

**OIML Member State**  
The Netherlands

Number R49/2013-A-NL1-20.01 revision 2  
Project number 2254799  
Page 1 of 9

Issuing authority  
Person responsible: NMi Certin B.V.  
M. Boudewijns

Applicant and  
Manufacturer: ABB Limited  
Oldends Lane  
GL10 3TA Stonehouse  
United Kingdom

Identification of the  
certified type: An electromagnetic **water meter**  
Type: AquaMaster4 FEW4XY.Z and FET4 \*

\*) With X being 1 or 3 (standard or enhanced), Y being 1, 2, 8 or 9 (integral/remote version, optionally sensor only) and Z being R (reduced bore), V (virtual full bore) or F (full bore).

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.

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**  
24 December 2020

#### Certification Board

This document is issued under the provision that no liability is accepted and that the applicant shall indemnify third-party liability.

The notification of NMi Certin B.V. as Issuing Authority can be verified at [www.oiml.org](http://www.oiml.org)

This document is digitally signed and sealed. The digital signature can be verified in the blue ribbon at the top of the electronic version of this certificate.



**OIML Member State**  
The Netherlands

Number R49/2013-A-NL1-20.01 revision 2  
Project number 2254799  
Page 2 of 9

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

- No. NMI-2254799-01 dated 14 August 2020 that includes 235 pages.
- No. NMI-2254799-03 dated 30 September 2020 that includes 44 pages.
- No. NMI-2254799-04 dated 24 December 2020 that includes 180 pages.

### Characteristics of the measuring instrument

In Table 1 the general characteristics of the measuring instrument are presented.

Table 2 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. T11851-3.

**Table 1 General characteristics**

Measuring principle	Electromagnetic
Accuracy class	1 and 2
Environmental class	B (installed in buildings) for flow transmitter O (installed outdoors) for flow sensor
Electromagnetic environment	E1
Temperature range ambient	+5 °C / +55 °C (for flow transmitter) -25 °C / +55 °C (for flow sensor)
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), except for full bore sizes DN250 and larger which have: U3 and D0 (3 x DN upstream and 0 x DN downstream)
Reverse flow	The sensor is intended to measure reverse flow
Pressure loss class	<u>Reduced bore:</u> - For sizes DN40 and DN50: $\Delta p$ 40 (0,40 bar) - For sizes larger than DN50: $\Delta p$ 63 (0,63 bar) <u>(Virtual) Full bore:</u> - For sizes DN40 and DN50: $\Delta p$ 10 (0,10 bar) - For sizes DN65 to DN200: $\Delta p$ 16 (0,16 bar) - For sizes DN250 and larger: $\Delta p$ 10 (0,10 bar)
Power supply	AC mains: 85 –240 VAC @ 50/60 Hz Renewable energy power (DC powered): 6 – 32 V Replaceable Battery: 3,6 V (operating range: 2,9 - 3,6 V)
Software identification	Version number: 03.00.03 with checksum: B26AFE6B Version number: 03.00.04 with checksum: 6E98963A
Checking facilities	Type P (permanent) automatic checking facility

**Table 2 General characteristics of the family of instruments**  
**Reduced bore - AC mains powered**

Meter size	Accuracy class	Flow rates [m <sup>3</sup> /h]				Ratio Q3/Q1
		Minimum Q1	Transitional Q2	Permanent Q3	Overload Q4	
DN40	1	0,05	0,08	25	31,25	500
	2	0,025	0,04	25	31,25	1000
DN50	1	0,08	0,128	40	50	500
	2	0,04	0,064	40	50	1000
DN65	1 & 2	0,063	0,1008	63	78,75	1000
DN80	1 & 2	0,1	0,16	100	125	1000
DN100	1	0,32	0,512	160	200	500
	2	0,16	0,256	160	200	1000
DN125	1	0,32	0,512	160	200	500
	2	0,16	0,256	160	200	1000
DN150	1 & 2	0,4	0,64	400	500	1000
DN200	1 & 2	0,63	1,008	630	787,5	1000
DN250	1	2	3,2	1000	1250	500
	2	1	1,6	1000	1250	1000
DN300	1	3,2	5,12	1600	2000	500
	2	1,6	2,56	1600	2000	1000
DN350	1	3,2	5,12	1600	2000	500
	2	1,6	2,56	1600	2000	1000
DN400	1 & 2	5	8	2500	3125	500
DN450	1 & 2	5	8	2500	3125	500
DN500	1	8	12,8	4000	5000	500
DN500	2	4	6,4	4000	5000	1000
DN600	1	12,6	20,16	6300	7875	500
DN600	2	6,3	10,08	6300	7875	1000

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;
- 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**  
**Reduced bore - Battery / Renewable energy powered**

Meter size	Accuracy class	Flow rates [m <sup>3</sup> /h]				Ratio Q3/Q1
		Minimum Q1	Transitional Q2	Permanent Q3	Overload Q4	
DN40	1 & 2	0,0625	0,1	25	31,25	400
DN50	1 & 2	0,1	0,16	40	50	400
DN65	1	0,39375	0,63	63	78,75	160
	2	0,1575	0,252	63	78,75	400
DN80	1	0,625	1	100	125	160
DN80	2	0,25	0,4	100	125	400
DN100	1	1	1,6	160	200	160
	2	0,4	0,64	160	200	400
DN125	1	1	1,6	160	200	160
	2	0,4	0,64	160	200	400
DN150	1 & 2	1	1,6	400	500	400
DN200	1 & 2	1,575	2,52	630	787,5	400
DN250	1	6,25	10	1000	1250	160
	2	2,5	4	1000	1250	400
DN300	1	10	16	1600	2000	160
	2	4	6,4	1600	2000	400
DN350	1	10	16	1600	2000	160
	2	4	6,4	1600	2000	400
DN400	1	15,625	25	2500	3125	160
DN400	2	12,5	20	2500	3125	200
DN450	1	15,625	25	2500	3125	160
DN450	2	12,5	20	2500	3125	200
DN500	1	100	160	4000	5000	40
DN500	2	40	64	4000	5000	100
DN600	1	157,5	252	6300	7875	40
DN600	2	63	100,8	6300	7875	100

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;

**OIML Member State**  
The Netherlands

Number R49/2013-A-NL1-20.01 revision 2  
Project number 2254799  
Page 5 of 9

- 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 family of instruments**  
**Full bore - AC mains powered**

Meter size	Accuracy class	Flow rates [m <sup>3</sup> /h]				Ratio Q3/Q1
		Minimum Q1	Transitional Q2	Permanent Q3	Overload Q4	
DN40	1 & 2	0,08	0,128	40	50	500
DN50	1 & 2	0,126	0,2016	63	78,75	500
DN65	1 & 2	0,2	0,32	100	125	500
DN80	1 & 2	0,32	0,512	160	200	500
DN100	1 & 2	0,5	0,8	250	312,5	500
DN125	1 & 2	0,5	0,8	250	312,5	500
DN150	1	2,52	4,032	630	787,5	250
	2	1,26	2,016	630	787,5	500
DN200	1	4	6,4	1000	1250	250
	2	2	3,2	1000	1250	500
DN250	1	6,4	10,24	1600	2000	250
	2	3,2	5,12	1600	2000	500
DN300	1	10	16	2500	3125	250
	2	5	8	2500	3125	500
DN350	1 & 2	40	64	4000	5000	100
DN400	1 & 2	40	64	4000	5000	100
DN450	1 & 2	63	100,8	6300	7875	100
DN500	1 & 2	63	100,8	6300	7875	100
DN600	1 & 2	63	100,8	6300	7875	100

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;
- 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 5 General characteristics of the family of instruments**  
**Full bore - Battery / Renewable energy powered**

Meter size	Accuracy class	Flow rates [m <sup>3</sup> /h]				Ratio Q3/Q1
		Minimum Q1	Transitional Q2	Permanent Q3	Overload Q4	
DN40	1	0,32	0,512	40	50	125
	2	0,16	0,256	40	50	250
DN50	1	0,504	0,8064	63	78,75	125
	2	0,252	0,4032	63	78,75	250
DN65	1 & 2	0,4	0,64	100	125	250
DN80	1 & 2	0,64	1,024	160	200	250
DN100	1 & 2	1	1,6	250	312,5	250
DN125	1 & 2	1	1,6	250	312,5	250
DN150	1	5,04	8,064	630	787,5	125
	2	2,52	4,032	630	787,5	250
DN200	1	8	12,8	1000	1250	125
	2	4	6,4	1000	1250	250
DN250	1	12,8	20,48	1600	2000	125
	2	6,4	10,24	1600	2000	250
DN300	1	20	32	2500	3125	125
	2	10	16	2500	3125	250
DN350	1 & 2	16	25,6	4000	5000	250
DN400	1 & 2	16	25,6	4000	5000	250
DN450	1 & 2	25,2	40,32	6300	7875	250
DN500	1 & 2	25,2	40,32	6300	7875	250
DN600	1	78,75	126	6300	7875	80
	2	39,375	63	6300	7875	160

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;
- 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 6 General characteristics of the indicating device**  
**Reduced bore – AC mains powered**

Meter size [mm]	Indicating range (maximum value) [m <sup>3</sup> ]	Indicating range (minimum value) [m <sup>3</sup> ]	Verification scale interval (maximum value) [m <sup>3</sup> ]
DN40, DN50, DN65	9999999	99999	0,0001
DN80	9999999	9999999	0,0001
DN100, DN125, DN150, DN200	9999999	9999999	0,001
DN250	9999999	9999999	0,001
DN300, DN350, DN400, DN450, DN500, DN600	9999999	9999999	0,01

**Table 7 General characteristics of the indicating device**  
**Reduced bore – Battery / Renewable energy powered:**

Meter size [mm]	Indicating range (maximum value) [m <sup>3</sup> ]	Indicating range (minimum value) [m <sup>3</sup> ]	Verification scale interval (maximum value) [m <sup>3</sup> ]
DN40, DN50	9999999	99999	0,0001
DN65	9999999	99999	0,001
DN80, DN100, DN125, DN150	9999999	9999999	0,001
DN200	9999999	9999999	0,01
DN250, DN300, DN350, DN400, DN450	9999999	9999999	0,01
DN500, DN600	9999999	9999999	0,1

**Table 8 General characteristics of the indicating device**  
**Full bore – AC mains powered**

Meter size [mm]	Indicating range (maximum value) [m <sup>3</sup> ]	Indicating range (minimum value) [m <sup>3</sup> ]	Verification scale interval (maximum value) [m <sup>3</sup> ]
DN40, DN50	9999999	99999	0,0001
DN65	9999999	9999999	0,0001
DN80, DN100, DN125, DN150	9999999	9999999	0,001
DN200, DN250, DN300	9999999	9999999	0,01

**OIML Member State**  
The Netherlands

Number R49/2013-A-NL1-20.01 revision 2  
Project number 2254799  
Page 8 of 9

Meter size [mm]	Indicating range (maximum value) [m <sup>3</sup> ]	Indicating range (minimum value) [m <sup>3</sup> ]	Verification scale interval (maximum value) [m <sup>3</sup> ]
DN350, DN400, DN450, DN500, DN600	9999999	9999999	0,1

**Table 9 General characteristics of the indicating device**  
**Full bore – Battery / Renewable energy powered:**

Meter size [mm]	Indicating range (maximum value) [m <sup>3</sup> ]	Indicating range (minimum value) [m <sup>3</sup> ]	Verification scale interval (maximum value) [m <sup>3</sup> ]
DN40, DN50	9999999	99999	0,001
DN65, DN80, DN100, DN125	9999999	999999	0,001
DN150	9999999	999999	0,01
DN200, DN250, DN300, DN350, DN400, DN450, DN500	9999999	9999999	0,01
DN600	9999999	9999999	0,1

### Production location

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

- ABB Limited  
Oldends Lane  
GL10 3TA Stonehouse  
United Kingdom (UK)
- ABB Engineering (Shanghai) Ltd.  
No. 4528, Kangxin Highway  
Pudong New District  
Shanghai, 201319  
P.R. China
- ABB Inc.  
125 E. County Line Road  
Warminster, PA 18974  
United States of America (USA)



**OIML Member State**  
The Netherlands

Number R49/2013-A-NL1-20.01 revision 2  
Project number 2254799  
Page 9 of 9

## Certificate history:

This revision replaces the previous version.

Revision	Date	Description of the modification
Initial	14 August 2020	First issue.
1	30 September 2020	Additional evaluation of reduced bore larger sizes up to DN600
2	24 December 2020	Additional evaluation of (virtual) full bore sensor and additional software version