OIML Certificate

OIML Member State
The Netherlands

Number R49/2013-A-NL1-21.03 revision 5
Project number 3891220

Issuing authority Person responsible:	NMi Certin B.V. M.Ph.D. Schmidt
Applicant	Badger Meter, Inc. 4545 West Brown Deer Road Milwaukee, WI 53224 United States of America
Manufacturer	Badger Meter Europe GmbH Nürtinger Straße 76 72639 Neuffen Germany
Identification of the certified type	An electromagnetic **water meter** Type: M5000
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):

R 49-1 (2013) "Water meters intended for the metering of cold potable water and hot water"

Accuracy class 1 and 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.

This certificate and supporting reports comply with the requirements of OIML-CS-PD-07 clause 6.2.

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 Report(s) is not permitted, although either may be reproduced in full.

Issuing Authority **NMi Certin B.V., OIML Issuing Authority NL1**
17 April 2024

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

- No. NMi-13200198-01 Revision 1 dated 7 July 2022 that includes 29 pages;
- No. NMi-3531004-01 revision 1 dated 4 July 2023 that includes 20 pages.
- No. NMi-3891220-01 dated 17 April 2025 that includes 19 pages.

Characteristics of the measuring instrument
In Table 1 the general characteristics of the measuring instrument are presented.
Tables 2 – 4 give an overview of the general characteristics of the family of instruments.
The construction of the measuring instrument is recorded in the Documentation folder no. T10554-3.

Table 1 General characteristics

Measuring principle	Electromagnetic flow metering
Accuracy class	1 and 2
Environmental class	M1 / O (installed outdoors)
Electromagnetic environment	E2
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 intended to measure reverse flow
Pressure loss class	Full bore meter Δp 10 (0,10 bar) Reduce bore Δp 40 (0,40 bar)
Power supply	Replaceable battery (2,9 – 3,7 V)
Software identification	See table 5

Table 2 General characteristics of the family of instruments with accuracy class 1

Meter size	Ø in- and outlet [mm]	Flow rates [m³/h]				Ratio Q3/Q1
		Minimum Q1	Transitional Q2	Permanent Q3	Overload Q4	
DN50	50	0,315	0,504	63	78,75	200
DN65	65	0,5	0,8	100	125	200
DN80	80	0,8	1,28	160	200	200
DN100	100	1	1,6	250	312,5	250
DN125	125	1,6	2,56	400	500	250
DN150	150	3,9375	6,3	630	787,5	160
DN200	200	6,25	10	1000	1250	160
DN250	250	10	16	1600	2000	160
DN300	300	15,625	25	2500	3125	160
DN350	350	15,625	25	2500	3125	160
DN400	400	25	40	4000	5000	160
DN450	450	39,375	63	6300	7875	160
DN500	500	39,375	63	6300	7875	160
DN600	600	50,400	80,640	6300	7875	125

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 3 General characteristics of the family of instruments with accuracy class 2

Meter size	Ø in- and outlet [mm]	Flow rates [m³/h]				Ratio Q3/Q1
		Minimum Q1	Transitional Q2	Permanent Q3	Overload Q4	
DN50	50	0,315	0,504	63	78,75	200
DN50 reduced bore*	50	0,158	0,25	63	78,75	400
DN65	65	0,5	0,8	100	125	200
DN65 reduced bore*	65	0,25	0,4	100	125	400
DN80	80	0,8	1,28	160	200	200
DN80 reduced bore*	80	0,4	0,64	160	200	400
DN100	100	1	1,6	250	312,5	250
DN100 reduced bore*	100	0,63	1,00	250	312,5	400
DN125	125	1,6	2,56	400	500	250
DN150	150	2,52	4,032	630	787,5	250
DN200	200	6,4	10,24	1600	2000	250
DN250	250	6,4	10,24	1600	2000	250
DN300	300	10	16	2500	3125	250
DN350	350	10	16	2500	3125	250
DN400	400	16	25,6	4000	5000	250
DN450	450	25,2	40,32	6300	7875	250
DN500	500	25,2	40,32	6300	7875	250
DN600	600	40	64	10000	12500	250

* For the reduced bore (RB) version, the size mentioned is the process connection size. On the inscriptions of the water meter the reduced bore meter will be identified as “DNxxx RB”.

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 [m³]	Verification scale interval [m³]
DN50	99.999	0,0001
DN65; DN80; DN100; DN125	999.999	0,001
DN150	999.999	0,01
DN200 till DN350	9.999.999	0,01
DN400 till DN500	9.999.999	0,1
DN600	99.999.999*	0,1

* This display indication range is only available with software revision 2.0.52 or later, other software versions shall not be used for meter size DN600

Table 5 Approved software versions

Software versions	CRC Checksum	Remarks
9.5.28	bdFc (OTP CRC) 63b5 (APP CRC)	-
2.0.30	0571 (OTP CRC) 1644 (APP CRC)	
2.0.33	0571 (OTP CRC) 7e5d (APP CRC)	
2.0.34	0571 (OTP CRC) 6D40 (APP CRC)	
2.0.35	0571 (OTP CRC) E151 (APP CRC)	
2.0.37	0571 (OTP CRC) 019A (APP CRC)	
2.0.38	0571 (OTP CRC) 6902 (APP CRC)	
2.0.40	0571 (OTP CRC) 7214 (APP CRC)	
2.0.42	0571 (OTP CRC) B459 (APP CRC)	
2.0.43	0571 (OTP CRC) 2191 (APP CRC)	
2.0.44	0571 (OTP CRC) 5ab6 (APP CRC)	

Software versions	CRC Checksum	Remarks
2.0.46	0571 (OTP CRC) E865 (APP CRC)	
2.0.50	0571 (OTP CRC) 3cc5 (APP CRC)	
2.0.51	0571 (OTP CRC) 6b5c (APP CRC)	
2.0.52	0571 (OTP CRC) 71ca (APP CRC)	
2.0.53	0571 (OTP CRC) 05A2 (APP CRC)	
2.0.54	0571 (OTP CRC) 1AD3 (APP CRC)	
2.0.55	0571 (OTP CRC) 48BE (APP CRC)	
2.0.56	0571 (OTP CRC) BFF6 (APP CRC)	
2.0.57	0571 (OTP CRC) 4C4E (APP CRC)	
2.0.58	0571 (OTP CRC) 846C (APP CRC)	
2.0.59	0571 (OTP CRC) 078E (APP CRC)	
2.0.60	0571 (OTP CRC) 1291(APP CRC)	

Production location
The water meter is produced at one of the following production locations:

- Badger Meter Czech Republic s.r.o.
  Maříkova 2082/26, 621 00 Brno, Czech Republic

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Certificate history:
This revision replaces the previous version.

Revision	Date	Description of the modification
Initial	11 January 2021	-
1	17 March 2022	Added production location.
2	15 June 2023	Extension of line sizes and additional software revisions
3	4 July 2023	Correction of small error in Q4 flowrate for DN600
4	17 May 2024	Correction of small error in Q4 flowrate for DN200/DN250
5	17 April 2025	Addition of the reduced bore version with ratio 400 and software version 2.0.60