SONL plummer block housings

Designed for oil lubrication



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The SKF brand now stands for more than ever before, and means more to you as a valued customer.

While SKF maintains its leadership as the hallmark of quality bearings throughout the world, new dimensions in technical advances, product support and services have evolved SKF into a truly solutions-oriented supplier, creating greater value for customers.

These solutions encompass ways to bring greater productivity to customers, not only with breakthrough application-specific products, but also through leading-edge design simulation tools and consultancy services, plant asset efficiency maintenance programmes, and the industry's most advanced supply management techniques.

The SKF brand still stands for the very best in rolling bearings, but it now stands for much more.

SKF – the knowledge engineering company

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Cost-effective and reliable

Standardized bearing housings are a cost-effective and reliable solution for many applications where bearing arrangements cannot be integrated into the machine. They are available as

- plummer (pillow) block housings
- flanged housings
- take-up housings.

Bearing housings are typically used together with self-aligning ball bearings, spherical roller bearings or CARB toroidal roller bearings. These bearings are used because they are insensitive to initial misalignment, which normally occurs during mounting, especially in cases where the housings are spaced far apart.

Why split plummer block housings?

Split plummer (pillow) block housings are the most common housings used in industrial applications. The main benefits of a split plummer block housing include

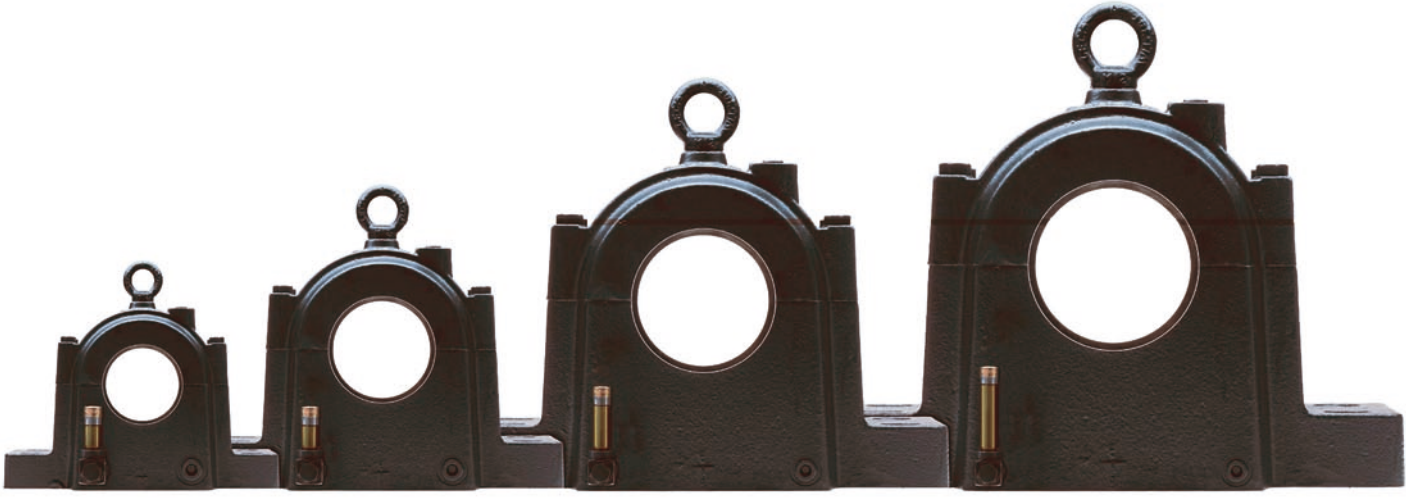
- easy installation
- pre-assembled shafts can be mounted
- various seals and end covers are available.

Why SKF split plummer block housings?

SKF, a leading manufacturer of power transmission products, manufacturers a wide range of split plummer block housings in a variety of designs and sizes. The product offering is based on successful experience in a variety of industries and applications. The new performance class of SKF plummer block housings, can accommodate shaft diameters ranging from 20 to 530 mm. What sets split SKF housings apart from other housings are their unique design features, and the benefits to OEMs and end users like

- no minimum order quantities
- short delivery times
- long-term supply stability
- worldwide availability.

SKF bearing housings together with the appropriate SKF bearings, seals and lubricants, provide a cost-effective, reliable shaft solution that is versatile and easy to maintain.



SONL plummer block housings – a quantum leap forward

SKF has added SONL housings to its family of SNL housings. They are called SONL housings because these innovative split pillow block housings were specifically designed for oil lubrication. Like other pillow block housings in the SNL family, the SONL split pillow block is characterized by a number of built-in features that make it universally applicable. These features include

- well-proven oil lubrication techniques
- deep and large oil reservoir
- strong, stiff and simple design
- efficient seals
- a full range of standard accessories
- fast and reliable mounting
- excellent operational reliability.

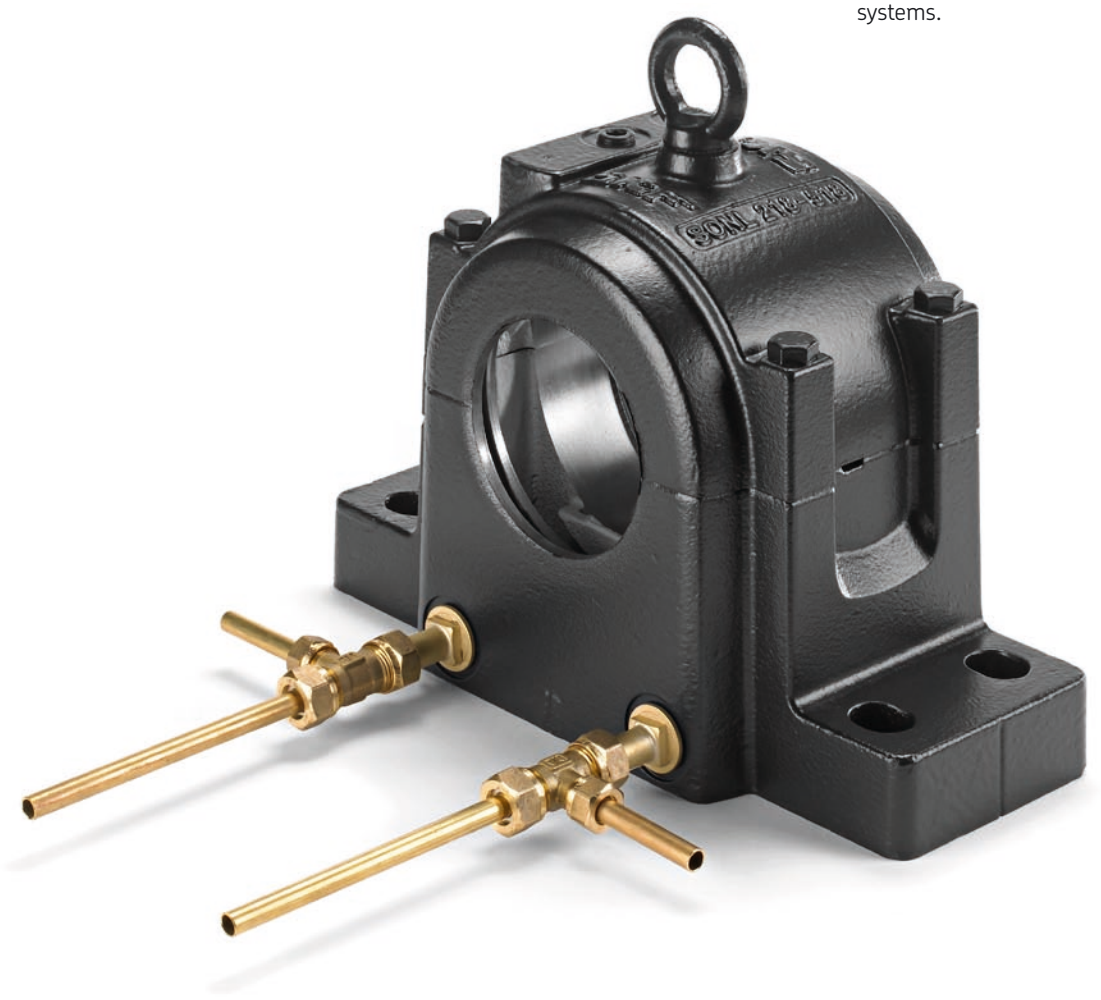
All of these features provide original equipment manufacturers and their customers with a highly reliable shaft solution that is designed to minimize maintenance.

SONL housings can be used with self-aligning ball bearings in the 22 series, SKF Explorer spherical roller bearings in the 222 series, and CARB bearings in the C 22 series with either a cylindrical or tapered bore, ranging from 75 mm up to 240 mm, to cover the most common shaft sizes. For other bearing sizes contact SKF.

Universal application advantages

SONL plummer block housings are designed on a "building block" principle to enable variable configurations. The SONL product line comprises a number of housings that all can be used to create

- locating or non-locating bearing arrangements
- arrangements with a bearing on an adapter sleeve and a straight shaft
- arrangements with a bearing on a stepped or straight shaft and a cylindrical seat
- bearing arrangements with a through shaft or at the end of a shaft
- circulating oil or oil pick-up ring lubrication systems.



In addition to ease of configuration, SONL housings offer a number of outstanding advantages in performance and reliability.

Well-proven oil lubrication techniques

SONL plummer block housings are designed for two methods of oil lubrication: oil lubrication with a pick-up ring and lubrication with a circulating oil system.

Oil lubrication with a pick-up ring

Oil lubrication with a pick-up ring (→ **fig. 1**) is normally used with SONL housings. It provides a uniform supply of lubricant to the bearing, resulting in favourable operating conditions. This oil lubrication method uses a ring that hangs loosely from a shaft spacer sleeve on one side of the bearing. It hangs deep into the oil reservoir in the bottom half of the housing (→ **fig. 1**, **page 16**). Then, as the shaft rotates, the ring follows and picks up the oil from the bottom half and brings it to a collecting trough. The oil then flows through the bearing and back into the oil reservoir. In the fifty years that this lubrication method has been used, there has not been any record of wear where the ring contacts the seat – regardless of the shaft dimensions, or how fast it is running.

Circulating oil lubrication systems

Circulating oil systems are generally preferred when high speeds generate an excessive amount of heat. When choosing this lubrication method, a pick-up ring is not needed.

A circulating oil system typically has supply lines attached to the housing cap and drain lines attached to the base. Circulation is normally produced with the aid of a pump. After the oil has passed through the bearing, it generally settles in a tank where it is filtered and, if required, cooled before being returned to the housing. Proper filtering and cooling of the oil are important factors for bearing service life, and can provide improved machinery performance as well as cost savings.

Fig. 1



Features and benefits of SONL housings

The SONL plummer block housings represent a further development of the SOFN housings. These housings have several special features and benefits, listed below.

Deep and large oil reservoir

SONL housings have a deep oil reservoir (→ **fig. 2**) that holds a large volume of oil so that heat can be dissipated effectively. In cases where an oil pick-up ring is used, this cooling effect increases the service life of both the lubricant and the bearing.

If operating conditions warrant it, auxiliary oil cooling tubes are available. These can be installed through the oil outlet holes in the housing base.

Strong, stiff and simple design

The SONL plummer block housing is a modern, two-piece housing consisting of a cap and base (→ **fig. 3**). Its simple, sturdy design provides maximum support and reduces the risk of deforming the cap or base during installation. Dowel pins between cap and base are off-centre (→ **fig. 2**) so that the cap can only be installed one way.

Efficient seals

Highly-efficient internal seals are available for these housings (→ **fig. 4** and **page 14**). The two-piece labyrinth seal consists of a spacer sleeve with a labyrinth flange that is fitted to the shaft, acting as a flinger, and a stationary seal ring that is fitted into a seal groove in the housing base and cap. Additionally, the sealing effect is enhanced by oil traps that return oil that has passed through the labyrinth, back to the oil reservoir (→ **fig. 1**, **page 10**).

To protect the bearing arrangement at the end of a shaft specifically designed end covers are available as standard. The end cover fits into the seal groove in the base and cap.

Standard accessories

SONL housings are delivered with two performance-enhancing accessories:

- An oil level gauge (→ **fig. 5**) that makes it easy to visually check the level and quality of the oil.
- A magnetic plug (→ **fig. 5**) that screws into one of the four tapped holes in the housing base. This plug attracts metal particles, extending the service life of the lubricant and the bearing.

Fast and reliable mounting

To simplify mounting and make alignment more accurate, SONL housings have a square base (→ **fig. 6**). To further simplify installation, cast indications, which are vertical to the centre of the housing bore, are provided on the side faces of the base. Indications cast into the end faces of the base locate the centre of the bearing seat.

Bases and caps individually marked

The housing base and cap are matched during manufacturing and are not interchangeable with the bases or caps of other housings. To prevent mixing components when mounting several housings, the same serial number is marked on the base and its matched cap (→ **fig. 7**).

Fig. 2

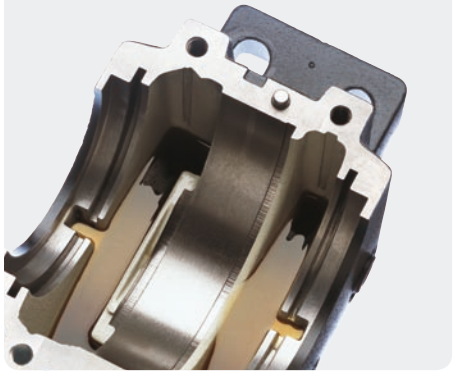


Fig. 4

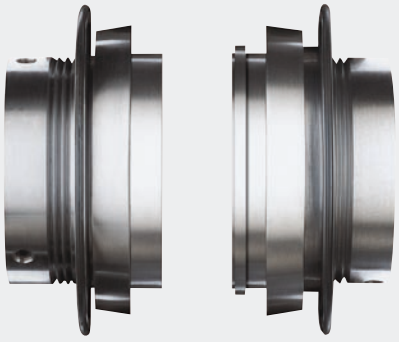


Fig. 6

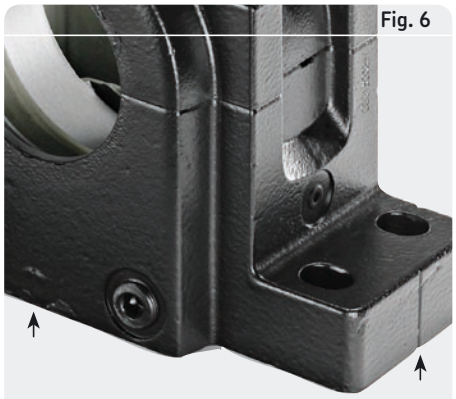


Fig. 3

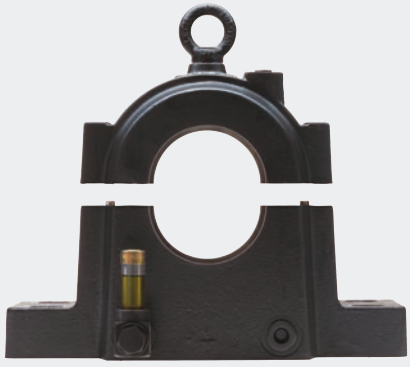


Fig. 5



Fig. 7



Drilled and tapped holes

SONL housings have drilled and tapped holes in the cap and base. Metal plugs protect these holes (→ **fig. 8**). The holes in the cap are intended to connect the oil supply lines to the housing. The threaded holes in the base are for the oil level gauge, the magnetic plug, additional cooling tubes or the oil drain lines.

Indications for holes to take other components

SONL housings can be fitted with permanently installed accelerometers for vibration monitoring equipment (→ **fig. 8**). The housings are supplied as standard with one M8 hole in the base for an appropriate vibration sensor. Dimples cast into the housing base indicate the positions for dowel holes for pinning the housing to its support.

Dimensionally interchangeable

SONL housings are dimensionally interchangeable with the earlier SKF SOFN housings in the 200 and 500 series, and most competitive housings that use an oil pick-up ring to lubricate the bearings.

Excellent operational reliability

The high load-carrying ability of SONL plummer block housings enables incorporated SKF bearings to achieve their full service life. Additionally, because the pick-up ring constantly brings oil to the bearing, more favourable operating conditions are created, and less maintenance is required.

Fig. 8



High performance in all applications

Applications
- Mine ventilators
- Exhaust and fresh air fans
- Flue gas fans
- Emergency power supply generator flywheels
- Transmissions
- Belt drives
- Impact and hammer mills

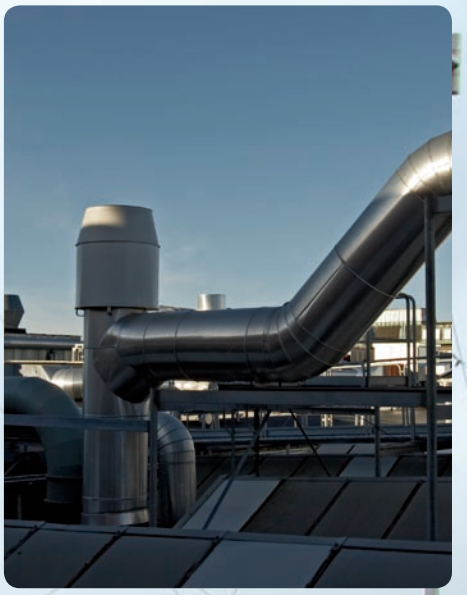
Demands
- Robust design
- High operational reliability
- Extremely tight seals
- Large oil reservoir
- Long maintenance intervals
- Condition monitoring facilities
- Fast and easy mounting and dismounting

Solution



SONL plummer block housings are particularly suitable for bearing arrangements, where spherical roller bearings, self-aligning ball bearings or CARB toroidal roller bearings are used and where speed and operating temperatures require oil lubrication. When used with either an oil pick-up ring or a circulating oil lubrication system, SONL housings provide a high-performance, cost-effective solution for a broad range of applications. SONL plummer block housings from SKF meet today's demands and open up new application horizons.

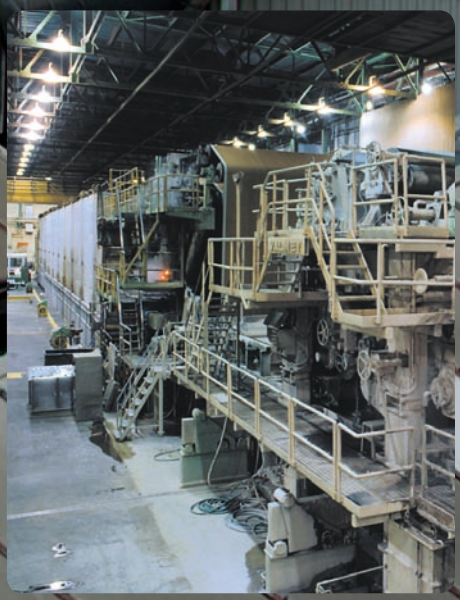












Bearing arrangement design

A typical bearing arrangement requires two bearings to support and locate the shaft radially and axially relative to a stationary part of the machine or housing. Generally the arrangement consists of one locating and one non-locating bearing position.

The bearing in the locating position provides radial support. At the same time, it locates the shaft axially in both directions. Therefore, it must be fixed in position both on the shaft and in the housing.

The bearing in the non-locating position provides radial support only. It must accommodate axial displacement so that the bearings do not mutually stress each other (e.g. when the shaft length changes as a result of thermal expansion).

At elevated speeds (70 % of the limiting speeds and above), spherical roller bearings having a radial internal clearance greater than Normal, e.g. C3, should be used because of the higher operating temperatures produced at such speeds. Similarly if heat is supplied to the bearing through the shaft so that there is a temperature gradient between inner and outer rings, bearings with greater radial internal clearance than Normal should be used.

SKF SONL plummer block housings can be used for both the locating and the non-locating bearing positions (→ **fig. 1**).

Non-locating bearing position

The bearing seat in SONL housings is sufficiently wide to enable the outer ring of a self-aligning ball bearing or a spherical roller bearing to be displaced axially. The seat is machined to provide a loose fit for the bearings. The maximum axial displacement from the middle position depends on the housing size and corresponds to the width of the appropriate locating ring. Locating ring dimensions are provided in the product tables.

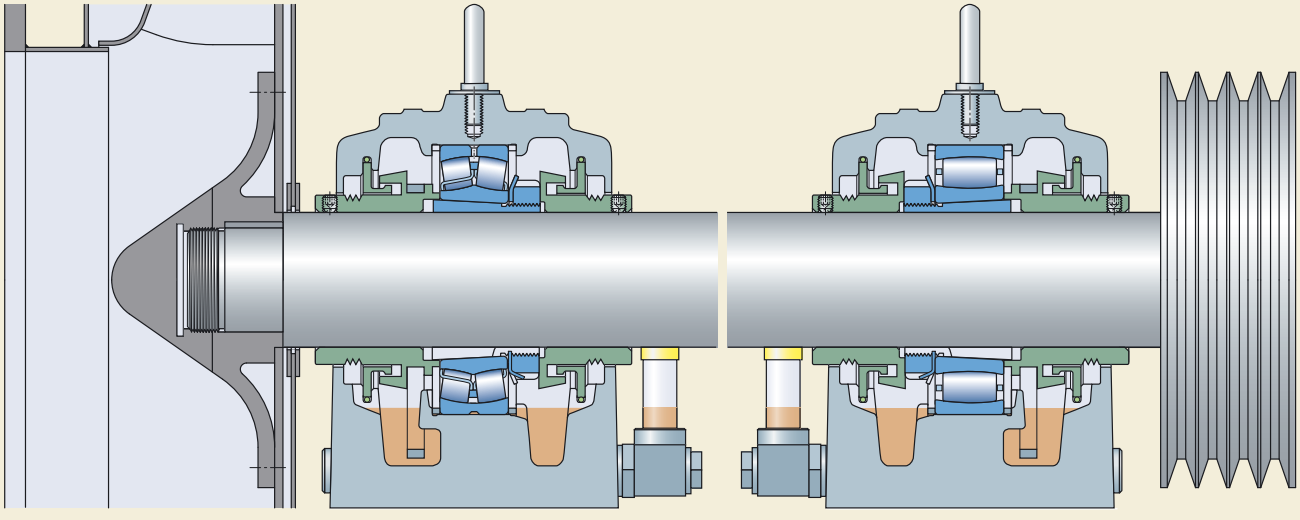
CARB bearings are non-locating bearings and can accommodate axial displacement of the shaft relative to the housing, within the bearing. For this reason, they must be secured axially in the housing bore using a locating ring on both sides of the bearing (→ **fig. 1**, right). The designations for appropriate locating rings are listed in the product tables.

The permissible axial displacement of one CARB bearing ring relative to the other depends on several factors and can be calculated using the equations shown in the

- SKF General Catalogue
- SKF Interactive Engineering Catalogue online at www.skf.com.

In general, the maximum axial displacement is about 10 % of the bearing width on either side of the bearing. However, the axial displacement from the middle position should never exceed the width of the locating ring.

Fig. 1



Locating bearing position

The locating bearing that provides simultaneous radial support and axial location of the shaft must be fixed in position by a locating ring at both sides of the spherical roller bearing or self-aligning ball bearing (→ **fig. 1**, left). This means locating bearings are placed in the middle of the bearing seat. The appropriate locating rings are listed in the product tables.

Locating rings

SKF locating rings are identified by the prefix FRB, followed by the size (width/outside diameter) in millimetres uncoded (e.g. FRB 11/230). Locating rings must be ordered separately

Location on the shaft

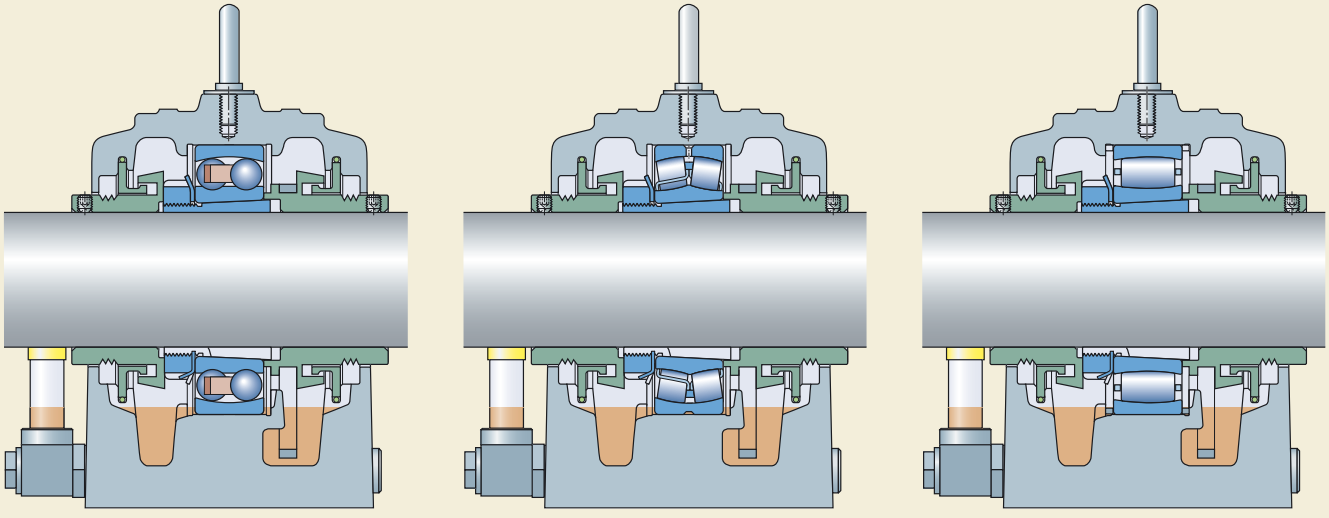
SONL housings are designed to accommodate self-aligning ball bearings, spherical roller bearings or CARB toroidal roller bearings mounted on an adapter sleeve or directly on a cylindrical shaft seat.

Bearing with a tapered bore on an adapter sleeve and a straight shaft

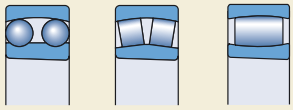
This type of arrangement (→ **fig. 2**) is very popular because it enables bearings to be mounted anywhere on a straight shaft. It also enables:

- Shafts with an h9 diameter tolerance to be used, without machining.
- The final position of the bearing on the shaft to be determined during mounting.
- Bearing radial clearance to be adjusted within certain limits during mounting, in order to meet application demands.

Fig. 2



SONL 5



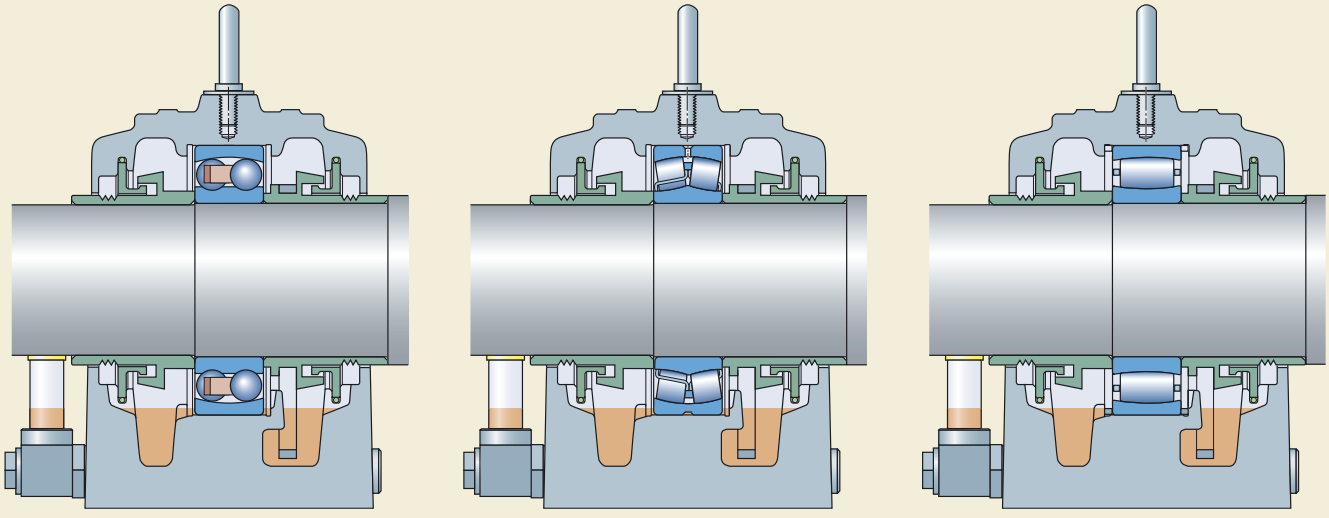
22 K 222 EK/CCK C 22 K

Bearings on a stepped shaft and a cylindrical seat

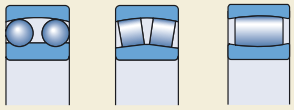
This type of arrangement (→ **fig. 3**) enables the use of stronger shafts to build stiffer bearing arrangements. This may be needed, for example, to accommodate heavy shock loads. Several advantages are provided by this arrangement, e.g.:

- The axial load-carrying ability of the bearing is not limited by an adapter sleeve.
- The bearing can be axially located by other components via the spacer sleeves with a labyrinth flange.

Fig. 3



SONL 2

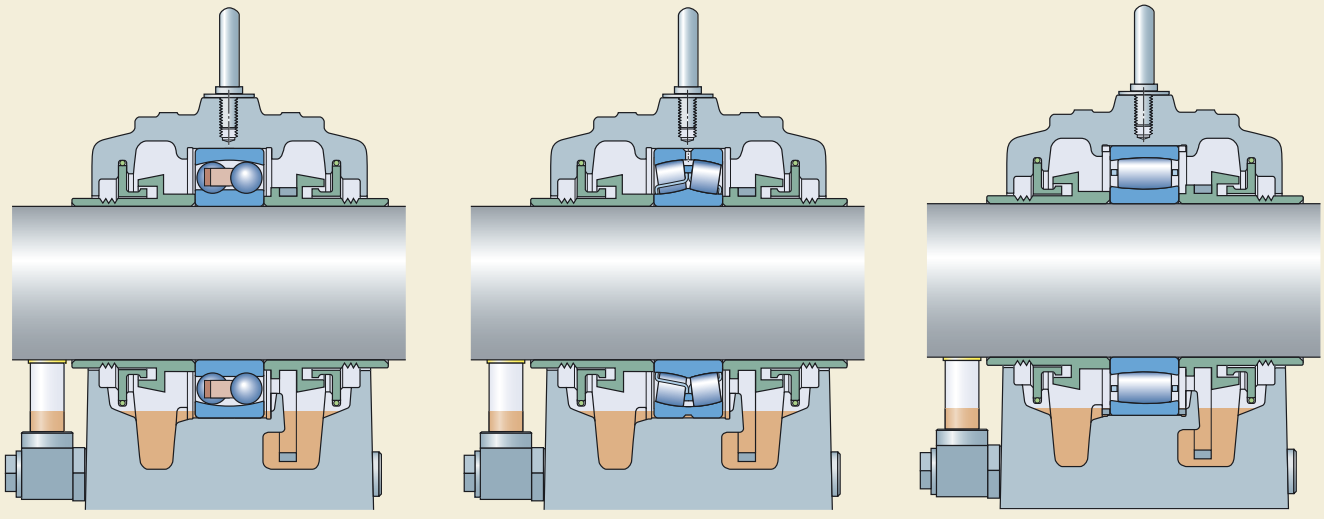


22 E 222 E C 22

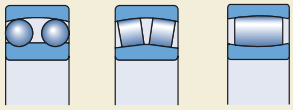
Bearings on a straight shaft and a cylindrical seat

This special type of arrangement (→ **fig. 4**) combines the advantages of "Bearings on a stepped shaft and a cylindrical seat" (→ previous page) together with less machining of the shaft. These arrangements use a VZ643 sealing kit that contains spacer sleeves with the same bore diameter.

Fig. 4



SONL 2



22 E 222 E C 22

Shaft tolerances

Bearings with a tapered bore on an adapter sleeve enable the use of solid or hollow commercial grade shafts. Shafts or seats conforming to h9 tolerances that meet IT5 tolerances for cylindricity will provide satisfactory results.

The seat for bearings with a cylindrical bore should be machined to

- j6 for shaft diameters $d_a \leq 100$ mm
- k6 for shaft diameters $d_a > 100$ mm

for self-aligning ball bearings,

- n6 for shaft diameters $d_a \leq 100$ mm
- p6 for shaft diameters 100 mm < $d_a \leq 200$ mm
- r6 for shaft diameters $d_a > 200$ mm

for spherical roller and CARB bearings.

Bearings with radial clearance greater than normal may be necessary.

Permissible misalignment

Bearing arrangements with SONL housings can accommodate initial misalignment between support surfaces and tolerate operational shaft deflections up to 0,3° (→ **fig. 5**).

Attachment to the support surface

SONL plummer block housings have four cast holes for attachment bolts. The holes enable subsequent adjustment of the housing position during mounting.

Surface roughness of the support surface

SKF recommends a support surface for the housing that is finished to $R_a \leq 12{,}5$ µm with a planicity tolerance to IT7. This provides maximum operational reliability and long service life.

Attachment bolts

SKF recommends using hexagonal bolts to EN ISO 4014:2000 in the class 8.8. If the load does not act vertically to the base, it may be necessary to use stronger class 10.9 bolts.

The recommended tightening torques for class 8.8 bolts are provided in **table 1**.

Doweling the housing

SONL plummer block housings are intended for loads acting vertically towards the base plate (support). Where loads act at angles between 55° and 120°, as well as when the axial loads are greater than 5 % of $P_{180°}$ (→ **table 1** on **page 28**), it is necessary to dowel the housing to its support or to provide a stop in the direction of the load. Recommendations for the position and size of the holes for these dowels can be found in **table 2**. Dimples cast in the housing base show the positions.

Sealing arrangements

Non-contact labyrinth seals protect SONL housings (→ **fig. 6**). These seals prevent contaminants and moisture from penetrating into the housing and retain the oil in the housing. The two-piece labyrinth seals consist of

- a spacer sleeve with a labyrinth flange that rotates with the shaft and acts as a flinger
- a non-rotating seal ring that fits in the seal groove in the housing base and cap.

The spacer sleeve and seal ring together form a long, narrow labyrinth sealing gap, which makes it difficult for the oil to pass. Oil that still passes the labyrinth is gathered in an oil trap and then flows back to the housing base.

The spacer sleeve with a labyrinth flange is mounted with a clearance fit on the shaft. For bearings on an adapter sleeve the labyrinth flange is locked in position on the shaft by tightening a hexagonal grub (set) screw with a cup point.

An O-ring inserted between the non-rotating seal ring and the seal groove in the housing base and cap provides a strong, efficient seal.

The permissible operating temperature range for this seal kit is between –40 and +110 °C. However SKF can supply needed components for higher temperatures.

End covers

For housings mounted at the end of a shaft, one opening of the housing must be fitted with an end cover that fits into the housing's seal groove (→ **fig. 7**). Details for the permissible length of the shaft end can be found in the product tables. An O-ring inserted between the end cover and the housing seal groove, as well as between housing bore at the shaft entrance and the end cover, provide a strong, efficient seal.

Due to the material of the O-ring, the permissible operating temperature range is between –40 and +110 °C. However, SKF can supply alternative materials for higher temperatures.

Table 1

Torque values for class 8.8 bolts

Housing Size	Attachment bolts Size	Recommended tightening torque
–	–	Nm
217-517	M 20	385
218-518	M 20	385
220-520	M 24	665
222-522	M 24	665
224-524	M 24	665
226-526	M 24	665
228-528	M 30	1 310
230-530	M 30	1 310
232-532	M 30	1 310
234-534	M 30	1 310
236-536	M 30	1 310
238-538	M 36	2 280
240-540	M 36	2 280
244-544	M 36	2 280
248-548	M 36	2 280

Fig. 5

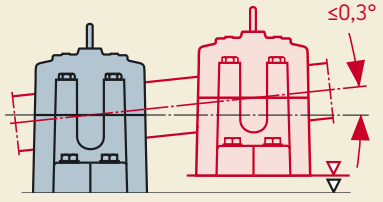
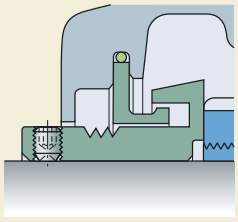


Fig. 6



End covers are identified by the prefix ECO followed by the housing size identification, e.g. ECO 218-518.

Seal kits

Seals are always supplied separately as kits. Different seal kits are available, whether the bearing is to be mounted directly on a cylindrical shaft seat, or via an adapter sleeve. Each seal kit for a through shaft (→ **fig. 8**) consists of

- two spacer sleeves with a labyrinth flange (Note: the flanges have different designs because one sleeve supports the oil pick-up ring)
- two non-rotating seal rings with appropriate O-rings
- an oil pick-up ring
- an oil level gauge
- a magnetic plug
- mounting instructions.

The seal kits for bearings to be mounted directly on a cylindrical shaft seat are identified by the prefix TSO followed by the size identification 2(00), e.g. TSO 218.

The seal kits for bearings to be mounted on a straight shaft with an adapter sleeve are identified by the prefix TSO followed by the size identification 5(00), e.g. TSO 518.

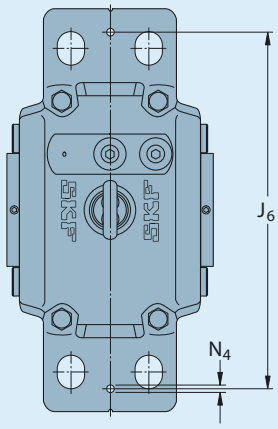
Each seal kit for mounting on a shaft end (→ **fig. 9**) consists of

- a spacer sleeve with a labyrinth flange
- a non-rotating seal ring with appropriate O-ring
- an end cover with appropriate O-rings
- an oil pick-up ring
- an oil level gauge
- a magnetic plug
- mounting instructions.

The seal kits for shaft end mounting are identified by the prefix TSO followed by the size identification, and an additional suffix A, e.g. TSO 518 A.

Table 2

Position and size of holes for dowels



Housing Size	Dimensions J_6	N_4 max
–	mm	
217-517	290	6
218-518	320	8
220-520	350	8
222-522	370	8
224-524	370	8
226-526	390	8
228-528	430	8
230-530	460	12
232-532	480	12
234-534	530	20
236-536	570	20
238-538	640	20
240-540	630	20
244-544	690	20
248-548	800	20

Fig. 7

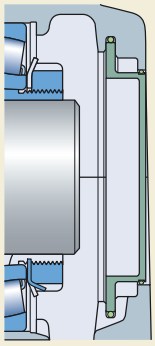


Fig. 8

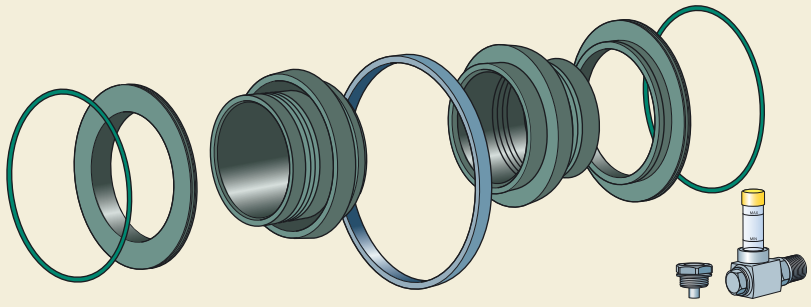
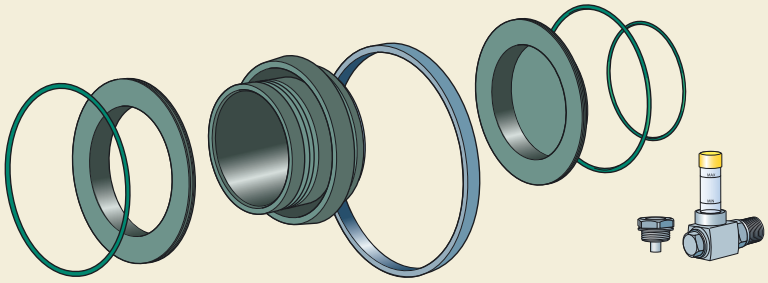


Fig. 9



Lubrication

SONL plummer block housings are designed for oil lubrication. They can be used with an oil circulating system with a pick-up ring or for circulating oil lubrication. The appropriate oil should be selected to match the operating conditions. In all cases, it should have good oxidation stability as well as rust inhibiting properties and an anti-foam additive. The viscosity of the oil should be selected based primarily on the operating temperature of the application. Oils with a higher viscosity should be chosen when heat dissipation conditions are unfavourable or the load ratio F_a/F_r exceeds the limiting value of the calculation factor e. Relevant information can be found

- in the SKF General Catalogue
- in the "SKF Interactive Engineering Catalogue" online at www.skf.com
- with the aid of the "SKF LubeSelect" program.

Magnetic plugs

Each seal kit contains a magnetic plug. The plug can be fitted in one of the oil outlet holes in the housing base. The plug attracts metal contaminants in the oil. This will extend the service life of the bearing.

Oil lubrication with a pick-up ring

SONL plummer block housings are specially designed as to use an oil pick-up ring to enhance oil distribution (→ **fig. 1**). The ring, which is located loosely in a groove in the labyrinth flange, hangs deep in the oil sump. As the shaft rotates, the ring follows, bringing oil to a collecting trough. The oil then flows through the bearing and back into the sump in the housing base.

Housings should be filled with the recommended oil quantities listed in **table 1**. Markings on the inside of the housing base and on the oil level gauge indicate the correct oil level. To avoid leakage, do not exceed the recommended oil level. The oil pick-up ring enables a wide range between maximum and minimum oil levels. This results in a correspondingly long period between refills or oil changes.

Note. The minimum and maximum levels indicated on the oil level gauge apply to standstill. The oil level may drop during operation and may vary even more during start-up.

A pick-up ring provides a uniform and optimum supply of oil to the bearing. Adequate oil quantity is supplied to the bearing to provide reliable lubrication, and a sufficient amount of oil remains in the collecting trough and in the bearing bottom, to provide lubrication after typical machine downtimes.

Before start-up, the oil level should be checked and if needed topped off to the maximum level on the oil level gauge.

Fig. 1

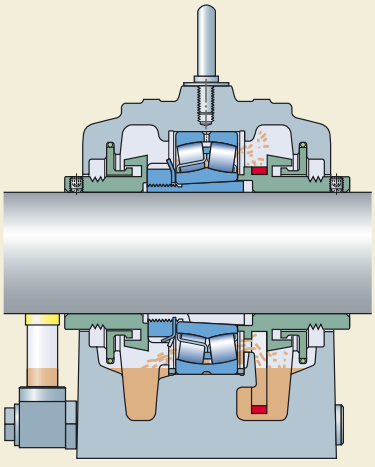
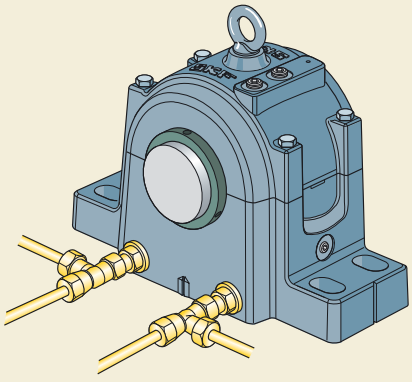


Fig. 2



Oil quantity and oil level check

An oil level gauge is supplied together with the seal kit and must be screwed into one of two tapped holes in the housing base positioned on the opposite side of the oil pick-up ring (→ **fig. 1**). Minimum and maximum oil levels are marked on the gauge. Required oil quantities are provided in **table 1**. Information about the space required by the oil level gauge is listed in **table 3** on **page 19** as well as in the product tables.

If oil is added to the housing during operation, keep the level 5 mm below the maximum mark.

Oil outlet

Tapped holes in the housing base that are not used for the oil level gauge, the magnetic plug or cooling tubes can be used as oil outlets.

Oil cooling tubes

In high temperature applications where an oil pick-up ring is used, auxiliary cooling tubes should be installed. These are available in different sizes (→ **table 2**). Depending on the need, one or two cooling tubes can be installed via the oil outlet holes in the housing base (→ **fig. 2**). Detailed mounting instructions can be found on **page 26**.

Oil cooling tubes are identified by the basic designation AVA-0001 followed by a size identification, e.g. AVA-0001/3.

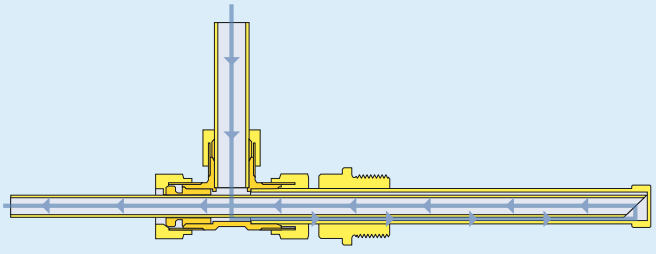
Table 1

Oil levels and oil quantities

Housing Size	Minimum oil fill Oil level	Minimum oil fill Oil quantity	Maximum oil fill Oil level	Maximum oil fill Oil quantity
–	mm	litre	mm	litre
217-517	48	0,3	63	0,4
218-518	48	0,3	68	0,5
220-520	53	0,4	70	0,6
222-522	53	0,6	77	0,9
224-524	63	0,9	80	1,3
226-526	63	0,9	85	1,4
228-528	63	1,0	85	1,5
230-530	63	1,0	90	1,7
232-532	68	1,3	95	2,0
234-534	80	2,5	105	3,5
236-536	83	2,9	115	4,2
238-538	88	3,1	120	4,5
240-540	88	3,0	125	4,5
244-544	98	3,8	140	5,8
248-548	113	4,8	155	6,9

Table 2

Oil cooling tubes



Cooling tube designation	Appropriate housings
AVA-0001/1	SONL 217-517 and SONL 218-518
AVA-0001/2	SONL 220-520 and SONL 222-522
AVA-0001/3	SONL 224-524 to SONL 232-532
AVA-0001/4	SONL 234-534 to SONL 240-540
	For SONL 244-544 and SONL 248-548, contact SKF for correct oil cooling tube

Circulating oil systems

Circulating oil systems are typically used in applications where there are high speeds, high ambient temperatures and heavy loads (→ **fig. 3**). A circulating oil system enables the oil to be continuously filtered and/or cooled. This significantly increases the service life of the oil and the bearing, and minimizes the need for frequent oil changes.

When using a circulating oil system together with SONL housings, an oil pick-up ring and oil level gauge are not needed.

One inlet hole in the housing cap and the four outlet holes, two provided on each side face of the housing base, are used for oil circulation (→ **fig. 4**).

The inlet hole in the middle of the housing cap is used to lubricate spherical roller bearings via the annular groove and through the lubrication holes in the outer ring.

For CARB bearings or self-aligning ball bearings that require inlet oil from the side of the bearing, SONL .. RA design housings should be used. The inlet hole that is offset on the housing cap is used. SONL .. RA housings have four additional tapped holes in the base that are positioned above the four standard holes (→ **fig. 5**). These serve as outlet holes. The higher positioned outlet holes make sure that oil gets inside the bearing and not just flows on the outside of the bearing, when a circulating oil system is applied.

All relevant abutment dimensions that are needed to connect a circulating oil system to SONL housings are provided in **table 3**.

Fig. 3

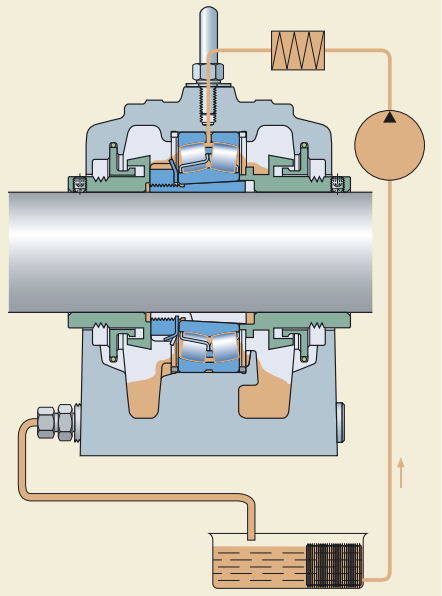


Fig. 4

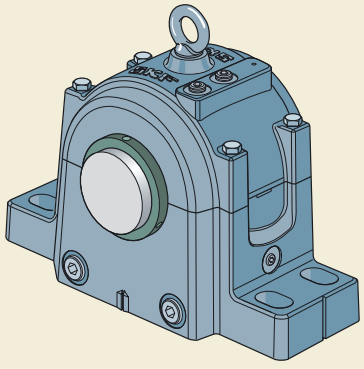


Fig. 5

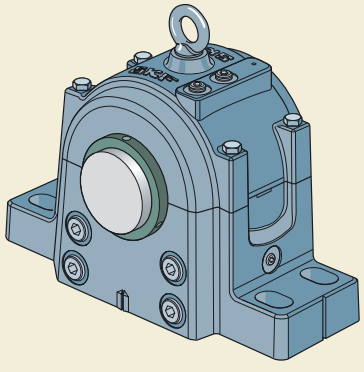
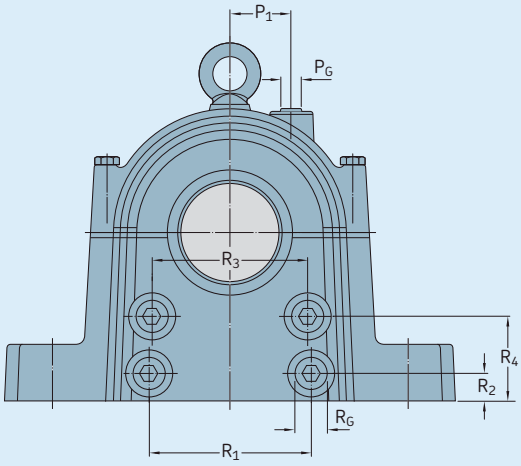
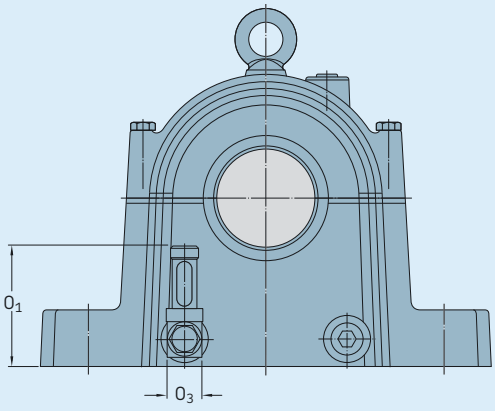
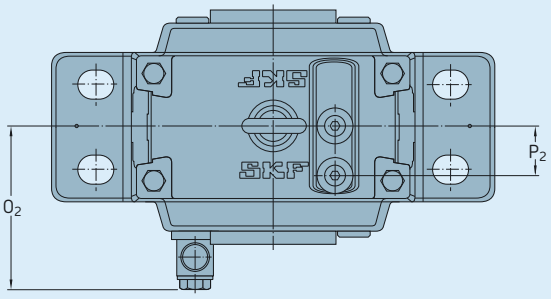


Table 3

Abutment dimensions for circulating oil systems and oil lubrication with a pick-up ring







Housing Size	Dimensions[1] P_G	P_1	P_2	R_G	R_1	R_2	R_3	R_4	O_1	O_2	O_3
–	in	mm		in	mm						
217-517	G 3/8	47,5	40	G 3/4	118	22	114	59	97	138	30
218-518	G 3/8	50	41	G 3/4	128	22	120	63	97	142	30
220-520	G 3/8	50	47	G 3/4	144	22	140	67	97	150	30
222-522	G 3/8	55	53	G 3/4	162	23	162	72	98	163	30
224-524	G 3/8	55	65	G 3/4	178	25	178	75	100	179	30
226-526	G 3/8	60	69	G 3/4	192	25	192	81	120	184	30
228-528	G 3/8	65	72	G 3/4	200	26	200	79	121	187	30
230-530	G 3/8	65	73	G 3/4	220	26	220	82	121	187	30
232-532	G 3/8	65	78	G 3/4	252	26	–	–	121	196	30
234-534	G 3/4	85	88	G 1 1/2	268	41	190	98	136	215	30
236-536	G 3/4	85	93	G 1 1/2	278	41	–	–	136	220	30
238-538	G 3/4	85	98	G 1 1/2	298	41	298	112	166	225	30
240-540	G 3/4	85	100	G 1 1/2	320	41	–	–	166	229	30
244-544	G 3/4	105	108	G 1 1/2	360	41	360	130	166	239	30
248-548	G 3/4	110	115	G 1 1/2	400	41	–	–	216	244	30

[1] For missing dimensions, consult the SKF application engineering service

Maintenance and condition monitoring

Lubrication recommendation

Before starting up a bearing arrangement with an SONL housing and oil pick-up ring for the first time, make sure that the oil collection trough and the bottom of the bearing are filled with oil. This prevents the bearing from running "dry" until the pick-up ring can supply an adequate amount of lubricant.

Even if the housing is carefully cleaned and painted inside, there is a risk that impurities will remain. Therefore, SKF recommends changing the oil after an initial trial running period of a few hours. Subsequent oil changes can then be made at convenient intervals but should be performed at least once a year. The bearings must be at a standstill when the oil is changed.

If there are no oil leaks from the housing during the trial run, a monthly check of the oil level should be adequate.

Inspections

Although SONL bearing arrangements are machine elements and are designed for long service life, they should be checked regularly. The frequency of inspection will depend on the operating conditions.

During operation, the oil level may drop below the minimum level. If that should happen, and oil needs to be added while the machine is running, keep the oil level at least 5 mm below the maximum oil level on the indicator or overfilling can result.

Condition monitoring is increasingly important for preventive maintenance. With SKF monitoring equipment, bearing damage can be detected at an early stage so that the bearing can be replaced during a planned maintenance interval. This is particularly important for critical machines where unplanned downtime can be very costly.

SKF offers a wide range of equipment and associated software for condition monitoring of bearing arrangements, complete machines and plants.



Because machines are not always monitored using modern equipment, it is important for maintenance engineers to be familiar with the "alarm signals" if a bearing problem occurs. These signals can be detected by listening to bearing noise, measuring temperatures, or visually inspecting the bearing.

Listening to bearing noise

A common way to monitor a bearing arrangement is to listen for noise. This can be done using an SKF electronic stethoscope. These stethoscopes can be used to identify the source and location of a noise. However, when using an electronic stethoscope, it should be remembered that different types of rolling bearings generate a specific inherent vibration/sound in operation.

Measuring temperatures

Unusually high temperatures or a sudden rise in temperature without any change in the operating conditions are sure signs that something is wrong. The temperature at the bearing position can be measured using an SKF digital thermometer.

Visual inspection

A visual inspection can be done to check the condition of the seals, plugs, housing joints and lubricant (via the oil level gauge). If a circulating oil system is used, be sure to check that sufficient oil is available in the system and that the proper quantity is actually supplied.

Condition monitoring

Condition monitoring is recommended for bearing arrangements with SONL housings, particularly if they are used on machines that have an impact on the operational reliability of the entire installation. SONL housings are provided with appropriate measurement points for accelerometers. These measurement points are perpendicular to the shaft and correspond to ISO 10816-1:1995.

SKF has extensive monitoring experience and knowledge of the dynamic behaviour of machines, machine components and bearings where damage develops. This enables SKF to recommend two powerful signal-processing techniques that can be used for condition monitoring.

Vibration velocity

The RMS (root mean square) of the velocity of vibrations in the frequency range 10 Hz to 1 kHz can be successfully used to measure phenomena such as imbalance, misalignment, resonance, etc. High levels of velocity vibration can be generated by poor machine conditions such as improper clearances, imbalance, misalignment, weak foundations, bent rotors, out-of-round, belt problems or damaged fan blades. The ISO Standard 10816-1:1995 contains recommendations for reference values for the RMS velocity values measured on different classes of machines and machine parts. Vibration velocity provides minimal information on defects in rolling element bearings or gear mesh problems. These types of defects can be easily detected by enveloped acceleration in the higher frequency ranges.

Enveloped acceleration

Enveloped acceleration can easily recognize bearing defects by measuring and analyzing a signal of the higher frequencies. This signal is generated by the impact signals typical of rolling bearing defects and gear teeth problems. The technique has proven to be extremely reliable in the detection of developing bearing damage.

Permanently installed condition monitoring systems

The SKF Multilog Condition Monitoring Unit (CMU) enables round-the-clock data acquisition from plant machinery in any industrial or process environment. The Multilog CMU collects and evaluates vibration and process machinery data from permanently installed sensors, then automatically captures alarms as they occur.

SKF Machine Condition Transmitters (MCT) deliver added value to essential production equipment by providing vital information on bearing performance that helps maximize potential machine utilization. These cost-effective MCTs can spot a potential problem before it becomes a catastrophic failure, enabling service personnel to schedule maintenance or repairs around production schedules.

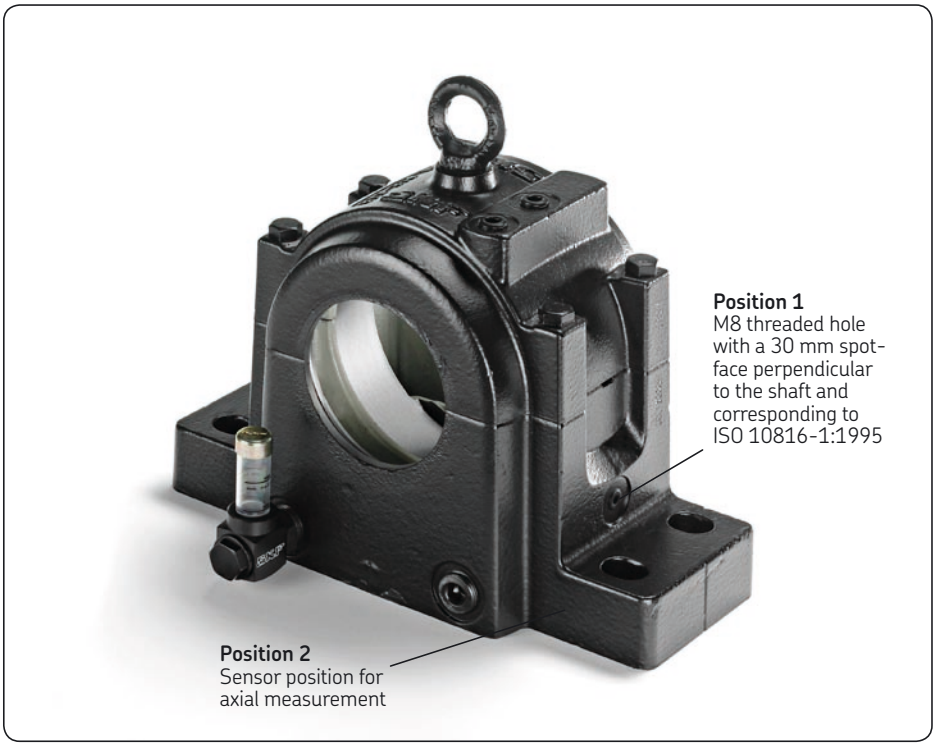
Each stand-alone monitoring device can be permanently mounted onto a machine to continuously monitor gear and bearing performance in pumps, fans, motors and other general purpose machinery.

Condition monitoring with a portable data collector and analyzer

SKF offers a range of portable condition monitoring hardware designed for the user who wishes to assess and report on temperature, oil condition, speed, bearing condition, shaft alignment, noise, vibration and more. If a measurement point is difficult to access, permanently installed sensors can be used. These can be connected by cable to a connection box accessible to the data collector.

SKF condition monitoring products

As a leading supplier of condition monitoring products, SKF offers a complete range of condition monitoring equipment to measure all important parameters. Additional information can be found in the chapter “Other related SKF products” on **page 45**.



Mounting

SONL housings equipped with SKF bearings, are robust and operationally reliable solutions. However, if they are to achieve maximum service life, they must be installed properly. Incorrect procedures or unsuitable tools can negatively impact service life.

When installing a housing, it is important to remember that the housings are internally asymmetrical.

Vertical markings on the housing base indicate the location of the axial centre of the bearing seat.

Mounting the bearing on an adapter sleeve

Mounting a bearing on an adapter sleeve requires considerable force. That is why the SKF Drive-up Method should be employed. This mounting method provides a very reliable and easy way to determine the starting position for a bearing, from which the axial displacement is to be measured. To achieve this, the following mounting equipment (→ **fig. 1**) should be used

- an SKF HMV .. E hydraulic nut (**a**)
- a hydraulic pump (**b**)
- a pressure gauge (**c**), appropriate to the mounting conditions
- a dial gauge (**d**).

Using the SKF Drive-up Method, the bearing is pushed up its seat to a defined starting position (→ **fig. 2**) using a given oil pressure (corresponding to a given drive-up force) in the hydraulic nut. In this way, part of the desired reduction in radial internal clearance is achieved. The oil pressure is monitored by the pressure gauge. The bearing is then driven up from the defined starting position through a given distance to its final position. The axial displacement is accurately determined using the dial gauge mounted on the hydraulic nut.

SKF has determined values of the requisite oil pressure and the axial displacement for individual bearings, mounted on an adapter sleeve on a straight shaft (one sliding surface).

Detailed mounting instructions, mounting tools, and the SKF Drive-up Method can be found in the catalogue "SKF Maintenance and Lubrication Products" or in the handbook "SKF Drive-up Method". Both are available online at www.skf.com.

Fig. 1

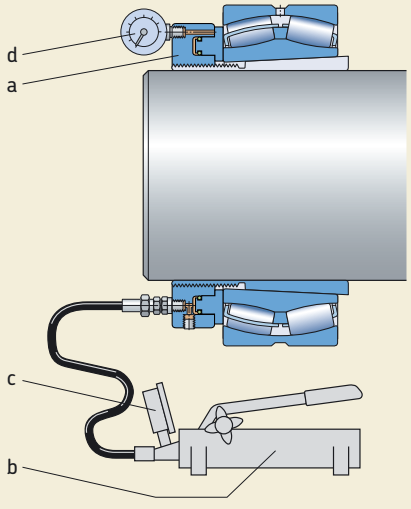
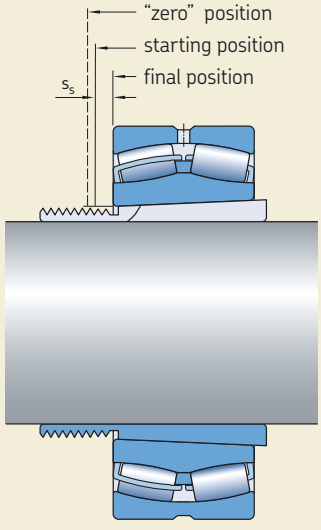


Fig. 2



Mounting the bearing on a cylindrical seat

Bearings with a cylindrical bore are mounted with an interference fit. Recommendations are provided in the section “Shaft tolerances” on **page 14**. These recommendations apply to self-aligning ball bearings, spherical roller bearings as well as to CARB bearings. The seat surface should be lightly coated with thin oil before mounting.

It is generally not possible to mount larger bearings in the cold state, as the force required to mount a bearing increases considerably as the bearing size increases. For this reason, the bearings are heated prior to mounting.

The requisite difference in temperature between the bearing ring and shaft or housing depends on the degree of interference and the diameter of the bearing seat. Bearings should not be heated to more than 125 °C. Otherwise, dimensional changes caused by alterations in the structure of the bearing material may occur.

When heating bearings, local overheating must be avoided. To heat bearings evenly, SKF electric induction heaters (→ **fig. 3**) are recommended. Detailed information on SKF heaters can be found in the catalogue “SKF Maintenance and Lubrication Products” or online at www.skf.com.

To handle heated bearings in a safe manner heat and oil resistant gloves should be worn. If a heavier hot bearing is to be mounted, lifting tackle should be used (→ **fig. 4**). A spring between the hook of the lifting tackle and the belt facilitates positioning when the bearing is pushed on the shaft. The bearing should be held in place until it has cooled sufficiently to maintain its position.

Fig. 3

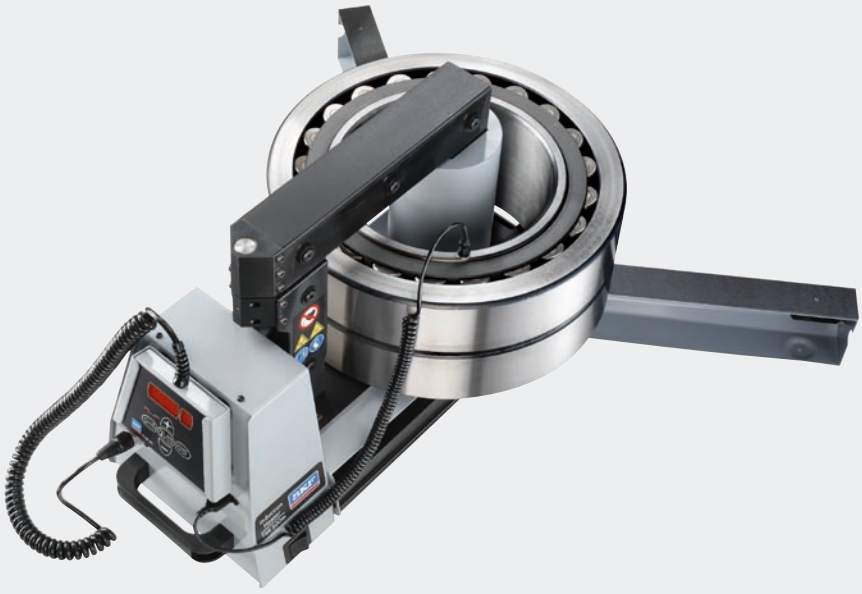
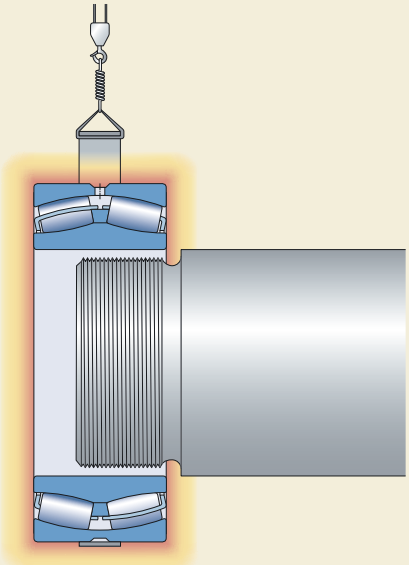


Fig. 4



Mounting SONL plummer block housings

Before beginning an installation, read the following instructions carefully.

1. Make sure that the work area is clean. Check the dimensional and form accuracy of the shaft seat. For bearings mounted on adapter sleeves, shaft seats should be machined to an h9 tolerance, a cylindricity tolerance of IT5/2 and a surface roughness $R_a \leq 3{,}2$ µm, will be satisfactory. For bearings mounted on cylindrical seats follow the guidelines in the General Catalogue. The inner spacer sleeve that carries the pick-up ring meets F7 tolerances and will fit h9 bearing seat tolerances. The outer spacer sleeve with labyrinth flange meets H7 tolerances. Guidelines for shaft tolerances can be found in the section "Shaft tolerances" on **page 14**.

2. Check that the roughness of the support surface is $R_a \leq 12{,}5$ µm. The flatness (planicity) tolerance should be to IT7.

3. Determine the position of the bearing or sleeve on the shaft.

4. Position the housing base on the support surface. The side with the oil-collecting trough at the bearing seat must be placed to the inner side of the bearing arrangement. Fit the attachment bolts, but do not tighten them.

If an oil pick-up ring will be used, install the oil level gauge on the housing base. Whenever possible, install the oil level gauge on the side opposite the oil pick-up ring so that the reading is not affected by the eddies caused by the ring.

If oil cooling tubes are used, install them now (→ "Installing oil cooling tubes" on **page 26**).

Note
To avoid oil leakage, apply an oil resistant sealant on the threads of all auxiliary components (e.g. the oil level gauge, piping or plugs).

5. Slide the inner spacer sleeve with the labyrinth flange (**a**) together with the seal ring (**b**) and O-ring (**c**) on the shaft and place the oil pick-up ring (**d**) in position on the spacer sleeve with the labyrinth flange.

Note
if an oil circulation system is going to be used, do not mount the oil pick-up ring (**d**).

6. Mount the bearing on the shaft or adapter sleeve.

7. Slide the outer spacer sleeve with the labyrinth flange (**a**) onto the shaft and place the seal ring (**b**) inclusive the O-ring (**c**) in position on the spacer sleeve. If the housing is at the end of the shaft, omit the second seal and insert the end cover together with the two O-rings in the housing base.

8. Arrange the seals against the bearing. If an adapter sleeve is used, tighten the grub (set) screw in the sleeve with a labyrinth flange. The recommended tightening torque is 8 Nm up to and including size 26, 18 Nm for sizes 28-32 and 35 Nm for sizes 34-48.

9. Place the shaft with the bearing and seal assemblies into position in the housing base.

Note
The oil pick-up ring must be placed on the side of the bearing seat, with the widest reservoir i.e. the inner side of the bearing arrangement.

10. For locating bearing arrangements and bearing arrangements with CARB bearings place a locating ring on each side of the bearing.

Note
Position the locating rings so that they are in full contact with the bearing seat in the housing base, and with the opening orientated upwards.

Do not install locating rings at the non-locating position if the housing contains a spherical roller bearing or self-aligning ball bearing.

11. Carefully align the housing base. Vertical markings at the middle of the housing base end faces can facilitate this. Then lightly tighten the attachment bolts.

12. If a circulating oil system will be used, connect the oil outlet pipes to the housing base.

Note
Make sure that the outlet pipe(s) can drain properly or the housing may overfill.

13. If an oil pick-up ring will be used, fill the housing to the indicated maximum level. The oil level gauge and cast markings inside the housing base indicate the maximum level (→ also **table 1** on **page 17**).

Note
Oil level may drop during operation. Do not overfill the housing or leaks may result.

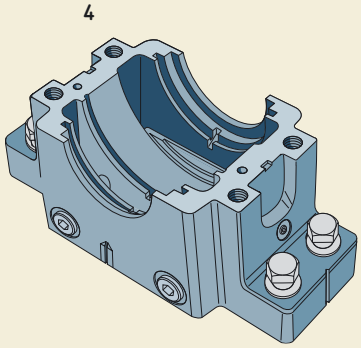
14. Cover the mating surfaces of the housing with an oil-resistant sealant.

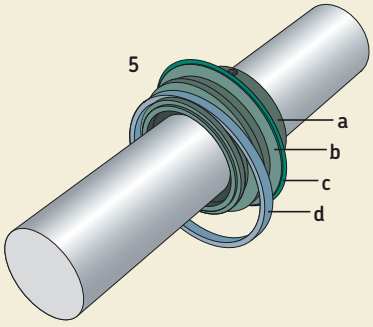
15. Place the housing cap on the base and tighten the cap bolts (to join the cap and base) according to the torque values specified in the **table 2**, on **page 28**. Place the housing cap on the base carefully to prevent damage to the O-rings.

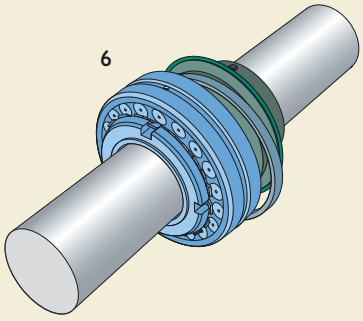
Note
The cap and base of one housing are not interchangeable with those of other housings. Check the cap and the base to make sure that they bear the same serial number.

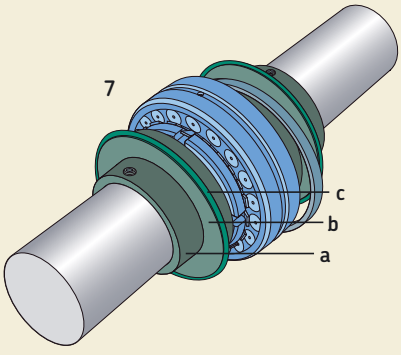
16. If an oil circulation system is used, connect the circulating oil system inlet pipe to the housing cap.

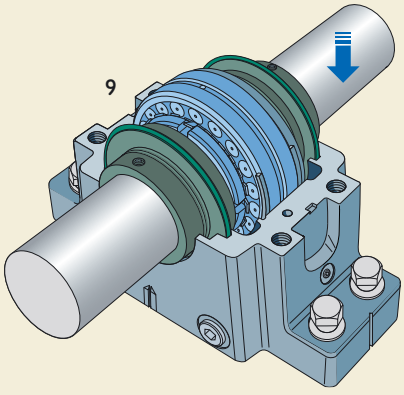
17. Check alignment and fully tighten the attachment bolts in the housing base according to the torque values specified in the **table 1** on **page 14**.

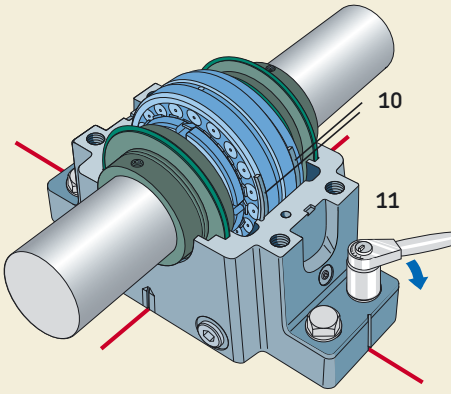

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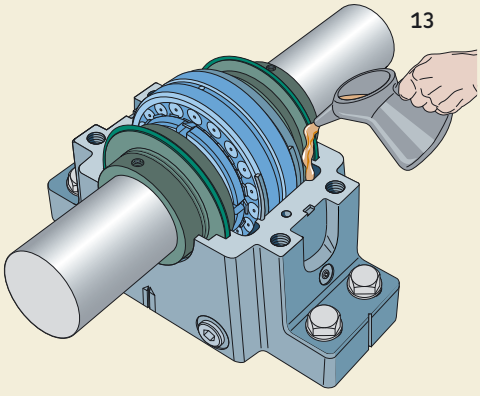

5
a
b
c
d

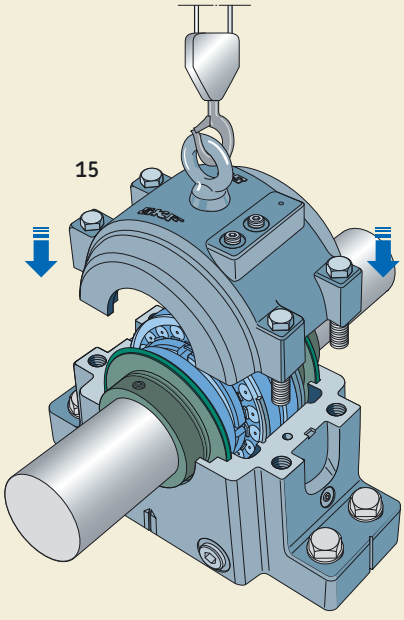

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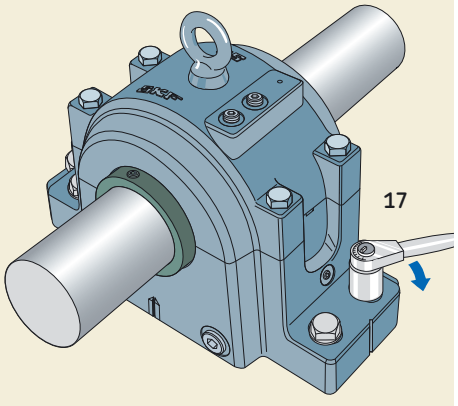

7
c
b
a


9


10
11


13


15


17

Installing oil cooling tubes

Before installing a cooling tubes, read these instructions carefully.

1. The box should contain four parts

- a pipe with a closed end (**a**)
- a T-connector (**b**)
- a long pipe with a chamfered end (**c**)
- a short pipe (**d**)

The pipes (**c**) and (**d**) are used as connections for the cooling water and have an outside diameter of 10 mm.

2. Remove a plug from the housing base.

3. Insert the pipe with the closed end (**a**) and tighten the nut.

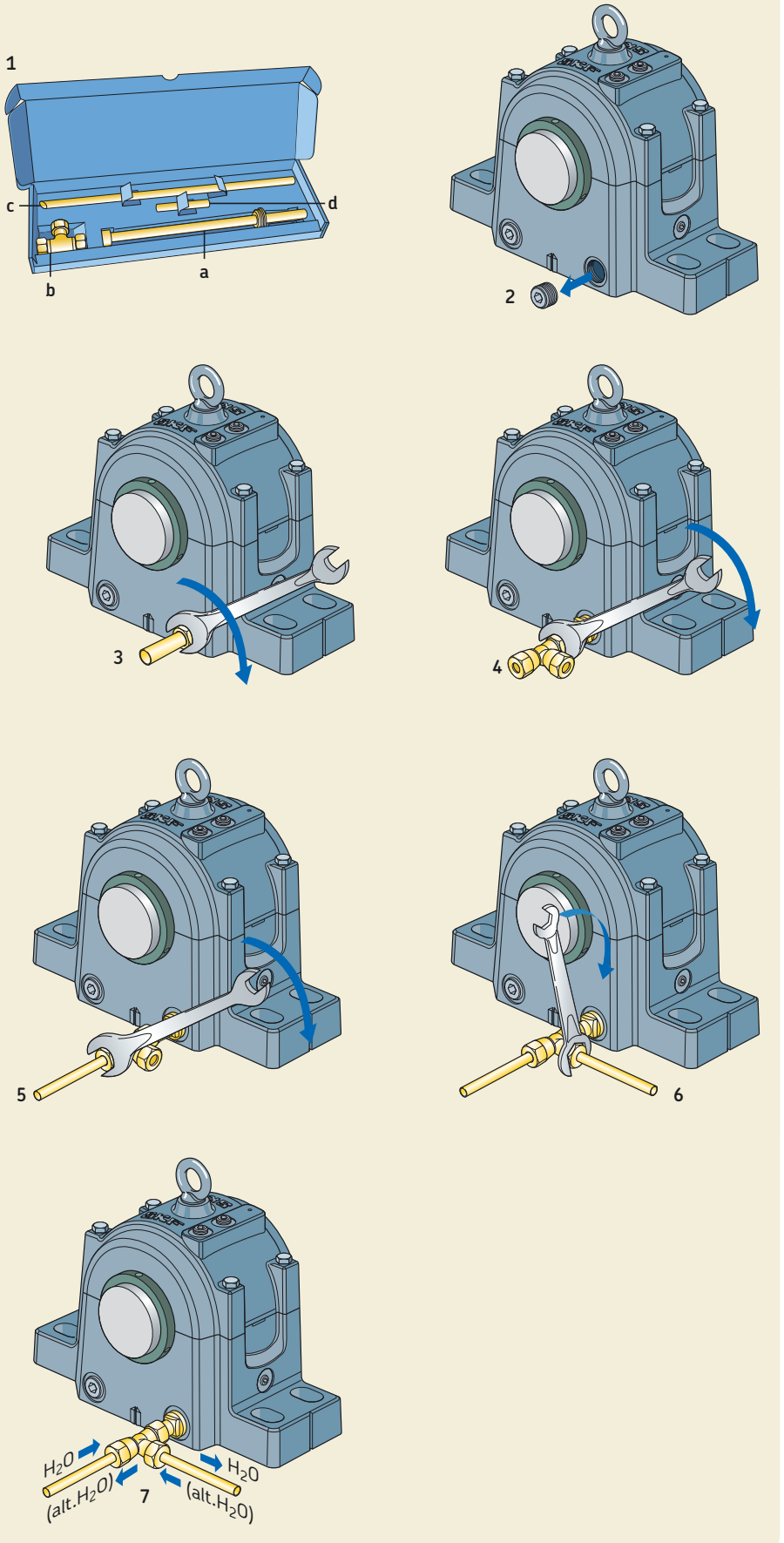
Note: To avoid oil leaks, use an oil-resistant sealant on the pipe threads.

4. Attach the T-connector (**b**) to the end of the pipe and tighten the nut. The T-connector can only be fitted one way.

5. Insert the long pipe with the chamfered end (**c**) through the T-connector into the pipe with the closed end until it reaches the end. Tighten the second nut on the T-connector.

6. Insert the short pipe (**d**) into the T-connector and tighten the nut.

7. Finally, connect the cooling water inlet and outlet to the two pipes.



Housing data – general

Dimensions

The boundary dimensions of SONL plummer block housings are dictated by practical application requirements and do not adhere to any international or national standard. These housings are dimensionally interchangeable with the previous SOFN housings in the 200 and 500 series.

Tolerances

The tolerance limit for the centre height H_1 of the shaft above the support surface is to js11. The bearing seats in the housings are machined to tolerances that enable:

- Axial displacement between the bearing outer ring and the seat in the non-locating bearing position.
- Maximum bearing service life for SKF Explorer bearings.

For SKF self-aligning bearing systems, incorporating a spherical roller bearing in the locating position and a CARB bearing in the non-locating position, SKF can supply SONL housings with a bearing seat diameter to K7 tolerance. This enables a tight fit for both outer rings to reduce substantially mechanical looseness and consequently vibrations.

Materials

Standard SONL plummer block housings are made of grey cast iron. For applications that require extra strength and resistance to shock loads, SKF can provide housings made of spheroidal graphite cast iron.

Corrosion protection

SONL plummer block housings are painted in accordance with ISO 12944-2:1998, environmental Class C2, black colour RAL 9005. An environmentally friendly, solvent-free rust inhibitor protects the unpainted surfaces. Before machining, the housing is painted inside with a light-grey oil resistant paint. Housings can be painted with other colours or to other environmental specifications upon request. The colour is resistant to normally used low-alcalic detergents. Follow the recommendations from the detergent supplier.

Axial bearing displacement

SONL plummer block housings are able to accommodate thermal elongations of the shaft between the bearing outer ring and the seat, within certain limits. Guideline values for the permissible axial displacement from the normal position of the bearing can be obtained from the designation of the appropriate locating ring. The locating ring identified by the prefix FRB and followed by the width and outside diameter in millimetres is listed in the product tables together with the bearing. This means that a housing with FRB 5/150 locating rings can accommodate axial displacements up to ± 5 mm from the normal position.

In the case of CARB bearings, where axial displacement takes place within the bearing, values for the permissible axial displacement can be estimated according to the guidelines listed in the

- SKF General Catalogue
- SKF Interactive Engineering Catalogue online at www.skf.com.

However, the axial displacement should never exceed the width of the locating ring.

Load carrying ability

SONL plummer block housings are intended for loads acting vertically towards the base plate (support). If loads acting in other directions occur, check that the magnitude of the load is permissible for the housing, for the housing, the cap bolts, and the attachment bolts.

Load carrying ability of the housing

Guideline values for the breaking load P of the housing for various load directions are provided in **table 1** on **page 28**. The permissible load for the housing can be calculated using these values and a safety factor selected relative to the operating conditions. In general engineering, a safety factor of 6 is often used.

It is important for the load carrying ability of the housing that the bolts joining the cap to the base are properly tightened to the recommended tightening torque provided in **table 2** on **page 28**. If load angles are between 55° and 120° or there are axial loads, or if the load acting parallel to the base plate (support surface) exceeds 5 % of $P_{180°}$, the housing should be doweled to the support, or a stop should be provided in the direction of the load.

Load carrying ability of the cap bolts

SONL plummer block housings are supplied with class 8.8 cap bolts. The guideline values for the yield point Q for the cap bolts are provided in **table 2** on **page 28** for various load directions. Corresponding maximum radial loads F are also provided. The cap bolt torque values in **table 2** are general guidelines based on industry specifications and normal operating conditions where external loads act through the plummer block base. For other load conditions consult the SKF application engineering service.

Table 1

Breaking loads of SONL housings

Housing Size	Breaking loads of SONL housings $P_{55°}$	$P_{90°}$	$P_{120°}$	$P_{150°}$	$P_{180°}$	P_a
–	kN					
217-517	690	260	190	180	230	90
218-518	900	350	250	230	300	120
220-520	1 080	450	300	280	360	140
222-522	1 260	500	350	320	420	170
224-524	2 100	780	580	540	700	280
226-526	2 550	980	700	650	850	340
228-528	2 550	1 020	700	650	850	340
230-530	3 000	1 230	830	770	1 000	400
232-532	3 000	1 230	830	770	1 000	400
234-534	3 360	1 330	940	860	1 120	450
236-536	3 750	1 530	1 040	960	1 250	500
238-538	3 750	1 530	1 040	960	1 250	500
240-540	4 950	2 000	1 380	1 270	1 650	660
244-544	6 350	2 550	1 750	1 600	2 100	840
248-548	6 350	2 550	1 750	1 600	2 100	840

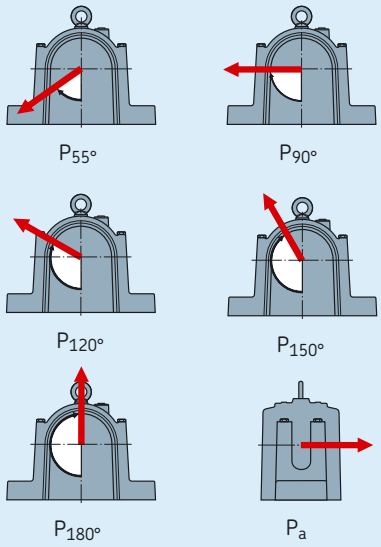
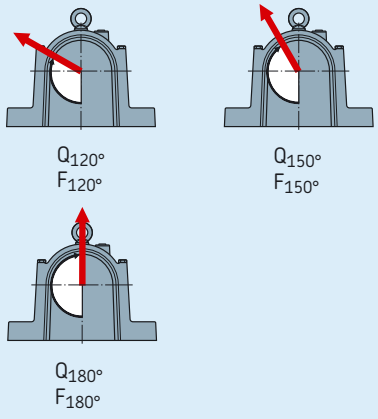


Table 2

Load carrying ability of cap bolts

Housing Size	Cap bolts Designation to ISO 4014	Yield point for 4 cap bolts $Q_{120°}$	$Q_{150°}$	$Q_{180°}$	Maximum load for 4 cap bolts $F_{120°}$	$F_{150°}$	$F_{180°}$	Recommended tightening torque for cap bolts
–	–	kN			kN			Nm
217-517	M 10×75	300	170	150	100	60	50	50
218-518	M 12×80	440	250	220	160	90	80	80
220-520	M 12×90	440	250	220	160	90	80	80
222-522	M 12×90	440	250	220	160	90	80	80
224-524	M 16×110	800	460	400	340	200	170	150
226-526	M 16×120	800	460	400	340	200	170	150
228-528	M 20×130	1 250	720	620	520	300	260	200
230-530	M 20×140	1 250	720	620	520	300	260	200
232-532	M 20×140	1 250	720	620	520	300	260	200
234-534	M 24×160	1 800	1 040	900	760	440	380	350
236-536	M 24×160	1 800	1 040	900	760	440	380	350
238-538	M 24×160	1 800	1 040	900	760	440	380	350
240-540	M 24×160	1 800	1 040	900	760	440	380	350
244-544	M 24×180	1 800	1 040	900	760	440	380	350
248-548	M 30×200	2 860	1 650	1 430	1 260	720	620	400



Designations

The designations used to identify SONL housings and their appropriate accessories are explained in the following chart. These designations consist of two main parts:

- A prefix, identifying the design of the housing or accessory, respectively.
- Figures identifying the series and size, and may be followed by a supplementary designation needed to identify a feature, which differs from the standard design.

How to order

Individual orders must be placed for the housing, the seal kit, and locating rings, if required. The appropriate ordering designations are provided in the product tables.

Example

A bearing arrangement consisting of two SKF Explorer spherical roller bearings 22224 EK on adapter sleeves must be housed and the lubricating oil needs to be cooled. The bearing in the non-locating position is at the end of the shaft. The bearing in the locating position holds the through-shaft. The following is a list of all items to be ordered

- 2 plummer block housings SONL 224-524
- 1 seal kit TSO 524
- 1 seal kit TSO 524 A
- 2 locating rings FRB 12/215
- 2 or 4 oil cooling tubes AVA 0001/3

and

- 2 SKF Explorer spherical roller bearings 22224 EK
- 2 adapter sleeves H 3124

Designation system for SONL housings and accessories

Examples

SONL	220–520	
SONL	218–518	RA
TSO	232	
TSO	232	A
ECO	224–524	
AVA	0001	/2

Identification of product design

SONL Plummer block housing of grey cast iron for oil pick-up ring lubrication or circulating oil lubrication

TSO Seal kit a through shaft, consisting of
– 2 spacer sleeves to be mounted on the shaft
– 2 seal rings and O-rings to be mounted in the housing
– 1 oil pick-up ring
– 1 oil level gauge
– 1 magnetic plug
– 1 mounting instruction

TSO .. A Seal kit for shaft end mounting, consisting of
– 1 spacer sleeve to be mounted on the shaft
– 1 seal ring and rubber O-ring to be mounted in the housing
– 1 ECO end cover and 2 rubber O-rings
– 1 oil pick-up ring
– 1 oil level gauge
– 1 magnetic plug
– 1 mounting instruction

AVA Oil cooling tubes

ECO End cover of grey cast iron supplied with two O-rings for housings for shaft end mounting

Identification of series and size

Plummer block housing

217-517 Housing for bearings in the Dimension Series 22 of size 17 to **248-548** Housing for bearings in the Dimension Series 22 of size 48

Seal kit

2(00) Seal kit for housing of same size and bearing arrangement type "Bearing on a stepped or straight shaft and cylindrical seat"

5(00) Seal kit for housing of same size and bearing arrangement type "Bearing on an adapter sleeve and straight shaft"

End cover

2(00)-5(00) End cover for housing of same size

Oil cooling tubes

0001 Basic size to fit G 3/4 to G 1 1/2 oil outlets

Identification of variants and other features

K7 Housing with bearing seat diameter machined to K7 tolerance

RA Housing with 8 tapped holes in the base for applications with circulating oil lubrication from one bearing side

VZ643 Seal kit for bearing arrangement: "Bearings on a straight shaft and a cylindrical seat"

/1 Oil cooling tubes, fit G 3/4 oil outlets

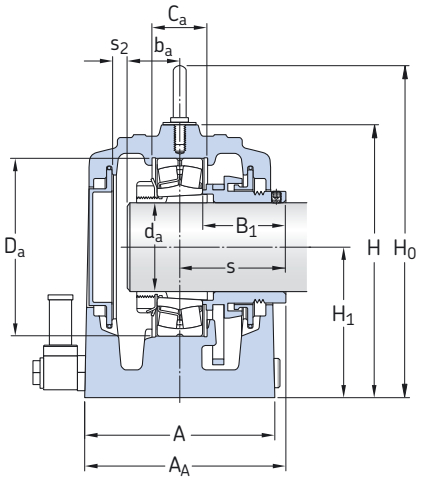
/2 Oil cooling tubes, fit G 3/4 oil outlets

/3 Oil cooling tubes, fit G 3/4 oil outlets

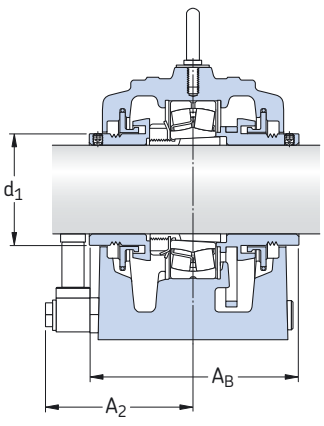
/4 Oil cooling tubes, fit G 1 1/2 oil outlets

SONL plummer block housings for bearings on an adapter sleeve, metric shafts

d_a **75 – 150** mm

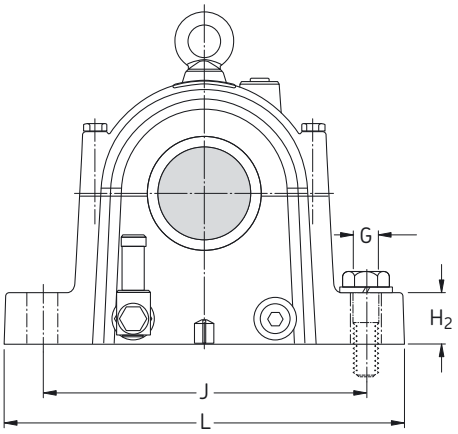


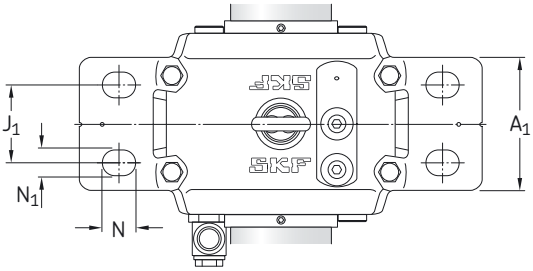
Housing for end mounting



Housing for through shaft

Shaft	Housing Dimensions																		Mass	Designations		
																				Housing	Seal kit for through shaft	Seal kit for end mounting
d_a	A	A_1	A_2	A_A	A_B	d_1	B_1	H	H_0	H_1	H_2	J	J_1	L	N	N_1	s	G				
mm	mm																		kg	–		
75	163	110	138	172	180	96	72	230	283	125	35	260	60	330	28	22	90	20	26	**SONL 217-517**	TSO 517	TSO 517 A
80	170	120	142	180	190	100	75	245	298	135	45	290	70	360	28	22	95	20	33	**SONL 218-518**	TSO 518	TSO 518 A
90	186	130	150	196	206	112	80	270	323	145	50	320	75	400	32	26	103	24	42	**SONL 220-520**	TSO 520	TSO 520 A
100	213	145	163	221	229	120	88	290	343	160	50	347	75	420	32	26	114,5	24	53	**SONL 222-522**	TSO 522	TSO 522 A
110	245	170	179	261	276	135	109	315	386	170	55	347	90	420	32	26	138	24	72	**SONL 224-524**	TSO 524	TSO 524 A
115	255	180	184	263	270	145	103	335	406	180	60	377	100	450	35	28	135	24	87	**SONL 226-526**	TSO 526	TSO 526 A
125	260	190	187	270	280	160	106	355	426	190	65	415	100	500	42	35	140	30	102	**SONL 228-528**	TSO 528	TSO 528 A
135	260	190	187	270	280	170	103,5	375	446	200	65	450	115	540	42	35	140	30	115	**SONL 230-530**	TSO 530	TSO 530 A
140	278	205	196	297	316	178	118	406	477	215	65	470	120	560	42	35	158	30	141	**SONL 232-532**	TSO 532	TSO 532 A
150	310	230	215	330	350	195	132	440	530	235	70	515	130	610	42	35	175	30	190	**SONL 234-534**	TSO 534	TSO 534 A



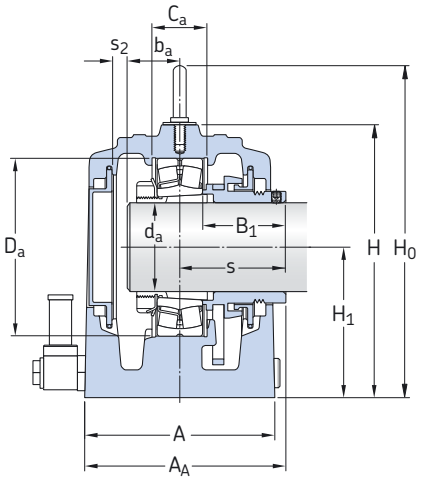


Shaft	Dimensions		Bearing seat		Oil quantity	Appropriate bearings and associated components Self-aligning ball bearing Spherical roller bearing CARB toroidal roller bearing	Adapter sleeve	Locating ring 2 per housing	Suitable end cover	Eye bolt to DIN 580
d_a	b_a	s_2	C_a	D_a	max					
mm	mm		mm		litre	–			–	–
75	40	19	46	150	0,4	**2217 K** **22217 EK** **C 2217 K**	H 317 H 317 H 317 E	FRB 5/150 FRB 5/150 FRB 5/150	ECO 217-517	M 10
80	42	19	50	160	0,5	**2218 K** **22218 EK** **C 2218 K**	H 318 H 318 H 318 E	FRB 5/160 FRB 5/160 FRB 5/160	ECO 218-518	M 12
90	46	25	60	180	0,6	**2220 KM** **22220 EK** **C 2220 K**	H 320 H 320 H 320 E	FRB 7/180 FRB 7/180 FRB 7/180	ECO 220-520	M 12
100	52,5	32,5	71	200	0,9	**2222 KM** **22222 EK** **C 2222 K**	H 322 H 322 H 322 E	FRB 9/200 FRB 9/200 FRB 9/200	ECO 222-522	M 12
110	56	47	82	215	1,3	**–** **22224 EK** **C 2224 K**[1)]	– H 3124 H 3124 L	– FRB 12/215 FRB 12/215	ECO 224-524	M 16
115	60	43	86	230	1,4	**–** **22226 EK** **C 2226 K**	– H 3126 H 3126 L	– FRB 11/230 FRB 11/230	ECO 226-526	M 16
125	63	42	90	250	1,5	**–** **22228 CCK/W33** **C 2228 K**	– H 3128 H 3128 L	– FRB 11/250 FRB 11/250	ECO 228-528	M 20
135	67,5	37,5	93	270	1,7	**–** **22230 CCK/W33** **C 2230 K**	– H 3130 H 3130 L	– FRB 10/270 FRB 10/270	ECO 230-530	M 20
140	73	42	104	290	2,0	**–** **22232 CCK/W33** **C 2232 K**[1)]	– H 3132 H 3132 L	– FRB 12/290 FRB 12/290	ECO 232-532	M 20
150	77	54	114	310	3,5	**–** **22234 CCK/W33** **C 2234 K**	– H 3134 H 3134 L	– FRB 14/310 FRB 14/310	ECO 234-534	M 24

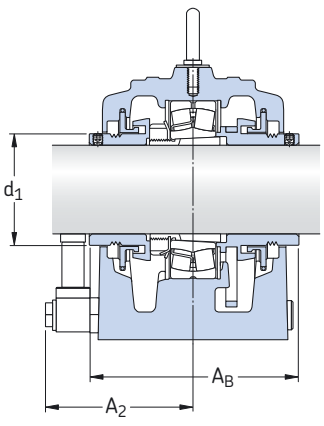
[1)] Check availability of the bearing before incorporating it in a bearing arrangement design

SONL plummer block housings for bearings on an adapter sleeve, metric shafts

d_a **160 – 220** mm

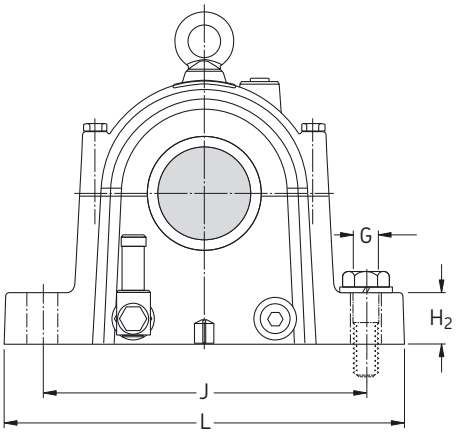


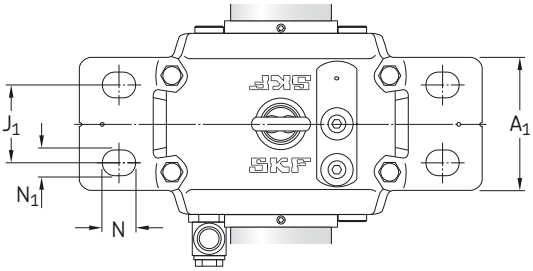
Housing for end mounting



Housing for through shaft

Shaft	Housing Dimensions																		Mass	Designations		
																				Housing	Seal kit for through shaft	Seal kit for end mounting
d_a	A	A_1	A_2	A_A	A_B	d_1	B_1	H	H_0	H_1	H_2	J	J_1	L	N	N_1	s	G				
mm	mm																		kg	–		
160	320	240	220	340	360	205	137	455	545	245	75	545	150	650	42	35	180	30	213	**SONL 236-536**	TSO 536	TSO 536 A
170	330	250	225	350	370	220	139	480	570	260	85	590	150	720	50	42	185	36	249	**SONL 238-538**	TSO 538	TSO 538 A
180	338	260	229	358	378	227	140	510	600	275	85	600	160	730	50	42	189	36	273	**SONL 240-540**	TSO 540	TSO 540 A
200	358	280	239	381	404	255	148	565	674	305	95	670	180	820	50	42	202	36	361	**SONL 244-544**	TSO 544	TSO 544 A
220	368	290	244	394	420	270	150	625	734	340	100	740	190	900	50	42	210	36	456	**SONL 248-548**	TSO 548	TSO 548 A





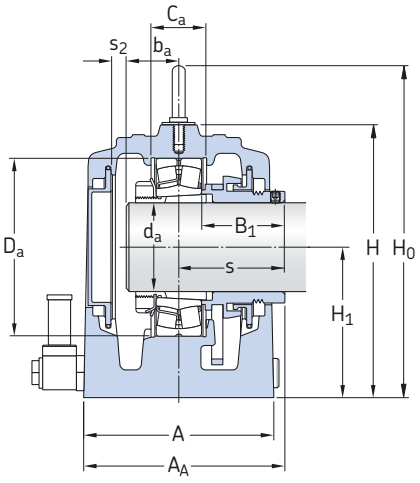
C

Shaft	Dimensions		Bearing seat		Oil quantity	Appropriate bearings and associated components Spherical roller bearing CARB toroidal roller bearing	Adapter sleeve	Locating ring 2 per housing	Suitable end cover	Eye bolt to DIN 580
d_a	b_a	s_2	C_a	D_a	max					
mm	mm		mm		litre	–			–	–
160	78	53,5	114	320	4,2	**22236 CCK/W33** **C 2236 K**[1)]	H 3136 H 3136 L	FRB 14/320 FRB 14/320	ECO 236-536	M 24
170	82	52,5	120	340	4,5	**22238 CCK/W33** **C 2238 K**	H 3138 H 3138	FRB 14/340 FRB 14/340	ECO 238-538	M 24
180	86	51	126	360	4,5	**22240 CCK/W33** **C 2240 K**[1)]	H 3140 H 3140	FRB 14/360 FRB 14/360	ECO 240-540	M 24
200	95	50	136	400	5,8	**22244 CCK/W33** **C 2244 K**	OH 3144 H OH 3144 H	FRB 14/400 FRB 14/400	ECO 244-544	M 24
220	105	45,5	148	440	6,9	**22248 CCK/W33** **C 2248 K**[1)]	OH 3148 H OH 3148 H	FRB 14/440 FRB 14/440	ECO 248-548	M 24

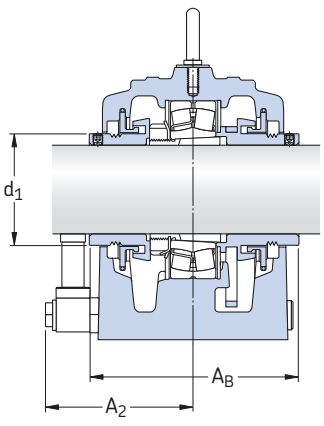
[1)] Check availability of the bearing before incorporating it in a bearing arrangement design

SONL plummer block housings for bearings on an adapter sleeve, inch shafts

d_a **2 15/16 – 5 15/16** in

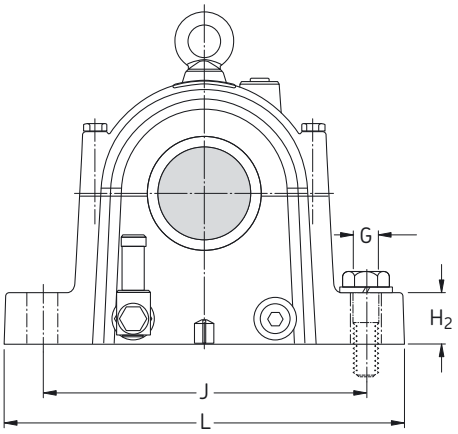


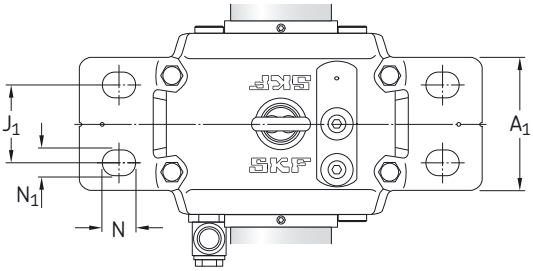
Housing for end mounting



Housing for through shaft

Shaft	Housing Dimensions																	Mass	Designations		
																			Housing	Seal kit for through shaft	Seal kit for end mounting
d_a	A	A_1	A_2	A_A	A_B	d_1	B_1	H	H_0	H_1	H_2	J	J_1	L	N	N_1	s	G				
in/*mm*	mm																	kg	–		
2 15/16 *74,613*	163	110	138	172	180	96	72	230	283	125	35	260	60	330	28	22	90	20	26	**SONL 217-517**	TSO 517/2.15/16	TSO 517/2.15/16 A
3 3/16 *80,963*	170	120	142	180	190	100	75	245	298	135	45	290	70	360	28	22	95	20	33	**SONL 218-518**	TSO 518/3.3/16	TSO 518/3.3/16 A
3 7/16 *87,313*	186	130	150	196	206	112	80	270	323	145	50	320	75	400	32	26	103	24	42	**SONL 220-520**	TSO 520/3.7/16	TSO 520/3.7/16 A
3 15/16 *100,013*	213	145	163	221	229	120	88	290	343	160	50	347	75	420	32	26	114,5	24	53	**SONL 222-522**	TSO 522/3.15/16	TSO 522/3.15/16 A
4 3/16 *106,363*	245	170	179	261	276	135	109	315	386	170	55	347	90	420	32	26	138	24	72	**SONL 224-524**	TSO 524/4.3/16	TSO 524/4.3/16 A
4 7/16 *112,713*	255	180	184	263	270	145	103	335	406	180	60	377	100	450	35	28	135	24	87	**SONL 226-526**	TSO 526/4.7/16	TSO 526/4.7/16 A
4 15/16 *125,413*	260	190	187	270	280	160	106	355	426	190	65	415	100	500	42	35	140	30	102	**SONL 228-528**	TSO 528/4.15/16	TSO 528/4.15/16 A
5 3/16 *131,763*	260	190	187	270	280	170	103,5	375	446	200	65	450	115	540	42	35	140	30	115	**SONL 230-530**	TSO 530/5.3/16	TSO 530/5.3/16 A
5 7/16 *138,113*	278	205	196	297	316	178	118	406	477	215	65	470	120	560	42	35	158	30	141	**SONL 232-532**	TSO 532/5.7/16	TSO 532/5.7/16 A
5 15/16 *150,813*	310	230	215	330	350	195	132	440	530	235	70	515	130	610	42	35	175	30	190	**SONL 234-534**	TSO 534/5.15/16	TSO 534/5.15/16 A





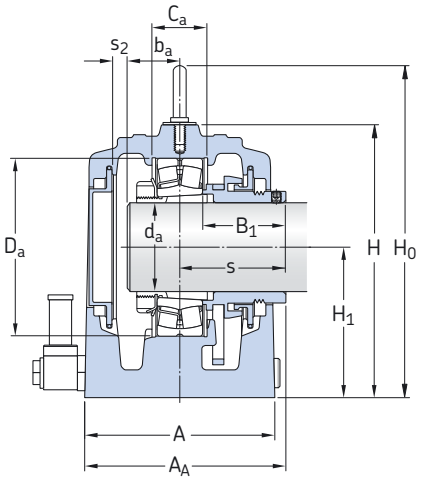
C

Shaft	Dimensions		Bearing seat		Oil quantity	Appropriate bearings and associated components Self-aligning ball bearing Spherical roller bearing CARB toroidal roller bearing	Adapter sleeve	Locating ring 2 per housing	Suitable end cover	Eye bolt to DIN 580
d_a	b_a	s_2	C_a	D_a	max					
in/*mm*	mm		mm		litre	–			–	–
2 15/16 *74,613*	40	19	46	150	0,4	**2217 K** **22217 EK** **C 2217 K**	HA 317 HA 317 HA 317 E	FRB 5/150 FRB 5/150 FRB 5/150	ECO 217-517	M 10
3 3/16 *80,963*	42	19	50	160	0,5	**2218 K** **22218 EK** **C 2218 K**	HA 318 HA 318 HA 318 E	FRB 5/160 FRB 5/160 FRB 5/160	ECO 218-518	M 12
3 7/16 *87,313*	47	25	60	180	0,6	**2220 KM** **22220 EK** **C 2220 K**	HA 320 HA 320 HA 320 E	FRB 7/180 FRB 7/180 FRB 7/180	ECO 220-520	M 12
3 15/16 *100,013*	52,5	32,5	71	200	0,9	**2222 KM** **22222 EK** **C 2222 K**	H 322 H 322 H 322 E	FRB 9/200 FRB 9/200 FRB 9/200	ECO 222-522	M 12
4 3/16 *106,363*	56	47	82	215	1,3	**–** **22224 EK** **C 2224 K**[1)]	– HA 3124 HA 3124 L	– FRB 12/215 FRB 12/215	ECO 224-524	M 16
4 7/16 *112,713*	60	43	86	230	1,4	**–** **22226 EK** **C 2226 K**	– HA 3126 HA 3126 L	– FRB 11/230 FRB 11/230	ECO 226-526	M 16
4 15/16 *125,413*	63	42	90	250	1,5	**–** **22228 CCK/W33** **C 2228 K**	– HA 3128 HA 3128 L	– FRB 11/250 FRB 11/250	ECO 228-528	M 20
5 3/16 *131,763*	67,5	37,5	93	270	1,7	**–** **22230 CCK/W33** **C 2230 K**	– HA 3130 HA 3130 L	– FRB 10/270 FRB 10/270	ECO 230-530	M 20
5 7/16 *138,113*	73	42	104	290	2,0	**–** **22232 CCK/W33** **C 2232 K**[1)]	– HA 3132 HA 3132 L	– FRB 12/290 FRB 12/290	ECO 232-532	M 20
5 15/16 *150,813*	77	54	114	310	3,5	**–** **22234 CCK/W33** **C 2234 K**	– HA 3134 HA 3134 L	– FRB 14/310 FRB 14/310	ECO 234-534	M 24

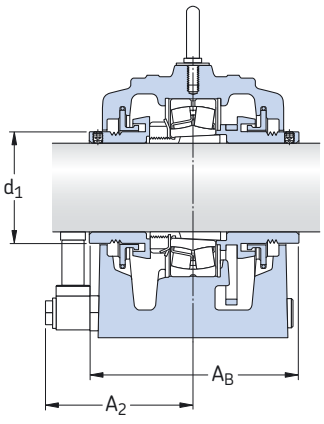
[1)] Check availability of the bearing before incorporating it in a bearing arrangement design

SONL plummer block housings for bearings on an adapter sleeve, inch shafts

d_a **6 7/16 – 8 15/16** in

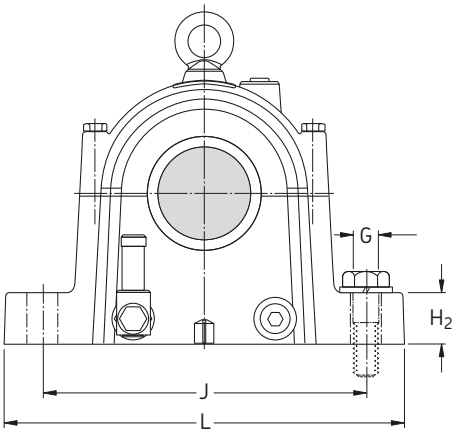


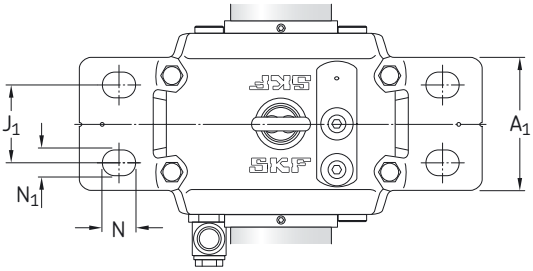
Housing for end mounting



Housing for through shaft

Shaft	Housing Dimensions																	Mass	Designations		
																			Housing	Seal kit for through shaft	Seal kit for end mounting
d_a	A	A_1	A_2	A_A	A_B	d_1	B_1	H	H_0	H_1	H_2	J	J_1	L	N	N_1	s	G				
in/*mm*	mm																	kg	–		
6 7/16 *163,513*	320	240	220	340	360	205	137	455	545	245	75	545	150	650	42	35	180	30	213	**SONL 236-536**	TSO 536/6.7/16	TSO 536/6.7/16 A
6 15/16 *176,213*	330	250	225	350	370	220	139	480	570	260	85	590	150	720	50	42	185	36	249	**SONL 238-538**	TSO 538/6.15/16	TSO 538/6.15/16 A
7 3/16 *182,563*	338	260	229	358	378	227	140	510	600	275	85	600	160	730	50	42	189	36	273	**SONL 240-540**	TSO 540/7.3/16	TSO 540/7.3/16 A
7 15/16 *201,613*	358	280	239	381	404	255	148	565	674	305	95	670	180	820	50	42	202	36	361	**SONL 244-544**	TSO 544/7.15/16	TSO 544/7.15/16 A
8 15/16 *227,013*	368	290	244	394	420	270	150	625	734	340	100	740	190	900	50	42	210	36	456	**SONL 248-548**	TSO 548/8.15/16	TSO 548/8.15/16 A

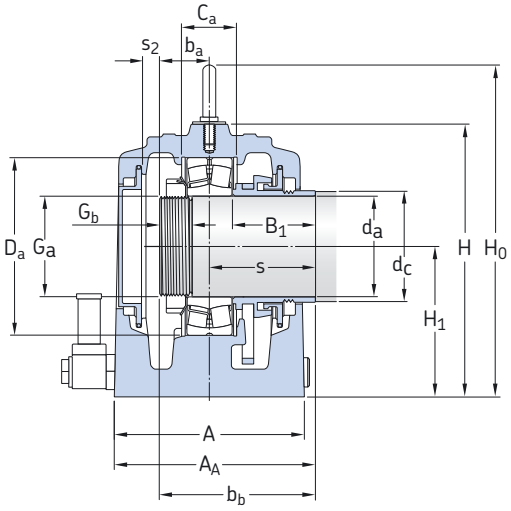




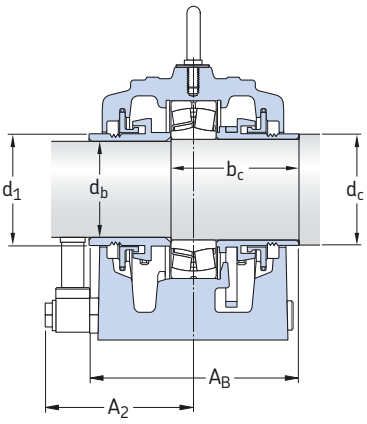
Shaft	Dimensions		Bearing seat		Oil quantity	Appropriate bearings and associated components Spherical roller bearing CARB toroidal roller bearing	Adapter sleeve	Locating ring 2 per housing	Suitable end cover	Eye bolt to DIN 580
d_a	b_a	s_2	C_a	D_a	max					
in/*mm*	mm		mm		litre	–			–	–
6 7/16 *163,513*	78	53,5	114	320	4,2	**22236 CCK/W33** **C 2236 K**[1)]	HA 3136 HA 3136 L	FRB 14/320 FRB 14/320	ECO 236-536	M 24
6 15/16 *176,213*	82	52,5	120	340	4,5	**22238 CCK/W33** **C 2238 K**	HA 3138 HA 3138	FRB 14/340 FRB 14/340	ECO 238-538	M 24
7 3/16 *182,563*	86	51	126	360	4,5	**22240 CCK/W33** **C 2240 K**[1)]	HA 3140 HA 3140	FRB 14/360 FRB 14/360	ECO 240-540	M 24
7 15/16 *201,613*	95	50	136	400	5,8	**22244 CCK/W33** **C 2244 K**	H 3044/7.15/16 H 3044/7.15/16	FRB 14/400 FRB 14/400	ECO 244-544	M 24
8 15/16 *227,013*	105	45,5	148	440	6,9	**22248 CCK/W33** **C 2248 K**[1)]	H 3148/8.15/16 H 3148/8.15/16	FRB 14/440 FRB 14/440	ECO 248-548	M 24

[1)] Check availability of the bearing before incorporating it in a bearing arrangement design

SONL plummer block housings for bearings with a cylindrical bore
d_a **85 – 170** mm

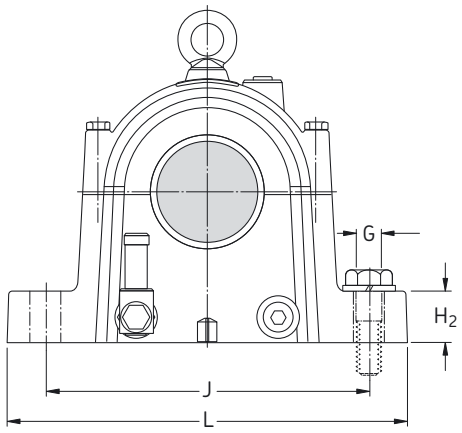


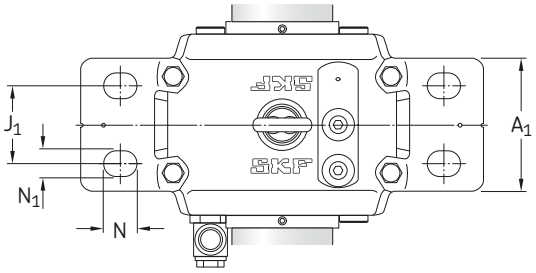
Housing for end mounting



Housing for through shaft

Shaft	Housing Dimensions																		Mass	Designations		
																				Housing	Seal kit for through shaft	Seal kit for end mounting
d_a	A	A_1	A_2	A_A	A_B	d_1	B_1	H	H_0	H_1	H_2	J	J_1	L	N	N_1	s	G				
mm	mm																		kg	–		
85	163	110	138	172	180	96	72	230	283	125	35	260	60	330	28	22	90	20	26	**SONL 217-517**	TSO 217	TSO 217 A
90	170	120	142	180	190	100	75	245	298	135	45	290	70	360	28	22	95	20	33	**SONL 218-518**	TSO 218	TSO 218 A
100	186	130	150	196	206	112	80	270	323	145	50	320	75	400	32	26	103	24	42	**SONL 220-520**	TSO 220	TSO 220 A
110	213	145	163	221	229	120	88	290	343	160	50	347	75	420	32	26	114,5	24	52	**SONL 222-522**	TSO 222	TSO 222 A
120	245	170	179	261	276	135	109	315	386	170	55	347	90	420	32	26	138	24	70	**SONL 224-524**	TSO 224	TSO 224 A
130	255	180	184	263	270	145	103	335	406	180	60	377	100	450	35	28	135	24	84	**SONL 226-526**	TSO 226	TSO 226 A
140	260	190	187	270	280	160	106	355	426	190	65	415	100	500	42	35	140	30	100	**SONL 228-528**	TSO 228	TSO 228 A
150	260	190	187	270	280	170	107	375	446	200	65	450	115	540	42	35	140	30	113	**SONL 230-530**	TSO 230	TSO 230 A
160	278	205	196	297	316	178	118	406	477	215	65	470	120	560	42	35	158	30	136	**SONL 232-532**	TSO 232	TSO 232 A
170	310	230	215	330	350	195	132	440	530	235	70	515	130	610	42	35	175	30	185	**SONL 234-534**	TSO 234	TSO 234 A

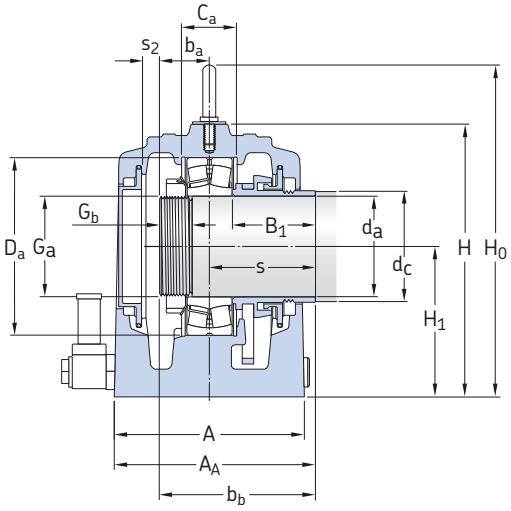




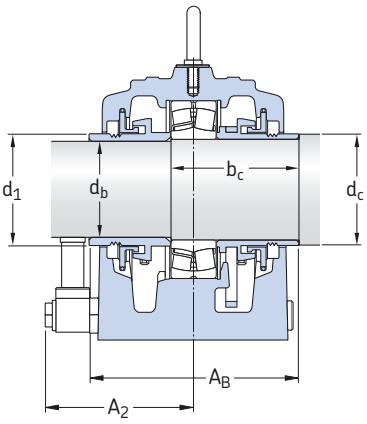
Shaft			Dimensions					Bearing seat		Oil quantity	Appropriate bearings and associated components Self-aligning ball bearing Spherical roller bearing CARB toroidal roller bearing	Locating ring 2 per housing	Lock nut	Locking washer	Suitable end cover	Eye bolt to DIN 580
d_a	d_b	d_c min	b_b	b_c	G_a	G_b	s_2	C_a	D_a	max						
mm			mm					mm		litre	–				–	–
85	83	91	130	105	M 85×2	24	19,0	46	150	0,4	**2217** **22217 E** **C 2217**	FRB 5/150 FRB 5/150 FRB 5/150	KM 17 KM 17 KMFE 17	MB 17 MB 17 –	ECO 217-517	M 10
90	88	96	137	112	M 90×2	24	19,0	50	160	0,5	**2218** **22218 E** **C 2218**	FRB 5/160 FRB 5/160 FRB 5/160	KM 18 KM 18 KMFE 18	MB 18 MB 18 –	ECO 218-518	M 12
100	98	106	150	123	M 100×2	26	25,0	60	180	0,6	**2220 M** **22220 E** **C 2220**	FRB 7/180 FRB 7/180 FRB 7/180	KM 20 KM 20 KMFE 20	MB 20 MB 20 –	ECO 220-520	M 12
110	108	116	167	138	M 110×2	28	32,5	71	200	0,9	**2222 M** **22222 E** **C 2222**	FRB 9/200 FRB 9/200 FRB 9/200	KM 22 KM 22 KMFE 22	MB 22 MB 22 –	ECO 222-522	M 12
120	118	126	194	164	M 120×2	29	47,0	82	215	1,3	**–** **22224 E** **C 2224**[1]	– FRB 12/215 FRB 12/215	– KM 24 KML 24	– MB 24 MBL 24	ECO 224-524	M 16
130	128	138	195	164	M 130×2	31	43	86	230	1,4	**–** **22226 E** **C 2226**	– FRB 11/230 FRB 11/230	– KM 26 KML 26	– MB 26 MBL 26	ECO 226-526	M 16
140	138	148	203	170	M 140×2	32	42,0	90	250	1,5	**–** **22228 E** **C 2228**	– FRB 11/250 FRB 11/250	– KM 28 KML 28	– MB 28 MBL 28	ECO 228-528	M 20
150	148	158	207,5	173	M 150×2	34	37,5	93	270	1,7	**–** **22230 E** **C 2230**	– FRB 10/270 FRB 10/270	– KM 30 KML 30	– MB 30 MBL 30	ECO 230-530	M 20
160	158	168	231	195	M 160×3	36	42,0	104	290	2,0	**–** **22232 E** **C 2232**[1]	– FRB 12/290 FRB 12/290	– KM 32 KML 32	– MB 32 MBL 32	ECO 232-532	M 20
170	168	180	252	213	M 170×3	38	54	114	310	3,5	**–** **22234 CC/W33** **C 2234**	– FRB 14/310 FRB 14/310	– KM 34 KML 34	– MB 34 MBL 34	ECO 234-534	M 24

[1] Check availability of the bearing before incorporating it in a bearing arrangement design

SONL plummer block housings for bearings with a cylindrical bore
d_a **180 – 240** mm

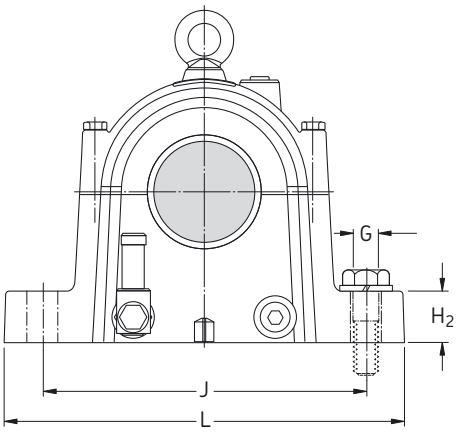


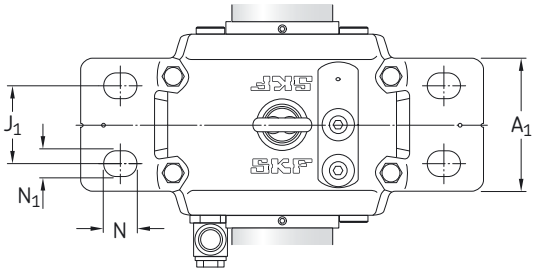
Housing for end mounting



Housing for through shaft

Shaft	Housing Dimensions																		Mass	Designations		
																				Housing	Seal kit for through shaft	Seal kit for end mounting
d_a	A	A_1	A_2	A_A	A_B	d_1	B_1	H	H_0	H_1	H_2	J	J_1	L	N	N_1	s	G				
mm	mm																		kg	–		
180	320	240	220	340	360	205	137	455	545	245	75	545	150	650	42	35	180	30	208	**SONL 236-536**	TS0 236	TS0 236 A
190	330	250	225	350	370	220	139	480	570	260	85	590	150	720	50	42	185	36	244	**SONL 238-538**	TS0 238	TS0 238 A
200	338	260	229	358	378	227	140	510	600	275	85	600	160	730	50	42	189	36	267	**SONL 240-540**	TS0 240	TS0 240 A
220	358	280	239	381	404	255	148	565	674	305	95	670	180	820	50	42	202	36	355	**SONL 244-544**	TS0 244	TS0 244 A
240	368	290	244	394	420	270	150	625	734	340	100	740	190	900	50	42	210	36	450	**SONL 248-548**	TS0 248	TS0 248 A





C

Shaft			Dimensions					Bearing seat		Oil quantity	Appropriate bearings and associated components Spherical roller bearing CARB toroidal roller bearing	Locating ring 2 per housing	Lock nut	Locking washer	Suitable end cover	Eye bolt to DIN 580
d_a	d_b	d_c min	b_b	b_c	G_a	G_b	s_2	C_a	D_a	max						
mm			mm					mm		litre	–				–	–
180	177	196	258	223	M 180×3	39	53,5	114	320	4,2	**22236 CC/W33** **C 2236**[1]	FRB 14/320 FRB 14/320	KM 36 KML 36	MB 36 MBL 36	ECO 236-536	M 24
190	188	208	267	231	M 190×3	40	52,5	120	340	4,5	**22238 CC/W33** **C 2238**	FRB 14/340 FRB 14/340	KM 38 KML 38	MB 38 MBL 38	ECO 238-538	M 24
200	198	218	275	233	M 200×3	41	51	126	360	4,5	**22240 CC/W33** **C 2240**[1]	FRB 14/360 FRB 14/360	KM 40 KML 40	MB 40 MBL 40	ECO 240-540	M 24
220	218	238	297	256	Tr 220×4	45	50	136	400	5,8	**22244 CC/W33** **C 2244**	FRB 14/400 FRB 14/400	HM 44 T HM 44 T	MB 44 MB 44	ECO 244-544	M 24
240	238	258	315	270	Tr 240×4	49	45,5	148	440	6,9	**22248 CC/W33** **C 2248**[1]	FRB 14/440 FRB 14/440	HM 48 T HM 3048	MB 48 MS 3052-48	ECO 248-548	M 24

[1] Check availability of the bearing before incorporating it in a bearing arrangement design

Other related SKF products

Robust, high-performance standard bearings

SKF produces spherical roller bearings, self-aligning ball bearings and CARB toroidal roller bearings normally incorporated in SONL plummer block housings. These bearings are available in many sizes and several designs. All three bearing types are self-aligning.

The spherical roller bearings and the self-aligning ball bearings can be used in both the locating and non-locating bearing position. CARB bearings accommodate axial displacements within the bearing and are always non-locating. It is common practice to combine a CARB bearing at the non-locating side with a spherical roller bearing or a self-aligning ball bearing arranged as a locating bearing at the other side.



Accessories

Adapter sleeves for easy mounting

Bearings with a tapered bore can be mounted on straight shafts with the aid of an adapter sleeve. These sleeves are produced by SKF in sizes appropriate for the range of bearings that can be used in SONL housings.

Adapter sleeves are slotted sleeves with a tapered outside diameter. The sizes used with bearings for SONL housings have an external taper of 1:12 and are supplied complete with lock nut and locking washer (sleeves for CARB bearings up to and inclusive size 22 have a KMFE locknut without locking washer). Their dimensions are in accordance with ISO 2982-1:1995.



Lock nuts for reliable locking

SKF lock nuts, also referred to as shaft nuts, are available in several designs to axially locate bearings on shaft ends. The most popular are series KM, KML and KMFE. KM and KML nuts have four equally spaced slots in the outside diameter and are locked in position with locking washers that engage a keyway in the shaft. For KMFE nuts, there is no keyway needed. The nut dimensions, and the dimensions of the series MB and MBL locking washers, are in accordance with ISO 2982-2:1995.



Other bearing housings

To meet a wide variety of application demands, SKF produces a comprehensive range of bearing housings in addition to the SONL plummer block housings. While most SKF housings are split plummer block housings, other designs are available, including

- one-piece plummer block housings
- flanged housings
- take-up housings
- two-bearing housings.

Most of these housings require grease lubrication and are designed to accommodate self-aligning bearings with shaft diameters up to 1 800 mm. The housings are available for bearings with a cylindrical or tapered bore for mounting on adapter or withdrawal sleeves. Straight or stepped shafts can be used.

The popular SKF plummer block housings in the SNL design for shaft diameters above 50 mm can be also used for oil-lubrication. When using oil, however, specially developed seals must be incorporated to avoid oil loss from the housing.

Most housings are made of grey cast iron, but spheroidal graphite cast iron or cast steel housings are included in the range.

More information about popular SNL housings can be found in the brochures 6112 "SNL plummer block housings" and 6101 "SNL 30, SNL 31 and SNL 32 plummer block housings".

Products for mounting and dismounting

Mounting and dismounting a spherical roller bearing or a CARB toroidal roller bearing requires a high degree of skill and the proper tools.

SKF's comprehensive range of tools and equipment offer everything that is required, including

- mechanical tools
- heaters
- hydraulic tools and equipment for all sizes of bearings.

Additionally, SKF provides a range of proven solutions for easy bearing mounting and dismounting. The most common are

- the "SKF Drive-up Method"
- the "SKF Oil injection Method".

Both methods were developed by SKF. Detailed information about these solutions can be found in handbooks available on CD-ROM from your SKF representative.



Condition monitoring products

The goal of condition monitoring is to significantly reduce operating downtime and maintenance costs by maximizing long-term performance, and virtually eliminating unplanned downtime.

To meet these goals, SKF recommends a programme of periodic or continuous condition monitoring. Through condition monitoring, initial bearing and gear damage can be detected and evaluated so that maintenance and repair activities can be scheduled accordingly. This helps to prevent unplanned stoppages. Applied to all machinery, condition monitoring can significantly decrease downtime, often exceeding the original equipment specifications.

To determine the condition of a machine and its bearings while in operation, SKF has a wide range of handheld measuring instruments that can analyse critical performance parameters like

- temperature
- speed
- noise
- oil condition.

Additionally, SKF provides a comprehensive range of vibration detection, analysis and diagnostic products, which enable process monitoring as an added benefit. This product assortment includes

- SKF Microlog Series Data Collector/ FFT Analyzers
- MARLIN System
- SKF MicroVibe P
- SKF Vibration Pen plus
- SKF Machine Condition Transmitters
- SKF Multilog Condition Monitoring Unit
- SKF Machine Analyst software
- SKF @ptitude Industrial Descision Support Software.

The SKF product range also includes alignment tools to measure and execute

- shaft alignment
- pulley alignment.

Basic information about SKF condition monitoring products as well as mounting, measuring and alignment tools can be found in the catalogue “SKF Maintenance and Lubrication Products” or online at www.skf.com.







SKF – the knowledge engineering company

From the company that invented the self-aligning ball bearing more than 100 years ago, SKF has evolved into a knowledge engineering company that is able to draw on five technology platforms to create unique solutions for its customers. These platforms include bearings, bearing units and seals, of course, but extend to other areas including: lubricants and lubrication systems, critical for long bearing life in many applications; mechatronics that combine mechanical and electronics knowledge into systems for more effective linear motion and sensorized solutions; and a full range of services, from design and logistics support to conditioning monitoring and reliability systems.

Though the scope has broadened, SKF continues to maintain the world's leadership in the design, manufacture and marketing of rolling bearings, as well as complementary products such as radial seals. SKF also holds an increasingly important position in the market for linear motion products, high-precision aerospace bearings, machine tool spindles and plant maintenance services.

The SKF Group is globally certified to ISO 14001, the international standard for environmental management, as well as OHSAS 18001, the health and safety management standard. Individual divisions have been approved for quality certification in accordance with ISO 9001 and other customer specific requirements.

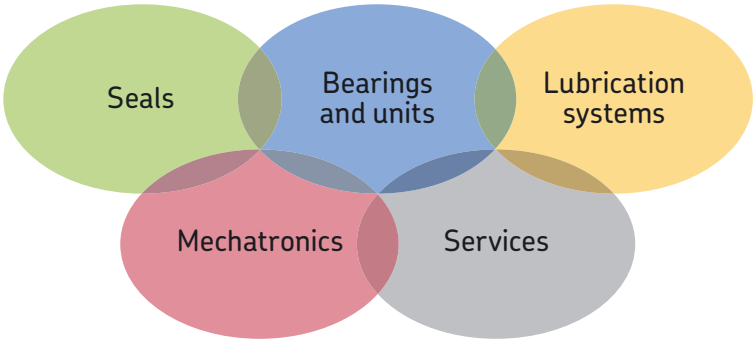
With over 100 manufacturing sites worldwide and sales companies in 70 countries, SKF is a truly international corporation. In addition, our distributors and dealers in some 15 000 locations around the world, an e-business marketplace and a global distribution system put SKF close to customers for the supply of both products and services. In essence, SKF solutions are available wherever and whenever customers need them. Overall, the SKF brand and the corporation are stronger than ever. As the knowledge engineering company, we stand ready to serve you with world-class product competencies, intellectual resources, and the vision to help you succeed.



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Evolving by-wire technology
SKF has a unique expertise in fast-growing by-wire technology, from fly-by-wire, to drive-by-wire, to work-by-wire. SKF pioneered practical fly-by-wire technology and is a close working partner with all aerospace industry leaders. As an example, virtually all aircraft of the Airbus design use SKF by-wire systems for cockpit flight control.

SKF is also a leader in automotive by-wire technology, and has partnered with automotive engineers to develop two concept cars, which employ SKF mechatronics for steering and braking. Further by-wire development has led SKF to produce an all-electric forklift truck, which uses mechatronics rather than hydraulics for all controls.







Harnessing wind power
The growing industry of wind-generated electric power provides a source of clean, green electricity. SKF is working closely with global industry leaders to develop efficient and trouble-free turbines, providing a wide range of large, highly specialized bearings and condition monitoring systems to extend equipment life of wind farms located in even the most remote and inhospitable environments.



Working in extreme environments
In frigid winters, especially in northern countries, extreme sub-zero temperatures can cause bearings in railway axleboxes to seize due to lubrication starvation. SKF created a new family of synthetic lubricants formulated to retain their lubrication viscosity even at these extreme temperatures. SKF knowledge enables manufacturers and end user customers to overcome the performance issues resulting from extreme temperatures, whether hot or cold. For example, SKF products are at work in diverse environments such as baking ovens and instant freezing in food processing plants.



Developing a cleaner cleaner
The electric motor and its bearings are the heart of many household appliances. SKF works closely with appliance manufacturers to improve their products' performance, cut costs, reduce weight, and reduce energy consumption. A recent example of this cooperation is a new generation of vacuum cleaners with substantially more suction. SKF knowledge in the area of small bearing technology is also applied to manufacturers of power tools and office equipment.



Maintaining a 350 km/h R&D lab
In addition to SKF's renowned research and development facilities in Europe and the United States, Formula One car racing provides a unique environment for SKF to push the limits of bearing technology. For over 50 years, SKF products, engineering and knowledge have helped make Scuderia Ferrari a formidable force in F1 racing. (The average racing Ferrari utilizes more than 150 SKF components.) Lessons learned here are applied to the products we provide to automakers and the aftermarket worldwide.



Delivering Asset Efficiency Optimization
Through SKF Reliability Systems, SKF provides a comprehensive range of asset efficiency products and services, from condition monitoring hardware and software to maintenance strategies, engineering assistance and machine reliability programmes. To optimize efficiency and boost productivity, some industrial facilities opt for an Integrated Maintenance Solution, in which SKF delivers all services under one fixed-fee, performance-based contract.



Planning for sustainable growth
By their very nature, bearings make a positive contribution to the natural environment, enabling machinery to operate more efficiently, consume less power, and require less lubrication. By raising the performance bar for our own products, SKF is enabling a new generation of high-efficiency products and equipment. With an eye to the future and the world we will leave to our children, the SKF Group policy on environment, health and safety, as well as the manufacturing techniques, are planned and implemented to help protect and preserve the earth's limited natural resources. We remain committed to sustainable, environmentally responsible growth.



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