

Innovative Power Transmission



PSC

Propeller Shaft Clutch

Applications

Efficiency

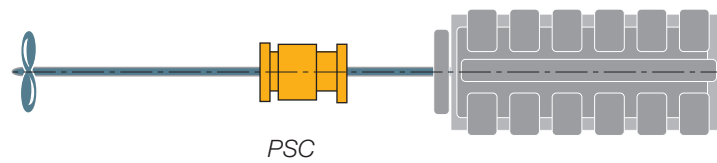
- Total efficiency improvement in single engine operating mode with disengaged propeller (free running)
- Engine maintenance during sea operation

Safety

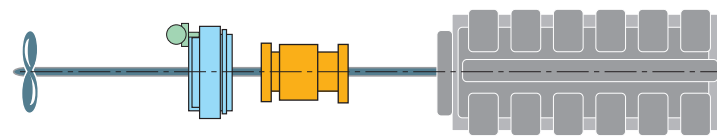
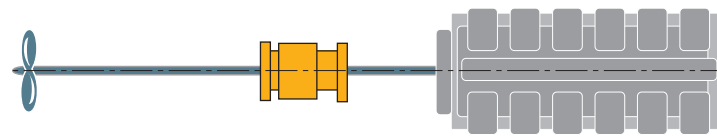
- Safety improvement in single screw propulsion
- Independant electric propulsion at main engine shut down
- Electric propulsion for slow steaming

Flexibility

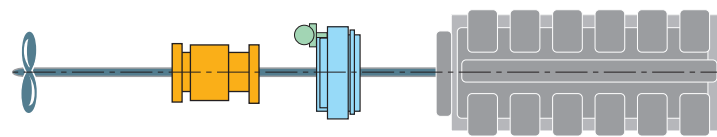
- Flexibility of power train for generator drive by prime mover with disengaged propeller



Twin screw and two PSC



Single screw and PSC secondary PTO or PTH** operating mode*



PSC and single screw: Primary PTO operating mode*

Functional Description

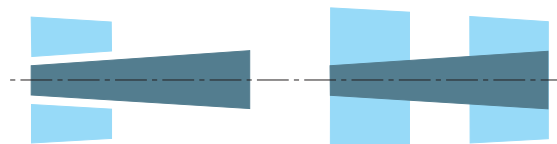
RENK PSC for connection or separation of engine and propeller; there are three ways of en-/disengagement:

- First: manually en-/disengagement in engine room by manually operated hydraulically actuated connection of gearing
- Second: semi-automatic en-/disengagement in engine room by hydraulically actuated connection of gearing (Standard PSC)
- Third: full automatic en-/disengagement in engine control room by hydraulic actuated connection of gearing

Further functions:

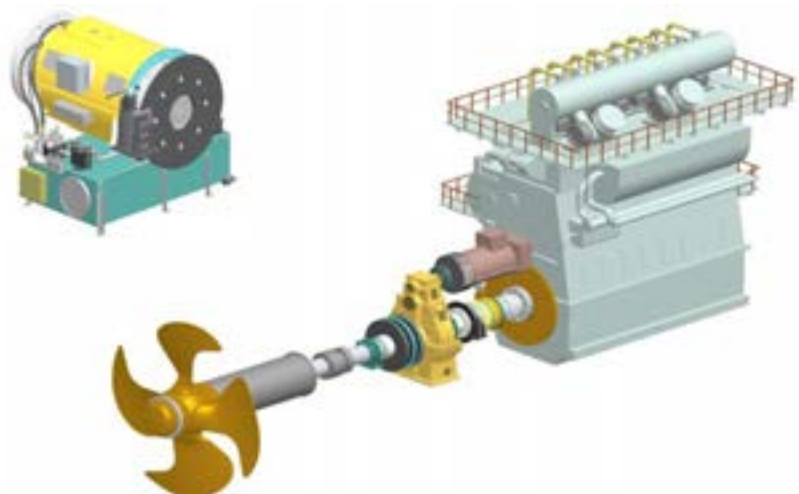
- Torque transmission form-locked and backlash-free via hardened, ground and slightly conical teeth
- Propeller thrust transmission statically to main engine thrust bearing

Conical toothing (highly exaggerated)



Disengaged PSC

Engaged PSC



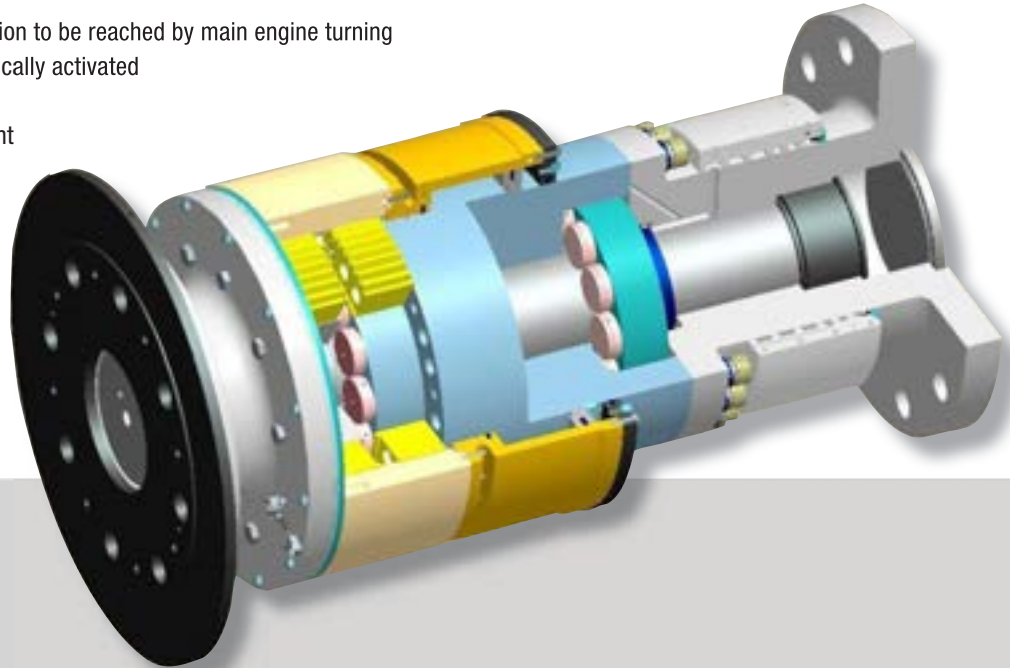
*Power take off

**Power take home

Engagement according to following steps:

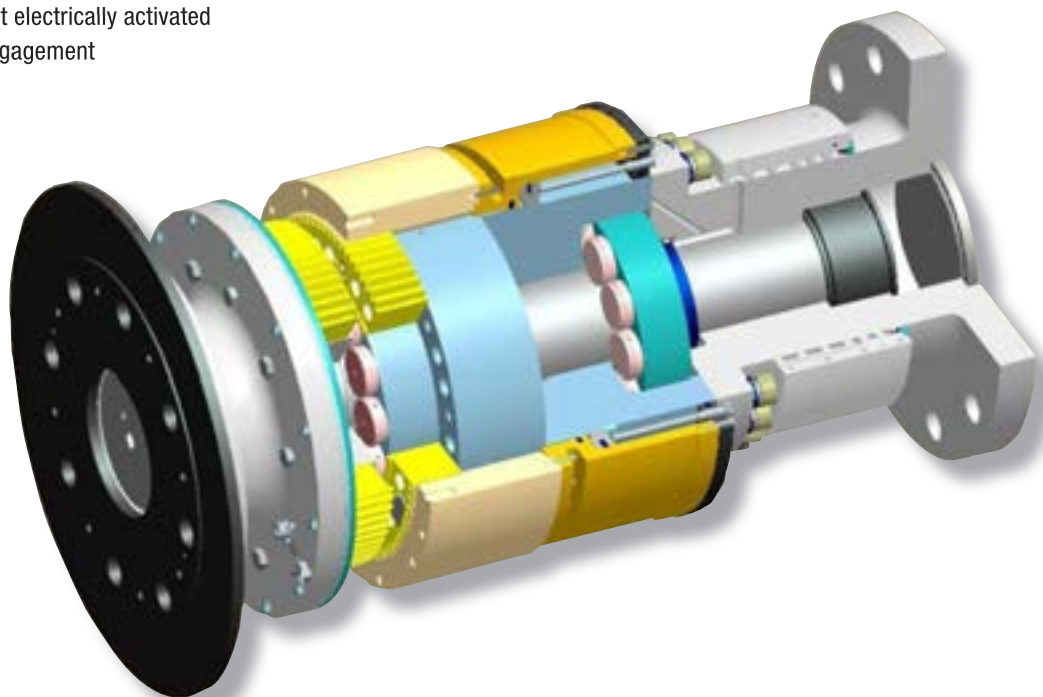
En-/disengaging process

- Vessel to be stopped
- PSC hydraulic pump to be started
- Main engine turning gear to be engaged
- PSC disc brake to be activated
- Final clutch engagement-position to be reached by main engine turning
- PSC gearing connection electrically activated
- PSC disc brake to be released
- Completion of PSC-engagement



Disengagement according to following steps

- Main engines to be stopped
- Speed reduction of vessel down to max. allowed torque (~ 10% of nominal main engine torque)
- Final PSC-disengagement electrically activated
- Completion of PSC-disengagement



Specification

- **Integrated axial bearing** for propeller thrust transmission to the main engine thrust bearing
- **Reliable torque transmission** via form locked and backlash free gearing
- Application of **gearbox technology**: Case hardened, ground and conically gearing
- **Hydraulic actuation of the clutch** (3 MPa)
- **Minimizing of shaft sagging and displacement** in disengaged position by core shaft in radial plain bearings
- **Compact design** by highly alloyed steel
- **Extremely low wear** by **hardened** and **ground gearing**. Thrust pads and core shaft bearings in bronze.
- **Avoidance of teeth sticking** by axial limitation
- **Mechanical emergency blocking**
- **PSC forming integral part** of propeller-shaft. No need of additional bearing support.



Main Technical Data

Size	Torque (kn)	Thrust (kn) max	Thrust max. disen- gaged	PSC length (mm)	Length spacer (mm)	Max. outer diameter (mm)	Flange diameter (mm)	PSC weight (to)	Spacer weight
32	320	600	125	1500	400	700	600	3,8	0,3
63	600	1040	208	1650	600	870	645	4,8	0,5
85	850	1250	280	1775	675	950	750	6,5	0,8
132	1260	1600	364	1875	750	1000	850	8,2	1,1
225	2150	2600	520	2350	1000	1230	1070	14	2,3
355	3400	3500	650	2650	1150	1430	1250	22	3,6
480	4600	4800	900	3050	1300	1680	1400	33	5,1
800	7800	7500	1600	3600	1450	1930	2050	44	6,5

Selection Example:

Main engine power:

P = 16,550 kW

Main engine speed:

n = 87 rpm

Remarks:

* Coupling selection subject to class requirements

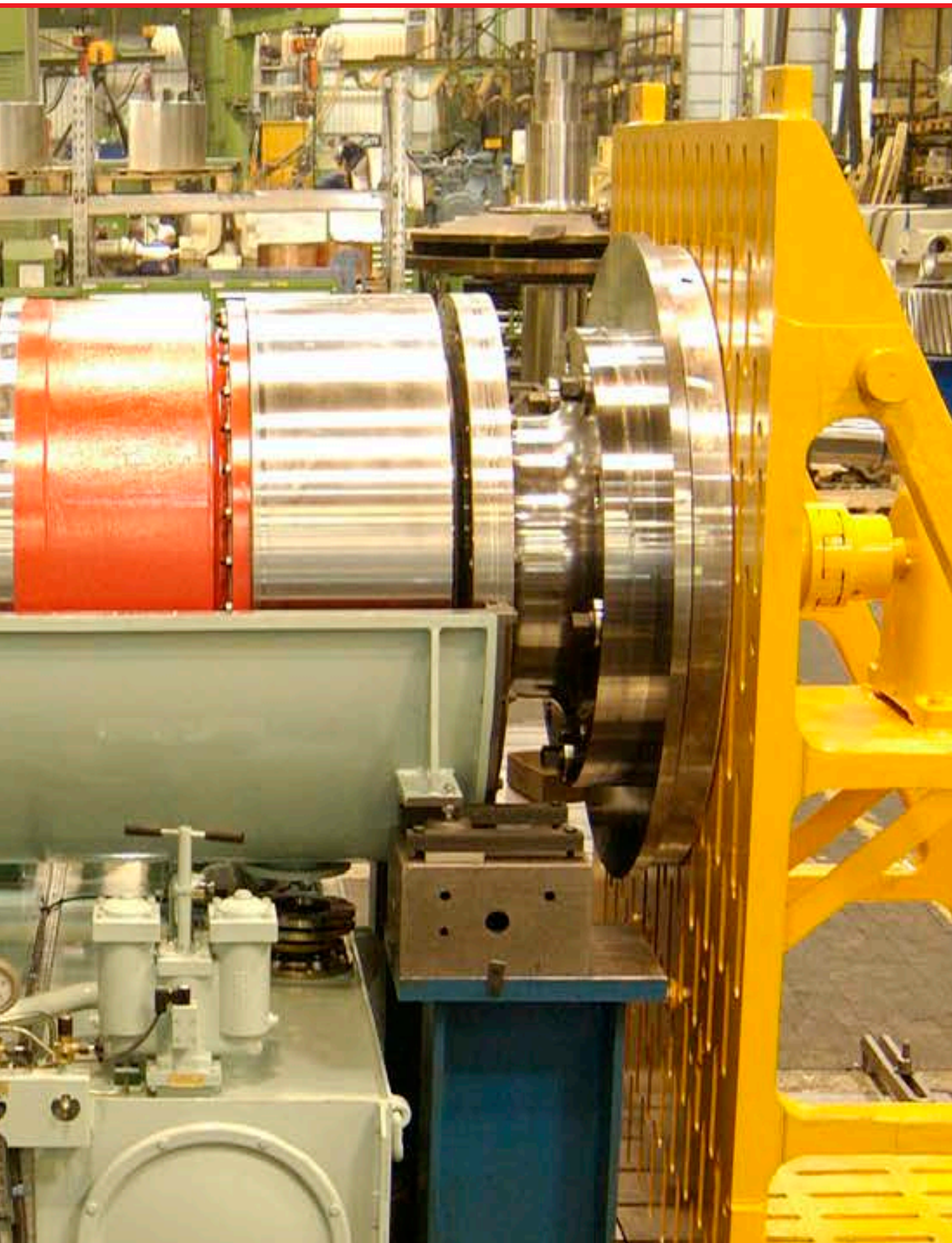
** PSC flange diameter adjustable

Power factor: $\frac{P}{n} = \frac{16,550 \text{ kW}}{87 \text{ rpm}} = 191$

Selected clutch size: PSC 225*









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