



TYPE APPROVAL CERTIFICATE

Certificate no.:
TAM00000DT
Revision No:
3

This is to certify:
that the Tunnel Thruster

with type designation(s)
SAC360, SAC400, SAC550, SAC700, SAC750, SAC900, SAC950, SAC1000, SAC1100, SAC1300, SAC1400, SH360, SH400, SH700, SH1000, SH1400, SRAC320, SRHP240, SRHP320, SRHP650, ERV130, ERV170, ERV210, ERL130, ERL170, SRL130, SRL170, SRV130, SRV170, SRV210, ERV250, ERV300, SRV300

issued to
Sleipner Motor AS
FREDRIKSTAD, Norway

is found to comply with
DNV rules for classification – Ships
DNV rules for classification – High speed and light craft
DNV rules for classification – Yachts

Application:
Manoeuvring duty only.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Issued at **Høvik** on **2024-01-01**

for **DNV**

This Certificate is valid until **2028-12-31**.

DNV local unit: **Sandefjord**

Approval Engineer: **Øystein Aagetvedt Larsen**

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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

Fixed and retractable tunnel thrusters with fixed pitch contra-rotating propellers. The following type designations and configurations are covered by this certificate:

AC Fixed Thrusters	
SAC360	ø300mm tunnel
SAC400	ø300mm tunnel
SAC550	Ø513mm tunnel
SAC700	ø412mm tunnel
SAC750	Ø513mm tunnel
SAC900	ø513mm tunnel
SAC900	ø610mm tunnel
SAC950	ø513mm tunnel
SAC950	ø610mm tunnel
SAC1000	ø513mm tunnel
SAC1100	ø513mm tunnel
SAC1100	ø610mm tunnel
SAC1300	ø610mm tunnel
SAC1400	ø610mm tunnel
Hydraulic Fixed Thrusters	
SH360	ø300mm tunnel
SH400	ø300mm tunnel
SH700	ø412mm tunnel
SH1000	ø513mm tunnel
SH1400	ø610mm tunnel

AC Retract Thrusters	
SRAC320	ø300mm tunnel
Hydraulic Retract Thrusters	
SRHP240	ø250mm tunnel
SRHP320	ø300mm tunnel
SRHP650	ø386mm tunnel
DC Retract Thrusters	
ERV130, ERV170, ERV210	ø250mm tunnel
ERL130, ERL170	ø250mm tunnel
SRL130, SRL170	ø250mm tunnel
SRV130, SRV170, SRV210	ø250mm tunnel
ERV250	ø300mm tunnel
ERV300	ø300mm tunnel
SRV300	ø300mm tunnel

Application/Limitation

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

Fixed type	Tunnel diameter	Maximum input torque [Nm]	Maximum power [kW]	Gear ratio [-]	Maximum motor speed [rpm]	Application factor, continuous	Application factor, peak
SM-139896	300 mm	85	28.6	1.615	3030	1.05	1.40
SM-135548	300 mm	94	30.6	1.615	2910	1.05	1.40
60 0600	412 mm	241	45.2	1.615	1790	1.05	1.40
70 0600	513 mm	430	61.1	1.615	1360	1.05	1.40
70 0602	513 mm	430	61.1	1.615	1360	1.05	1.40
100 0600	610 mm	660	80.2	1.615	1160	1.05	1.40
100 0602	610 mm	660	80.2	1.615	1160	1.05	1.40

Retractable type	Tunnel diameter	Maximum input torque [Nm]	Maximum power [kW]	Gear ratio [-]	Maximum motor speed [rpm]	Application factor, continuous	Application factor, peak
13 0602	250 mm	46	14.9	1.6	2930	1.05	1.40
20 0603	300 mm	68	21.2	1.6	2810	1.05	1.40
50 0600	386 mm	201	49.9	1.6	2375	1.05	1.40

The thrusters covered by this type approval certificate are exempted from the requirement of local temperature indication of the lubrication oil due to their small size and demonstrated service history. For the retractable units, an exemption has also been granted for low oil level alarm of the lubrication oil as the oil is of very small quantity and fully enclosed within the units.

The thrusters covered by this type approval is approved for maneuvering duty only. Additional class notations such as e.g. Dynamic Positioning, and/or projects following other rule sets than stated on the front page of this certificate will need case-by-case evaluation.

Type Approval documentation

Title	Drawing no.	Revision
SH360		
SH360 Gearleg compl	SM-139896	A
SH400		
Q-Prop RH SH400	SM-139895	A
Styretapp Ø3x8 m6	01-03-550-114	1
Crown Wheel Z21 SH400TC	SM-138421	A
Pinion Z13 SH400TC	SM-135545	A
Gear Case SH400 ⁽¹⁾	SM-135546	C
Driveshaft SH400	SM-135972	A
Housing for bearings SH400 ⁽¹⁾	SM-136003	A
Propeller shaft SH400	SM-136006	B
Bearing lockin-nut	SM-136012	A
Låseskive tannhjul SH400	SM-136028	A
Protection ring	SM-136005	A
Festeskive drivaksel SH400	SM-136146	A
Q-Prop LH SH400	SM-139667	A
Protection ring SH400	SM-136033	A
Gearleg compl SH400	SM-135548	C
Oil tank arrangement	SM164443	A
SH700		
Styretapp Ø3x8 m6	01-03-550-114	A
Propeller shaft SH 700	SM-121141	C
Gear case SH700 TC ⁽¹⁾	SM-122915	F
Propell SH700 LH	SM-121010	A
Propell SH700 RH	SM-121011	A
Crown wheel Z21 SH700TC	SM-121972	A
Washer pinion	SM-121214	A
Ring pinion	SM-122754	A
Pinion Z13 SH700TC	SM-121978	A
Driveshaft SH700	SM-122486	C
Locking washer Crown wheel SH700 TC	SM-122798	A
Housing for bearings SH700 ⁽¹⁾	SM-122868	C
Lockingnut bearings SH700	SM-122762	A
Propellmutter M24 PM 35-40	SM-123290	B
Protection ring Tetnings ring SH700	SM-123310	B
Gearleg compl SH700	SM-122510	D
Oil tank arrangement	SM164543	A
SH1000		
Gear Case SH1000TC ⁽¹⁾	01-01-1000-100	Y
Pinion Drive (z13)	01-03-1000-118	A

Driveshaft	01-03-1000-106	F
Crown Wheel Z21	01-03-1000-117	B
Propeller Shaft	01-03-1000-102	Y
Propeller LH1 Ø500	01-03-1000-104-01	A
Propeller RH1 Ø500	01-03-1000-104-01	B
Housing for bearings ⁽¹⁾	01-03-1000-101	T
Protection ring Protection ring for simmering propeller shaft	01-03-1000-114	B
Lockingnut bearings	01-03-1000-125	H
Spacer ring	01-03-1000-129	A
Washer Pinion	01-03-1000-127	E
Ring pinion	01-03-1000-128	A
Propellernut PM45	Propellmutter PM45	A
Washer crown wheel	SM-123414	A
SH1000 Gearhus Montert Part list without oil tube	SM-123130	C
Gearhouse assembly SH1000 with oil tube	SM-142609	B
Oil pipe SH1000	SM-123112	B
Oil tank arrangement	SM164543	A
Oil tank arrangement – on-water oil change	SM164444	A

SH1400

Pinion Drive (z13)	01-03-1000-118	A
Locking ring bearings SH1000/1400	SM-122947-02	A
Propeller Shaft	01-03-1000-102	Y
Crown Wheel Z21	01-03-1000-117	B
Protection ring for simmering propeller shaft	01-03-1000-114	B
Gear Case ⁽¹⁾	01-03-1400-100	M
Housing for bearings ⁽¹⁾	01-03-1000-101	T
Propeller LH1 Ø596 SH1400TC	01-03-1400-104	D
Driveshaft	01-03-1400-110	F
Propeller RH1 Ø596 SH1400TC	100 1270 RH1	A
Spacer ring	01-03-1000-129	A
Washer Pinion	01-03-1000-127	E
Ring pinion	01-03-1000-128	A
Propellernut PM45	Propellernut PM45	A
Locking ring bearings SH1000/1400- oljestyling	SM-122947-01	A
Washer crown wheel	SM-123414	A
Girhus Montert SH1400 with oil pipe	SM-123143	B
Gearhouse assembly SH1400 without oil pipe	SM-142633	B
Oil pipe SH1400	SM-122755	A
Oil tank arrangement	SM164543	A
Oil tank arrangement – on-water oil change	SM164444	A

13 0602

Gear leg w/propeller Ø250mm	SM-103278	A
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Retract mechanical Ø250mm	SM-101951	A
Gear leg w/out propeller	SM159957	B

20 0603

Gear leg w/propeller Ø300mm	SM-178451	A
Retract mechanical Ø300mm	SM-118569	A
Gear leg w/out propeller	SM-144364	D

50 0600

Gear leg w/propeller Ø386mm	SM-106161	D
Retract mechanical Ø386mm	SM-160266	A
Gear leg w/out propeller	SM158780	C

General

Statement letter – Thrusters oil temperature		2020-11-10
Statement letter – Oil level monitoring on retractable thrusters		2023-01-04
Statement thruster rpm measurement	211220AUA01	0.2
Materiallegeringer ⁽²⁾	10.3.2	13
Oil tank approval drawing	SM-163865	A

⁽¹⁾Alternative material CC492K acc. material list⁽²⁾ accepted

Marking of product

Manufacturers name or trade mark and type designation.

Periodical assessment

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

In case 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