1 EU-TYPE EXAMINATION CERTIFICATE

2 **Equipment or Protective systems intended for use in Potentially Explosive Atmospheres - Directive 2014/34/EU**

3 **EC-Type Examination Certificate No:** **FM14ATEX0016X**

4 **Equipment or protective system: (Type Reference and Name)** **CoriolisMaster Mass Flowmeter FCB1* and FCH1***

5 **Name of Applicant:** **ABB AG**

6 **Address of Applicant:** **Anna-Vandenhoeck-Ring 5**
37081 Göttingen,
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 Europe Ltd, notified body number 2809 in accordance with Article 17 of Directive 2014/34/EU of 26 February 2014 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:

3052875 dated 04th August 2014

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 60079-7:2015+A1:2018, EN 60079-11:2012, EN 60079-18:2015+A1:2017
EN 60079-31:2014 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 EU-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the Directive 2014/34/EU. 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 2/1 G Ex eb ia mb IIC T*…T2 Ga/Gb	when option d = A1
II 2 D Ex ia tb IIIC T* °C…Tmed Db	when option d = A1
II 2 D Ex tb IIIC T*°C…Tmed Db	when option d = A2

* See Specific Conditions of Use

See description for ambient temperature options

Martin Crowe
Certification Manager, FM Approvals Europe Ltd.

Issue date: 06th April 2022

FM Approvals Europe Limited, One Georges Quay Plaza, Dublin. Ireland. D02 E440
T: +353 (0) 1761 4200 E-mail: atex@fmapprovals.com www.fmapprovals.com

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

The CoriolisMaster Mass flowmeter system is comprised of a Flowmeter Primary and a Transmitter (converter/secondary). The flowmeter primary is installed in the pipeline while the Transmitter for evaluating the flow signals. The CoriolisMaster is available as an Integral Design and the transmitter is directly mounted on the primary. Protection is provided by encapsulation with intrinsically safe output to the sensor coils. Termination is made via increased safety terminals. The enclosure is manufactured from either stainless steel or aluminium alloy.

The ambient temperature range for the CoriolisMaster Mass Flowmeter FCB1* and FCH1* indicated by Option n is;

-20 °C to +70 °C when n = TA3
-40 °C to +55 °C when n = TA8
-40 °C to +70 °C when n = TA9

The temperature class is dependent on the ambient temperature range and also the process temperature. The process temperature range is between -40 °C and 205 °C

Ingress protection rating
IP65, IP67 or IP68

Electrical parameters
Supply; Terminals 1+, 2- U = 11- 30 V dc Imax < 380 mA Pmax < 5 W

	Non-intrinsically safe connections		Intrinsically safe connections					
	(V)	(mA)	V_{max_O} (V)	I_{max_O} (mA)	P_O (mW)	C_O (nF)	$C_{O\ PA}$ (nF)	L_O (µH)
Modbus, active Terminals A, B	30	30	4.2	150	150	13900	0	20
			Vmax (V)	Imax (mA)	P_I (mW)	C_I (nF)	$C_{I\ PA}$ (nF)	L_I (µH)
			4.2	150	150	13900	0	20
Digital output 1 DO1, passive Terminals 41/42	30	25	30	25	187	20	0	200
Digital output 2 DO2, passive Terminals 51/52	30	25	30	25	187	20	0	200

FCa1cdY0fghijklm.n.TF1.p.q Coriolis Mass Flowmeter

a = Product family; B or H
c = Tiers; 30, 50, 70 or 80.
d = Explosion Protection Certification; A1 or A2
f = Meter Size/Connection size; Any Connection Size up to DN150; three numbers plus two letters.
g = Process Connection Type; Any two digit character
h = Material of wetted parts; A1, A2, H1, H2, C1, C2, C3, C4, T1 or L1
i = Flow calibration; Any single letter
j = Density calibration; Any single number
k = Connection design/Transmitter housing type/transmitter housing material/cable glands; B1, B2, T1, T2, T3 or T4
l = Outputs; M2 or Y0
m = Power supply; C or Y

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n = Ambient temperature range; TA3, TA8 or TA9
p = Extended Tower Length; TE1, TE2, or TE3
q = Pressure resistant housing; PR4, PR5, PR6 or PR7
Note: Option q is optional and may not be marked.

14 **Specific Conditions of Use:**

1. The ambient temperature range, process temperature and applicable temperature class of the CoriolisMaster is detailed in the applicable Instruction Manual.

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.

16 **Test and Assessment Procedure and Conditions:**

This EU-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 Europe 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 Europe 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 the Notified Body.

18 **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
05th August 2014	Original Issue.
29th July 2016	Supplement 1: Report Reference: 3051312 dated 26th July 2016. Description of the Change: 1. Increase of maximum permitted ambient temperature to 70 °C.
16th November 2016	Supplement 2: Report Reference: RR206812 dated 03rd November 2016. Description of the Change: Addition of alternative potting material; removal of spacers in potted version, updated standards.
08th April 2019	Supplement 3: Report Reference: RR216984 dated 25th February 2019. Description of the Change: Addition of manufacturing locations related label documentation. Certificate transferred from FM Approvals Ltd., notified body no. 1725, to FM Approvals Europe Ltd., notified body no. 2809.

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Date	Description
16th August 2019	Supplement 4: Report Reference: – PR450152 dated 06th August 2019. Description of the Change: 1. Gap analysis performed to bring standards up to the latest edition. 2. Addition of a Sensor assembly for Marine applications. 3. Energy Limitation parameter changes to the terminal Board I/O used with MODBUS/DP 4. Change type of Zone 2 protectioin from “nA” to “ec”
06th April 2022	Supplement 5: Report Reference: – RR229562 dated 30th March 2022. Description of the Change: Company name and address change.

Blueprint Report

ABB AG (1000007035)

Class No 3610

Original Project I.D. 3051312

Certificate I.D. FM14ATEX0016X

Drawing No.	Revision Level	Drawing Title	Last Report
3KQR020700U0609	01	Transformer Specification MinT	3052875
3KXF000085G0009	02	Additional Name Plate Drawing Re-location	RR216984
3kxf000001G0009	03	CoriolisMaster complete	PR450152
3kxf000005G0009	04	temperature data	PR450152
3kxf000006G0009	01	Sensor electrical wiring	3051312
3kxf000011G0009	05	Warning label FCB MINT	PR450152
3kxf000012G0009	16	name plates	RR229562
3kxf000013G0009	14	Instruction manual MINT	RR229562
3kxf000014G0009	08	Installation diagram FCB MINT	PR450152
3kxf000015G0009	07	Description FC_4WCTW_PlatformMINT	3053232
3kxf000016G0009	13	Description FC_4WCTW_CoriolisMINT	RR229562
3kxf000045G0009	01	CoriolisMaster complete	3053232
3kxf000046G0009	01	FM connection board assembly	3053232
3kxf000072G0009	01	Model number	PR450152
3kxf000103G0009	01	Sensor PCB DN80-150	PR450152
3kxf000117G0009	01	Sensor interconnection board	RR229562
3kxf002175u0009	03	coils intrinsically safe	3051312
3kxf002189u0009	02	Sensor+Inter AP	3051312
3kxf002395G0009	03	Portfolio FCB	PR450152
3kxf002398U0109	06	Coriolis Front End Board A1 wire	3051312
3kxf002535U0109	02	Memory Module	3051312
3kxf002568U0009	01	T-Box housing	3051312
3kxf002600U0009	01	FM Connection Board Schematic	3051312
3kxf002617G0009	02	Slide In MINT	3051312
3kxf002618G0009	04	T-box complete	3051312
3kxf002630G0009	02	Slide In MINT	RR206812
3kxf002631G0009	01	T-Box complete	3053232
3kxf002900G0109	04	Terminal Board MINT	PR450152
3kxf002905U0009	01	FM Connection Board assembly	3051312
3kxf003060G0109	03	TerminalBoard_MinT	3053232
3kxf003061U0109	05	BOM MinT	PR450152
3kxf003062U0122	02	Coriolis_Front End Board_A1_wire	3053232
3kxf003080U0109	01	Sensor PCB DN15	PR450152
3kxf003080U0209	01	Sensor PCB DN25	PR450152
3kxf003080U0309	01	Sensor PCB DN50	PR450152
3kxf003388u0009	01	Coils IS update	3051312