

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Tunnel Thruster**

with type designation(s)

Dia. 513 mm & Dia. 610 mm

Issued to

**SLEIPNER MOTOR AS
FREDRIKSTAD, Norway**

is found to comply with

Det Norske Veritas' Rules for Classification of Ships/High Speed and Light Craft**Application :****Auxiliary duty**This Certificate is valid until **2018-12-31**.Issued at **Høvik** on **2015-01-21**DNV GL local station: **Sandefjord**Approval Engineer: **Hans-Kristian Eriksen**for **DNV GL**

**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.

Certificate No: **M-12712**
 File No: **717.30**
 Job Id: **262.1-008901-3**

Product description

Tunnel thruster with fixed pitch contra-rotating propellers.

Application/Limitation

The thrusters are approved for auxiliary duty, driven by any power source e.g hydraulic or electric motor with the following ratings:

Type	Maximum input torque [Nm]	Gear ratio [-]	Maximum motor speed [RPM]	Application factor continous	Application factor peak
Dia. 513 mm	593	1,615	1360	1,05	1,40
Dia. 610 mm	626	1,615	1160	1,05	1,40


Type Approval documentation

Drawing number	Revision	Title
SM-111342	E	Parts List SH1000TC
01-03-1000-121	A	Assembly SH1000TC
01-03-1400-102	1	Assembly SH1400TC
SM-111340	F	Parts List SH1400TC
01-01-1000-100	I	Gear case SH1000TC
01-03-1400-100	C	Gear case SH1400TC
01-03-1000-102	M	Propeller shaft SH1000TC/SH1400TC
01-03-1000-106	B	Driveshaft SH1000TC
01-03-1400-106	A	Driveshaft SH1400TC
01-03-1000-104	F	Propeller LH Ø500
01-03-1400-104	B	Propeller LH Ø596
01-03-1000-108	I	Flange
01-03-1400-108	B	Flange for SH1400TC
01-03-1000-103	A	Top bracket
01-03-1000-105	B	Bushing SH1000TC/SH1400TC
01-03-1400-117	A	Top bracket
01-03-1000-115	B	Locking ring bearings SH1000TC/SH1400TC
01-03-1000-111	B	Washer crown wheel SH1000TC/SH1400TC
01-03-1000-110	C	Anode for SH1000TC/SH1400TC
01-03-1000-107	B	Locking inc for bolts SH1000TC/SH1400TC
01-03-1000-101	H	Housing for bearings SH1000TC/SH1400TC
01-03-1000-113	A	Gasket for housing SH1000TC/SH1400TC
01-03-1000-112	B	Gasket for flange SH1000/SH1400TC
01-03-1000-114	A	Protection ring for SH1000TC/SH1400TC
01-03-1000-118		Pinion drive Z13
01-03-1000-117		Crown wheel Z21
20009-11-27		Bearing calculation
		Propeller blade geometry Ø500
		Propeller blade geometry Ø596
01-03-1000-109		Housing bolt for SH1000TC/SH1400TC

Marking of product

Manufacturers name or trade mark and type number designation

Periodical assessment



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For retention of the Type Approval, a DNV surveyor shall perform a survey every second year and before the expiry date of this certificate to verify that the conditions of the type approval are complied with.

The objective of the Periodical Assessment is to verify that the conditions for the Type Approval are not altered since the Type Approval Certificate was issued. The main scope of the Periodical Assessment will normally include:

- Verification of the Type Approval applicant's production and quality system w.r.t. ensuring continued consistent production of the Type Approved products at the Type Approval applicant's own premises and at other companies that are given the responsibility for manufacturing of the products.
- Review of the Type Approval documentation and that this is still used as basis for the production
- Review of possible changes to the design, the material and the performance of the product
- Verification of the product marking.

END OF CERTIFICATE

