

# 1 EU-TYPE EXAMINATION CERTIFICATE



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

3 EU-Type Examination Certificate No: FM15ATEX0015X

4 Equipment or protective system: Series FCB4\*\*\*, FCH4\*\*\* CoriolisMaster Mass Flowmeters  
(Type Reference and Name) and FCT4\*\*\* CoriolisMaster Transmitters

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:

3050239 dated 22<sup>nd</sup> October 2015

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 60079-1:2014, EN IEC 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:



## **FCT4\* – Transmitter only**

II 2(1) G Ex db eb ia mb [ia Ga] IIC T6...T1\* Gb  
II 2(1) D Ex ia mb tb [ia Da] IIIC T80°C\* Db  
(Transmitter Housing Type = R1, R2, R3 or R4)

**Martin Crowe**  
Certification Manager, FM Approvals Europe Ltd.

Issue date: 22<sup>nd</sup> July 2022

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

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



**FCT4\* – Transmitter only**

II 2(1) G Ex db ia mb [ia Ga] IIB+H<sub>2</sub> T6...T1\* Gb  
II 2(1) D Ex ia tb [ia Da] IIIC T80°C\* Db  
(Transmitter Housing Type = R5, R6, R7 or R8)

**FCB4\*/FCH4\* - Integral Transmitter and Sensor**

II 1/2(1)G Ex db eb ia mb [ia Ga] IIC T6...T1\* Gb  
II 2(1)D Ex ia tb [ia Da] IIIC T80°C\* Db  
(Connection design = Y0 and Transmitter Housing Type = D1, D2, D3 or D4)

**FCB4\*/FCH4\* - Integral Transmitter and Sensor**

II 1/2(1)G Ex db ia mb [ia Ga] IIB+H<sub>2</sub> T6...T1\* Gb  
II 2(1)D Ex ia tb [ia Da] IIIC T80°C\* Db  
(Connection design = Y0 and Transmitter Housing Type = D5, D6, D7 or D8)

**FCB4\*/FCH4\* - Remote Sensor**

II 1/2 G Ex eb ia mb IIB+H<sub>2</sub> T6...T1\* Ga/Gb  
II 2 D Ex ia tb IIIC T80°C\* Db  
(Connection design = U1, U2, A1, or A2 and Transmitter Housing Type = Y0)

**FCT4\* – Transmitter only (option I = M6 n = DRH or m = DSH)**

II 2 G Ex db eb mb IIC T6...T1\* Gb  
II 2 D Ex mb tb IIIC T80°C\* Db  
(Transmitter Housing Type = R1, R2, R3 or R4)

**FCT4\* – Transmitter only (option I = M6 n = DRH or m = DSH)**

II 2 G Ex db mb IIB+H<sub>2</sub> T6...T1\* Gb  
II 2 D Ex tb IIIC T80°C\* Db  
(Transmitter Housing Type = R5, R6, R7 or R8)

**FCB4\*/FCH4\* - Integral Transmitter and Sensor (option I = M6 n = DRH or m = DSH)**

II 1/2 G Ex db eb mb IIC T6...T1\* Gb  
II 2 D Ex tb IIIC T80°C\* Db  
(Connection design = Y0 and Transmitter Housing Type = D1, D2, D3 or D4)

**FCB4\*/FCH4\* - Integral Transmitter and Sensor (option I = M6 n = DRH or m = DSH)**

II 1/2 G Ex db mb IIB+H<sub>2</sub> T6...T1\* Gb  
II 2 D Ex tb IIIC T80°C\* Db  
(Connection design = Y0 and Transmitter Housing Type = D5, D6, D7 or D8)

\*Ambient temperature range dependent on options TA1, TA3, TA4 or TA9 between -40°C and +70°C

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

The CoriolisMaster FCx4 flowmeters are designed to measure gases and fluid flow in process pipelines using the Coriolis Effect. All signal outputs are available in 4 to 20mA and HART or Modbus/ProfibusDP communications. The electronics enclosure is a dual compartment cylindrical stainless steel or aluminium alloy enclosure identified as a Type 3. (FM09ATEX0001U). The terminal compartment of the electronics enclosure is protected by either increased safety or flameproof depending on the configuration.

The CoriolisMaster is available as an integral version with the electronics housing mounted directly to the

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sensor and as a remote version.

The remote version of the transmitter has a separate terminal compartment for connection to the sensor. The remote sensor has a separate terminal compartment which also includes processing electronics.

In both the remote and integral versions the electrical part are not in direct contact with the process medium.

A number of customer replaceable option cards are available for the different communications options.

The sensor is available in two different versions: Process Sensor and Hygienic Sensor. The Sensor is available in meter sizes DN15 to DN150. The medium temperature range for the Sensor is -50°C to 205°C. Further details are provided in the ABB Instruction Manual.

Ambient Temperature ranges;

-20°C ≤ Ta ≤ 60°C Option Code = TA1

-40°C ≤ Ta ≤ 60°C Option Code = TA4

-20°C ≤ Ta ≤ 70°C Option Code = TA3

-40°C ≤ Ta ≤ 70°C Option Code = TA9

Enclosure rating (Integral and transmitter): IP65, IP67

Enclosure rating (Remote sensor): IP65, IP67, IP68

## **Electrical ratings**

For Model numbers;

FCa4cdefghijklA U/fnom: 110-230V ac, 50/60Hz Smax: <25VA

FCa4cdefghijklC U/fnom: 11-30 V dc, Pmax: <20W

For the intrinsically safe communications connections see Installation drawing 3KXF000028G0009.

The following options are available:

## ***FCa4cA1Y0fghijklm.n.o.p.q.r.s.t CoriolisMaster – Integral Transmitter and sensor***

a = B or H

c = 30, 50, 70, 80

f = Meter size/Connection size; 5-digit alpha-numeric code

g = Process Connection Type; 2-digit alpha-numeric code

h = Material of wetted parts; A1, A2, H1, H2, C1, C2, T1 or L1

i = Flow calibration; single digit alpha numeric code – not critical to safety

j = Density Calibration; single digit numeric code – not critical to safety

k = Connection Design/Transmitter Housing Type/Transmitter Housing Material/ Cable Glands; D1, D2, D3, D4, D5, D6, D7, or D8

l = Outputs; D1, G0, G1, G2, G3, G4, G5, G6, G7, G8, G9, M1, M6 or Y0

m = Power Supply; A or C

Optional (Each option is separated by a "." and may be in any order);

n = Additional Output 1; DRN, DRG, DRA, DRM, DRD, DRH or DRT

o = Additional Output 2; DSN, DSG, DSA, or DSH

p = Integrated Digital Display; L2

q = Pressure Rating of Secondary Sensor Secondary Containment; PR4, PR5, PR6, or PR7

r = Ambient temperature range; TA1, TA3, TA4, or TA9

s = Fluid temperature range; TF1, TF2, TF6 or TF7

t = Extended Tower length; TE1, TE2, or TE3

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FM Approvals Europe Limited, One Georges Quay Plaza, Dublin. Ireland. D02 E440

T: +353 (0) 1761 4200 E-mail: [atex@fmaprovals.com](mailto:atex@fmaprovals.com) [www.fmaprovals.com](http://www.fmaprovals.com)



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## ***FCa4cA1efghijY0m.q.r.s.t CoriolisMaster – Remote Sensor***

a = B or H

c = 30, 50, 70, 80

e = Connection Design/Connection Box Material/Cable glands; U1, U2, A1 or A2

f = Meter size/Connection size; 5-digit alpha-numeric code

g = Process Connection Type; 2-digit alpha-numeric code

h = Material of wetted parts; A1, A2, H1, H2, C1, C2, T1 or L1

i = Flow calibration; 2-digit alpha code – not critical to safety

j = Density Calibration; 2-digit numeric code – not critical to safety

m = Power Supply; Y

Optional (Each option is separated by a “.” and may be in any order);

q = Pressure Rating of Secondary Sensor Secondary Containment; PR4, PR5, PR6, or PR7

r = Ambient temperature range; TA1, TA3, TA4, or TA9

s = Fluid temperature range; TF1 TF2, TF6 or TF7

t = Extended Tower length; TE1, TE2 or TE3

## ***FCT4cA1klm.n.o.p.r CoriolisMaster – Transmitter only***

c = 30, 50, 70, 80

k = Connection Design/Transmitter Housing Type/Transmitter Housing Material/ Cable Glands; R1, R2, R3, R4, R5, R6, R7, or R8

l = Outputs; D1, G0, G1, G2, G3, G4, G5, G6, G7, G8, G9, M1, M6 or Y0

m = Power Supply; A or C

Optional (Each option is separated by a “.” and may be in any order);

n = Additional Output 1; DRN, DRG, DRA, DRM, DRD, DRH or DRT

o = Additional Output 2; DSN, DSG, DSA, or DSH

p = Integrated Digital Display; L2

r = Ambient temperature range; TA1, TA3, TA4, or TA9

## **14 Specific Conditions of Use:**

1. The painted surface of the CoriolisMaster Flowmeters may store electrostatic charge and become a source of ignition in applications with a low relative humidity (<~30% relative humidity) even 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 PD CLC/TR 60079-32-1 and IEC TS 60079-32-1. Cleaning of the painted surface should only be done with a damp cloth.
2. The ABB Instruction Manual for the CoriolisMaster FCB4 and FCH4 details the permitted Temperature Classification and Ambient Temperature ratings as influenced by the Process Medium temperature.
3. Contact the manufacturer for specific flamepath joint details during repair of flameproof Ex d apparatus.

## **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

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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
23 <sup>rd</sup> October 2015	Original Issue.
12 <sup>th</sup> April 2016	Issue 2 – Drawing number in Description of Equipment or Protective System corrected.
02 <sup>nd</sup> November 2016	<u>Supplement 1:</u> Report Reference: RR206813 dated 24 <sup>th</sup> October 2016. Description of the Change: Add optional potting material for the EMC board and the Slide-in. Outline of EMC board is increased. Eliminate use of spacers for Potted version. Update certificate to EU format.
11 <sup>th</sup> January 2019	<u>Supplement 2:</u> Report Reference: 3063079 dated 20 <sup>th</sup> December 2018. Description of the Change: Addition of Option Card Active supply, Option Card CO current out, Option Card Modbus Profibus DP and Marine meter installation.
08 <sup>th</sup> April 2019	<u>Supplement 3:</u> Report Reference: RR216984 dated 25 <sup>th</sup> 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.
28 <sup>th</sup> May 2019	<u>Supplement 4:</u> Report Reference: RR217985 dated 21 <sup>st</sup> May 2019. Description of the Change: Model code change. Error in standard designation for EN IEC 60079-7 corrected.
23 <sup>rd</sup> April 2021	<u>Supplement 5:</u> Report Reference: PR457503 dated 12 <sup>th</sup> April 2021. Description of the Change: Update to add EN IEC 60079-0:2018. Drawing update, corrections to the model codes.
22 <sup>nd</sup> July 2022	<u>Supplement 6:</u> Report Reference: PR459095 dated 20 <sup>th</sup> June 2022. Description of the Change: Addition of Active Pulse Output option card. Change of company name and address.

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# Blueprint Report

## ABB AG (1000007035)

Class No 3610

Original Project I.D. 3050239

Certificate I.D. FM15ATEX0015X

<u>Drawing No.</u>	<u>Revision Level</u>	<u>Drawing Title</u>	<u>Last Report</u>
3KQR000392U0209	02	Transformer Modbus APO II	PR459095
3KQR001185U0109	02	Digital Isolator APO II	PR459095
3KQR00246U0109	01	Transformer-Ulow	3050239
3KQR00247U0109	01	Transformer-Uhigh	3050239
3KQR065003U0409	01	Transformer AS	3050239
3KQZ207037U0109	01	T2-blind-cover-SST	3050239
3KQZ400007U0150	'01	EMC_T3_PCB_Mag	3063079
3KQZ400027U0150	'01	Option Card Modbus	3063079
3KQZ400029U0121	03	CCL-CO	3050239
3KQZ400030U0121	03	CCL-DO	3050239
3KQZ400032U0121	03	CCL-DI	3050239
3KQZ400034U0150	'02	Option Card CO II	3063079
3KQZ400056U0121	01	APO--CCL	PR459095
3KQZ400056U0150	01	Active Pulse Output Module	PR459095
3KQZ400063U0100	01	CCL-Active Pulse Output Module II	PR459095
3KQZ400063U0150	01	Active Pulse Output Module II	PR459095
3KQZ402001U0121	09	CCL-MB-Ulow	3050239
3KQZ402001U0221	08	CCL-MB-Uhigh	3050239
3KQZ402003U0221	07	CCL-EMC-board-Z1D1	RR206813
3KQZ402011U0009	'02	MB_T4_pre assembled	3063079
3KQZ402013U0150	'01	MB_T3_PCB_Mag	3063079
3KQZ404080U0150	'02	MB_T4_PCB_Mag	3063079
3KQZ406011U0121	07	CCL-HMI-Size-C-part1	3050239
3KQZ406011U0221	03	CCL-HMI-Size-C-part2	3050239
3KQZ406011U0321	03	CCL-HMI-Size-C-part3	3050239
3KQZ407004U0150	'01	Option Card Activesupply	3063079
3KQZ407005U0109	01	Power-Supply-Cover	3050239
3KQZ407007U0109	01	EMC-Cover	3050239
3KQZ407009U0109	01	T3 EMC ZN1 feed through	3050239
3KQZ407012U0009	02	wall bracket-ALU	3050239
3KQZ407013U0009	01	wall bracket-SST	3050239
3KQZ407060U0009	'01	T3 Ex-feed-through-Crimppi	3063079
3KQZ407115U0009	'03	Type3 Assembly	3063079
3KQZ407128U0150	'03	Option Card Modbus-DP	3063079
3KXF000031G0009	04	Description-Coriolis	3050239
3KXF000032G0009	03	Description-Platform	3050239
3KXF000043G0009	01	PCB-specification	3050239
3kxf000002G0009	'02	CoriolisMaster complete	3063079
3kxf000003G0009	'01	Sensor cabled	3063079
3kxf000025G0009	'03	temperature-measuring-points	3063079
3kxf000028G0009	07	Installation diagram FCB4	PR459095
3kxf000029G0009	11	name plates FCB4	PR459095
3kxf000030G0009	09	model-coding	PR459095
3kxf000033G0009	11	Instruction manual FCB4	PR459095
3kxf000037G0009xd	06	Portfolio FCB4	PR459095
3kxf000037G0009	05	Portfolio FCB4	PR457503
3kxf000038G0009	06	Warning label FCB4	PR457503

3kxf000047G0009	'01	Type4 remote complete	3063079
3kxf000048G0009	'02	Type4 integral complete	3063079
3kxf000049G0009	'02	Type4 integral	3063079
3kxf000102G0009	05	Description-FCB4_Coriolis	PR459095