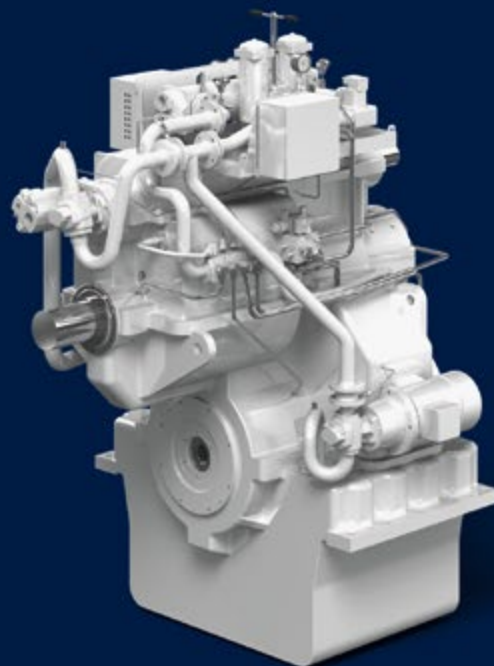




Innovative Power Transmission



Single Marine Gear Solutions
Type RSV(L) / RSH(L) 1,000 – 22,000 kW

RSV/RSH Gearboxes – High performance, energy-efficient, reliable.



RSV(H)(L)

R = RENK AG
S = Single Marine
V = Vertical Offset
H = Horizontal Offset
L = Multiple Disc Clutch
C = Compact Version

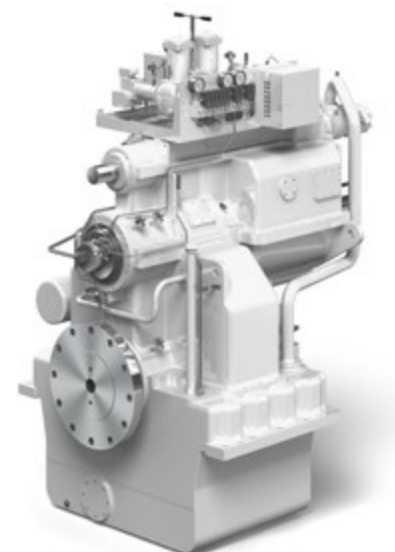
More than 140 years of experience are the basis for the production of highly developed and efficient gearboxes, which are used in thousands of ships all over the world today. Precisely fitting gearboxes are our specialty. We can develop customized solutions for our customers' demands. RENK gearboxes extend the performance of single engine marine propulsion by offering a number of additional features. Propeller speed is optimized and power transmission to the main engine is regulated.

RENK gearboxes are manufactured according to international standards, which together with our own quality criteria, show a unique consistency. Taking every standard and our own quality criteria into consideration we can provide our customers with customized versions of our standard specifications.

The RENK quality standards

Due to the high standards of our internal quality control, RENK offers our customers consistent high quality in the development and design of the relevant gearbox components: from gearing technology and axial bearing to the multi-disc clutch. Precision and diligence in every step of the production as well as elaborate fine tuning of the separate components regarding the overall system are the key to our quality.

RENK is able to manufacture durable gearboxes which prove their reliability and high-standard performance for decades and over thousands of miles.



Reliability through precision – The three pillars of RSV/RSH technology

Gears which mesh perfectly

Our gears are designed for maximum safety as well as minimum noise and vibration. The technological basis is the optimum fine tuning of the macro and micro gear geometry.

A solid foundation and strong casing withstand high strain

The design of the casing and foundation has a considerable influence on the load-carrying characteristics of the gears and bearings as well as noise absorption and vibration during operation. RENK casings have high stiffness due to the use of torsion-resistant materials with especially resilient strengthening ribs.

The thrust bearing is usually located on the engine side. This results in a high stiffness of the whole structure in the area of the thrust bearing. A solid connection between gearbox and engine foundation creates a system which ensures optimal absorption of the propeller thrust.

Sleeve bearings with leading qualities

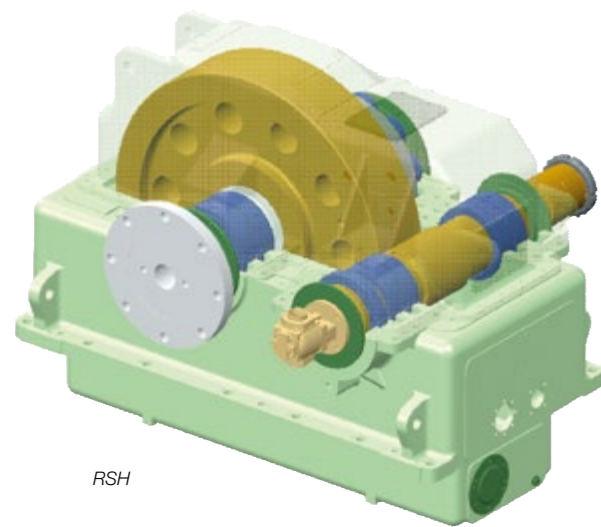
High-quality gearboxes need bearings with special features like low-friction sleeve bearings. The RSV/RSH gearboxes use extremely durable high-performance plain bearings with an unlimited life time. Thick-walled axial bearings with circular thrust pads made for reliable operation and durability.

The following aspects are of particular benefit. Maintenance of the thrust bearing is feasible without draining the oil and disassembling the gearbox housing. Aft and forward thrust pads are identical, a fact that simplifies replacement and maintenance to a considerable extent.

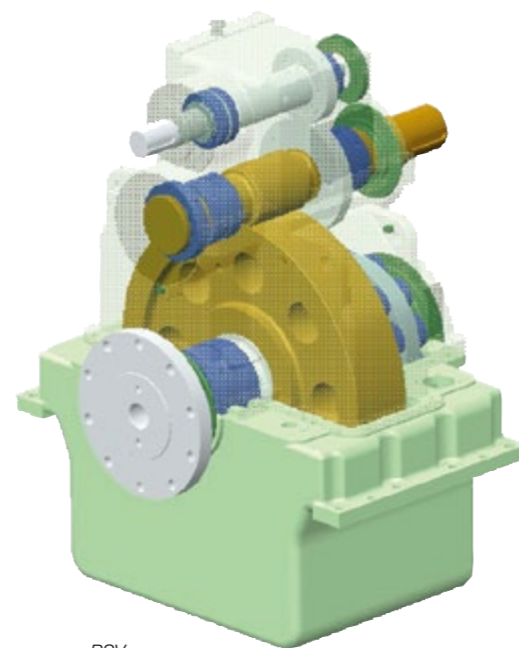


Customized gearbox solutions

- Reduction from main engine to propeller is realized in one step with optimized efficiency
- RSV(L)/RSH(L) are supported on sleeve bearings according to DIN 7474
- To absorb the axial forces of the propeller, RENK supplies all gearboxes with an integrated thrust bearing
- Assembly and Instrumentation according to the rules and regulations of the relevant classification society. In addition to this we ensure the high-standard RENK quality of all gearbox components.
- Stiff housings (grey cast iron or welded steel) and high quality internal ribs ensure maximum stiffness
- Case-hardened helical gearing with high-addendum toothing allows minimal torsion even under full loads.
- Ready-to-use auxiliary equipment: pumps, coolers, control and monitoring systems are readily piped and wired and mounted on the gearbox.
- Spare parts according to classification society standards are included.



RSH



RSV

Our customized gearbox solutions are setting standards at sea

Numerous optional specifications and the quality of our RSV/RSH gearboxes are the result of our extensive research and development as well as the experience we have gained from decades of use of our gearboxes at sea.



Optional Equipment

Turning Device

Enables the turning of the propeller shaft on ships with electrical propulsion for safe and comfortable maintenance work.

CPP Pump Drive

Additional mechanical pump drive at the PTO-shaft for mounting of oil pump to supply oil to the propeller.

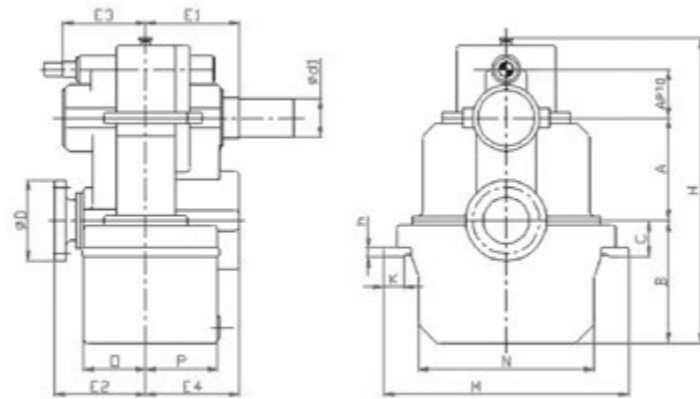
Multiple Disc Clutch(es)

Can be installed at the main shaft and PTO/PTH/PTI shaft to offer variable drive systems.

Optional Holding Brakes

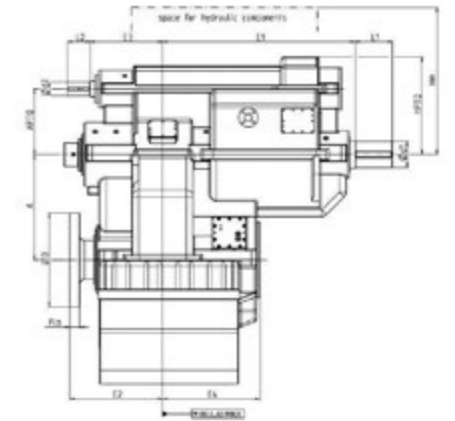
For propulsion systems it is possible to lock the propeller for safer and easier maintenance work.

Main Dimensions RSV



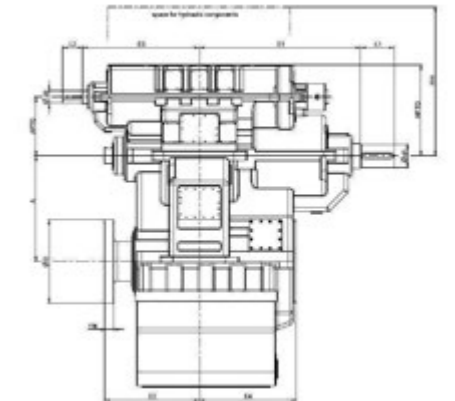
RSV Size	RSV C-Version	A _{PTO} Position	Shaft Position			Casing						Thrust [kN]	~ Weight [t]
			E1	E2	E3	B	C	G	H	M	N		
A	A	APTO	E1	E2	E3	B	C	G	H	M	N		
500	560	315	500	450	360	600	180	690	2100	1230	960	245	2,5
560	630	315	530	500	380	670	200	770	2250	1360	1060	302	3,5
630	670	335	580	560	450	750	225	850	2400	1510	1200	366	4,7
670	710	335	630	600	460	800	250	900	2650	1590	1130	472	5,6
710	750	355	650	630	490	850	250	950	2750	1700	1220	472	6,4
750	800	375	670	670	500	900	280	1020	2850	1780	1280	592	7,3
800	850	400	700	700	550	950	280	1070	3000	1910	1380	592	8,8
850	900	425	780	750	570	1000	315	1140	3150	1990	1440	774	10,5
900	950	450	800	800	610	1060	315	1200	3250	2110	1530	774	12,5
950	1000	450	850	850	650	1120	355	1270	3350	2220	1620	979	14,5
1000	1060	475	900	900	680	1180	355	1370	3800	2320	1700	979	17,0
1060	1120	500	950	950	710	1250	400	1940	3950	2460	1660	1068	20,6
1120	1180	530	1020	1000	760	1320	400	2030	3380	2560	1720	1209	23,8
1180	1250	530	1050	1000	790	1360	450	2100	3520	2720	1850	1319	26,8
1250	1320	560	1100	1050	820	1400	450	2190	3630	2880	1990	1319	31,2
1320	1400	560	1180	1120	880	1450	500	2330	3750	3020	2100	1530	37,2
1400		600	1240	1180	900	1500	500	2440	3900	3180	2230	1669	44,0

Main Dimensions RSVL (PPTO/PTI)



RSVL	C-Version	Head option	A _{PTO}	E1	E3	∅d1 ¹⁾ standard/enlarged	L1 standard/enlarged	∅d2	L2
710	750	small	500	1430	490	180/200	250/280	110	160
750	–					180/200	250/280	110	160
–	800	middle	530	1525	560	200/220	280/310	120	170
800	850					200/220	280/310	120	170
850	900					200/220	280/310	120	170
900	950	large	560	1710	660	220/250	310/350	130	180
950	1000					220/250	310/350	130	180
–	1060					220/250	310/350	130	180

Main Dimensions RSVL (PTO/PTH/PTI) with Quillshaft design



RSVL	C-Version	Head option	A _{PTO}	E1	E3	∅d1 ¹⁾ standard/enlarged	L1 standard/enlarged	∅d2	L2
710	750	small	530	1515	490	180/200	250/280	110	160
750	–					180/200	250/280	110	160
–	800	middle	600	1625	560	200/220	280/310	120	170
800	850					200/220	280/310	120	170
850	900					200/220	280/310	120	170
900	950	large	630	1840	660	220/250	310/350	130	180
950	1000					220/250	310/350	130	180
–	1060					220/250	310/350	130	180

1) „Enlarged“ means that connecting pin and input shaft bearing are in the enlarged version. The „enlarged“ version is selected whenever shaft calculation requires this because of the torque.

Efficient energy management for your ship

Efficient and flexible distribution of the complete energy available on board. In this way you can reduce energy costs, increase comfort and keep your ship maneuverable in case of emergency.

PTO – more power flexibility for your ship

PTO offers additional electrical power possibilities for different applications.

Secondary PTO (SPTO)

Simultaneous operation of shaft generator and propeller

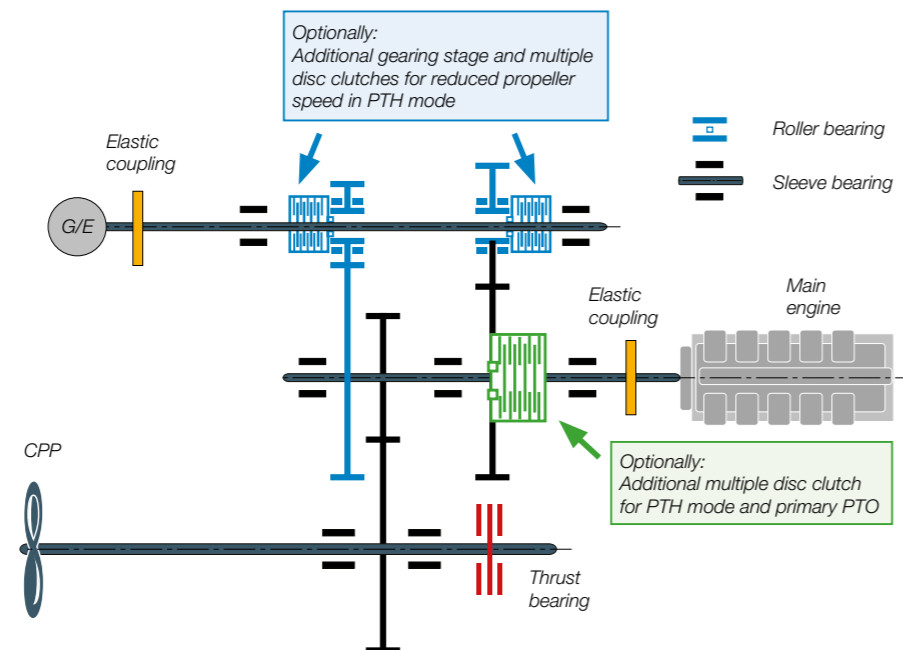
Primary PTO (PPTO)

Independent shaft generator operation without propeller

PTI & PTH – Higher power and additional safety for ship propulsion systems

In PTI-mode the energy of the generator is used as an additional source of energy for the ship propulsion, to complement the power of the main diesel engine as a booster.

The PTH-mode is meant as emergency propulsion in case of failure of the main engine or as hybrid propulsion.



RSVL Quill

The Quillshaft version RSVL (PTO/PTH/PTI) with tubular shaft coupling

The Quillshaft version of the gearbox can also supply energy from the propulsion shaft generators and pumps on the SPTO as PPTO. PTI and PTH modes can also be integrated into this version of the gearbox. PTH enables the use of the electric generators as auxiliary propulsion to be able to guarantee the emergency propulsion of the ship in case of unforeseen failure of the main diesel engine. The reduced speed in PTH mode can be alternatively used to navigate critical passages at sea or in ports. PTI works as a booster to generate additional power for the propulsion from an optional electric generator.

RENK product support – competent, effective and always there for you

Our customer service is the central contact point for our whole service, be it for general questions about our products and services or maintenance and repair enquiries. A team of experienced engineers and highly qualified personnel supports you in your choice of individual solutions and accompanies the quick realization of the process – from development to implementation of our gearbox into the propulsion system of your ship. – Even after delivery and professional implementation of the RENK gearbox our team stays a competent partner for all your concerns.

The RENK maintenance and repair service – maximized capacity and service life for ship gearboxes

Our state-of-the-art maintenance and repair equipment ensures first class service:

- 3D gear teeth measurement
- 3D coordinate measuring machine
- Crack testing, surface testing and ultrasonic testing
- Endoscope for internal inspection

Upon completion of the analysis, you will receive a study report containing prevention measures and repair recommendations for all components of the gearbox.

We are available 24/7 for you, we help answer all your questions and even on short notice we are able to provide technical personnel to help you complete your tasks quickly and straightforwardly. Our competent team is kept up to date by regular training and is able to answer any current questions.





RENK Aktiengesellschaft

Rheine Plant

Rodder Damm 170

48432 Rheine

Germany

Phone: +49 5971 790-0

Fax: +49 5971 790-208

Email: info.rheine@renk.biz

www.renk-ag.com