DNV·GL

Certificate No:
TAS0000170

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Gears

with type designation(s)
2000 Series - planetary, PLUS series - planetary, A series - bevel

Issued to
Reggiana Riduttori S.r.l.
San Polo d'Enza RE, Italy

is found to comply with
DNV GL standard DNVGL-ST-0378 – Standard for offshore and platform lifting appliances
DNVGL-OS-E101 – Drilling plant, Edition July 2015
IMO SOLAS 1974 Convention, including 1996 Amendments

Application :

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

Issued at **Høvik** on **2017-10-09**

This Certificate is valid until **2021-09-08**.
DNV GL local station: **Milan**

Approval Engineer: **Sorina Thompson**

for **DNV GL**

Digitally Signed By: Matteucci, Aldo

Location: DNV GL Høvik, Norway

Aldo Matteucci
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.

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Product description

- 2000 and PLUS series are planetary gear stages and rotating housing.
- A series are bevel gears.
- The type approval of the whole unit is covered by the Type Approval of the single stages it is assembled of. Brakes are connected to input shaft and can be delivered with or without backstop device.

Application/Limitation

- Output speed is 15 rpm. If other output speed is required, the rating values are to be interpolated.
- Load spectrum and classes of utilisation according to F.E.M. (1.001 3rd edition – Revised 1998.10.01) are defined below.
- 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.
- 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.
- Our 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. Load distribution factors as stated by the manufacturer (based on his experience) have been used and we have not considered these.
- The bearing lifetime for the gears has not been evaluated in this Type Approval. It is assumed that the manufacturer delivers bearings with sufficient capacity for the class of utilization they are intended for with respect to strength and materials.

L1 (km = 0.1)

Load	Time
100 %	2 %
60 %	12 %
40 %	86 %

L2 (km = 0.2)

Load	Time
100 %	4 %
60 %	46 %
50 %	50 %

L3 (km = 0.4)

Load	Time
100 %	10 %
80 %	50 %
50 %	40 %

L4 (km = 0.8)

Load	Time
100 %	30 %
90 %	70 %

Classes of utilisation

Class	T1	T2	T3	T4	T5	T6	T7	T8
Hours	400	800	1600	3200	6300	12500	25000	50000

Output torque according to L1 [Nm]

Name	Gear Ratio	T1 M1	T2 M1	T3 M2	T4 M3	T5 M4	T6 M5	T7 M6	T8 M7	SOLAS
RR20	3,52	366	301	278	231	199	183	148	122	239
RR20	4,65	409	342	316	260	226	208	167	138	217

Name	Gear Ratio	T1 M1	T2 M1	T3 M2	T4 M3	T5 M4	T6 M5	T7 M6	T8 M7	SOLAS
RR20	6,21	498	430	361	324	284	242	213	176	205
RR65	3,52	615	503	464	386	332	305	248	203	294
RR65	4,65	695	578	533	440	382	351	282	234	256
RR65	6,21	817	737	629	560	488	422	364	299	243
RR105	3,21	1290	1135	1043	865	751	688	562	460	464
RR105	4,1	1291	1176	1069	933	821	749	608	505	395
RR105	5,43	1039	955	886	816	750	689	631	578	393
RR105	7,2	970	892	828	759	662	573	518	454	364
RR110	3,31	1552	1442	1334	1173	1051	955	770	648	604
RR110	3,91	1597	1471	1366	1257	1157	1064	967	822	628
RR110	4,94	1508	1391	1293	1193	1100	1013	932	856	578
RR110	5,79	1463	1347	1251	1152	1061	975	895	813	562
RR110	7,09	1299	1138	994	885	772	674	608	534	470
RR210	3,31	1718	1607	1503	1406	1317	1148	950	848	815
RR210	3,91	2129	1986	1851	1726	1613	1506	1393	1241	956
RR210	4,94	2265	2118	1984	1854	1726	1585	1452	1330	877
RR210	5,79	2259	2102	1968	1811	1663	1524	1393	1273	852
RR210	7,09	2051	1823	1585	1414	1233	1074	969	851	707
RR310	3,4	3150	2677	2447	2010	1771	1615	1312	1089	1501
RR310	4	3997	3480	3164	2572	2305	2093	1690	1423	1444
RR310	5	3901	3588	3332	3066	2823	2491	2093	1782	1367
RR310	5,8	3805	3543	3169	2726	2468	2163	1798	1526	1232
RR310	7	3201	2750	2425	2154	1880	1656	1492	1310	1312
RR510	3,4	7522	6853	6336	5195	4808	4274	3485	3015	2450
RR510	4	7330	6852	6300	5774	5256	4772	4322	3793	2350
RR510	5	6959	6393	5933	5454	5016	4489	4056	3612	2234
RR510	5,8	6389	6087	5630	5109	4483	3901	3539	3131	2011
RR510	7	5787	4972	4386	3896	3399	2996	2698	2368	2145
RR515	3,57	8634	7812	7139	6503	5931	5128	4123	3869	3109
RR515	4	8193	7500	6950	6369	5836	5286	4708	4271	2989
RR515	5,5	7047	6350	5714	5279	4782	4299	3707	3449	2314
RR710	4	9241	8494	7880	7239	6658	6008	4920	4292	3388
RR710	5,2	8364	7231	6292	5642	4968	4323	3910	3476	3252
RR710	6,25	7079	6107	5375	4788	4193	3677	3325	2933	2921
RR810	3,92	14470	13021	11705	10838	9783	8791	7878	7051	5864
RR810	4,3	13254	12169	11292	10374	9535	8751	8018	7326	5552
RR810	5,47	11915	10954	10168	9355	8610	7912	7260	6658	4882
RR810	6,43	11080	10162	9410	8650	7942	7256	6550	5774	4579
RR810	7,91	8663	7436	6610	5845	5084	4525	4054	3542	4170
RR810	8,6	7552	6472	5780	5096	4421	3959	3535	3078	3382
RR1010	4	21161	19398	17990	16502	15146	13880	12702	11618	8867
RR1010	5	20027	18371	17031	15641	14365	13174	12064	11042	8471
RR1010	5,8	20068	18303	16853	15471	14132	12580	11395	10086	7604

Name	Gear Ratio	T1 M1	T2 M1	T3 M2	T4 M3	T5 M4	T6 M5	T7 M6	T8 M7	SOLAS
RR1010	7	15942	13765	12236	10848	9479	8410	7566	6648	7450
RR1700	3,9	38062	37954	32871	27325	25477	22354	18459	16206	14225
RR1700	4,41	34450	34218	29671	24613	22955	20160	16634	14589	12921
RR1700	5,14	37704	33105	29581	26371	23333	20696	18760	16707	14018
RR1700	6,27	29853	26014	23246	20635	18137	16146	14559	12868	10831
RR2100	4,22	41616	38696	35859	32941	30036	25524	21010	19834	14496
RR2500	4	47860	44021	40821	37509	34505	31702	29089	26682	19948
RR2500	4,71	38102	34511	31434	28937	26268	23791	21512	19440	17687
RR2500	5,85	38739	34311	30751	27214	24031	21775	19506	17232	17163
RR3200	4	58711	53928	50030	45947	42247	38796	35581	32624	25338
RR3200	4,71	56756	52041	48055	42713	37814	34023	30679	27261	23841
RR3200	5,85	44824	39793	35648	31561	27895	25309	22673	20046	22586
RR4000	4,17	81327	74140	68409	62576	57096	52017	47323	43035	32407
RR4000	4,65	72931	67136	62361	57411	52913	48707	44779	41155	31264
RR4000	5,29	74542	68020	62734	57530	52585	47992	43738	39131	30865
RR4000	6,21	65285	60335	54434	48342	42760	38520	34690	30787	27221
RR5200	4,17	86749	79082	72970	66747	60902	55485	50478	45904	33822
RR5200	4,84	83426	75904	69768	63974	58313	53064	48129	42766	32058
RR5200	5,87	71593	63681	57027	50511	44679	40579	36353	32162	31028
RR6500	4,17	108832	99610	92283	84569	77517	70956	64860	59264	45896
RR6500	4,84	91446	83759	77583	71178	65288	59799	54696	50006	39852
RR6500	5,87	84770	77790	72109	66266	60894	55881	51210	46096	36241
RR8000	4,17	130015	118693	109752	100451	91844	83852	76444	69661	58560
RR8000	4,65	123532	113628	105533	97106	89443	82283	75598	69433	53019
RR8000	5,29	119020	108550	100031	91751	83821	76453	69631	63389	53049
RR8000	6,21	109383	101023	93903	86675	78401	70765	63722	56602	45559
RR10000	4,17	138682	126606	117069	107148	97968	89442	81541	74305	62464
RR10000	4,84	130507	119224	110180	100981	92394	84413	77009	70225	57930
RR10000	5,87	122334	111698	103003	94538	86461	78950	71139	63032	53957
RR15000	4,17	213220	195353	180946	165774	151909	139019	127053	116079	95992
RR15000	4,84	199051	182488	169063	155104	142309	130398	119327	109161	88010
RR15000	5,87	184649	169456	157096	144357	132676	121784	111644	99107	80090
RR20000	4,17	307312	281489	261054	239300	219155	200445	183094	167196	140116
RR20000	4,84	287087	263237	244133	223947	205306	187971	171879	157120	128701
RR20000	5,87	265193	243589	225977	207543	190600	174817	160141	144498	116587
RR25000	4,17	428552	392579	364043	334009	306678	280650	256482	234337	196497
RR25000	4,84	396618	363733	337355	309937	284684	260781	238589	218232	178705
RR25000	5,87	365060	335392	311295	286478	263371	241691	221529	198485	161276
RR40000	4,17	615667	563961	522873	479602	440318	403841	369441	337627	283602
RR40000	4,84	577160	529273	490811	450765	414292	380383	348213	318585	261434
RR40000	5,87	526373	483446	448574	412615	379798	348994	319864	287717	234018
RR55000	4,17	891915	815872	755844	692801	635233	581120	530322	483845	412699
RR55000	4,84	845618	774247	717218	658461	603342	551725	503874	460049	383678

Name	Gear Ratio	T1 M1	T2 M1	T3 M2	T4 M3	T5 M4	T6 M5	T7 M6	T8 M7	SOLAS
RR55000	5,87	776575	712233	660160	606909	556644	509879	466114	415230	345526
A60	2,29	1145	1058	984	909	841	778	719	664	450
A60	3,22	1035	978	904	836	773	715	660	610	413
A60	5,89	511	473	437	404	374	344	314	285	200
A220	2,69	3511	3256	3018	2789	2581	2386	2204	2036	1379
A220	3,15	3050	2833	2622	2422	2241	2072	1914	1768	1198
A220	4	2569	2390	2209	2041	1888	1746	1613	1516	1009
A620	2,73	9842	9127	8461	7817	7234	6688	6178	5707	3867
A620	3,3	8936	8305	7683	7098	6568	6073	5610	5182	3511
A620	3,89	8552	7954	7353	6792	6286	5812	5368	5032	3360
A820	2,77	14337	13299	12325	11387	10538	9743	9000	8313	5633
A820	3,17	11564	10743	9943	9185	8500	7859	7260	6706	4544
A820	4,09	8546	7950	7348	6788	6282	5808	5365	5052	3358
A1000	2,46	29612	27413	25455	23519	21765	20124	18589	17171	11636
A1000	3,17	21472	19948	18461	17055	15783	14592	13479	12451	8437
A1000	3,82	17459	16238	15012	13867	12833	11865	10960	10255	6860

Output torque according to L2 [Nm]

Name	Gear Ratio	T1 M1	T2 M2	T3 M3	T4 M4	T5 M5	T6 M6	T7 M7	T8 M8	SOLAS
RR20	3,52	286	234	203	192	177	147	122	117	239
RR20	4,65	322	265	231	219	203	166	138	133	217
RR20	6,21	406	336	293	256	229	210	176	163	205
RR65	3,52	480	390	339	320	295	247	203	195	294
RR65	4,65	545	448	389	369	341	281	234	225	256
RR65	6,21	695	571	498	446	399	363	299	283	243
RR105	3,21	1075	880	766	723	669	560	460	442	464
RR105	4,1	1154	961	839	793	729	606	505	486	395
RR105	5,43	946	885	816	749	688	631	578	555	393
RR105	7,2	884	811	687	601	548	501	447	384	364
RR110	3,31	1439	1226	1076	1019	935	769	648	626	604
RR110	3,91	1463	1365	1257	1155	1063	966	822	796	628
RR110	4,94	1383	1292	1192	1098	1012	932	856	781	578
RR110	5,79	1335	1249	1152	1059	973	893	802	700	562
RR110	7,09	1103	940	807	707	648	592	528	459	470
RR210	3,31	1607	1503	1395	1315	1145	950	848	829	815
RR210	3,91	1986	1851	1726	1610	1505	1393	1241	1213	956
RR210	4,94	2112	1983	1854	1723	1583	1452	1330	1228	877
RR210	5,79	2085	1963	1810	1659	1522	1393	1273	1118	852
RR210	7,09	1770	1505	1286	1127	1030	942	840	729	707
RR310	3,4	2486	2072	1810	1709	1571	1307	1089	1048	1501
RR310	4	3163	2688	2361	2233	2047	1686	1423	1373	1444
RR310	5	3559	3329	2952	2656	2375	2091	1782	1723	1367

Name	Gear Ratio	T1 M1	T2 M2	T3 M3	T4 M4	T5 M5	T6 M6	T7 M7	T8 M8	SOLAS
RR310	5,8	3344	2870	2530	2302	2084	1796	1526	1475	1232
RR310	7	2662	2283	1978	1737	1596	1455	1296	1132	1312
RR510	3,4	6345	5557	4972	4678	4217	3482	3015	2913	2451
RR510	4	6741	6268	5772	5244	4767	4322	3793	3672	2350
RR510	5	6331	5926	5416	4787	4282	3946	3565	3133	2234
RR510	5,8	6087	5447	4686	4152	3758	3447	3095	2703	2011
RR510	7	4813	4128	3577	3141	2887	2632	2344	2047	2145
RR515	3,57	7657	6694	6322	5867	5097	4123	3869	3740	3109
RR515	4	7413	6940	6369	5825	5280	4708	4271	4166	2989
RR515	5,5	6198	5578	5261	4769	4294	3707	3449	3306	2314
RR710	4	8447	7845	7064	6641	5927	4918	4292	4155	3388
RR710	5,2	6990	6035	5201	4607	4138	3808	3434	3013	3252
RR710	6,25	5906	5088	4404	3889	3548	3246	2904	2530	2921
RR810	3,92	12709	11564	10817	9759	8780	7878	7051	6890	5864
RR810	4,3	12048	11281	10374	9516	8742	8018	7326	7105	5553
RR810	5,47	10853	10156	9355	8593	7905	7260	6658	6240	4883
RR810	6,43	10054	9390	8649	7654	7013	6407	5722	5021	4580
RR810	7,91	7203	6170	5378	4719	4365	3961	3510	3050	4170
RR810	8,6	6272	5364	4691	4140	3822	3458	3052	2642	3382
RR1010	4	19197	17973	16501	15115	13866	12702	11618	11368	8868
RR1010	5	18180	17008	15640	14337	13161	12064	10951	9637	8471
RR1010	5,8	18052	16781	15072	13364	12167	11149	9996	8753	7605
RR1010	7	13314	11479	10023	8814	8132	7408	6593	5765	7450
RR1700	3,9	33049	29306	26584	24889	22169	18452	16206	15681	14224
RR1700	4,41	29813	26415	23938	22416	19985	16627	14589	14112	12921
RR1700	5,14	32033	28100	24747	22070	20110	18434	16588	14669	14019
RR1700	6,27	25150	21890	19251	17038	15672	14302	12780	11258	10830
RR2100	4,22	38634	33886	32143	29543	25430	21010	19834	19205	14496
RR2500	4	43790	40801	37508	34438	31671	29089	26682	25065	19949
RR2500	4,71	33883	31212	28920	26208	23763	21512	19440	18792	17687
RR2500	5,85	32908	28857	25754	23082	21297	19320	17168	15134	17163
RR3200	4	53628	50004	45947	42164	38757	35582	32624	31043	25338
RR3200	4,71	51501	45439	40439	35976	33227	30293	27137	24073	23839
RR3200	5,85	38134	33485	29922	26861	24775	22468	19976	17627	22587
RR4000	4,17	73082	68196	62568	56974	51961	47323	43035	41961	32409
RR4000	4,65	66787	62330	57410	52812	48660	44779	41155	39860	31264
RR4000	5,29	67123	62515	57520	51616	47322	43290	38915	34629	30865
RR4000	6,21	58457	51395	45747	40644	37615	34253	30646	27150	27220
RR5200	4,17	77954	72743	66739	60772	55425	50478	45904	44759	33822
RR5200	4,84	74764	69442	63422	56414	52231	47565	42586	37781	32062
RR5200	5,87	60991	53615	47957	43117	39749	36038	32054	28308	31026
RR6500	4,17	98471	92163	84565	77360	70883	64860	59264	57818	45897
RR6500	4,84	82832	77458	71173	65156	59738	54696	50006	48364	39853

Name	Gear Ratio	T1 M1	T2 M2	T3 M3	T4 M4	T5 M5	T6 M6	T7 M7	T8 M8	SOLAS
RR6500	5,87	77007	72003	66262	60774	55825	51210	45950	40616	36241
RR8000	4,17	117156	109512	100442	91653	83763	76444	69661	67935	58565
RR8000	4,65	112895	105470	97103	89272	82203	75598	69433	67236	53019
RR8000	5,29	107080	99647	91733	83644	76371	69631	63389	60980	53053
RR8000	6,21	100571	93863	83981	74714	69179	62973	56362	49988	45559
RR10000	4,17	124966	116813	107139	97763	89347	81541	74305	72464	62469
RR10000	4,84	117729	109893	100970	92203	84324	77009	70225	67879	57930
RR10000	5,87	110261	102629	93766	84535	77883	70584	62843	55596	53953
RR15000	4,17	193090	180703	165766	151600	138876	127053	116079	113259	95992
RR15000	4,84	180502	168820	155096	142024	130265	119327	109161	105611	88010
RR15000	5,87	167771	156885	144349	132416	121663	110903	98855	87629	80091
RR20000	4,17	278260	260690	239288	218707	200237	183094	167196	163137	140130
RR20000	4,84	260355	243739	223933	204889	187778	171879	157120	151995	128701
RR20000	5,87	241138	225625	207530	190222	174641	160141	144169	127997	116588
RR25000	4,17	388240	363642	333996	306070	280360	256482	234337	228682	196517
RR25000	4,84	359913	336925	309922	284111	260515	238589	218232	211160	178706
RR25000	5,87	332164	310917	286464	262852	241450	221529	198071	176077	161278
RR40000	4,17	557859	522377	479587	439443	403435	369441	337627	329508	283630
RR40000	4,84	523843	490279	450747	413477	380005	348213	318585	308297	261435
RR40000	5,87	478835	448077	412597	379066	348645	319864	287162	255590	234021
RR55000	4,17	806273	754764	692767	633953	580510	530322	483845	472082	412722
RR55000	4,84	765348	715864	658412	602105	551150	503873	460049	444928	383712
RR55000	5,87	704658	658926	606861	555524	509358	463599	414391	368877	345527
A60	2,29	1054	984	909	840	777	719	664	632	450
A60	3,22	976	904	836	772	714	660	609	555	413
A60	5,89	473	437	404	370	337	311	284	257	200
A220	2,69	3247	3018	2789	2576	2384	2204	2036	1968	1379
A220	3,15	2829	2622	2422	2237	2071	1914	1768	1735	1198
A220	4	2389	2209	2041	1885	1744	1613	1516	1495	1009
A620	2,73	9104	8460	7817	7221	6682	6178	5707	5523	3867
A620	3,3	8294	7683	7098	6556	6067	5610	5182	5106	3511
A620	3,89	7949	7353	6792	6274	5806	5368	5032	4648	3360
A820	2,77	13266	12324	11387	10519	9734	9000	8313	8057	5633
A820	3,17	10727	9942	9185	8485	7852	7260	6706	6581	4544
A820	4,09	7946	7348	6788	6270	5803	5365	5052	4983	3358
A1000	2,46	27318	25449	23519	21726	20105	18589	17171	16457	11636
A1000	3,17	19917	18460	17055	15754	14579	13479	12451	12220	8437
A1000	3,82	16226	15011	13867	12810	11854	10960	10255	10113	6860

Output torque according to L3 [Nm]

Name	Gear Ratio	T1 M2	T2 M3	T3 M4	T4 M5	T5 M6	T6 M7	T7 M8	T8 M8	SOLAS
RR20	3,52	238	181	151	142	126	120	115	111	239
RR20	4,65	269	204	171	161	144	136	131	127	217
RR20	6,21	334	260	218	199	173	160	144	135	205
RR65	3,52	398	303	252	236	210	200	192	184	294
RR65	4,65	456	346	289	272	243	230	221	213	256
RR65	6,21	577	444	370	346	302	278	251	236	243
RR105	3,21	892	686	570	533	478	452	434	417	464
RR105	4,1	946	741	625	586	523	496	477	459	395
RR105	5,43	802	735	691	659	612	561	545	505	393
RR105	7,2	751	652	554	464	416	383	346	328	364
RR110	3,31	1204	934	802	755	676	639	617	595	604
RR110	3,91	1238	1136	1017	959	860	812	785	760	628
RR110	4,94	1178	1083	1024	944	812	756	693	638	578
RR110	5,79	1135	1042	979	844	742	688	626	584	562
RR110	7,09	880	757	647	548	494	455	412	391	470
RR210	3,31	1379	1141	1047	997	891	841	823	805	815
RR210	3,91	1734	1624	1532	1458	1296	1230	1202	1175	956
RR210	4,94	1836	1692	1591	1490	1274	1185	1084	997	877
RR210	5,79	1776	1625	1519	1351	1184	1097	998	931	852
RR210	7,09	1412	1211	1033	873	784	723	654	620	707
RR310	3,4	2072	1597	1348	1264	1128	1070	1029	990	1500
RR310	4	2638	2049	1759	1655	1481	1401	1352	1304	1444
RR310	5	3021	2532	2202	2076	1813	1691	1551	1429	1367
RR310	5,8	2784	2177	1887	1778	1593	1480	1348	1258	1232
RR310	7	2128	1841	1581	1351	1222	1128	1020	969	1312
RR510	3,4	5230	4201	3719	3497	3138	2973	2872	2774	2450
RR510	4	5590	5066	4677	4404	3956	3746	3625	3464	2350
RR510	5	5364	4920	4379	3771	3269	3049	2797	2575	2234
RR510	5,8	5027	4384	3787	3251	2874	2669	2433	2270	2011
RR510	7	3847	3328	2860	2443	2211	2041	1846	1753	2145
RR515	3,57	6198	4975	4731	4389	3947	3816	3688	3563	3109
RR515	4	6210	5590	5213	4984	4516	4213	4144	3887	2989
RR515	5,5	5057	4476	4152	3954	3554	3344	3288	3216	2314
RR710	4	7121	5921	5292	4984	4477	4221	3907	3544	3388
RR710	5,2	5595	4853	4206	3623	3162	2947	2700	2495	3252
RR710	6,25	4726	4099	3539	3038	2717	2519	2290	2152	2921
RR810	3,92	10344	9275	8627	8264	7585	6965	6854	6745	5864
RR810	4,3	10194	9344	8851	8418	7783	7182	7068	6957	5553
RR810	5,47	9210	8453	7960	7488	6601	6146	5623	5221	4883
RR810	6,43	8487	7770	6949	5982	5383	4990	4534	4274	4580
RR810	7,91	5757	4982	4271	3640	3348	3077	2807	2662	4171

Name	Gear Ratio	T1 M2	T2 M3	T3 M4	T4 M5	T5 M6	T6 M7	T7 M8	T8 M8	SOLAS
RR810	8,6	5014	4334	3708	3154	2934	2689	2467	2339	3382
RR1010	4	16184	14814	14097	13366	12327	11484	11313	10362	8869
RR1010	5	15355	14064	13269	11559	10095	9425	8660	7978	8471
RR1010	5,8	15066	13718	12133	10484	9340	8688	7936	7408	7604
RR1010	7	10656	9265	7996	6870	6248	5776	5228	4971	7449
RR1700	3,9	27029	22176	19955	18769	16874	15998	15476	14969	14226
RR1700	4,41	24395	19988	17964	16893	15186	14398	13925	13465	12922
RR1700	5,14	25827	22760	19983	17497	15561	14526	13357	12361	14018
RR1700	6,27	20199	17696	15414	13385	12103	11240	10248	9642	10829
RR2100	4,22	30666	25420	24198	22455	20222	19589	18720	17369	14496
RR2500	4	36912	33876	32345	29852	26572	24841	22886	21139	19949
RR2500	4,71	27909	25240	23505	22542	20783	18982	18102	16963	17685
RR2500	5,85	26619	23413	20524	17957	16671	15432	14068	13418	17163
RR3200	4	45186	41449	39564	36778	32815	30687	28286	26134	25339
RR3200	4,71	41762	36888	32470	28533	25923	24146	22129	20740	23840
RR3200	5,85	30872	27182	23860	20907	19427	17989	16403	15650	22586
RR4000	4,17	60852	55369	52264	49808	45833	42379	41764	39262	32409
RR4000	4,65	56644	52085	49437	46981	42061	39381	36372	33418	31264
RR4000	5,29	56091	51128	46652	41035	36815	34371	31614	29346	30862
RR4000	6,21	47276	41716	36679	32191	29355	27304	24977	23501	27219
RR5200	4,17	64909	59060	55748	53129	48888	45204	44305	41096	33824
RR5200	4,84	62112	56447	50899	44770	40843	38019	34820	32724	32060
RR5200	5,87	49413	43545	38263	33566	31218	28907	26373	25164	31023
RR6500	4,17	82796	75696	71819	68238	62921	58397	57545	53797	45900
RR6500	4,84	69751	63810	60193	57392	53063	48851	48134	45574	39854
RR6500	5,87	65109	59679	54809	48144	44813	41506	37877	36150	36240
RR8000	4,17	97983	89343	84521	80441	74090	68616	67613	66624	58562
RR8000	4,65	95729	87967	83432	79319	73462	67908	66919	61522	53024
RR8000	5,29	89382	81421	76140	72917	67441	61593	57987	53845	53050
RR8000	6,21	85824	76499	67373	59239	54108	50338	46073	43358	45555
RR10000	4,17	104515	95299	90156	85804	79029	73191	72121	71066	62466
RR10000	4,84	98601	89970	84603	80800	74643	68560	67558	65589	57932
RR10000	5,87	92247	84127	74908	65877	61365	56850	51891	49537	53951
RR15000	4,17	162244	148301	140699	133698	123253	114382	112730	111099	96000
RR15000	4,84	152073	139183	131401	125253	115794	106660	104361	98130	88012
RR15000	5,87	141883	130088	117633	103751	96832	89771	81977	78319	80090
RR20000	4,17	234011	213782	202729	192706	177589	164745	162380	160046	140123
RR20000	4,84	219322	200572	189196	180439	166749	153494	151288	144140	128704
RR20000	5,87	203766	186684	171360	151456	141534	131270	119923	114625	116587
RR25000	4,17	327265	299399	284092	269961	248819	230923	227625	224374	196507
RR25000	4,84	304035	278339	262751	250502	231519	213230	210184	198136	178709
RR25000	5,87	281608	258165	235226	208246	194791	180724	165160	157917	161276
RR40000	4,17	470577	430664	409159	388874	358435	332723	327991	323325	283616

Name	Gear Ratio	T1 M2	T2 M3	T3 M4	T4 M5	T5 M6	T6 M7	T7 M8	T8 M8	SOLAS
RR40000	4,84	442866	405754	383510	365633	337928	311306	305748	287671	261437
RR40000	5,87	406039	372593	340830	302142	282867	262516	239995	229536	234018
RR55000	4,17	677809	619378	586971	558295	514222	476706	469903	463195	412709
RR55000	4,84	644150	588393	554203	528988	488628	449299	441515	415442	383680
RR55000	5,87	594773	544187	491823	436060	408091	378638	346241	331024	345503
A60	2,29	902	833	785	751	700	647	629	620	450
A60	3,22	829	766	731	658	594	536	492	460	413
A60	5,89	401	374	337	304	274	250	235	217	200
A220	2,69	2767	2556	2434	2310	2146	1986	1925	1848	1379
A220	3,15	2404	2220	2133	2010	1864	1751	1706	1637	1198
A220	4	2025	1891	1816	1696	1571	1509	1488	1435	1009
A620	2,73	7757	7165	6829	6477	6016	5575	5444	5225	3867
A620	3,3	7043	6506	6265	5893	5463	5154	4845	4531	3511
A620	3,89	6740	6280	6039	5500	4966	4477	4158	3879	3361
A820	2,77	11300	10438	9957	9437	8763	8133	7880	7563	5633
A820	3,17	9115	8420	8091	7624	7070	6644	6475	6214	4544
A820	4,09	6736	6299	6046	5642	5225	5030	4946	4747	3358
A1000	2,46	23339	21559	20416	19451	18098	16738	16383	16157	11636
A1000	3,17	16924	15633	15024	14156	13127	12336	12022	11539	8437
A1000	3,82	13761	12804	12320	11524	10674	10209	10038	9634	6860

Output torque according to L4 [Nm]

Name	Gear Ratio	T1 M3	T2 M4	T3 M5	T4 M6	T5 M7	T6 M8	T7 M8	T8 M8	SOLAS
RR20	3,52	177	136	126	120	116	111	107	103	239
RR20	4,65	200	154	144	137	132	127	123	118	217
RR20	6,21	253	196	182	157	145	136	129	122	205
RR65	3,52	297	227	211	200	193	185	178	171	294
RR65	4,65	338	261	243	231	222	214	206	198	256
RR65	6,21	434	334	310	274	253	237	224	212	243
RR105	3,21	670	514	476	453	436	419	404	389	464
RR105	4,1	721	563	523	497	479	460	442	425	395
RR105	5,43	692	634	607	576	545	508	481	455	393
RR105	7,2	624	526	441	378	348	330	312	296	364
RR110	3,31	904	722	675	641	619	598	577	556	604
RR110	3,91	1069	916	859	815	789	764	738	714	628
RR110	4,94	1020	937	892	762	689	641	609	579	578
RR110	5,79	980	899	798	679	627	587	558	529	562
RR110	7,09	721	613	519	450	414	393	372	354	470
RR210	3,31	1082	941	896	847	828	811	793	776	815
RR210	3,91	1528	1377	1310	1238	1209	1181	1153	1119	956
RR210	4,94	1592	1458	1398	1198	1080	1003	951	902	877
RR210	5,79	1529	1397	1278	1084	999	936	887	841	852

Name	Gear Ratio	T1 M3	T2 M4	T3 M5	T4 M6	T5 M7	T6 M8	T7 M8	T8 M8	SOLAS
RR210	7,09	1155	980	827	714	657	623	591	561	707
RR310	3,4	1555	1215	1129	1073	1033	993	954	917	1501
RR310	4	1983	1585	1480	1406	1358	1310	1263	1217	1444
RR310	5	2440	1984	1858	1695	1542	1435	1366	1299	1367
RR310	5,8	2100	1700	1591	1456	1348	1264	1202	1142	1232
RR310	7	1748	1496	1276	1113	1027	974	924	877	1312
RR510	3,4	4022	3354	3138	2984	2885	2787	2691	2597	2450
RR510	4	4762	4217	3956	3761	3642	3489	3309	3151	2350
RR510	5	4629	4140	3561	3055	2779	2587	2462	2342	2234
RR510	5,8	4164	3581	3071	2626	2433	2281	2168	2060	2011
RR510	7	3160	2705	2309	2013	1859	1762	1672	1586	2145
RR515	3,57	4755	4262	3963	3830	3704	3580	3457	3338	3109
RR515	4	5254	4722	4536	4271	4169	3904	3718	3541	2989
RR515	5,5	4264	3818	3569	3432	3308	3232	3124	3019	2314
RR710	4	5652	4771	4477	4255	3847	3567	3384	3225	3387
RR710	5,2	4611	3976	3421	2936	2686	2506	2385	2268	3252
RR710	6,25	3889	3345	2870	2475	2296	2163	2056	1953	2921
RR810	3,92	8716	7805	7531	7058	6895	6786	6678	6571	5864
RR810	4,3	8789	8050	7760	7323	7110	6999	6887	6564	5553
RR810	5,47	7953	7295	7000	6078	5604	5244	4992	4751	4883
RR810	6,43	7308	6564	5645	4904	4550	4294	4084	3883	4579
RR810	7,91	4726	4041	3442	3050	2821	2677	2537	2404	4171
RR810	8,6	4111	3509	2983	2671	2479	2352	2229	2111	3382
RR1010	4	13931	12787	12374	11639	11233	10426	9894	9435	8868
RR1010	5	13227	12109	10903	9412	8596	8012	7635	7273	8471
RR1010	5,8	12894	11454	9891	8523	7925	7441	7086	6747	7604
RR1010	7	8775	7554	6486	5692	5266	4995	4748	4511	7450
RR1700	3,9	21121	18006	16886	16061	15548	15043	14546	14061	14223
RR1700	4,41	19043	16211	15196	14454	13989	13531	13080	12640	12921
RR1700	5,14	21482	18824	16474	14398	13278	12413	11839	11289	14018
RR1700	6,27	16720	14535	12614	11032	10264	9683	9225	8786	10829
RR2100	4,22	24002	21821	20313	19670	18619	17439	16647	15888	14497
RR2500	4	31866	29378	28087	24643	22715	21224	20265	19346	19949
RR2500	4,71	23714	21435	20587	19361	18081	17031	16255	15510	17686
RR2500	5,85	22063	19325	16905	15218	14128	13474	12849	12250	17163
RR3200	4	38986	35922	34596	30414	28071	26238	25064	23938	25338
RR3200	4,71	34759	30562	26846	23656	22100	20823	19880	18977	23840
RR3200	5,85	25608	22462	19678	17738	16475	15715	14991	14297	22585
RR4000	4,17	52035	47328	45810	43111	41997	39531	37662	35982	32410
RR4000	4,65	49011	45050	43511	39331	36014	33551	32044	30599	31264
RR4000	5,29	48056	43786	38606	33902	31448	29464	28128	26847	30864
RR4000	6,21	39312	34529	30293	26791	24992	23597	22516	21481	27220
RR5200	4,17	55504	50483	48864	45985	44036	41258	39420	37659	33824

Name	Gear Ratio	T1 M3	T2 M4	T3 M5	T4 M6	T5 M7	T6 M8	T7 M8	T8 M8	SOLAS
RR5200	4,84	53044	47901	42118	37282	34813	32856	31368	29942	32060
RR5200	5,87	41016	36016	31588	28510	26483	25267	24104	22989	31026
RR6500	4,17	71171	65060	63037	59366	57652	54010	51589	49269	45897
RR6500	4,84	60002	54867	52872	50013	48405	45756	43690	41709	39856
RR6500	5,87	56130	51426	45300	40933	38040	36297	34636	33044	36240
RR8000	4,17	83980	76542	74121	69778	67993	67010	66029	65061	58561
RR8000	4,65	82766	76028	73409	69466	66277	61765	59001	56353	53019
RR8000	5,29	76527	69680	66823	62129	57684	54059	51620	49282	53049
RR8000	6,21	72065	63409	55734	49394	46097	43533	41551	39651	45558
RR10000	4,17	89579	81645	79062	74430	72526	71477	70431	69399	62465
RR10000	4,84	84575	77139	74260	70231	67937	65849	62898	60070	57933
RR10000	5,87	79078	70486	61977	56061	52119	49737	47473	45303	53947
RR15000	4,17	139428	127432	123493	116293	113356	111736	110119	106139	95993
RR15000	4,84	130875	119742	115449	109207	104306	98513	94149	89966	88011
RR15000	5,87	122352	110648	97576	88498	82366	78628	75111	71740	80090
RR20000	4,17	200975	183552	177913	167519	163279	160960	158647	155223	140118
RR20000	4,84	188578	172406	166195	157199	152127	144698	138344	132255	128704
RR20000	5,87	175559	160796	142408	129397	120516	115072	109976	105092	116587
RR25000	4,17	281470	257259	249367	234809	228882	225650	222426	213677	196498
RR25000	4,84	261706	239401	230858	218367	210477	198898	190221	181904	178707
RR25000	5,87	242795	221168	195774	178141	166003	158529	151561	144882	161276
RR40000	4,17	405218	370651	359296	338324	329796	325158	320531	308811	283604
RR40000	4,84	381828	349450	337041	318807	305519	288774	276248	264242	261435
RR40000	5,87	350578	320351	284007	258763	241250	230420	220360	210719	234018
RR55000	4,17	582347	531368	514992	484822	472494	465828	459174	451027	412702
RR55000	4,84	553123	505074	486667	460281	441272	417044	398815	381343	383665
RR55000	5,87	511667	462386	409904	373366	347983	332308	317670	303642	345519
A60	2,29	785	725	693	662	632	624	615	583	450
A60	3,22	721	672	618	557	503	453	424	399	413
A60	5,89	349	317	285	257	232	216	203	194	200
A220	2,69	2407	2223	2148	2037	1965	1858	1833	1807	1379
A220	3,15	2091	1946	1882	1773	1736	1647	1624	1601	1198
A220	4	1761	1669	1602	1516	1496	1443	1389	1317	1009
A620	2,73	6747	6233	6026	5713	5528	5254	5098	4769	3867
A620	3,3	6126	5722	5529	5198	4942	4456	4178	3933	3511
A620	3,89	5863	5543	5168	4653	4200	3819	3582	3392	3360
A820	2,77	9829	9079	8787	8324	8041	7605	7500	7290	5633
A820	3,17	7928	7381	7140	6724	6587	6249	6163	5860	4544
A820	4,09	5859	5560	5334	5055	4987	4682	4389	4164	3358
A1000	2,46	20301	18753	18018	17157	16471	16247	16023	15455	11636
A1000	3,17	14721	13705	13257	12485	12231	11603	11443	11074	8437
A1000	3,82	11970	11301	10870	10261	10122	9688	9141	8650	6860

Type Approval documentation

Drawings of sun wheels, planets, ring gears, planetary carriers, and calculations for all stages.

Tests carried out

- For delivery according to DNVGL-ST-0378, gear unit and winch or similar is to be function and load tested according to Section 14 of the Rules before a DNV GL product certificate can be issued
- For delivery according to SOLAS a functional test is to be carried out showing compliances with IMO Resolution MSC 81(70) "Testing Part II"

Marking of product

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

Periodical assessment

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

END OF CERTIFICATE