



TYPE APPROVAL CERTIFICATE

Certificate No:
TAM000001Y
Revision No:
7

This is to certify:

That the Reduction Gear for Propulsion

with type designation(s)
ZF665, ZF665A, ZF665V and Super Shift 2 Family

Issued to
ZF Padova S.r.l.
Caselle di Selvazzano PD, PD, Italy

is found to comply with
DNV rules for classification – Ships Pt.4 Ch.4 Rotating machinery – power transmission
DNV rules for classification – High speed and light craft

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Input torque See page 2
Input speed See page 2
Reduction ratio See page 2

Issued at **Hamburg** on **2023-07-05**

This Certificate is valid until **2028-07-04**.

DNV local unit: **Venice**

for **DNV**

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 ZF665 and Super shift 2 Family

Standard marine reduction gear ZF665 with cylindrical gears, built-in hydraulic clutch and reversing stage (1:1).

Application/Limitation

The following maximum ratings are approved according to DNV Rules for Ships and High Speed Light Craft:

Ratio	Ship – Light Duty			Ship – Medium Duty			Ship – Continuous Duty		
	kW	rpm _{IN}	Torque _{IN}	kW	rpm _{IN}	Torque _{IN}	kW	rpm _{IN}	Torque _{IN}
1,111	926	2600	3401	746	2400	2968	696	2400	2770
1,182	926	2600	3401	746	2400	2968	696	2400	2770
1,262	926	2600	3401	746	2400	2968	696	2400	2770
1,400	926	2600	3401	746	2400	2968	696	2400	2770
1,500	926	2600	3401	746	2400	2968	696	2400	2770
1,743	926	2600	3401	746	2400	2968	696	2400	2770
1,833	926	2600	3401	746	2400	2968	696	2400	2770
2,000	926	2600	3401	746	2400	2968	696	2400	2770
2,233	890	2600	3269	696	2400	2770	646	2400	2571
2,593	740	2600	2718	640	2400	2547	625	2400	2487
3,042	595	2600	2185	520	2400	2069	495	2400	1970

The following maximum ratings are approved for Class Notations Naval, Patrol, Yacht and Crew:

Ratio	Pleasure Duty			Light Duty		
	kW	rpm _{IN}	Torque _{IN}	kW	rpm _{IN}	Torque _{IN}
1,111	1163	2600	4274	926	2600	3401
1,182	1163	2600	4274	926	2600	3401
1,262	1163	2600	4274	926	2600	3401
1,400	1163	2600	4274	926	2600	3401
1,500	1163	2600	4274	926	2600	3401
1,743	1163	2600	4274	926	2600	3401
1,833	1163	2600	4274	926	2600	3401
2,000	1109	2600	4073	926	2600	3401
2,233	1035	2600	3801	918	2600	3372
2,593	883	2600	3243	805	2600	2957
3,042	686	2600	2520	629	2600	2310

Ratio	Medium Duty			Continuous Duty		
	kW	rpm _{IN}	Torque _{IN}	kW	rpm _{IN}	Torque _{IN}
1,111	746	2400	2968	696	2400	2770
1,182	746	2400	2968	696	2400	2770
1,262	746	2400	2968	696	2400	2770
1,400	746	2400	2968	696	2400	2770
1,500	746	2400	2968	696	2400	2770
1,743	746	2400	2968	696	2400	2770
1,833	746	2400	2968	696	2400	2770
2,000	746	2400	2968	696	2400	2770
2,233	696	2400	2770	646	2400	2571
2,593	696	2400	2770	646	2400	2571
3,042	572	2400	2276	537	2400	2137

Product description ZF665A and Super shift 2 Family

Down-angle marine reduction gear ZF665 A with beveloid gears, built-in hydraulic clutch and reversing stage (1:1).

Application/Limitation

The following maximum ratings are approved according to DNV Rules for Ships and High Speed Light Craft:
 (All Class Notations – including Naval, Patrol, Yacht and Crew)

Ratio	Pleasure Duty			Light Duty		
	kW	rpm _{IN}	Torque _{IN}	kW	rpm _{IN}	Torque _{IN}
1,525	1115	2600	4095	926	2600	3401
1,757	1129	2600	4147	926	2600	3401
1,971	1113	2600	4088	926	2600	3401
2,226	1146	2600	4209	926	2600	3401
2,448	1066	2600	3915	919	2600	3376
2,517	880	2600	3232	767	2600	2817
2,960	760	2600	2791	657	2600	2413

Ratio	Medium Duty			Continuous Duty		
	kW	rpm _{IN}	Torque _{IN}	kW	rpm _{IN}	Torque _{IN}
1,525	746	2400	2968	696	2400	2770
1,757	746	2400	2968	696	2400	2770
1,971	746	2400	2968	696	2400	2770
2,226	696	2400	2770	646	2400	2571
2,448	676	2400	2690	646	2400	2571
2,517	676	2400	2690	636	2400	2531
2,960	597	2400	2376	572	2400	2276

Product description ZF665V and Super shift 2 Family

Down-angle marine reduction gear ZF665 V with beveloid gears, built-in hydraulic clutch and reversing stage (1:1).

Application/Limitation

The following maximum ratings are approved according to DNV Rules for Ships and High Speed Light Craft:
 (All Class Notations – including Naval, Patrol, Yacht and Crew)

Ratio	Pleasure Duty			Light Duty		
	kW	rpm _{IN}	Torque _{IN}	kW	rpm _{IN}	Torque _{IN}
1,525	926	2600	3401	926	2600	3401
1,757	926	2600	3401	926	2600	3401
1,971	926	2600	3401	926	2600	3401
2,226	926	2600	3401	926	2600	3401
2,448	926	2600	3401	919	2600	3376
2,517	851	2600	3126	767	2600	2817
2,960	729	2600	2678	657	2600	2413

Ratio	Medium Duty			Continuous Duty		
	kW	rpm _{IN}	Torque _{IN}	kW	rpm _{IN}	Torque _{IN}
1,525	746	2400	2968	696	2400	2770
1,757	746	2400	2968	696	2400	2770
1,971	746	2400	2968	696	2400	2770
2,226	696	2400	2770	646	2400	2571
2,448	696	2400	2770	636	2400	2531
2,517	676	2400	2690	636	2400	2531
2,960	597	2400	2376	572	2400	2276

All different duties above are according to ZF specification.

Maximum application factor $K_A = 1,2$.

Minimum lubrication oil FZG load stage = 12.

Type Approval documentation

Other conditions

The following is not included in this Type Approval Certificate and has to be submitted for approval case-by-case or project based:



Job Id: **262.1-012627-8**
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- Connection to propeller shaft
- Supervision of gearbox
- Fastening arrangement

Marking of product

Manufacturer's name or trademark, type designation and serial number.

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 Type Approval are complied with. Refer to DNV-CP-0338, Sec.4.

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.

END OF CERTIFICATE