

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Electric Actuator**with type designation(s)
ASAC 120, QHFQ 490, PULS

Issued to

Q-TAGG R&D AB
Västerås, Swedenis found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.****Location classes:**

Type	Temperature	Humidity	Vibration	EMC	Enclosure
ASAC 120	A	B	B	A	*
QHFQ 490	A	B	A	A	*
PULS	B	B	A	A	*

***Required protection according to relevant rules shall be provided upon installation on board.**Issued at **Høvik** on **2018-03-07**This Certificate is valid until **2020-03-06**.for **DNV GL**DNV GL local station: **Stockholm**Approval Engineer: **Jabber Abbas**

Odd Magne Nesvåg
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.



Product description

ASAC 120 (article number 2613 4100)

Fuel rack positioning actuator for marine diesel and gas engines. Terminal box (QHFQ 290) located on ASAC 120 with electrical connections for motor voltage, resolver position, motor temperature, brake coil and electronic min/max position switches.

Nominal torque: 120 Nm
Peak torque: 260 Nm

The fuel actuator can be operated by hand using a 4mm hexagon key.

Control unit QHFQ 490 (article number: 1411 4490)

Actuator control unit with the following functions:

- Homing (synchronization of the mechanical and electrical positions)
- Command from external system/governor (CANopen, 4-20mA, PWM)
- Manual operation (homing, increase, decrease)
- Alarm and monitoring of actuator faults

Consists of:

- QHFQ 230 Control Board
- Low volt Metronix DIS-2 power amplifier

Current software version: **1.0.xx**

Software version is denoted on the format MM.NN.RR where MM is major software version number, NN minor software version number and RR indicates software revisions to correct bugs or minor improvements where approval by DNV GL is not required.

Description of software maintenance and development is found in document "4417 2002 Quality Plan"/2014-10-23. Control system revision changes are documented in Software Change Record files, "1415 2003".

Power Supply PULS (article number: QS40.484)

Application / limitation

1. The system will keep the last fuel rack position upon power failure.
2. The system supply shall be protected with line fuse.
3. For generator applications QHFQ 490 shall be arranged with dual power supply, according to instructions provided in "Power Unit QHFQ490 Supply Circuits" (doc no. 2213_4497, rev 2014-09-20).
4. I/O list and associated alarms shall be according to Pt.4 Ch.3 Sec.1 Table 9, 10 and 11 (as applicable) and Ch.9 Sec.2 2. Also if E0 class notation apply Pt.6 Ch.2 Sec.2 Table 4, 8 and 12 (as applicable).

Approval conditions

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

- Reference to this Type Approval Certificate
- System block diagram
- Software version for the specific delivery
- Confirmation that power supply arrangement is according to Application/limitation 2 and 3.
- Confirmation that I/O is arranged according to Application/limitation 4.

The Type Approval covers hardware and software listed under Product description.

As long as the units are covered by the Type Approval, a product certificate according to Pt.4 Ch.9 Sec.1 will **not** be required. Correct configuration and set up for each delivery to be tested during commissioning after installation.

Job Id: **262.1-017490-2**
Certificate No: **TAA00001S1**

When the type approved software is revised (affecting all future deliveries) DNV GL is to be informed by forwarding updated software version documentation. If the changes are judged 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 software version.

Clause for application software control

All changes in software are to be recorded as long as the system is in use on board. The records of all changes are to be forwarded to DNV GL for evaluation and approval.

Major changes in the software are to be approved before being installed in the computer.

A Certification of Application Functions may be required for the particular vessel.

Type Approval documentation

Tests carried out

Applicable tests according to Standard for Certification No. 2.4, April 2006.

Functional tests in Västerås, Sept/Oct 2014.

Type Approval Assessment Report 2017-03-14.

Marking of product

The products to be marked with:

- manufacturer
- type
- article number
- serial number

Job Id: **262.1-017490-2**
Certificate No: **TAA00001S1**

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 at least every second year and at renewal of this certificate.

END OF CERTIFICATE