

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Reduction Gear for Propulsion**

with type designation(s)

HR-A, HL-A, HR-B, HL-B, HR PTI-A, HL PTI-A, HR PTI-B, HL PTI-B

Issued to

Servogear AS**RUBBESTADNESET, Norway**

is found to comply with

DNV GL rules for classification – Ships**DNV GL rules for classification – High speed and light craft****Application :****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.****The approval is valid for propulsion with limitations as given on page 2.**

Type	Input torque	Input speed	Reduction ratio
HR-A	2728	2100	2.952
HL-A	2728	2100	2.952
HR-B	3865	2100	2.952
HL-B	3865	2100	2.952
HR PTI-A	2728	2100	2.952
HL PTI-A	2728	2100	2.952
HR PTI-B	3865	2100	2.952
HL PTI-B	3865	2100	2.952

Issued at **Høvik** on **2018-05-15**This Certificate is valid until **2023-05-14**.for **DNV GL**DNV GL local station: **Haugesund**Approval Engineer: **Nadine Grace Mosteiro
Halvorsen**

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

Reduction gear HDE220 with built-in clutch and controllable pitch mechanism. Power take in (PTI) available. Both rotational directions of the output shaft are available.

Application/Limitation

The clutch pressure is to be set according to the type approval certificate for the Ortlinghaus 0-002-837-47-151 clutch.

Maximum design servo pressure is 110 bar (set point of relief valve)

Gear oil with FZG class 12 or better shall be used.

For single screw propulsion line the lubrication oil system is to be fitted with duplex filter.

Gear type	Application	Max. total Input torque (Nm)	Input speed (rpm)	Max. PTI torque (Nm)	Application factor K_A	Reduction ratio
HR-B, HL-B, HR PTI-B, HL PTI-B	Twin screw propulsion	3865	2100	492	1.20	2.952
HR-B, HL-B, HR PTI-B, HL PTI-B	Single screw propulsion	3297	2100	492	1.20	2.952
HR-A, HL-A, HR PTI-A, HL PTI-A	Twin / single screw propulsion	2728	2100	492	1.20	2.952

Type Approval documentation

Marking of product

The product 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, both referring to the issue date of the Type Approval Certificate to verify that the conditions of the Type Approval are complied with. A renewal assessment will be performed at renewal of the certificate.

- END OF CERTIFICATE -