



# EU-TYPE EXAMINATION CERTIFICATE

Number: TCM 142/17 - 5502

## Addition 1

This addition replaces all previous versions of this certificate in full wording.

Page 1 from 8 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: MAGX2

Accuracy class: 2  
Temperature class: T50

**Valid until:** 13 September 2027

**Document No:** 0511-CS-A028-17

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

**Date of issue:** 18 October 2018

**Certificate approved by:**



  
RNDr. Pavel Klenovský

## 1 Characteristics of instrument:

The inductive water meters type MAGX2 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 MAGX2 are electromagnetic water meter. There are two modifications: compact and remote version.

The water meters type MAGX2 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 and there are equipped with an electronic calculating/indicating device. The display shows the measurements in cubic meter volume (positive, negative, total and auxiliary) and cubic meter per hour flow rate. The meter is not designed to measure reverse flow. The meter does not require any extra-mechanical housing or adjustments. The passwords (user, service and factory) secure access to the metrological parameters.

The water meters type MAGX2 are equipped with the electronic indicating device. The display is a digital type that show up to 9 digits in two lines, and is equipped by 6 buttons. The normal resolution mode is used during normal operation. The water meter displays in the normal resolution mode up to 000000.001 m<sup>3</sup>/h flow rate and 000.001 m<sup>3</sup> 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 buttons or factory tool (software would be attached). Version of software and checksum can be displayed using buttons.

The water meters type MAGX2 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 MAGX2 can be equipped by frequency output which can be used for remote reading or by RS485.

## 2 Main characteristics:

Basic technical data of water meters type MAGX2 DN25 to DN150:

Nominal diameter (DN) [mm]	25	32	40	50	65	80	100	125	150
Overload flowrate ( $Q_4$ ) [m <sup>3</sup> /h]	flowrates are shown in Table flowrates (table follow)								
Permanent flowrate ( $Q_3$ ) [m <sup>3</sup> /h]									
Transitional flowrate ( $Q_2$ ) [m <sup>3</sup> /h]									
Minimum flowrate ( $Q_1$ ) [m <sup>3</sup> /h]									
Ratio $Q_3/Q_1$ :	400 or 250 or 200 or 160 or 100 or 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 <sub>1</sub> )	±5%								
Maximum permissible error for the upper flowrate zone (MPE <sub>2</sub> )	±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 <sup>3</sup> ]	99 999				999 999				
Resolution of the indicating device[m <sup>3</sup> ]	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					250		300	
Connection type-screw thread size	flange								
Climatic environment class:	B								
Electromagnetic environment class:	E2								

Software version	21.39
Checksum	09585
Power supply	(90 – 250) VAC / 50 Hz or 60 Hz
	(12 – 36) VDC
Low flow cut off	1 % from nominal flowrate

## Basic technical data of water meters type MAGX2 DN200 to DN300:

Nominal diameter (DN) [mm]	200	250	300
Overload flowrate ( $Q_4$ ) [m <sup>3</sup> /h]	flowrates are shown in Table flowrates (table follow)		
Permanent flowrate ( $Q_3$ ) [m <sup>3</sup> /h]			
Transitional flowrate ( $Q_2$ ) [m <sup>3</sup> /h]			
Minimum flowrate ( $Q_1$ ) [m <sup>3</sup> /h]			
Ratio $Q_3/Q_1$ :			
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 <sub>l</sub> )	±5%		
Maximum permissible error for the upper flowrate zone (MPE <sub>u</sub> )	±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 <sup>3</sup> ]	9 999 999		
Resolution of the indicating device[m <sup>3</sup> ]	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:	E2		
Software version	21.39		
Checksum	09585		
Power supply	(90 – 250) VAC / 50 Hz or 60 Hz		
	(12 – 36) VDC		
Low flow cut off	1 % from nominal flowrate		

## Basic technical data of water meters type MAGX2 flowrates

Nominal diameter:	25	32	40	50	65	80	100	125	150	200	250	300
Type details:												
$Q_1$ [m <sup>3</sup> /h]:	0.04	0.06	0.10	0.16	0.25	0.40	0.63	1.00	1.58	2.50	2.50	4.00
$Q_2$ [m <sup>3</sup> /h]:	0.06	0.10	0.16	0.25	0.40	0.64	1.00	1.60	2.52	4.00	4.00	6.40
$Q_3$ [m <sup>3</sup> /h]:	16.0	25.0	40.0	63.0	100.0	160.0	250.0	400.0	630.0	1000.0	1000.0	1600.0
$Q_4$ [m <sup>3</sup> /h]:	20.0	31.3	50.0	78.8	125.0	200.0	312.5	500.0	787.5	1250.0	1250.0	2000.0
$Q_3/Q_1$ :	400											
$Q_1$ [m <sup>3</sup> /h]:	0.06	0.10	0.16	0.25	0.40	0.64	1.00	1.60	2.52	4.00	4.00	6.40
$Q_2$ [m <sup>3</sup> /h]:	0.10	0.16	0.26	0.40	0.64	1.02	1.60	2.56	4.03	6.40	6.40	10.24
$Q_3$ [m <sup>3</sup> /h]:	16.0	25.0	40.0	63.0	100.0	160.0	250.0	400.0	630.0	1000.0	1000.0	1600.0
$Q_4$ [m <sup>3</sup> /h]:	20.0	31.3	50.0	78.8	125.0	200.0	312.5	500.0	787.5	1250.0	1250.0	2000.0
$Q_3/Q_1$ :	250											

$Q_1$ [m <sup>3</sup> /h]:	0.08	0.13	0.20	0.32	0.50	0.80	1.25	2.00	3.15	5.00	5.00	8.00
$Q_2$ [m <sup>3</sup> /h]:	0.13	0.20	0.32	0.50	0.80	1.28	2.00	3.20	5.04	8.00	8.00	12.80
$Q_3$ [m <sup>3</sup> /h]:	16.0	25.0	40.0	63.0	100.0	160.0	250.0	400.0	630.0	1000.0	1000.0	1600.0
$Q_4$ [m <sup>3</sup> /h]:	20.0	31.3	50.0	78.8	125.0	200.0	312.5	500.0	787.5	1250.0	1250.0	2000.0
$Q_3/Q_1$ :	200											
$Q_1$ [m <sup>3</sup> /h]:	0.10	0.16	0.25	0.39	0.63	1.00	1.56	2.50	3.94	6.25	6.25	10.00
$Q_2$ [m <sup>3</sup> /h]:	0.16	0.25	0.40	0.63	1.00	1.60	2.50	4.00	6.30	10.00	10.00	16.00
$Q_3$ [m <sup>3</sup> /h]:	16.0	25.0	40.0	63.0	100.0	160.0	250.0	400.0	630.0	1000.0	1000.0	1600.0
$Q_4$ [m <sup>3</sup> /h]:	20.0	31.3	50.0	78.8	125.0	200.0	312.5	500.0	787.5	1250.0	1250.0	2000.0
$Q_3/Q_1$ :	160											
$Q_1$ [m <sup>3</sup> /h]:	0.16	0.25	0.40	0.63	1.00	1.60	2.50	4.00	6.30	10.00	10.00	16.00
$Q_2$ [m <sup>3</sup> /h]:	0.26	0.40	0.64	1.01	1.60	2.56	4.00	6.40	10.08	16.00	16.00	25.60
$Q_3$ [m <sup>3</sup> /h]:	16.0	25.0	40.0	63.0	100.0	160.0	250.0	400.0	630.0	1000.0	1000.0	1600.0
$Q_4$ [m <sup>3</sup> /h]:	20.0	31.3	50.0	78.8	125.0	200.0	312.5	500.0	787.5	1250.0	1250.0	2000.0
$Q_3/Q_1$ :	100											
$Q_1$ [m <sup>3</sup> /h]:	0.32	0.50	0.80	1.26	2.00	3.20	5.00	8.00	12.60	20.00	20.00	32.00
$Q_2$ [m <sup>3</sup> /h]:	0.51	0.80	1.28	2.02	3.20	5.12	8.00	12.80	20.16	32.00	32.00	51.20
$Q_3$ [m <sup>3</sup> /h]:	16.0	25.0	40.0	63.0	100.0	160.0	250.0	400.0	630.0	1000.0	1000.0	1600.0
$Q_4$ [m <sup>3</sup> /h]:	20.0	31.3	50.0	78.8	125.0	200.0	312.5	500.0	787.5	1250.0	1250.0	2000.0
$Q_3/Q_1$ :	50											

### 3 Tests

Technical tests of the water meters type MAGX2 were performed in compliance with the International Recommendation OIML R 49 Edition 2013 (E) with conformity to ISO 4064, Test Reports No. 6015-PT-P0025-17, No. 8553-PT-S1005-17, No. 8551-PT-E0122-16, No. 8551-PT-E0142-16, No. 8551-PT-E0152-17 and No. 8551-PT-E0153-17.

### 4 Conformity marks and inscription:

The water meters type MAGX2 shall be clearly and indelibly marked with the following information:

- Water meter type
- Unit of measurement (m<sup>3</sup>)
- Numerical value  $Q_3$  in m<sup>3</sup>/h ( $Q_3 \times \times$ ) and the ratio  $Q_3 / Q_1$  (R400 or R250 or R200 or 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 ( $\Delta p$  10)
- The installation sensitivity class (U5 D3)
- Climatic and electromagnetic environmental classes (B; E2)
- For an external power supply: the voltage and frequency
- 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 or RS 485 communication:

- 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 3.

### 5 Additional specifications:

The water meters type MAGX2 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) and by putting seals on following places:

- screw on the cover plate inside the electronic (Figure 1);
- SD card inside the body (Figure 1) and screw on the outside of the body;
- the frequency module, if equipped (Figure 2);
- the RS 485 module, if equipped (Figure 2);
- connecting flow sensor and indicating device in case of compact version (Figure 3);
- connecting the label to the body (Figure 3).

Alternatively sealing: the connection of both sides cover of the electronic have to be sealed by a safeguarding stickers (Figure 4) and connecting flow sensor and indicating device in case of compact version (Figure 3).

The location and type of the seals are described in Figure 1 to Figure 4.

Connecting of the power supply cable and the frequency output and/or RS485, if equipped, have to be secured by manufacturer's installation seal or other relevant authority seal.

### 7 Drawing of the instrument:

Water meters type MAGX2 are manufactured according to the technical documentation of manufacturer. Technical documentation contains following drawings:

Document reference	Date	Brief description
1012/02	8.2.2010	coil cover
1000/01	11.2.2010	side rings
1028/05	5.11.2010	table of pipes DN300
1028/06	21.1.2007	table of pipes DN25-DN250
1030/02	8.2.2010	cover coils - welded
1086/02	11.11.2009	seal for housing
1700/04	28.3.2010	sensor DN25
1700/05	28.3.2010	sensor DN32
1700/07	28.3.2010	sensor DN50
1700/09	28.3.2010	sensor DN80
1700/10	28.3.2010	sensor DN100
1700/12	28.3.2010	sensor DN150
1700/15	28.3.2010	sensor DN300
3016/05	22.6.2010	housing DPS + printing
4000-1/01	1.12.2006	sensor for DN25-DN300
4000-2/01	3.4.2008	pad for sensor
5016/01	13.5.2010	Pulse box

5017/01	15.4.2010	modul box
5018/01	13.4.2010	sensor cover
5019/01	15.4.2010	module cap
7001/02	10.9.2010	T-handle plastic
9008/02	2.3.2010	seal
9010/02	15.3.2010	neck - piece 1
9011/02	15.3.2010	neck - piece 2 - compact
9011/03	15.3.2010	neck - piece 2 - remote
9014/01	9.3.2007	coil holder DN25
9015/01	9.3.2007	coil holder DN32, DN40
9016/01	8.7.2008	coil holder DN50, DN65
9017/01	9.3.2007	coil holder DN80, DN100
9018/01	9.3.2007	coil holder type "U"
9022/01	10.3.2010	seal
NH-10	9.7.2015	housing A
NH-11	9.7.2015	housing B
PCB 1001 (2 pages)	28.1.2014	MB7_v3
PCB 1002 (4 pages)	28.1.2014	sensor 8_v4
PCB 1003	-	PS4
PCB_1013	12.9.2017	Board for PS5_v4
PCB_1014	12.9.2017	Board for PS5_4_Filter
PCB 1005	-	pulse 3_1
PCB 1008	28.1.2014	RS485_7
PP-M Electrodes assembly PR_2004; issue 1 (no revision); 2 pages	27.1.2014	electrodes assembly

### History of additions

Addition No.	Description
Addition 0	Issuing certificate
Addition 1	Correction of power supply

Figure 1: The water meter type MAGX2 – sealing of the screw on the cover plate inside the electronic and SD card inside the body:

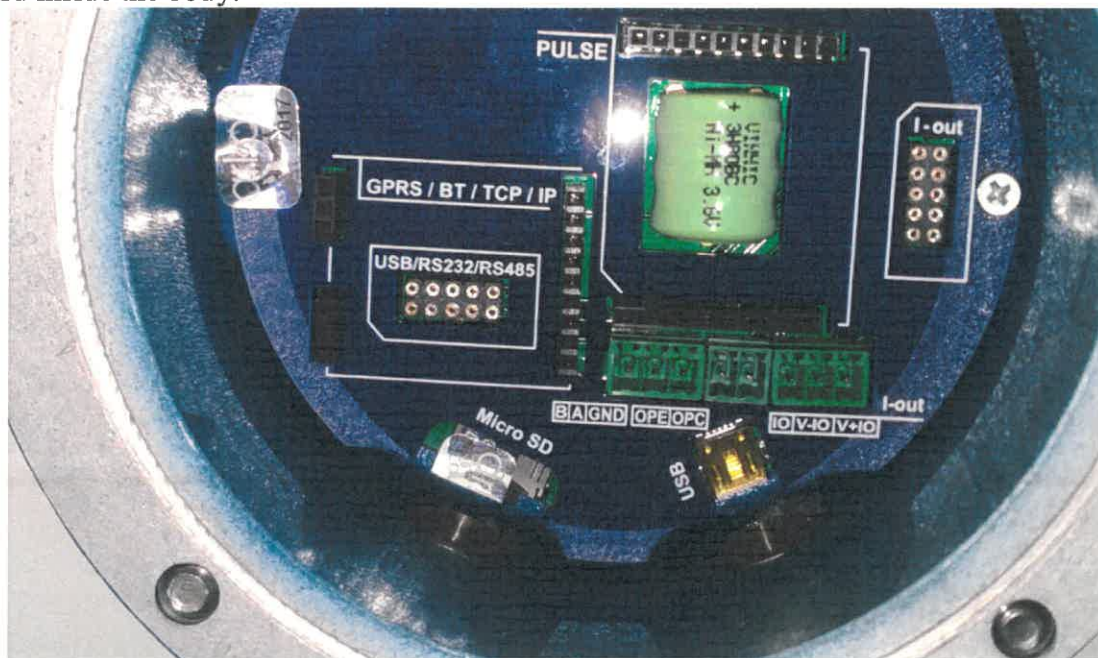


Figure 2: The water meter type MAGX2 – frequency module and RS 485 module sealing:



Figure 3: The water meter type MAGX2 – sealing of connecting flow sensor and indicating device in case of compact version including an example of the label:



Figure 4: The water meter type MAGX2 – alternatively sealing:

