The RENK slide bearing type ZM is a center flange mounted bearing, designed to achieve exceptional operational performance as a fully self-contained bearing, especially for machines operating at 2 pole speeds. This leaflet contains the data required for machine designs incorporating ZM bearings.
The RENK slide bearing type ZM is a center flange mounted high performance self lubricating bearing of exceptional design. The housing incorporates integral seal carriers at the outboard and inboard ends and also an integral machine seal. The ZM design is available in a number of variant options.

Specifically, this bearing has been designed to achieve an exceptional operational performance as a fully self-contained bearing, especially for machines operating at 2 pole speeds.

**Bearing Housing**

The finned housing, made of high quality cast iron (GG-25) has optimum heat dissipation properties through a combination of external and internal cooling fins. The special shape of the housing provides ample space for a high capacity oil sump and can also accommodate a highly efficiency oil cooler. The shell is supported by spherical segments available in the top and bottom halves of the housing. The spherical seating allows for a well directed oil flow. The seal carriers, machine seal and air vent port are integral parts of the housing casting.

The housing cap has two flat faces, angled at 45° from the vertical centerline, to accommodate vibration detectors. In addition, the outboard end face of the housing has a centering groove and is drilled and tapped to accommodate an intermediate ring (available from RENK upon request) for the installation of proximity probes or speed monitors. These same tapped holes can also be used to mount an auxiliary IP 55 baffle.

Two pre-drilled holes are provided at the main mounting flange for reaming and dwelling into the machine’s end bracket. The two holes provided at the parting face of the bottom half of the housing can be used to attach a rotor shipping brace during the transportation of the equipment.

The oil sight glass is available only on one side of the housing. It is always located on the right side, looking towards the outboard end of the bearing. As a standard feature, one drilled and tapped hole on each side of the housing can accommodate bearing temperature detectors. The screwed-in oil ring sight glass in the housing cap can also be used as the oil filling port.

ZM housings are manufactured and stocked for standard natural cooled bearings. For special applications, requiring water cooling, external oil supply system, vibration detectors, etc., finished machined housings are taken from stock and remachined to provide the additional connections.

**Bearing Shell**

The shell is made of steel (C 10/ C 15) lined with a tin based whitemetal (RENKmetal therm 89). The two halves of the spherically seated shell are bolted together at the parting faces.

The plain cylindrical bore of the shell has been designed for loose oil ring lubrication. The shape and placement of the oil pockets at the horizontal split have been optimized for each bore diameter.

The temperature detection holes in the bottom half of the shell are sized and positioned to comply with the requirements of API Standard 670.

The shells are provided with plain whitemetal faces (type B). Such faces are suitable to carry transient loads of limited magnitude.

**Seals**

The diameter for both floating labyrinth seals, type 10, (protection IP 44), is 80 mm at the outboard and inboard ends.

Integral lips (patent pending) at the inside of the seals will catch and divert oil mist and vapors away from the rotating shaft. Due to their asymmetric shape, the seals cannot be installed in the wrong way. For the ease of assembly and to prevent damage, the inboard end floating labyrinth seal is positioned by a location pin at the split line of the housing.

When specified, the weather protection of the outboard floating labyrinth seal can be enhanced to IP 55 (seal type 12) by adding a bolt-on baffle. The mounting holes for this baffle are a standard feature of the ZM design. For applications without a shaft extension, the outboard seal can be replaced by an end cover (type 00).

To prevent leakage to the inside of the machine due to negative pressure or high air velocity, the housing has an integrated air or machine seal. A cast-in port in the bottom half of the housing vents the cavity between the outboard floating labyrinth seal and the machine seal to atmospheric pressure. This port can be drilled and tapped for connections for applications where a pressurized or purged seal is required. All RENK seals (type 00, 10, 12 and the insert for the machine seal) are injection molded and made of fiber reinforced, high temperature resistant RENK plastic therm 50 material and are therefore resistant to wear.

**Oil Supply**

The standard ZM bearing is a fully self-contained, oil ring lubricated design. Loose oil ring lubrication is suitable for 26 m/s peripheral speed of the shaft.

To ensure optimum immersion depth into the oil sump, the loose oil ring is available in two standard sizes: one for the 50 mm (marked I) and one for the 65 and 75 mm shaft diameters (marked II).

**Electrical Insulation**

As a protection against the stray electric currents, conducted through the shaft, the ZM design can also be supplied as an internally insulated bearing. The spherical seat of the shell is coated with a high quality insulating material (treated PTFE foil).

Electrically insulated housings are readily available from stock.

**Heat Dissipation**

The large surface of the ZM housing combined with the full control of the internal oil circulation ensure superior performance with natural cooling, especially for applications operating at 2 pole speeds.

For unfavourable conditions, for example very high ambient temperatures, a water cooled version of the ZM design can be supplied. The spacious and unobstructed oil sump of the ZM housing can accommodate a large and very efficient seawater resistant oil cooler. The directed and controlled oil flow to and over the cooler will ensure excellent heat dissipation. When specified, ZM bearings can also be machined to enable them to be connected to an external oil supply system.

**Temperature Control**

Two independent, commercially available thermosensors can be used for monitoring the temperature of the bearing. The position of the measurement location is in accordance with API Standard 670 for all available bore diameters (55, 65 and 75 mm) We recommend the use of the standard RENK resistance thermometers PT 100; alternatively RENK angular thermometers (for direct visual readings).

**Oil Selection**

In general, any brand of mineral oil of low foaming tendency and a good resistance against premature aging can be used as a lubricant. However, the suitability of exotic synthetic lubricants must be confirmed by RENK. The appropriate oil viscosity for the operating conditions should be based on a hydrodynamic slide bearing analysis. Such calculations are performed for each individual inquiry or order. Printouts of these computer calculations are available upon request.
Dimensions of Bearings

- **Type**: Z
- **Housing**: M = finned, center flange-mounted
- **Heat dissipation**: N = natural cooled, W = water cooled (special variant)
- **Shape of bore and type of lubrication**: L = plain cylindrical bore, with loose oil ring
- **Thrust part**: B = plane sliding surfaces (locating or non-locating bearing)

Example:
RENK slide bearing ZMNLB 7 - 65
drilled and tapped hole G½ for bearing temperature detector

### Dimensions in mm

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<tr>
<th>Size</th>
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<th>Weight kg</th>
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<td>107</td>
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Shaft Dimensions

### Locating bearing
Type of bearing shell Z.NLB

- Chamfered edges 0.5 x 45°
- Surface condition DIN ISO 1302

### Non-locating bearing
Type of bearing shell Z.NLB

Dimensions in mm:

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1) For shaft tolerances see „Manual for the application of RENK slide bearings“.

2) Where a non-locating bearing is to permit greater axial movement (e.g. to allow for thermal expansion), the distance between the collars may be increased.

3) The normal axial clearance is 0.5 mm. When directional changes of thrust loads or axial shocks are to be anticipated, the dimensions b_13 may be reduced by a further 0.3 mm. Where a locating bearing is only required for test run, the dimension b_13 can be increased by 3...6 mm.

Tolerance of form and position to DIN 31 699. General tolerance DIN 7168 mS.
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We reserve the right to changes made in the interests of technical improvement.