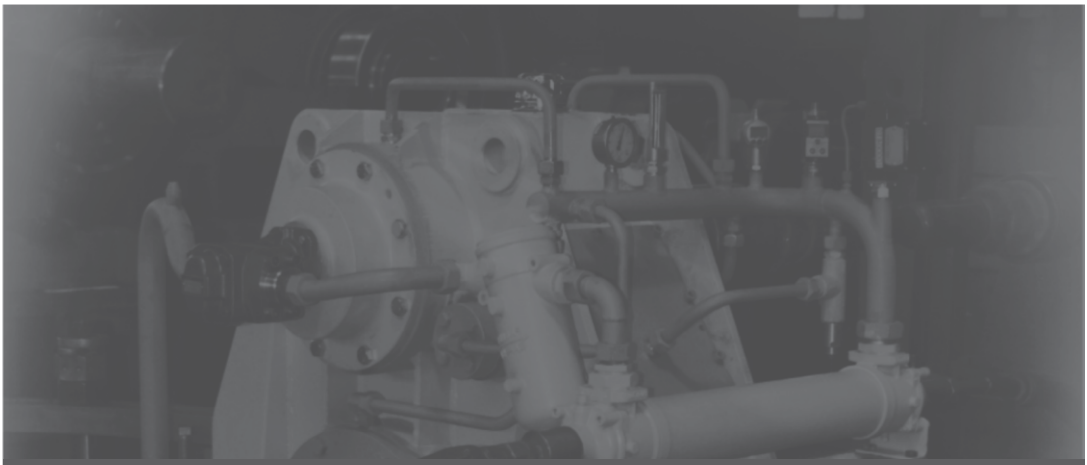

Products Catalogue
R|R|R
RESITA REDUCTOARE & REGENERABILE SA



About us

RESITA REDUCTOARE & REGENERABILE S.A.

REŞIŢA REDUCTOARE & REGENERABILE S.A. is a joint stock company, privately owned, incorporated in 1973 in Resita, Romania.

REŞIŢA REDUCTOARE & REGENERABILE S.A. has specialised itself in the manufacturing of speed reduction/multiplying gear units for different kinds of industrial applications. The manufacturing program of REŞIŢA REDUCTOARE & REGENERABILE S.A. includes high power gear units for installations used mainly for the steel, mining, petrochemical, cement and energy industries, as well as for ship propulsion systems. The company's specialists have conceived, designed and commissioned more than 15.000 gear units of all kinds, in these all years of experience.

The company's production capacities include helical and bevel-helical gear units in various stages and configurations, with transmission ratios between 1 and 160 and powers ranging from 5 kW to 20.000 kW, as well as turbo and planetary gear units with high technical demands for high speed installations. Manufacturing is done according to international standards.

Aside from it's own products, RESITA REDUCTOARE & REGENERABILE S.A. also produces gear units according to customer design, designs new gear units suited to the customer's needs, repairs and refurbishes used gear units, executes welded assemblies. Furthermore, RESITA REDUCTOARE & REGENERABILE S.A. produces parts according to customer documentation, spare parts for all delivered products, and also insures technical assistance at mounting and commissioning.

RESITA REDUCTOARE & REGENERABILE S.A. was authorised as a Railway Supplier by the Romanian Railway Authority, certifying that the company has the capabilities to manufacture and supply certain critical railway products according to specific technical requirements in the railway transport industry, namely helical and bevel gears. Also, the gear units designed for ship propulsion are manufactured according to the standards of the field, with LRS, DNV-GL, BV, ANR a.s.o. reception.

During it's activity, RESITA REDUCTOARE & REGENERABILE S.A. has delivered products both in Romania and abroad (The Netherlands, Germany, Norway, Greece, Bulgaria, Serbia, Croatia, Iraq, India, China, Austria, Lebanon, a.s.o.).

The company's quality control operates according to international standards. The Quality Management System is certified according to ISO 9001:2015 by LRQA. On the test stand every gear unit undergoes a rigorous test run before being shipped to customers. RESITA REDUCTOARE & REGENERABILE S.A. gives it's customers, besides the quality and guarantee certificate, measurement sheets of the components, issued following careful checks made with appropriate measuring devices.

Our experience recommends us and we would be honoured to become partners regarding investments in driving systems for various industrial

Quality

Only a consistentquality assurance policy can guarantee the high standards and reability of RESITA REDUCTOARE & REGENERABILE S.A. products. All raw materials and externally sources supplies are scrupulously inspected on a routine basis. Every tool is checked time and again as it passes through the production cycle. The finction interaction of individual subassemblies is tested as early as at the assembly stage using measuring and test equipment which are them selves subject to continous inspection. Every RRR gear unit undergoes a full test rig trial before being shipped to the customer.

The quality control of RESITA REDUCTOARE & REGENERABILE S.A. is working according to the international standards.

The quality management is certified in compliance with ISO 9001:2015 by LRQA.

On the test stand every RRR reduction gear undergoes a running test before being shipped to the customer

RESITA REDUCTOARE & REGENERABILE S.A. does not give only a declaration of quality and guaranty for its products, but issue all the corresponding test documents and can prove them with the measurement apparatus which are in the endowing of the Quality Assurance Department

Lloyd's Register

Certificate of Approval

This is to certify that the Management System of:

RESITA REDUCTOARE SI REGENERABILE S.A.

Str. Fagarasului, Nr. 30, 320162 Resita, Romania

has been approved by LRQA to the following standards:

ISO 9001:2015

Gilles Bessiere - Area Technical Manager
Issued by: Lloyd's Register (Romania) (Srl)
for and on behalf of: Lloyd's Register Quality Assurance Limited

Current issue date: 27 August 2018
Expiry date: 26 August 2021
Certificate identity number: 10122454

Original approval(s):
ISO 9001 – 6 August 2008

Approval number(s): ISO 9001 – 0027384

The scope of this approval is applicable to:
Design, development, production, installation, servicing and repairing of gear boxes and related spare parts for industrial and marine engineering. Production, repair and service of hydro power equipment up to 10 MW and spare parts for these. Management of production, repair and service activities for hydro power equipment over 10 MW.

UKAS MANAGEMENT SYSTEMS
001

Quality Management System certified according to ISO9001 - 2015 by Lloyd's Register Quality Assurance

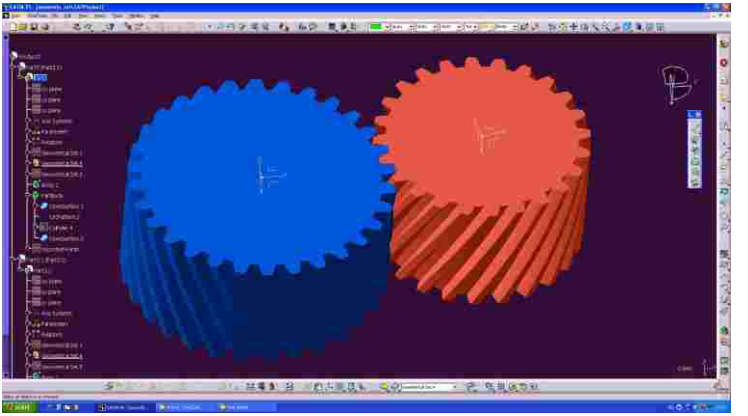
Here are some apparatus used to test our products:

- apparatus for the gearing geometry measurement: KLINGELNBERG PNC 150 (made in 1995, it was the 5th pc. sold by Klingelnberg in all the world), micrometers with plates for gear wheels CARL-MAHR;
- apparatus for the hardness measurements ZWICK 3212-63099, BRINELL-DIALTESTOR 3b - S - E 3175, ROCKWELL - DIALTERSTOR ZRC - 8470, portable UCI 3000 (for HRC, HB, and HV hardness), portable POLDI-HAHND KOLB;
- apparatus for the metallography measurement: microscope AXITECH 25 Hz 960322, video cam SONY SPC-2000 P No. 161332 and color printer;
- apparatus for nondestructive testing: UT-SONATEST SITSCAN 150, MT-UM10 HELLING, UV lamp HELLING SUPER UV 2005, Residualmeter EMU 10, apparatus for measurement of visible light intensity and UV;
- apparatus for different kind of measurements like:
  - roughness: MAHR MARSURF PS1
  - temperature / pressure / speed: protable apparatus

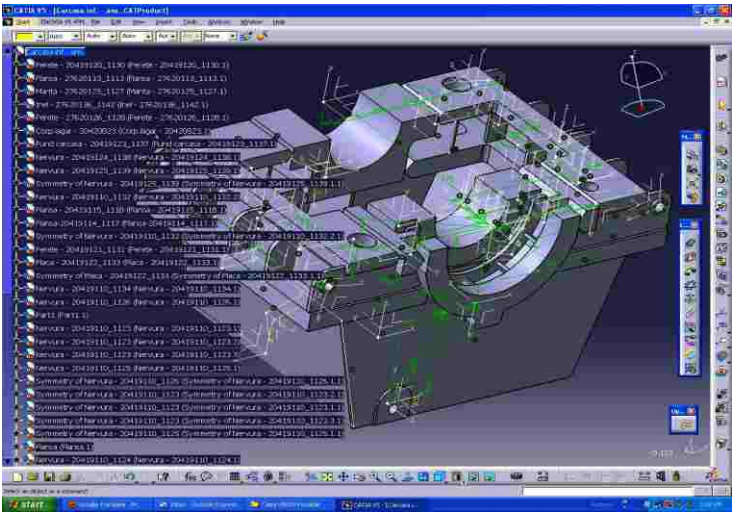
Controls made to our products:

- general measurements/checking: dimensional, geometrical form and position, roughness; crossing axis, distance between axis and holes for the casing;
- measurements/checkings for the inner/outer gearings: thickness of tooth, dimension over teeth, tooth's profile, flank line, both flanks division, roughness of tooth's surface;
- measurements/checkings for the keynuts: width, symmetry, depth
- measurements/checkings for holes/holes'thread: position deviations(division), diameter, thread;
- measurements/checkings for bore/bevel journal: effective dimensions, contact spot;
- measurements/checkings for materials: UT control, fissure control with magnetic powder/penetration liquids, hardness on tooth head, hardness on tooth flank for mn>4, case/ nitriding depth, microstructure;
- different kinds of measurements/checkings: paint adhesion, pressure manometers measurements P=0-40 bar;

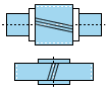
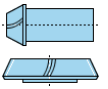
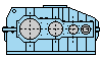
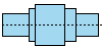
Design capabilities



The RRR design department has experienced engineers, the latest hardware and software tools (such as CATIA), and a comprehensive library of gearbox documentation, used to design several types of gearboxes for different kinds of applications, according to the customer's requirements.



Production capabilities

Type	Desen	Characteristics		Machine type
Cylindrical gears (outer)		**Milling** m_n= 2 – 15 mm d_0= 30 – 4.000 mm b_{max}= 2.400 mm Precision class: Q_{min} = 7 (acc. to DIN 3965)	**Grinding** m_n= 2 – 25 mm Ø = 80 – 1.250 mm (Q=4) $Ø_{max}$= 1.500 mm (Q=6) $ß_{max}$= 35° max. weight = 6.000 kg	Milling machines type LIEBHERR and SCHIESS Grinding machines type HÖFLER CNC grinding machine type Niels
Inner gears		**Slotting** m_n= max. 10 mm $Ø_{max}$= 1.000 mm; $ß_{max}$= 200 mm Precision class: Q_{min}= 8 (acc. to DIN 3965)		LORENZ machines de type 43431
Bevel gears		**Milling and Lapping** m_n=4 ÷ 15 mm; $ß_{max}$ = 140 mm D_{0min}= 150 mm (for pinion) d_{0max}= 900 mm (for wheels) Precision class: Q_{min}= 8 (acc. to DIN 3965) Cyclo-paloid gearing in Klingelnberg system		Milling and Lapping machines type KLINGELNBERG
Housings		H_{max}= 3.500 L_{max}= 9.000 l_{max}= 3.500		Boring and milling machines of type SCHIESS, SCHARMANN and COLET
Shafts (wheels)		**Turning** Horizontal lathe: Ø 1.000 x 4.000 mm Ø 1.600 x 3.000 mm Vertical lathe: Ø 2.500 x 1.000 mm Horizontal CNC lathe: Ø 480 x 1240 mm		Horizontal lathe and Vertical lathe Horizontal CNC lathe DMG-Mori
Other parts	**CNC machines** DMG–DMC 63SV (3 axes): X=635 mm; Y=510 mm; Z=460 mm DMG – DMF 180 (5 axes): X=1.800 mm; Y=650 mm; Z=700mm; B= – 100°; C=360°			Vertical CNC machines DECKEL – MAHO - GILDEMEISTER
Heat treatments in electrically heated furnaces	**Stress-relieving** 600 (l) x 500 (h) x 600 (w) mm with max. temperatures = 900 °C 2.500 (l) x 2.500 (h) x 6.300 (w) mm with max. temperatures = 750 °C			Furnace type INDEPENDENŢA
	Shrinking Ø 3.000 x 1.500 mm Range of regulation: 190 ÷ 200 °C Max. temperature = 650 °C, max. weigh = 5.000 kg			Furnace type INDEPENDENŢA
	Nitriding Automatically controlled gas nitriding (ammoniac dissociation in "Hidromat") Ø 900 x 2.400 mm with max. weigh = 2.000 kg			AICHELIN furnaces with vertical room
	Annealing Ø 1.250 x 3.000 mm Max. temperatures: 700 °C and weigh of charge max.7.000 kg			
	Carburizing Made in controlled atmosphere Ø 1.250 x 3.000 mm Process temperatures: 450 ÷ 950 °C and max. weigh =7.000 kg			
Heat treatments in gas heated furnaces	**Oil hardening and tempering** 1.500 (l) x 800 (h) x 2.000 (w) mm Process temperatures: 500 ÷ 1.050 °C Max. weigh = 2.000 kg			AICHELIN furnaces with horizontal room
Blasting	**Manual blasting** 8.000 (l) x 4.000 (h) x 4.000 (w)			Sanding cabin type INDEPENDEN ŢA
	Automatic blasting (with rotary table) 2.500 (l) x 1.500 (h) x 2.000 (w)			
Painting	Painting cabin: 7000 x 5560 x 3430			B2B 8200

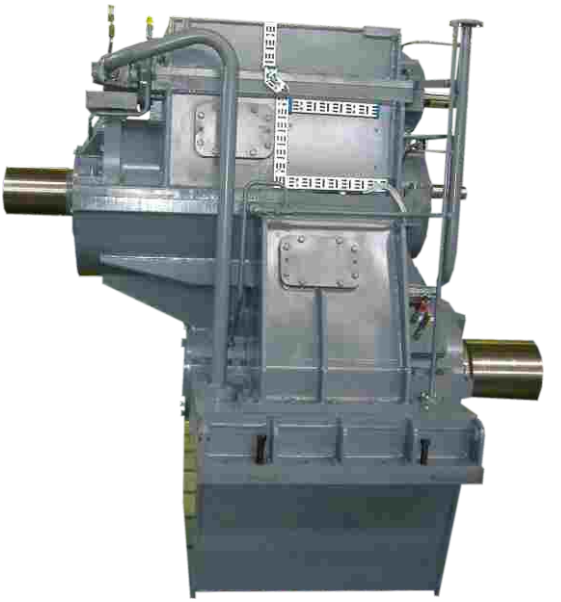
Product overview

1. Industrial gear units:

- cylindrical gear units;
- bevel helical gear units;
- planetary gear units;
- turbo cylindrical gear units;
- gear units for rolling mills.

2. Marine gear units:

- main propulsion reduction gear units;
- reversing gear units;
- single - engine gear units;
- multi - engine gear units;
- auxiliary gear units.



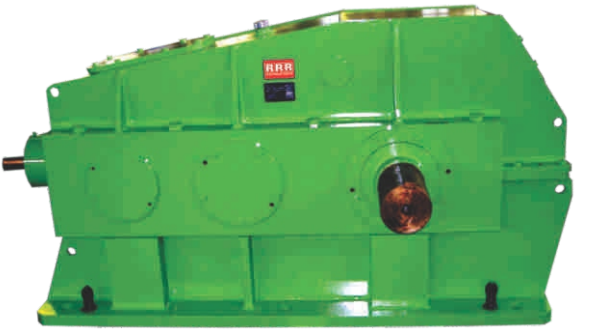
3. Gears:

- spur and helical gears;
- bevel gears;
- inner gears.

4. Welded assemblies

Industrial gear units

The product range of RESITA REDUCTOARE & REGENERABILE S.A. includes high performance gear units for steelmaking and steel processing plants (main and auxiliary drive systems for complete rolling mills, steel mills and metallurgical plants, tube mills and rotary furnaces), mining (belt conveyor drives, excavators, stackers, belt trolleys), chemical plants (mixers and rubber calenders,



RRR also manufactures gear unites according to the customer's specifications, develops new projects tailored to the customer's needs, and also repairs and refurbishes used gear units and supplies spare parts for it's own gear units.

RRR names it's gear units according to a well planned coding system.
Every letter has it's own meaning:
A = cylindrical gear unit, single stage
B = cylindrical gear unit, two stage
C = cylindrical gear unit, three stage
K = bevel gear stage
G = plain bearings
W = antifriction bearings
V = vertical output shaft
P = planetary gear units

Gear units in modular design

RRR has its own standard line of products, comprised of cylindrical and bevel helical gear units in modular design (RMS System). This system brings many advantages, such as:

- Extensive interchangeability of components within the individual gear unit types, as well as simplified stocking of spare parts;

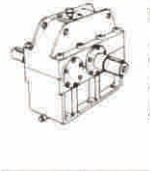
- Low initial cost – through economical manufacturing methods and restricting the number of components to a minimum;

- High power transmission capacity and quiet running combined with small size – achieved through case hardened and ground or lapped teeth;

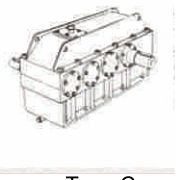
- Capable of withstanding brief overloads without damage – through the application of the latest developments, particularly regarding to tooth design and manufacture;

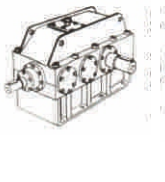
- Welded housing – allowing special customer requirements within the series.

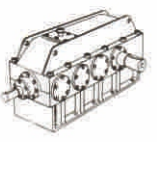
The RMS gear unit range comprises the following series: single stage helical gear units type A, double stage helical gear units type B, triple stage helical gear units type C, double stage bevel helical gear units type KA, triple stage bevel helical gear units type KB.


Type A


Type B


Type C


Type KA


Type KB

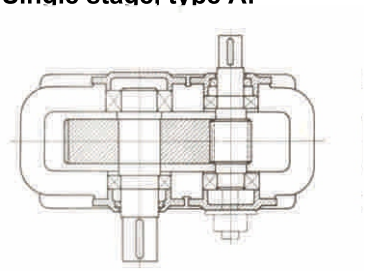
All series are designed as pedestal type gear units with cylindrical shaft journals. All gear units in the RMS range have a single helical tooth system and are cased and ground. The bevel gears have case hardened and lapped spiral teeth. All shafts are mounted in antifriction bearings, and the housing is a rigid welded structure. The oil is supplied exclusively by splash lubrication, cooling by free radiation with or without a fan.

The RMS gear units can be used in mechanical engineering installations of all

Cylindrical gear units

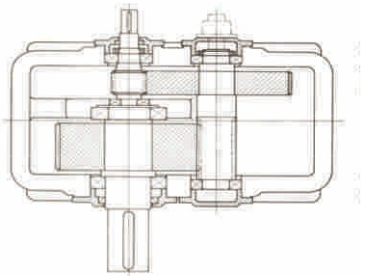
Cylindrical gear units have single helical teeth, case hardened and grinded, with input and output shafts in horizontally position. The housing is of solid low-vibration welded design, consisting of bottom and top part as well as all required inspection covers. The bottom part is used as oil tank. The shafts are supported by standard roller bearings with sufficient life time calculation. Lubrication of the gear units is done with either splash or forced lubrication systems. The gearboxes are cooled by either free radiation cooling or cooling systems.

Single stage, type A:



Cylindrical gear unit with one stage (2 parallel shafts).
This type is used in industrial installations of all kinds, where ratios between 1 and 8 are needed, and the power transmitted is between 16 and 3600 kW (up to 50000 kW for double helical teeth variants).
Variants: with double helical teeth and plain bearings (type AG), with double helical teeth and antifriction bearings (type AW), with shafts in vertical position (type AV).

Double stage, type B:



Cylindrical gear unit with two stages (3 parallel shafts).
This type is used in industrial installations of all kinds, where ratios between 7 and 45 are needed, and the power transmitted is between 16 and 3600 kW (up to 20000 kW for double helical teeth variants).
Variants: with non axial shaft alignment (type BH), with double helical teeth and plain bearings (type BG), with double helical teeth and antifriction bearings (type BW).
The a.m. variants are used extensively in the

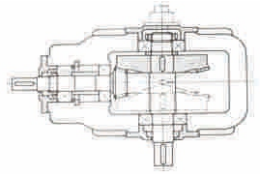
Triple stage, type C:

Cylindrical gear unit with three stages (4 parallel shafts).
This type is used in industrial installations of all kinds, where ratios between 28 and 112 are needed, and the power transmitted is between 6 and 2300 kW (up to 5000 kW for double helical teeth variant).
Variants: with double helical teeth and antifriction bearings (type CW).

Bevel helical gear units

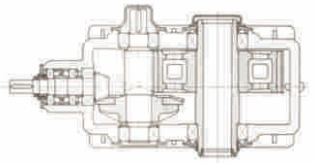
Bevel helical gear units have bevel gears of cyclo-palloid teeth (Klingelnberg system), case hardened and lapped, and cylindrical gears with single helical teeth, case hardened and grinded, with input and output shafts in horizontally position.
The housing is of solid low-vibration welded design, consisting of bottom and top part as well as all required inspection covers. The bottom part is used as oil tank.
The shafts are supported by standard roller bearings with sufficient life time calculation.

Single stage, type K:



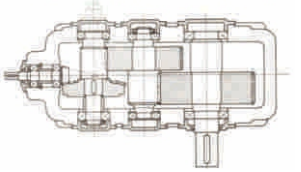
Bevel gear unit, single stage.
This type is used in industrial installations of all kinds, where ratios between 1 and 6 are needed, and the power transmitted is between 20 and 3000 kW.
Variants: with output shaft in vertical position (type KV).

Double stage, type KA:



Bevel helical gear unit with two stages, one bevel stage and one single helical stage.
This type is used in industrial installations of all kinds, where ratios between 6 and 22 are needed, and the power transmitted is between 17 and 3000 kW.
Variants: with hollow output shaft (type Ka…z), with output shaft in vertical position (type KAV).

Triple stage, type KBH:



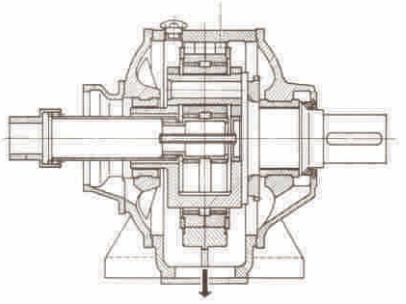
Bevel helical gear unit with three stages, one bevel stage and two single helical stages.
This type is used in industrial installations of all kinds, where ratios between 20 and 80 are needed, and the power transmitted is between 5 and 2000 kW.
Variants: with output shaft in vertical position (type KBHV).

Quadruple stage, type KC:

Bevel helical gear unit with four stages, one bevel stage and three single helical stages.
This type is used in industrial installations of all kinds, where ratios between 1 and 6 are needed, and the power transmitted is between 20 and 3000 kW.

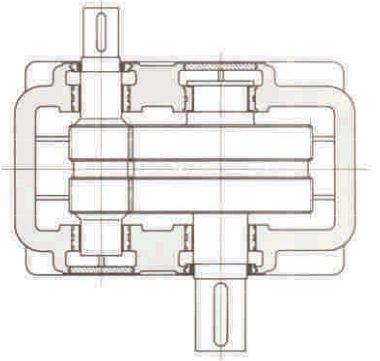
Other gear units

Planetary gear units:



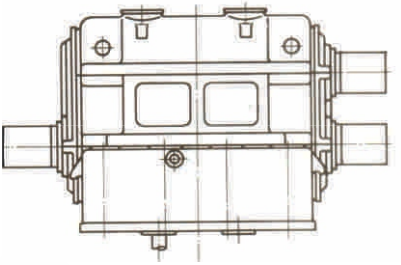
Planetary gear units, spur teeth case hardened and grinded, coaxial shafts in horizontally position. Housing of
solid low-vibration welded design, consisting of bottom and top part as well as all required inspection covers. The bottom part will be used as oil tank. Shafts supported by standard roller bearings with sufficient life time calculation. Splash lubrication and free radiation cooling, also by lubrication and cooling systems.
This type is used in special industrial installations, where
ratios between 3 and 3000 are needed, and the power transmitted is between 20 and 3000 kW (30000 kW for turbo units).

Turbo cylindrical gear units:



Cylindrical gear unit with one stage (2 parallel shafts), of
double helical teeth, case hardened and grinded, input and output shafts in horizontally position. High teeth quality allows functioning at very high peripheral speeds. Housing of solid low-vibration welded design, consisting of bottom and top part as well as all required inspection covers. The bottom part will be used as oil tank. Shafts supported by antifriction bearings. Forced lubrication and cooling systems.
Variants: with normal double helical teeth (type Ta…n),

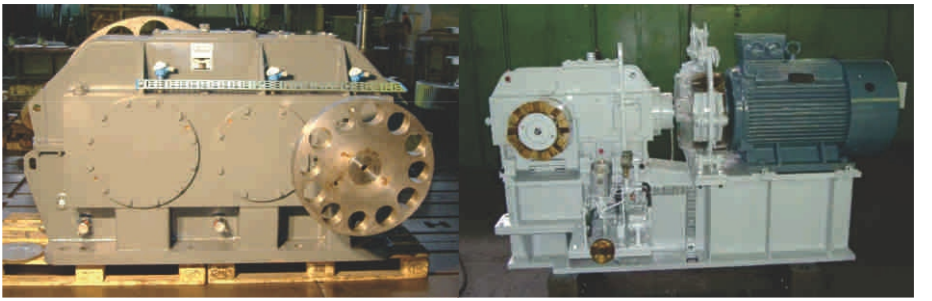
Gear units for rolling mills:



Cylindrical gear unit, with two-high or three high pinion housing, of single helical teeth, input and output shafts in horizontally position. Output shafts with vertical offset. Housing of solid low-vibration welded design, consisting of bottom and top part as well as all required inspection covers. The bottom part will be used as oil tank.
Shafts supported by standard roller bearings with sufficient life time calculation. Splash lubrication and free radiation cooling, also by lubrication and cooling systems.
Variants: with two-high pinion housing (type KD), with three high pininion housing (type KT), combinations with cylindrical and bevel helical stages.

Gear units for the cement industry

The cement industry is a demanding environment for any gear unit.
Based on more than 40 years of experience in delivering gear units for the cement industry, RRR offers today complete drive systems for mills, separators and rotary kilns, which simplify the service activities for the customer.
The drive system for cement mills is one of the best suited applications for our gear units. The main gear unit is designed to work in dusty and dry environments, while being able to withstand brief shocks and overloads.
Usually, these gear units must transmit between 960 and 3200 kW at 900 rpm.
For small to medium demands, the gear units type BH are best suited. In harsher conditions, the gear units type BG and BW assure power transmission



Beside the main gear unit, RRR also supplies the auxiliary gear unit, which is used to drive the mill in case of damage or maintenance. For this purpose, the standard gear units type RMS KA or RMS KB are suited best. RRR also supplies the auxiliary electric motor, the couplings between the main gear unit and the mill, the main gear unit and the auxiliary gear unit, and the auxiliary gear unit and the auxiliary electric motor, as well as the braking system for the auxiliary gear unit, and also the base plating for both the main and auxiliary drives and fixing elements.
During its existence, RRR has delivered thousands of industrial gear units of different types. In the cement industry, we supply complete drive systems to all Romanian cement factories, as wekk as in Bulgaria, Iraq, Lebanon, Egypt, Pakistan, Bangladesh a.s.o.

Marine gear units

About 2,000 RRR marine gear units of various types are currently in use worldwide. The range includes reduction and reversing gears, single-engine gears with vertically or horizontally offset shafts, and units for use with multi-engine marine gears.

Depending on the individual application, these gears are equipped with integral multi disk clutches, propeller thrust bearings, power take-off (PTO) systems, and the necessary monitoring attachment.

Build to RRR's design and reflecting many years of RRR know-how, these gear units meet the requirements of all classification societies.

The extended license also includes the manufacture of marine auxiliary gear units for an economically efficient on-board power generation with the main propulsion engines.

RRR also manufactures gear unites according to the customer's specifications, develops new projects tailored to the customer's needs, and also repairs and refurbishes used gear units and supplies spare parts for it's own gear units.

RRR names it's gear units according to a well planned coding system.

Every letter has it's own meaning:

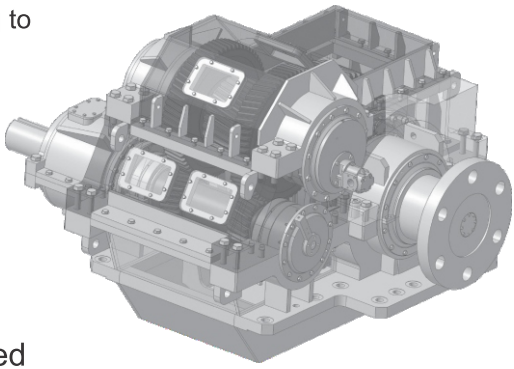
A=single stage

B=two stage

F=in line shafts

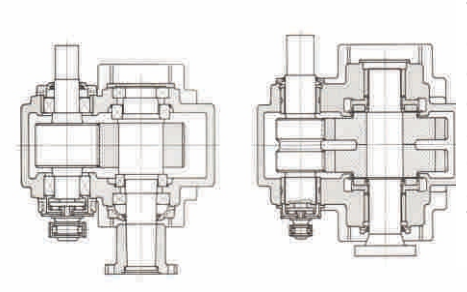
S=marine gear units

U=reduction or superimposed shafts resp.



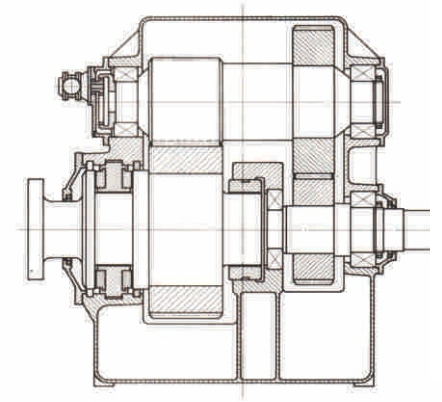
Single engine marine gear unit type AS

The Gear Unit AS is a single-stage marine reduction gear unit with horizontally offset shafts and built-in thrust bearing. The gear unit is very compact and particularly economical, as an elevated engine foundation is not necessary.



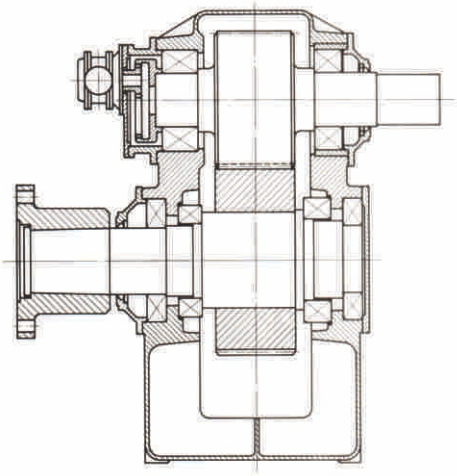
Type AS is preferred for ships where the conditions of the hull allow a horizontal offset of the shafts. That will e.g. be the case very often with single screw ships with large stern and with twin screw ships. As no elevated engine foundation is required, the gear unit is an advantage also for low engine rooms.
The gear unit is suitable to transmit the power from a reversible enginge to a fixed-pitch propeller as well as from a non-reversible engine to a controlable pitch propeller.

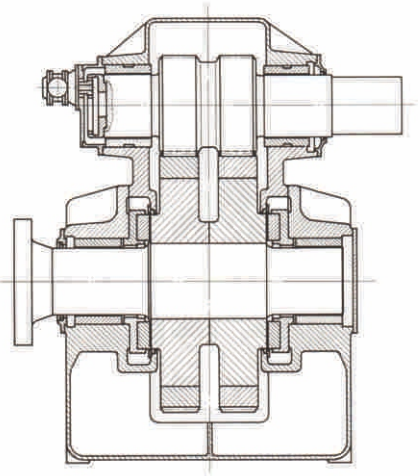
Single engine marine gear unit type BUS



The BUS Gear Unit is a two-stage marine reduction gear unit with in-line input and output shafts.
The BUS design is preferred for vessels where, for structural reasons, the arrangement of the engine does not allow an offset between the input and the output shaft. This is, for example, the case with fine shaped stern lines and for vessels in which the engine room does not permit a raised engine foundation.
The gear unit is equally suitable for transmitting power form reversible engines to fixed-pitch propellers and from non-reversible engines to controlable pitch propellers.

Single engine marine gear unit type AUS





The gear Unit AUS is a single-stage marine reduction gear unit with vertically offset shafts and built-in thrust bearing. The gear unit is particularly short in length.

Type AUS is preferred for ships where a vertical offset of the engine compared with the propeller shaft will be the best solution from the point of view of the ship's architect. That will e.g. be the case with a fine shaped stern requiring a short engine room, but where enough space is available in height.

The gear unit is suitable to transmit the power from a reversible engine to a fixed-pitch propeller as well as from a non-reversible engine to a controlable pitch propeller.

Detailed description of the gear unit type AUS:

Standard design

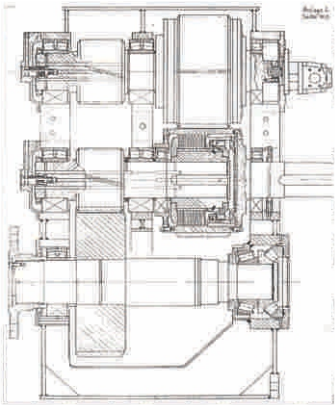
Materials: The gear housing is of welded construction.
The input shaft is of case-hardening steel and the output shaft of steel for quenching and teempering. The wheel body (only with the larger sizes) is of cast iron or nodular cast iron with a gear rim of case-hardening steel.
Gear cutting: The teeth are hobbed, case-hardened, and grinded. The teeth of the input pinion are calculated according to the latest methods and modified to achieve the best results.
Bearings: The input and output shafts are provided with antifriction bearings. The propeller thrust is absorbed by an antifriction type thrust bearing. If needed, the input and output shafts can be provided with plain bearings and the propeller thrust is absorbed by a segment thrust bearing. The plain bearings of the output shaft are easily accessible without dismantling of the gear unit.
Lubricating oil system: The gear unit housing is designed as oil collecting tank with gauge stick and air vent. A built-on gear type oil pump supplies the oil required for the lubrication of the gear mesh and bearings. It passes from the housing bottom part through a filter cooler into the lubricating oil pressure line of the gear unit. The filter screen of the filter cooler of sea water resisting construction can be disconnected to be cleared during operation. All lubricating oil supply lines are readily accessible and easy to remove as they are fitted outside the gear unit. The standby oil pump as an electric unit is mounted separately.
Direction of rotation: Input and output shafts rotate in opposite directions.
Efficiency: Under full load the efficiency is at least 98.5 %.
Painting and preservation: The housing is primed outside. The color is standard RAL 7031, but painting can be done according to the customer's requests. Inside, the raw surfaces are primed.
The exposed parts are preserved with Tectyl 506. This preservation will last for 6 months in suitable storage conditions.

Special design

The special design includes e.g. a PTO, contact instruments for unmanned machinery space, hollow bored input shaft, input shaft flange fitted, hollow bored output shaft, and housing flange at the forward output shaft bearing to mount the oil supply unit for the controlable pitch propeller.

Reversing marine gear unit type AWS

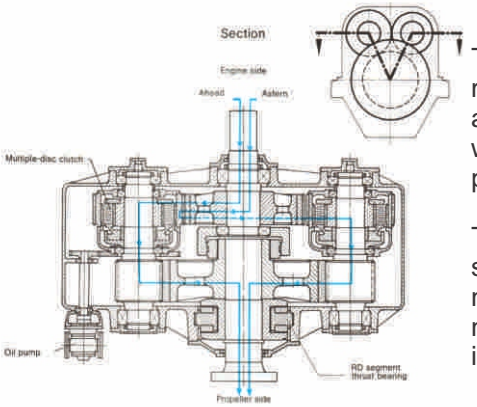
The gear unit AWS is a marine reversing reduction gear unit, single stage, thrust bearing integrated, with vertically offset input and output shafts. It is employed in ships with fixed pitch propeller.
The two directions of rotation of the output shaft are determined by oil-pressure operated multi-disc clutches. Power flow passes to the output shaft direct if input and output shafts rotate in opposite directions. If the shafts rotate in the same direction, power flow passes through an intermediate shaft. In the neutral position, the two clutches are open and input and output sides are disconnected.
The gear unit can be fitted with a trailing oil pump driven by the output shaft, which will ensure sufficient lubrication in case the gear unit is turned by the propeller shaft with the engine stopped. Remote control of the gear unit can also be electric, hydraulic or pneumatic.



Reversing marine gear unit type BWS

The gear unit BWS is a marine reversing reduction gear unit, two stage, thrust bearing integrated, with vertically offset input and output shafts.
The two directions of rotation of the output shaft are determined by oil-pressure operated multi-disc clutches. Power flow passes to the output shaft direct if input and output shafts rotate in opposite directions. If the shafts rotate in the same direction, power flow passes through an iintermediate shaft. In the neutral position, the two clutches are open and input and output sides are disconnected.

Reversing marine gear units type SWUF



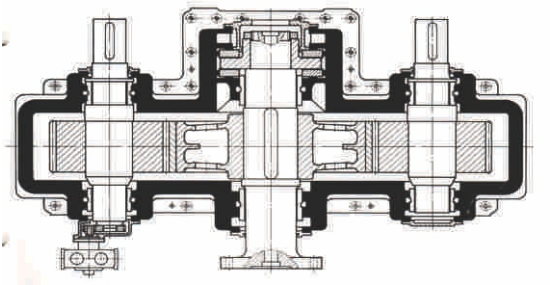
The Gear Unit Type SWUF is a marine reverse reduction gear with co-axial input and output shafts. It is employed in ships with non reversible engines and fixed-pitch propellers.

The unit has one ahead and one astern speed. The maneuvering is carried out by, means of two oil-pressure operated multiple-disc clutches. A thrust bearing is incorporated in the gear unit.

Two engine marine gear unit type ASL

The gear is of single-stage type for drive by 2 diesel engines each via a flexible coupling or drive by 2 electric motors.

All shafts are supported by exchangeable plain bearings All bearings are lubricated and cooled direct with fresh oil. They operate within the hydrodynamic lubrication range.



Thrust bearings built into the gear. The thrust bearing chamber is permanently filled with oil, even when the oil supply is not in operation.

Lubrication is by means of a built-on gearwheel oil pump.

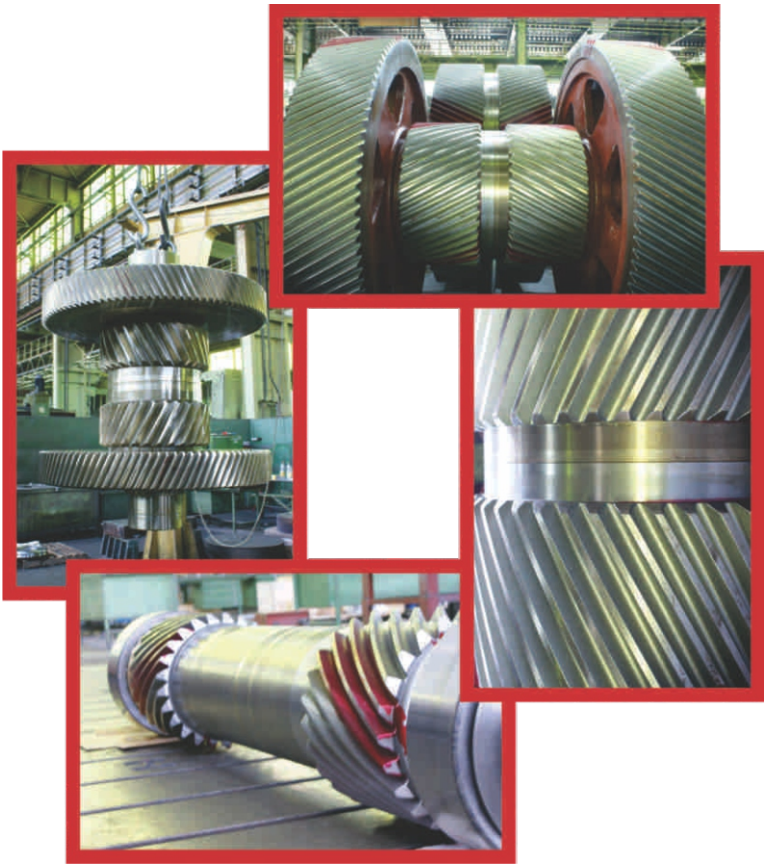
During it's long existence, RRR has delivered gear units to all Romanian shipyards, as well as shipyards in Bulgaria, Croatia, Serbia and Germany. We are presently supplying some well known Dutch shipyards as Bodewes, Volharding, Maas, Bijlsma, Ihda Transmare, as well as Chinese shipyards as Dongfeng and Zhejiang Hexing.

Dredge pump gearboxes

Type	Design	Ratio	Power (kW)	Application
SV 200	**Cylindrical gear unit, single-stage , shafts vertically with vertical offset.**	1,8...5,5	...240	Dredge pump
SV 250	**Cylindrical gear unit, single-stage , shafts vertically with vertical offset.**	1,8...5,5	...485	Dredge pump
SV 320	**Cylindrical gear unit, single-stage , shafts vertically with vertical offset.**	1,8...5,5	...895	Dredge pump
SV 355	**Cylindrical gear unit, single-stage , shafts vertically with vertical offset.**	1,8...5,5	...1350	Dredge pump
SV 450	**Cylindrical gear unit, single-stage , shafts vertically with vertical offset.**	1,8...5,5	...1940	Dredge pump

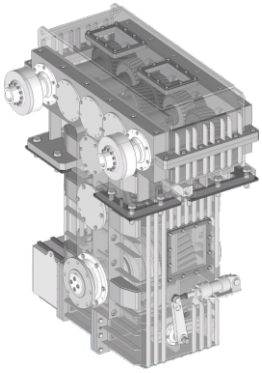
Gears as spare parts

RESITA REDUCTOARE & REGENERABILE S.A. manufactures spare parts for all the delivered reduction gearboxes and can also manufacture gear parts and other parts and components on the basis of the customer's documentation.

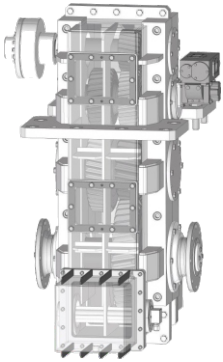


Rail Rolling Stock Gear Units

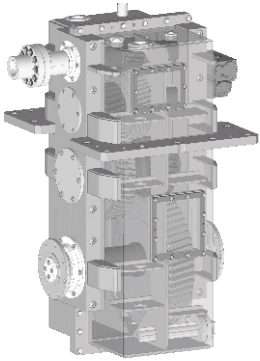
2xAB50/StCU110



CU95

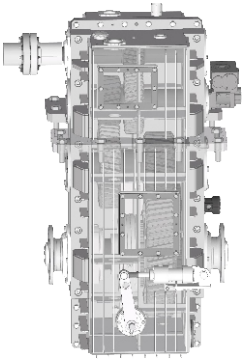


CU110

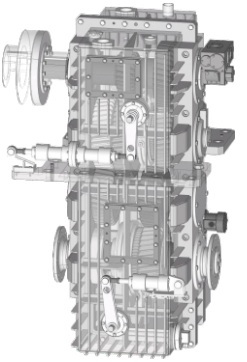


Type	Design	Ratio	Power (kW)	Application
2xAB50/StCU110	Cylindrical gear unit driven by two electric motors, summing up by two horizontal stages, vertical offset, input shafts positioned on top, bilateral output shaft, with the posibility of disengagement of the output shaft from the transmision.	6,287	2 x 155	Electric Li-Ion batteries driven shunting locomotives with two electric motors, having the posibility of being towed in convoy on regular railway between marshalling yards.
CU95	Cylindrical gear unit , three stages, vertical offset, input shaft positioned on top, bilateral output shaft	4,687	310	Electric Li-Ion driven shunting locomotives.
CU110	Cylindrical gear unit , three stages, vertical offset, input shaft positioned on top, bilateral output shaft	13-17	155	Electric Li-Ion driven shunting locomotives.
StCU110	Cylindrical gear unit , three stages, vertical offset, input shaft positioned on top, bilateral output shaft, with the posibility of disengagement of the output shaft from the transmision.	7,465	310	Electric Li-Ion batteries driven shunting locomotives, having the posibility of being towed in convoy on regular railway between marshalling yards.

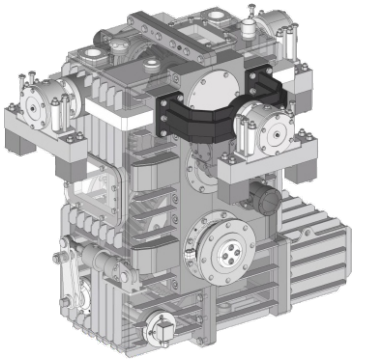
StCU110



StCU110/2



StBU64

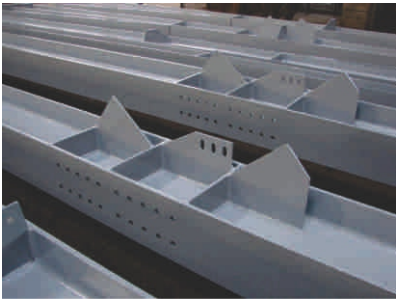


Type	Design	Ratio	Power (kW)	Application
StCU110/2	Cylindrical gear unit , three stages, vertical offset, input shaft positioned on top, bilateral output shaft, with the posibility of switching between two ratios and disengagement of the output shaft from the transmision.	i_1=2,381 i_2=1	310	Electric Li-Ion batteries driven shunting locomotives, having the posibility of being towed in convoy on regular railway .
StBU64	Cylindrical gear unit, two stages, vertical offset, input shaft positioned on top, bilateral output shaft, with the posibility of disengagement of the output shaft from the transmition.	4,798	310	Electric Li-Ion batteries driven shunting locomotives, having the posibility of being towed in convoy on regular railway between marshalling yards.
Cylindrical and bevel gears for rolling stock	Cylindrical gears mounted on the bogies for the following types of locomotives of different speeds: • LE 5100 kW & 3400 kW, v=120 km/h (mn=12, z=20/73) • LE 5100 kW & 3400 kW, v=160 km/h (mn=8, z=38/104) • LE 5100 kW, v=200 km/h (mn=8, z=46/97) • LE 5100 kW, v=160 km/h modernized (mn=8, z=39/104) • LE 2100 CP, v=100 km/h (mn=11, z=15/69) • LE 2100 CP, v=120 km/h (mn=11, z=17/67) • LE 2100 CP, v=140 km/h (mn=11, z=19/65) • LE asincronous motors			

Welded assemblies

A. HEAVY METALIC STRUCTURES

a. Metalic bridges
b. Metalic structures for buildings
c. Poles for relays
d. Marine and auto platforms



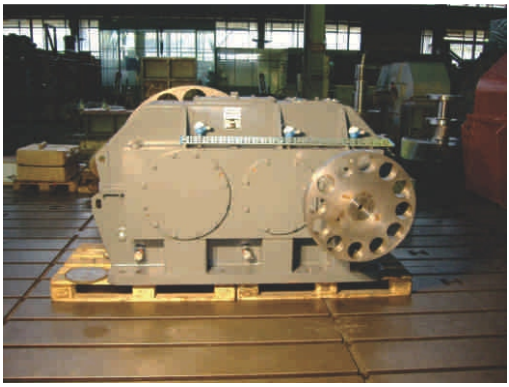
B. LIGHT METALIC STRUCTURES

a. Installations for airport operations: baggage carts, airport stairways
b. Advertising boards
c. Industrial shelves and supports
d. Containers
e. Scenes
f. Bunker
g. Canopies

References

Gearbox type BH 100
Customer: Lafarge Cement Romania

Power = 1600 kW
Ratio = 8.04 (990 rpm / 123.10 rpm)
Weight = 6100 kg
Application: Cement Mill
Two stages cylindrical gearbox



Gearbox type BUSL 71
Customer: Sea Cargo Ships AS Norway

Power = 6000 kW
Ratio = 1.894 (750 rpm / 396 rpm)
Weight = 14500 kg
Application: Main Ship Propulsion Systems
Two stages gearbox

Gearbox type CWC 1600
Customer: Al-Qaim Cement Plant
Iraq

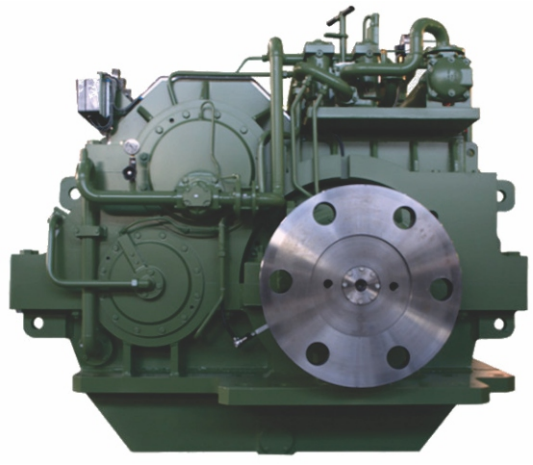
Power = 1600 kW
Ratio = 12.352 (960 rpm / 77.7 rpm)
Weight = 38500 kg
Application: Cement Mill
Four stages, cylindrical gearbox

Gearbox type AUS 71G
Customer: Sanfirden Technics BV
The Netherlands

Power = 1850 kW
Ratio = 5.172 (750 rpm / 145 rpm)
Weight = 8000 kg
Application: Main Ship Propulsion
One stage, vertical offset + PTO

Gearbox type AUS 63G
Customer: Sandfirden Technics BV
The Netherlands

Power = 1980 kW
Ratio = 3.393 (750 rpm / 221,1 rpm)
Weight = 5800 kg
Application: Main Ship Propulsion System
One stage, vertical offset + PTO stage



Gearbox type BHSL 90
Customer Anglo Belgian Corporation
Belgium

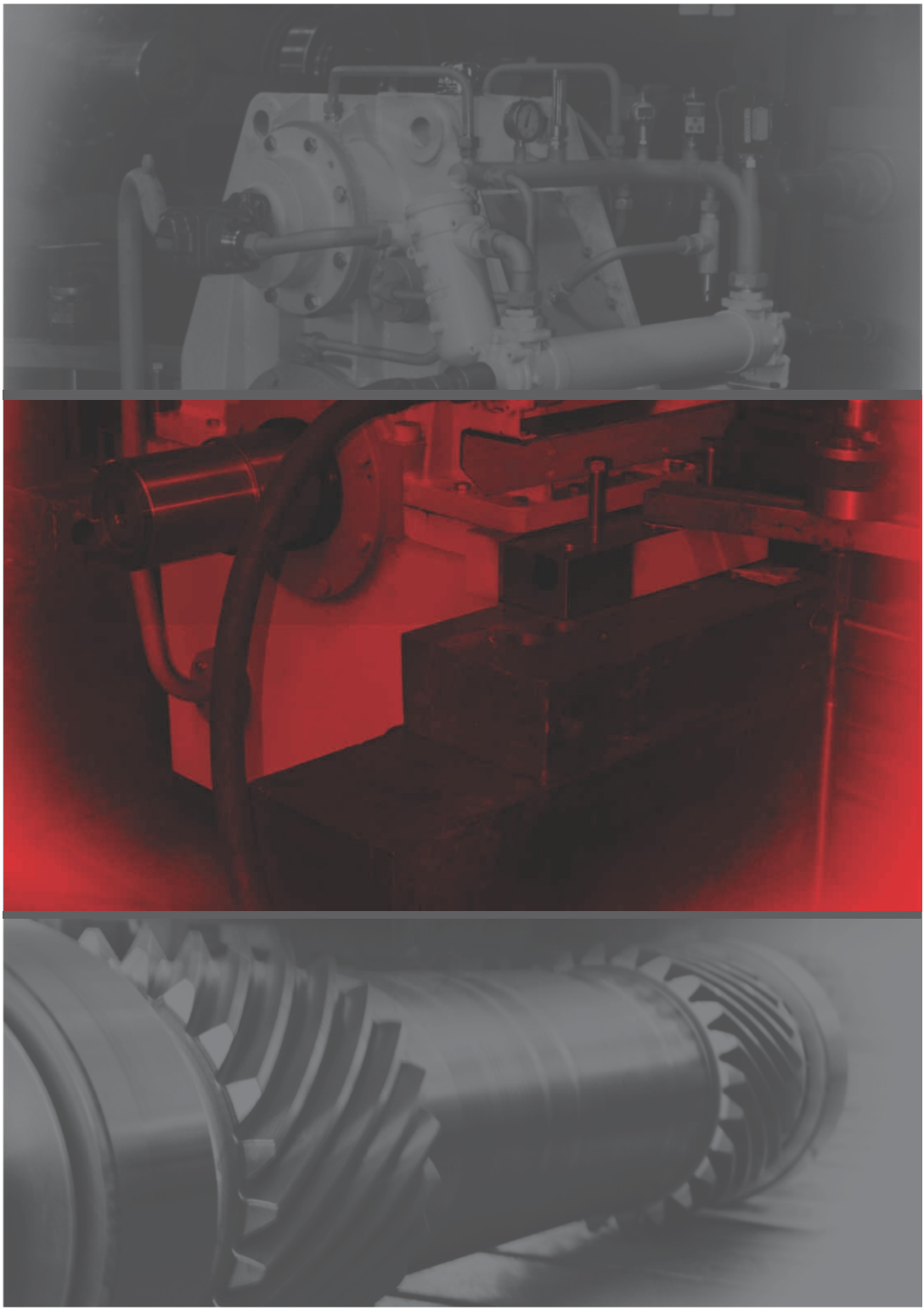
Power = 2500 kW
Ratio = 7.22 (900 rpm / 124,6 rpm)
Weight = 19200 kg
Application: Main Ship Propulsion Systems
Two stages, horizontal offset

Gearbox type SV 355 - C
Customer: IHC Holland BV
The Netherlands

Power = 1350 kW
Ratio = 2.69 (1600 rpm / 595 rpm)
Weight = 3500 kg
Application: Dredge Pump
One stage, vertical offset

Gearbox type SV 320 - C - 04
Customer: IHC Holland BV
The Netherlands

Power = 895 kW
Ratio = 2.852 (1800 rpm / 631 rpm)
Weight = 2400 kg
Application: Dredge Pump
One stage, vertical offset



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