Certificate No:
TAA0000320

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Control and Monitoring System

with type designation(s)
VISCOCHIEF 3

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

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.

Temperature	**A**
Humidity	**B**
Vibration	**A**
EMC	**A**
Enclosure	**B**

Issued at **Hamburg** on **2021-11-02**
This Certificate is valid until **2026-11-01**.
DNV local station: **Hamburg Control Systems**

Approval Engineer: **Didier Girardin**

for **DNV**

Joannis Papanuskas
Head of Section

Product description

Control switchboard for VISCOCHIEF 3 (Viscosity Control & Monitoring Unit) for engine MDO/HFO operation and fuel change transition. Temperature and viscosity control and monitoring in accordance with engine manufacturer's specification.

including automatic open & close loops controlling:

- Viscosity control
- Electrical heater control
- S&T heaters control
- Cooler for fuel recirculation heat dissipation
- Switching between cooling/heating
- Change over three-way fuel valve

Communication to peripheral equipment with Modbus TPC/IP or RTU communication protocol

System configuration of controlling switchboard may include type approved tested components as listed in ANNEX

Manufactured by

Elettrica 101 S.r.l. on behalf of
P.C. Project S.r.l.
Merate LC, Italy

Approval conditions

The Type Approval covers hardware listed under Product description for described application (see also Annex). When the hardware is used in applications to be 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 classification of ships Pt.4 Ch.9 Control and monitoring systems.

The following documentation of the actual application is to be submitted for approval in each case:
- Reference to this Type Approval Certificate
- Functional description
- Software version
- System block diagram with peripherical controlled HW, simplified P&ID & sensorics, equipment ID`s
- Power supply arrangement (may be part of the System block diagram)

Product certificate

Each delivery of the application system is to be certified according to Pt.4 Ch.9 Sec.1. The certification test is to be performed at the manufacturer of the application system before the system is shipped to the yard. After the certification the clause for application software control will be put into force.

Application software control

All changes in software are to be recorded as long as the system is in use on board. Documentation of major changes is to be forwarded to DNV for evaluation and approval before implemented on board. Certification of modified functionality may be required for the particular vessel.

Type Approval documentation

Tests carried out

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

Marking of product

The products to be marked with:
- manufacturer name
- model name
- serial number
- power supply ratings

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

ANNEX
Documentation
Hidden

Product description [1)]
Configuration of control equipment might include:

Cabinet box
Basic kit cabinet 500x500 and cabinet 500x700 (Auger AT5525, AT5725)

PLC boards

Type name	Description	Manufacturer
X20BB52	X20BB52	X20BB52
X20PS9602	Compact-S power supply module	B&R
X20CP0482	Compact-S CPU	B&R
X20BM11	Bus module for 24 VDC I/O-Module	B&R
X20DIF371	DI module 16x	B&R
X20DO9322	DO module 12x	B&R
X20AI2622	AI module 2x	B&R
X20AT2222	AI 2x RTD	B&R
X20DI2377	DI module 2x	B&R
X20AO2622	AO module 2x	B&R
X20AO2437	AO module 2x, Galvanic insulation	B&R
X20CS1030	I/O Interface RS422/RS485	B&R
X20DO6322	DO module 6x	B&R
X20DO4322	DO module 4x	B&R
X20DI6371	DI module 6x	B&R
X20DO6529	DO module 6x	B&R

HMI Touch screen

6PPT50.0702-16B	Power Panel T50, 7", Display	B&R
6PPT30.043F-20B	Power Panel T30, 4.3" Display	B&R

Additional components
DNV Type approved Viscosity Sensor and Temperature transmitter PT100 [2)]

Notes:
1) With reference to documents 9053185_BOM_rev2 and 9053186_BOM_rev1 for exhaustive bill of material and tested electrical configuration of tested cabinet boxes AT5525, AT5725.
2) Validity expiring day to be observed.