

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Hydraulic Rudder Actuator for Steering Gear**with type designation(s)
SR562

Issued to

Rolls-Royce Marine AS
ÅLESUND, Norway

is found to comply with

DNV GL rules for classification – Ships**DNV GL rules for classification – High speed and light craft****Application :****Can be used for all steering gears which according to current rules may be provided with single rudder actuator, not including compliance with Appendix A.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Høvik** on **2018-07-03**This Certificate is valid until **2023-07-02**.for **DNV GL**DNV GL local station: **Ålesund**Approval Engineer: **Ingrid Solvang**

Oddvar Deinboll
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

Type of actuator: Hydraulic rotary vane

Application/Limitation

Approval cover hydraulic actuator

	SR562			Unit
Number of vanes	2			-
Max design pressure	166			bar
Max safety valve set	166			bar
Max working pressure	133			bar
Test pressure	249			bar
Max design torque	50			kNm
Max working torque	40			kNm
Max rule rudder torque	50			kNm
Max rudder stock Ø	160			mm
Min rudder stock Ø ¹⁾	140			mm
Max rudder angle	35	45	61	deg
Max pump capacity ²⁾	165			l/min
Max radial force	175			kN
Max axial force	104			kN

1. Based on rudder stock material with yield strength of 235 N/mm². Minimum rudder stock diameter is due to limitation in torque capacity for Tenfjord friction rings at a design pressure of 166 bar. A smaller rudderstock may be accepted in case of reduced design pressure and rule rudder torque.
2. Stated value is per pump. Changes in pump capacities may lead to required change in relief valve capacity (Pt.4 Ch.10 Sec.1 [2.10.6]). Valve characteristics shall then be submitted.

Type Approval documentation

Marking of product

The product is to be marked with the manufacturer's name or trademark and type number identification.

Periodical assessment

For retention of the type approval, a DNV GL surveyor shall perform an assessment after 2 years and after 3.5 years to verify that the conditions of the type approval are complied with. A renewal assessment will be performed at renewal of the certificate.

In cases where the type approved product is manufactured at other companies, the periodical assessment shall verify that the type approval applicant has a quality control system for consistent production at their licensees/subcontractors. Furthermore, periodical assessment shall be carried out randomly at these companies.

Other conditions

A steering test is to be carried out under normal working conditions to demonstrate compliance with requirements in Pt.4 Ch.10 Sec.1 [9].

Connection to rudderstock shall be by means of 4 type approved Tenfjord friction rings.

For approval of the complete steering gear the following shall be submitted case-by-case:

- Technical data sheet
- Pump capacity and relief valve capacity
- Hydraulic diagram with list of alarms and set points
- Arrangement drawing of steering gear
- Mounting and operation instructions to follow each delivery

- Operation instructions for all operation modes including local control (Yard supply)
- Foundation and mounting arrangement, including bolting and chocking calculations (Yard supply)
- Arrangement of steering gear compartment (Yard supply)

END OF CERTIFICATE