1 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:** **FM22UKEX0095X**

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

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

6 **Address of Applicant:** **Anna-Vandenhoeck-Ring 5
37081 Gottingen
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:

3050239_RR234039 dated 17th January 2023

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 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.

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

II 3 G Ex ec IIC T6…T1* Gc
II 3 G Ex ec IIC T6* Gc
*Ambient temperature range dependent on options TA1, TA3, TA4, or TA9 between -40°C and +70 °C

Digitally signed by Victor Aluko-Oginni
DN: O=FM Approvals Limited, CN= Victor Aluko-Oginni, E=victor.aluko-oginni@fmapprovals.com

Victor Aluko-Oginni
Certification Manager, FM Approvals Ltd.

Issue date: 21st April 2023

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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 20 mA 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 (FM21UKEX0131U) or a single compartment aluminium alloy enclosure identified as a Type 4.

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

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;
FCa4cdefghijkIA U/fnom: 110-230V ac, 50/60Hz Smax: <25VA
FCa4cdefghijkIC U/fnom: 11-30 V dc, Pmax: <20W

The following options are available:

FCa4cU2Y0fghijklm.n.o.p.q.r.s.t CoriolisMaster – Integral
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

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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

FCa4cU2Y0fghijklm.n.o.p.q.r.s.t CoriolisMaster – Integral
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; S1, S2
l = Outputs; D1, G0, G1, G2, G3, G4, G5, G6, G7, G8, G9, M1, M6, E2, E3 or E4
m = Power Supply; A or C

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

n = Additional Output 1; DRM, DRD, DRH or DR6
o = Additional Output 2; DSN, DSG, DSA, DSH or DS8
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
u = Connector type: U0, UE, UF, UG, U5, UB, UC, U6, UD, UH, U7, UJ, UK, U8, UN or UP

FCT4cU2klm.n.o.p.r.u 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

FCT4cU2klm.n.o.p.r.u CoriolisMaster – Transmitter only
c = 30, 50, 70, 80
k = Connection Design/Transmitter Housing Type/Transmitter Housing Material/ Cable Glands; W1, W2
l = Outputs; D1, G0, G1, G2, G3, G4, G5, G6, G7, G8, G9, M1, M6, E2, E3 or E4
m = Power Supply; A or C

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

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n = Additional Output 1; DRM, DRD, DRH or DR6
o = Additional Output 2; DSN, DSG, DSA, DSH or DS8
p = Integrated Digital Display; L2
r = Ambient temperature range; TA1, TA3, TA4, or TA9
u = Connector type: U0, UE, UF, UG, U5, UB, UC, U6, UD, UH, U7, UJ, UK, U8, UN or UP

FCa4cU2efghijY0m.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

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 details the permitted Temperature Classification and Ambient Temperature ratings as influenced by the Process Medium temperature.
3. For models with option m = C provision shall be made external to the equipment, to provide the transient protection device to be set at a level not exceeding 140% of the peak rated voltage value of 42V.

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.

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.

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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 FM Approvals Ltd.

18 **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
30th January 2023	Original Issue.
21st April 2023	Supplement 1 Report Reference: RR236433 dated 20th April 2023. Description of the Change: Addition of the model FCH4 and FCT4.

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Blueprint Report

ABB AG (1000007035)

Class No 3610

Original Project I.D. 3050239

Certificate I.D. FM22UKEX0095X

Drawing No.	Revision Level	Drawing Title	Last Report	Electronic Drawing
3KQR000392U0209	02	Transformer Modbus APO II	PR459095	Yes (pdf)
3KQR00247U0109	01	Transformer-Uhigh	3050239	Yes (pdf)
3KQR065003U0409	01	Transformer AS	3050239	Yes (pdf)
3KQZ002535U0109	02	Memory Module	3050239	Yes (pdf)
3KQZ207036U0101	01	blind-cover-aluminium	3050239	Yes (pdf)
3KQZ207037U0109	01	T2-blind-cover-SST	3050239	Yes (pdf)
3KQZ400001G0009	02	Type4 Ethernet assembly	PR457503	Yes (pdf)
3KQZ400007U0150	01	EMC_T3_PCB_Mag	3063079	Yes (pdf)
3KQZ400027U0150	01	Option Card Modbus	3063079	Yes (pdf)
3KQZ400029U0121	03	CCL-CO	3050239	Yes (pdf)
3KQZ400030U0121	03	CCL-DO	3050239	Yes (pdf)
3KQZ400031U0121	04	CCL-AS	3050239	Yes (pdf)
3KQZ400032U0121	03	CCL-DI	3050239	Yes (pdf)
3KQZ400034U0150	02	Option Card CO II	3063079	Yes (pdf)
3KQZ400036U0150	01	Ethernet Module	PR457503	Yes (pdf)
3KQZ400038U0150	01	PoE-Module Ethernet	PR457503	Yes (pdf)
3KQZ400063U0100	01	CCL-Active Pulse Output Module II	PR459095	Yes (pdf)
3KQZ400063U0150	01	Active Pulse Output Module II	PR459095	Yes (pdf)
3KQZ402000U0122	09	T3 MB	3050239	Yes (pdf)
3KQZ402001U0121	09	CCL-MB-Ulow	3050239	Yes (pdf)
3KQZ402001U0221	08	CCL-MB-Uhigh	3050239	Yes (pdf)
3KQZ402002U0122	07	T3 EMC Board	RR206813	Yes (pdf)
3KQZ402003U0121	06	CCL-EMC-board-Z2D2	3050239	Yes (pdf)
3KQZ402003U0221	07	CCL-EMC-board-Z1D1	RR206813	Yes (pdf)
3KQZ402011U0009	02	MB_T4_pre assembled	3063079	Yes (pdf)
3KQZ402013U0150	01	MB_T3_PCB_Mag	3063079	Yes (pdf)
3KQZ404080U0150	02	MB_T4_PCB_Mag	3063079	Yes (pdf)
3KQZ406010U0122	06	HMI-Size-C	3050239	Yes (pdf)
3KQZ406011U0121	07	CCL-HMI-Size-C-part1	3050239	Yes (pdf)
3KQZ406011U0221	03	CCL-HMI-Size-C-part2	3050239	Yes (pdf)
3KQZ406011U0321	03	CCL-HMI-Size-C-part3	3050239	Yes (pdf)
3KQZ407001U0122	10	Option Card CO	3050239	Yes (pdf)
3KQZ407002U0122	10	Option Card DO	3050239	Yes (pdf)
3KQZ407003U0122	10	Option Card DI	3050239	Yes (pdf)
3KQZ407004U0122	10	Option Card AS	3050239	Yes (pdf)
3KQZ407004U0150	01	Option Card Activesupply	3063079	Yes (pdf)
3KQZ407005U0109	01	Power-Supply-Cover	3050239	Yes (pdf)
3KQZ407007U0109	01	EMC-Cover	3050239	Yes (pdf)
3KQZ407009U0109	01	T3 EMC ZN1 feed through	3050239	Yes (pdf)
3KQZ407012U0009	02	wall bracket-ALU	3050239	Yes (pdf)
3KQZ407013U0009	01	wall bracket-SST	3050239	Yes (pdf)
3KQZ407060U0009	01	T3 Ex-feed-through-Crimppi	3063079	Yes (pdf)
3KQZ407062U0109	01	T3 EMC ZN2 feed through	3050239	Yes (pdf)
3KQZ407115U0009	03	Type3 Assembly	3063079	Yes (pdf)
3KQZ407128U0150	03	Option Card Modbus-DP	3063079	Yes (pdf)
3KXF000004G0009	01	coils IS	3050239	Yes (pdf)
3KXF000006G0009	01	electrical wiring	3050239	Yes (pdf)
3KXF000026G0009	01	dielectric test	3050239	Yes (pdf)
3KXF000031G0009	04	Description-Coriolis	3050239	Yes (pdf)
3KXF000032G0009	03	Description-Platform	3050239	Yes (pdf)
3KXF000043G0009	01	PCB-specification	3050239	Yes (pdf)
3KXF000112U0009	05	T-Box Alu	3050239	Yes (pdf)
3KXF000114U0009	01	T-Box SST	3050239	Yes (pdf)
3KXF002536U0121	01	CCL-Memory-Module	3050239	Yes (pdf)
3KXF002566U0009	02	Slidein-Remote-Assembly	RR206813	Yes (pdf)
3KXF002627G0009	02	T3 remote wall mounted	3050239	Yes (pdf)
3KXF002629G0009	01	T-Box Remote Assembly	3050239	Yes (pdf)
3KXF002901U0122	01	TerminalBoard Remote	3050239	Yes (pdf)
3KXF002903U0121	03	CCL-TB-Remote	3050239	Yes (pdf)
3KXF002905U0009	01	Connection Board	3050239	Yes (pdf)

3KXF002905U0121	02	CCL-FM-connection-board	3050239	Yes (pdf)
3KXF003062U0122	02	Coriolis Front End Board A1 wire	3050239	Yes (pdf)
3kxf000002G0009	02	CoriolisMaster complete	3063079	Yes (pdf)
3kxf000003G0009	01	Sensor cabled	3063079	Yes (pdf)
3kxf000025G0009	03	temperature-measuring-points	3063079	Yes (pdf)
3kxf000028G0009	07	Installation diagram FCB4	PR459095	Yes (pdf)
3kxf000029G0009	12	name plates FCB4	RR234039	Yes (pdf)
3kxf000030G0009	10	model-coding_FCB4	RR234039	Yes (pdf)
3kxf000033G0009	12	Instruction manual FCB4	RR234039	Yes (pdf)
3kxf000037G0009	07	Portfolio FCB4	RR234039	Yes (pdf)
3kxf000038G0009	06	Warning label FCB4	PR457503	Yes (pdf)
3kxf000047G0009	01	Type4 remote complete	3063079	Yes (pdf)
3kxf000048G0009	02	Type4 integral complete	3063079	Yes (pdf)
3kxf000049G0009	02	Type4 integral	3063079	Yes (pdf)
3kxf000050U0009	02	Type4 remote	3063079	Yes (pdf)
3kxf000102G0009	08	Description-FCB4_Coriolis	RR234039	Yes (pdf)
3kxf000103G0009	01	Sensor PCB DN80-150	3063079	Yes (pdf)
3kxf000118G0009	01	Name Plate drawing UKCA-Transfer Master add on	RR234039	Yes (pdf)
3kxf002564U0009	03	FE-Board-Assembly	3063079	Yes (pdf)
3kxf002953U0150	01	TB_remote_PCB_Mag	3063079	Yes (pdf)
3kxf003071U0009	02	Slide In Remote pre assembled	3063079	Yes (pdf)
3kxf003080U0109	01	Sensor PCB DN15	3063079	Yes (pdf)
3kxf003080U0209	01	Sensor PCB DN25	3063079	Yes (pdf)
3kxf003080U0309	01	Sensor PCB DN50	3063079	Yes (pdf)
IDM-10-A0189	02	Type3 blind cover ALU	3050239	Yes (pdf)