



**Propeller Shaft Clutch (PSC)**



## The best materials – the best workmanship

- **Easy operation of the clutch:** switching done hydraulically
- **No additional loads** for the main engine thrust bearing and foundation by switching forces
- Tothing and thrust bearing **easy to inspect**
- Executed with **integrated thrust bearing**
- During main propulsion **reliable transmission of the propeller thrust** to the main engine thrust bearing
- During **PTH mode** reliable transmission of the propeller thrust through the clutch axial bearing
- **Mechanical emergency activation possible**

## Clutches that provide flexibility

RENK marine clutches for merchant ships with 2-stroke engines are universally acknowledged as a hallmark of maritime power transmission engineering. They have proven their value for decades and are setting standards for safe ocean-going transport.

RENK clutches guarantee maximum reliability and economy in all operating modes. To ensure ever increasing performance and to meet the ever rising technological challenges, there is one distinct solution: **RENK Inside!**

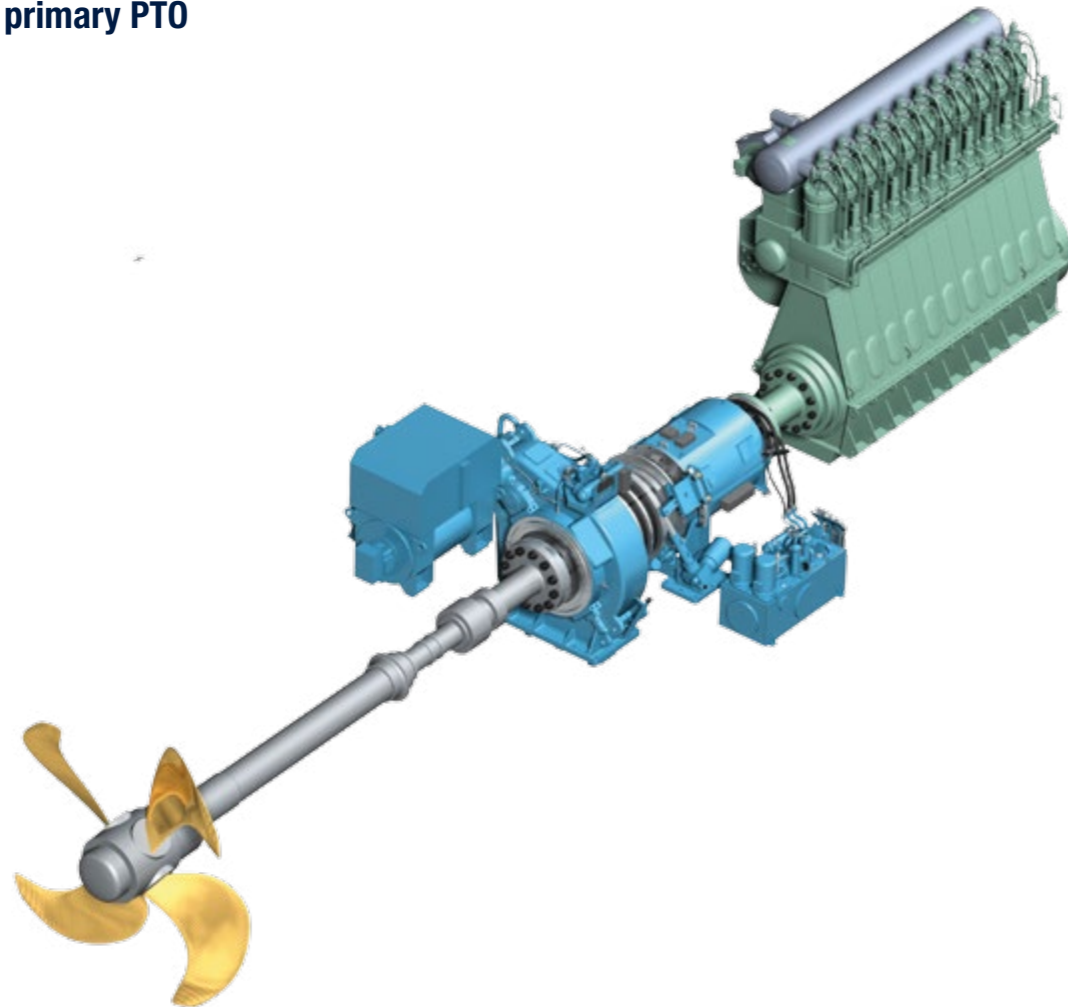


## Variable energy supply and easier maintenance on board

With the engaging/disengaging process of the propeller shaft clutch you can access a variety of functions quickly and comfortably.

### Designed for engaging/disengaging the power train for:

- maintenance
- saving fuel
- using a second drive (PTH mode)
- using a primary PTO



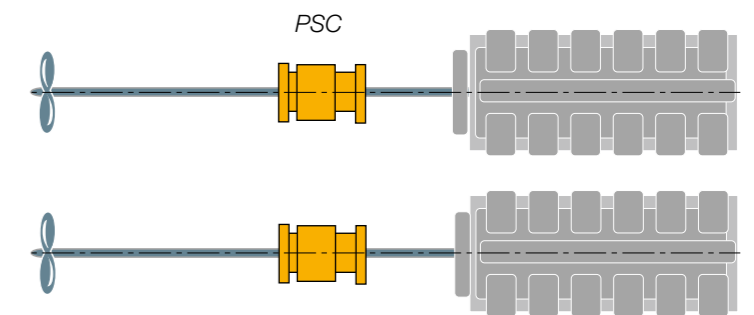
## Prepared for different applications: PSC for single screw and twin screw vessels

Thanks to its hydraulic system the PSC is able to quickly engage or disengage the propeller, even without complicated manual work by the crew!

### Efficiency for twin screw vessels

The mode of operation with only one propeller offers several advantages.

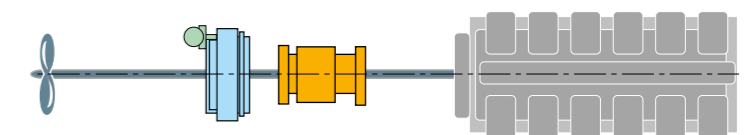
- If the ship is not fully loaded or if the full propulsion capacity is not needed fuel can be saved
- The disengagement of one propeller further allows maintenance work at sea even while cruising



Twin screw and two PSC

### Safety for single screw vessels

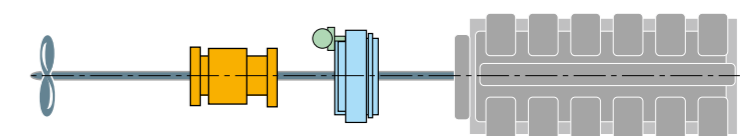
- PTH mode for safety improvement in single screw propulsion
- Independent electric propulsion at main engine shut down prevents the ship from losing control
- Electric propulsion for slow steaming in harbours and critical passages



Single screw and PSC with secondary PTO\* or PTH\*\*

### Flexibility for propulsion and on board electricity

- Flexibility of power train for generator drive by prime mover with disengaged propeller to generate energy for onboard electric consumers



PSC and single screw with primary PTO

\*Power take off

\*\*Power take home

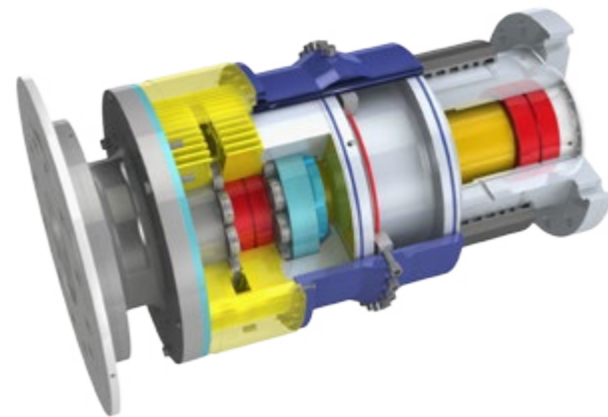
## PSC versions in application

### Semi-Automatic

With the semi-automatic version only a little manual work is needed to disengage or engage the PSC. Especially in case of failure of the main propulsion train only a few steps are necessary to change to emergency propulsion.

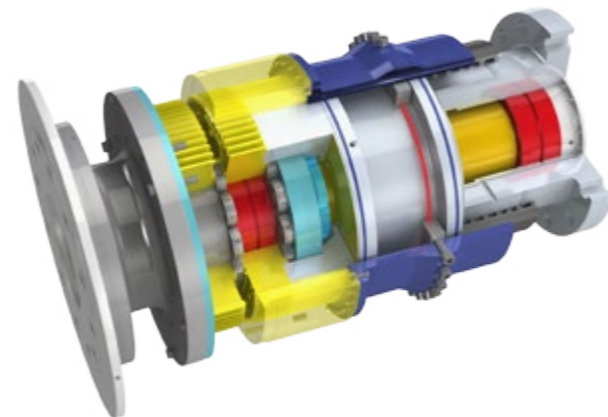
#### Engagement

- Vessel to be stopped
- PSC hydraulic pump to be started via electronic device
- PSC disc brake to be activated
- Propeller is locked
- Main engine turning gear to be engaged
- A crew member has to be inside the engine room to operate the tuning device via remote control
- Final clutch engagement position to be reached by main engine turning device
- A light signals the reaching of the final position of the PSC
- PSC gear connection hydraulically activated
- PSC disc brake to be released
- Completion of PSC engagement



#### Disengagement

- Main engine to be stopped
- Speed reduction of vessel down to max. allowed torque (ca. 10% of nominal main engine torque)
- Final PSC disengagement hydraulically activated by switch
- Completion of PSC disengagement



### Fully-Automatic

For those wanting more flexibility for their ship propulsion: with the fully-automatic PSC no crew is necessary in the engine room. The engagement and disengagement of the PSC is controlled directly from the engine control room.

#### Engagement

- Vessel to be stopped
- PSC hydraulic pump to be started by PSC control system out of Engine Control Room (ECR)
- Combined turning and locking device automatically activated
- Final clutch engagement position will be reached automatically via PSC turning device
- Automatic clutch-in after reaching final position
- Completion of PSC engagement



#### Disengagement

- Main engine to be stopped
- Speed reduction of vessel down to max. allowed torque (ca. 10% of nominal main engine torque)
- Final PSC disengagement hydraulically activated by switch
- Completion of PSC disengagement

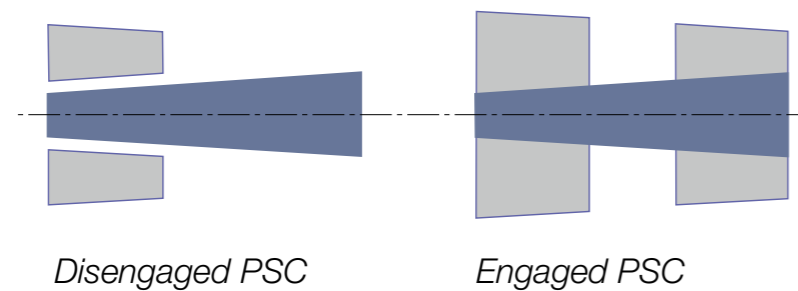
## Torque Transfer

The gear technology of the PSC is unique thanks to the know-how we have acquired during 140 years of R&D activity in gear technology. In this way we are able to supply you with perfectly adapted gear and clutch components: with the highest quality and reliability.



- **Reliable transmission of torque via clearance free gearing**
- **Torque transmission form-locked and backlash-free via case hardened, ground and slightly conical tooth**
- **Ground and wedge-shaped toothing in flank direction**
- **Extremely low wear due to hardened and ground toothing**
- **No clamping (wedging) of the toothing due to axial limitation of the switching piston**
- **Compact design due to hardened and ground toothing and the use of alloy composite steel**

Conical toothing (highly exaggerated)



## Main Technical Data

Size	Torque [kNm]	Thrust [kN] max. engaged	Thrust [kN] max. disengaged	PSC length [mm]	Spacer length (mm)	Max. outer diameter [mm] (without cover)	Flange diameter [mm]	PSC weight [kg]	Spacer weight [kg]
32	320	600	125	1500	400	700	600	3800	300
63	600	1040	208	1650	600	870	645	4800	500
85	850	1250	280	1775	675	950	750	6500	800
132	1260	1600	364	1875	750	1000	850	8200	1100
160	1500	2100	420	2200	875	1150	975	11000	1700
225	2150	2600	520	2350	1000	1230	1070	14000	2300
250	2500	2600	520	2800	1000	1320	1070	16000	2300
355	3400	3500	650	2650	1150	1430	1250	22000	3600
480	4600	4800	900	3050	1300	1680	1400	33000	5100
800	7800	7500	1600	3600	1450	1930	2050	44000	6500



## 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 remains a competent partner for all your concerns.



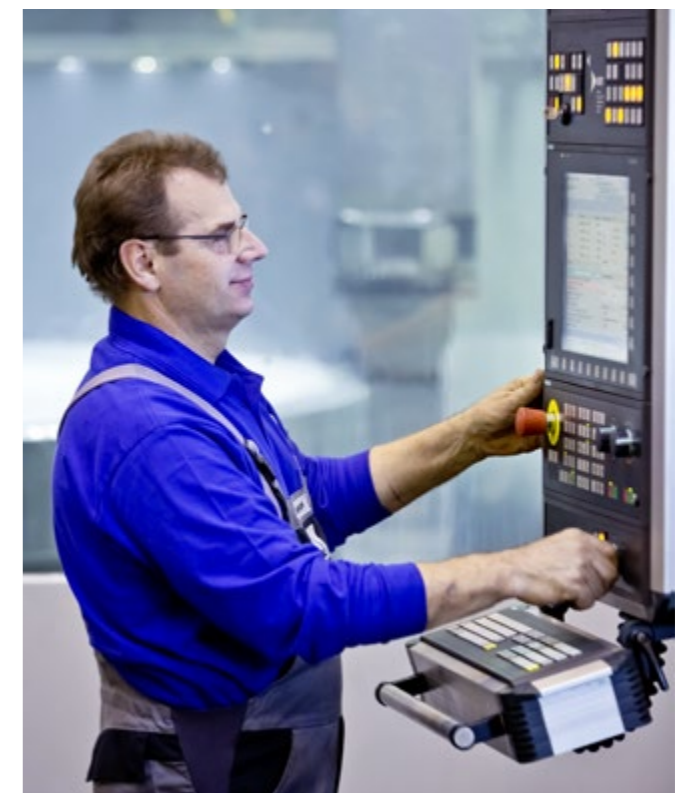
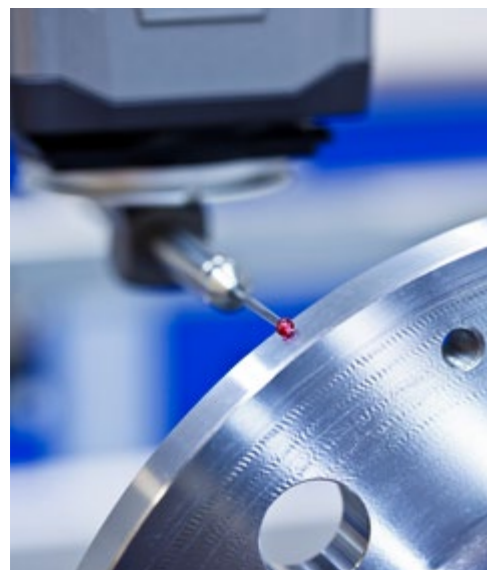
### The RENK maintenance and repair service – maximized capacity and service life for ship gearboxes

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

- 3D gear tooth 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 at 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





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