

VOITH WIDENS VORECON'S REACH

NEW VORECONNX VARIABLE SPEED PLANETARY GEAR BEEFS UP LOW-POWER RANGE, OFFERS 8% EFFICIENCY IMPROVEMENTS AT PART LOAD

BY BRENT HAIGHT

Voith Turbo has introduced the newest version of its Vorecon variable speed planetary gear, the VoreconNX. The VoreconNX targets the low end of the product line's power range up to 10 MW, strengthening the Vorecon's portfolio of hydrodynamic variable speed planetary gears for output of up to 50 MW and speeds exceeding 20,000 rpm.

The basic components of the Vorecon are a hydrodynamic torque converter, acting as the control unit, coupled with a planetary gear. The planetary gear is designed as a superimposing gear.

"An advantage of using the planetary gear with the torque converter is that we are able to split the power in the unit," said Carsten Lenz, Vice President Technical Sales at Voith Turbo. "That means about 75% of the power goes from the motor

through the input shaft to the planetary gear and to the parallel shaft gear and the output. The advantage here is that 75% of the transmitted power is only subject to some mechanical losses in the gears and bearings. Only about 25% of the transmitted power goes through the torque converter and is subject to hydrodynamic losses."

According to Voith, the VoreconNX is an advanced development of hydrodynamic power transmission in combination with a planetary gear. Because of the adjustable pump blades in the torque converter, VoreconNX offers an efficiency improvement of up to 8% at part load.

In the new series, an optimized torque provides speed control. In accordance with the proven Vorecon superimposition principle, this uses only a small part of the input power. De-

Targeting a power range up to 10 MW, the Voith VoreconNX is the latest addition to the Vorecon portfolio of hydrodynamic variable speed planetary gears for output of up to 50 MW.

pending on the speed required, this power is fed back to the driveline by way of the planetary gear on the driven side. Adjustable pump blades in the torque converter provide the control – stepless and wear-free, according to Voith.

The VoreconNX is located in the driveline, between the drive motor and the driven machine. The input shaft is connected to the planet carrier of the planetary gear. This means that a large portion of the input power is therefore transmitted to the planetary gear directly, mechanically, and nearly loss-free, the company said.

Additionally, the pump wheel of a hydrodynamic torque

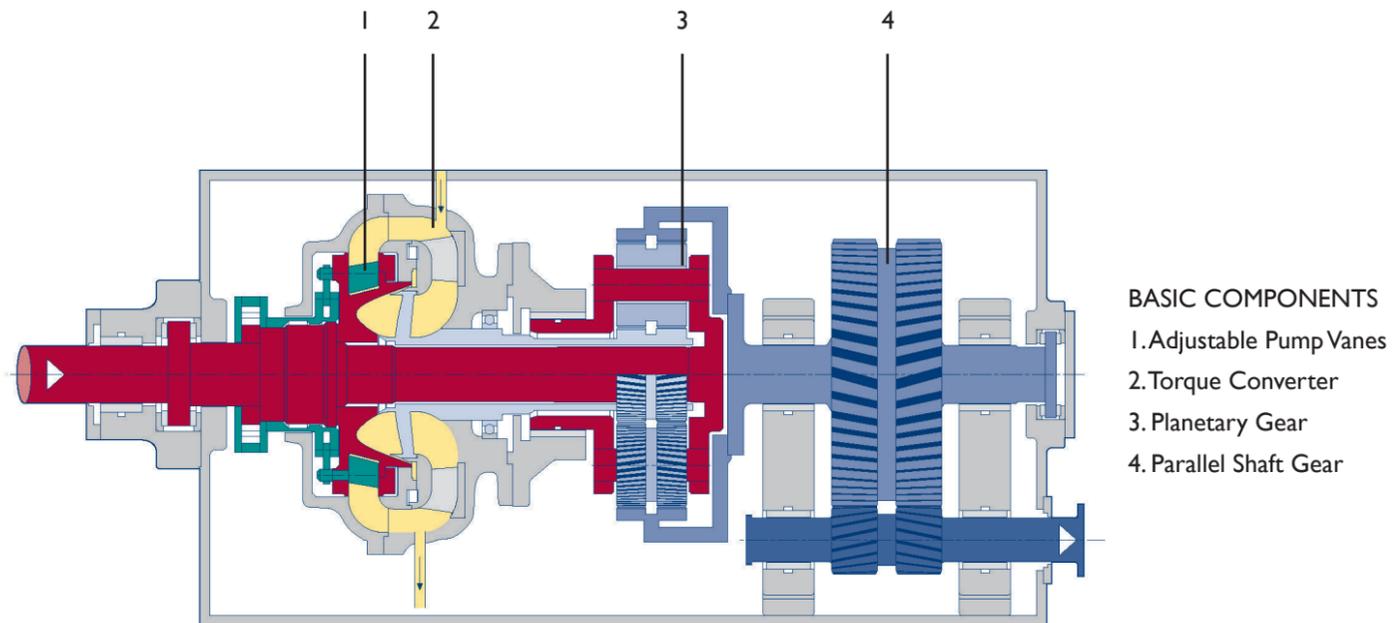
converter is coupled to the input shaft and diverts just a small portion of the input power. A liquid flow transmits this power from the pump wheel to the turbine wheel of the torque converter. The diverted power is transmitted to the sun gear of the planetary gear. The power from the planet carrier and the sun gear is combined in the planetary gear, where the ring gear transmits the accumulated power to the output gear stage.

The required specified output speed is achieved by the gear ratio of the parallel shaft gear. Adjustable pump blades at the pump wheel control the liquid flow in the torque converter and determine the speed of the turbine wheel. This allows the speed of the driven machine to be infinitely adjusted.

A helical gear on the output side of the VoreconNX adapts the output speed to the compressor. This allows modular design with a standardized speed control system. As a result, Voith can provide components of the new Vorecon within six months, the company said.

Like the entire Vorecon product family, the VoreconNX has an integrated control and lubrication oil system. This system fills the torque converter and supplies its own gearbox, the drive motor, and the driven machine with lubrication oil in parallel.

"The VoreconNX will be offered in three housing sizes," said Lenz. "The housing for the middle range, 4600 to 7200 kW (4.6 to 7.2 MW), is the first we are bringing to the market. The others will be introduced according to the market demand. The other two housings will cover 2800 to 4600 kW (2.8 to 4.6 MW) and 7200 to 9400 kW (7.2 to 9.4 MW), always referring to 60 Hz." 



- BASIC COMPONENTS
1. Adjustable Pump Vanes
 2. Torque Converter
 3. Planetary Gear
 4. Parallel Shaft Gear