



Innovative Power Transmission



RENK-MAAG

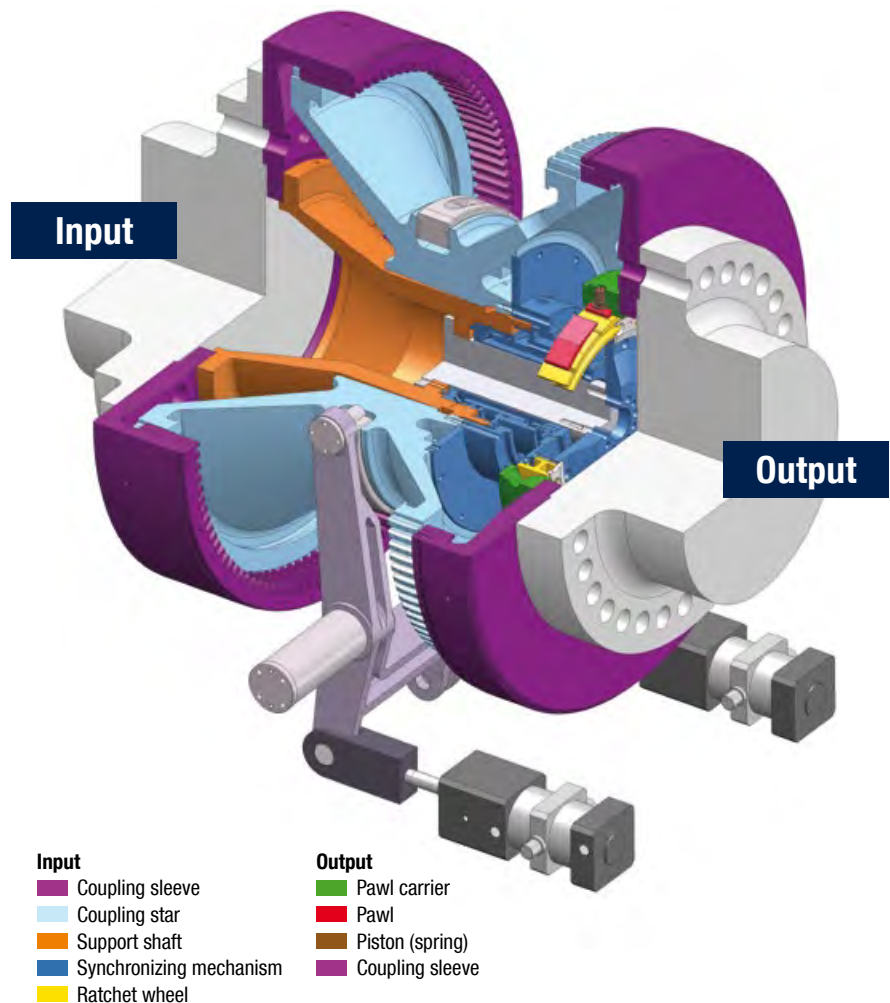
Synchronous Clutch Coupling type HS

...your compact engine translator!

HS Clutch – For full positive and negative torque transmission

The HS Clutch has a very similar synchronizing mechanism to the MS Clutch, but instead of the main helical toothing, it has a spur gear power transmission toothing (straight gear). The synchronizing mechanism is used to find a clean “tooth to gap” position. The HS starts the screw like motion and a small front face toothing engages. Right then the hydraulic system is automatically activated and finishes the engagement by a pure axial shifting. As soon as the clutch is fully engaged the high pressure hydraulics are de-loaded and the HS Clutch works now like a classic gear coupling, which can transmit full positive and negative torque, without disengaging. Disengagement is carried out by the remote controlled hydraulic system, which pulls out the coupling star in a no-load situation in axial direction until it is fully disengaged and the clutch is free-wheeling.

The RENK-MAAG HS Clutch understands everything in the range of 0.5 to well over 200 MW!



RENK-MAAG Synchronous Clutch Couplings are used in a wide range of applications

Power generation

- Peaking power stations
 - Condensing plant
 - Power discharge
- Combined cycle power plants (CCPP)
- Combined heat and power (CHP) plants
- Compressed air energy storage (CAES)

Energy recovery, combined cycle technologies, cogeneration and others

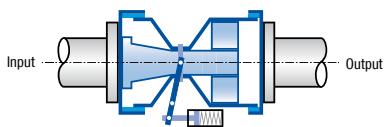
- Connecting expander turbines to main drives in petrochemical plants or steel manufacturing (blast furnaces)
- Blower drives in nuclear power stations for use during starting sequence

Marine applications

- Combined propulsion systems such as CODOG, COGOG, CODAG, COGAG, CODAD, etc.
- Efficiency booster drives for diesel engine propulsion systems

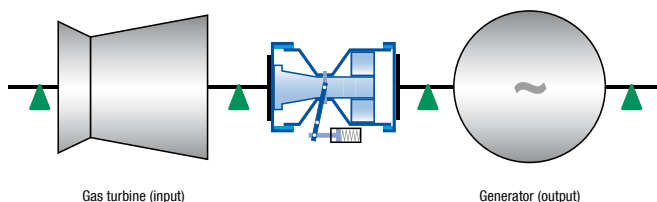
Design

Between flanges



- **Standard solution**
- Easy assembly due to bolted connection
- Lube oil supply approx 2 bar
- Hydraulic system approx 5–10 bar

Train arrangement



Possible operation modes

- Peak power
- Condenser operation (grid stabilisation)
- Power discharge from the grid

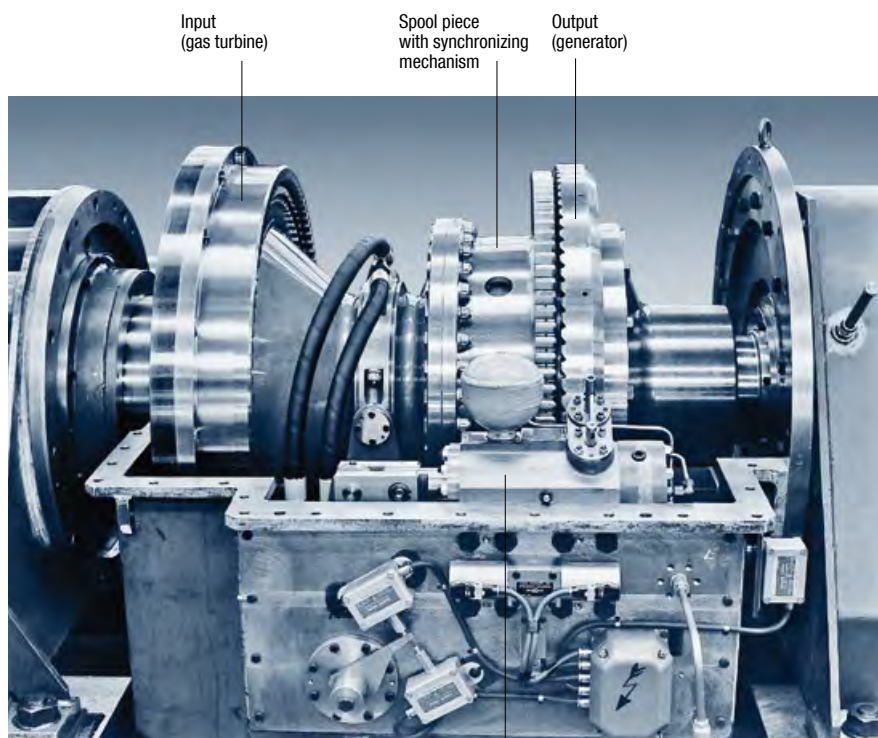
▲ = Bearing



RENK-MAAG clutch design allows for a very short and compact shaft train, so overall plant costs (including foundation, civil works, cranes etc.) are reduced compared to other solutions. Finally this even allows to retrofit the RENK-MAAG Synchronous Clutch into existing plants.

- In the optimal case no support bearings are required, or just a small support bearing if required by rotor dynamics (shaft overhangs).
- No additional flexible couplings are required.

This offers the grid and plant operators to improve the utilization of the existing infrastructure, and so to increase the flexibility and profitability.



Servo mechanism

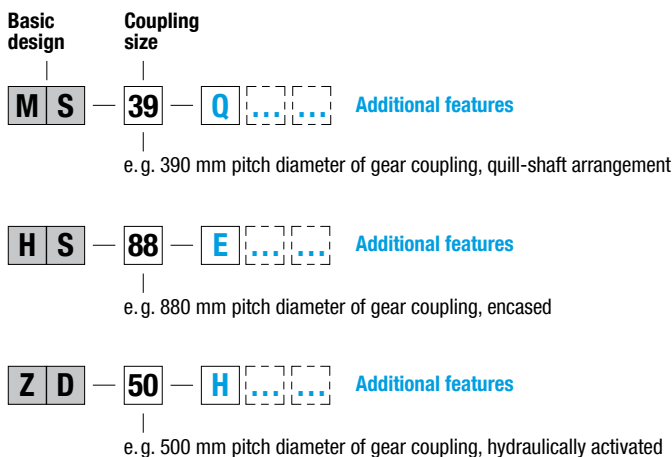
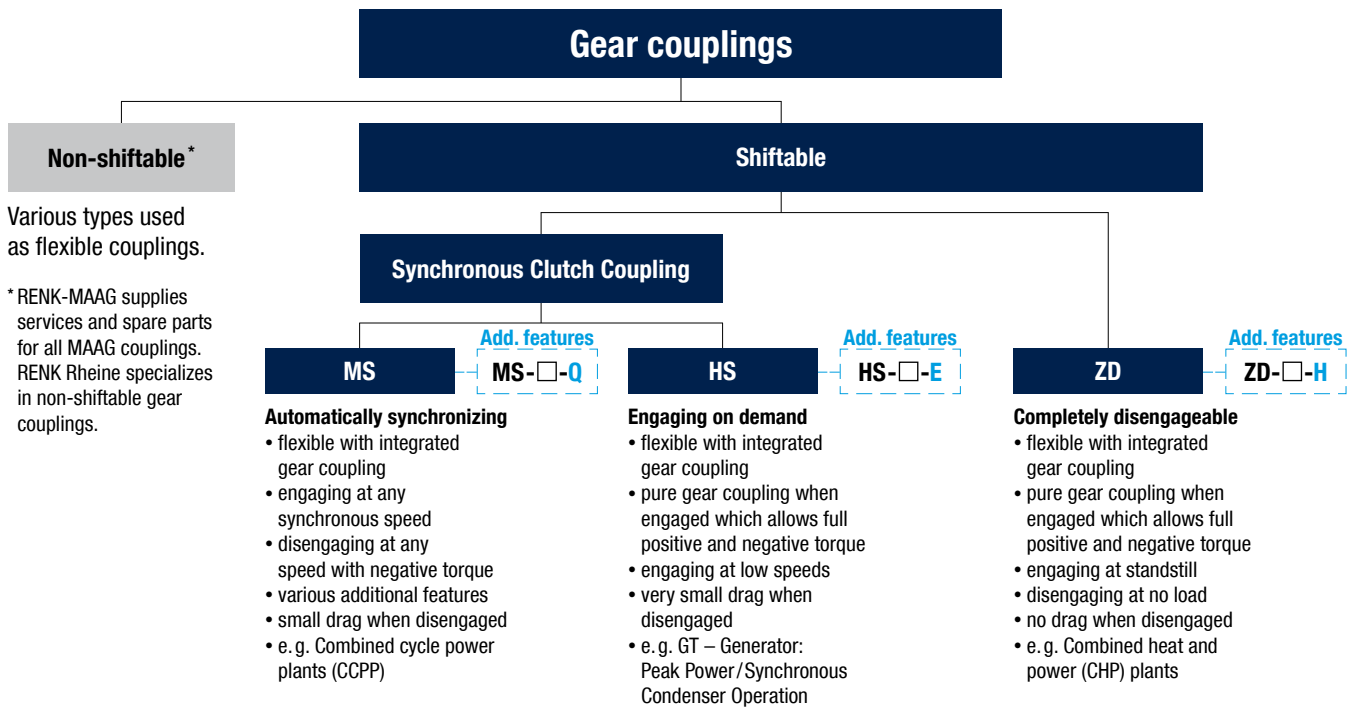
Summary

More than 50 years of experience within RENK-MAAG! Over 450 Synchronous Clutch Couplings sold!

- Flexible with integrated gear coupling
- Engaging at low speeds < 500 rpm
- Gear coupling when engaged which allows full positive and negative torque
- Compact, long-lived and wear-free
- Retrofittable into existing plants
- Suitable for high torque and high speed
- Wide range of application
- Tailored for customer requirements

Product portfolio

RENK-MAAG provides new products, services, inspections, repairs and spare parts (incl. complete couplings) for all types of MAAG/RENK-MAAG couplings.



Basic design

- M** Mechanical automatic disengagement/engagement
- H** Hydraulically operated
- S** Synchronous clutch coupling
- Z** Gear coupling (Zahnkupplung)
- D** Disengageable

Additional features

- A** for starter drives
 - E** encased
 - F** isolating device (pawl free)
 - H** hydraulically activated
 - L** lever activated (manually)
 - N** engagement at low speed
 - Q** quill-shaft arrangement
 - R** locking mechanism
 - T** for turning gears
- More features on request!



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Our manufacturing and other operational activities are implemented in accordance with our internal quality assurance system and in strict compliance with ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007.