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UNITED KINGDOM CONFORMITY ASSESSMENT



TYPE EXAMINATION CERTIFICATE

2 **Equipment or Protective systems intended for use in Potentially Explosive Atmospheres – UKSI 2016:1107 (as amended)**

3 **Type Examination Certificate No:** FM21UKEX0136X

4 **Equipment or protective system: (Type Reference and Name)** FMT SensyMaster Thermal Mass Flowmeter with optional Hot Tap Device Accessory

5 **Name of Applicant:** ABB AG

6 **Address of Applicant:** Anna-Vandenhoeck-Ring 5
Gottingen D37081
Germany

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 product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Schedule 1 of the Regulations.

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

3059713-RR229063 dated 23rd August 2021

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 IEC 60079-0:2018, EN IEC 60079-7:2015+A1:2018, EN IEC 60079-18:2015+A1:2017,
EN 60079-26:2015, EN 60079-31:2014, EN ISO 80079-36:2016, EN ISO 80079-37:2016
and EN 60529:1991+A1:2000+A2:2013

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of 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 with the Regulations. Further requirements of the Regulations apply to the manufacturing process and supply of this product. These are not covered by this certificate.



Digitally signed by Victor Aluko-Oginni
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Foxit PhantomPDF Version: 10.1.5

Victor Aluko-Oginni
Certification Manager, FM Approvals Ltd.

Issue date: 25th November 2022

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F UKEX 029 (Jan/21)



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



FMT4*0*

II 3 G Ex ec IIC T6...T1 Gc

II 3 D Ex tc IIIC T80°C...Tmedium Dc

Ta = -20°C to +70°C (p = TA3) or Ta = -40°C to +70°C (p = TA9)

FMT4*2*

II 3 G Ex ec IIC T6 Gc

II 3 D Ex tc IIIC T80°C

Ta = -20°C to +70°C (p = TA3) or Ta = -40°C to +70°C (p = TA9)

FMT2*

II 3 G Ex ec mc IIC T6...T2 Gc

II 3 D Ex tc IIIC T85°C...Tmedium Dc

Ta = -20°C to +70°C (p = TA3) or Ta = -40°C to +70°C (p = TA9)

FMT09*

II 3 G Ex h IIC T6...T3 Gc

II 3 D Ex h IIIC T85°C...T150°C Dc

Ta = -20°C to 150°C

- 13 **Description of Equipment or Protective System:**

The FMT SensyMaster are a series of thermal mass flowmeters. The electronics enclosure is a cylindrical enclosure identified as a Type 3 or a single compartment rectangular housing identified as a Type 4. The remote sensor and the MinT design use an enclosure identified as a T-Box. The ambient temperature range for the transmitters and sensors is either -20°C to +70°C or -40°C to +70°C depending on the options chosen.

The FMT SensyMaster is available as integral and remote designs.

The FMT SensyMaster is used to convert the measurement signal of a gas flow into an electrical Signal. Depending on the version, the Flowmeter provides an analogue output Signal (4-20 mA) with digital communication (HART). Optional digital outputs and/or digital inputs are available. MODBUS and Profibus DP option cards can be fitted. The MinT version of the Flowmeter consists of an aluminum increased safety or dust protected enclosure. The sensor is intrinsically safe. The terminal compartment contains terminal boards for connection of the supply and Signal Circuits. The electronics compartment contains the electronic circuits and a display. The sensor works with a heating element and temperature sensors that measure the temperature of the flowing gas and the cooling of the heater due to the flowing gas.

Enclosure rating IP65, IP67, or IP68 depending on the option selected.

The FMT SensyMaster includes an optional Hot Tap Device assembly models FMT09*, with type of protection "h" for non-electrical equipment by constructional safety "c". The assembly is intended for integrated insertion and removal of the equipment probe, and is rated for process pressures up to 16 bar, with temperature ratings as detailed in the instructions.

Electrical parameters

FMT2*

24 V DC ± 20% (ripple: ≤ 5%) Pmax ≤ 10 W

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FMT4*

Power Supply (Terminals L and N)

$U_{DC} = 24\text{ V} \pm 20\%$ power supply ($=U_{Low}$); $P_{max} \leq 20\text{W}$; C, Ripple: $< 5\%$.

$U_{AC} = 100\text{V}(-15\%)$ to $240\text{V}(+10\%)$ power supply ($=U_{High}$); $S_{max} \leq 20\text{VA}$

See ABB Instruction Manual for the parameters for the Current Output, Digital Output, and Digital Input connections.

FMT430U2efghY0jY0Y.p SensyMaster Thermal Mass Flowmeter – Remote sensor

FMT450U2efghY0jY0Y.p SensyMaster Thermal Mass Flowmeter – Remote sensor

e = Measuring medium. Any two digits.

f = Sensor element type/Temperature range of measuring medium: A, B, or E

g = Mounting length/Flowmeter sensor material: Any single digit

h = Sensor connection: D3, G2 or F1

j = Connection design/Sensor housing material: A1, A2, U1 or U2

Additional information

p = Ambient temperature range: TA3 or TA9

FMT430U2efghijkl.m.n.L2.p SensyMaster Thermal Mass Flowmeter - Integral

FMT450U2efghijkl.m.n.L2.p SensyMaster Thermal Mass Flowmeter - Integral

e = Measuring medium. Any two digits.

f = Sensor element type/Temperature range of measuring medium: A, B, or E

g = Mounting length/Flowmeter sensor material: Any single digit

h = Sensor connection: D3, G2 or F1

i = Connection design, transmitter housing type, transmitter housing material, entry: S1 or S2.

j = Blank

k = Outputs: G0, G1, G2, G3, G4, G5, G6, G7, G8, G9, M1 or D1

l = Power supply: A or B

Additional information

m = Additional output 1: DRN, DRG, DRA, DRT, DRM or DRD

n = Additional output 2: DSN, DSG, or DSA

p = Ambient temperature range: TA3 or TA9

FMT430U2efghijkl.m.n.L2.p SensyMaster Thermal Mass Flowmeter - Integral

FMT450U2efghijkl.m.n.L2.p SensyMaster Thermal Mass Flowmeter - Integral

e = Measuring medium. Any two digits.

f = Sensor element type/Temperature range of measuring medium: A, B, or E

g = Mounting length/Flowmeter sensor material: Any single digit

h = Sensor connection: D3, G2 or F1

i = Connection design, transmitter housing type, transmitter housing material, entry: D1, D2, D3, D4, D5, D6, D7 or D8.

j = Blank

k = Outputs: G0, G1, G2, G3, G4, G5, G6, G7, G8, G9, M1 or D1

l = Power supply: A or B

Additional information

m = Additional output 1: DRN, DRG, DRA, DRT, DRM or DRD

n = Additional output 2: DSN, DSG, or DSA

p = Ambient temperature range: TA3 or TA9

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FMT432U2ikl.m.n.L2.p SensyMaster Thermal Mass Flowmeter - Transmitter
FMT452U2ikl.m.n.L2.p SensyMaster Thermal Mass Flowmeter - Transmitter

i = Connection design, transmitter housing type, transmitter housing material, entry: W1 or W2
k = Outputs: G0, G1, G2, G3, G4, G5, G6, G7, G8, G9, M1 or D1
l = Power supply: A or B
Additional information
m = Additional output 1: DRN, DRG, DRA, DRT, DRM or DRD
n = Additional output 2: DSN, DSG, or DSA
p = Ambient temperature range: TA3 or TA9

FMT432U2ikl.m.n.L2.p SensyMaster Thermal Mass Flowmeter - Transmitter
FMT452U2ikl.m.n.L2.p SensyMaster Thermal Mass Flowmeter - Transmitter

i = Connection design, transmitter housing type, transmitter housing material, entry: R1, R2, R3, R4, R5, R6, R7 or R8
k = Outputs: G0, G1, G2, G3, G4, G5, G6, G7, G8, G9, M1 or D1
l = Power supply: A or B
Additional information
m = Additional output 1: DRN, DRG, DRA, DRT, DRM or DRD
n = Additional output 2: DSN, DSG, or DSA
p = Ambient temperature range: TA3 or TA9

FMT230U2efghiM2B.I SensyMaster Thermal Mass Flowmeter - MinT
FMT250U2efghiM2B.I SensyMaster Thermal Mass Flowmeter - MinT

e = Measuring medium. Any two digits.
f = Sensor element type/Temperature range of measuring medium: A, B, or E
g = Mounting length/Flowmeter sensor material: Any single digit
h = Sensor connection: D3, G2 or F1
i = Connection design, transmitter housing type, transmitter housing material, entry: B1, B2, T1 or T2
Additional information
l = Ambient temperature range: TA3 or TA9

FMT09a(*) SensyMaster Hot Tap Device Accessory

a = Pipe Connections. 1, 2, or 4.
(*) = additional optional model code characters not affecting safety.

14 Specific Conditions of Use:

1. When used for a Group III application, the painted surface of the enclosures may store electrostatic charge and become a source of ignition in applications with a low relative humidity <~30% relative humidity where the painted 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 IEC 60079-32-1. Cleaning of the painted surface should only be done with a damp cloth.
2. The ambient temperature range, process temperature and applicable temperature class of the FMT SensyMaster is detailed in the manufacturer's Instruction Manual.

15 Essential Health and Safety Requirements:

In addition to the Essential Health and Safety Requirements covered by the standards listed at item 9, all other requirements are demonstrated in the confidential report identified in item 8.

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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 UKCA Marking, FM Approvals Ltd accepts no responsibility for the compliance of the equipment against all applicable Regulations in all applications.

This Certificate has been issued in accordance with FM Approvals Ltd's UKCA 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 the Approved Body.

18 Certificate History

Details of the supplements to this certificate are described below:

Date	Description
8 th September 2021	Original Issue.
11 th August 2022	<u>Supplement 1:</u> Report Reference: PR461155 dated 10th August 2022. Description of the Change: Update made to Standard EN 60079-26; Update made to O-ring material to a -40°C Temperature. Addition of Models FMT09* Hot Tap Device accessory and compliance with EN ISO 80079-36 and EN ISO 80079-37. Revised certificate Company Name and Address from ABB Automation Products GmbH Dransfelder Strasse 2 to ABB AG Anna-Vandenhoeck-Ring 5
26 th September 2022	<u>Supplement 2:</u> Report Reference: RR233847 dated 12 th September 2022. Description of the Change: Modification to the build to allow the Type 3 glued (EPL Gb and Db) window with EPL Gc and Dc applications.
25 th November 2022	<u>Supplement 3:</u> Report Reference: RR234759 dated 21 st November 2022. Description of the Change: Update to Model number.

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Blueprint Report

ABB AG (1000007035)

Class No 3610

Original Project I.D. 3059713

Certificate I.D. FM21UKEX0136X

<u>Drawing No.</u>	<u>Revision Level</u>	<u>Drawing Title</u>	<u>Last Report</u>
3KQR000392U0209	1	Transformer U-high technical data	3059713
3KQR00246U0109	2	Transformer Modbus technical data	3059713
3KQR00247U0109	1	Transformer U-low technical data	3059713
3KQR065003U0409	1	Transformer active supply module technical data	3059713
3KQZ002535U0109	2	Memory module	3059713
3KQZ400007U0150	1	EMC_T3_PCB	3059713
3KQZ400034U0150	2	Option Card CO II	3059713
3KQZ402011U0009	2	Motherboard Type4 pre assembled	3059713
3KQZ402013U0121	1	CCL_T3-MB-Ulow	3059713
3KQZ402013U0150	1	Motherboard Type3 PCB	3059713
3KQZ402013U0221	1	CCL_T3-MB-Uhigh	3059713
3KQZ406010U0122	6	HMI-Size-C PCB	3059713
3KQZ407001G0009	2	Type3 Assembly	3059713
3KQZ407002U0122	10	Option Card DO digital out	3059713
3KQZ407003U0122	10	Option Card DI digital in	3059713
3KQZ407004U0150	1	Option Card AS active supply	3059713
3KQZ407005U0109	1	Power supply cover	3059713
3KQZ407006U0109	1	EMC Type3 Insulation sheet	3059713
3KQZ407007U0109	1	EMC-cover	3059713
3KQZ407009U0109	2	T3 EMC Zone 1 feed through	3059713
3KQZ407058U0009	1	FEED-THROUGH-4POL wallbracket	3059713
3KQZ407059U0109	1	Feed-Through-8pol Cumulus	3059713
3KQZ407062U0109	1	T3 EMC Zone 2 feed through	3059713
3KQZ407128U0150	3	Option Card Modbus DP	3059713
3KXF000043G0009	1	PCB-specification	3059713
3KXF000047G0009	2	Type4 remote complete	3059713
3KXF000048G0009	3	Type4 integral complete	3059713
3KXF000090G0009	05	Description for Approval	RR234759
3KXF000094G0009	3	Installation diagram FMT	3059713
3KXF000095G0009	07	Instruction manual FMT400_200	RR234759
3KXF000096G0009	05	Model Number	RR234759
3KXF000097G0009	08	Name Plate drawing	RR234759
3KXF000098G0009	1	Portfolio FMT	3059713
3KXF000099G0009	2	warning labels FMT	3059713
3KXF000100G0009	11	List of Controlled Documents	PR461155
3KXF000106G0009	1	dielectrical test FMT200	3059713
3KXF000107G0009	1	dielectrical test FMT400	3059713
3KXF000122G0009	02	warning labels FMT09 hot tap	PR461155
3KXF000123G0009	02	Hot-Tapping device	PR461155
3KXF000139G0009	01	O-ring FMT	PR461155
3KXF002029G0009	01	SensyMster Risk Analyse EN ISO 80079-37	PR461155
3KXF002128G0009	01	SensyMster Risk Analyse EN ISO 80079-36	PR461155
3KXF002564U0009	3	Front End Assembly	3059713
3KXF002627G0009	2	T3 remote wall mounted	3059713
3KXF002629G0009	1	T-Box remote Assembly	3059713
3KXF002630G0009	2	Slide In MINT Assembly	3059713
3KXF002631G0009	2	T-Box complete MINT	3059713
3KXF002632G0009	6	T-Box remote complete	3059713

3KXF002633G0009	1	dielectrical test FMT	3059713
3KXF002800U1150	2	Front End Board PCB	3059713
3KXF002801U1121	1	FEB_Cumulus_CCL-ZN1	3059713
3KXF002801U1221	1	FEB_Cumulus_CCL-ZN2	3059713
3KXF002802U1150	1	FM-Connection-board-PCB	3059713
3KXF002803U0009	1	FM-Connection-Board-Assembly	3059713
3KXF002860G0009	1	temperature measurement points	3059713
3KXF002861G0009	03	SensyMaster_system overview	PR461155
3KXF002862G0009	1	SensyMaster_Sensor electrical wiring	3059713
3KXF002863G0009	1	SensyMaster complete	3059713
3KXF002953U0150	1	Terminal-board Remote PCB	3059713
3KXF003060G0109	4	Terminal-board MINT PCB	3059713
3KXF003071U0009	2	Slide In Remote pre assembled	3059713
3kxf000143G0009	01	Type3 instead Type4 enclosure FMT4	RR233847
IIG-AD-0012	1	RR-potting elastosil RT745S	3059713
IIG-AD-0015	1	varnishing instructions of PCBs	3059713
IIG-AD-0016	1	Motherboard Type4 cover	3059713
IIG-AD-0020	1	Potting material preparation FMT4 - FMT2	3059713