

# Everything from a single source – MWM Elektro relies on Schaeffler for hoisting machines



View of the heart of the copper mine shaft L-VI in Lubin – the hoisting machine from MWM Elektro

Source: MWM Elektro

MWM Elektro is one of Europe's market leaders in the development, manufacture and modernisation of shaft hoisting machines, shaft signalling and power supply systems as well as control and monitoring systems for mine ventilation and pumping stations.

The hoisting machine described here is used in the L-VI shaft hoisting system near the Polish town of Lubin and is operated by KGHM Polska Miedź S.A., one of the largest copper and silver producers in the world.

The system is designed to transport passengers as well as materials and machinery.

The largest and most complex project in the history of the ZG Lubin copper mine was the L-VI shaft modernisation project, which involved a full rebuild of the existing ventilation shaft for a multipurpose hoisting usage.

Smooth, reliable operation and, as a result, the safety of personnel and machinery are of the utmost importance. For this reason, the customer chose high-quality bearings and sensor technology from Schaeffler for the modernisation project. The task of mounting was also entrusted to Schaeffler experts.

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## Technical data

- travel speed: 12 m/s
- number of persons (man-riding hoist): 150
- payload: 25 t
- traction sheave  $\varnothing$ : 3 600 mm
- number of ropes: 4
- drive power: 2 400 kW
- depth: 910 m

## Bearing arrangement

The hoisting machine is designed as a gearless sheave drive hoisting machine, better known as a Koepe machine, with four ropes. The payload together with the dead load comprising the shaft, traction sheave with ropes, conveyor cage and the rotor of the DC motor is supported by two high-performance spherical roller bearings.

- Designed as a locating/non-locating bearing arrangement with one 231/710-B-K-MB (locating bearing ①) and one 232/500-K-MB (non-locating bearing ②)
- Axial load reversal due to alternating operation is reliably supported by the locating bearing of dimension series 31
- For optimal mounting of the bearings, adapter sleeves of design HGJ, that is with oil grooves on the tapered surface and in the sleeve bore, are used ③

The rolling bearings are designed for 25 years (> 200 000 h) of theoretical continuous operation.

## Lubrication

Due to the recurrent braking and acceleration of the system for loading and unloading, the bearings regularly run in the mixed friction range. The suitability of the lubricating grease used in this process is therefore of central importance. For this reason, the customer opted for the lubricating grease Arcanol LOAD400 from Schaeffler with the requisite additive package.

## Condition monitoring

- Very high requirements for condition monitoring based on vibration measurement due to short time portions involving constant speeds
- Use of FAG SmartCheck for reliable temperature and vibration detection (position for SmartCheck ④)
- During the trial phase, Schaeffler experts commissioned the system on site and set the alarm level
- Integration of the signals in the machine controller with visual output in the control cabin when the warning or alarm threshold is reached

## Scope of service

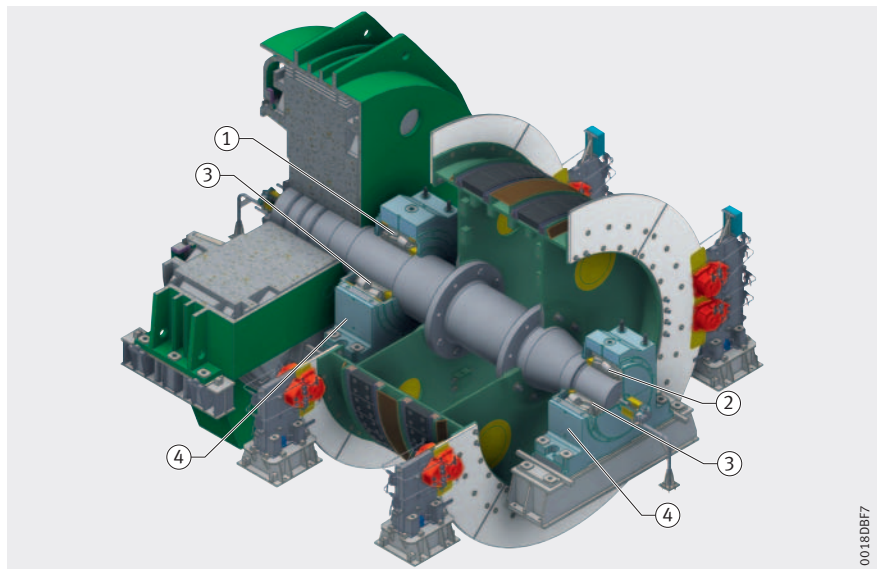
Schaeffler was already involved as a partner in the design phase and assisted with the rolling bearing calculation in the in-house BEARINX calculation program, including shaft and traction sheave modelling.

The mounting of the bearings at MWM Elektro by Schaeffler's industrial service experts also formed part of the delivery scope.

Even now that the installation and set up of the SmartCheck is complete, local Schaeffler experts are still on hand to answer questions from the customer.

## Customer benefits

- One point of contact and everything from a single source, from design to condition monitoring
- CM system optimized in line with operating conditions for maximum operational safety
- Direct integration into the machine controller for maximum ease of operation



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