



TYPE APPROVAL CERTIFICATE

Certificate No:
TAA000015Z
Revision No:
4

This is to certify:

That the Flow Sensor

with type designation(s)
FCB Series 100 & FCB Series 400 & FCT Series 400

Issued to
ABB AG
Minden, Nordrhein-Westfalen, Germany

is found to comply with
DNV rules for classification – Ships

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Location classes:

Temperature	D
Humidity	B
Vibration	B
EMC	A
Enclosure	IP66 / IP67

Issued at **Hamburg** on **2022-07-05**

for **DNV**

This Certificate is valid until **2024-04-18**.

DNV local station: **Hamburg**

Approval Engineer: **Holger Jansen**

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Joannis Papanuskas
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

CoriolisMaster FCB1 mass flowmeter

Model Number (coding): FCabcdeghijklm.u.v.w

- a = B (CoriolisMaster)
- b = 1 (Series 100)
- c = 30, 50, 70, 80 (Tier)
- d = Y0, A2, A1, F2, F1 S1, S2 (explosion protection certification)
- e = Y0 (Connection design & material)
- f = Meter size/Connection size; 5-digit alpha-numeric code
- g = D2, D4, D5, D6, D7, E1, S5, S6, S7, A1, A3, A6, A7, A8, A9, J1, J2, J3, J5, P1 (Process Connection Type)
- h = A1, A2, H1, H2, C1, C2, T1 or L1 (material of wetted parts)
- i = Flow calibration; single digit alpha numeric code
- j = Density Calibration; single digit numeric code
- k = B1, B2, B3, B4, Y0 (Connection Design / transmitter housing type / transmitter housing material/ cable entries)
- l = M2 (Outputs)
- m = C (Power supply)

After the dot of the Model Number the coding may be in any order and more or less;

- u = TA9 (Ambient temperature range)
- v = CL1 (DNVGL-Approval)
- w = TE3 (Tower extension)

CoriolisMaster FCB4 mass flowmeter

Model Number(coding): FCabcdeghijklm.u.v.w.x.y.z

- a = B (CoriolisMaster)
- b = 4 (Series 400)
- c = 30, 50, 70, 80 (Tier)
- d = Y0, A2, A1, F2, F1, S1, S2 (explosion protection certification)
- e = Y0, U1, U2 (Connection design & material)
- f = Meter size/Connection size; 5-digit alpha-numeric code
- g = D2, D4, D5, D6, D7, E1, S5, S6, S7, A1, A3, A6, A7, A8, A9, J1, J2, J3, J5, P1 (Process Connection Type)
- h = A1, A2, H1, H2, C1, C2, T1 or L1 (Material of wetted parts)
- i = Flow calibration; single digit alpha numeric code
- j = Density Calibration; single digit numeric code
- k = B1, B2, B3, B4, D1, D2, D5, D6, Y0 (Connection Design / transmitter housing type / transmitter housing material/ cable entries)
- l = D1, M1, G0, G1, G2, G3, G4, Y0 (Outputs)
- m = A, C, Y (power supply)

After the dot of the Model Number the coding may be in any order and more or less;

- u = TA9 (Ambient temperature range)
- v = CL1 (DNVGL-Approval)
- w = TE3 (Tower extension) only for k = B1, B2, B3, B4
- x = DRN, DRG, DRA, DRM, DRD, DRT(Additional output 1, optional)
- y = DSN, DSG, DSA (Additional output 2, optional)
- z = L2 (Integrated digital display, optional)

CoriolisMaster FCT4 Transmitter

Model Number(coding): FCabcdefg.u.v.x.y.z

- a = T (Transmitter)
- b = 4 (Series 400)
- c = 30, 50, 70, 80 (tier)
- d = Y0, A2, F2 (explosion protection certification)
- e = W1, W2 (Transmitter housing type / transmitter housing material/ cable entries)
- f = D1, M1, G0, G1, G2, G3, G4, Z9 (Outputs)
- g = A, C (power supply)

After the dot of the Model Number the coding may be in any order and more or less;

- u = TA9 (Ambient temperature range)
- v = CL1 (DNVGL-Approval)
- x = DRN, DRG, DRA, DRT, DRM, DRD (Additional output 1, optional)
- y = DSN, DSG, DSA (Additional output 2, optional)
- z = L2 (Integrated digital display, optional)

Application/Limitation

Ex-certification is not covered by this certificate. Application in hazardous area to be approved in each case according to the Rules and Ex-Certification/ Special Condition for Safe Use listed in valid Ex-certificate issued by a notified/recognized Certification Body

This Type Approval covers hardware listed under Product description.

For installation on ships classed by DNV, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case.

Reference is made to DNV Rules for Ships Pt.4 Ch.9 Control and Monitoring Systems.

Production testing

Welding's shall be carried out by qualified welders using approved welding procedure specifications (WPS) and type approved welding consumables. Ref. to Pt.4, Ch.6, Sec. 10.

Material certificates for pressurized part such as pre-material, flanges, pipes and fittings according to Table 3 of Pt.4, Ch.6 – Section 2 - Piping Systems are to be provided.

For application in piping systems of pipe class I and II the following additional requirements are to be observed:

- Each mass flowmeter is to be hydraulically pressure tested up to 1,5 times the maximum design pressure in the presence of a DNV surveyor. Appropriate product certificate (PC) is to be issued.
- Welding requires approval based on a welding procedure qualification test (WPQT)

Type Approval documentation

Test Reports: U170204E1; U170204E2; E170204E1; 4787065711_IEC 60529, Inspection Certificate; RS No. 2020132, 2020-11-26; RS No. 2020133, 2020-12-08; RS No. 2020134, 2020-12-08

Serial-No.: 243967975/X001, dated 07-02-2017; TR_IIGE0818_T3; TR_IIGE0819_T4

Model Number (coding): FCB1+4_MARINE_IIG-AD-0013_2019-11-28_Modelnummernschlüssel_03_GE;

Drawings: Overview FCB1+4_DNVGL_IIG-AD-0014_2017-03-14_CD-overview_E;

Data Sheets: DS/FCB400/FCH400-EN Rev.K, DS_FCB400_FCH400_J01; DS_FCB100_FCH100_EN_G02;

Interface Documents: COM_FCB400_FCH400_MB_DE_A01_Modbus_Protokoll;

COM_FCB400_FCH400_PB_DE_A01_PROFIBUS_DP_Protokoll

Operating Instructions: OI-FCB400-FCH400-EN-G; CI-FCB400-FCH400-EN-E; OI-FCB100-FCH100-EN-D; CI-FCB100-FCH100-EN-C01;

Place of Production:

ABB AG
Schillerstraße 72
32425 Minden, Germany

ABB AG
Dransfelder Straße 2
37079 Göttingen, Germany

Tests carried out

Applicable tests according to class guideline DNV-CG-0339, August 2021.

Marking of product

The products to be marked with:

- Model name
- Manufacturer name
- Serial number

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE