

OIML Member State
The Netherlands

Number R49/2013-A-NL1-21.04 revision 2
Project number 3575332
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Issuing authority
Person responsible: NMi Certin B.V.
M.Ph.D. Schmidt

Applicant and
Manufacturer: Badger Meter, Inc.
4545 West Brown Deer Road
Milwaukee, WI 53224
United States of America

Identification of the
certified type: An ultrasonic **water meter**
Type: E-Series G2®

Characteristics: See page 2 and further

This OIML Certificate is issued under scheme A.

This Certificate attests the conformity of the above identified type (represented by the sample(s) identified in the OIML Type Evaluation Report) with the requirements of the following Recommendation of the International Organization of Legal Metrology (OIML):

OIML R 49 (2013) "Water meters intended for the metering of cold potable water and hot water"

Accuracy class: 2

This Certificate relates only to the metrological and technical characteristics of the type of measuring instrument covered by the relevant OIML International Recommendation identified above. This Certificate does not bestow any form of legal international approval.

Important note: Apart from the mention of the Certificate's reference number and the name of the OIML Member State in which the Certificate was issued, partial quotation of the Certificate and of the associated OIML Type Evaluation Reports is not permitted, although either may be reproduced in full.

Issuing Authority: **NMi Certin B.V., OIML Issuing Authority NL1**
2 September 2022

Certification Board

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The conformity was established by the results of tests and examinations provided in the associated reports:

- No. NMI-2284950-01 dated 11 June 2021 that includes 120 pages.
- No. NMI-2619384-01 dated 21 January 2022 that includes 70 pages.

Characteristics of the measuring instrument

In Table 1 the general characteristics of the measuring instrument are presented.
Table 3 gives an overview of the general characteristics of the family of instruments.
The construction of the measuring instrument is recorded in the Documentation folder no. T12126-2.

Table 1 General characteristics

Measuring principle	Ultrasonic
Accuracy class	2
Environmental class	M1 / O (installed outdoors)
Electromagnetic environment	E1
Temperature range ambient	-25 °C / +55 °C
Water temperature class	T50 (+0,1 °C / +50 °C)
Maximum admissible pressure (MAP)	1,6 MPa (16 bar)
Orientation	All positions (Horizontal, vertical or diagonal)
Flow profile sensitivity class	U0 and D0 (0 x DN upstream and 0 x DN downstream)
Reverse flow	The sensor is not intended to measure reverse flow
Pressure loss class	Δp 25 (0,25 bar)
Power supply	Non-replaceable battery (3,2 – 3,6 V); Battery life 15 years
Software identification	See table 2
Characteristics of indicating device	See table 4

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Table 2 Software identification

Product Code	Firmware Platform	Firmware Version	Checksum *
0x0700	ARM - Standard Output	F 1.0.4414	0x6A4A 68EB
0x0702	ARM - Wire M-BUS	F 1.0.548	0xC8AD E86F
0x0703	ARM - Wireless M-BUS (434/868 MHz)	F 1.0.548	0x5FB7 298F
0x0701	ASIC - Ultrasonic transit time data	A 1.0.4414	0x 8580 or 0x 2BC7 **
		A 1.0.4491	0x B106 or 0x 62FF **

*) Only the lower 16-bits of the 32-bit calculations is displayed as stated in **bold**.

***) Two checksums are possible depending on the memory section used at that time.

Table 3 General characteristics of the family of instruments

Meter size	Flow rates [m ³ /h]				Ratio Q3/Q1
	Minimum Q1	Transitional Q2	Permanent Q3	Overload Q4	
DN15 ¹	0,0063	0,01	2,5	3,125	400
DN20 ¹	0,01	0,016	4	5	400
DN15 ²	0,0031	0,005	2,5	3,125	800
DN20 ²	0,005	0,008	4	5	800

Please note that the flow rates Q1, Q2, Q3 and Q4 can be freely chosen as long as:

- Values Q3 and ratio Q3/Q1 are selected from paragraph 4.1 of OIML R49-1: 2013(E);
- Values mentioned for Q1 and Q2 are minimum values and the ratio Q2/Q1 = 1,6;
- Values mentioned for Q3 and Q4 are maximum values and the ratio Q4/Q3 = 1,25;
- The ratio Q3/Q1 is at least 40.

Table 4 General characteristics of the indicating device

Meter size	Indicating range (minimum value) [m ³]	Verification scale interval (minimum resolution) [m ³]
DN15; DN20	9999,9999	0,00001

¹ The measurement sensor with element insert according to documentation number 12126/0-05.

² The measurement sensor with element insert according to documentation number 12126/1-01.

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Certificate history:

This revision replaces the previous version.

Revision	Date	Description of the modification
0	11 June 2021	Initial issue.
1	21 January 2022	Increasing flow rate ratio Q3/Q1 to R800 due to revised element insert
2	2 September 2022	ASIC firmware update to support alternate pressure transducer