



EU-TYPE EXAMINATION CERTIFICATE

Number: TCM 142/17 - 5478

Page 1 from 9 pages

In accordance: with Directive 2014/32/EU of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments (implemented in Czech Republic by Government Order No. 120/2016 Coll.).

Manufacturer: Arkon Flow Systems, s.r.o.
Berkova 534/92
612 00 Brno
Czech Republic

For: water meter – inductive
Type: MAGB1

Accuracy class: 2
Temperature class: T50

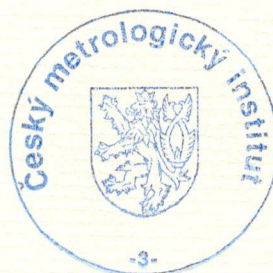
Valid until: 27 June 2027

Document No: 0511-CS-A023-17

Description: Essential characteristics, approved conditions and special conditions, if any, are described in this certificate.

Date of issue: 28 June 2017

Certificate approved by:



RNDr. Pavel Klenovský

1. Characteristics of instrument:

The inductive water meters type MAGB1 are designed to measure, memorise and display the volume at metering conditions of water passing through the measurement transducer in the sense of the Directive 2014/32/EU of the European Parliament and of the Council of the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments (implemented in Czech Republic by Government Order No. 120/2016 Coll.), as amended.

The water meters type MAGB1 are the electromagnetic water meters. There are two modifications: compact and remote version.

The water meters type MAGB1 consist of flow sensor and an electronic calculating/indicating device. The flow sensor measure based on an induction principle with PTFE and hard rubber lining, with straight inlet (5 times the diameter) and outlet (3 times the diameter) length, without flow conditioner. The maximum cable length for remote version is 10 meters. The meter is not designed to measure reverse flow. The meter does not require any extra-mechanical housing or adjustments.

The water meters type MAGB1 are equipped with the electronic indicating device. The display shows the measurements in cubic meter volume (positive, negative, total and auxiliary) and cubic meter per hour flow rate. The display is a digital type that can show up to 9 digits in two lines, and is equipped by 1 button. The normal resolution mode is used during normal operation. The water meter displays in the normal resolution mode up to 000000.001 m³/h flow rate and 000.001 m³ volume on the digital display. The water meter displays the volume resolution of 0.001 L on the digital display in the high resolution mode which would be used during the calibration process. This mode is set up by factory tool (software has to be attached) where the passwords (user, service and factory) secure access to the metrological parameters. Version of software is shown after reset system in last row right and on label. Checksum can be displayed by switching button.

The water meters type MAGB1 shall be installed to operate in arbitrary positions with the flow axis in the horizontal and vertical (from bottom to top and from top to bottom) plane and with the indicating device positioned at the top and at the side.

The water meters type MAGB1 can be equipped by frequency output which can be used for remote reading or by RS 485 (with maximum cable length 3 m).

2. Main characteristics:

Basic technical data of water meters type MAGB1 DN25 to DN40:

Nominal diameter(DN)[mm]	25			32			40		
Overload flowrate(Q ₄)[m ³ /h]	20			31.3			50		
Permanent flowrate(Q ₃)[m ³ /h]	16			25			40		
Transitional flowrate(Q ₂)[m ³ /h]	0.16	0.26	0.51	0.25	0.40	0.80	0.40	0.64	1.28
Minimum flowrate(Q ₁)[m ³ /h]	0.10	0.16	0.32	0.16	0.25	0.50	0.25	0.40	0.80
Ratio Q ₃ /Q ₁ :	160	100	50	160	100	50	160	100	50
Ratio Q ₂ /Q ₁ :	1.6								
Ratio Q ₄ /Q ₃ :	1.25								
Accuracy class	2								
Maximum permissible error for the lower flowrate zone (MPE _l)	±5%								
Maximum permissible error for the upper flowrate zone (MPE _u)	±2% for water having a temperature ≤ 30°C ±3% for water having a temperature > 30°C								
Temperature class:	T50								
Pressure-loss classes	Δp 10								
Indicating range[m ³]	99 999								
Resolution of the indicating device[m ³]	0.001 (normal mode) 0.000001 (calibration mode)								
Flow profile sensitivity classes	U5 D3								
Orientation limitation	any								
Length of horizontal water meter L [mm]	200								
Connection type-screw thread size	flange								
Climatic environment class:	B								
Electromagnetic environment class:	E1 (compact version)								

	E2 (remote version)								
Software version	v10.34								
Checksum	25668								
Battery	3.6 V								
Minimum battery life time:	5 years								
Low flow cut off	1 % from nominal flowrate								

Basic technical data of water meters type MAGB1 DN50 to DN80:

Nominal diameter(DN)[mm]	50			65			80		
Overload flowrate(Q ₄)[m ³ /h]	78.8			125			200		
Permanent flowrate(Q ₃)[m ³ /h]	63			100			160		
Transitional flowrate(Q ₂)[m ³ /h]	0.63	1.01	2.02	1.00	1.60	3.20	1.60	2.56	5.12
Minimum flowrate(Q ₁)[m ³ /h]	0.40	0.63	1.26	0.63	1.00	2.00	1.00	1.60	3.20
Ratio Q ₃ /Q ₁ :	160	100	50	160	100	50	160	100	50
Ratio Q ₂ /Q ₁ :	1.6								
Ratio Q ₄ /Q ₃ :	1.25								
Accuracy class	2								
Maximum permissible error for the lower flowrate zone (MPE _l)	±5%								
Maximum permissible error for the upper flowrate zone (MPE _u)	±2% for water having a temperature ≤ 30°C ±3% for water having a temperature > 30°C								
Temperature class:	T50								
Water pressure class:	MAP 10								
Pressure-loss classes	Δp 10								
Indicating range[m ³]	99 999			999 999					
Resolution of the indicating device[m ³]	0.001 (normal mode) 0.000001 (calibration mode)								
Flow profile sensitivity classes	U5 D3								
Orientation limitation	any								
Length of horizontal water meter L [mm]	200								
Connection type-screw thread size	flange								
Climatic environment class:	B								
Electromagnetic environment class:	E1 (compact version) E2 (remote version)								
Software version	v10.34								
Checksum	25668								
Battery	3.6 V								
Minimum battery life time:	5 years								
Low flow cut off	1 % from nominal flowrate								

Basic technical data of water meters type MAGB1 DN100 to DN150:

Nominal diameter(DN)[mm]	100			125			150		
Overload flowrate(Q ₄)[m ³ /h]	312.5			500			788		
Permanent flowrate(Q ₃)[m ³ /h]	250			400			630		
Transitional flowrate(Q ₂)[m ³ /h]	2.50	4.00	8.00	4.00	6.40	12.80	6.30	10.08	20.16
Minimum flowrate(Q ₁)[m ³ /h]	1.56	2.50	5.00	2.50	4.00	8.00	3.94	6.30	12.60
Ratio Q ₃ /Q ₁ :	160	100	50	160	100	50	160	100	50
Ratio Q ₂ /Q ₁ :	1.6								
Ratio Q ₄ /Q ₃ :	1.25								
Accuracy class	2								
Maximum permissible error for the lower flowrate zone (MPE _l)	±5%								
Maximum permissible error for the upper flowrate zone (MPE _u)	±2% for water having a temperature ≤ 30°C ±3% for water having a temperature > 30°C								

Temperature class:	T50		
Water pressure class:	MAP 10		
Pressure-loss classes	Δp 10		
Indicating range[m ³]	999 999		
Resolution of the indicating device[m ³]	0.001 (normal mode) 0.000001 (calibration mode)		
Flow profile sensitivity classes	U5 D3		
Orientation limitation	any		
Length of horizontal water meter L [mm]	250	250	300
Connection type-screw thread size	flange		
Climatic environment class:	B		
Electromagnetic environment class:	E1 (compact version) E2 (remote version)		
Software version	v10.34		
Checksum	25668		
Battery	3.6 V		
Minimum battery life time:	5 years		
Low flow cut off	1 % from nominal flowrate		

Basic technical data of water meters type MAGB1 DN200 to DN300:

Nominal diameter(DN)[mm]	200			250			300		
Overload flowrate(Q ₄)[m ³ /h]	787.5			1250			2000		
Permanent flowrate(Q ₃)[m ³ /h]	630			1000			1600		
Transitional flowrate(Q ₂)[m ³ /h]	6.30	10.08	20.16	10.00	16.00	32.00	16.00	25.60	51.20
Minimum flowrate(Q ₁)[m ³ /h]	3.94	6.30	12.60	6.25	10.00	20.00	10.00	16.00	32.00
Ratio Q ₃ /Q ₁ :	160	100	50	160	100	50	160	100	50
Ratio Q ₂ /Q ₁ :	1.6								
Ratio Q ₄ /Q ₃ :	1.25								
Accuracy class	2								
Maximum permissible error for the lower flowrate zone (MPE _l)	±5%								
Maximum permissible error for the upper flowrate zone (MPE _u)	±2% for water having a temperature ≤ 30°C ±3% for water having a temperature > 30°C								
Temperature class:	T50								
Water pressure class:	MAP 10								
Pressure-loss classes	Δp 10								
Indicating range[m ³]	9 999 999								
Resolution of the indicating device[m ³]	0.001 (normal mode) 0.000001 (calibration mode)								
Flow profile sensitivity classes	U5 D3								
Orientation limitation	any								
Length of horizontal water meter L [mm]	350			400			500		
Connection type-screw thread size	flange								
Climatic environment class:	B								
Electromagnetic environment class:	E1 (compact version) E2 (remote version)								
Software version	v10.34								
Checksum	25668								
Battery	3.6 V								
Minimum battery life time:	5 years								
Low flow cut off	1 % from nominal flowrate								

3. Tests

Technical tests of the water meters type MAGB1 were performed in compliance with the International Recommendation OIML R 49 Edition 2013 (E) with conformity to ISO 4064, Test Reports No. 6015-PT-P0024-17, 6015-PT-P0050-17, 8553-PT-S1004-17, 8553-PT-S1012-17, 8551-PT-E0096-16 and 8551-PT-E0097-16.

4. Conformity marks and inscription:

The water meters type MAGB1 shall be clearly and indelibly marked with the following information:

- Water meter type
- Unit of measurement (m^3)
- Numerical value Q_3 in m^3/h ($Q_3 \times \times$) and the ratio Q_3 / Q_1 (R160 or R100 or R50)
- EU-type examination certificate number
- Manufacturer's name, registered trade name or registered trade mark
- Post address of manufacturer
- Year of manufacture, two last digits of the year of manufacture, or the month and year of manufacture
- Serial number (as near as possible to the indicating device)
- Direction of flow, by means of an arrow (shown on both sides of the body or on one side only provided the direction of flow arrow is easily visible under all circumstances)
- Maximum admissible pressure (MAP 10)
- The temperature class (T50)
- The pressure loss class (Δp 10)
- The installation sensitivity class (U5 D3)
- Climatic and electromagnetic environmental classes (B; E1 or E2)
- The latest date that the battery is to be replaced
- Software version
- CE marking and metrology marking in line with the Directive 2014/32/EU

There are additional data required if the water meter is equipped with impulse output:

- Output signals for ancillary devices (type / levels)
- External power supply requirements (voltage – frequency)

These markings shall be visible without dismantling the water meter after the instrument has been placed on the market or put into use. Examples are in Figure 4.

5. Additional specifications:

The water meters type MAGB1 shall be put onto the market in line with the procedure of conformity assessment according to the Annex D or F of the Directive 2014/32/EU as well as in compliance with the technical description of this report and shall be tested in accordance with the requirements determined in ISO 4064-1:2014, respectively OIML R 49-1:2013.

A metrological test may only be performed by a producer, or a notified body respectively in line with the conformity assessment procedure by the D or F Annexes of the Directive 2014/32/EU, respectively.

6. Ensuring the integrity of the instruments:

The sealing is realized by passwords (user, service and factory) in case of factory tool and by putting seals on following places:

- screw on the cover plate inside the electronic (Figure 1);
- the screw covering the USB (Figure 2);
- reset jumper (Figure 3);
- the label to the body (Figure 4).

Alternatively sealing: the connection of both sides cover of the electronic have to be sealed by a safeguarding stickers (Figure 5) and the screw covering the USB (Figure 2).

The location and type of the seals are described in Figure 1 to Figure 5.

Connecting of the battery and the case of flow sensor and the frequency output and/or RS485 (Figure 6), if equipped, have to be secured by manufacturer's installation seal or other relevant authority seal.

7. Drawing of the instrument:

Water meters type MAGB1 are manufactured according to the technical documentation of manufacturer. Technical documentation contains following drawings:

Document reference	Date	Brief description
1000/01	11.2.2010	side rings
1028/06	21.1.2007	table of pipes
1030/03	8.2.2010	cover coil welded
1900/01	28.3.2010	MAGB1 sensor DN25
1900/02	28.3.2010	MAGB1 sensor DN32
1900/03	28.3.2010	MAGB1 sensor DN40
1900/04	28.3.2010	MAGB1 sensor DN50
1900/05	28.3.2010	MAGB1 sensor DN65
1900/06	28.3.2010	MAGB1 sensor DN80
1900/07	28.3.2010	MAGB1 sensor DN100
1900/08	28.3.2010	MAGB1 sensor DN125
1900/09	28.3.2010	MAGB1 sensor DN150
1900/10	28.3.2010	MAGB1 sensor DN200
1900/11	28.3.2010	MAGB1 sensor DN250
1900/12	28.3.2010	MAGB1 sensor DN300
3015/03	13.1.2010	housing DPS
3016/03	13.1.2010	housing DPS + printing
3018/02	7.1.2010	front glass printing
4000-1/01	1.12.2006	sensor
9006/01	2.3.2010	neck - welded
9006-2/01	2.3.2010	neck - tube
9006-1/01	20.3.2010	neck - flange
9006/02	2.3.2010	neck welded - complete
9007/02	1.12.2007	plastic cube
20000	-	table of coils
NH-10; rev. 1	9.7.2015	housing A
NH-11; rev. 1	9.7.2015	housing B
PCB_1012 (sheet 1-4)	28.1.2014	electronic scheme
SMT_Mount_MBB-COM_v5_1 MS_3003; issue 1 (no changes); 4 pages	-	electronic description
SMT_Mount_MBB_CPU_V5 MS_3004; issue 1 (no changes); 2 pages	-	electronic description
PP-M - Sensor tube assembly; issue 1 (no revision); 22 pages	27.1.2014	assembly instructions
MAGB1_User_Guide_V1.8_ENG	16.11.2015	User Guide

History of additions

Addition No.	Description
Addition 0	Issuing certificate

Figure 1: The water meter type MAGB1 – sealing of screw on the cover plate inside the electronic:

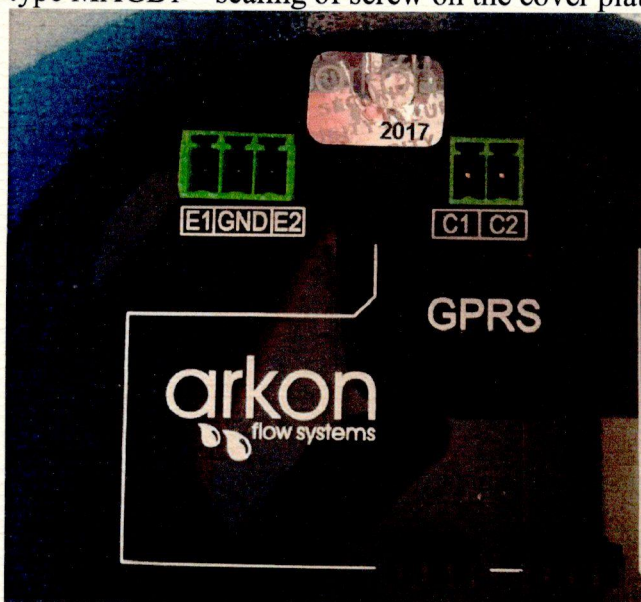


Figure 2: The water meter type MAGB1 – sealing of the screw covering the USB:



Figure 3: The water meter type MAGB1 – reset jumper:

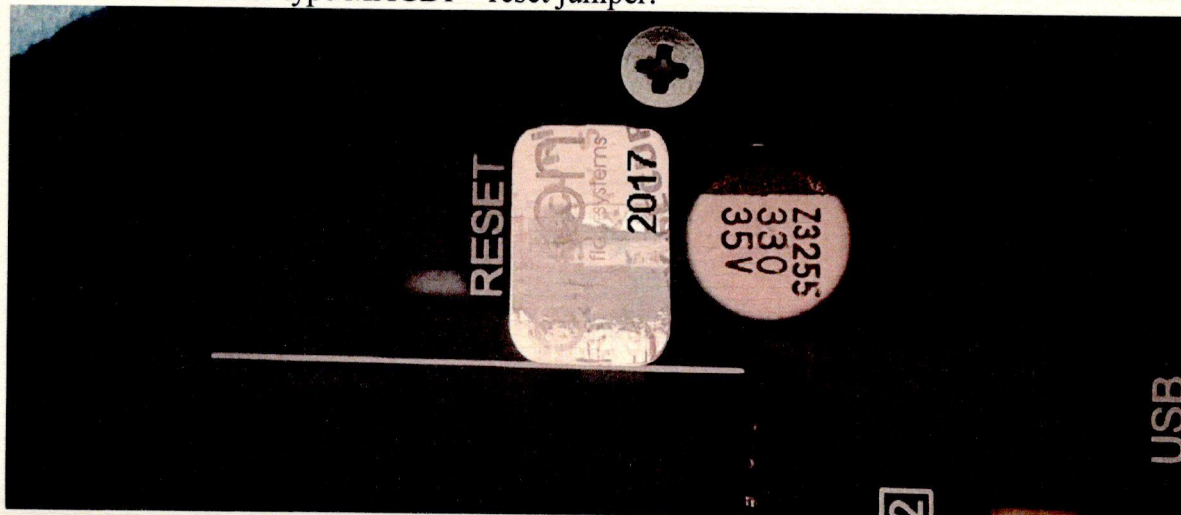


Figure 4: An example of the label and sealing:



Figure 5: The water meter type MAGB1 – alternatively sealing:

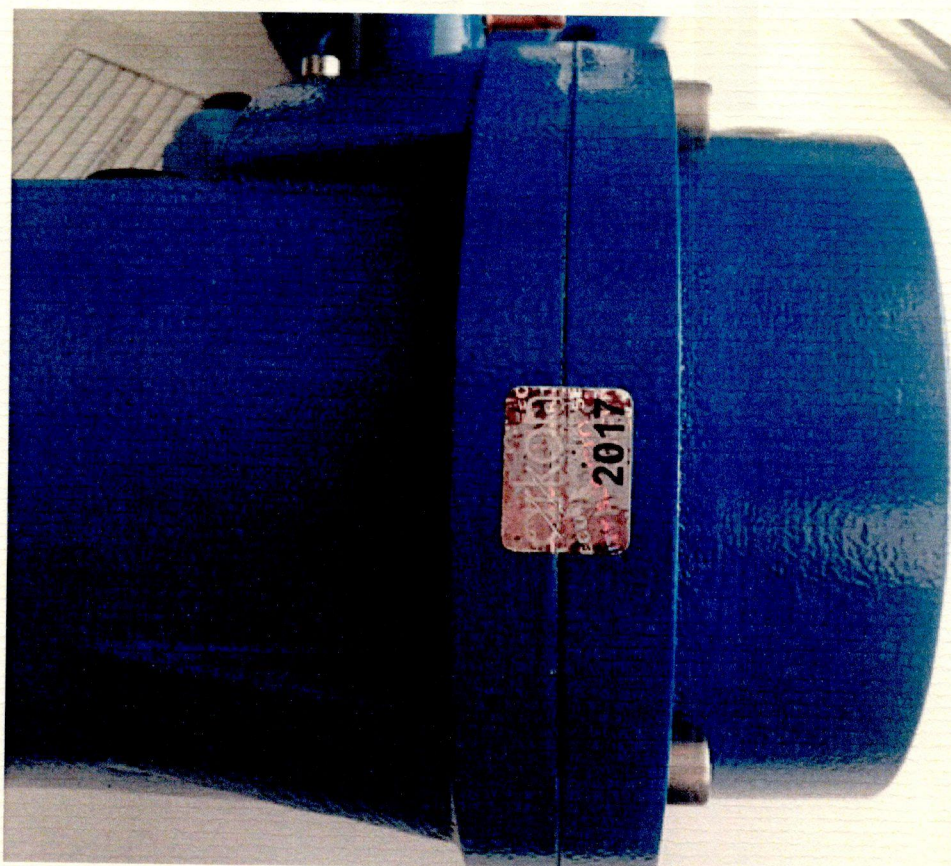


Figure 6: The water meter type MAGB1 – frequency output and RS 485 sealing:

