

HIGH SPEEDS WITH A NEW TEST BENCH

With the new FHHS series, RINGSPANN is expanding its range of housing freewheels with a further solution for the implementation of overrun functions in stationary multi-engine drives and turbines. The special thing about it is these housing freewheels are designed for very high speeds of up to 12,000 rpm. Wherever multi-stage drive systems with high-speed shafts are to be designed in plant engineering, they can be used as automatically operating and wear-free couplings. The technological prerequisite for the realisation of this innovative high-speed series was the development and commissioning of a unique freewheel test bench at RINGSPANN's main plant in Bad Homburg.

They do not require switchgear, transmit nominal torques from 1,356 Nm to 24,405 Nm, operate wear-free and take over the demand-based engagement and disengagement of various motors of the same drive train in high-speed operation: With the housing freewheels of its new FHHS series, RINGSPANN offers all designers of drive systems for refinery, chemical process engineering or the natural gas and petroleum industry an innovative coupling solution for the realisation of flexibly switchable and energy-efficient multi-mo-

tor drives. These are fully enclosed overrun freewheels with input and output shafts that are intended for stationary installation and can be driven at up to 12,000 rpm. The speeds in freewheeling and driving operation may be at the same or similar level.

HIGH-SPEED EXPERTISE THANKS TO HYDRODYNAMICS

The key design factor for the high-speed competence of the new FHHS housing freewheels is the use of the hydrodynamic clamping roller lift-off. The lifting force is generated by an oil jet guided in the bearing of the freewheel, which allows both high speeds and wear-free freewheeling operation. Thomas Heubach, Head of the Freewheel Division at RINGSPANN, explains: "The relative speed between the inner and outer ring is decisive for the effect of the hydrodynamic lifting of the clamping rollers. If it decreases, the lifting force is also reduced. Even before synchronous running is reached, the clamping rollers, which are guided in a cage, attach themselves to the outer ring race of the freewheel via the central spring and are ready for locking. This ensures immediate load transfer when the synchronous



Thomas Heubach
Head of Division Freewheels
at RINGSPANN GmbH

speed is reached." Housing freewheels with hydrodynamic clamping roller lift-off are always an ideal solution when a unit is driven by two or more motors or turbines with the same or similarly high speed. The plant operator benefits from this in three ways: firstly, it can engage or disengage individual power-train units as required without complex control technology; secondly, it enables process operation without interruption even in the event of a failure of an energy source or a drive unit. And thirdly, it opens up significant energy savings – especially in partial load operation.

THE WORLD'S FIRST

In order to be able to provide reliable proof that the new FHHS housing freewheels are suitable as overrunning freewheels for high speeds, RINGSPANN developed a new test bench especially for this purpose. It was put into operation a few weeks ago at the company's main plant in Bad Homburg and is likely to be the most modern test bench for housing freewheels currently available on the world market. "For the first time, we can generate speeds of up to 12,000 rpm and validate and document the performance of our housing freewheels. Currently is unique in this segment," reports Thomas Heubach. For the plant manufacturers and the designers of the drive systems, this also means that they can incorporate the measurement and test results from RINGSPANN into their own quality assurance.

COMPLETION AND CONNECTION

With the new FHHS series, RINGSPANN is once again underlining its market and technology leadership in the field of freewheel technology. The company now offers a third alternative for high-speed applications via the standard FH Series housing freewheels and the FHD series with mechanically separable housing freewheels – which feature an OSHA-compliant lockout-tagout safety feature with customer oil supply. With the commissioning of the new test bench, the entire RINGSPANN housing freewheel range is also experiencing a significant innovation boost, as the performance of the models of all series can be proven and verified under practical conditions. The development engineers at RINGSPANN are likely to draw important impulses for their work from this.

THE HYDRODYNAMIC CLAMPING ROLLER LIFT

Housing freewheels are primarily used as automatically operating overrunning clutches in multi-motor drives. They are considered an alternative to complex switching devices. A technical highlight of the housing freewheels from RINGSPANN is the hydrodynamic clamping roller lift-off. In this case, the lifting force of the clamping rollers is generated by an oil film, which is applied to the raceway of the outer ring with centrifugal force during idle operation.

This enables virtually wear-free idle operation.

As part of its one-stop-shop offer, RINGSPANN also provides its customers with a wide range of different shaft connections that are tailored to the design connection of the input and output shafts of the housing freewheels. These include, for example, the company's latest claw, multi-plate and bolt couplings. The designer of a multi-motor drive therefore obtains the shaft connections from the same source as the housing freewheels and can be sure that all components fit together exactly.

By the way: the FHHS already comes with wired sensor monitoring of storage temperatures as standard. As an option, the new housing freewheels can also be equipped with the sensor and telematics modules of the condition monitoring system from RINGSPANN. This solution includes data analysis, remote maintenance and integration into higher-level control systems. In this way, the operators and maintainers of complex drive systems can monitor all relevant performance and MRO parameters of the installed freewheels in real time.

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