



CERTIFICATE NUMBER	20-2004469-PDA
EFFECTIVE DATE	11-Aug-2020
EXPIRY DATE	10-Aug-2025
ABS TECHNICAL OFFICE	Genoa Engineering Department

CERTIFICATE OF Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

DINAMIC OIL S.P.A.

located at

VIA TOGLIATTI NO. 15, BOMPORTO, MODENA, Italy, 41030

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product Gearbox

**Model RA 813 T3S 60,56 ME132 and RE 813 TS 81 ST BG with Pinion M10 Z14 X0,5 BU94
RA 813 T3S 60,56 ME132 and RE 813 TS 81 ST BG with Pinion M12 Z14 X0,48 BU105
RE 1022 DBS S 51,43 F601 ...**

This Product Design Assessment (PDA) Certificate remains valid until 10/Aug/2025 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau Of Shipping
Lucio Trevisan, Engineer/Consultant

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

DINAMIC OIL S.P.A.

VIA TOGLIATTI NO. 15

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Tier: 5 - Unit Certification Required

Product: Gearbox

Model: RA 813 T3S 60,56 ME132 and RE 813 TS 81 ST BG with Pinion M10 Z14 X0,5 BU94
RA 813 T3S 60,56 ME132 and RE 813 TS 81 ST BG with Pinion M12 Z14 X0,48 BU105
RE 1022 DBS S 51,43 F601 with Pinion M12 Z12 X0.5
RE 1022 DBS S 43.68 F602 with Pinions M12 Z12 X0.5 and M14 Z12 X0.5
RA 1023 T8S 60,56L ME132 and RE 1023 T8S 81 ST BG with Pinion M12 Z14 X0.48 BU105
RA 1023 DBS S 61,70 ME160 and RE 1023 DBS S 81 ST BG with Pinion M16 Z14 X0,5 BU125
RA 1023 DBS S 52.9 with Pinion M14 Z12 X0.5 and RA 1023 DBS S 52.9 with pinion M12 Z12 X0.48
RA 1523 DBS S 62,15 ME180 and RE 1523 DBS S 80,57 ST BG with Pinion M16 Z14 X0,48 BU140

Intended Service:

Thruster Steering - Multiple arrangement only.

Description:

In line and right angle, two and three stages, planetary reduction gears with splined male overhung output pinion shafts.

Model names including F601 or F602 designate gearboxes with static friction brake on input shaft.

Rating:

Nominal power from 7.4 to 29.1 kW.

For additional details, see attachment.

Service Restriction:

- 1) As per 4-3-1/1.1 of ABS Marine Vessel Rules, Unit Certification is required for this product, regardless of power rating, when used on steering mechanism for main propulsion azimuthal thrusters or for auxiliary thrusters of vessel covered by APS, PAS or DPS additional Class Notation.
- 2) Factory Acceptance Tests required for Unit Certification are as per 4-3-1/9.7.1 ii) of the Marine Vessels Rules, as applicable.
- 3) If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

Comments:

- 1) Present approval is valid only in conjunction with service profile as per the attachment.
- 2) Output pinion teeth mesh are not covered by present certificate and are to be approved on a case-by-case basis.
- 3) Minimum operating temperature is -9.9°C. Where operation at lower temperature is requested, considerations shall be given to provision of adequate heating systems for entire reduction gear or for adoption of materials with adequate resilience. Relevant design data are to be submitted for review on a case-by-case basis.
- 4) Hydraulic motors driving pinions for thruster steering mechanisms are to be certified by the Surveyor at Manufacturers' plants in accordance with 4-3-5/5.11 and 4-6-1/7.3 of ABS Marine Vessels Rules.
- 5) The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

Notes/Drawing/Documentation:

Reference technical drawings and documents as per attachment.

Terms of Validity:

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Tier: 5 - Unit Certification Required

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

STANDARDS

ABS Rules:

- Rules for Condition of Classification (2020) : 1-1-4/7.7, 1-1-A3 and A4, which covers the following:
- Rules for Building and Classing Marine Vessels (2020): 4-3-1 and 4-3-5;
- Rules for Building and Classing Steel Vessels for Service on Rivers and Intracoastal Waterways (2020): 4-2-1;
- Rules for Conditions of Classification – High-Speed Crafts (2020): 1-1-4/11.9, 1-1-A2 and 1-1-A3, which covers the following:
- Rules for Building and Classing High-Speed Craft (2020): 4-3-1.
- Rules for Conditions of Classifications – Offshore Units and Structures (2020): 1.1.4/9.7, 1-1-A2 and A3, which covers the following:
- Rules for Building and Classing Mobile Offshore Units (2020) 4-1-2.

National:

NA

International:

NA

Government:

NA

EUMED:

NA

OTHERS:

NA

Additional Product Details

PDA Certificate No. 20-2004469-PDA

Issued on 11-Aug-2020

Expiring on 10-Aug-2025

PLANETARY REDUCTION GEAR RA 813 T3S 60,56 ME132 WITH PINION M10 Z14 X0.5 BU94 GEARBOX CODE: ABT91L3FSH00601

Ratings

Phase	Time percentage	Output torque T ₂	Output speed n ₂
	%	[Nm]	[rpm]
1	99.8	1143	23.57
2	0.2	2982	23.57

Gear ratio 1:60.56

Expected service life: 160000 hours at 6 cycles/minute

Application factor K_a = 1

Maximum static output torque: 3728 Nm

Drawings List

Drawing No	Revision No	Drawing Title
DI14480	01	RA 813 T3S ME132 GENERAL ASSEMBLY DRAWING
ST7039	02	RA 813 T3S ME132 SECTIONAL VIEW
3833	00	RA 813 T3S 60.56 ME132 PART LIST
4000183200	00	RE810 BOTTOM
2030024000	05	RE310 SUN GEAR
2030021300	18	RE300 RING GEAR
025710224ABT	02	RE810 PINION M10 Z14 X0.5 BU93
025710224	07	RE810 PINION M10 Z14 X0.5 BU94
022610228ABT	00	RE810 SPLINED SHAFT B70X64
022610228	02	RE810 SPLINED SHAFT B70X64
20300228	04	RE300 RING
2030021500	10	RE310 PLANETARY GEAR
02971249	01	RE810 BODY
02771001	02	KEY 22X14X34
02741009	04	RE810 RING
02741007	05	RE310 RING
02731552	02	RE810/RE1020 STEEL INTERMEDIATE FLANGE
02731037	04	RE310 FLANGE
02731035	05	BEVEL GEAR FLANGE
02631011	00	BEVEL GEAR SPLINED COUPLING
02621002	06	RE810 PLANETARY GEAR
02611030	04	RE810 SUN GEAR
02611027	01	BEVEL GEAR PINION
02581025	02	RE810 PLANETARY CARRIER PIN
02581006	13	RE310 PLANETARY CARRIER PIN
02551021	02	RE810 BOTTOM
02551015	03	RE310 BOTTOM

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02501039	06	RE110 INPUT SUPPORT
02261026	04	BEVEL GEAR SHAFT
02251010	06	RE810 CAP
02241166	02	RE110 INPUT COUPLING
02231011	10	RE810 RING GEAR
02231010	03	BEVEL GEAR WHEEL
02221057	11	RE810 PLANETARY CARRIER
02221056	08	RE310 PLANETARY CARRIER
02211006	00	BEVEL GEAR CAP
02201356	04	CC120 CARTER
02201029	11	RE810 BODY

Additional Product Details

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PLANETARY REDUCTION GEAR RE 813 TS 81 ST BG WITH PINION M10 Z14 X0.5 BU94

GEARBOX CODE: ABT91L3FS300810

Ratings

Phase	Time percentage	Output torque T_2	Output speed n_2
	%	[Nm]	[rpm]
1	99.8	1143	23.57
2	0.2	2982	23.57

Gear ratio 1:81.0

Expected service life: 160000 hours at 6 cycles/minute

Application factor $K_a = 1$

Maximum static output torque: 3728 Nm

Drawings List

Drawing No	Revision No	Drawing Title
DI13835	02	RE 813 TS ST BG GENERAL ASSEMBLY DRAWING
ST5869	01	RE 813 TS ST BG SECTIONAL VIEW
3136	00	RE 813 TS 81 ST BG PART LIST
4000183200	00	RE810 BOTTOM
4000067200	00	SPLINED COUPLING 12/24 DP Z14
2030024100	06	RE310 SUN GEAR
2030022800	04	RE300 RING
027310487	01	RE310/510 STEEL INTERMEDIATE FLANGE
2030021600	10	RE310 PLANETARY GEAR
2030021300	18	RE300 RING GEAR
2030001600	03	RE110 PLANETARY GEAR
402004000	04	RE100 RING
02741009	04	RE810 RING
02741007	05	RE310/510 RING
02731552	02	RE810/1020 STEEL INTERMEDIATE FLANGE
02621002	06	RE810 PLANETARY GEAR
02611030	04	RE810 SUN GEAR
02611022	06	RE100 SUN GEAR
02581034	03	RE110 PLANETARY CARRIER PIN
02581025	02	RE810 PLANETARY CARRIER PIN
02581006	13	RE310 PLANETARY CARRIER PIN
02551021	02	RE810 BOTTOM
02551015	03	RE310/510 BOTTOM
02551010	03	RE110 BOTTOM
02511108	04	MOTOR COUPLING FLANGE
02501003	15	RE110 INPUT SUPPORT
02251010	06	RE810 CAP

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02241005	11	INPUT COUPLING SHAFT
02231011	10	RE810 RING GEAR
02231006	09	RE110 RING GEAR
02221057	11	RE810 PLANETARY CARRIER
02221056	08	RE310 PLANETARY CARRIER
02221019	01	RE100 PLANETARY CARRIER
02201029	11	RE810 BODY
025710224ABT	02	RE810 PINION M10 Z14 X0.5 BU93
025710224	07	RE810 PINION M10 Z14 X0.5 BU94
022610228BVT	00	RE810 SPLINED SHAFT B70X64
022610228	02	RE810 SPLINED SHAFT B70X64

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PLANETARY REDUCTION GEAR RA 813 T3S 60,56 ME132 WITH PINION M12 Z14 X0.48 BU105 GEARBOX CODE: ABT91L3FSH00601

Ratings

Phase	Time percentage	Output torque T ₂	Output speed n ₂
	%	[Nm]	[rpm]
1	99.8	1866	23.57
2	0.2	4303	23.57

Gear ratio 1:60.56

Expected service life: 160000 hours at 6 cycles/minute

Application factor K_a = 1

Maximum static output torque: 5378 Nm

Drawings List

Drawing No	Revision No	Drawing Title
DI14480	04	RA 813 T3S ME132 GENERAL ASSEMBLY DRAWING
ST7039	02	RA 813 T3S ME132 SECTIONAL VIEW
3728	00	RA 813 T3S 60.56 ME132 PART LIST
4000183200	00	RE810 BOTTOM
2030024000	05	RE310 SUN GEAR
2030021300	18	RE300 RING GEAR
025710210ABT	01	RE810 PINION M12 Z14 X0.48 BU105
025710210	07	RE810 PINION M12 Z14 X0.48 BU105
022610228ABT	00	RE810 SPLINED SHAFT B70X64
022610228	02	RE810 SPLINED SHAFT B70X64
2030022800	04	RE300 RING
2030021500	10	RE310 PLANETARY GEAR
02971249	01	RE810 BODY
02771001	02	KEY 22X14X34
02741009	04	RE810 RING
02741007	05	RE310 RING
02731552	02	RE810/RE1020 STEEL INTERMEDIATE FLANGE
02731037	04	RE310 FLANGE
02731035	05	BEVEL GEAR FLANGE
02631011	00	BEVEL GEAR SPLINED COUPLING
02621002	06	RE810 PLANETARY GEAR
02611030	04	RE810 SUN GEAR
02611027	01	BEVEL GEAR PINION
02581025	02	RE810 PLANETARY CARRIER PIN
02581006	13	RE310 PLANETARY CARRIER PIN
02551021	02	RE810 BOTTOM
02551015	03	RE310 BOTTOM

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02501039	06	RE110 INPUT SUPPORT
02261026	04	BEVEL GEAR SHAFT
02251010	06	RE810 CAP
02241166	02	RE110 INPUT SHAFT
02231011	10	RE810 RING GEAR
02231010	03	BEVEL GEAR WHEEL
02221057	11	RE810 PLANETARY CARRIER
02221056	08	RE310 PLANETARY CARRIER
02211006	00	BEVEL GEAR CAP
02201356	04	CC120 CARTER
02201029	11	RE810 BODY
ABT91L3FSH00601	00	ABS TYPE TEST REPORT DATED 8-MAY-2015

Additional Product Details

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PLANETARY REDUCTION GEAR RE 813 TS 81 ST BG WITH PINION M12 Z14 X0.48 BU105 **GEARBOX CODE: ABT91L3FS300810**

Ratings

Phase	Time percentage	Output torque T ₂	Output speed n ₂
	%	[Nm]	[rpm]
1	99.8	1866	23.57
2	0.2	4303	23.57

Gear ratio 1:81.0

Expected service life: 160000 hours at 6 cycles/minute

Application factor K_a = 1

Maximum static output torque: 5378 Nm

Drawings List

Drawing No	Revision No	Drawing Title
DI12992	01	RE 813 TS ST BG GENERAL ASSEMBLY DRAWING
ST5380	00	RE 813 TS ST BG SECTIONAL VIEW
3127	00	RE 813 TS 81 ST BG PART LIST
4000183200	00	RE810 BOTTOM
4000067200	00	SPLINED COUPLING 12/24 DP Z14
2030024100	06	RE310 SUN GEAR
2030022800	04	RE300 RING
027310487	01	RE310/510 STEEL INTERMEDIATE FLANGE
2030021600	10	RE310 PLANETARY GEAR
2030021300	18	RE300 RING GEAR
2030001600	03	RE110 PLANETARY GEAR
402004000	04	RE100 RING
02741009	04	RE810 RING
02741007	05	RE310/510 RING
02731552	02	RE810/1020 STEEL INTERMEDIATE FLANGE
02621002	06	RE810 PLANETARY GEAR
02611030	04	RE810 SUN GEAR
02611022	06	RE110 SUN GEAR
02581034	03	RE110 PLANETARY CARRIER PIN
02581025	02	RE810 PLANETARY CARRIER PIN
02581006	13	RE310 PLANETARY CARRIER PIN
02551021	02	RE810 BOTTOM
02551015	03	RE310/510 BOTTOM
02551010	03	RE110 BOTTOM
02511108	04	MOTOR COUPLING FLANGE
02501003	15	RE110 INPUT SUPPORT
02251010	06	RE810 CAP

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02241005	11	INPUT COUPLING SHAFT
02231011	10	RE810 RING GEAR
02231006	09	RE110 RING GEAR
02221057	11	RE810 PLANETARY CARRIER
02221056	08	RE310 PLANETARY CARRIER
02221019	01	RE100 PLANETARY CARRIER
02201029	11	RE810 BODY
025710210ABT	01	RE810 PINION M12 Z14 X0.48 BU105
025710210	07	RE810 PINION M12 Z14 X0.48 BU105
022610228BVT	00	RE810 SPLINED SHAFT B70X64
022610228	02	RE810 SPLINED SHAFT B70X64

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PLANETARY REDUCTION GEAR RE 1022 DBS S 51.43 F601 WITH PINION M12 Z12 X0.5 GEARBOX CODE: ABT91L3GS000001

Ratings

Phase	Time percentage	Output torque T ₂	Output speed n ₂
	%	[Nm]	[rpm]
1	10	3368	27.5
2	20	2764	27.5
3	30	2149	27.5
4	30	1519	27.5
5	9.7	861	27.5
6	0.3	5137	27.5

Gear ratio 1:51,43

Expected output pinion service life: 57.6 million cycles
Equivalent to 160000 hours at 6 cycles/minute
(intermittent) or 35000 hours at 27.5 rpm (continuous)

Application factor K_a = 1

Maximum static output torque: 6422 Nm

Drawings List

Drawing No	Revision No	Drawing Title
DI18508	00	RE 1022 DBS S 51.43 GENERAL ASSEMBLY DRAWING
ST8896	01	RE 1022 DBS S 51.43 SECTIONAL VIEW
4460	01	RE 1022 DBS S 51.43 PART LIST
4000184000	00	RE 1020-1520 END PLATE EP150
4000067200	00	SPLINED COUPLING 12/24DP Z14
2030032200	07	RE510 SUN GEAR
2030031100	09	RE510 PLANETARY GEAR
2030030600	21	RE500 RING GEAR
025810102	02	RE1020 PLANETARY CARRIER PIN
025710296ABT	01	RE1020 PINION M12 Z12 X0.5 BU100
025710296	05	RE1020 PINION M12 Z12 X0.5 BU100
022610227ABT	00	RE1020 SPLINED SHAFT B80X74
022610227	03	RE1020 SPLINED SHAFT B80X74
022510143	02	RE1020 HOLDER SEAL CAP
022210126	05	RE1020 PLANETARY CARRIER
022010169	05	RE1020 GEARBOX BODY DBS NO ECC.
02731552	02	RE810/1020 STEEL INTERMEDIATE FLANGE
02621043	03	RE1020 PLANETARY GEAR
02611125	03	RE1020 SUN GEAR
02581014	05	RE510 PLANETARY CARRIER PIN
02511108	04	MOTOR COUPLING FLANGE SAE "C"
02501000	09	BRAKE INPUT SUPPORT
02431014	01	RE510 BRAKE BODY F6

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02271000	04	F6 BRAKE PISTON
02241000	04	BRAKE INPUT SHAFT F6
02231028	08	RE1020 RING GEAR
02221161	03	RE510 PLANETARY CARRIER
02221156	05	RE510 PLANETARY CARRIER (TURNED)

Additional Product Details

PDA Certificate No. 20-2004469-PDA

Issued on 11-Aug-2020

Expiring on 10-Aug-2025

PLANETARY REDUCTION GEAR RE 1022 DBS S 43.7 F602 WITH PINION M14 Z12 X0.5 GEARBOX CODE: ABT91L3GS000002

Ratings

Phase	Time percentage	Output torque T ₂	Output speed n ₂
	%	[Nm]	[rpm]
1	10	4749	27.5
2	20	3908	27.5
3	30	3050	27.5
4	30	2167	27.5
5	9.7	1239	27.5
6	0.2	7932	27.5
7	0.1	9915	0.01

Gear ratio 1:43.7

Expected output pinion service life: 57.6 million cycles
Equivalent to 160000 hours at 6 cycles/minute
(intermittent) or 35000 hours at 27.5 rpm (continuous)

Application factor K_a = 1

Maximum static output torque: 9915 Nm
Nominal input braking torque: 215 Nm

Drawings List

Drawing No	Revision No	Drawing Title
DI18843	04	RE 1022 DBS S 43.68 GENERAL ASSEMBLY DRAWING
ST9123	03	RE 1022 DBS S 43.68 SECTIONAL VIEW
4941	01	RE 1022 DBS S 43.68 PART LIST
4000184000	00	RE 1020 END PLATE EP150
4000067200	00	SPLINED COUPLING 12/24DP Z14
2030032200	07	RE510 SUN GEAR
2030031100	09	RE510 PLANETARY GEAR
2030030600	21	RE500 RING GEAR
025810102	02	RE1020 PLANETARY CARRIER PIN
025710299ABT	01	RE1020 PINION M14 Z12 X0.5 BU100
025710299	02	RE1020 PINION M14 Z12 X0.5 BU100
022610227ABT	00	RE1020 SPLINED SHAFT B80X74
022610227	03	RE1020 SPLINED SHAFT B80X74
022510143	02	RE1020 HOLDER SEAL CAP
022210126	05	RE1020 PLANETARY CARRIER
022010226	05	RE1020 GEARBOX BODY DBS NO ECC.
02731552	02	RE810/1020 STEEL INTERMEDIATE FLANGE
02621042	03	RE1020 PLANETARY GEAR
02611124	04	RE1020 SUN GEAR
02581014	05	RE510 PLANETARY CARRIER PIN
02511108	04	MOTOR COUPLING FLANGE SAE "C"

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02501000	09	BRAKE INPUT SUPPORT
02431014	01	RE510 BRAKE BODY F6
02271000	04	F6 BRAKE PISTON
02241000	04	BRAKE INPUT SHAFT F6
02941001	04	STEEL BLADE THICKNESS 1.3MM
02941000	02	BRONZE DISK THICKNESS 1MM
02731004	00	BRAKE BLADES SPACER
02701000	03	BRAKE SPRING F5-F6
02231028	08	RE1020 RING GEAR
02221161	03	RE510 PLANETARY CARRIER
02221156	05	RE510 PLANETARY CARRIER (TURNED)
025510100	01	END PLATE RE1020-1520
02551015	03	END PLATE RE 300-500

Additional Product Details

PDA Certificate No. 20-2004469-PDA

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PLANETARY REDUCTION GEAR RE 1022 DBS S 43.7 F602 WITH PINION M14 Z12 X0.5 GEARBOX CODE: ABT91L3GS000005

Ratings

Phase	Time percentage	Output torque T_2	Output speed n_2
	%	[Nm]	[rpm]
1	10	3431	27.5
2	20	2968	27.5
3	30	2464	27.5
4	30	1900	27.5
5	9.7	1228	27.5
6	0.2	5345	27.5
7	0.1	6681	0.01

Gear ratio 1:43.7

Expected output pinion service life: 57.6 million cycles
Equivalent to 160000 hours at 6 cycles/minute
(intermittent) or 35000 hours at 27.5 rpm (continuous)

Application factor $K_a = 1$

Maximum static output torque: 9400 Nm
Nominal input braking torque: 215 Nm

Drawings List

Drawing No	Revision No	Drawing Title
D24501	00	RE 1022 DBS S 43.68 GENERAL ASSEMBLY DWG
ST9123	03	RE 1022 DBS S 43.68 SECTIONAL VIEW
5653	00	RE 1022 DBS S 43.68 PART LIST
025510100	01	RE 1020-1520 END PLATE
02621042	03	RE1020 PLANETARY GEAR
025810102	02	RE1020 PLANETARY CARRIER PIN
022210126	05	RE1020 PLANETARY CARRIER
025710296ABT	01	RE1020-1520 PINION M12 Z12 x0,5 BU100
025710296	05	RE1020-1520 PINION M12 Z12 x0,5 BU100
022610227	03	RE1020 SPLINED SHAFT B80x74
022510143	02	RE1020 HOLDER SEAL CAP
2030032200	07	RE510 SUN GEAR
022010226	05	RE1020 GEARBOX BODY DBS NO ECC.
02731552	02	RE810/1020 STEEL INTERMEDIATE FLANGE
02611124	04	RE1020 SUN GEAR
02581014	05	RE510 PLANETARY CARRIER PIN
02231028	08	RE1020 RING GEAR
02501000	09	BRAKE INPUT SUPPORT
02431014	01	RE510 BRAKE BODY F6
02271000	04	F6 BRAKE PISTON
02241000	04	BRAKE INPUT SHAFT F6
02941001	04	STEEL BLADE THICKNESS 1.3mm

Additional Product Details

PDA Certificate No. 20-2004469-PDA
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02941000	02	BRONZE DISK THICKNESS 1mm
02731004	00	BRAKE BLADES SPACER
02701000	03	BRAKE SPRING F5-F6
02221156	05	RE510 PLANETARY CARRIER (TURNED)
02221161	03	RE510 PLANETARY CARRIER
2030030600	21	RE500 RING GEAR
2030031100	09	RE510 PLANETARY GEAR
02551015	03	RE310 END PLATE
4000067200	00	SPLINED COUPLING
4000184000	00	RE102-1520 END PLATE
02511108	04	MOTOR COUPLING FLANGE SAE “C”
022610227ABT	00	RE1020 SPLINED SHAFT B80x74

Additional Product Details

PDA Certificate No. 20-2004469-PDA

Issued on 11-Aug-2020

Expiring on 10-Aug-2025

PLANETARY REDUCTION GEAR RA 1023 T8S 60,56L ME132 WITH PINION M12 Z14 X0.48 BU105 GEARBOX CODE: ABT91L3GSH00600

Ratings

Phase	Time percentage	Output torque T ₂	Output speed n ₂
	%	[Nm]	[rpm]
1	29.8	851	23.57
2	40	1701	23.57
3	30	2835	23.57
2	0.2	6114	23.57

Gear ratio 1:60.56

Expected service life: 160000 hours at 6 cycles/minute

Application factor K_a = 1

Maximum static output torque: 7643 Nm

Drawings List

Drawing No	Revision No	Drawing Title
DI13826	01	RA 1023 T8S ME132 GENERAL ASSEMBLY DRAWING
ST5702	01	RA 1023 T8S 60.56I ME132 SECTIONAL VIEW
3134	01	RA 1023 T8S 60.56I ME132 PART LIST
026310116	01	RE1020 SPLINED COUPLING B80x74 – A70x64
025810102	02	RE1020 PLANETARY CARRIER PIN
025510100	01	RE1020 END PLATE
022210191	04	RE1020 PLANETARY CARRIER
2030024000	05	RE310 SUN GEAR
2030022800	04	RE310 BLANK WASHER FOR PIN
2030021500	10	RE310 PLANETARY GEAR
2030021300	18	RE300 RING GEAR
02771001	02	PARALLEL KEY 22x14x34
02741009	04	RE810 FIFTH WHEEL
02741007	05	RE310 SHIM ADJUSTMENT FIFTH WHEEL
02731552	02	RE810/1020 STEEL INTERMEDIATE FLANGE
02731037	04	RE310 RING GEAR COUPLING FLANGE
02731035	05	BEVEL GEAR PAIR FLANGE MEDIA
02631011	00	BEVEL GEAR REDUCTION COUPLING
02621039	04	RE1020 PLANETARY GEAR
02611121	04	RE1020 SUN GEAR
02611027	01	MIDDLE BEVEL GEAR PAIR PINION
02581006	13	RE310 PLANETARY CARRIER PIN
02551015	03	RE310 END PLATE
02501039	06	RE110 INPUT SUPPORT

Additional Product Details

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Issued on 11-Aug-2020

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02261026	04	SHAFT BEVEL GEAR PAIR CC120
02251010	06	RE810 FRONT CAP
02241166	02	RE110 INPUT COUPLING
02231028	08	RE1020 RING GEAR
02231010	03	CC120 RING GEAR
02221056	08	RE310 PLANETARY CARRIER
02211006	00	BEVEL GEAR PAIR CAP
02201356	04	BEVEL GEAR PAIR HOUSING
02201029	11	RE810 BODY
025710210ABT	01	RE810 PINION M12 Z14 x0.48 BU105
025710210	07	RE810 PINION M12 Z14 x0.48 BU105
022610228ABT	00	RE810 SPLINED SHAFT B70x64
022610228	02	RE810 SPLINED SHAFT B70x64
4000183200	00	RE810 END PLATE
ABT91L3GSH00600	00	ABS TYPE TEST REPORT DATED 7-MAY-2015

Additional Product Details

PDA Certificate No. 20-2004469-PDA

Issued on 11-Aug-2020

Expiring on 10-Aug-2025

PLANETARY REDUCTION GEAR RA 1023 DBS S 52.9 P12 Z12 X0.5 WITH PINION M12 Z12 X0.48 BU100
GEARBOX CODE: ABT91L3GS000004

Ratings

Phase	Time percentage	Output torque T ₂	Output speed n ₂
	%	[Nm]	[rpm]
1	10	3431	27.5
2	20	2968	27.5
3	30	2464	27.5
4	30	1900	27.5
5	9.7	1228	27.5
6	0.2	5345	27.5
7	0.1	6681	0.01

Gear ratio 1:52.9

Expected service life: 35000 hours corresponding to 57.6x10⁶ cycles

Application factor K_a = 1

Maximum static output torque: 6681 Nm
Nominal input braking torque: 126.65 Nm

Drawings List

Drawing No	Revision No	Drawing Title
DI21576	00	RA 1023 DBS ME160 GENERAL ASSEMBLY DRAWING
ST10364	00	RA 1023 DBS52.9I ME160 SECTIONAL VIEW
5569	00	RA 1023 DBS52.9I ME160 PART LIST
022610227	03	RE1020 SPLINED COUPLING B80x74
022610227ABT	00	RE1020 SPLINED SHAFT B80x74
025810102	02	RE1020 PLANETARY CARRIER PIN
025510100	01	RE1020 END PLATE
022210126	05	RE1020 PLANETARY CARRIER
2030032000	05	RE510 SUN GEAR
2030030900	09	RE510 RING GEAR
2030030600	21	RE500 RING GEAR
02771001	02	PARALLEL KEY 22X14X34
02741009	04	RE810 FIFTH WHEEL
02741007	05	RE310 SHIM ADJUSTMENT FIFTH WHEEL
02731043	10	RE810/1020 STEEL INTERMEDIATE FLANGE
02731037	04	RE310 RING GEAR COUPLING FLANGE
02731035	03	BEVEL GEAR FLANGE
02631011	00	REDUCTION COUPLING 58x53
02621039	04	RE1020 PLANETARY GEAR
02611121	04	RE1020 SUN GEAR
0261105100	01	BEVEL GEAR PINION CC120
02581014	05	RE510 PLANETARY CARRIER PIN

Additional Product Details

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02551015	03	RE310 END PLATE
02261026	04	SHAFT BEVEL GEAR PAIR CC120
022510143	02	RE1020 HOLDER SEAL CAP
02231028	08	RE1020 RING GEAR
022310100	01	CROWN GEAR WHEEL CC120
02221156	05	RE510 PLANETARY CARRIER (TURNED)
02211006	00	BEVEL GEAR PAIR CAP
02201356	04	BEVEL GEAR PAIR HOUSING
022010226	05	RE1020 GEARBOX BODY
025710296ABT	01	RE1020-1520 PINION M12 Z12 X0.5 BU100
025710296	05	RE1020-1520 PINION M12 Z12 X0.5 BU100
4000184000	00	RE1020-1520 END PLATE
2029992300	11	RE110-210 DIRECT INPUT SUPPORT ME160
2029992500	01	SEAL CAP ME160
2029992400	07	INPUT COUPLING ME160

Additional Product Details

PDA Certificate No. 20-2004469-PDA

Issued on 11-Aug-2020

Expiring on 10-Aug-2025

PLANETARY REDUCTION GEAR RE 1023 T8S 81 ST BG WITH PINION M12 Z14 X0.48 BU105 **GEARBOX CODE: ABT91L3G3H00810**

Ratings

Phase	Time percentage	Output torque T ₂	Output speed n ₂
	%	[Nm]	[rpm]
1	29.8	851	23.57
2	40	1701	23.57
3	30	2835	23.57
4	0.2	6114	23.57

Gear ratio 1:81.0

Expected service life: 160000 hours at 6 cycles/minute

Application factor K_a = 1

Maximum static output torque: 7643 Nm

Drawings List

Drawing No	Revision No	Drawing Title
DI13827	01	RE 1023 T8S ST BG GENERAL ASSEMBLY DRAWING
ST5861	01	RE 1023 T8S 81 ST BG SECTIONAL VIEW
3133	01	RE 1023 T8S 81 ST BG PART LIST
4000067200	00	SPLINED COUPLING 12/24 DP Z14
026310116	01	RE1020 SPLINED COUPLING B80X74 – A70X64
025810102	02	RE1020 PLANETARY CARRIER PIN
025510100	01	RE1020 END PLATE
022210191	04	RE1020 PLANETARY CARRIER
2030052100	04	EH202 SUN GEAR
2030032000	05	RE510 SUN GEAR
2030030900	09	RE510 PLANETARY GEAR
2030030600	21	RE500 RING GEAR
027310487	01	RE310/510 STEEL INTERMEDIATE FLANGE
2030010800	05	RE210 PLANETARY GEAR
402004000	04	RE100 RING
02741009	04	RE810 FIFTH WHEEL
02741008	01	RE810 BRONZE PAD
02741007	05	RE310 RING
02731552	02	RE810/1020 STEEL INTERMEDIATE FLANGE
02621039	04	RE1020 PLANETARY GEAR
02611121	04	RE1020 SUN GEAR
02581035	03	RE210 PLANETARY CARRIER PIN
02581014	05	RE510 PLANETARY CARRIER PIN
02551015	03	RE310 END PLATE

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02551010	03	RE110 END PLATE
02511108	04	MOTOR COUPLING FLANGE
02501003	15	RE110 INPUT SUPPORT
02251010	06	RE810 CAP
02241005	11	INPUT COUPLING SHAFT
02231028	08	RE1020 RING GEAR
02231009	09	RE210 RING GEAR
02221156	05	RE510 PLANETARY CARRIER (TURNED)
02221033	05	RE100 PLANETARY CARRIER
02221019	01	RE100 PLANETARY CARRIER
02201029	11	RE810 BODY
025710210ABT	00	RE810 PINION M12 Z14 X0.48 BU105
025710210	05	RE810 PINION M12 Z14 X0.48 BU105
022610228ABT	00	RE810 SPLINED SHAFT B70X64
022610228	02	RE810 SPLINED SHAFT B70X64

Additional Product Details

PDA Certificate No. 20-2004469-PDA

Issued on 11-Aug-2020

Expiring on 10-Aug-2025

PLANETARY REDUCTION GEAR RA 1023 DBS S 61.7 ME160 with pinion M16 Z14 X0.5 BU125 GEARBOX CODE: ABT91L3GSH00611

Ratings

Phase	Time percentage	Output torque T_2	Output speed n_2
	%	[Nm]	[rpm]
1	99.8	3502	23.57
2	0.2	9054	23.57

Gear ratio 1:61.7

Expected service life: 160000 hours at 6 cycles/minute

Application factor $K_a = 1$

Maximum static output torque: 11317 Nm

Drawings List

Drawing No	Revision No	Drawing Title
DI14478	02	RA 1023 DBS S ME160 GENERAL ASSEMBLY DRAWING
ST6792	01	RA 1023 DBS S ME160 SECTIONAL VIEW
3683	01	RA 1023 DBS S 61.7 ME160 PART LIST
4000071700	01	0.5 LT OIL VESSEL
2030032000	05	RE510 SUN GEAR
2030030900	09	RE510 PLANETARY GEAR
2030030600	21	RE500 RING GEAR
2029992300	12	RE 110 DIRECT INPUT SUPPORT
4000184000	00	RE1020 END PLATE
026115100	01	CC120 PINION
025810102	02	RE1020 PLANETARY CARRIER PIN
025710201ABT	00	RE1520 PINION M16 Z14 x0.5 BU125
025710201	05	RE1520 PINION M16 Z14 x0.5 BU125
025510100	01	RE1020 END PLATE
022610227ABT	00	RE1020 SPLINED SHAFT B80x74
022610227	03	RE1020 SPLINED SHAFT B80x74
022510143	02	RE1020 HOLDER SEAL CAP
022310100	01	CC120 CROWN GEAR
022210126	05	RE1020 PLANETARY CARRIER
022010226	05	RE1020 GEARBOX BODY
2029992500	01	SEAL CAP ME160-180
2029992400	07	RE110 INPUT COUPLING ME160
02771001	02	PARALLEL KEY 22x14x34
02741009	04	RE810 FIFTH WHEEL
02741007	05	RE310 SHIM ADJUSTMENT FIFTH WHEEL
02731552	02	RE810/1020 STEEL INTERMEDIATE FLANGE
02731037	04	RE310 RING GEAR COUPLING FLANGE

Additional Product Details

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02731035	05	BEVEL GEAR PAIR FLANGE
02631011	00	BEVEL GEAR REDUCTION COUPLING
02621040	03	RE1020 PLANETARY GEAR
02611122	03	RE1020 SUN GEAR
02581014	05	RE510 PLANETARY CERRIER PIN
02551015	03	RE310 END PLATE
02261026	04	SHAFT BEVEL GEAR PAIR CC120
02231028	08	RE1020 RING GEAR
02221156	05	RE510 PLANETARY CARRIER (TURNED)
02211006	00	BEVEL GEAR COVER
02201356	04	BEVEL GEAR PAIR HOUSING
ABT91L3GSH00611	00	ABS TYPE TEST REPORT DATED 8-MAY-2015

Additional Product Details

PDA Certificate No. 20-2004469-PDA

Issued on 11-Aug-2020

Expiring on 10-Aug-2025

PLANETARY REDUCTION GEAR RA 1023 DBS S 52.9 ME160 WITH PINION M14 Z12 X0.5 GEARBOX CODE: ABT91L3GS000003

Ratings

Phase	Time percentage	Output torque T ₂	Output speed n ₂
	%	[Nm]	[rpm]
1	10	4749	27.5
2	20	3908	27.5
3	30	3050	27.5
4	30	2167	27.5
5	9.7	1239	27.5
6	0.2	7932	27.5
7	0.1	9915	0.01

Gear ratio 1:52.9

Expected output pinion service life: 57.6 million cycles
Equivalent to 160000 hours at 6 cycles/minute
(intermittent) or 35000 hours at 27.5 rpm (continuous)

Application factor K_a = 1

Maximum static output torque: 9915 Nm

Drawings List

Drawing No	Revision No	Drawing Title
DI17251	01	RA 1023 DBS S ME160 GENERAL ASSEMBLY DRAWING
ST9943	01	RA 1023 DBS S ME160 SECTIONAL VIEW
4944	01	RA 1023 DBS S 52.9 ME160 PART LIST
2030032000	05	RE510 SUN GEAR
2030030900	09	RE500 PLANETARY GEAR
2030030600	21	RE500 RING GEAR
2029992400	07	RE110 INPUT COUPLING
2029992300	12	RE110 DIRECT INPUT SUPPORT ME 160
4000184000	00	END PLATE EP 150 T-H
026115100	01	CC120 PINION 1:2.78
025810102	02	RE1020 PLANETARY CARRIER PIN
025710299ABT	01	RE1520 PINION M14 Z12 X0.5 BU100
025710299	02	RE1520 PINION M14 Z12 X0.5 BU100
025510100	01	RE1020 END PLATE
022610227ABT	00	RE1020-1520 SPLINED SHAFT B80X74
022610227	03	RE1020 SPLINED SHAFT B80X74
022510143	02	RE1020 HOLDER SEAL CAP
022310100	01	CC120 CROWN GEAR 1:2.78
022210126	05	RE1020 PLANETARY CARRIER
022010226	05	RE1020 GEARBOX BODY
02741009	04	RE810 FIFTH WHEEL

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02741007	05	RE310 SHIM ADJUSTMENT FIFTH WHEEL
02731552	02	RE810/1020 STEEL INTERMEDIATE FLANGE
02731037	04	RE310 FLANGE
02731035	05	BEVEL GEAR FLANGE
02631011	00	BEVEL GEAR SPLINED COUPLING
02621039	04	RE1020 PLANETARY GEAR
02611121	04	RE1020 SUN GEAR
02581014	05	RE510 PLANETARY CERRIER PIN
02551015	03	RE310 END PLATE
02261026	04	BEVEL GEAR OUTPUT SHAFT
02231028	08	RE1020 RING GEAR
02221156	05	RE510 PLANETARY CARRIER
02211006	00	BEVEL GEAR CAP
02201356	04	CC120 CARTER

Additional Product Details

PDA Certificate No. 20-2004469-PDA

Issued on 11-Aug-2020

Expiring on 10-Aug-2025

PLANETARY REDUCTION GEAR RE 1023 DBS S 81 ST BG WITH PINION M16 Z14 X0.5 BU125 **GEARBOX CODE: ABT91L3GSH00810**

Ratings

Phase	Time percentage	Output torque T_2	Output speed n_2
	%	[Nm]	[rpm]
1	99.8	3502	23.57
2	0.2	9054	23.57

Gear ratio 1:81.0

Expected service life: 160000 hours at 6 cycles/minute

Application factor $K_a = 1$

Maximum static output torque: 11317 Nm

Drawings List

Drawing No	Revision No	Drawing Title
DI12718	01	RE 1023 DBS S ST BG GENERAL ASSEMBLY DRAWING
ST5859	01	RE 1023 DBS S 81 ST BG SECTIONAL VIEW
3132	01	RE 1023 DBS S 81 ST BG PART LIST
4000067200	00	SPLINED COUPLING 12/24 DP Z14
025810102	02	RE1020 PLANETARY CARRIER PIN
025510100	01	RE1020 END PLATE
4000184000	00	RE 1020-1520 END PLATE
022510143	02	RE1020 HOLDER SEAL CAP
022210126	05	RE1020 PLANETARY CARRIER
022010169	05	RE1020 DBS GEARBOX BODY
2030052100	04	EH202 SUN GEAR
2030032000	05	RE510 SUN GEAR
2030030900	09	RE510 PLANETARY GEAR
2030030600	21	RE500 RING GEAR
027310487	01	RE310/510 STEEL INTERMEDIATE FLANGE
2030010800	05	RE210 PLANETARY GEAR
402004000	04	RE110 FIFTH WHEEL
02741009	04	RE810 FIFTH WHEEL
02741008	01	RE810 BRONZE PAD
02741007	05	RE310 SHIM ADJUSTMENT FIFTH WHEEL
02731552	02	RE810/1020 STEEL INTERMEDIATE FLANGE
02621039	04	RE1020 PLANETARY GEAR
02611121	04	RE1020 SUN GEAR
02581035	03	RE210 PLANETARY CARRIER PIN
02581014	05	RE510 PLANETARY CARRIER PIN
02551015	03	RE310 END PLATE
02551010	03	RE110 END PLATE

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02511108	04	MOTOR COUPLING FLANGE
02501003	15	RE110 INPUT SUPPORT
02241005	11	INPUT COUPLING SHAFT
02231028	08	RE1020 RING GEAR
02231009	09	RE210 RING GEAR
02221156	05	RE510 PLANETARY CARRIER (TURNED)
02221033	05	RE110 PLANETARY CARRIER (TURNED)
02221019	01	RE110 PLANETARY CARRIER
025710201ABT	00	RE1520 PINION M16 Z14 x0.5 BU125
025710201	05	RE1520 PINION M16 Z14 x0.5 BU125
022610227ABT	00	RE1020 SPLINED SHAFT B80x74
022610227	03	RE1020 SPLINED SHAFT B80x74

Additional Product Details

PDA Certificate No. 20-2004469-PDA

Issued on 11-Aug-2020

Expiring on 10-Aug-2025

PLANETARY REDUCTION GEAR RA 1523 DBS S 62.15 ME180 WITH PINION M16 Z14 X0.48 BU140 GEARBOX CODE: ABT91L3HSH00623

Ratings

Phase	Time percentage	Output torque T ₂	Output speed n ₂
	%	[Nm]	[rpm]
1	99.8	5050	23.57
2	0.2	11808	23.57

Gear ratio 1:62.15

Expected service life: 160000 hours at 6 cycles/minute

Application factor K_a = 1

Maximum static output torque: 14760 Nm

Drawings List

Drawing No	Revision No	Drawing Title
DI14475	02	RA 1523 DBS S ME180 GENERAL ASSEMBLY DRAWING
ST6794	01	RA 1523 DBS S 62.15 ME180 SECTIONAL VIEW
3752	01	RA 1523 DBS S 62.15 ME180 PART LIST
2030030800	09	RE 510 PLANETARY GEAR
4000184000	00	RE1024-1520 BOTTOM
029710757	00	RE1520 GEARBOX BODY
029710535	00	RE1520 BEARING SPACER
026115100	01	CC120 PINION
025710165ABT	02	RE1520 PINION M16 Z14 x0.48 BU140
025710165	09	RE1520 PINION M16 Z14 x0.48 BU140
025510100	01	RE1020 END PLATE
022610225ABT	00	RE1520 SPLINED SHAFT B80x74
022610225	03	RE1520 SPLINED SHAFT B80x74
022510140	01	RE1520 SEAL HOLDER
022310100	01	CC120 CROWN GEAR
2030031900	05	RE500 SUN GEAR
2030030600	21	RE500 RING GEAR
2029992600	05	RE110 INPUT COUPLING ME180
2029992500	01	RE100 SEALING CAP
2029992300	12	RE110 DIRECT INPUT SUPPORT ME160-180
02771001	02	PARALLEL KEY 22x14x34
02741007	05	RE310 SHIM ADJUSTMENT FIFTH WHEEL
02731288	02	RE1520 BEARING SPACER
027310485	03	RE1520/2000 STEEL INTERMEDIATE FLANGE
02731037	04	RE310 RING GEAR COUPLING FLANGE
02731035	05	BEVEL GEAR PAIR FLANGE
02631011	00	CC120 REDUCTION COUPLING

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02621037	05	RE1520 PLANETARY GEAR
02611117	04	RE1520 SUN GEAR
02581021	04	RE1520 PLANETARY CARRIER PIN
02581014	05	RE510 PLANETARY CARRIER PIN
02551015	03	RE310 END PLATE
02261026	04	SHAFT BEVEL GEAR PAIR CC120
02231027	12	RE1520 RING GEAR
02221260	07	RE1520 PLANETARY CARRIER
02221156	05	RE510 PLANETARY CARRIER (TURNED)
02211006	00	BEVEL GEAR PAIR CAP
02201356	04	CC120 BEVEL GEAR PAIR HOUSING
02201187	05	RE1520 GEARBOX BODY
ABT91L3HSH00623	00	ABS TYPE TEST REPORT DATED 7-MAY-2015

Additional Product Details

PDA Certificate No. 20-2004469-PDA

Issued on 11-Aug-2020

Expiring on 10-Aug-2025

PLANETARY REDUCTION GEAR RE 1523 DBS S 80.57 ST BG WITH PINION M16 Z14 X0.48 BU140 GEARBOX CODE: ABT91L3HS300800

Ratings

Phase	Time percentage	Output torque T ₂	Output speed n ₂
	%	[Nm]	[rpm]
1	99.8	5050	23.57
2	0.2	11808	23.57

Gear ratio 1:80.57

Expected service life: 160000 hours at 6 cycles/minute

Application factor K_a = 1

Maximum static output torque: 14760 Nm

Drawings List

Drawing No	Revision No	Drawing Title
DI13003	02	RE 1523 DBS S ST BG GENERAL ASSEMBLY DRAWING
ST5309	01	RE 1523 DBS S 80.57 ST BG SECTIONAL VIEW
3128	01	RE 1523 DBS S 80.57 ST BG PART LIST
4000067200	00	SPLINED COUPLING 12/24 DP Z14
2030030700	09	RE510 PLANETARY GEAR
4000184000	00	RE1020 END PLATE
029710536	00	RE1520 GEARBOX BODY
029710535	00	RE1520 BEARING SPACER
025710165ABT	02	RE1520 PINION M16 Z14 x0.48 BU140
025710165	09	RE1520 PINION M16 Z14 x0.48 BU140
025510100	01	RE1020 END PLATE
022610225ABT	00	RE1520 SPLINED SHAFT B80x74
022610225	03	RE1520 SPLINED SHAFT B80x74
022510140	01	RE1520 SEAL HOLDER
2030052100	04	EH202 SUN GEAR
2030031800	06	RE510 SUN GEAR
2030030600	21	RE500 RING GEAR
027310487	01	RE310/510 INTERMEDIATE FLANGE
2030010800	05	RE210 PLANETARY GEAR
402004000	04	RE100 FIFTH WHEEL
02741008	01	RE810 BRONZE PAD
02741007	05	RE310/510 SHIM ADJUSTMENT FIFTH WHEEL
027310485	03	RE1520/2000 STEEL INTERMEDIATE FLANGE
02621037	05	RE1520 PLANETARY GEAR
02611117	04	RE1520 SUN GEAR
02581035	03	RE210 PLANETARY CARRIER PIN
02581021	04	RE1520 PLANETARY CARRIER PIN

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02581014	05	RE510 PLANETARY CARRIER PIN
02551015	03	RE310 END PLATE
02551010	03	RE110 END PLATE
02511108	04	MOTOR COUPLING FLANGE
02501003	15	RE110 INPUT SUPPORT
02241005	11	SPLINED INPUT COUPLING
02231027	12	RE1520 RING GEAR
02231009	09	RE210 RING GEAR
02221260	07	RE1520 PLANETARY CARRIER
02221156	05	RE510 PLANETARY CARRIER (TURNED)
02221033	05	RE110 PLANETARY CARRIER (TURNED)
02221019	01	RE110 PLANETARY CARRIER