DANAK
PROD Reg. No. 7026

FORCE Certification

EU-Type Examination Certificate

Measuring Instrument Directive

Certificate number: DK-0200-MI001-027

Issued by FORCE Certification A/S, Denmark
EU-notified body number 0200

In accordance with Directive 2014/32/EU of the European Parliament and Council of February 26, 2014 on measuring instruments (MID).

Issued to:	**ABB Limited** **Oldends Lane, Stonehouse** **GL10 3TA, Gloucestershire** **United Kingdom**
Type of instrument:	Water meter
Type designation:	AquaMaster Battery Powered Model MM/GA
Valid until:	31 December 2020
Number of pages:	12, including appendix
Date of issue:	20 April 2020
Version:	2 This new version of DK-0200-MI001-027 is an administrative extension of its validity period and it replaces the previous version.

Approved by

Lars Poder
Certification Manager

Processed by

Nikki Christoffersen
Examiner

The conformity markings may only be affixed to the above type approved equipment. The manufacturer's Declaration of Conformity may only be issued and the notified body identification number may only be affixed on the instrument when the production/product assessment module (D or F) of the Directive is fully complied with and controlled by a written inspection agreement with a notified body.
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FORCE Certification references: TASK no.: 120-22309.05 and ID. No.: 0200-MID-08349

Appendix to

EU-Type Examination Certificate
Measuring Instrument Directive

Number: DK-0200-MI001-027
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Version	Issue date	Changes
DK-0200-MI001-027	6 May 2019	Original certificate
DK-0200-MI001-027 ver 1	3 October 2019	Editorial change on page 7
DK-0200-MI001-027 ver 2	20 April 2020	Administrative extension of the validity period

Applied standards and documents:
OIML R 49:2006

The instruments/measuring systems shall correspond with the following specifications:

Type designation:
A family of cold-water meters named AquaMaster, utilising a common, electromagnetic principle and having the following characteristics:

AquaMaster Battery Powered Model MM/GA, Size DN40, DN50, DN80, DN100, DN150, DN200, DN250 & DN300.
Transmitter model FER2, Battery Powered and Explorer AM/E
Q_3/Q_1 (R) = 160 or 250.

Introduction:
This pattern of liquid measuring instrument is for measuring the volume of cold water which has passed through it. It relates to models of the AquaMaster battery powered family based on an electromagnetic measurement principle.

Functional description:
The AquaMaster consists of two main elements, the flow transmitter (calculator/indicator) and the flow sensor (meter). The transmitter is available in the "Explorer" form with an external battery pack and also the metal AquaMaster form with internal batteries´.

The flow transmitter may be mounted on the sensor or positioned separately (Figures 1, 2, 3, 4 and 5).

Technical documentation:
Reference No.: 120-22309.05, 119-25135.13 and 119-25135.04

Technical data

Flow Designation

Meters with Q_3/Q_1 = 160

DN	Q_4 [m³/h]	Q_3 [m³/h]	Q_2 [m³/h]	Q_1 [m³/h]
40	31	25	0.25	0.16
50	50	40	0.4	0.25
80	125	100	1	0.63
100	200	160	1.6	1
150	500	400	4	2.5
200	788	630	6.3	3.9
250	1,250	1,000	10	6.3
300	2,000	1,600	16	10

Table 1: Related flow rates according to DN

Meters with Q_3/Q_1 = 250

DN	Q_4 [m³/h]	Q_3 [m³/h]	Q_2 [m³/h]	Q_1 [m³/h]
40	31	25	0.16	0.1
50	50	40	0.26	0.16
80	125	100	0.64	0.4
100	200	160	1	0.63
150	500	400	2.56	1.6
200	788	630	4	2.5
250	1,250	1,000	6.4	4
300	2,000	1,600	10	6.3

Table 2: Related flow rates according to DN

Other Designations

Temperature class:	T30 (0.1 – 30 °C) Also tested T50 according to OIML R 49:2006
Orientation requirements:	None
Maximum admissible pressure (MAP):	16 bar
Pressure loss at Q_3:	0.25 bar max
Climatic environment:	-25 °C to +55 °C
Humidity:	Condensing / non-condensing
Mechanical environment:	M1
Electromagnetic environment:	E1
Location:	Integral or Remote (< 200 m cable)
Reverse flow:	Bi-directional measurement
Minimum straight length of inlet pipe:	0D (0)
Minimum straight length of outlet pipe:	0D (0)
Orientation:	Can be installed in any position
Power supply:	ABB Supplied Battery Pack U_{max}: Main Pack = 10 VDC Standby Pack = 5.1 VDC U_{min}: Main Pack = 6 VDC Standby Pack = 3.3 VDC Frequency: N/A

Software versions

	Software i.d.	Software version
Main Application	WAJC 2027	V2.46 or V2.48
Bootloader	WAJC 2009	V1.02
Update Application Manager (Non-GSM Version)	WAJC 2010	V1.04
Update Application Manager (GSM Version)	WAJC 2026	V1.27
Pre-Amp Sensor Memory	WAJC 2004	V1.04
Pre-Amp EEROM	WAJC 2033	V1.03

Interfaces and Peripheral Devices

Interfaces

The instrument may have the following interfaces:

(i) Digital Pulse Output
(ii) Scancoder Remote Reading Interface
(iii) RS232 Communications
(iv) Optional GSM Radio Communications
(v) Optional Pressure Transducer Connection

Peripheral Devices

The instrument may be connected to any peripheral device that has been issued with a test certificate or parts certificate by a Notified Body responsible for Annex B (MI-001) under Directive 2004/22/EC in any Member State and bears the CE marking of conformity to the relevant directives; or

A peripheral device without a test certificate may be connected under the following conditions:

- It bears the CE marking for conformity to the EMC Directive;
- It is not capable of transmitting any data or instruction into the flow meter, other than to check for correct data transmission or validation / verification;
- Any Pulse / Frequency Output receiving equipment;
- Alarm Contact Output receiving equipment;
- RS232 communications equipment
- Scancoder reader via wired connection or an individual pad

Approval Conditions

The certificate is issued subject to the following conditions:

The instrument bears the following legends:

- 'CE' marking
- Supplementary metrology marking
- Notified Body identification number
- Accuracy class
- Serial number
- Manufacturers mark or name
- Certificate number
- Permanent flow rate Q_3
- Flow rate range Q_3/Q_1 (R)

Location of Seals and Verification Marks

Securing the software – Explorer Form

After installation and commissioning, to prevent unauthorized modification of any parameters the transmitter must be put into "read-only" mode, which prevents login, thereby making all parameters read only. For this product, it is achieved by a wire link between two pins on the connector shown in Figure 6. ABB supplies either the plug WEBX0060 or adapter lead WEBC2025 which have this link made, as shown in Figure 7. The adapter is to facilitate connection of pressure transducers which do not have this "read only" shorting link already made.

The "read only" mode works on all interfaces including the GSM / SMS communication option.

Sealing the transmitter – Explorer Form

Anti-tamper seals should be fitted, as shown in Figure 8.

Securing the software – AquaMaster Metal Form

After installation and commissioning, to prevent unauthorized modification of any parameters the "read only" dip switch, must be set to "ON", which prevents login thereby making all parametes read only. As shown in Figures 9 and 10.

The "read only" mode works on all interfaces including the GSM / SMS communication option.

Sealing the transmitter – Explorer Form

Anti-tamper seals should be fitted, as shown in Figure 11.

Alternatives

Alternative manufacturing address:

ABB Engineering (Shanghai) Ltd.
No. 4528 KangXin Highway
201319 Shanghai
China

Illustrations

Figure 1 AquaMaster Explorer Remote Transmitters

Figure 2 AquaMaster Metal Form, Battery Powered, Remote Transmitter

Figure 3 AquaMaster Remote Sensor

Figure 4 AquaMaster Explorer Integral Flowmeter

Figure 5 AquaMaster, Metal Form, Integral Flowmeter

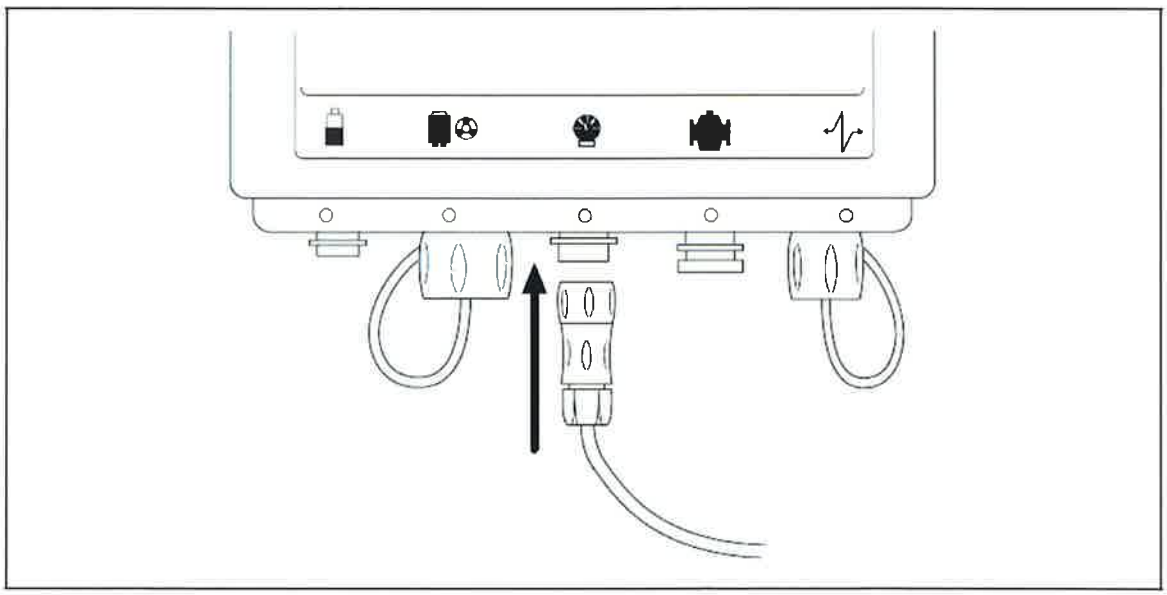

Figure 6 Explorer – Transmitter Read Only Connector Location

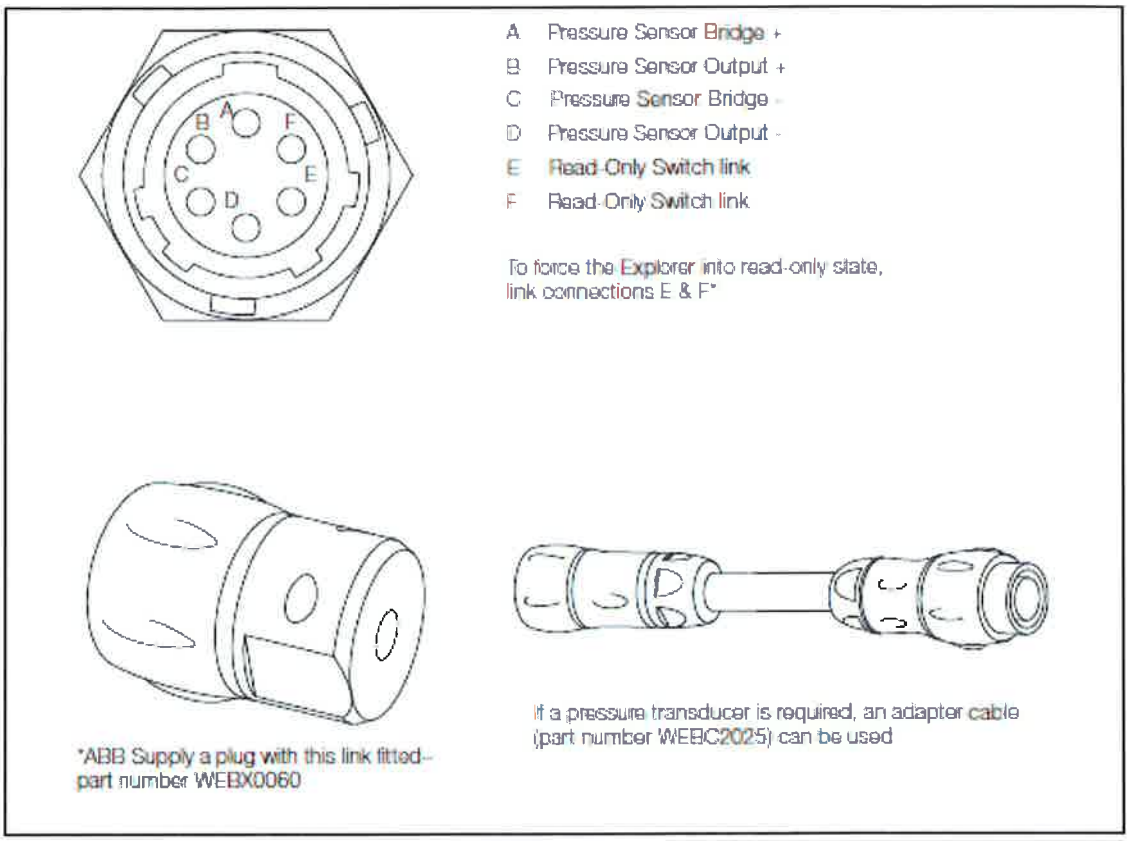

Figure 7 Explorer – Read Only shorting plugs

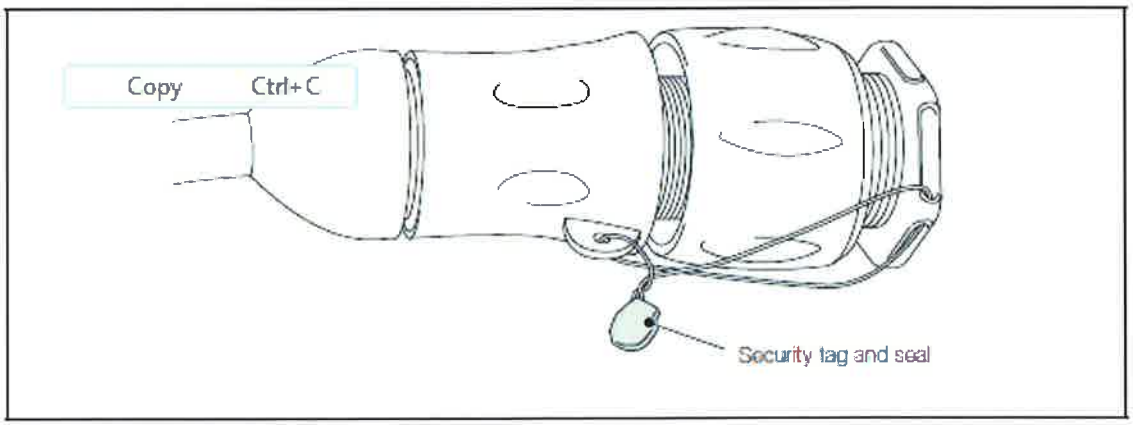

Figure 8 Explorer – Transmitter Read Only sealing

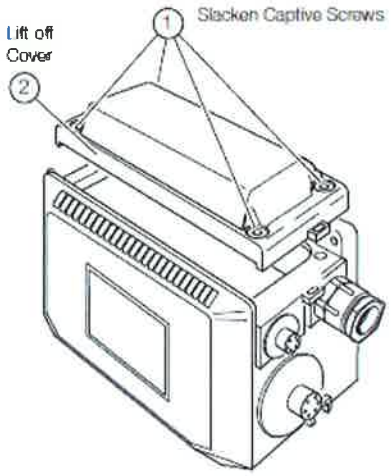

Figure 9 AquaMaster – Access to Read Only Switch

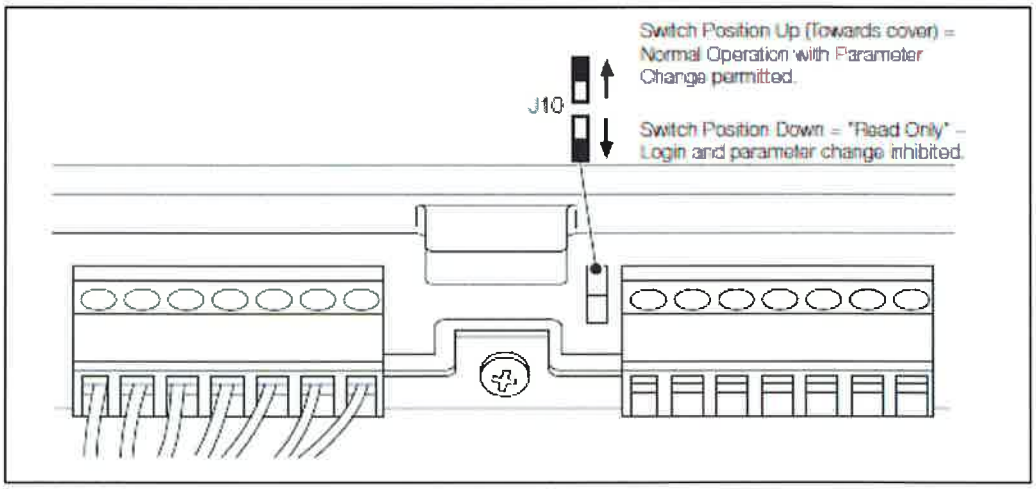

Figure 10 AquaMaster – Location and setting of the Read Only Switch

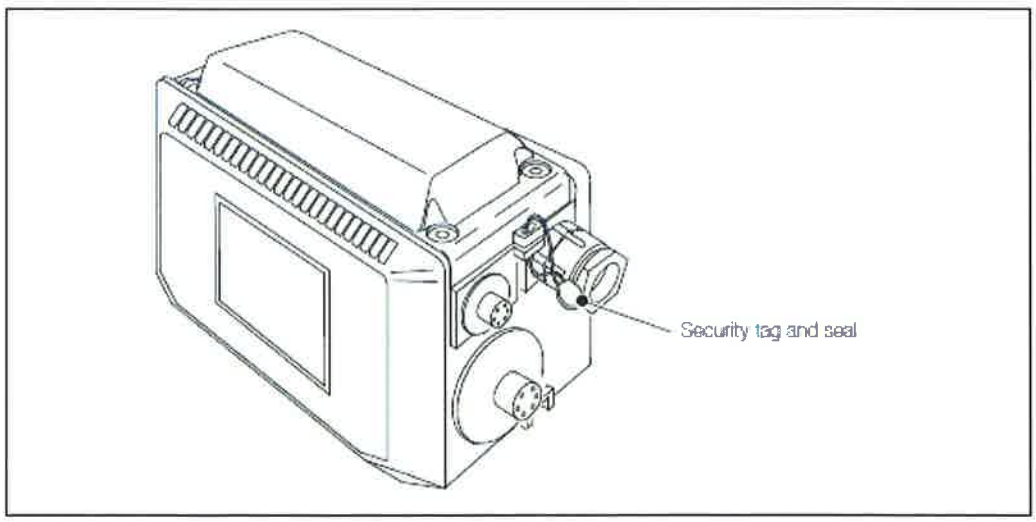

Figure 11 AquaMaster – Transmitter sealing