b>
m <sup>3</sup> /min	<b>L04</b>	A function = Off	<b>L65</b>
GPM	<b>L05</b>	Volume per pulse A = x 0.0001 <sup>4)</sup>	<b>L70</b>
CFM	<b>L06</b>	Volume per pulse A = x 0.001 <sup>4)</sup>	<b>L71</b>
l/h	<b>L07</b>	Volume per pulse A = x 0.01 <sup>4)</sup>	<b>L72</b>
m <sup>3</sup> /h	<b>L08</b>	Volume per pulse A = x 0.1 <sup>4)</sup>	<b>L73</b>
GPH	<b>L09</b>	Volume per pulse A = x 1 <sup>4)</sup>	<b>L74</b>
CFH	<b>L10</b>	Pulse A pulse width 5 ms (volume per pulse x 1)	<b>L75</b>
GPS	<b>L11</b>	Pulse A pulse width 10 ms (volume per pulse x 1)	<b>L76</b>
MI/d	<b>L12</b>	Pulse A pulse width 50 ms (volume per pulse x 1)	<b>L77</b>
m <sup>3</sup> /d	<b>L13</b>	Pulse A pulse width 100 ms (volume per pulse x 1)	<b>L78</b>
GPD	<b>L14</b>	Pulse A pulse width 500 ms (volume per pulse x 1)	<b>L79</b>
BBL42/s	<b>L15</b>	B function = FW, forward flow	<b>L80</b>
BBL42/min	<b>L16</b>	B function = RV, reverse flow	<b>L81</b>
BBL42/h	<b>L17</b>	B function = FWnet, forward net flow	<b>L82</b>
BBL42/d	<b>L18</b>	B function = RVnet, reverse net flow	<b>L83</b>
<b>Totalizer</b>		B function = Alarm	<b>L84</b>
Volume calculation (default totalizer 1= forward and totalizer 2 = reverse)		B function = Call up	<b>L85</b>
Totalizer 1 = RV, reverse flow	<b>L20</b>	Volume per pulse B = x 0.0001 <sup>4)</sup>	<b>L90</b>
Totalizer 1 = NET, net flow	<b>L22</b>	Volume per pulse B = x 0.001 <sup>4)</sup>	<b>L91</b>
Totalizer 2 = FW, forward flow	<b>L30</b>	Volume per pulse B = x 0.01 <sup>4)</sup>	<b>L92</b>
Totalizer 2 = NET, net flow	<b>L31</b>	Volume per pulse B = x 0.1 <sup>4)</sup>	<b>L93</b>
		Volume per pulse B = x 1 <sup>4)</sup>	<b>L94</b>

## Flow Measurement

### SITRANS FM (electromagnetic) Flow sensors

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

3

Selection and ordering data	Order code
<b>Additional information</b>	
Please add "-Z" to Article No. and specify Order code(s) and plain text.	
<b>Device operation</b>	
Only operator menu activated	M11
<b>Data logger set up (default month logging)</b>	
DataloggerInterval = Daily	M31
DataloggerInterval = Weekly	M32
<b>Factory mounted cables</b>	
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
<b>FM Fire Service Approval</b>	
(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
<b>Region/customer specific labels</b>	
KCC label (South Korea)	W28
DIN 43863 label <sup>1)</sup>	H21
DIN 43863 label with SWM mark <sup>1)</sup>	H22
ADDC label	H23
<b>Region specific settings</b>	
Low flow cutoff = 5 mm/s	M20

<sup>1)</sup> Under preparation

<sup>2)</sup> 20 %, 40 %, 60 %, 80 %, 100 % of factory  $Q_{max}$

<sup>3)</sup> Ascending and descending at 20 %, 40 %, 60 %, 80 %, 100 % of factory  $Q_{max}$

<sup>4)</sup> Pulse width = 10 ms

<sup>5)</sup> Pulse width = 5 ms

<sup>6)</sup> 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