

# Split plummer block housings for converters in steel making SKND series

**Bearing types**

- Spherical roller bearings
- Split spherical roller bearings
- CARB toroidal roller bearings

**Shaft diameter range**

530 to 1 180 mm

**Typical shaft-bearing combinations**

Stepped trunnion with bearing on cylindrical seat

**Seal**

Lip seal with metal protecting ring

**Lubrication**

Grease

**Material**

Spheroidal graphite cast iron

**Supersedes**

SDKD

SKND plummer (pillow) block housings are robust housings, specially designed to withstand the harsh operating conditions surrounding LD and AOD converters. Whether manufacturing LD or AOD converters, the design of each component used to support the trunnion ring is driven by the challenges of contamination, heavy radial loads, misalignment and the induced axial loads that result from expansion and contraction of the trunnion ring. There is a simple solution to the challenge of induced axial loads. It's the total trunnion solution from SKF, which consists of the unique SKF self-aligning bearing system, combined with a re-designed housing and seals. The total trunnion solution avoids induced axial loads, eliminating the need for additional components.

# Split plummer block housings for converters in steel making SKND series

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## Designations

Designation system for SKND converter housings

SKND 49/950 F

Housing series

SKND Converter housing

Size identification

30 Housing for bearings in the 230 and C30 series  
49 Housing for bearings in the 249 and C49 series  
/530 Bearing bore diameter [mm]

Suffixes

F Housing for the locating bearing  
L Housing with sliding bushing  
VC Housing for CARB bearing

Designation system for seals

CS 1 000

Series

CS Lip seal for SKND converter housings

Size identification

1 000 Sealing position shaft diameter ("d<sub>b</sub>") [mm]

## Split plummer block housings for steel converters, SKND series

### Housing design

SKND converter housings are split housings consisting of a cap and base (→ **fig. 1**) and split housing covers and seal covers on each side. The base has four bosses that have been drilled and spotfaced to provide a flat surface for washers and attachment bolts.

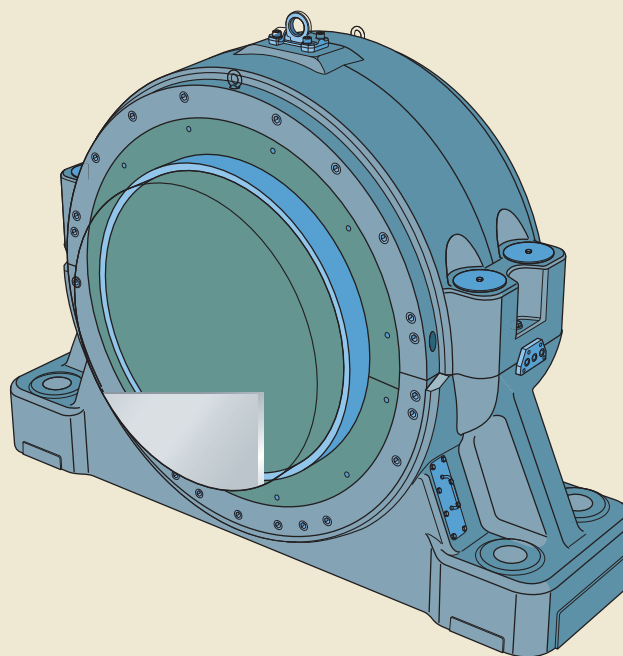
There are three basic housing variants:

- Housings for locating (fixed) bearings (designation suffix F)
- Housings for non-locating (free or loose) spherical roller bearings (designation suffix L)
- Housings for non-locating CARB toroidal roller bearings (designation suffix VC)

Housings for the locating bearing position are initially mounted with non-split spherical roller bearings but due to downtime costs, the original bearings are replaced by split spherical roller bearings. For this reason, SKND... F converter housings are equipped with spacers that are initially mounted on each side of the bearing inner ring (→ **fig. 2**). Then, when the bearing needs to be replaced, a split spherical roller bearing, which has a wider inner ring than the original, can be mounted without any modifications to the housing.

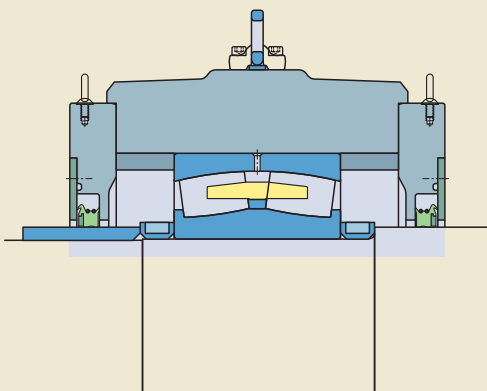
Housings for non-locating bearings are available for spherical roller bearings and CARB toroidal bearings (→ **fig. 3**). Housings for spherical roller bearings contain a cast iron bushing that serves as the bearing seat in the housing. The outer ring of the spherical roller bearing slides in the bushing to accommodate thermal elongation of the shaft. Housings for CARB bearings do not contain a bushing because the bearing accommodates thermal elongation of the shaft internally, as well as misalignment of the inner ring relative to the outer ring.

Fig. 1

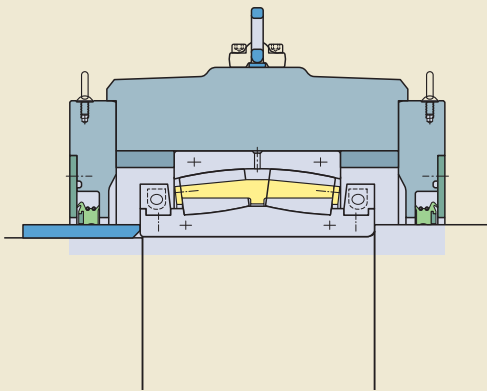


Housing design

Fig. 2

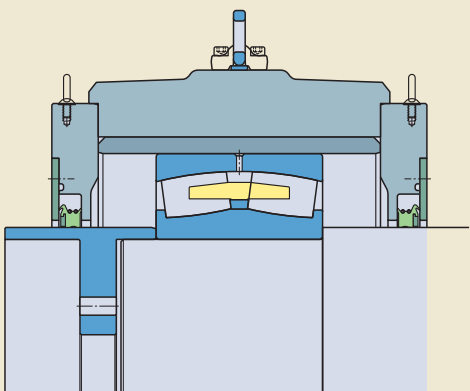


Spherical roller bearing in the locating bearing position

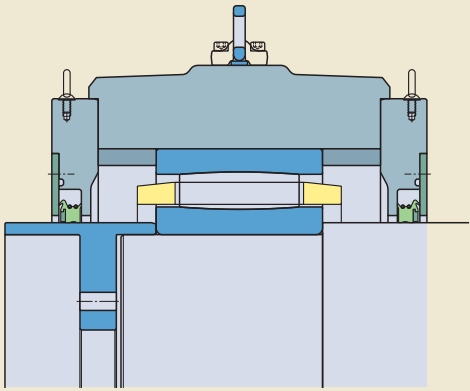


Split spherical roller bearing in the locating bearing position

Fig. 3



Spherical roller bearing in the non-locating bearing position



CARB bearing in the non-locating bearing position

Split plummer block housings for steel converters, SKND series

Features and benefits

SKND converter housings have the following features:

**Optimal design concerning strength and weight**  
SKND housings are designed to accommodate operational converter loads. Finite element analysis and advanced modeling programs helped to maximize stiffness and reduce total weight when compared to earlier designs (→ fig. 4).

**Superbolt tensioners to join cap and base**  
Superbolt® multi-jack tensioners provide a simple, safe and accurate way to tighten cap bolts (→ fig. 5). The tensioner consists of a nut with jackbolts and a separate hardened steel washer. Once the bolt, washer and Superbolt have been assembled manually, the jackbolts can be tightened with a torque wrench. A disk-shaped cover protects the Superbolt from contaminants.

**Machined pads simplify installation**  
Pads on the base ends and sides (→ fig. 4) are machined relative to the housing bore to simplify installation and alignment.

**Designed to facilitate maintenance**  
SKND converter housings have built-in features to make installation and maintenance safer and easier. This includes reducing the number of components, which is particularly important during routine maintenance operations. On request, SKF can provide detailed mounting and maintenance instructions or on-site installation.

Fig. 4

Strengthened load zones

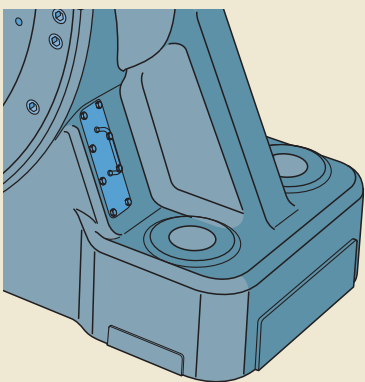
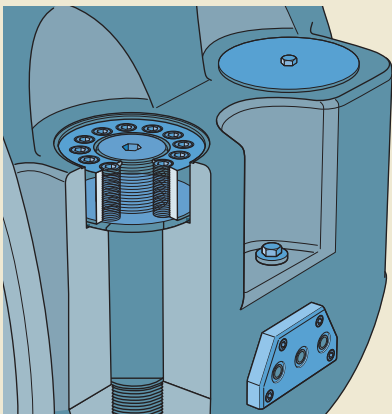


Fig. 5



Sealing solutions

Housing material

SKND housings are made of spheroidal graphite cast iron. Cast steel is available on request.

Paint, corrosion protection

SKND converter housings are painted blue (RAL 5007) using a solvent based acrylic paint. The paint protects the housing in accordance with ISO 12944-2, corrosivity category C2 (i.e. exterior atmospheres with low level of pollution, interior atmospheres where condensation may occur) (→ *Environmental conditions*, **page 36**). The paint is not affected by most lubricating and engine oils, cutting fluids or alkalescent washing chemicals. Housings can be repainted with most water or solvent based 1- or 2-component paints.

Unpainted surfaces are treated with a solventless rust inhibitor.

Dimension standards

The boundary dimensions of SKND housings are not standardized either nationally or internationally.

Housing variants

In addition to the three basic housing variants (see housing design) SKND converter housings can be tailored with special features to meet the needs of a particular application. For additional information contact the SKF application engineering service.

Sealing solutions

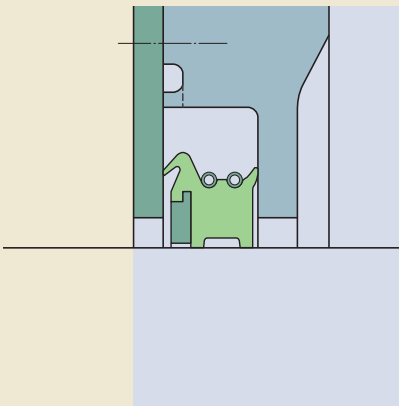
SKND housings are equipped with a heavy-duty NBR double-lip contact seal. The seal incorporates a separate metal ring to protect against hot dust and slag (→ **fig. 6**).

Two springs provide tension on the seal so that it makes positive contact with the trunnion shaft. Grease in the chamber above the seal enhances the effectiveness of the seal. When relubricating the seal, the outer lip allows excess grease and any contaminants to be purged from the seal cavity. The inner seal lip prevents contaminated grease from entering the housing.

The NBR seal is cut to the proper length to provide a tight fit on the trunnion.

The designation for lip seals is CS followed by a size code, e.g. CS 570. The size code is the shaft diameter at the seal position (attribute “d<sub>b</sub>” listed in the product tables).

Fig. 6



## Split plummer block housings for steel converters, SKND series

### Design considerations

SKND housings for converters are application specific products. For designing converter bearing solutions, contact the SKF application engineering service. For additional information about rolling bearings, refer to the product information available online at [skf.com/bearings](http://skf.com/bearings).

#### Load carrying capacity

SKND housings are designed to accommodate the same loads as the incorporated bearing. For additional information, contact the SKF application engineering service.

#### Operating temperature

SKND housings and their seals are designed to withstand operating temperatures typical for converter environments. For additional information, contact the SKF application engineering service.

#### Axial displacement

The values for the maximal axial displacement of the non-locating bearing are listed in the product tables. Larger axial displacement in one direction can be accommodated by offset mounting the inner and outer rings of CARB bearings.

Lubrication

SKND converter housings are intended for grease lubrication. SKF recommends using SKF LGEV 2, which is a proven grease for converter applications. For additional information, contact the SKF application engineering service.

Initial grease fill

If no other requirements exist, the free space in the bearing should be completely filled with grease and the free space in the housing should be filled to 60% of its volume. SKF can provide values for the grease quantities for the relevant housing size. For additional information contact the SKF application engineering service.

Relubrication

SKND converter housings have central grease piping connectors on both sides of the housings to relubricate the bearing and seals (→ fig. 7). As the trunnion does not fully rotate, lubricant is provided from both sides. Lubricating the seals provides better contaminant exclusion to extend the service life of both the bearing and seal.

Housings with the suffix L, the variant with sliding bushings, have two additional relubrication holes positioned at the bottom of the housing to relubricate the sliding bushing (→ fig. 8).

Grease sampling slots

SKND converter housings have two grease sampling slots on each side (→ fig. 9) so that samples are taken directly from the bearing load zone. The slots can also be used to purge grease from the housing without removing the housing covers and seals.

Fig. 8

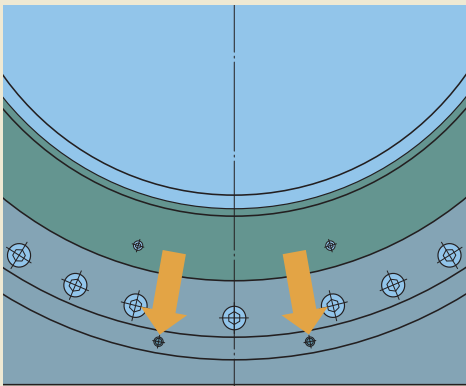


Fig. 7

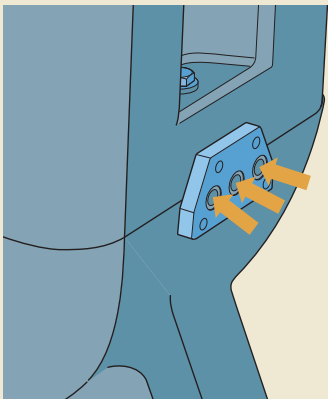
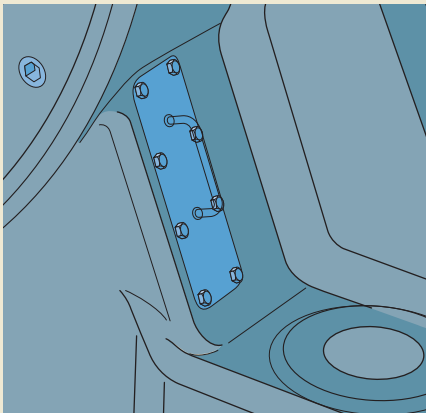


Fig. 9



Split plummer block housings for steel converters, SKND series

Mounting

SKND housings must be mounted and aligned properly, applying special knowledge and using the correct tools. SKF can provide detailed mounting instructions, assist during mounting or provide a complete installation service. For additional information, contact the SKF application engineering service.

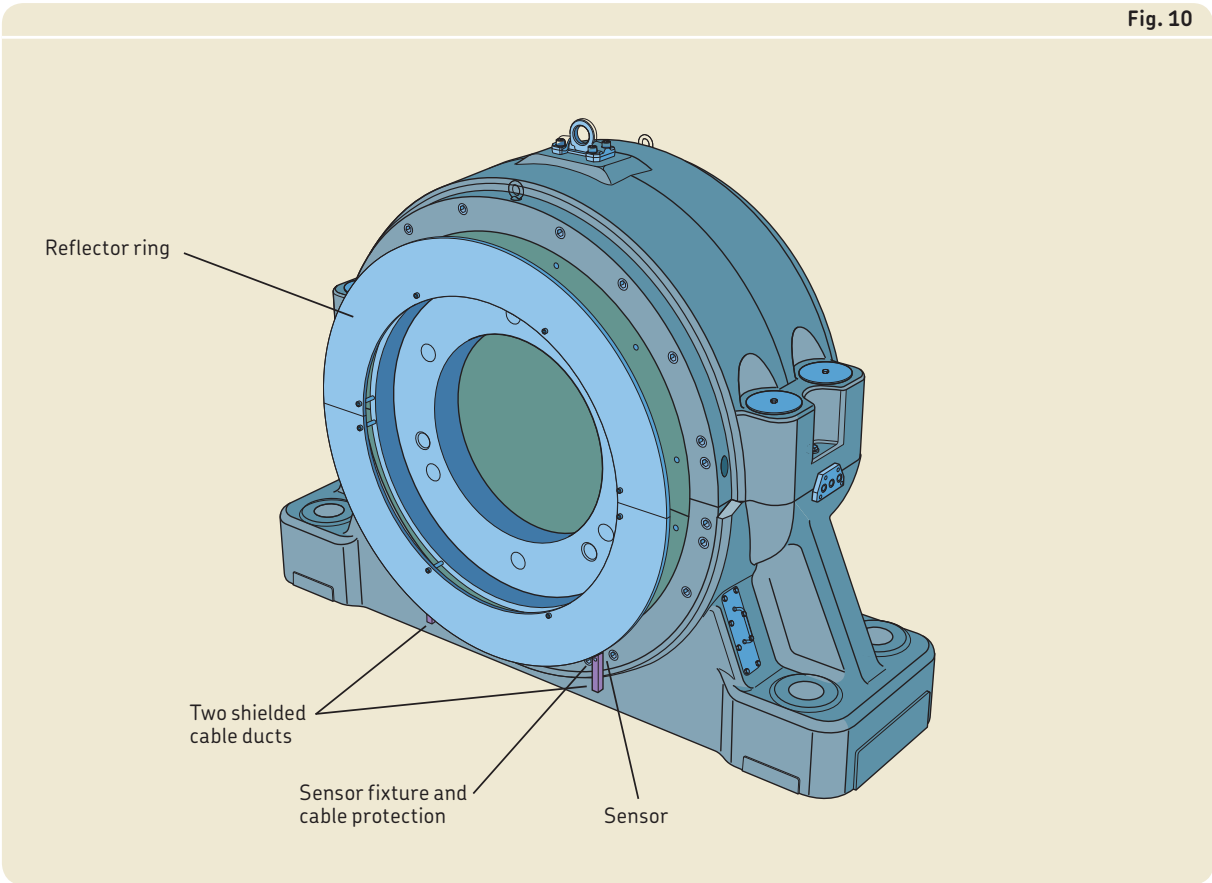
Axial support for the housing

Stops should be placed against the pads on the ends and sides of the base. These stops should be sufficiently strong to accommodate operating loads acting parallel to the support surface.

Accessories

Axial position measuring system

For SKND converter housings an axial position measuring system is available. The system measures and reports the position of the trunnion end at the non-locating bearing position. It consists of a radially split reflector ring mounted on the trunnion end, two ultrasonic sensors for redundant measurements, a sensor fixture and protected and shielded cabling (→ fig. 10).



## Ordering information

### Temperature sensor

Temperature sensors for SKND housings can be supplied on request. For more information contact the SKF application engineering service.

### Grease pumps and lubrication systems

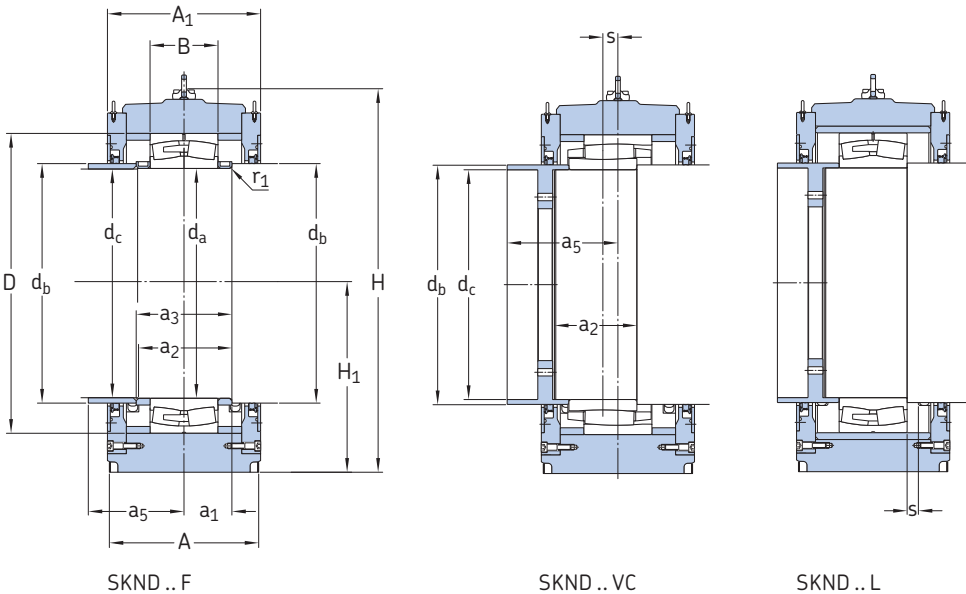
Grease pumps and automatic lubrication systems for SKND housings are available from SKF. For additional information contact the SKF application engineering service or visit [skf.com/lubrication](http://skf.com/lubrication).

## Ordering information

For detailed information about ordering contact the SKF application engineering service.

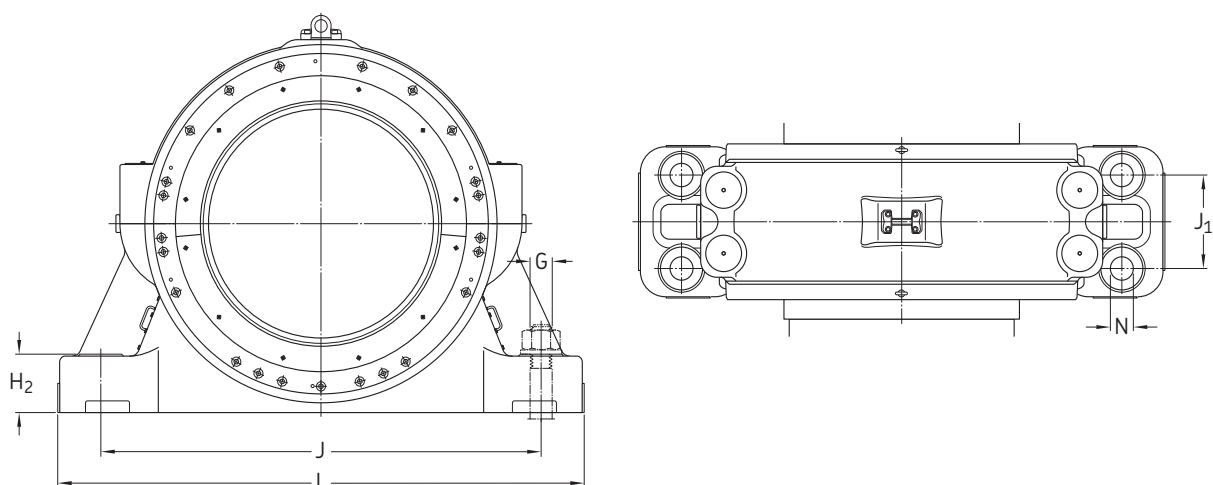
# 14.1 SKND plummer block housings for converters

d<sub>a</sub> 530 – 1 000 mm



Shaft diameter d <sub>a</sub>	Housing designation	Appropriate parts Bearing	Replacement bearing	Dimensions Housing						
				A	B	D	A <sub>1</sub>	H	H <sub>1</sub>	H <sub>2</sub>
mm	–	–		mm						
530	SKND 30/530 F	230/530 CA/C3W33	BSR-8024	400	185	780	475	935	450	140
	SKND 30/530 VC	C 30/530 M/VB569	–	400	185	780	475	935	450	140
600	SKND 30/600 F	230/600 CA/C3W33	BSR-8025	440	200	870	500	1 030	500	155
	SKND 30/600 VC	C 30/600 M/VB569	–	440	200	870	500	1 030	500	155
670	SKND 30/670 F	230/670 CA/C3W33	BSR-8035	500	230	980	540	1 170	570	175
	SKND 30/670 VC	C 30/670 M/VB569	–	500	230	980	540	1 170	570	175
710	SKND 49/710 F	249/710 CA/C3W33	BS2B 247249	600	243	950	640	1 250	600	185
	SKND 49/710 VC	C 49/710 MB1/VB569	–	600	243	950	640	1 250	600	185
	SKND 49/710 L	249/710 CA/C3W33VL017	–	600	243	950	640	1 250	600	185
750	SKND 49/750 F	249/750 CA/C3W33	BSR-8027	600	250	1 000	640	1 295	630	195
	SKND 49/750 VC	C 49/750 MB1/VB569	–	600	250	1 000	640	1 295	630	195
	SKND 49/750 L	249/750 CA/C3W33VL017	–	600	250	1 000	640	1 295	630	195
800	SKND 49/800 F	249/800 CA/C3W33	BS2B 243262	600	258	1 060	640	<sup>1)</sup>	670	205
	SKND 49/800 VC	C 49/800 MB1/VB569	–	600	258	1 060	640	<sup>1)</sup>	670	205
	SKND 49/800 L	249/800 CA/C3W33VL017	–	600	258	1 060	640	<sup>1)</sup>	670	205
850	SKND 49/850 F	249/850 CA/C3W33	BSR-8028	600	272	1 120	640	1 430	700	220
	SKND 49/850 VC	C 49/850 MB1/VB569	–	600	272	1 120	640	1 430	700	220
	SKND 49/850 L	249/850 CA/C3W33VL017	–	600	272	1 120	640	1 430	700	220
900	SKND 49/900 F	249/900 CA/C3W33	BSR-8044	<sup>1)</sup>	280	1 180	<sup>1)</sup>	<sup>1)</sup>	740	<sup>1)</sup>
	SKND 49/900 VC	C 49/900 MB1/VB569	–	<sup>1)</sup>	280	1 180	<sup>1)</sup>	<sup>1)</sup>	741	<sup>1)</sup>
	SKND 49/900 L	249/900 CA/C3W33VL017	–	<sup>1)</sup>	280	1 180	<sup>1)</sup>	<sup>1)</sup>	742	<sup>1)</sup>
950	SKND 49/950 F	249/950 CA/C3W33	BSR-8029	690	300	1 250	710	1 630	780	250
	SKND 49/950 VC	C 49/950 MB1/VB569	–	690	300	1 250	710	1 630	780	250
	SKND 49/950 L	249/950 CA/C3W33VL017	–	690	300	1 250	710	1 630	780	250
1 000	SKND 49/1000 F	249/1000 CAF/C3W33	BSR-8045	<sup>1)</sup>	315	1 320	<sup>1)</sup>	<sup>1)</sup>	830	255
	SKND 49/1000 VC	C 49/1000 MB1/VB569	–	<sup>1)</sup>	315	1 320	<sup>1)</sup>	<sup>1)</sup>	830	255
	SKND 49/1000 L	249/1000 CAF/C3W33VL017	–	<sup>1)</sup>	315	1 320	<sup>1)</sup>	<sup>1)</sup>	830	255

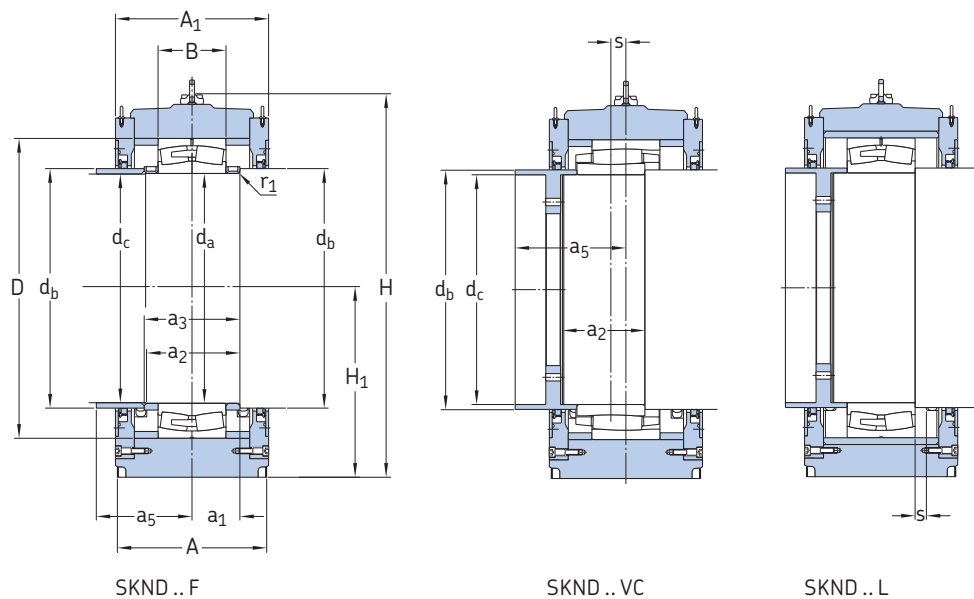
<sup>1)</sup> Contact SKF for missing values.



Shaft diameter	Dimensions Housing					Axial displacement	Dimensions Shaft abutment and fillet							Mass Housing
	J	J <sub>1</sub>	L	G	N		d <sub>b</sub>	d <sub>c</sub>	a <sub>1</sub>	a <sub>2</sub>	a <sub>3</sub>	a <sub>5</sub>	r <sub>1</sub>	
mm	mm					mm	mm							kg
530	1 050	240	1 280	M 42	48	–	570	525	142,5	280	285	340	10	1)
	1 050	240	1 280	M 42	48	±35	570	530	92,5	225	–	340	5	1)
600	1 150	270	1 400	M 52	58	–	645	595	155	305	310	350	12	1)
	1 150	270	1 400	M 52	58	±35	645	600	100	245	–	350	5	1)
670	1 300	310	1 570	M 56	62	–	720	665	175	345	350	370	15	1)
	1 300	310	1 570	M 56	62	±40	720	670	115	275	–	370	6	1)
710	1 375	325	1 660	M 64	70	–	760	705	175	345	350	420	15	1)
	1 375	325	1 660	M 64	70	±50	760	710	121,5	330	–	420	5	1)
	1 375	325	1 660	M 64	70	±50	760	710	121,5	330	–	420	5	1)
750	1 450	335	1 750	M 64	70	–	800	745	177,5	350	355	420	15	1)
	1 450	335	1 750	M 64	70	±55	800	750	125	340	–	420	5	1)
	1 450	335	1 750	M 64	70	±55	800	750	125	340	–	420	5	1)
800	1 550	345	1 850	M 72	80	–	860	795	185	365	370	420	15	1)
	1 550	345	1 850	M 72	80	±55	860	800	129	350	–	420	5	1)
	1 550	345	1 850	M 72	80	±55	860	800	129	350	–	420	5	1)
850	1 600	360	1 940	M 72	80	–	900	845	192,5	380	385	420	15	1)
	1 600	360	1 940	M 72	80	±60	900	850	136	365	–	420	5	1)
	1 600	360	1 940	M 72	80	±60	900	850	136	365	–	420	5	1)
900	1)	1)	1)	1)	1)	–	960	895	195	385	390	1)	15	1)
	1)	1)	1)	1)	1)	±60	960	900	1)	1)	–	1)	1)	1)
	1)	1)	1)	1)	1)	±60	960	900	1)	1)	–	1)	1)	1)
950	1 820	390	2 180	M 90	100	–	1 000	945	205	405	410	455	15	5 200
	1 820	390	2 180	M 90	100	±65	1 000	950	150	355	–	455	6	5 100
	1 820	390	2 180	M 90	100	±65	1 000	950	150	355	–	455	6	4 900
1 000	1 980	360	2 330	M 90	100	–	1 065	995	225	445	450	1)	15	1)
	1 980	360	2 330	M 90	100	±65	1 065	1 000	157,5	405	–	1)	6	1)
	1 980	360	2 330	M 90	100	±65	1 065	1 000	157,5	405	–	1)	6	1)

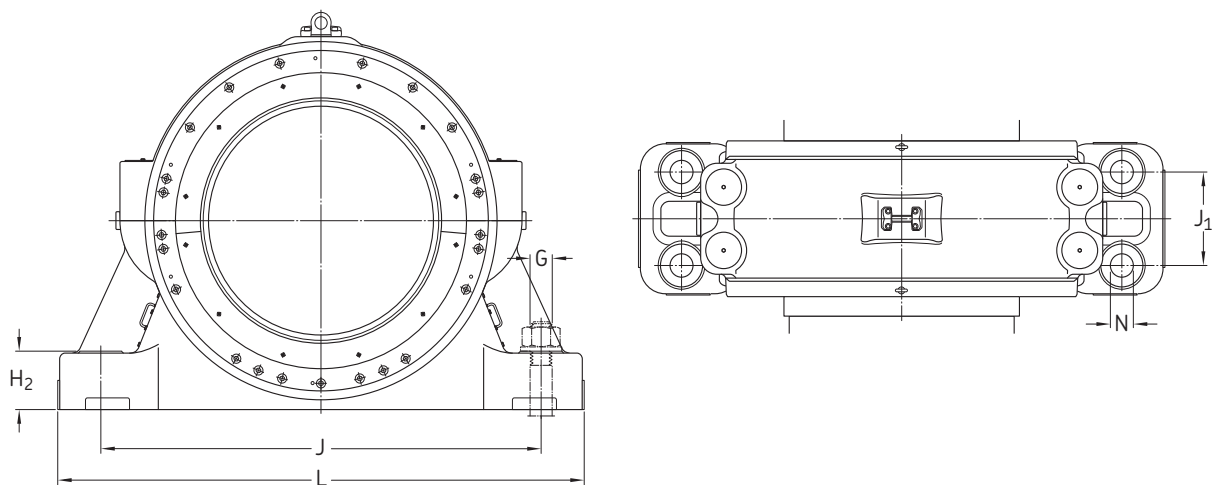
1) Contact SKF for missing values.

14.1 SKND plummer block housings for converters  
d<sub>a</sub> 1 060 – 1 180 mm



Shaft diameter	Housing designation	Appropriate parts Bearing	Replacement bearing	Dimensions Housing						
				A	B	D	A <sub>1</sub>	H	H <sub>1</sub>	H <sub>2</sub>
d <sub>a</sub>				mm						
mm	–	–		mm						
1 060	SKND 49/1060 F	249/1060 CAF/C3W33	BSR-8039	740	335	1 400	<sup>1)</sup>	<sup>1)</sup>	880	275
	SKND 49/1060 VC	C 49/1060 MB1/VB569	–	740	335	1 400	<sup>1)</sup>	<sup>1)</sup>	880	275
	SKND 49/1060 L	249/1060 CAF/C3W33VL017	–	740	335	1 400	<sup>1)</sup>	<sup>1)</sup>	880	275
1 120	SKND 49/1120 F	249/1120 CAF/C3W33	BSR-8040	780	335	1 460	760	1 900	920	285
	SKND 49/1120 VC	C 49/1120 MB1/VB569	–	780	335	1 460	760	1 900	920	285
	SKND 49/1120 L	249/1120 CAF/C3W33VL017	–	780	335	1 460	760	1 900	920	285
1 180	SKND 49/1180 F	249/1180 CAF/C3W33	BSR-8031	780	355	1 540	800	1 970	970	300
	SKND 49/1180 VC	C 49/1180 MB1/VB569	–	780	355	1 540	800	1 970	970	300
	SKND 49/1180 L	249/1180 CAF/C3W33VL017	–	780	355	1 540	800	1 970	970	300

<sup>1)</sup> Contact SKF for missing values.



Shaft diameter	Dimensions Housing					Axial displacement	Dimensions Shaft abutment and fillet							Mass Housing
	J	J <sub>1</sub>	L	G	N		d <sub>b</sub>	d <sub>c</sub>	a <sub>1</sub>	a <sub>2</sub>	a <sub>3</sub>	a <sub>5</sub>	r <sub>1</sub>	
mm	mm					mm	mm							kg
1 060	2 000	460	2 450	M100	110	–	1 110	1 055	237,5	470	475	<sup>1)</sup>	15	<sup>1)</sup>
	2 000	460	2 450	M100	110	±75	1 110	1 060	167,5	420	–	<sup>1)</sup>	6	<sup>1)</sup>
	2 000	460	2 450	M100	110	±75	1 110	1 060	167,5	420	–	<sup>1)</sup>	6	<sup>1)</sup>
1 120	2 150	460	2 560	M100	110	–	1 195	1 115	237,5	470	475	480	15	7 500
	2 150	460	2 560	M100	110	±75	1 195	1 120	167,5	420	–	480	6	7 400
	2 150	460	2 560	M100	110	±70	1 195	1 120	167,5	420	–	480	6	7 100
1 180	2 300	480	2 750	M110	120	–	1 230	1 175	250	495	500	500	15	8 700
	2 300	480	2 750	M110	120	±80	1 230	1 180	177,5	430	–	500	6	8 500
	2 300	480	2 750	M110	120	±70	1 230	1 180	177,5	430	–	500	6	8 200

<sup>1)</sup> Contact SKF for missing values.

