



EU-TYPE EXAMINATION CERTIFICATE

Number: TCM 142/23 - 5905

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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: MAGB2

Accuracy class: 2
Temperature class: T30 and T50

Valid until: 5 February 2033

Document No: 0511-CS-A002-23

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

Date of issue: 6 February 2023

Certificate approved by:




RNDr. Pavel Klenovský

1 Characteristics of instrument

The inductive water meters type MAGB2 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 MAGB2 are the electromagnetic water meters. There are two modifications: compact and remote version.

The water meters type MAGB2 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 (0 times the diameter) and outlet (0 times the diameter) length, without flow conditioner. The maximum cable length for remote version is 10 meters. The meter is designed to measure reverse flow. The meter does not require any extra-mechanical housing or adjustments.

The water meters type MAGB2 are equipped with the electronic indicating device. The display shows the measurements in cubic meters (positive, negative, total and auxiliary) and cubic meters per hour. The display is a digital type that can show up to 10 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 00000000.001 m³/h flow rate and 00000000.001 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 on the display. Checksum can be displayed by entering menu Info – FW Checksum.

The water meters type MAGB2 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 MAGB2 can be equipped by frequency output which can be used for remote reading and can be equipped RS 485 (with maximum cable length 30 m).

2 Main characteristics

Basic technical data of water meters type MAGB2:

Manufacturer:	Arkon Flow Systems, s.r.o.				
Model number:	MAGB2				
Nominal diameter:	25	32	40	50	65
Type details:					
Q_1 [m ³ /h]:	flowrates are shown in Table <i>Basic metrological data (flowrates)</i>				
Q_2 [m ³ /h]:					
Q_3 [m ³ /h]:					
Q_4 [m ³ /h]:					
Q_3/Q_1 :	R250 for H↑ (horizontal position with the indicating device at the top) R100 for V↑ (vertical position with flow from bottom to top)				
Q_2/Q_1 :	1.6				
Q_4/Q_3 :	1.25				
Measuring principle:	Water meter – inductive				
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:	T30; T50				
Water pressure class:	MAP16				

<i>Pressure loss class:</i>	<i>Δp_{16}</i>	
<i>Reverse flow:</i>	<i>designed to measure</i>	
<i>Environmental class:</i>	<i>B (from 5 to 55 °C)</i>	
<i>Electromagnetic environment:</i>	<i>E2</i>	
<i>Maximum admissible temperature [°C]:</i>	<i>50°C</i>	
<i>Maximum admissible pressure [MPa]:</i>	<i>1,6MPa</i>	
<i>Orientation limitation:</i>	<i>H↑ (horizontal position with the indicating device at the top) for R250 V↑ (vertical position with flow from bottom to top) for R100</i>	
<i>Indicating range [m³]:</i>	<i>99 999</i>	<i>99 999 999</i>
<i>Resolution of the indicating device [m³]:</i>	<i>0.000 001</i>	<i>0.001</i>
<i>Resolution of the device for rapid testing [m³]:</i>	<i>-</i>	
EUT testing requirements (OIML R 49-2:2013, 8.1.8):		
<i>Category:</i>	<i>B</i>	
<i>Case:</i>	<i>B</i>	
Installation details:		
<i>Connection type (screw thread):</i>	<i>Flanges</i>	
<i>Minimum straight length of inlet pipe [mm]:</i>	<i>0</i>	
<i>Minimum straight length of outlet pipe [mm]:</i>	<i>0</i>	
<i>Flow profile sensitivity class:</i>	<i>U0D0</i>	
<i>Flow conditioner (details if required):</i>	<i>No</i>	
<i>Mounting:</i>	<i>Flanges</i>	
<i>Orientation:</i>	<i>H↑ (horizontal position with the indicating device at the top) for R250 V↑ (vertical position with flow from bottom to top) for R100</i>	
<i>Other relevant information:</i>	<i>-</i>	
<i>Length [mm]:</i>	<i>200</i>	
<i>Reed switch power supply (U_{max} / I_{max}):</i>	<i>-</i>	
<i>Reed switch K-factor (impulse / L):</i>	<i>-</i>	
Installation details (electrical):		
<i>Wiring instructions:</i>	<i>-</i>	
<i>Mounting arrangement:</i>	<i>-</i>	
<i>Orientation limitations:</i>	<i>-</i>	
Power supply:		
<i>Type (battery, mains AC, mains DC):</i>	<i>Battery</i>	
<i>U_{max} (V):</i>	<i>4.2V</i>	
<i>U_{min} (V):</i>	<i>2V</i>	
<i>Frequency:</i>	<i>-</i>	
<i>Minimum battery life time [years]:</i>	<i>5</i>	
<i>Software version (of legally relevant SW):</i>	<i>22.28</i>	
<i>CRC checksum (of legally relevant SW):</i>	<i>0xCB68D76D</i>	
Information specified by the manufacturer (information in the table below are not certified)		
<i>-</i>	<i>-</i>	

Manufacturer:	Arkon Flow Systems, s.r.o.				
Model number:	MAGB2				
Nominal diameter:	80	100	125	150	200
Type details:					
Q_1 [m ³ /h]:	flowrates are shown in Table <i>Basic metrological data (flowrates)</i>				
Q_2 [m ³ /h]:					
Q_3 [m ³ /h]:					
Q_4 [m ³ /h]:					
Q_3/Q_1 :	H↑ (horizontal position with the indicating device at the top) for R250 V↑ (vertical position with flow from bottom to top) for R100				
Q_2/Q_1 :	1.6				
Q_4/Q_3 :	1.25				
Measuring principle:	Water meter – inductive				
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:	T30; T50				
Water pressure class:	MAP16				
Pressure loss class:	$\Delta p16$				
Reverse flow:	designed to measure				
Environmental class:	B (from 5 to 55 °C)				
Electromagnetic environment:	E2				
Maximum admissible temperature [°C]:	50°C				
Maximum admissible pressure [MPa]:	1,6MPa				
Orientation limitation:	H↑ (horizontal position with the indicating device at the top) for R250 V↑ (vertical position with flow from bottom to top) for R100				
Indicating range [m ³]:	99 999 999				
Resolution of the indicating device [m ³]:	0.001				
Resolution of the device for rapid testing [m ³]:	-				
EUT testing requirements (OIML R 49-2:2013, 8.1.8):					
Category:	B				
Case:	B				
Installation details:					
Connection type (screw thread):	Flanges				
Minimum straight length of inlet pipe [mm]:	0				
Minimum straight length of outlet pipe [mm]:	0				
Flow profile sensitivity class:	U0D0				
Flow conditioner (details if required):	No				
Mounting:	Flanges				
Orientation:	H↑ (horizontal position with the indicating device at the top) for R250 V↑ (vertical position with flow from bottom to top) for R100				

Other relevant information:	-			
Length [mm]:	200	250	300	350
Reed switch power supply (U_{\max} / I_{\max}):	-			
Reed switch K-factor (impulse / L):	-			
Installation details (electrical):				
Wiring instructions:	-			
Mounting arrangement:	-			
Orientation limitations:	-			
Power supply:				
Type (battery, mains AC, mains DC):	Battery			
U_{\max} (V):	4.2V			
U_{\min} (V):	2V			
Frequency:	-			
Minimum battery life time [years]:	5			
Software version (of legally relevant SW):	22.28			
CRC checksum (of legally relevant SW):	0xCB68D76D			
Information specified by the manufacturer (information in the table below are not certified)				
-	-			

Manufacturer:	Arkon Flow Systems, s.r.o.
Model number:	MAGB2
Nominal diameter:	250
Type details:	
Q_1 [m ³ /h]:	flowrates are shown in Table <i>Basic metrological data (flowrates)</i>
Q_2 [m ³ /h]:	
Q_3 [m ³ /h]:	
Q_4 [m ³ /h]:	
Q_3/Q_1 :	H↑ (horizontal position with the indicating device at the top) for R250 V↑ (vertical position with flow from bottom to top) for R100
Q_2/Q_1 :	1.6
Q_4/Q_3 :	1.25
Measuring principle:	Water meter – inductive
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:	T30; T50
Water pressure class:	MAP16
Pressure loss class:	$\Delta p16$
Reverse flow:	designed to measure
Environmental class:	B (from 5 to 55 °C)
Electromagnetic environment:	E2

Maximum admissible temperature [°C]:	50°C
Maximum admissible pressure [MPa]:	1,6MPa
Orientation limitation:	H↑ (horizontal position with the indicating device at the top) for R250 V↑ (vertical position with flow from bottom to top) for R100
Indicating range [m ³]:	99 999 999
Resolution of the indicating device [m ³]:	0.001
Resolution of the device for rapid testing [m ³]:	-
EUT testing requirements (OIML R 49-2:2013, 8.1.8):	
Category:	B
Case:	B
Installation details:	
Connection type (screw thread):	Flanges
Minimum straight length of inlet pipe [mm]:	0
Minimum straight length of outlet pipe [mm]:	0
Flow profile sensitivity class:	U0D0
Flow conditioner (details if required):	No
Mounting:	Flanges
Orientation:	H↑ (horizontal position with the indicating device at the top) for R250 V↑ (vertical position with flow from bottom to top) for R100
Other relevant information:	-
Length [mm]:	400
Reed switch power supply (U_{max} / I_{max}):	-
Reed switch K-factor (impulse / L):	-
Installation details (electrical):	
Wiring instructions:	-
Mounting arrangement:	-
Orientation limitations:	-
Power supply:	
Type (battery, mains AC, mains DC):	Battery
U_{max} (V):	4.2V
U_{min} (V):	2V
Frequency:	-
Minimum battery life time [years]:	5
Software version (of legally relevant SW):	22.28
CRC checksum (of legally relevant SW):	0xCB68D76D
Information specified by the manufacturer (information in the table below are not certified)	
-	-

Basic metrological data (flowrates)

Manufacturer:	Arkon Flow Systems, s.r.o.								
Model number:	MAGB2								
Nominal diameter:	25								
Type details:									
Q_1 [m ³ /h]:	0.064	0.080	0.100	0.128	0.160	0.200	0.254	0.320	0.400
Q_2 [m ³ /h]:	0.102	0.128	0.160	0.205	0.256	0.320	0.406	0.512	0.640
Q_3 [m ³ /h]:	16	16	16	16	16	16	16	16	16
Q_4 [m ³ /h]:	20	20	20	20	20	20	20	20	20
Q_3/Q_1 :	250	200	160	125	100	80	63	50	40

Manufacturer:	Arkon Flow Systems, s.r.o.								
Model number:	MAGB2								
Nominal diameter:	32								
Type details:									
Q_1 [m ³ /h]:	0.100	0.125	0.156	0.200	0.250	0.313	0.400	0.500	0.625
Q_2 [m ³ /h]:	0.160	0.200	0.250	0.320	0.400	0.500	0.635	0.800	1.000
Q_3 [m ³ /h]:	25	25	25	25	25	25	25	25	25
Q_4 [m ³ /h]:	31.25	31.25	31.25	31.25	31.25	31.25	31.25	31.25	31.25
Q_3/Q_1 :	250	200	160	125	100	80	63	50	40

Manufacturer:	Arkon Flow Systems, s.r.o.								
Model number:	MAGB2								
Nominal diameter:	40								
Type details:									
Q_1 [m ³ /h]:	0.160	0.200	0.250	0.320	0.400	0.500	0.635	0.800	1.000
Q_2 [m ³ /h]:	0.256	0.320	0.400	0.512	0.640	0.800	1.016	1.280	1.600
Q_3 [m ³ /h]:	40	40	40	40	40	40	40	40	40
Q_4 [m ³ /h]:	50	50	50	50	50	50	50	50	50
Q_3/Q_1 :	250	200	160	125	100	80	63	50	40

Manufacturer:	Arkon Flow Systems, s.r.o.								
Model number:	MAGB2								
Nominal diameter:	50								
Type details:									
Q_1 [m ³ /h]:	0.252	0.315	0.394	0.504	0.630	0.788	1.000	1.260	1.575
Q_2 [m ³ /h]:	0.403	0.504	0.630	0.806	1.008	1.260	1.600	2.016	2.520
Q_3 [m ³ /h]:	63	63	63	63	63	63	63	63	63
Q_4 [m ³ /h]:	79	79	79	79	79	79	79	79	79
Q_3/Q_1 :	250	200	160	125	100	80	63	50	40



Manufacturer:	Arkon Flow Systems, s.r.o.								
Model number:	MAGB2								
Nominal diameter:	65								
Type details:									
Q_1 [m ³ /h]:	0.400	0.500	0.625	0.800	1.000	1.250	1.587	2.000	2.500
Q_2 [m ³ /h]:	0.640	0.800	1.000	1.280	1.600	2.000	2.587	3.200	4.000
Q_3 [m ³ /h]:	100	100	100	100	100	100	100	100	100
Q_4 [m ³ /h]:	125	125	125	125	125	125	125	125	125
Q_3/Q_1 :	250	200	160	125	100	80	63	50	40

Manufacturer:	Arkon Flow Systems, s.r.o.								
Model number:	MAGB2								
Nominal diameter:	80								
Type details:									
Q_1 [m ³ /h]:	0.640	0.800	1.000	1.280	1.600	2.000	2.540	3.200	4.000
Q_2 [m ³ /h]:	1.024	1.280	1.600	2.048	2.560	3.200	4.064	5.120	6.400
Q_3 [m ³ /h]:	160	160	160	160	160	160	160	160	160
Q_4 [m ³ /h]:	200	200	200	200	200	200	200	200	200
Q_3/Q_1 :	250	200	160	125	100	80	63	50	40

Manufacturer:	Arkon Flow Systems, s.r.o.								
Model number:	MAGB2								
Nominal diameter:	100								
Type details:									
Q_1 [m ³ /h]:	1.000	1.250	1.563	2.000	2.500	3.125	3.970	5.000	6.250
Q_2 [m ³ /h]:	1.600	2.000	2.500	3.200	4.000	5.000	6.350	8.000	10.000
Q_3 [m ³ /h]:	250	250	250	250	250	250	250	250	250
Q_4 [m ³ /h]:	313	313	313	313	313	313	313	313	313
Q_3/Q_1 :	250	200	160	125	100	80	63	50	40

Manufacturer:	Arkon Flow Systems, s.r.o.								
Model number:	MAGB2								
Nominal diameter:	125								
Type details:									
Q_1 [m ³ /h]:	1.60	2.00	2.50	3.20	4.00	5.00	6.35	8.00	10.00
Q_2 [m ³ /h]:	2.56	3.20	4.00	5.12	6.40	8.00	10.16	12.80	16.00
Q_3 [m ³ /h]:	400	400	400	400	400	400	400	400	400
Q_4 [m ³ /h]:	500	500	500	500	500	500	500	500	500
Q_3/Q_1 :	250	200	160	125	100	80	63	50	40

Manufacturer:	Arkon Flow Systems, s.r.o.								
Model number:	MAGB2								
Nominal diameter:	150								
Type details:									
Q_1 [m ³ /h]:	2.52	3.15	3.94	5.04	6.30	7.88	10.00	12.60	15.75
Q_2 [m ³ /h]:	4.03	5.04	6.30	8.06	10.08	12.60	16.00	20.16	25.20
Q_3 [m ³ /h]:	630	630	630	630	630	630	630	630	630
Q_4 [m ³ /h]:	788	788	788	788	788	788	788	788	788
Q_3/Q_1 :	250	200	160	125	100	80	63	50	40

Manufacturer:	Arkon Flow Systems, s.r.o.								
Model number:	MAGB2								
Nominal diameter:	200								
Type details:									
Q_1 [m ³ /h]:	2.52	3.15	3.94	5.04	6.30	7.88	10.00	12.60	15.75
Q_2 [m ³ /h]:	4.03	5.04	6.30	8.06	10.08	12.60	16.00	20.16	25.20
Q_3 [m ³ /h]:	630	630	630	630	630	630	630	630	630
Q_4 [m ³ /h]:	788	788	788	788	788	788	788	788	788
Q_3/Q_1 :	250	200	160	125	100	80	63	50	40

Manufacturer:	Arkon Flow Systems, s.r.o.								
Model number:	MAGB2								
Nominal diameter:	250								
Type details:									
Q_1 [m ³ /h]:	4.00	5.00	6.25	8.00	10.00	12.50	15.87	20.00	25.00
Q_2 [m ³ /h]:	6.40	8.00	10.00	12.80	16.00	20.00	25.40	32.00	40.00
Q_3 [m ³ /h]:	1000	1000	1000	1000	1000	1000	1000	1000	1000
Q_4 [m ³ /h]:	1250	1250	1250	1250	1250	1250	1250	1250	1250
Q_3/Q_1 :	250	200	160	125	100	80	63	50	40

3 Tests

Technical tests of the water meters type MAGB2 were performed in compliance with the International Recommendation OIML R 49 Edition 2013 (E) with conformity to EN ISO 4064:2017, Type Evaluation Report No. 0511-ER-V115-21 (with related Test Reports No. 6015-PT-P0001-23; No. 8551-PT-E0063-22; No. 6011-PT-SW021-22 according to WELMEC 7.2, 2020).

4 Conformity marks and inscription

The water meters type MAGB2 shall be clearly and indelibly marked with the following information:

- Water meter type
- Unit of measurement (m³)
- Numerical value Q_3 in m³/h ($Q_3 \times \times$) and the ratio Q_3/Q_1 ,
- 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 $\times \times$)
- Letter H \uparrow (horizontal position with the indicating device at the top)
- The temperature class (T $\times \times$)
- The pressure loss class ($\Delta P \times \times$)
- The installation sensitivity class (U \times D \times)
- CE marking and metrology marking in line with the Directive 2014/32/EU

These markings shall be visible without dismantling the water meter after the instrument has been placed on the market or put into use. Example is in Figure 1.

5 Additional specifications

The water meters type MAGB2 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 EN ISO 4064-1:2017, 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);
- the label to the body and marks (Figure 3).

The location and type of the seals are described in Figure 1 to Figure 3.

Connecting of the battery and the case of flow sensor and the frequency output and/or RS485 (Figure 4), if equipped, have to be secured by manufacturer's installation seal or other relevant authority seal.

7 Drawing of the instrument

Water meters type MAGB2 are manufactured according to the technical documentation of manufacturer. Technical documentation contains following drawings:

Document reference	Date	Brief description
AFS-2000-550-104	8.8.2022	DN25 remote
AFS-2000-550-105	8.8.2022	DN32 remote
AFS-2000-550-106	8.8.2022	DN40 remote
AFS-1520-100-007	9.9.2022	DN50 remote
AFS-1520-100-008	12.9.2022	DN65 remote
AFS-1520-100-009	12.9.2022	DN80 remote
AFS-1520-100-010	13.9.2022	DN100 remote
AFS-1520-100-011	13.9.2022	DN125 remote
AFS-1520-100-012	14.9.2022	DN150 remote
AFS-1520-100-013	14.9.2022	DN200 remote
AFS-1520-100-014	14.9.2022	DN250 remote
AFS-2000-650-104	5.8.2022	DN25 compact
AFS-2000-650-105	5.8.2022	DN32 compact
AFS-2000-650-106	8.8.2022	DN40 compact
AFS-1510-100-007	9.9.2022	DN50 compact
AFS-1510-100-008	12.9.2022	DN65 compact
AFS-1510-100-009	12.9.2022	DN80 compact
AFS-1510-100-010	12.9.2022	DN100 compact
AFS-1510-100-011	13.9.2022	DN125 compact
AFS-1510-100-012	14.9.2022	DN150 compact
AFS-1510-100-013	14.9.2022	DN200 compact
AFS-1510-100-014	14.9.2022	DN250 compact
AFS-5100-100-100	18.12.2018	Transmitter MAGB2 compact
AFS-5100-200-200	18.12.2018	Transmitter MAGB2 remote
AFS-5021-001	19.12.2022	Cover for transmitter MAGB2
V1.12.2023-01-10	-	User guide MAGB2

History of additions

Addition No.	Description
-	First issue of certificate

Figure 1: The water meter type MAGB2 – screw on the cover plate inside the electronic:

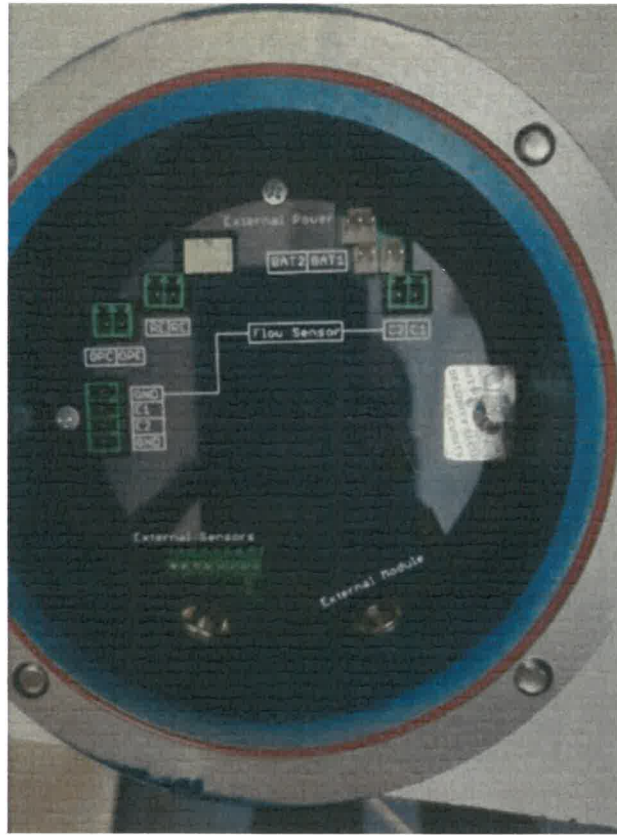


Figure 2: The water meter type MAGB2 – the screw covering the USB:



Figure 3: The water meter type MAGB2 – the label to the body and marks:



Figure 4: The water meter type MAGB2 – outputs:

