

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Controllable Pitch Propeller**

with type designation(s)

3H/3J60, 3H/3J70, 3H/3J80, 3H/3J100, 3H/3J120, 3H/3J140 and 3H160

Issued to

Helseth AS**Hjelset, Norway**

is found to comply with

DNV GL rules for classification – Ships**DNV GL rules for classification – High speed and light craft****Application :****The approval is valid for main propulsion with the ratings and conditions as specified in the certificate.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Høvik** on **2018-08-20**This Certificate is valid until **2023-06-30**.for **DNV GL**DNV GL local station: **Kristiansund N**Approval Engineer: **Dag Harald Williksen**

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

Propeller shaft, propeller boss, pitch control mechanism, stern tube with bearings and fitting of propeller to shaft.

Application/Limitation

The propeller plants are approved for ratings and conditions as listed below:

3H60/3J60:

Maximum rated power:	170 kW
Maximum rated torque:	1670 Nm
Pull-up length of propeller hub at 15°C:	0.7 mm
Maximum vibratory torsional stress in propeller shaft for continuous operation:	16.1 MPa
Maximum servo force 3H60:	27000 N

3H70/3J70:

Maximum rated power:	250 kW
Maximum rated torque:	2670 Nm
Pull-up length of propeller hub at 15°C:	0.85 mm
Maximum vibratory torsional stress in propeller shaft for continuous operation:	17.3 MPa
Maximum servo force 3H70:	40000 N

3H80/3J80:

Maximum rated power:	300 kW
Maximum rated torque:	3820 Nm
Pull-up length of propeller hub at 15°C:	1.0 mm
Maximum vibratory torsional stress in propeller shaft for continuous operation:	17.3 MPa
Maximum servo force 3H80:	50000 N

3H100/3J100:

Maximum rated power:	370 kW
Maximum rated torque:	6450 Nm
Pull-up length of propeller hub at 15°C:	min.1.0 mm, max. 1.3 mm
Maximum vibratory torsional stress in propeller shaft for continuous operation:	17.5 MPa
Maximum servo force 3H100:	85000 N

3H120/3J120:

Maximum rated power:	550 kW
Maximum rated torque:	11300 Nm
Pull-up length of propeller hub at 15°C:	1.6 mm
Maximum vibratory torsional stress in propeller shaft for continuous operation:	17.5 MPa
Maximum servo force 3H120:	120000 N

3H140:

Maximum rated power:	700 kW
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Maximum rated torque:	17000 Nm
Pull-up length of propeller hub at 15°C:	min.1.6 mm, max. 1.8 mm
Maximum vibratory torsional stress in propeller shaft for continuous operation:	17.5 MPa
Maximum servo force:	140000 N

3H160:

Maximum rated power:	850 kW
Maximum rated torque:	24200 Nm
Pull-up length of propeller hub at 15°C:	2.0 mm
Maximum vibratory torsional stress in propeller shaft for continuous operation:	17.6 MPa
Maximum servo force:	170000 N

Marking of product

The product is to be marked with 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

Following documentation is to be submitted for approval for each installation:

1. Propeller blade (w/propeller data)
2. Torsional vibration calculations

END OF CERTIFICATE