

EC-Type Examination Certificate Measuring Instrument Directive

Certificate number: DK-0200-MI001-002

Issued by FORCE Certification A/S, Denmark
EC-notified body number 0200

In accordance with The Danish Safety Technology Authority's statutory order no. 339 of 29 March 2010 on changes to statutory order no. 436 of 16 May 2006 which implements the Directive 2004/22/EC of the European Parliament and Council of March 31, 2004 on measuring instruments (MID).

Issued to: **Siemens Flow Instruments A/S
Nordborgvej
DK-6430 Nordborg**

Reference No.: 80.976-194 /10

Type of instrument: Coldwater meter, electro magnetic flowmeter

Type designation: MAG5100W DN50-300 with MAG8000CT

Valid until: Marts 30, 2017

Number of pages: 6, including appendix

Date of issue: November 10, 2010

Revision no.: 2
This certificate is an extension of earlier revisions, which are still valid

Approved by


Hans Falster
Director

Processed by


Birger Lind-Nielsen
Certification Manager

The conformity markings may only be affixed to the above type approved equipment. The manufacturer's Declaration of Conformity may only be issued and the notified body identification number may only be affixed on the instrument when the production/product assessment module (D or F) of the Directive is fully complied with and controlled by a written inspection agreement with a notified body.
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Appendix to

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Applied standards and documents:
OIML R49: 2006

Revision no. 1 - 80.976-087/09, changes in pressure and flow ranges.
Revision no. 2 - 80.976.194/10, changes to the value of the ratio Q_3/Q_1 and in software version.

The instruments/measuring systems shall correspond with the following specifications:

Type designation

MAG5100W DN50-300 with MAG8000CT

Description

The construction consists of an electromagnetic flow sensor, MAG5100W, and a signal transmitter, MAG8000CT.

The design principle is, as for any electro magnetic flow sensor, that a constant pulsed DC electrical current through the coil circuit results in a magnetic field through the sensor bore with direction from coil to coil. When a conductive liquid passes through the magnetic field a differential DC voltage is introduced between the measuring electrodes.

MAG8000CT signal converter operates at 3.125 - 6.25Hz depending on sensors size. All sensors are charged with 20mA constant current. The sensitivity of the sensors gives a nominal signal of 20 μ V per m/s flow.

The sensor has a steel tube and steel flanges and the bore are fitted with an electrically insulating lining which is coned to optimize the velocity profile of the fluid. Between the lining and the steel tube the coil is fitted that generate the magnetic field.

Only approved for cold water.

Technical documentation

FORCE Certification A/S File no. 80.970.6-004C/06, 80.976-087/09 and 80.976.194/10.



Technical data

Instrument tested according to	: OIML R49:2006
Software version	: 3.03
Environment class	: E2, M1
Climatic class	: -25...55°C, condensing, closed.
Durability specification	: Battery 6 years, Product 10 years
Verification tolerance	$\pm 5\% Q_1 \leq Q < Q_2$ $\pm 2\% Q_2 \leq Q \leq Q_4$
Unit of measurement	: Cubic metre
Temperature	: 0.1 - 30°C
Pressure	: PN = 16 bar or PN = 10 bar or PN = 6
Power supply	: 3.6V Lithium Battery

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	250
Q1 [m³/h]	0.160	0.25	0.40	0.63	1.00	1.60	2.5	4.0	6.3
Q2 [m³/h]	0.250	0.40	0.63	1.00	1.60	2.50	4.00	6.40	10.0
Q3 [m³/h]	63	100	160	250	400	630	1000	1600	1600
Q4 [m³/h]	78.75	125	200	312.5	500	787.5	1250	2000	2000

Above mentioned table describe the maximum specification of flow range. Other dynamic ranges are allowed if "R" is 10, 12.5, 16, 20, 25, 31.5, 40, 50, 63, 80, 100, 125, 160, 200, 250.

and
 $Q1 \geq$ values in table
 and
 $Q2/Q1 = 1,6$
 and
 $Q4/Q3 = 1,25$



Verification

Errors: Maximum permissible errors according to Directive 2004/22/EC of the European Parliament and Council of March 31, 2004 on measuring instruments (MID), Annex MI-001.

Procedure: Test points and verification requirements according to OIML R49:2006.

The water temperature range shall be $20 \pm 10^{\circ}\text{C}$.

At least the following three flowrates shall be used for verification:

$$Q_1 \leq Q \leq 1.1Q_1 \text{ (5 \%)}$$

$$Q_2 \leq Q \leq 1.1Q_2 \text{ (2 \%)}$$

$$0.9Q_3 \leq Q \leq Q_3 \text{ (2 \%)}$$

Sealing

Write protection of parameters.

The system has four levels of write-protection of parameters: software, hardware, double, and full protections.

Software: As default, all registers in the database are protected by a user access code (software code). The user access code shall be given to the system before changing registers. This protection covers all application relevant parameters that do not meet the restriction described by other protections.

Hardware: HW-lock protected registers are only changeable when the physical seal is broken and the HW-key is mounted. And when the seal is broken, then the software access code will be unnecessary, that is, software and hardware protected registers are all accessible. This protection covers legal parameters and values that make influence on the measurement while installed as a custody transfer application.

Double: Some parameters identify the variety of meters. These are not hard coded and must therefore be secured in another way. The registers are protected with the HW-lock and a special access code known by SFI-production only. This protection covers parameters describing functionality used for variant creation and factory information identifying the product. It also covers internal variables that need to be saved and are not relevant to the user. Or information that must be read-only, but are updated by the device.

Full: Full protection against external access is only possible to measurement values (RAM values) and values controlled by the data administration software (checksum and change status). These registers are all read only. Full protection cannot be broken.

Internal sealing

The internal sealing is carried out as shown where the front and back shielding plate is locked using two labels:



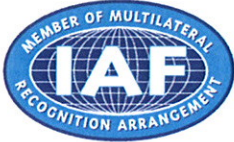
Furthermore the JTAG connector is sealed with an additional label:



External sealing

The external sealing is carried out as shown with a tread and seal via the sealing bolt.





Installation

The product requires minimum 5 x [Dia] of straight pipe upstream from the sensor and minimum 3 x [Dia] of straight pipe downstream from the sensor.

The sensor can only be installed in a horizontal condition.

The direction of flow through the sensor must be forward.

It is recommended to ensure that reverse flow does not occur in the installation.

MAG8000CT must be installed as described by the manual for a standard MAG8000.

Labeling and inscriptions

Manufacturer, type, year

Serial no.

EC-Type examination certificate number

Tmax and Pmax

Application temperature range

Power supply

Accuracy class

Software version

Unit of measurements: Cubic metre

Direction of flow

Letter H, for the position.

SIEMENS		
SITRANS F M MAG8000 CT		
7ME6820-2YC11-1AA1		
System no	7ME682 123456N123	Certification no: DK-0200-MI001-002
DN50	EN 1092-1 PN16 PED	Accuracy: Class 2 DIML R49
Meter orientation:	Horizontal (H)	Year: 2007
Environmental class:	E2, M1 IP68	Q3: m3/h
Pressure max.	PN16 Temp. max 30°C	Q2/Q1:
Amb. Temp.:	-25 to +55°C	Q3/Q1:
Software version	3.01	CE M07 0200
Supply:	Lithium battery inside	
Siemens Flow Instruments A/S		
Made in Denmark		