



# 1 TYPE EXAMINATION CERTIFICATE

2 Equipment or Protective systems intended for use in Potentially  
Explosive Atmospheres - Directive 94/9/EC

3 Type Examination Certificate No: FM10ATEX0036X  
4 Equipment or protective system: WaterMaster FEV, FEW, FEF and FET Electromagnetic  
(Type Reference and Name) Flowmeters

5 Name of Applicant: ABB Ltd

6 Address of Applicant: Oldends Lane  
Stonehouse, Gloucestershire, GL10 3TA  
United Kingdom

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and documents therein referred to.

8 FM Approvals Ltd. certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number:

3040495 dated 1<sup>st</sup> October 2012

9 Compliance with the Essential Health and Safety Requirements, with the exception of those identified in item 15 of the schedule to this certificate, has been assessed by compliance with the following documents:

EN 60079-0:2009 and EN 60079-15:2010

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment or protective system shall include:



II 3 G Ex nA IIC T5 Ta= -20 to +60 °C – Remote Transmitter and Integral Transmitter/Sensor  
II 3 G Ex nA IIC T5 Ta= -20 to +70 °C – Remote Sensor

**Mick Gower**  
Certification Manager, FM Approvals Ltd.

Issue date: 23<sup>rd</sup> September 2013

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals Ltd. 1 Windsor Dials, Windsor, Berkshire, UK. SL4 1RS  
T: +44 (0) 1753 750 000 F: +44 (0) 1753 868 700 E-mail: [atex@fmaprovals.com](mailto:atex@fmaprovals.com) [www.fmaprovals.com](http://www.fmaprovals.com)

# SCHEDULE

to Type Examination Certificate No. FM10ATEX0036X

## 13 Description of Equipment or Protective System:

The WaterMaster is an electromagnetic flowmeter that is supplied in two main forms; an integral transmitter and sensor version and a remote version which has a separate sensor assembly and transmitter.

The transmitter is available with three different input voltage ranges;

85 to 265 V AC at <7 VA;

Low Voltage version: 24 V AC +10%/-30% @ <7 VA /24 V  $\pm$  30% @<0.4 A

Three different input and output configuration options available, HART, ModBus and Profibus.

### ***FEF1a5cdefghijk1AnMpqrst WaterMaster Series F Flowmeter***

- a = Housing type: 1, 2, 8, or 9
- c = Bore Diameter: 600, 700, 760, 800, 900, 001, 051, 101, 201, 401, 501, 601, 801, 002, 202, 204, or 999
- d = Liner material: B, C, J, K, L, M, U, or Z
- e = Electrode design: 1 or 2
- f = Electrode material: C, D, E, S, or U
- g = Grounding accessories: 0, 1, 3, 4, 5, 6, or 9
- h = Process connection type: A1, A3, C1, C2, E0, E1, E2, E3, E4, E5, E6, E7, E8, J0, J1, J2, S0, S1, S2, S3, S4, or Z9
- i = Process connection material: B or Z
- j = Usage certifications: Single number (Not important for safety)
- k = Calibration type: Single digit (Not important for safety)
- n = Cable length: Single digit (Not important for safety)
- p = Protection Class: 1, 2, or 3
- q = Cable Conduits: A, B, D or F
- r = Power supply: 0, 1, 2, 3, or 4
- s = Input and Output Signal Type: A, G, or M
- t = Configuration Type/Diagnostics Type: Single number (Not important for safety)

### ***FEV1a5cvefghijk1AnMpqrst WaterMaster Series V Flowmeter***

- a = Housing type: 1, 2, 8, or 9
- c = Bore Diameter: 040, 050, 065, 080, 100, 125, 150, 200, 250 or 300
- e = Electrode design: 1 or 2
- f = Electrode material: C, D, E, S, or U
- g = Grounding accessories: 0, 1, 3, 4, 5 or 6
- h = Process connection type: A1, E0, E1, E2, E3, E4, E5, E6, S2, S3, S4, J0, or J1
- i = Process connection material: B or Z
- j = Usage certifications: Single number (Not important for safety)
- k = Calibration type: Single digit (Not important for safety)
- n = Cable length: Single digit (Not important for safety)
- p = Protection Class: 1, 2, or 3
- q = Cable Conduits: A, B, D or F
- r = Power supply: 0, 1, 2, 3, or 4
- s = Input and Output Signal Type: A, G, or M
- t = Configuration Type/Diagnostics Type: Single number (Not important for safety)

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## ***FEWab5defghijkl1AoMqBrstu WaterMaster Series ProcessMaster Sensor***

- a = Options: 1 or 3
- b = Housing type: 1, 2 or 8
- d = Bore Diameter: 003, 004, 006, 008, 010, 015, 020, 025, 032, 040, 050, 065, 080, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 750, 760, 800, 900, 001, 051, 101, 201, 351, 401, 501, 601, 651, 801, 951, 002, 202, or 204
- e = Liner material: A, E, F, H, J, K, L, M, P, S, or U
- f = Electrode design: 1, 2, 5 or 6
- g = Electrode material: A, C, D, E, F, G, H, J, K, N, S, T, or W
- h = Grounding accessories: 0, 1, 3, 4, 5, or 6
- i = Process connection type: A1, A3, A6, A7, A8, A9, B1, B3, C1, C2, C3, C4, D0, D1, D2, D3, D4, D5, D6, E0, E1, E2, E3, E4, E5, E6, E7, E8, J0, J1, J2, J3, S0, S1, S2, S3, or S4
- j = Process connection material: B, D or S
- k = Usage certifications: Single number (Not important for safety)
- l = Calibration type: Single digit (Not important for safety)
- o = Cable length: Single digit (Not important for safety)
- q = Protection Class: 1, 2, 3, or 7
- r = Cable Conduits : A, B, D or F
- s = Power supply: 0, 1, 2, 3, or 4
- t = Input and Output Signal Type: A, G, or M
- u = Configuration Type/Diagnostics Type: Single number (Not important for safety)

## ***FET1a51A0M1qrst WaterMaster Transmitter Only***

- a = Housing type: 1, or 2
- q = Cable Conduits : A, B, D or F
- r = Power supply: 1, 2, 3, or 4
- s = Input and Output Signal Type: A, G, or M
- t = Configuration Type/Diagnostics Type: Single number (Not important for safety)

### **14 Special Conditions for Safe Use:**

1. Suitable precautions to prevent mechanical damage to the remote terminal housing shall be taken if the enclosure is to be installed in an area of high mechanical danger.
2. The non-metallic material of the remote terminal housing may store electrostatic charge and become a source of ignition in applications with a low relative humidity <~30% relative humidity where the surface is relatively free of surface contamination such as dirt, dust, or oil. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in EN TR50404 and IEC TR60079-32 (in preparation). Cleaning of the surface should only be done with a damp cloth.
3. The temperature at the entry point of the transmitter and remote sensor under rated conditions is higher than 70 °C. Cables rated for 100°C should be used.

### **15 Essential Health and Safety Requirements:**

The relevant EHSRs that have not been addressed by the standards listed in this certificate have been identified and assessed in the confidential report identified in item 8.

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# SCHEDULE

to Type Examination Certificate No. FM10ATEX0036X

## 16 Test and Assessment Procedure and Conditions:

This Type Examination Certificate is the result of testing of a sample of the product submitted, in accordance with the provisions of the relevant specific standard(s), and assessment of supporting documentation. It does not imply an assessment of the whole production.

Whilst this certificate may be used in support of a manufacturer's claim for CE Marking, FM Approvals Ltd accepts no responsibility for the compliance of the equipment against all applicable Directives in all applications.

This Certificate has been issued in accordance with FM Approvals Ltd's ATEX Certification Scheme.

## 17 Schedule Drawings

A list of the significant parts of the technical documentation is annexed to this certificate and a copy has been kept by FM Approvals Ltd.

## 18 Certificate History

Details of the supplements to this certificate are described below:

Date	Description
1 <sup>st</sup> October 2012	Original Issue.
8 <sup>th</sup> November 2012	<u>Supplement 1:</u> Report Reference:.. 3040495rev120717 dated 16 <sup>th</sup> October 2012 and 3040495rev121003 dated 5 <sup>th</sup> October 2012 Description of the Change: 1. Update to allow alternate sensor body construction. 2. Change to Model code structure
23 <sup>rd</sup> April 2013	<u>Supplement 2:</u> Report Reference:.. 3040495rev130219 dated 16 <sup>th</sup> April 2013 Description of the Change: 1. Addition of a lockable remote terminal housing.
9 <sup>th</sup> July 2013	<u>Supplement 3:</u> Report Reference:.. 3040495rev130429 dated 2 <sup>nd</sup> July 2013 Description of the Change: 1. Update to Type 4 Remote Housing.
23 <sup>rd</sup> September 2013	<u>Supplement 4:</u> Report Reference:.. 3040495rev130710 dated 13 <sup>th</sup> September 2013 Description of the Change: 1. Alternative Metal Terminal Box added.

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# Blueprint Report

ABB LTD (1000000485)

Class No 3611

Original Project I.D. 3040495

Certificate I.D. FM10ATEX0036X

<u>Drawing No.</u>	<u>Revision Level</u>	<u>Drawing Title</u>	<u>Last Report</u>	<u>Electronic Drawing</u>
3KXF002002G0009	4	Type 4 Housing Remote	04-29-13	Yes (pdf)
3KXF002003G0009	3	Type 4 Housing Integral	3040495	Yes (pdf)
3KXF002004G0009	4	Type 4 Housing Remote	04-29-13	Yes (pdf)
3KXF002005G0009	3	Type 4 Housing Integral	3040495	Yes (pdf)
3KXF004000U0104	3	WaterMaster Type 4 Lid casting Drawing	3040495	Yes (pdf)
3KXF004000U0106	2	VM Type 4 Lid Painted	3040495	Yes (pdf)
3KXF004000U0400	1	Type 4 Lid Assembly	3040495	Yes (pdf)
3KXF004000U0401	1	Type 4 Lid Common Kit Build Assembly	3040495	Yes (pdf)
3KXF004001U0004	3	Type 4 Integral Base Casting	3040495	Yes (pdf)
3KXF004001U0006	3	Type 4 base intergral painted	3040495	Yes (pdf)
3KXF004001U0101	3	Type 4 Integral Base Machined to M20	3040495	Yes (pdf)
3KXF004001U0201	3	Type 4 Integral Base Machined to 1/2" NPT	3040495	Yes (pdf)
3KXF004003U0001	1	Type 4 Integral Base Common Build Kit	3040495	Yes (pdf)
3KXF004005U0004	2	VKJ Type 4 Remote Base Casting	04-29-13	Yes (pdf)
3KXF004006U0001	1	Type 4 Intergal Base with M5 inserts	3040495	Yes (pdf)
3KXF004008U0100	3	PLASTIC TERMINAL BOX COMMON KIT ASSEMBLY INSTRUCTIONS	19-Feb-13	Yes (pdf)
3KXF004008U0200	2	LOCKABLE PLASTIC TERMINAL BOX BASE DRAWING	19-Feb-13	Yes (pdf)
3KXF004013U0001	1	DN 40 MACHINED BODY AM/WATERMASTER	07/17/12	Yes (pdf)
3KXF004013U0004	1	DN 40 CAST BODY AM/WATERMASTER	07/17/12	Yes (pdf)
3KXF004014U0001	1	DN 50 MACHINED BODY AM/WATERMASTER	07/17/12	Yes (pdf)
3KXF004014U0004	1	DN 50 CAST BODY AM/WATERMASTER	07/17/12	Yes (pdf)
3KXF004015U0001	1	DN 65 MACHINED BODY AQUA/WATER/PROCESSMASTER	07/17/12	Yes (pdf)
3KXF004015U0004	1	DN 65 CAST BODY AM/WM/PROCESSMASTER	07/17/12	Yes (pdf)
3KXF004016U0001	1	DN 80 MACHINED BODY AM/WATERMASTER	07/17/12	Yes (pdf)
3KXF004016U0004	1	DN 80 CAST BODY AM/WATERMASTER	07/17/12	Yes (pdf)
3KXF004017U0001	1	DN 100 MACHINED BODY AM/WATERMASTER	07/17/12	Yes (pdf)
3KXF004017U0004	1	DN 100 CAST BODY AM/WATERMASTER	07/17/12	Yes (pdf)
3KXF004018U0001	1	DN 125 MACHINED BODY AQUA/WATER/PROCESSMASTER	07/17/12	Yes (pdf)
3KXF004018U0004	1	DN 125 CAST BODY AQUA/WATER/PROCESSMASTER	07/17/12	Yes (pdf)
3KXF004019U0001	2	DN 150 MACHINED BODY AM/WATERMASTER	07/17/12	Yes (pdf)
3KXF004019U0004	2	DN 150 CAST BODY AM/WATERMASTER	07/17/12	Yes (pdf)
3KXF004006U0100	1	Type 4 Integral M20 Base	3040495	Yes (pdf)
3KXF004006U0200	1	Type 4 Integral 1/2 NPT Base	3040495	Yes (pdf)
3kxf004000u0301	2	EMF TERMINAL BOX LID LOCKING VERSION	19-Feb-13	Yes (pdf)
3kxf004000u0501	2	PLASTIC TERMINAL BOX INTEGRAL EARTH ASSY.	19-Feb-13	Yes (pdf)
3kxf004002u0001	3	PLASTIC TERMINAL BOX NPT COMMON KIT ASSY	19-Feb-13	Yes (pdf)
3kxf004008u0007_drw	3	PLASTIC TERMINAL BOX M20 COMMON KIT ASSY	19-Feb-13	Yes (pdf)
KXF004005U0101	3	VKJ Type 4 Remote Base Machined - M20 Option	04-29-13	Yes (pdf)
KXF004005U0201	3	VKJ Type 4 Remote Base Machined - 0.5" NPT	04-29-13	Yes (pdf)
MJAG 9902	1	VKJ Type 4 Lid Seal	3040495	Yes (pdf)
MJAX9901	2	VKJ Cartridge Lid	3040495	Yes (pdf)
MJAX9902 SHT 1	2	VKJ Cartridge Body	3040495	Yes (pdf)
MJAX9902 SHT 2	2	VKJ Cartridge Body	3040495	Yes (pdf)
MJAX9903	2	VKJ Cartridge Base	3040495	Yes (pdf)
MJAX9956-1	1	VKJ Type 4 TX Insulation Sheet	3040495	Yes (pdf)
MJBX9930-1	1	VKJ Type 4 Integral Mounting Assembly	3040495	Yes (pdf)
MJFA9000DWG-1	2	VKJ Type 4 Transmitter Assembly	3040495	Yes (pdf)
MJFA9901-1	1	VKJ Cartridge AC & DC Assembly	3040495	Yes (pdf)
MJFA9911-1	1	VKJ Cartridge Lid Assembly	3040495	Yes (pdf)
MVEX0120	4	Product Codes FEV1, FEF1, & FET1 FEW1 and FEW3	3040495	Yes (pdf)
MVEX2520-1	3	WaterMaster VKJ TX FM/CSA/ATEX/IECEX Approval Drawings - Cartridge	3040495	Yes (pdf)
MVEX2521-1	2	WaterMaster VKJ TX FM/CSA/ATEX/IECEX Approval Drawings - Backplane	3040495	Yes (pdf)
MVEX2522-1	2	WaterMaster VKJ TX FM/CSA/ATEX/IECEX Approval Drawings - Sensor Memory	3040495	Yes (pdf)
TS1768-1	2	VKJ (WaterMaster) Transmitter Flash & Earth Continuity Test Specification	3040495	Yes (pdf)
WAAB2505	7	VKJ TX Data Label	3040495	Yes (pdf)
WAAB2543	6	Terminal Box Data label Sheet 2 & 3	3040495	Yes (pdf)
WAAB2552	1	VKJ ATEX / IECEX Label	3040495	Yes (pdf)
WABM2501-1	2	VKJ Transformer - DC	3040495	Yes (pdf)
WABM2502-1	2	VKJ Transformer - AC	3040495	Yes (pdf)