

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Thruster Components**with type designation(s)
Propeller hub KT

Issued to

KAWASAKI HEAVY INDUSTRIES, LTD.
Kobe, HYOGO, Japan

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.5 Rotating machinery – driven units**Application :****The approval is valid for lateral thruster with the ratings and conditions as specified in the certificate.**This Certificate is valid until **2023-06-21**.Issued at **Høvik** on **2018-06-22**DNV GL local station: **Kobe**for **DNV GL**Approval Engineer: **Hamid Amini**

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.

If any person suffers loss or damage which is proven to have been caused by any negligent act or omission of the Society, then the Society shall pay compensation to such person for his proven direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question. The maximum compensation shall never exceed USD 2 million.

In this provision the "Society" shall mean DNV GL AS as well as all its direct and indirect owners, affiliates, subsidiaries, directors, officers, employees, agents and any other person or entity acting on behalf of DNV GL AS.

Certificate No: **TAM00000XU**
File No: **717.90**
Job Id: **262.1-025554-1**

Product description

Propeller hub of controllable pitch propeller for lateral thruster.

Application/Limitation

The hubs are approved for ratings and conditions as listed below. Only propeller hubs for KT-B5 type are valid for both DP and Auxiliary duty.

Type	Maximum rated power [kW]	Maximum rated torque [kNm]	Propeller speed [rpm]	Propeller diameter [mm]
KT-300B5	3500	152	220	3100
KT-255B5	3000	117	245	2850
KT-219B5	2500	88.4	270	2600
KT-187B5	2150	69.8	294	2400
KT-157B5	1800	54.6	315	2200
KT-300B3	3200	139	220	3100
KT-255B3	2700	105	245	2850
KT-219B3	2200	77.8	270	2600
KT-187B3	1850	60.1	294	2400
KT-157B3	1600	48.5	315	2200
KT-130B3	1350	37.2	346	2200
KT-105B3	1070	27	379	1800
KT-88B3	920	21.1	416	1650
KT-72B3	700	14.1	475	1450
KT-55B3	550	9.93	529	1300
KT-43B1	330	6.1	517	1150
KT-32B3	320	4.47	683	1000

Type Approval documentation

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, 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.

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.

END OF CERTIFICATE