



Certificate no.:
TAA00003GU

TYPE APPROVAL CERTIFICATE

This is to certify:

that the **Fuel Gas Control and Monitoring System**

with type designation(s)

FCM One, FMC 1.5, LPG, and Methanol 3 systems

issued to

Alfa Laval S.p.A.
Monza MB, Italy

is found to comply with

DNV rules for classification – Ships Pt.6 Ch.5 Sec.21 Cyber security

Application:

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

This type approval covers security capabilities for DNV Cyber security profile level 1 (SP1) and IACS UR E27, subject to conditions stated in this certificate.

Issued at **Høvik** on **2025-02-04**

This Certificate is valid until **2027-02-03**.

for **DNV**

DNV local unit: **Italy/Malta CMC**

Approval Engineer: **Qitao Gan**

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 USD 300 000.

Product description

The type approval of cyber security capabilities for **Alfa Laval S.p.A.'s Fuel Conditioning Module (FCM)** systems, with model types **FCM One, FCM 1.5, FCM LPG, and FCM Methanol 3** where the following components are covered:

Component Description	Type Designation /HW version	OS/Platform/Firmware SW version	Application SW version
Process PLC, for FCM One and FCM 1.5	B&R X20CP1584 (FCM One) X20CP1583 (FCM 1.5) X20CP1684 (New installations) Including all possible X2X I/O modules ^[1]	Firmware = 1.4.3.0 Firmware = 1.8.1.0 Firmware = 1.1.0.0	System software = B&R Automation Runtime I 4.9z revisions (where z is 0 or newer) + Development software = B&R Automation Studio 4.9.z.p (where z.p is 3.144 or newer) + Application software = Alfa Laval FCM_PLC V4.00.z (where z is 00 or newer)
Process PLC, for FCM LPG, FCM Methanol 3	B&R X20CP1586 X20CP1686X Including all possible X2X I/O modules ^[1]	Firmware = 1.8.1.0 Firmware = 1.6.2.0	System software = B&R Automation Runtime G 4.9z revisions (for X20CP1586) (where z is 0 or newer), J 4.9z revisions (for X20CP1686X) (where z is 3 or newer), + Development software = B&R Automation Studio 4.12.z.p (where z.p is 3.27 or newer), BR Mapp View 5.24.z.p (where z.p is 1.53 or newer), BR Mapp Services 5.24.z.p (where z.p is 1.9 or newer), + Application software = Alfa Laval FCM METHANOL 3 V2.00.z (where z is 00 or newer)
Remote I/O	Powerlink I/O B&R X20BC0083	Firmware = 1.0.0.2	-
Local and Remote HMI, for FCM One, FCM 1.5	Beijer X2 Marine 15" (FCM One, FCM 1.5), 7" (FCM 1.5)	Firmware = V8 Build 909, OS = Windows CE 8.0	Development software = Alfa Laval IX Developer 2.22.z (where z is 395 or newer) + Application software = Alfa Laval FCM_HMI_X2_15 V4.00.z (where z is 00 or newer)
Local and Remote HMI, for FCM LPG, FCM Methanol 3	B&R 6PPT80.156B-16B	Firmware = 1.1.0.0	System software = B&R PPT80 OS – Linux based – Image version 1.6.z (where z is 0 or newer) + Application software = B&R Integrated service page + VNC Client + Web Browser = Chromium
Switch	Weidmuller IE-SW-BL08-8TX	Firmware = N/A	-
VFD (Variable frequency drive)	ABB ACS 800 (FCM One), ACS 880 (FCM One, FCM 1.5) ACS 880-01 (FCM LPG, FCM Methanol 3)	Firmware = N/A	-

FT (Volumetric & Mass transmitter)	VAF PT2 series (FCM One, FCM 1.5), E+H Promass E100 (FCM One, FCM 1.5), E300 (FCM LPG, FCM Methanol 3)	Firmware = N/A	-
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^[1] Refer to the following table for all possible X2X I/O modules for FCM 1.5:

Manufacturer	I/O modules	Hardware version
B & R	X20DI9371	1.1.0.0
	X20DO6529	1.0.1.3
	X20AI9371	1.1.0.0

Approval conditions

The following documentation of the actual application is to be submitted for approval in each case:

- Reference to this Type Approval Certificate
- Inventory list
- System block diagram (topology)
- Report from test at manufacturer.

Any modifications in the system to be delivered compared with the type approved system covered by this certificate shall be documented and submitted for approval in each case.

Major changes of the type approved system affecting future deliveries shall be informed to DNV. If the changes are considered to affect functionality for which rule requirements apply, a new functional type test may be required, and the certificate may have to be renewed to identify the new version. Minor changes are covered by this type approval.

Application/Limitation

All hardware devices and accessible interfaces in the system shall be installed in areas with means to prevent unauthorised access and/or with physical access restrictions.

This type approval does not cover network communication with/via untrusted networks.

Tests carried out

All hardware and software versions were tested in Sept. 09th ~ 11th 2024 at **Alfa Laval** site in Monza, Italy, in accordance with requirements for DNV security profile 1 (SP1) for

- Cyber Secure (Essential), ref. DNV-RU-SHIP Pt.6 Ch.5 Sec.21 (2024-07 Edition)
- Cyber resilience of on-board systems and equipment, ref. IACS UR E27 (Rev.1, 2023-09)

Marking of product

The type designation and the manufacturer name and contact address shall be affixed visibly, legibly and indelibly to the product. In addition, the product shall be marked with:

- model name
- serial number
- power supply rating

Place of manufacture

Alfa Laval S.p.A. site in Monza, Italy, with panel shop produced by:

PC Project S.r.l. – Merate (LC), Italy

Cablotech S.r.l. – Bonate Sopra (BG), Italy

Jiangsu Denison Electric Automation Technology Co., LTD – Qidong, China

Taicang Lanyan Marine Automatic Equipment Factory – Suzhou, China

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
- Review documented evidence of adherence to Secure Development Lifecycle processes

A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE