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:** **FM12ATEX0044X**

4 **Equipment or protective system: (Type Reference and Name)** **CoriolisMaster FCB3_ _ _, FCH3_ _ _ Integral Transmitter and Sensor, CoriolisMaster FCB3_ _ _, FCH3_ _ _ Remote Sensor**

5 **Name of Applicant:** **ABB Automation Products GmbH**

6 **Address of Applicant:** **Dransfelder Strasse 2**
37079 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 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:

3046185 dated 2nd August 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, EN 60079-15:2010 and EN 60529:1991 + A1:2000

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 T6…T2 Ta = -40°C to +60°C - IP65, IP67 – Remote Sensor

II 3 G Ex nA nR IIC T6…T2 Ta = -40°C to +60°C - IP65, IP67 – Integral Transmitter and Sensor

Mick Gower
Certification Manager, FM Approvals Ltd.

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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 can be mounted locally at the meter location or in a centralized location. The CoriolisMaster is available as an Integral Design where the transmitter is directly mounted on the primary.

The CoriolisMaster Mass flowmeter remote sensor is designed for use with the CoriolisMaster transmitter. The flowmeter primary is installed in the pipeline while the Transmitter for evaluating the flow signals can be mounted remotely.

Electrical parameters - Transmitter
U = 110 V…230Vac or 24 Vac/dc

Electrical parameters - Sensor

FCa3cA2A_… Size DN15-150 Remote Sensor		Size	Operating Value		Ex nA	
			U_N [V]	I_N [mA]	U_N [V]	I_N [mA]
Driver	Terminal 91/92	DN15	12	37	12	37
		DN25		37		37
		DN50		27		27
		DN80		37		37
		DN100		37		37
		DN150		37		37
Sensor Flowsignal	Terminal 85…90	DN15 to DN150	6	6	6	6
PT1000	Terminal 93…96	DN15 to DN150	12	2	12	2

Temperature Class and Process Temperature

Model FCa330-A2, FCa350-A2A2			
Ambient temperature	≤40 °C	≤50 °C	≤60 °C
Temperature class	Maximum Process Temperature		
T2	200 °C	200 °C	---
T3	180 °C	180 °C	180 °C
T4	115 °C	115 °C	115 °C
T5	80 °C	80 °C	75 °C
T6	60 °C	60 °C	60 °C

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FCa3cA2Y0fghijklm.n.o.p CoriolisMaster - Integral transmitter/sensor

a = Product Family; B or H
c = Tiers: 30 or 50
f = Meter Size: 015E1, 015R0, 015R1, 025E1, 025R0, 025R2, 050E1, 050R0, 050R1, 080E1, 080R0, 080R1, 100E1, 100R0, 100R1, 150E1, 150R0 or 150R1.
g = Process Connection Type: D2, D4, D5, D6, D7, E1, A1, A3, A6, A7, A8, A9, J1, J2, J3, M1, F1, T1, T2, T3, N3, or P1.
h = Material wetted parts; A1, A2, H1, H2, C1, C2, T1 or L1.
i = Flow calibration: Any single letter
j = Density calibration: Any single letter
k = Connection Design/Transmitter Housing type/Transmitter housing material/Cable glands: D1, or D2
l = Outputs: A1, A2, A3, H1, H2, H3 or Y0.
m = Power Supply: A, B or Y
n = Ambient temperature range: Blank, TA1, or TA4
o = Fluid temperature range : Blank or TF1
p = Extended Tower length: Blank or TE1

FCa3cA2efghijY0Y0Y.n.o.p CoriolisMaster – sensor only

a = Product Family; B or H
c = Tiers: 30 or 50
e = Connection Design: A1 or A2.
f = Meter Size: 015E1, 015R0, 015R1, 025E1, 025R0, 025R2, 050E1, 050R0, 050R1 080E1, 080R0, 080R1, 100E1, 100R0, 100R1, 150E1, 150R0 or 150R1.
g = Process Connection Type: D2, D4, D5, D6, D7, E1, A1, A3, A6, A7, A8, A9, J1, J2, J3, M1, F1, T1, T2, T3, N3, or P1.
h = Material wetted parts; A1, A2, H1, H2, C1, C2, T1 or L1.
i = Flow calibration: Any single letter
j = Density calibration: Any single letter
n = Ambient temperature range: Blank, TA1, or TA4
o = Fluid temperature range : Blank or TF1
p = Extended Tower length: Blank or TE1

14 **Special Conditions for Safe Use:**

1) When installed using the protection concept Restricted Breathing (nR) routine testing is required. The CoriolisMaster Transmitter is not fitted with a dedicated test port; see the Manufacturer's Instructions for details of the routine tests.

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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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**
9th August 2012	Original Issue.
31st August 2012	Supplement 1 Description of the Change: Correction to include CDL report
18th December 2012	Supplement 2 Report Reference: 3047118 dated 14th December 2012 Description of the Change: 1. Addition of nR transmitter option 2. Addition of special condition 3. Meter sizes DN80, DN100 and DN150 added.
20th May 2013	Supplement 3 Report Reference: 3047118 dated 7th May, 2013 Description of the Change: Correction to Description and clarification of special condition