



Type examination certificate

No. CH-MI004-08008-02

Applicant:

ISOIL INDUSTRIA SPA
Via F.lli Gracchi 27
20092 Cinisello Balsamo (Mi)
Italy

Requirements:

Directive 2004/22/EC of the European Parliament and Council of March 31, 2004 on measuring instruments (MID) with instrument specific annex MI-004

conformity of superseded standard:
EN 1434: Edition 2007

Type of instrument:

Electromagnetic flow sensor as part of a heat meter

Type designation:

ISOMAG

Accuracy class(es):

2

Characteristics:

DN 25 ... DN 200, PN 16, T_{max} 150 °C

Certificate valid until:

22 November 2017

CH-3003 Bern-Wabern, 21 March 2012

Notified body:

Certification body METAS-Cert
No. 1259

For the test:

Dr Hugo Bissig

Guiljan Couvreur, Head of METAS-Cert



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Beilage zu Bauartprüfzertifikat

1 Name and Type of the measuring instrument

ISOMAG – family of electromagnetic flow sensor as part of a heat meter

2 Description of the Type

The family of flow sensors ISOMAG covers the nominal diameters in the range of DN25 to DN200 consisting of 10 nominal diameters.

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The flow sensors are designed for a nominal pressure of 16 bar and a maximal water temperature of 100 °C.

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The flow sensors are designed for a nominal pressure of 16 bar and a maximal water temperature of 150 °C.

3 Design

The family of flow sensors ISOMAG is designed for measuring the flow of electrically conductive mediums (water) by means of the electromagnetic flow measuring system. The conductive medium flows through a magnetic field which induces a voltage that is proportional to the mean flow speed as the magnitude of the magnetic field is kept constant and the nominal pipe diameter is a constant factor. The converter of the sensor manages the input and output signals and converts the data.

Versions:

Compact flow sensor

The converter and the flow sensor are fixed together.

Split version:

The converter and the flow sensor are connected via cable.

4 Sensor

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Type MS 2500

Process connection	Flanges: ANSI, DIN, JIS
Flanges material	Carbon steel Stainless steel AISI 304- AISI316 (op.)
Liquid temperature	0°C ÷ 60°C
Vacuum resistance	20 kPa (absolute) at 100 °C (60/80 °C for PP/Ebon)
Lining material	Polypropylene 0 °C ÷ 60 °C Ebonite 0 °C ÷ 80 °C PTFE 0 °C ÷ 100 °C



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Electrodes material	Stainless steel AISI 316 Hastelloy Platinum-Rhodium Titanium Tantalum
Version – protection rate	Compact version – IP 67 Separate version – Sensor IP 68 / Sensorelektronik IP 67

Adjustment:

- The converter corrects the sensor linearly with the k-factor.

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Type MS 2500

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Electrodes material	Stainless steel AISI 316 Hastelloy Platinum-Rhodium Titanium Tantalum
Version – protection rate	Compact version – IP 67 Separate version – Sensor IP 68 / Sensorelektronik IP 67

5 Converter of the sensor

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Type ML 110 or ML 210

- Upper part of the housing AZ.020420.A1
- Lower part of the housing AZ.020421.A1
- Software revision 3.53

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Software code is composed of three digits, where the first one affects the metric part of the hardware and software whereas the second and third digits do not affect the metric part.

- Software revision 3.xx

6 Accessory components

None



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7 Technical specifications

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DN	q _i	q _p	q _s	Orientation	Disturbance	T	Meter Class	Length
mm	m ³ /h	m ³ /h	m ³ /h			°C	q _p /q _i	mm
25	0.140	3.5	7.0	H / V	U0 / D0	0 bis 100	25	200
32	0.240	6.0	12.0	H / V	U0 / D0	0 bis 100	25	200
40	0.400	10.0	20.0	H / V	U0 / D0	0 bis 100	25	200
50	0.600	15.0	30.0	H / V	U0 / D0	0 bis 100	25	200
65	1.000	25.0	50.0	H / V	U0 / D0	0 bis 100	25	200
80	1.600	40.0	80.0	H / V	U0 / D0	0 bis 100	25	200
100	2.400	60.0	120.0	H / V	U0 / D0	0 bis 100	25	250
125	4.000	100.0	200.0	H / V	U0 / D0	0 bis 100	25	250
150	6.000	150.0	300.0	H / V	U0 / D0	0 bis 100	25	300
200	10.000	250.0	500.0	H / V	U0 / D0	0 bis 100	25	350

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DN	q _i	q _p	q _s	Orientation	Disturbance	T	Meter Class	Length
mm	m ³ /h	m ³ /h	m ³ /h			°C	q _p /q _i	mm
25	0.16	16	20.0	H / V	U0 / D0	Polypropylen 0 °C – 60 °C	100	200
32	0.25	25	31.3			Ebonite 0 °C – 80 °C		
40	0.40	40	50.0			PTFE Compact version 0 °C – 100 °C		
50	0.63	63	78.8			PTFE Split version 0 °C – 150 °C		
65	1.00	100	125.0			250		
80	1.60	160	200.0					
100	2.50	250	312.5					
125	4.00	400	500.0					
150	6.30	630	787.5					
200	10.00	1000	1250.0	350				

8 Requirements for manufacturing, putting into use and utilization

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Requirements for the manufacturing

The flow sensor shall be tested at the end of the manufacturing process according to the EN 1434-5:2007 with a water temperature of (55 ± 5) °C at the following flow rates:

$$q_i \leq q \leq 1.1 q_i$$

$$0.1 q_p \leq q \leq 0.11 q_p$$

$$0.9 q_p \leq q \leq 1.0 q_p$$

The errors of indication determined at each of the above flow rates shall not exceed the maximum permissible errors.

The flow sensors of all nominal diameters can also be tested with cold water.



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Requirements for the putting into use

There is no requirement for installation lengths of straight pipe upstream and downstream of the meter.

User instructions

A user / mounting instruction has to be enclosed for each flow sensor.

9 Instructions for the examination of devices in use

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Documents for the verification

Type approval certificate

Testing equipment

The verification can be done by means of volumetric or gravimetric measurement principle or by comparison with secondary standards (calibrated water meters). The measurement principle has to cover the range of flow rates mentioned in section 8.

Metrological verification

The metrological verification has to be performed at rated operation conditions.

10 Terms of placing on the market

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The water meter shall be clearly and indelibly marked with the following information:

- Accuracy class
- No. of the type examination certificate
- Name or trademark of the manufacturer
- Year of manufacture and serial number
- Direction of flow
- Maximum admissible pressure
- Limits of temperature
- Limits of flow rate
- Nominal meter factor (e.g. liters/pulse) or corresponding output signal

11 Sealing and conformity markings

The boreholes of the fixing screws in the housing cover are sealed with the provided security caps once the power connection is done. The access to parameters that influence the determination of the results of measurements is only allowed to authorized people by means of a code.

The CE marking, the metrology M and the number of the certification body have to be on the identification plate of the sensor.



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12 Overview of test results

CH-MI004-08008-00

In the following check list for the type examination from heat meters after EN 1434 the accomplished examinations are summarized. The results of the examinations after OIML R49 from the type examination certificate CH-MI001-07008-00 for the electromagnetic flow meter ISOMAG were taken over, if they correspond to the requirements of the EN 1434.

CH-MI004-08008-01

In the following check list for the type examination from heat meters after EN 1434 the accomplished examinations are summarized. The results of the examinations after OIML R49 from the type examination certificate CH-MI001-07008 for the electromagnetic flow meter ISOMAG were taken over, if they correspond to the requirements of the EN 1434.

Teil 4	Beschreibung der Prüfungen	+	-	Bemerkungen
	Anmerkungen:	X		Das Gerät hat bestanden
			X	Das Gerät hat nicht bestanden
		/	/	Nicht zutreffend
	Durchflusssensor	/	/	Nur Durchflusssensor
6.4.2.1	Leistungsprüfung	X		AQUAMETRO report EN 1434
6.4.2.3	Prüfung von elektromagnetischen Durchflusssensoren mit einer elektrischen Leitfähigkeit < 200 µS/cm	/	/	
6.4.2.4	Prüfung von schnell ansprechenden Wärmezählern	/	/	
6.5.3 a)	Trockene Wärme	X		METAS report 135-10686
6.6.3 a)	Kälte	X		METAS report 135-10686
6.7 a)	Statische Abweichungen der Versorgungsspannung	X		AQUAMETRO report EN 1434
6.8.2.2	Messbeständigkeit, Basisprüfung	X		AQUAMETRO report EN 1434
6.8.2.3	Messbeständigkeit, zusätzliche Prüfung	X		AQUAMETRO report R49-3
6.9 a)	Wasserdampf-atmosphäre, zyklisch	X		METAS report 135-10686
6.10 a)	Kurzzeitige Reduzierung der Netzspannung	/	/	
6.11.1 a)	Schnelle Transienten (Bursts)	X		MONTENA report no. 15027
6.11.2 a)	Stoßspannungen	X		MONTENA report no. 15027
6.12 a)	Elektromagnetisches Feld	X		MONTENA report no. 15027
6.13 a)	Durch digitale Funkgeräte speziell erzeugtes elektromagnetisches Feld	X		MONTENA report no. 15027
6.14 a)	Amplitudenmodulierte Hochfrequenz	X		MONTENA report no. 15027
6.15 a)	Elektrostatische Entladung	X		MONTENA report no. 15027
6.16	Statisches Magnetfeld	X		MONTENA report no. 15027
6.17 a)	Elektromagnetisches Feld mit Netzfrequenz	X		MONTENA report no. 15027
6.18	Innendruck	X		AQUAMETRO report EN 1434
6.19	Druckverlust	/	/	Voller Durchgang
6.20.2 a)	Leitungsgeführte Abstrahlung auf Netzspannungsleitungen	X		MONTENA report no. 15027
6.20.3 a)	Leitungsgeführte Abstrahlung auf Signal- und Gleichspannungsleitungen	X		MONTENA report no. 15027
6.20.4 a)	Strahlungsaussendung	X		MONTENA report no. 15027
6.21 a)	24-stündige Unterbrechung der Versorgungsspannung	/	/	
6.22	Durchflusstörungen			
a)	Nur für Durchflusssensoren mit elektronischen Vorrichtungen	X		AQUAMETRO report R49-3

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Auxiliary examinations for cooling mode - not relevant for this type examination as partial equipment of a heat meter

Teil 4	Beschreibung der Prüfungen	+	-	Bemerkungen
	Anmerkungen:	X		Das Gerät hat bestanden
			X	Das Gerät hat nicht bestanden
		/	/	Nicht zutreffend
	Durchflusssensor	/	/	Nur Durchflusssensor
6.4.2.1	Leistungsprüfung	X		AQUAMETRO report EN 1434
6.4.2.3	Prüfung von elektromagnetischen Durchflusssensoren mit einer elektrischen Leitfähigkeit < 200 µS/cm	/	/	
6.4.2.4	Prüfung von schnell ansprechenden Wärmezählern	/	/	
6.5.3 a)	Trockene Wärme	X		METAS report 135-10686
6.6.3 a)	Kälte	X		METAS report 135-10686
6.7 a)	Statische Abweichungen der Versorgungsspannung	/	/	
6.8.2.2	Messbeständigkeit, Basisprüfung	X		AQUAMETRO report EN 1434
6.8.2.3	Messbeständigkeit, zusätzliche Prüfung	X		AQUAMETRO report R49-3
6.9 a)	Wasserdampfatmosphäre, zyklisch	X		METAS report 135-10686

13 History of certificate

Edition	Date	Description
CH-MI004-08008-00	12 December 2008	First type examination certificate
CH-MI004-08008-01	16 December 2009	Software revision 3.xx and the number of certificate in the overview of test results.
CH-MI004-08008-02	21 March 2012	Extension of q_p and q_s Extension of the temperature range Testing with cold water