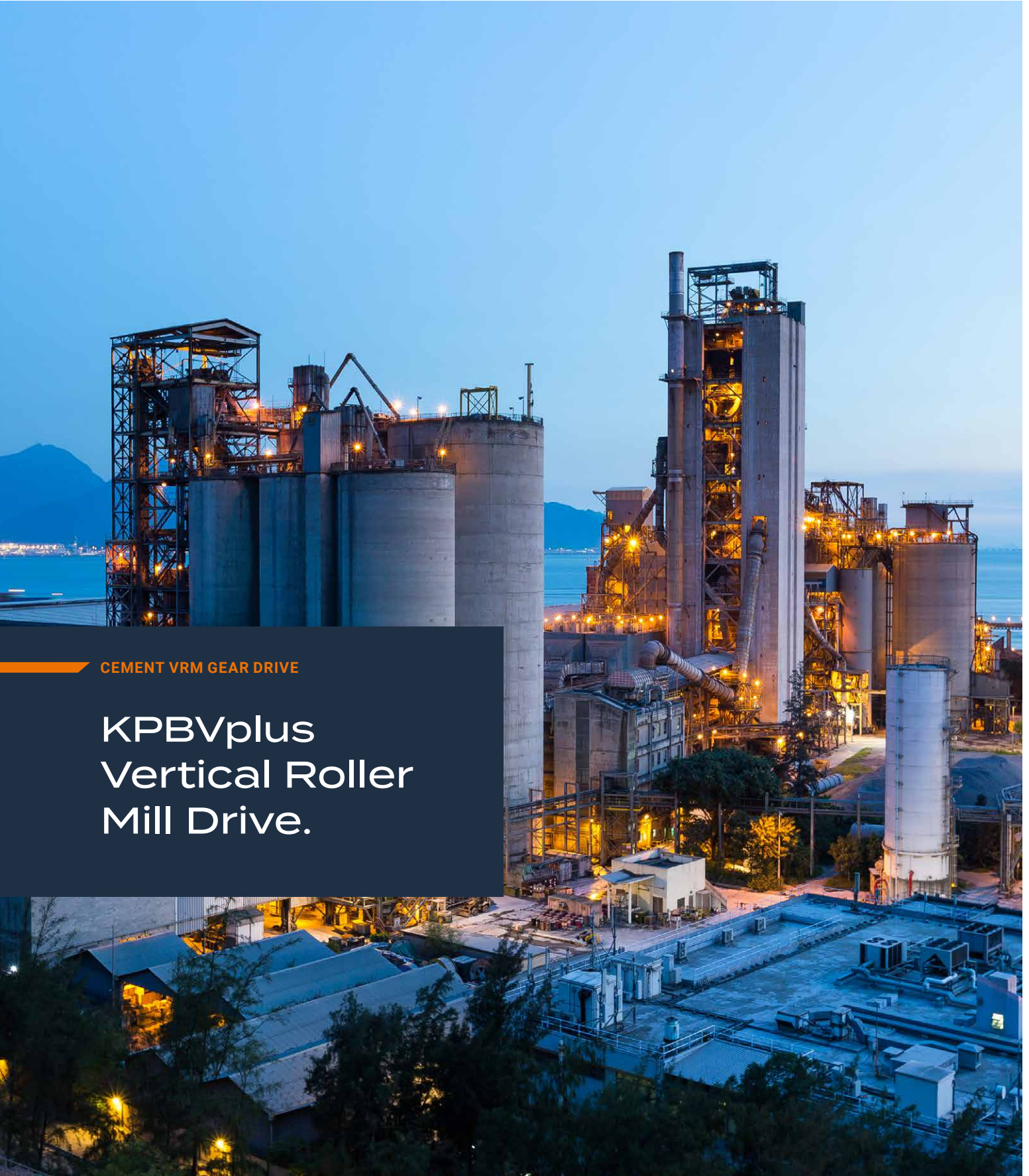


RENK

CEMENT VRM GEAR DRIVE

KPBVplus  
Vertical Roller  
Mill Drive.



/ Higher transmittable torque with less footprint

/ Simplified lube oil unit  
no jacking oil system required

/ Best-in-class reliability



## Since 1999, RENK is successfully offering the KPBV series for VRM Drives in the market.

It was developed from the KPAV series in order to meet the market demand for higher power densities. Compared to the KPAV, the KPBV still has one bevel stage but there are now two smaller planetary gear stages offering the same performance with a smaller footprint. This is particularly advantageous for high power applications. With hundreds of references in the field, the gearbox design has reached a high degree of maturity and reliability.

With the launch of the next generation KPBVplus, RENK is addressing market requirements for energy saving, better performance and reduced CAPEX while keeping the same high quality standards and reliability. The design incorporates more than 70 years of experience with vertical mill drives combined with a proven and efficient approach to integrating the lube oil system adopted from RENK's marine gear business.

By optimizing the original design, RENK has been able to considerably increase the power density and thus reducing the foot print without compromising proven design standards and safety.



Cement mills incorporating vertical mill drives

# Large vertical mill drives

## Higher transmittable torque

Thanks to state-of-the-art calculation software and the vast in-house experience the KPBVplus design can transmit up to 30% more torque with the same housing size compared to the previous design. At the same time, the amount of lubrication can also be reduced accordingly avoiding the need of an external oil reservoir (gearbox housing is oil tank).

## Energy saving

The material of the axial sleeve bearing pads for the KPBVplus design has been modified so it can permanently withstand up to 5 times more surface pressure. A jacking oil system for hydrostatic lifting with four high-pressure pumps is not needed anymore deducting around 20 kW of installed motor power resulting in a significant energy saving.

## Aftersales

Over ninety sales agencies and 10 service hubs in fifty countries ensure world-class coverage in the service sector and provide the basis for fast response times and high availability.

## Extreme durability

The KPBVplus gearbox offer the highest levels of reliability by integrating proven components into a technically mature design. High housing stiffness, outstanding materials, quality, optimum protection against dirt, dust, high temperatures and radial loads, ensures high availability and forms a basis for long lifetime in harsh environments.

## On-board lube oil system

The KPBVplus features an integrated lubrication system on the gear housing considerably reducing the overall footprint of the drive system. Mounted on the opposite side of the input shaft, it does no longer require space for a separate lube oil console and connecting piping. Only the oil cooler is separately placed close to the gearbox on a pedestal.

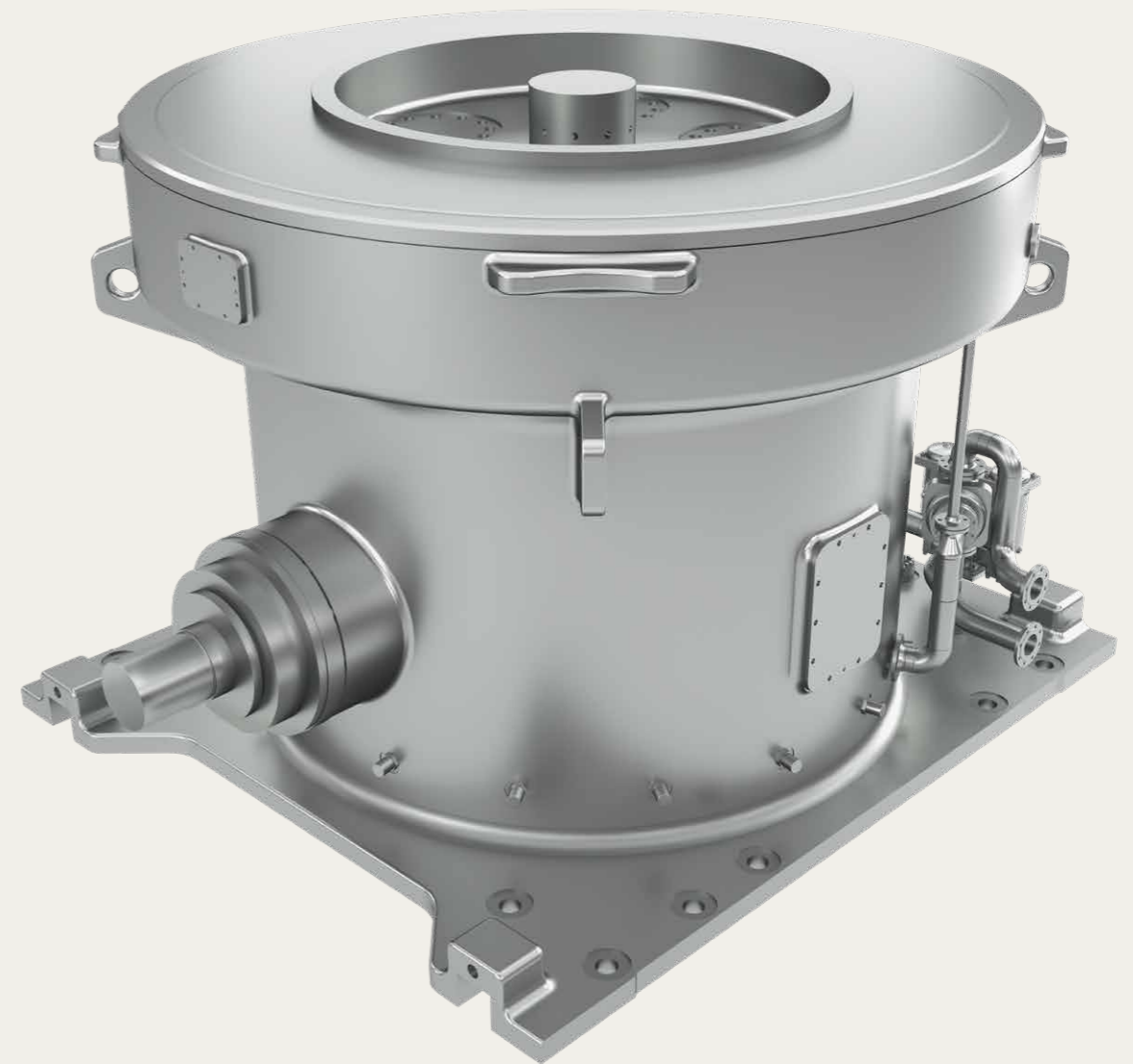
## High degree of functionality

The design of the housing allows straightforward load transfers while also serving as an oil reservoir. Large inspection covers ensure easy accessibility during maintenance work.

### Available sizes

Type	Output Torque [kNm] @AGMA>2,5	Standard housing type IV	Standard housing type III	Standard housing type II	Standard housing type I	Customized housing
KPBV250plus	6.460					x
KPBV230plus	4.640	x				x
KPBV220plus	4.224	x				x
KPBV210plus	3.760	x				x
KPBV200plus	3.274	x	x			x
KPBV190plus	2.881	x	x			x
KPBV180plus	2.450	x	x			x
KPBV170plus	2.087		x			x
KPBV160plus	1.758		x	x		x
KPBV150plus	1.463		x	x	x	x
KPBV140plus	1.211			x	x	x
KPBV130plus	1.012			x	x	x
KPBV120plus	774				x	x
KPBV110plus	600				x	x

The KPBVplus gear unit range is standardised to allow a high degree of pre-engineering and fast customisation with a very short lead time. All gearbox sizes can also be manufactured according to customer-specific dimensions.



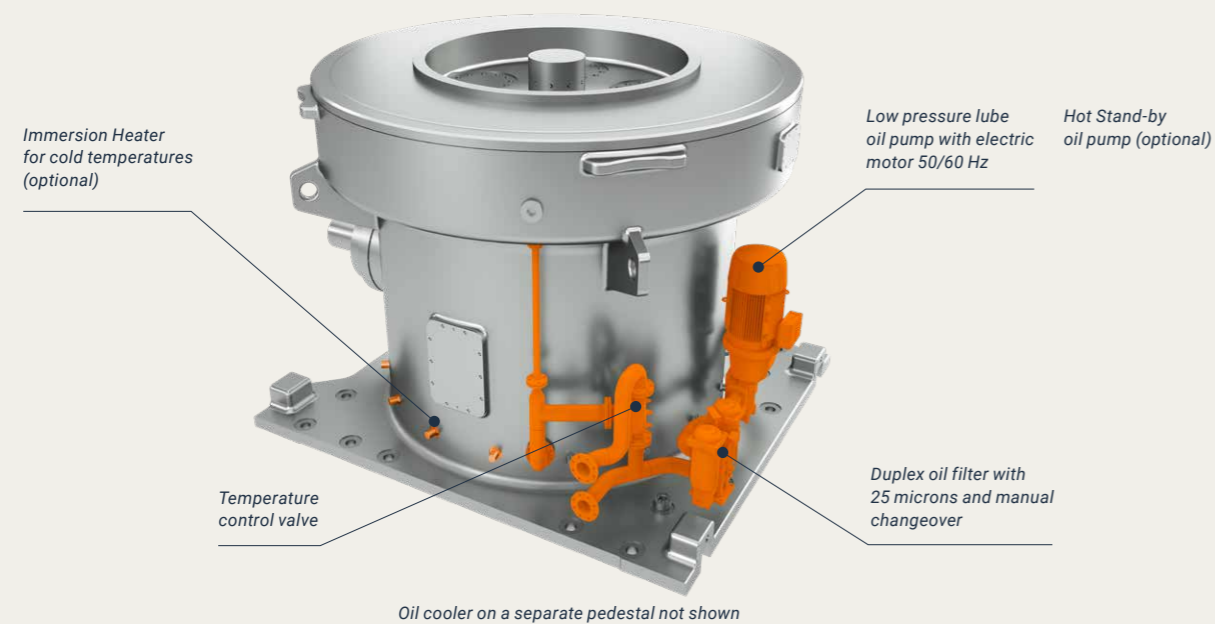
### Dimensions of standardized housings

Housing type	Diameter	Height
IV	4.180 mm	3.130 mm
III	3.800 mm	2.850 mm
II	3.300 mm	2.460 mm
I	3.100 mm	2.460 mm

## On-board lube oil system

The KPBVplus gear unit incorporates an integral lube oil system directly mounted on the gear housing which also serves as the oil tank.

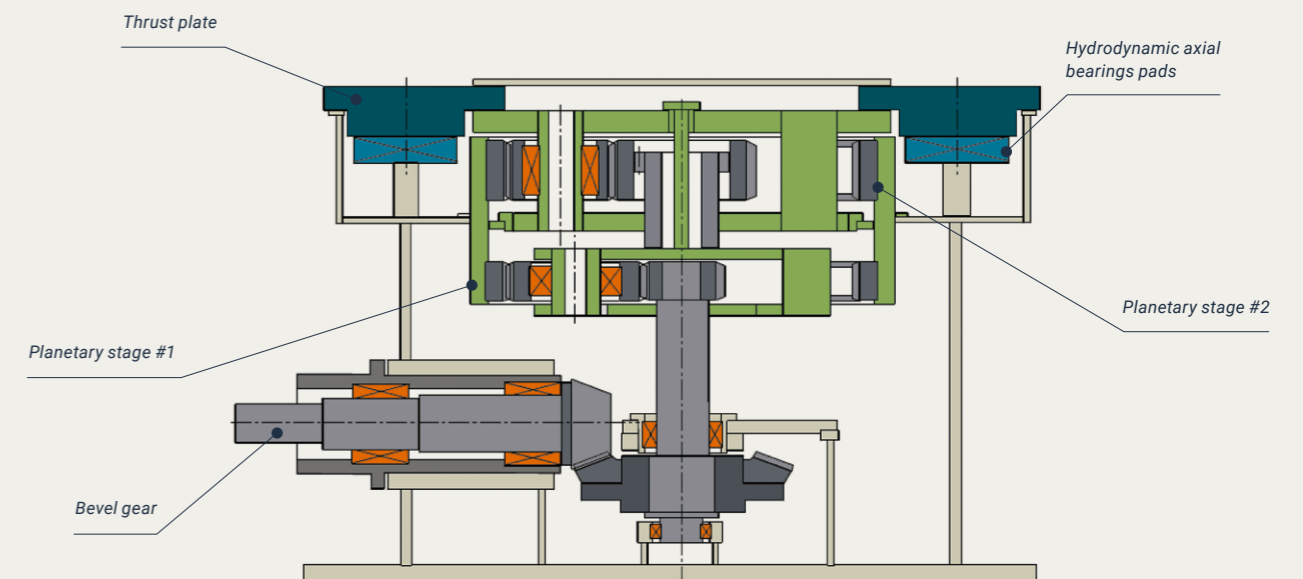
Located on the opposite side of the input shaft, it ensures a minimum footprint and good accessibility when installed under the mill. It supplies the gear unit with the necessary amount of lube oil for the gearing (tooth spray), the pressure lubricated roller and the flooded thrust bearings.



## Technical details

### Housing

The housing enables a straight-line transmission of the vertical load from the grinding table to the foundation, and at the same time serves as the oil tank. Hydrodynamic round thrust bearing pads support the grinding table and carry the vertical load from the grinding process.



### Benefits

- Lower commissioning cost and time as no external piping/pits/rooms
- No planning for pipework necessary
- Easier regular inspection
- Quick warm-up
- Duplex oil filter system with 25 microns filter fineness and quick changeover possibility
- Large inspection windows
- Due to elimination of the high pressure pump for the jacking oil system, about 20 kW of motor power can be permanently erased saving both on energy and maintenance cost over the gearbox lifetime
- Simple positioning of the oil cooler beside the gearbox.
- ATEX Zone available (option)

### Input stage

The electric motor is connected to the horizontal input shaft via a flexible coupling. The bevel pinion shaft and the bevel gear shaft are mounted on sleeve bearings. A pair of sleeve bearings supports the bevel wheel.

### Output

The output torque is transmitted from the spindles to the thrust ring and grinding bowl of the ring.

### Planetary gear stages

Planetary gear stage #1 is the element being customized to the gear ratio defined by the vertical roller mill and the motor speed. The bevel wheel is connected to planetary stage #2 via a double articulated tooth coupling. The sun pinion is freely centring in the planet wheels, thereby ensuring a symmetrical load distribution to the planets

### Bearings

The standard scope is either a hybrid design with roller and sleeve bearings or an all sleeve bearing design for unlimited bearing lifetime.



## Trusted Partner.

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