



TYPE APPROVAL CERTIFICATE

Certificate no.:
TAS00000NE
Revision No:
3

This is to certify:
that the Gears

with type designation(s)
Gearbox RE series

issued to
Dinamic Oil S.p.A.
Bomporto, MO, Italy

is found to comply with
DNV standard DNV-ST-0377 – Standard for shipboard lifting appliances
DNV standard DNV-ST-0378 – Offshore and platform lifting appliances

Application:

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

Issued at **Høvik** on **2025-03-06**

for **DNV**

This Certificate is valid until **2030-03-05**.

DNV local unit: **Venice**

Approval Engineer: **Thomas Henrik Tranesen**

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 USD 300 000.

Product description

Planetary gear unit with 3 stages and rotating housing.

Load spectrum and class of utilisation (based on principles according to F.E.M. 1.001 3rd edition) are defined below. If other output speed is required, the number of hours is to be interpolated.

Gearbox RE 3513, load spectrum:

Class	Torque (Nm)	Load in % of max	Fraction of total time
L1	30925.00	100	3
	18555.00	60	10
	15462.50	50	52
	8968.25	29	35

STAGE 1	STAGE 2	STAGE 3	RATIO
RE 3510 (3.84)	RE 1020 (3.56)	RE 510 (5.33)	72.86

Output speed: 19 rpm
 Service Life in Hours (T2): 800 hours
 Brakes (F608) with Max braking torque: 596,00 Nm

Gearbox RE 3513 HRS, load spectrum:

Class	Torque (Nm)	Load in % of max	Fraction of total time
L2	64000	100	2
	38400	60	65
	32000	50	23
	25600	40	10

STAGE 1	STAGE 2	STAGE 3	RATIO
RE 3510 (5.44)	RE 1020 (5.10)	RE 510 (7.5)	208.08

Output speed: 25 rpm
 Service Life in Hours (T2): 800 hours
 Brakes (F606) with Max braking torque: 629,00 Nm

Standard multi-disc failsafe brake design. The number of lamella and spring packages is adjusted to obtain the correct brake torque for the specific application. The given friction coefficients have not been evaluated.

Application/Limitation

1. Materials with 3.1 certificates are to be used when manufacturing load carrying parts. Traceability is assumed taken care of by the manufacturer's quality system.
2. Upon final installation of gear unit to foundation/frame the fastening bolts are to be pre-stressed according to procedures acceptable to the attending surveyor. We have assumed that the load carrying bolts are of 8.8 quality or higher.
3. Gear calculations are based on that optimum hardening depths have been achieved according to recognised standards and manufacturer's experience. Material fatigue values based on 90% reliability of survival have been applied according to the requirements for lifting appliances in our rules.
4. Load distribution factors as stated by the manufacturer have been used and we have not considered these.
5. The bearing lifetime is not evaluated in this Type Approval. It is assumed that the manufacturer delivers bearings with sufficient capacity for the class of utilization.
6. Freewheel sprag clutch is to be delivered with the manufacturers certificate documenting sufficient capacity.

Type Approval documentation

Drawing No.	rev.	Title
2030030600	24	Ring gear
22210126	08	Planetary carrier
02739912	02	Casting input support
02731043	10	Intermediate flange RE 810/1020
02730043	01	Casting intermediate flange
02621046	06	Planetary gear R=5,43
02621044	06	Planetary gear R=3,84
02621039	05	Satellite RE1020 R=3,56 RE 1020
02271000	04	Brake piston F5-F6
02251138	01	Seal holder cap RE3510 HR
02241098	03	Brake input shaft 8/16 Z13
02241000	05	Brake input shaft F5-F6
02231030	13	Ring gear RE 3510-4800
02231028	10	Ring gear RE 1020
02221566	05	Male planetary carrier
02221362	10	Input side planetary carrier RE 3510
02221156	07	Planetary RE 510 (turned+broached)
02201135	06	Output support RE3510 HR/HR2 EEC.
2030031100	10	Planetary gear 1:7,5
2030030900	10	Planetary gear 1:5,33
022210616	01	Planetary carrier R=5.33
022210614	02	Planetary carrier R=3.6 cantilevered pin
02221056	13	Planetary carrier RE310/510/610 (turning+broaching)
025810129	06	Planetary carrier pin RE 510/610 (cantilevered pin)
027410148	01	Shim adjustment fifth wheel 46.7x31.9x1 RE 510
027410180	01	Thrust bearing 50x31.1x3.2 RE 510-610
026210176	01	Planetary gear R=5.33 (cantilevered pin RE510)
022210618	02	Planetary carrier R=7.5 cantilevered pin
026210178	01	Planetary R=7.5

Doc No.	Rev.	Title
LR 453-05	-	RID.RE3513 HS RINF.ECC.208 F606 BG+ KIT SFIATO SPEC.D.B.
LR 194-03	-	RE 3513 HMC (SHORT) 72,86 F608 SAE"D"

Tests carried out

After completion the gears are to be function and pressure tested prior to issuance of a DNV product certificate.

Marking of product

The product to be marked with manufacturer's name or trademark and type number identification

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNV-CP-0338.

Manufactured by:

Dinamic Oil S.p.A.
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 41030 - Bomporto (MO), ITALY

END OF CERTIFICATE