



Innovative Power Transmission

RENK-MAAG

Synchronous Clutch Coupling type MS

...your compact engine translator!

MS Clutch – Automatic clutch engagement at any synchronous speed

Synchronous clutch couplings type MS engage automatically at synchronous speed between driving and driven machine and also disengage again automatically if the driver falls below the speed of the driven machine or torque becomes negative – this happens at any speed within the machine’s speed range. Due to the fact that all parts are hydrodynamically lubricated, the clutch is wear-free. The RENK-MAAG MS 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

Marine applications

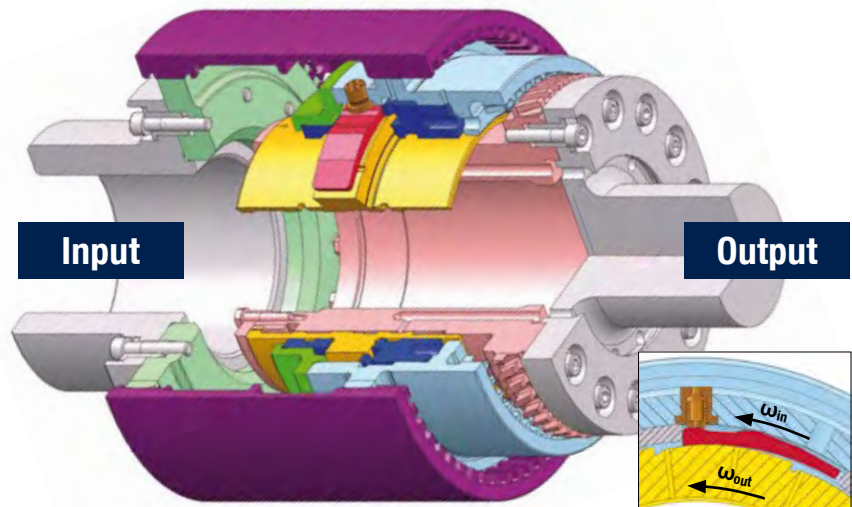
- Combined propulsion systems such as CODOG, COGOG, CODAG, COGAG, CODAD, etc.
- Efficiency booster drives for diesel engine propulsion systems










Power generation

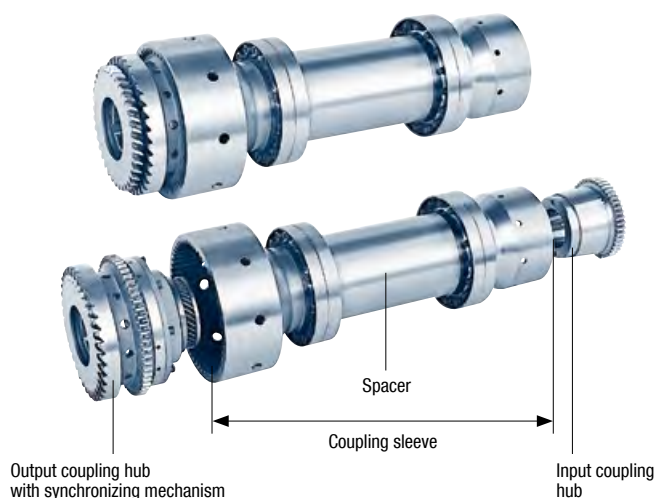
- Peaking power station
 - Condensing plant
 - Power discharge
- Combined cycle power plants (CCPP)
- Combined heat and power (CHP) plants
- Compressed air energy storage (CAES)

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
- Starting device for gas turbines
- Automatic turning gears



| Input | | Output | |
|---|-----------------|---|-----------------------|
|  | Coupling sleeve |  | Buffer (spring) |
|  | Coupling star |  | Piston (spring) |
|  | Pawl carrier |  | Gear ring |
|  | Pawl |  | Ratchet wheel |
| | |  | Ratchet wheel carrier |



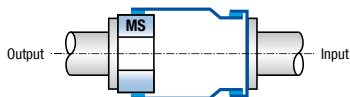
Synchronous clutch coupling type MS consists of two main elements

Gear coupling: axial, radial and angular displacement

Synchronizing mechanism: automatic engagement/disengagement

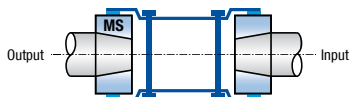
Design versions

Between flanges



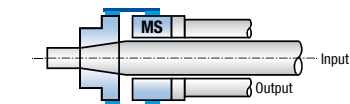
- **Standard solution**
- Easy assembly due to bolted connection
- Also available as semi-rigid version

Shrink-fitted hubs with spacer

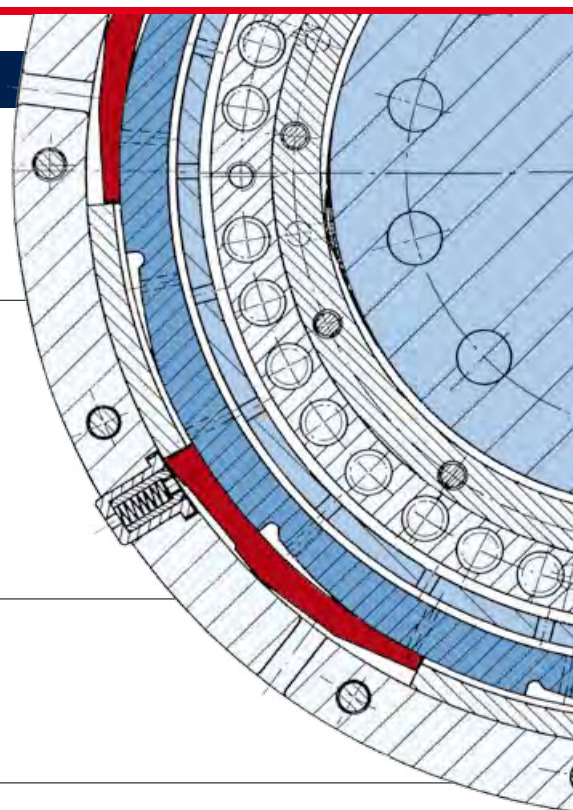


- Hydraulically fitted conical hubs
 - shaft end with hydraulic connection for more convenient assembly
- Cylindrical hubs with fitted key and safety nut
 - also convenient for assembly (slight heating)
- Cylindrical hub without fitted key
 - stronger thermal shrink fit (more heating)
 - more demanding assembly

Quill-shaft mounted

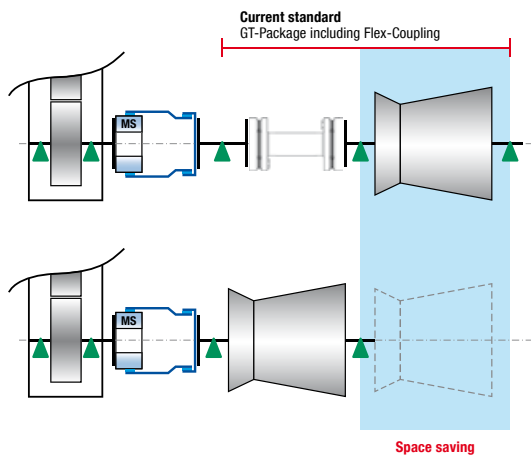


- Special space-saving solution
- Proven application in marine arrangements
- Used in all kinds of applications: industry, power generation and energy recovery.



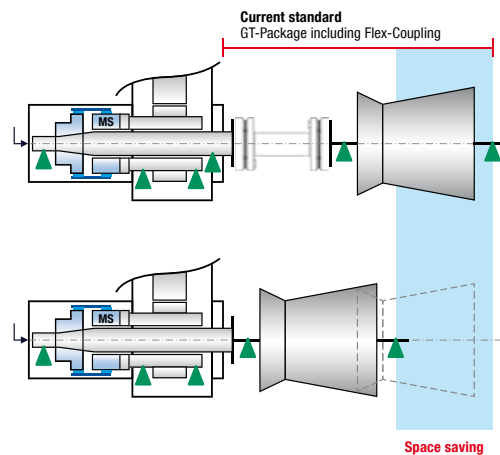
Train arrangements – compact solution, space saving, shortest train possible!

Standard solution with and without GT-Flex-Set



- Very compact shaft train
- No Flex-Coupling
- 1 bearing less means higher efficiency

Quill-shaft arrangement with and without GT-Flex-Set



- Very compact shaft train
- No Flex-Coupling
- 1 bearing less means higher efficiency
- MS fully integrated in gear box casing

▲ = Bearing

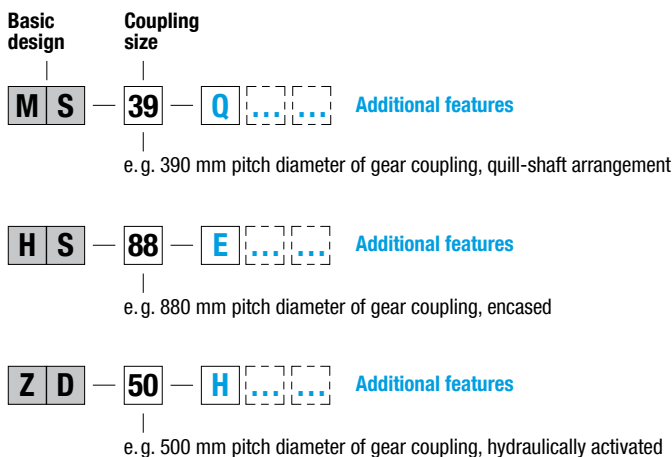
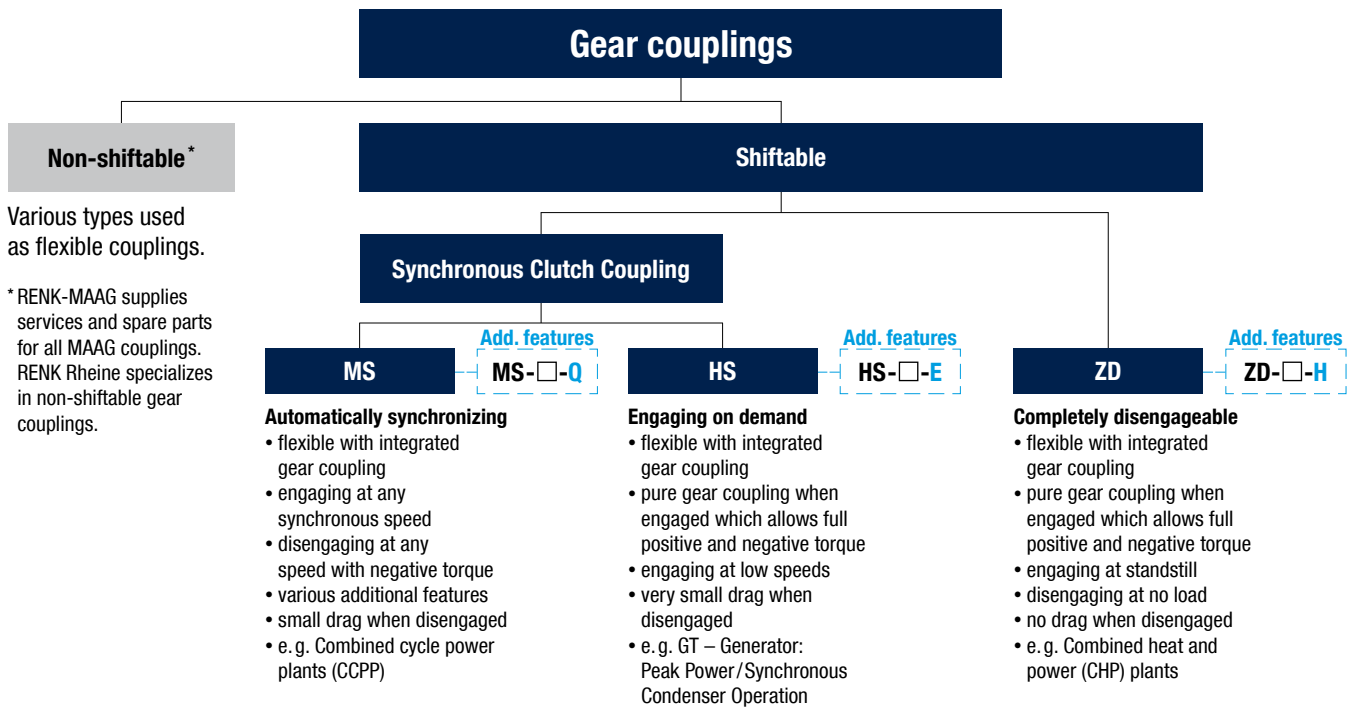
Summary

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

- Automatic engagement/disengagement
- Engaging at any synchronous speed
- Flexible with integrated gear coupling
- 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!

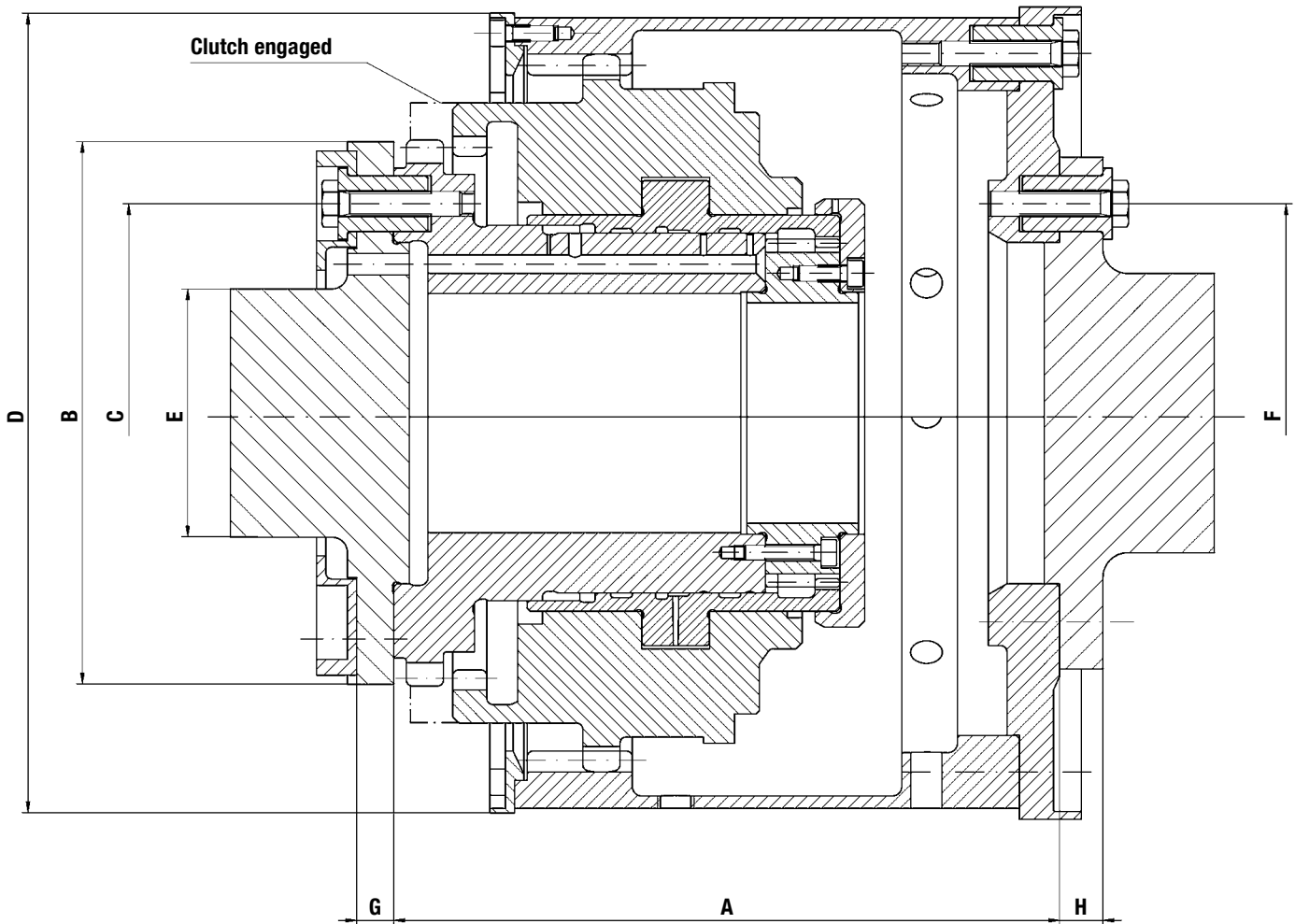


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Our manufacturing and other operational activities are implemented in accordance with our internal quality assurance system and in strict compliance with ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007.

MS standard (flange mounted)



| Size | P/n* [kW/rpm] | T* [kNm] | n max. [rpm] | A min [mm] | B [mm] | C [mm] | D [mm] | E max [mm] | F [mm] | G [mm] | H [mm] |
|------|------------------|-------------|-----------------|---------------|-----------|-----------|-----------|---------------|-----------|-----------|-----------|
| 15 | 0.3 | 2.8 | 12 500 | 180 | 156 | 120 | 200 | 60 | | 11 | |
| 20 | 0.68 | 6.5 | 10 000 | 215 | 175 | 135 | 260 | 80 | 135 | 12 | 14 |
| 25 | 1.6 | 15.2 | 7 000 | 260 | 230 | 186 | 320 | 110 | 186 | 17 | 17 |
| 30 | 3.2 | 30.6 | 6 000 | 310 | 280 | 240 | 380 | 140 | 240 | 18 | 18 |

* max continuous