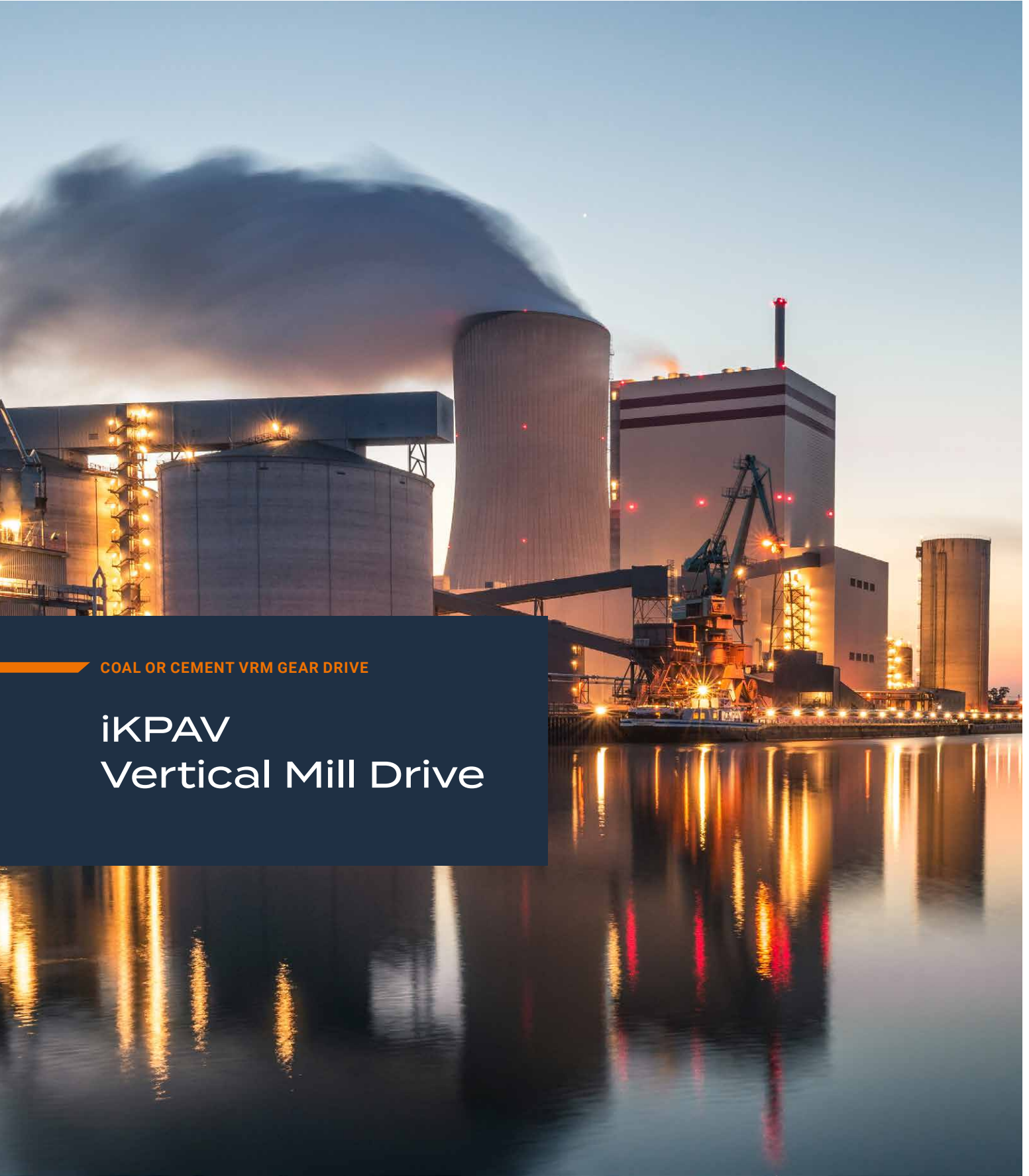


RENK

COAL OR CEMENT VRM GEAR DRIVE

iKPAV Vertical Mill Drive



/ Compact
and durable
design

/ Minimum
part count

/ Best-in-class
reliability

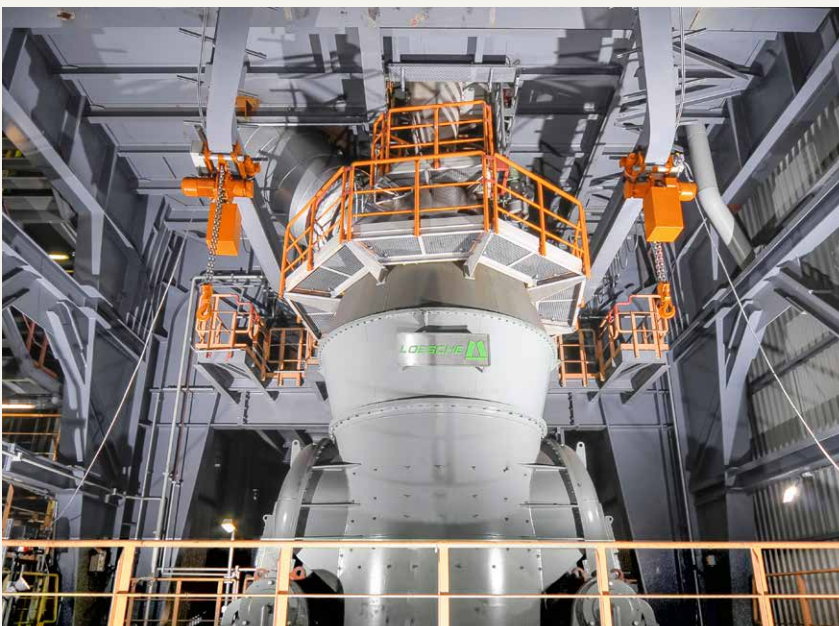


RENK iKPAV bevel planetary gear units have been successful in the market since 1979.

With hundreds of references in the field, the gear unit design has reached a high degree of maturity and reliability.

With the launch of the next generation of the iKPAV, RENK is addressing the market requirements for a cost-efficient, reliable and space-saving solution that is optimised for vertical roller mills. The design incorporates more than 60 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 simplifying the original design, RENK has been able to considerably reduce the internal part count, leading to a more maintenance-friendly and thus cost-optimised solution – without compromising safety.



Cement mills incorporating vertical mill drives



Coal mills incorporating vertical mill drives

Compact midsize vertical mill drives

Minimal number of components

Thanks to ongoing development, RENK has been able to reduce the number of components in a practical manner. With each new generation, this has resulted in cost-effective solutions that are easier to use and maintain, and with no compromises in terms of reliability.

Extreme durability

RENK's iKPAV gear mills 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.

Optional: Integrated lube oil system

The iKPAV gear features an integrated lubrication system on the gear housing. Mounted on the opposite side of the input shaft, it does not longer require any space for a lube oil console and no external piping.

Excellent price/performance ratio

Competition in the market for vertical gearboxes has steadily increased in recent years. However, thanks to a high degree of standardisation we are able to combine optimum quality with an outstanding price/performance ratio. The interfaces to the grinding table (bores, fixtures) are adapted to individual mills.

After-sales

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.

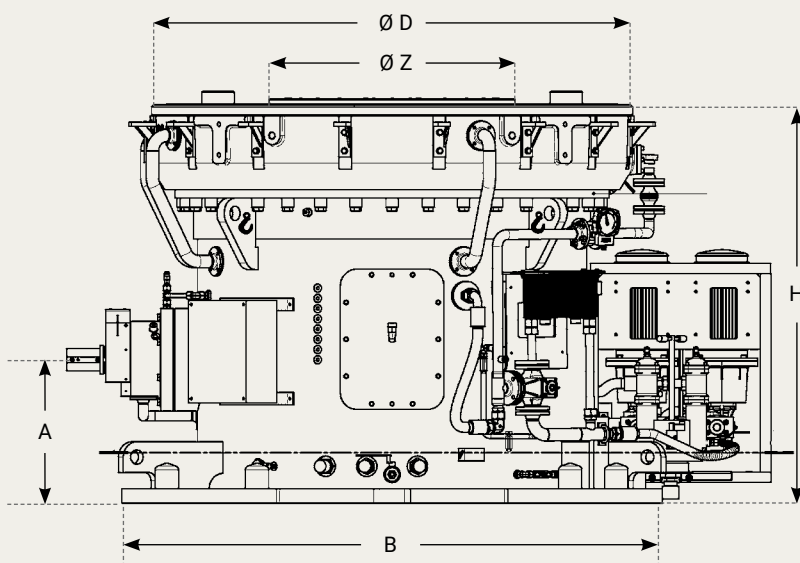
High degree of functionality

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

Available sizes (Other sizes available on request)

| iKPAV | Power | Ø D | Ø Z min | H | A | B |
|-------|-------|-------|---------|-------|------|-------|
| Size | [kW] | [mm] | [mm] | [mm] | [mm] | [mm] |
| 180 | 1.900 | 2.700 | 1.300 | 2.000 | 800 | 2.500 |
| 160 | 1.500 | 2.405 | 1.200 | 1.900 | 675 | 2.280 |
| 140 | 1.000 | 2.185 | 1.100 | 1.800 | 650 | 2.060 |
| 130 | 800 | 2.065 | 1.020 | 1.750 | 650 | 1.940 |
| 120 | 700 | 1.965 | 940 | 1.650 | 600 | 1.840 |
| 110 | 550 | 1.810 | 860 | 1.600 | 600 | 1.720 |
| 100 | 400 | 1.710 | 760 | 1.550 | 580 | 1.600 |

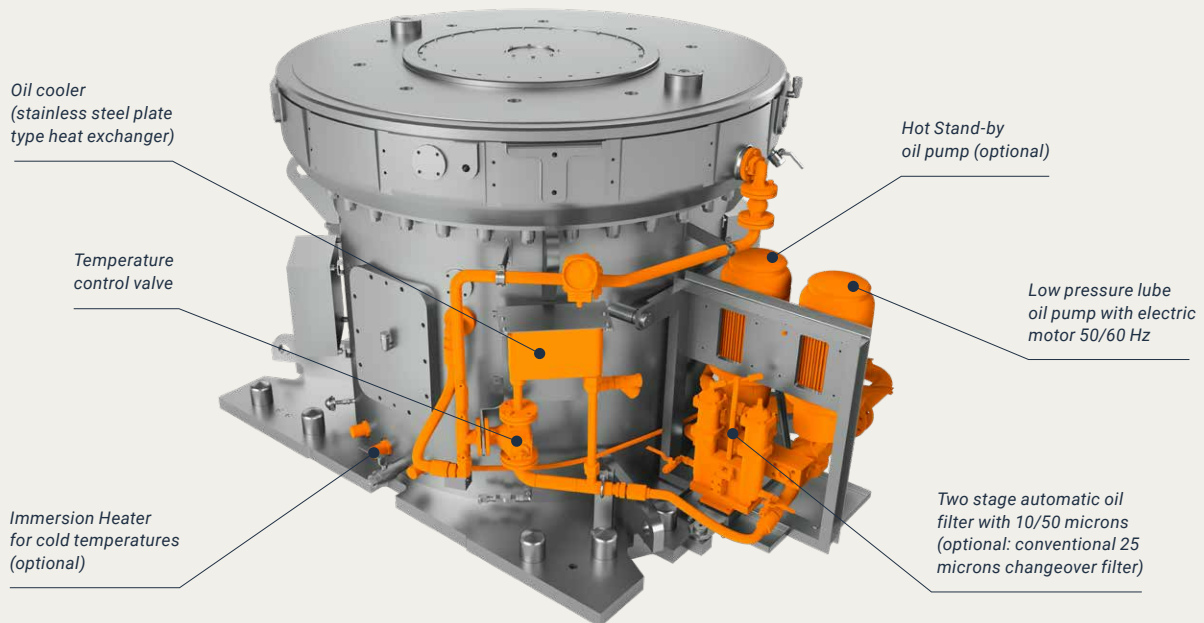
The iKPAV gear unit range is standardised to allow a high degree of pre-engineering and fast customisation with a very short lead time.



Optional: Integral lube oil system

The iKPAV 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 minimal 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.



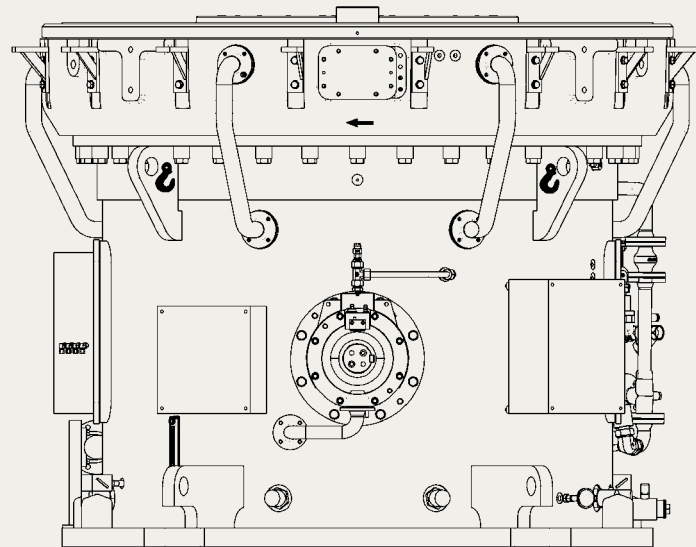
Benefits

- Lower construction cost since there is no external piping/pits/rooms
- No uncontrolled piping process on site and no planning for piping
- Regular inspection is easy as there is just one area to inspect
- Quick warm-up
- Automatic changeover filter with a fine filtration stage (MTBO of >24 months)
- Fine filtration (10 µm) of the oil prolongs the service life, especially of the roller bearings
- As the filter MTBO has been greatly extended, it is not necessary to change the filter basket during operation.
- Large inspection windows
- ATEX Zone available (option)

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 thrust bearing pads support the grinding table and carry the vertical load from the grinding process.



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 tapered roller bearings.

A pair of tapered roller bearings supports the bevel wheel. It is connecte to the second stage via a double articulated tooth coupling. The bevel stage is the element in the drive train that is customised to the gear ratio defined by the vertical roller mill and motor speed.

Output

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

Axial and radial thrust support of the mill

The vertical load from the grinding process is supported by a set of hydrodynamic round thrust bearing pads. This arrangement ensures a straight-line transmission of the grinding forces to the foundation.

Radial loads from the mill are covered by a large size sleeve bearing into the casing directly below the grinding bowl. This separates the mill forces from the gear forces.

Planetary gear stages

The sun pinion is freely centring in the three planet wheels, thereby ensuring a symmetrical load distribution to the planets, which are supported by spherical roller bearings on the planet spindles.



Trusted Partner.

RENK Gear Private Ltd.

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