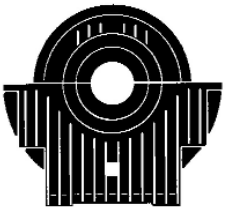
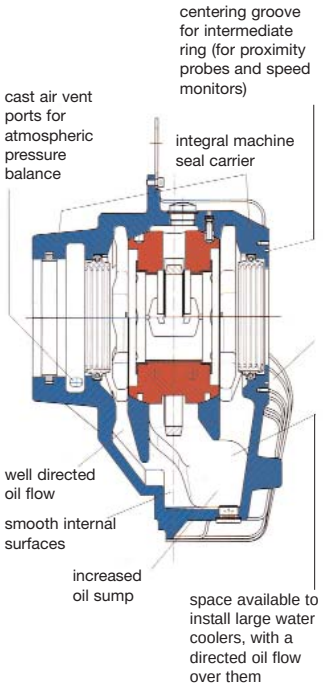
Slide Bearings Type EM 9S
For Shaft Diameters 80, 90, 100 mm
Main Application Field
Electric Machines

Centre flange mounted slide bearing type EM 9S



The RENK EM 9S bearing is a fully self-contained, centre flange mounted bearing that gives superior performance - especially at 2 poles speeds.

This leaflet contains the data required for machine designs incorporating EM 9S bearings.



Technical Information

The RENK slide bearing EM 9S is a high performance bearing of exceptional design, uncomplicated construction and limited variant options, having an integrated machine seal.

Specifically, the bearing has been designed to give an exceptional operational performance as a fully self-contained centre flange mounted bearing; especially for machines operating at 2 pole speeds.

Bearing Housing

The finned housing made from a high quality cast iron (EN-GJL-250), incorporates the machine seal with its integral air vent ports (eliminating the use of vent hoses).

The seal carriers for the floating labyrinth seals are at both ends, and together with the machine seal, are integral parts of the housing casting. A cast port provides an atmospheric pressure balance inside the machine seal.

Because the basic EM 9S design is air cooled, there is no provision made for oil inlets or outlets. The oil sight glass is only available on one side of the housing (always on the right side, when looking at the outboard end of the bearing).

In this bearing the screw-in top oil sight plug is also the oil filling port. This position also allows for a good control of the loose oil ring.

The bearing shell is supported by spherical segments situated in the top and bottom halves of the housing. The spherical seating allows for a well directed oil flow and leaves more space for a larger water cooler.

The top half of the housing is provided with two flat faces, angled at 45° to accommodate vibration detectors. In addition, the outboard end face 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 (six in all) can also be used to mount a baffle.

Two pre-drilled holes are provided in the bottom half of the housing for reaming and doweling into the machine's end bracket. The two holes provided at the joint face of the bottom half of the housing can be used to attach a rotor shipping brace during the transportation of the equipment.

There are two drilled and tapped holes on each side of the bottom half housing for bearing temperature detectors.

For special cases (fitting of oil coolers or vibration detectors) finished machined housings are taken from stock and modified to provide the additional holes.

Bearing Shell

The shell is made from steel lined with a tin based whitemetal (RENK therm 89). The design and manufacture are both in accordance with the highest engineering standards, to ensure long life, even under severe operational conditions.

The shell has a plain cylindrical bore arranged for lubrication by a loose oil ring.

Apart from the bearings without thrust faces (type...Q), these shells can be provided with plain whitemetal faces (type...B). Such faces are suitable only for non-continuous axial loads of a limited magnitude. Shells with whitemetal taper-land faces (type...K) are also available to carry continuous axial loads of a medium magnitude.

Seals

For standard applications both ends of the bearing are installed with type 10 floating labyrinth seals (protection IP 44) having a bore of 100 mm (fixed size).

Provision is made for the outer floating labyrinth seal to be enhanced to a type 12 (IP 55 protection), if specified. For this reason the outboard end face of the housing is suitably drilled and tapped.

This outboard end seal can also be replaced by a plastic end cover (type 00) for cases where the shaft has to terminate inside the bearing.

To prevent negative pressure or high air velocity causing oil leakage to the inside of the machine, the bearing has an integrated machine seal. A cast-in port in the bottom half of the housing vents the cavity between the outboard floating labyrinth seal to atmosphere.

The machine seal is provided with a spacer ring to ease assembly.

All seals (type 00, 10, 12) are made of fibre reinforced, high temperature resistant material (RENK plastic therm P50), and are therefore resistant to wear.

Oil Supply

Self contained oil bath lubrication, by means of one loose oil ring, is supplied for shaft speeds up to 20 m/s. The loose oil ring take the lubricant direct to the shaft. If the bearings are supplied with cool oil from an external lubrication system, the loose oil ring can be retained as a back-up for shaft speeds up to 26 m/s. Such an arrangement will permit emergency shut-down without damage to the shells.

Lubrication by loose oil ring is also possible for marine applications. In this case additional guide bushes are build into the shells (details on request).

Electrical Insulation

To prevent problems from electrical eddy currents, the EM 9S bearing can be electrically insulated, internally. In such cases the spherical seating of the shell is coated with a layer of insulating plastic material.

Such EM 9S electrically insulated housings are readily available from stock.

Heat Dissipation

The large casing heat dissipation surface of the EM 9S, combined with the full flow control of its internal oil circulation ensures an excellent performance when air cooled; especially when it is operating at 2 pole speeds.

The special version of the EM 9S bearings can be supplied with a very effective heat exchanger (seawater resistant). This water cooled bearing can eliminate the need for an external oil lubrication system when operating under unfavourable conditions such as for instance high ambient temperature.

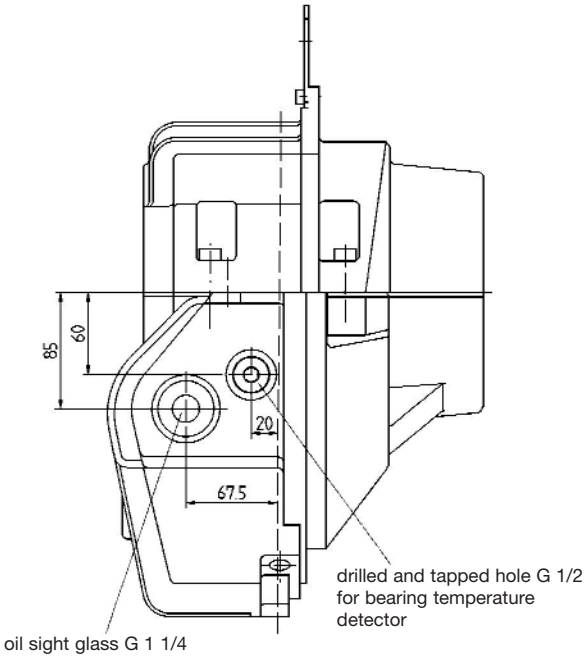
Temperature Control

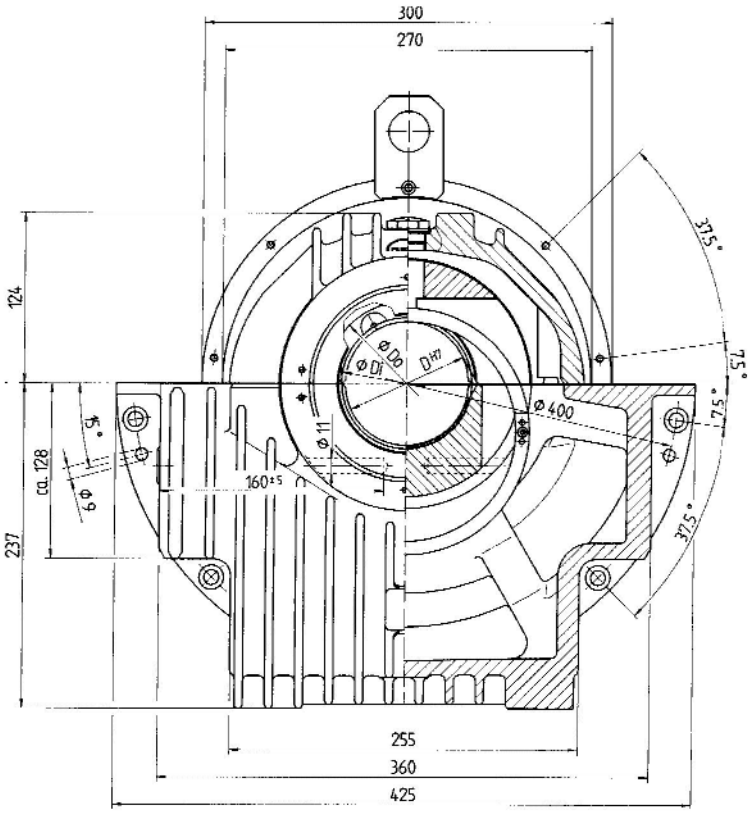
Two independent commercially available thermometers can be used for monitoring the temperature of the bearing. We recommend the use of the standard RENK resistance thermometers PT 100; or RENK angle thermometers for direct visual readings.

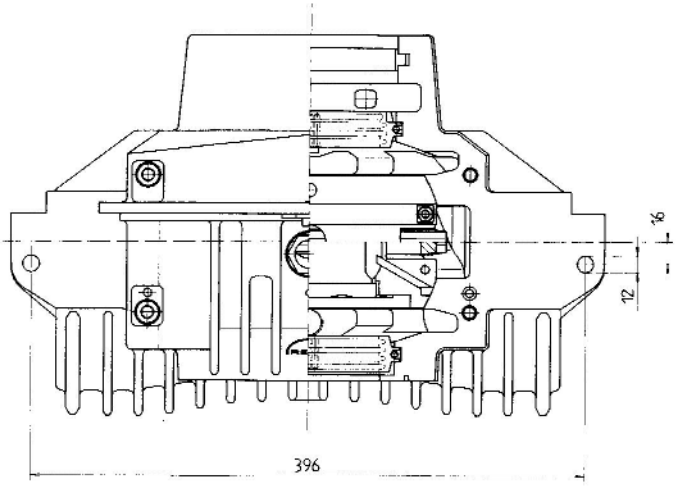
Oil Selection

Generally, any branded oil of low foaming tendency can be used as a lubricant. The correct viscosity for each operating condition will be determined by EDP calculation. Such calculations are always carried out at the design stage. A print-out of the results can be provided on request.

Dimensions of Bearings



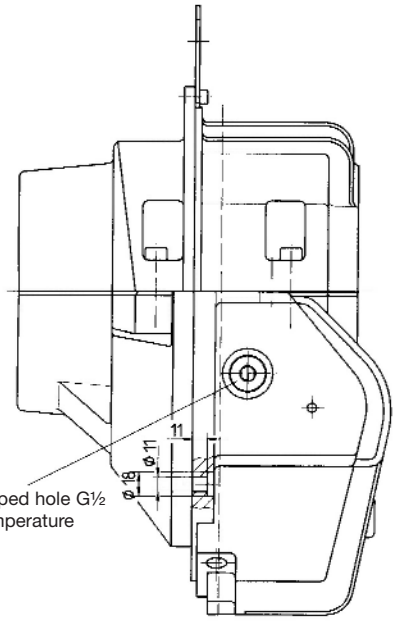




Type	E	
Housing	M =	finned centre flange mounted
Heat dissipation	N =	natural cooling
	Z =	lubrication by oil circulation with external oil cooling
	W =	water cooling (finned tubes in oil sump)
Shape of bore and type of lubrication	L =	plain cylindrical bore, loose oil ring lubrication
Thrust parts	Q =	without thrust parts (non-locating bearing)
	B =	plane sliding surfaces (locating bearing)
	K =	taper land faces for both senses of rotation (locating bearing)

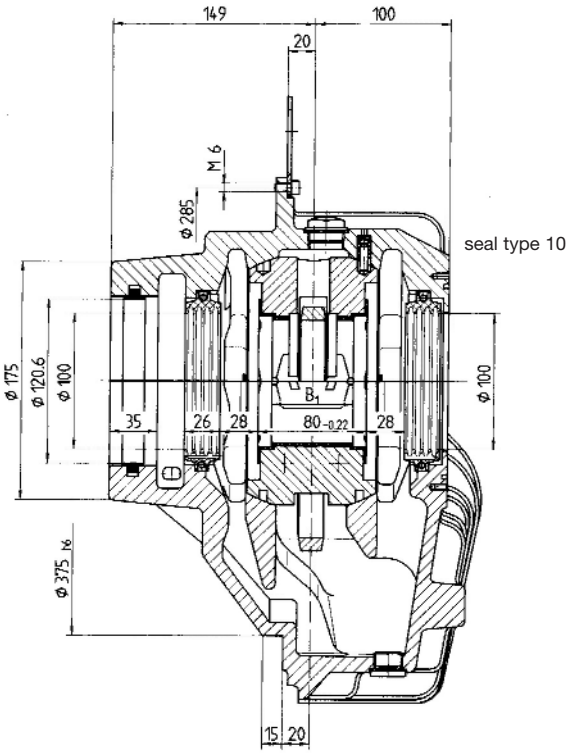
Example:

RENK slide bearing EMNLB 9S - 100



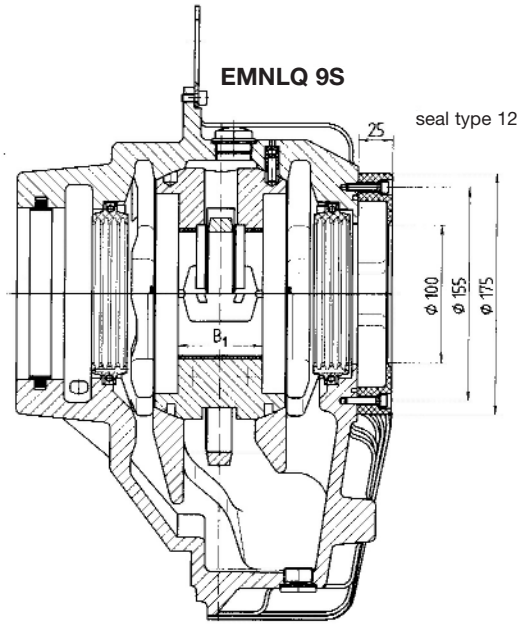
drilled and tapped hole G½
for bearing temperature
detector

EMNLB 9S



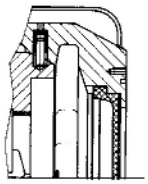
seal type 10

EMNLQ 9S



seal type 12

EMNLQ 9S



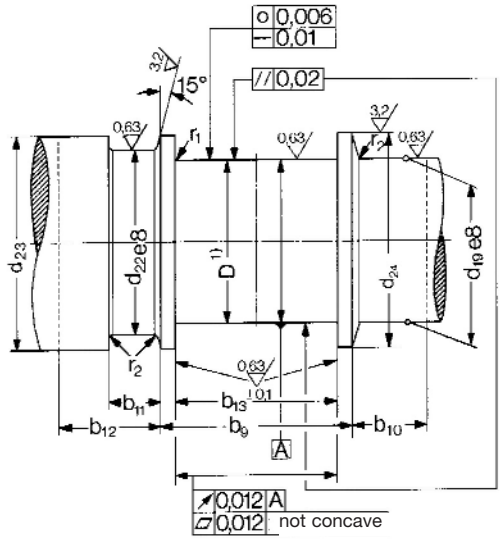
end cover type 00

Dimensions in mm

Size	D^{H7}	Di	Do	B_1	Weight [kg]	Oil quantity [l]
	80	86	110	61,4		
9	90	96	120	61,4	approx. 60	2,9
	100	106	130	65		

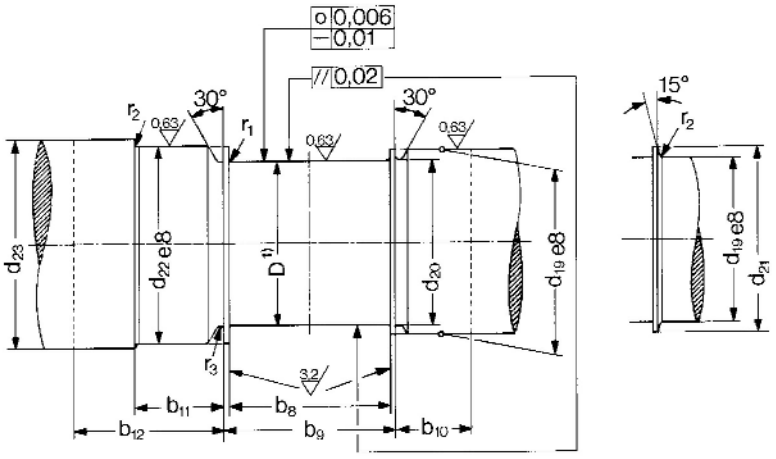
Shaft Dimensions

locating bearing
type of bearing shell
E...B
E...K



chamfered edges 0,5 x 45°
surface condition DIN ISO 1302

non-locating bearing
type of bearing shell
E...Q
E...B



Dimensions in mm

Size	D[1]	b_8[2]	b_9	b_{10}	b_{11}	b_{12}	b_{13}[3]	d_{19}	d_{20}	d_{21}	d_{22}	d_{23}	d_{24}	r_1	r_2	r_3
	80									—			110			
9	90	90	100	55	65	100	80,4	100	90	—	100	120 ± 0,1	120	2,5	4	1,6
	100							—	—	110			130			

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 b_8 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.

Sales Organisation

Headquarters and Manufacturing Plant

RENK AKTIENGESELLSCHAFT
Werk Hannover
Weltausstellungsallee 21
D-30539 Hannover
Phone: +49 (5 11) 86 01-0
Fax: +49 (5 11) 86 01-288
Email: info.hannover@renk.biz
Internet: www.renk.biz

Manufacturing Plant and Distribution Center

OMEGA RENK BEARINGS PVT. LTD.
Anand Nagar, Raisen Road
Bhopal - 462 021
India
Phone: (91 -7 55) 5 28 45 61
Fax: (91 -7 55) 2 75 16 26
Email: omtec@sancharnet.in
Internet: www.omegarenk.com

Sales Agencies

Australia
Austria
Belgium
Brazil
Canada
Czech Republic
Croatia
Finland
France
G.B. and Ireland
Hungary
India
Italy
Japan
Liechtenstein
Luxembourg
Mexico
Netherlands
Norway
PR China
Slovak Republic
Slovenia Republic
South Africa
South Korea
Spain
Switzerland
USA

Assembly and Distribution Centers

RENK Corporation
304, Tucapau Road
29334 Duncan S.C.
USA
Phone: (1-8 64) 4 33 00 69
Fax: (1-8 64) 4 33 06 36

COFICAL RENK MANCAIS DO BRASIL LTDA.
Rodovia BR-280,
km 54 - Em frente ao Parque Municipal de Exposições
CEP 89270-000 - Guaramirim - SC - Brasil
Phone: (55-47) 337 36 400
Fax: (55-47) 337 36 499

MAN Diesel Japan Ltd.
MAN Diesel Japan Ltd.
RH Division;
Fuji Building (Room 121)
3-2-3 Marunouchi
Chiyoda-ku, Tokyo 100-0005
Japan
Phone: (81-3) 3215 1310
Fax: (81-3) 3284 0867

RH-1163 (8.05) Printed in Germany