

PLUMMER BLOCKS



Warranty

NTN warrants, to the original purchaser only, that the delivered product which is the subject of this sale (a) will conform to drawings and specifications mutually established in writing as applicable to the contract, and (b) be free from defects in material or fabrication. The duration of this warranty is one year from date of delivery. If the buyer discovers within this period a failure of the product to conform to drawings or specifications, or a defect in material or fabrication, it must promptly notify NTN in writing. In no event shall such notification be received by NTN later than 13 months from the date of delivery. Within a reasonable time after such notification, NTN will, at its option, (a) correct any failure of the product to conform to drawings, specifications or any defect in material or workmanship, with either replacement or repair of the product, or (b) refund, in part or in whole, the purchase price. Such replacement and repair, excluding charges for labor, is at NTN's expense. All warranty service will be performed at service centers designated by NTN. These remedies are the purchaser's exclusive remedies for breach of warranty.

NTN does not warrant (a) any product, components or parts not manufactured by NTN, (b) defects caused by failure to provide a suitable installation environment for the product, (c) damage caused by use of the product for purposes other than those for which it was designed, (d) damage caused by disasters such as fire, flood, wind, and lightning, (e) damage caused by unauthorized attachments or modification, (f) damage during shipment, or (g) any other abuse or misuse by the purchaser.

THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

In no case shall NTN be liable for any special, incidental, or consequential damages based upon breach of warranty, breach of contract, negligence, strict tort, or any other legal theory, and in no case shall total liability of NTN exceed the purchase price of the part upon which such liability is based. Such damages include, but are not limited to, loss of profits, loss of savings or revenue, loss of use of the product or any associated equipment, cost of capital, cost of any substitute equipment, facilities or services, downtime, the claims of third parties including customers, and injury to property. Some states do not allow limits on warranties, or on remedies for breach in certain transactions. In such states, the limits in this paragraph and in paragraph (2) shall apply to the extent allowable under case law and statutes in such states.

Any action for breach of warranty or any other legal theory must be commenced within 15 months following delivery of the goods.

Unless modified in a writing signed by both parties, this agreement is understood to be the complete and exclusive agreement between the parties, superceding all prior agreements, oral or written, and all other communications between the parties relating to the subject matter of this agreement. No employee of NTN or any other party is authorized to make any warranty in addition to those made in this agreement.

This agreement allocates the risks of product failure between NTN and the purchaser. This allocation is recognized by both parties and is reflected in the price of the goods. The purchaser acknowledges that it has read this agreement, understands it, and is bound by its terms.

CONTENTS

Technical Data

3~32

Index of Bearing Tables

Split type

34~51

Unit type

52~59

Specialized Plummer Blocks

60~63

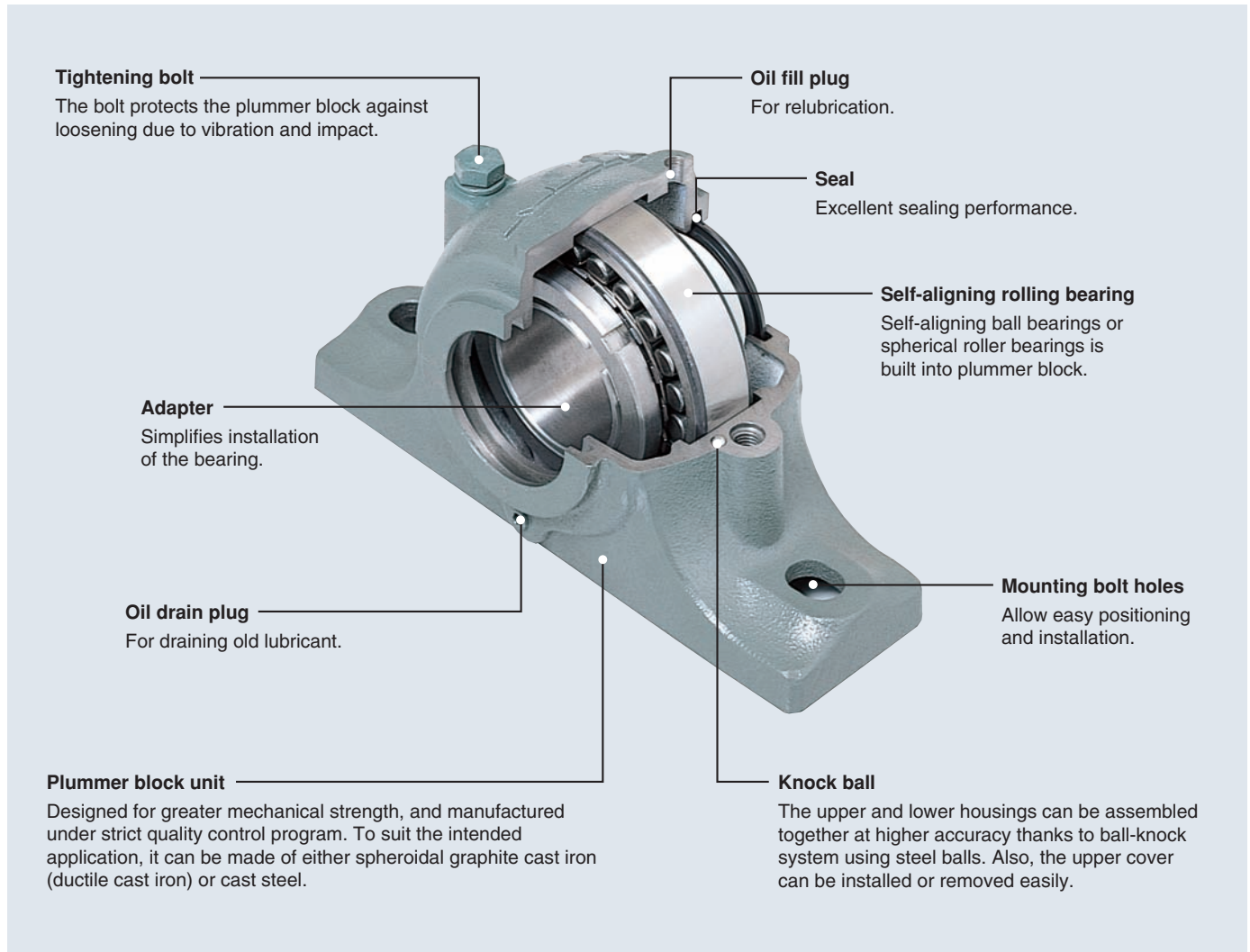
NTN

PLUMMER BLOCKS

CONTENTS

1. Structure	2
2. Nominal number of plummer block and bearing	3
3. Plummer Block and Rolling Bearing Tolerances	5
3.1 Plummer block tolerances	5
3.2 Machining tolerances of mounting bolt seat faces	9
3.3 Rolling bearing accuracies	10
3.4 Rolling bearing internal clearance	11
4. Plummer Block and Bearing Materials	13
4.1 Plummer block materials	13
4.2 Bearing materials	14
5. Strength of Plummer Blocks, and Combination with Bearings	15
5.1 Strength of plummer blocks	15
5.2 Combinations of plummer blocks and bearings	16
6. Allowable Speed	18
7. Bearing Seals	19
7.1 Contact seals	19
7.2 Non-contact seals	20
7.3 Combination seals	20
8. Shaft Design	21
8.1 Bearing-to-shaft fit	21
8.2 Mounting dimensions	21
9. Lubrication	23
9.1 Grease lubrication	23
10. Handling the Plummer Blocks and Bearings	24
10.1 Inspection before installation	24
10.2 Preparation for installing the bearing	24
10.3 Installation of the bearing and associated components	25
10.4 Assembling the plummer blocks	29
10.5 Running inspection	30
10.6 Maintenance and inspection	31
10.7 Bearing disassembly	31
10.8 Cleaning the bearing	32
10.9 Storing the bearing	32

1. Structure



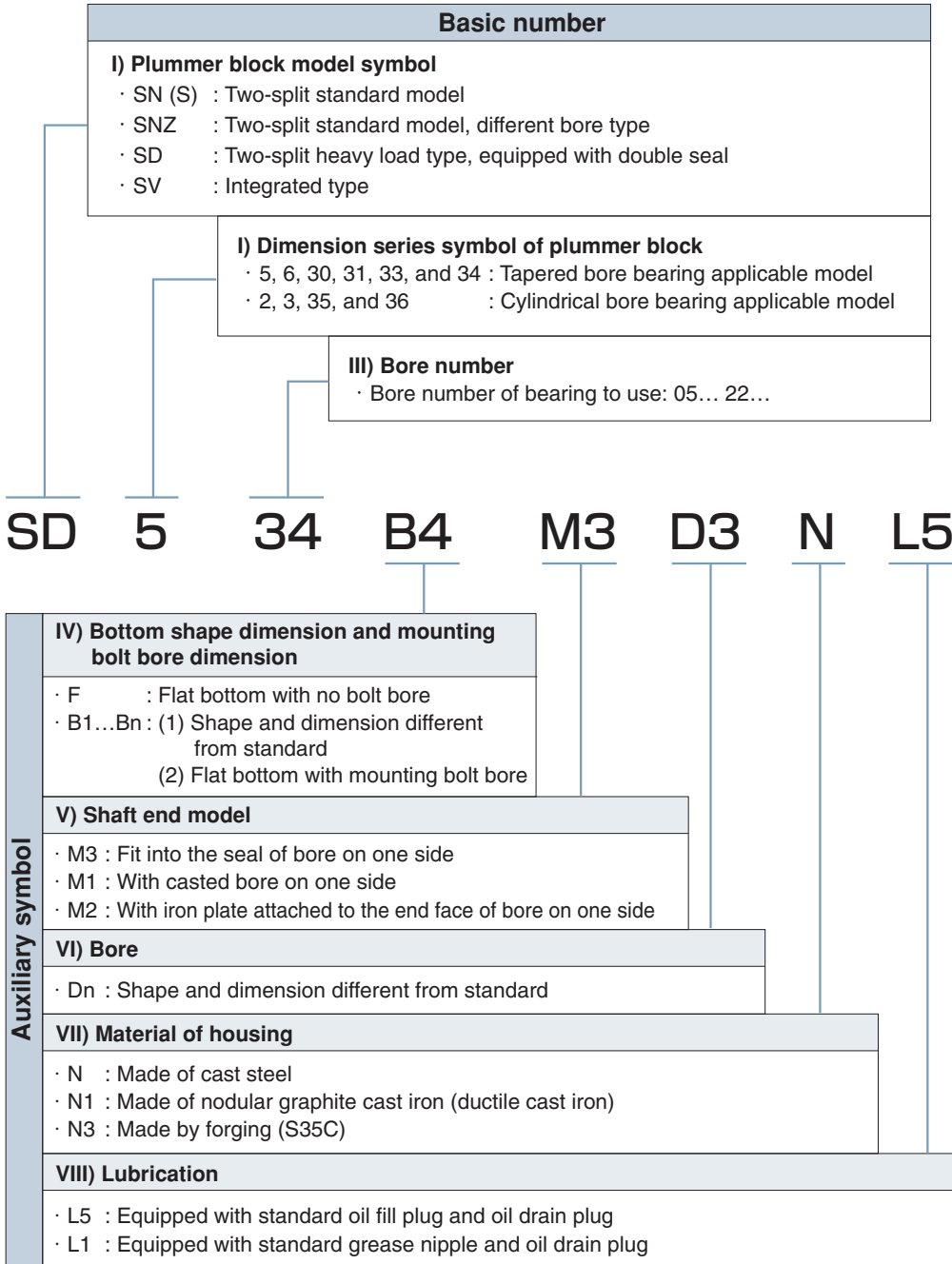
◀Products painted in user-specified colors

2. Nominal number of plummer block and bearing

2.1 Nominal number of plummer block

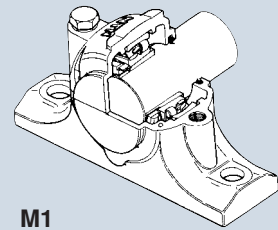
Nominal number of plummer block represents its model and structure, consisting of basic number and auxiliary symbol.

Table 2.1 How to indicate the basic number and auxiliary symbol

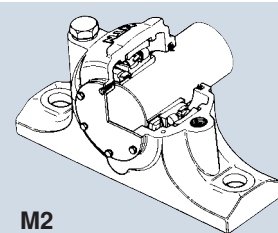


Information

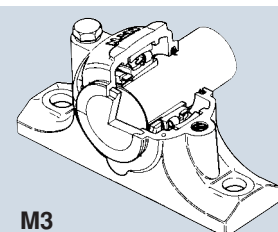
When using a plummer block for shaft end, it is typical to use that with its bore un-penetrated on shaft end side (external side), and there are three models available shown below:



M1



M2



M3

When placing an order

Nominal number of plummer block does not contain those of applicable parts.

Therefore, when respective part is necessary, place an order by respective nominal number.

[Example]

SN506	1206SK	H206X	SR62X7	ZF6
Plummer block	Roller bearing	Adapter	Positioning ring (only on fixed side)	Rubber seal

Nominal number of plumber block and bearing

2.2 Nominal number of rolling bearing

Rolling bearing part numbers indicate bearing type, dimensions, tolerances, internal construction, and other related specifications. Bearing numbers are comprised of a "basic number" followed by "supplementary codes." The makeup and order of bearing numbers is shown in **Tables 2.2-2.4**.

The basic number indicates general information about a bearing, such as its fundamental type, boundary dimensions, series number, bore diameter code and contact angle. The supplementary codes derive from prefixes and suffixes which indicate a bearing's tolerances, internal clearances, and related specifications.

Table 2.2 Bearing number arrangement

Bearing number arrangement			
Prefix supplementaly code	Special applivation code		
	Material / heat treatment code		
Basic number	Bearing series	Type code	
		Dimensions series code	Width / height series code
	Diameter series code		
	Single bore number		
Suffix supplementaly code	Internal modification		
	Cage code		
	Bearing ring shape code		
	Internal clearance code		

TS3- 2 3 1 20 EM K D1 C3 + H

Table 2.3 Bearing series number

Bearing series code	Type code	Dimension series code		Bearing type
		Width / height series ^①	Dimension series	
12	1	(0)	2	Self-aligning ball bearings
13	1	(0)	3	
22	2	(2)	2	
23	2	(2)	3	
239	2	3	9	Sherical roller bearings
230		3	0	
240		4	0	
231		3	1	
241		4	1	
222		2	2	
232		3	2	
213		0	3	
223		2	3	

① Codes in () are not shown in nominal numbers.

Table 2.4 Suffix supplementary code

Code		Contents
Cage code	EA	Window-type pressed steel cage
	EM	One-piece machined high-tension brass cage
	L1	High-strength brass machined cage
	F1	Carbon steel machined cage
Bearing ring shape code	K	Standard taper single bore 1/12 taper hole
	K30	Standard taper single bore 1/30 taper hole
	D1	With oil hole / groove
Innternal clearance code	C2	Smaller than normal clearance
	C3	Larger than normal clearance
	C4	Larger than C3 clearance
	C5	Larger than C4 clearance

3. Plummer Block and Rolling Bearing Tolerances

3.1 Plummer block tolerances

The tolerances of NTN split plummer blocks meet JIS B 1551, and those of unit type plummer blocks with Japan Bearing Industrial Association standard BAS 188. The tolerances of both types are given in the tables below.

- Tolerances of bearing seating bore diameter, width and center height **Table 3.1**
- Tolerances of length of cast iron components
(As cast portions on bearing base, bolt holes, etc.) **Table 3.2**
- Dimensions and tolerances of bore **Table 3.3**
- Dimensions and tolerances of stabilizing ring **Table 3.4**

Table 3.1 Tolerances of plummer blocks

Unit: mm

Split type				Unit type					
Plummer block series	Housing bore diameter ΔD_s	Housing width Δg_s	Center height ΔH_s	Plummer block series	Housing bore diameter ΔD_s	Center height ΔH_s	Body width I_1	Cover dimensions I_2	Cover spigot width I_3
SN5, SN5F SN (S)6, SN (S)6F SN2, SNZ2, SN30 SN (S)3, SNZ (SZ)3, SN31 SBG5	H8	H13	h13	SV5 SV6 SV2 SV3 SV30 SV35 VA5	H7	h11	+0.2 0	±1	0 -0.2
SD30, SD31 SD33 SD34, SD35 SD36 SD2, SD3 SD5, SD6 SD31TS, SD32TS	H8	±0.2	h13						

Table 3.2 Tolerances of length of cast iron components

Unit: mm

Casting size				
120 or less	120 to 250	250 to 400	400 to 800	800 to 1600
±1.5	±2.0	±3.0	±4.0	±6.0

Plummer Block and Rolling Bearing Tolerances

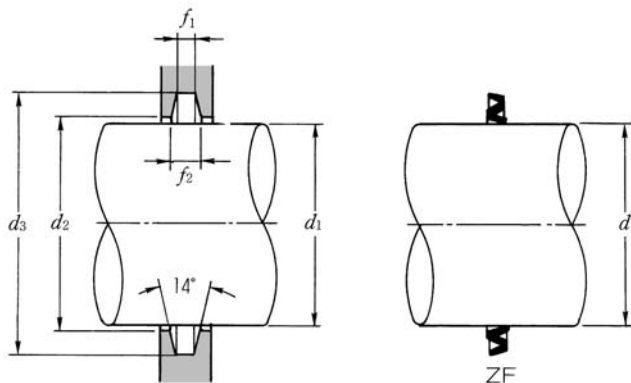


Table 3.3 Bore dimensions and tolerances

Unit: mm

Shaft diameter d_1	d_2		d_3		f_1		f_2	Angular tolerance	Rubber seal part number (reference)
	Dimension	Tolerance	Dimension	Tolerance	Dimension	Tolerance	Dimension		
20	21.5	+0.210	31		3	+0.140 0	4.2	±1°	ZF 5
25	26.5	0	38	+0.250	4		5.4		ZF 6
30	31.5	+0.250 0	43	0	4		5.4		ZF 7
35	36.5		48	+0.300 0	4		5.4		ZF 8
40	41.5	53	4		5.4	ZF 9			
45	46.5	58	4		5.4	ZF10			
50	51.5	+0.300 0	67	+0.350 0	5	+0.180 0	6.9		ZF11
55	56.5		82		5		6.9		ZF12
60	62		77		5		6.8		ZF13
65	67	+0.350 0	82	+0.400 0	5	+0.220 0	6.8		ZF15
70	72		89		6		8.1		ZF16
75	77		94		6		8.1		ZF17
80	82	+0.400 0	99	+0.460 0	6	+0.270 0	8.1		ZF18
85	87		104		6		8.1		ZF19
90	92		111		7		9.3		ZF20
100	102	+0.460 0	125	+0.520 0	8	+0.270 0	10.8		ZF22
110	113		135		8		10.7		ZF24
115	118		140		8		10.7		ZF26
125	128	+0.520 0	154	+0.630 0	9	+0.270 0	12.2		ZF28
135	138		164		9		12.2		ZF30
140	143		173		10		13.7	ZF32	
150	153	+0.520 0	183	+0.700 0	10	+0.270 0	13.7	ZF34	
160	163		193		10		13.7	ZF36	
170	173		203		10		13.7	ZF38	
180	183	+0.570 0	213		10	+0.270 0	13.7	ZF40	
200	203		240		11		15.5	ZF44	
220	223		260		11		15.5	ZF48	
240	243	+0.570 0	286		12	+0.270 0	17.3	ZF52	
260	263		306		12		17.3	ZF56	
280	283		332		13		19	ZF60	
300	303	+0.630 0	352		13	+0.270 0	19	ZF64	
320	323		372		13		19	ZF68	
340	343		390		14		19.8	GS72	
360	363	+0.630 0	412		13	+0.270 0	19	GS76	
380	383		432		13		19	GS80	
400	403		452		14		20	GS84	
410	413	+0.630 0	460		14	+0.270 0	19.8	GS88	
430	433		480		14		19.8	GS92	
450	453		505		14		20.3	GS96	

Plummer Block and Rolling Bearing Tolerances

Table 3.4 (1) Dimensions and tolerances of locating rings

Unit: mm

Part number	Outside dia. h12	Inside dia.	Width 0 -0.2	Material
SR 52× 5	52	44	5	Die-cast zinc alloy, class 2, ZDC2
SR 52× 6	52	44	6	
SR 52× 7	52	44	7	
SR 52× 9	52	44	9	
SR 62× 6	62	54	6	
SR 62× 6.5	62	54	6.5	
SR 62× 7	62	54	7	
SR 62× 8.5	62	54	8.5	
SR 62×10	62	54	10	
SR 72× 6	72	64	6	
SR 72× 7	72	64	7	
SR 72× 8	72	64	8	
SR 72× 9	72	64	9	
SR 72×10	72	64	10	
SR 80× 6	80	70	6	
SR 80× 7	80	70	7	
SR 80× 7.5	80	70	7.5	
SR 80× 8	80	70	8	
SR 80× 9.5	80	70	9.5	
SR 80×10	80	70	10	
SR 85× 6	85	75	6	
SR 85× 8	85	75	8	
SR 85×10	85	75	10	
SR 90× 6	90	80	6	
SR 90× 6.5	90	80	6.5	
SR 90× 8	90	80	8	
SR 90× 9.5	90	80	9.5	
SR 90×10	90	80	10	
SR100× 6	100	89	6	
SR100× 8	100	89	8	
SR100× 8.5	100	89	8.5	
SR100×10	100	89	10	
SR100×10.5	100	89	10.5	
SR110× 6	110	99	6	
SR110× 8	110	99	8	
SR110× 9	110	99	9	
SR110× 9.5	110	99	9.5	
SR110×10	110	99	10	
SR110×11.5	110	99	11.5	
SR110×12	110	99	12	
SR120× 6	120	108	6	
SR120× 9	120	108	9	

Unit: mm

Part number	Outside dia. h12	Inside dia.	Width 0 -0.2	Material
SR120×10	120	108	10	Die-cast zinc alloy, class 2, ZDC2
SR120×12	120	108	12	
SR120×13	120	108	13	
SR125× 9.5	125	113	9.5	
SR125×10	125	113	10	
SR125×13	125	113	13	
SR130× 4	130	118	4	
SR130× 8	130	118	8	
SR130× 9.5	130	118	9.5	
SR130×10	130	118	10	
SR130×12.5	130	118	12.5	
SR140× 8	140	125	8	
SR140× 8.5	140	125	8.5	
SR140×10	140	125	10	
SR140×11.5	140	125	11.5	
SR140×12.5	140	125	12.5	
SR140×15	140	125	15	
SR150× 5	150	135	5	
SR150× 9	150	135	9	
SR150×10	150	135	10	
SR150×10.5	150	135	10.5	
SR150×14	150	135	14	
SR150×13	150	135	13	
SR160× 7	160	144	7	
SR160× 9.6	160	144	9.6	
SR160×10	160	144	10	
SR160×11	160	144	11	
SR160×11.2	160	144	11.2	
SR160×12.5	160	144	12.5	
SR160×14	160	144	14	
SR160×15	160	144	15	
SR160×16	160	144	16	
SR160×16.2	160	144	16.2	
SR170× 4	170	154	4	
SR170× 9.5	170	154	9.5	
SR170×10	170	154	10	
SR170×10.5	170	154	10.5	
SR170×11.5	170	154	11.5	
SR170×14.5	170	154	14.5	
SR170×15	170	154	15	
SR180× 9.5	180	163	9.5	
SR180× 9.7	180	163	9.7	

Plummer Block and Rolling Bearing Tolerances

Table 3.4 (2) Dimensions and tolerances of locating rings

Unit: mm

Part number	Outside dia. h12	Inside dia.	Width 0 -0.2	Material
SR180×10	180	163	10	Die-cast zinc alloy, class 2, ZDC2
SR180×12	180	163	12	
SR180×12.1	180	163	12.1	
SR180×14.5	180	163	14.5	
SR180×18	180	163	18	
SR180×18.1	180	163	18.1	
SR190× 6	190	173	6	
SR190× 9.5	190	173	9.5	
SR190×13.5	190	173	13.5	
SR190×15.3	190	173	15.3	
SR200× 9.5	200	180	9.5	
SR200×10	200	180	10	
SR200×12.2	200	180	12.2	
SR200×13.5	200	180	13.5	
SR200×14.5	200	180	14.5	
SR200×15	200	180	15	
SR200×15.8	200	180	15.8	
SR200×18.5	200	180	18.5	
SR200×21	200	180	21	
SR200×22	200	180	22	
SR210×9.5	210	190	9.5	
SR210×10	210	190	10	
SR215× 6	215	195	6	
SR215× 9	215	195	9	
SR215× 9.5	215	195	9.5	
SR215×10	215	195	10	
SR215×12	215	195	12	
SR215×14	215	195	14	
SR215×17.5	215	195	17.5	
SR215×17.8	215	195	17.8	
SR225× 9.5	225	205	9.5	
SR225×10	225	205	10	
SR230× 6	230	210	6	
SR230×10	230	210	10	
SR230×11	230	210	11	
SR230×13	230	210	13	
SR240× 9.5	240	218	9.5	
SR240×10	240	218	10	
SR240×16	240	218	16	
SR240×19.8	240	218	19.8	
SR240×23	240	218	23	
SR250× 5	250	230	5	

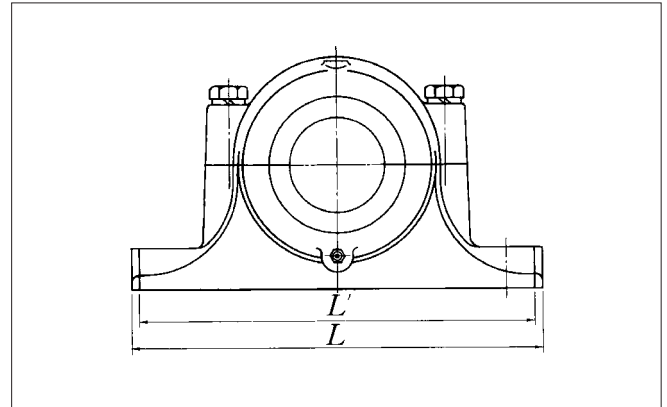
Unit: mm

Part number	Outside dia. h12	Inside dia.	Width 0 -0.2	Material
SR250× 6	250	230	6	Gray cast iron, class 3, FC200
SR250× 9.5	250	230	9.5	
SR250×10	250	230	10	
SR250×13	250	230	13	
SR250×15	250	230	15	
SR260× 9.5	260	238	9.5	
SR260×10	260	238	10	
SR260×17	260	238	17	
SR270× 7	270	248	7	
SR270× 9.5	270	248	9.5	
SR270×10	270	248	10	
SR270×15	270	248	15	
SR270×16.5	270	248	16.5	
SR280× 9.5	280	255	9.5	
SR280×10	280	255	10	
SR280×15	280	255	15	
SR290× 9	290	268	9	
SR290×10	290	268	10	
SR290×16.5	290	268	16.5	
SR290×17	290	268	17	
SR300× 9.5	300	275	9.5	
SR300×10	300	275	10	
SR300×11	300	275	11	
SR310×10	310	290	10	
SR310×12	310	290	12	
SR310×18	310	290	18	
SR320× 9.5	320	290	9.5	
SR320×10	320	290	10	
SR320×14	320	290	14	
SR320×18	320	290	18	
SR340× 9.5	340	310	9.5	
SR340×10	340	310	10	
SR340×16	340	310	16	
SR340×19	340	310	19	
SR360×10	360	330	10	
SR380×10	380	350	10	
SR400×10	400	370	10	
SR500×15.5	500	470	15.5	
SR540×18.5	540	510	18.5	
SR580×21.5	580	550	21.5	

3.2 Machining tolerances of mounting bolt seat faces

When subjected to a greater lateral load, a plummer block cannot be reliably secured with the tightening force of mounting bolts alone. To overcome this problem the end faces of the mounting bolt seat are secured with stoppers to lock the plummer block. With the plummer block used in this type of application, the end faces in contact with the stoppers are machined.

When a plummer block mounting seat end faces have been machined, the bottom length L of the bearing housing is smaller by the dimension in **Table 3.5**.



L : Basic casting dimension (as cast dimension)

L' : Dimension after machining of the end faces of bearing base

Table 3.5 Machining allowance

Unit: mm

Plummer block part number	Machining allowance $L-L'$	Surface roughness
SN506~SN519 SN206~SN219 SNZ206~SNZ219 SN606~SN616 SN306~SN316 SNZ306~SNZ316 SV505~SV519 SV205~SV219 SV605~SV616 SV305~SV316	3	12.5Ra
SN520~ SN220~ SNZ220~ SN617~ SN317~ SNZ317~ Model SN30, model SN31 Model SN..F, model SD SV520~ SV220~ SV617~ SV317~	5	

Table 3.6 Tolerances of dimension L after machining of mounting bolt seat end faces

Unit: mm

Dimension after machining L'	30~120	120~315	315~1 000	1 000~2 000
Tolerance	± 0.8	± 1.2	± 2.0	± 3.0

Plummer Block and Rolling Bearing Tolerances

3.3 Rolling bearing accuracies

The tolerances of self-aligning ball bearings and spherical roller bearings used in conjunction with NTN plummer blocks conform to JIS B 1514 (Tolerances for rolling bearings).

Table 3.7 Bearing tolerances

(1) Tolerances of inner rings (JIS class 0)

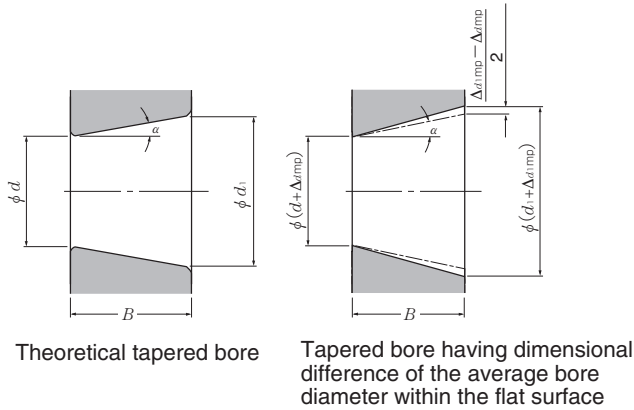
Unit: μm

Nominal bore diameter d		Dimensional tolerance of mean bore diameter within plane Δ_{dmp}		Bore diameter variation V_{dp}		Mean bore diameter variation V_{dmp}	Inner ring radial runout K_{ia}	Inner ring width deviation Δ_{Bs}		Inner ring width variation V_{Bs}
(mm)				diameter series	diameter series					
over	incl.	high	low	0, 1 max	2, 3, 4 max	max	max	high	low	max
18	30	0	-10	10	8	8	13	0	-120	20
30	50	0	-12	12	9	9	15	0	-120	20
50	80	0	-15	19	11	11	20	0	-150	25
80	120	0	-20	25	15	15	25	0	-200	25
120	150	0	-25	31	19	19	30	0	-250	30
150	180	0	-25	31	19	19	30	0	-250	30
180	250	0	-30	38	23	23	40	0	-300	30
250	315	0	-35	44	26	26	50	0	-350	35
315	400	0	-40	50	30	30	60	0	-400	40
400	500	0	-45	56	34	34	65	0	-450	50

(2) Tolerances of outer rings (JIS class 0)

Unit: μm

Nominal outside diameter D		Dimensional tolerance of mean outside diameter within plane Δ_{Dmp}		Outside diameter variation V_{Dp}		Mean outside diameter variation V_{Dmp}	Outer ring radial runout K_{ea}	Outer ring width deviation Δ_{Cs}		Outer ring width variation V_{Cs}
(mm)				diameter series	diameter series					
over	incl.	high	low	0, 1 max	2, 3, 4 max	max	max	high	low	max
30	50	0	-11	11	8	8	20	Depends on tolerance of Δ_{Bs} relative to d of the same bearing.		Depends on tolerance of V_{Bs} relative to d of the same bearing.
50	80	0	-13	13	10	10	25			
80	120	0	-15	19	11	11	35			
120	150	0	-18	23	14	14	40			
150	180	0	-25	31	19	19	45			
180	250	0	-30	38	23	23	50			
250	315	0	-35	44	26	26	60			
315	400	0	-40	50	30	30	70			
400	500	0	-45	56	34	34	80			
500	630	0	-50	63	38	38	100			
630	800	0	-75	94	55	55	120			



(3) Tolerance of and tolerance values for tapered bore of radial bearings (JIS class 0)

Unit: μm

Nominal bore diameter d (mm)	Δ_{tmp}	$\Delta_{tmp} - \Delta_{tmp}$		V_{dp} ①
		high	low	
over 18	incl. 30	+33	0	13
30	50	+39	0	16
50	80	+46	0	19
80	120	+54	0	22
120	180	+63	0	40
180	250	+72	0	46
250	315	+81	0	52
345	400	+89	0	57
400	500	+97	0	63

① Applicable to all radial planes of inner ring tapered bore.

Note 1: Applicable to 1/12 tapered bore

2: Quantifiers

d_1 : Standard diameter at theoretical large end of tapered bore

$$d_1 = d + \frac{1}{12} B$$

Δ_{tmp} : Dimensional difference of the average bore diameter within the flat surface at the theoretical small end of the tapered bore.

Δ_{tmp} : Dimensional difference of the average bore diameter within the flat surface at the theoretical large end of the tapered bore.

V_{dp} : Unevenness of the bore diameter with the flat surface

B : Nominal width of inner ring

α : Half of the tapered bore's nominal taper angle

$$\alpha = 2^\circ 23' 9.4''$$

$$= 2.38594^\circ$$

$$= 0.041643 \text{ rad}$$

3.4 Rolling bearing internal clearance

The radial clearance values of the self-aligning ball bearings used in the NTN plummer blocks are summarized in **Table 3.8 (1) and (2)**, and those of the spherical roller bearings in **Table 3.9 (1) and (2)**.

Table 3.8 Radial internal clearance of self-aligning ball bearings

(1) Data for cylindrical bore bearings

Unit: μm

Nominal bore diameter d (mm)		Clearance									
		C2		CN (normal)		C3		C4		C5	
over	incl.	min	max	min	max	min	max	min	max	min	max
24	30	5	16	11	24	19	35	29	46	40	58
30	40	6	18	13	29	23	40	34	53	46	66
40	50	6	19	14	31	25	44	37	57	50	71
50	65	7	21	16	36	30	50	45	69	62	88
65	80	8	24	18	40	35	60	54	83	76	108
80	100	9	27	22	48	42	70	64	96	89	124
100	120	10	31	25	56	50	83	75	114	105	145

(2) Data for tapered bore bearings

Unit: μm

Nominal bore diameter d (mm)		Clearance									
		C2		CN (normal)		C3		C4		C5	
over	incl.	min	max	min	max	min	max	min	max	min	max
24	30	9	20	15	28	23	39	33	50	44	62
30	40	12	24	19	35	29	46	40	59	52	72
40	50	14	27	22	39	33	52	45	65	58	79
50	65	18	32	27	47	41	61	56	80	73	99
65	80	23	39	35	57	50	75	69	98	91	123
80	100	29	47	42	68	62	90	84	116	109	144
100	120	35	56	50	81	75	108	100	139	130	170

Plummer Block and Rolling Bearing Tolerances

Table 3.9 Radial internal clearance of spherical roller bearings

(1) Data for cylindrical bore bearings

Unit: μm

Nominal bore diameter <i>d</i> (mm)		Clearance									
		C2		CN (normal)		C3		C4		C5	
over	incl.	min	max	min	max	min	max	min	max	min	max
30	40	15	30	30	45	45	60	60	80	80	100
40	50	20	35	35	55	55	75	75	100	100	125
50	65	20	40	40	65	65	90	90	120	120	150
65	80	30	50	50	80	80	110	110	145	145	180
80	100	35	60	60	100	100	135	135	180	180	255
100	120	40	75	75	120	120	160	160	210	210	260
120	140	50	95	95	145	145	190	190	240	240	300
140	160	60	110	110	170	170	220	220	280	280	350
160	180	65	120	120	180	180	240	240	310	310	390
180	200	70	130	130	200	200	260	260	340	340	430
200	225	80	140	140	220	220	290	290	380	380	470
225	250	90	150	150	240	240	320	320	420	420	520
250	280	100	170	170	260	260	350	350	460	460	570
280	315	110	190	190	280	280	370	370	500	500	630
315	355	120	200	200	310	310	410	410	550	550	690
355	400	130	220	220	340	340	450	450	600	600	750
400	450	140	240	240	370	370	500	500	660	660	820
450	500	140	260	260	410	410	550	550	720	720	900

(2) Data for tapered bore bearing

Unit: μm

Nominal bore diameter <i>d</i> (mm)		Clearance									
		C2		CN (normal)		C3		C4		C5	
over	incl.	min	max	min	max	min	max	min	max	min	max
30	40	25	35	35	50	50	65	65	85	85	105
40	50	30	45	45	60	60	80	80	100	100	130
50	65	40	55	55	75	75	95	95	120	120	160
65	80	50	70	70	95	95	120	120	150	150	200
80	100	55	80	80	110	110	140	140	180	180	230
100	120	65	100	100	135	135	170	170	220	220	280
120	140	80	120	120	160	160	200	200	260	260	330
140	160	90	130	130	180	180	230	230	300	300	380
160	180	100	140	140	200	200	260	260	340	340	430
180	200	110	160	160	220	220	290	290	370	370	470
200	225	120	180	180	250	250	320	320	410	410	520
225	250	140	200	200	270	270	350	350	450	450	570
250	280	150	220	220	300	300	390	390	490	490	620
280	315	170	240	240	330	330	430	430	540	540	680
315	355	190	270	270	360	360	470	470	590	590	740
355	400	210	300	300	400	400	520	520	650	650	820
400	450	230	330	330	440	440	570	570	720	720	910
450	500	260	370	370	490	490	630	630	790	790	1 000

4. Plummer Block and Bearing Materials

4.1 Plummer block materials

The housings of NTN plummer blocks are made of class 3 gray cast iron (FC200). **Table 4.1** summarizes the mechanical properties of this material.

Cast iron materials boasts the greatest vibration dampening capability among various metal materials.

They also perform well in a wider operating temperature range of -20 to 300°C.

For application involving shock load and vibration, class 2 spheroidal graphite cast iron (FCD450) or class 3 carbon cast steel (SC450) is used.

Table 4.1 Mechanical properties

(1) Mechanical properties of gray cast iron

Type	Symbol	Typical wall thickness of cast iron product mm	Cast diameter of samples mm	Tensile strength MPa (kgf/mm ²)	Transverse test		Brinell hardness HB
					Maximum load N (kgf)	Flexure mm	
Gray cast iron, class 3	FC200	4 to 8	13	235 {24} over	1 960 {200} over	2.0 over	255 incl.
		over 8, incl. 15	20	216 {22} over	4 410 {450} over	3.0 over	235 incl.
		over 15, incl. 30	30	196 {20} over	8 820 {900} over	4.5 over	223 incl.
		over 30, incl. 50	45	167 {17} over	19 600 {2 000} over	6.5 over	217 incl.

(2) Mechanical properties of spheroidal graphite cast iron

Type	Symbol	Tensile test			Impact test
		Proof stress MPa (kgf/mm ²)	Tensile strength MPa (kgf/mm ²)	Elongation %	Charpy absorption energy N · m {kgf · m}
Class 2 spheroidal graphite cast iron	FCD450	226 {23} over	450 {46} over	10 over	—

(3) Mechanical properties of carbon cast steel

Type	Symbol	Yield point MPa (kgf/mm ²)	Tensile test		
			Tensile strength MPa (kgf/mm ²)	Elongation %	Reduction in area %
Carbon cast steel	SC450	226 {23} over	451 {46} over	19 over	30 over

Table 4.2 Plummer block accessories materials

Accessory	Material used	Symbol	Applicable JIS standard
Tightening bolt and nut	Class 2 rolled steel for general structure	SS400	G3101
Spring washer	Hard drawn steel wire	SWRH62B	G3506
Grease nipple (on housing)	Copper and copper alloy rod and bar	C3604B	H3250
Plug for relubrication or draining	Class 2 rolled steel for general structure	SS400	G3101
Stabilizing ring, general purpose (normal width)	Class 3 gray cast iron and class 2 zinc die-casting	FC200, ZDC2	G5501, H5301
	Class 2 rolled steel for general structure	SS400	G3101

4.2 Bearing materials

Raceway and rolling element materials

When the contact surfaces of a bearing raceway and rolling elements are repeatedly subjected to heavy stress, they still must maintain high precision and running accuracy. To accomplish this, the raceway and rolling elements must be made of a material that has high hardness, is resistant to rolling fatigue, is wear resistant, and has good dimensional stability.

By using pure materials, low in these non-metallic impurities, the rolling fatigue life of the bearing is lengthened. For all NTN bearings, pure material is prepared which has low oxygen content and low non-metallic impurities, by vacuum degassing process and secondary refining process.

Table 4.3 Adapter materials

	Part description	Material used	Symbol	Applicable JIS standard	Remarks
Sleeve, adapter	Bearing bore #14 or smaller	Carbon steel for machine structural purposes	STKM13A	G3445	Can be SS400 (G3101), S20C to S35C (G4051), STPG370 (G3454) or STKM13A (G3445).
	Bearing bore #15 or greater	Carbon steel for machine structural purposes	S25C	G4051	
Nut	#05~#07	Carbon steel for machine structural purposes	S20C	G4051	Can be SS400 (G3101), or S20C to S35C (G4051).
	#08~#32	Rolled steel for general structure	SS400	G3101	
	#34~	Carbon steel for machine structural purposes	S25C	G4051	
Lock-washer	Thickness: less than 3 mm	Cold rolled steel plate and strip	SPCC-SD	G3141	
	Thickness: 3 mm or greater	Rolled steel for general structure	SS400	G3101	Can be SPHD (G3131).
Lock plate		Rolled steel for general structure	SS400	G3101	Can be S20C to S35C (G4051).

Cage materials

Bearing cage materials must be strong enough to withstand the vibration and shock load occurring on running bearings, develop limited friction with rolling elements and bearing ring, be light, and resist the heat occurring on running bearings.

The cages for small- and medium-sized bearings are pressed cages prepared through pressing process with cold or hot rolled steel plate, while the cages for large-sized bearings are machined cages made of cast high tensile brass or carbon steel for machine structural purposes.

5. Strength of Plummer Blocks, and Combination with Bearings

5.1 Strength of plummer blocks

The disruptive strength of plummer block varies depending on its type, nature and direction of a load working on it, as well as the flatness of a surface to which it is installed. The typical trend of static disruptive strength of SN5 and SN6 (S6) series of cast iron plummer blocks is plotted in **Figs. 5.1 and 5.2** respectively.

When selecting a plummer block, the safety factors in **Table 5.1** must be considered. Also, a higher grade of flatness is required of a surface for mounting a plummer block.

Table 5.1 Safety factors of cast iron plummer blocks

Nature of load	Light	Repeated	Alternating	Shock
Safety factor	4	6	10	15

To counter a horizontal or axial load, the face of the bed must be secured with a stopper.

For applications where extreme shock load is present or a fractured plummer block can lead to severe accident, NTN offers special plummer blocks made of spherical graphite cast iron or cast steel. For further information, contact NTN Engineering.

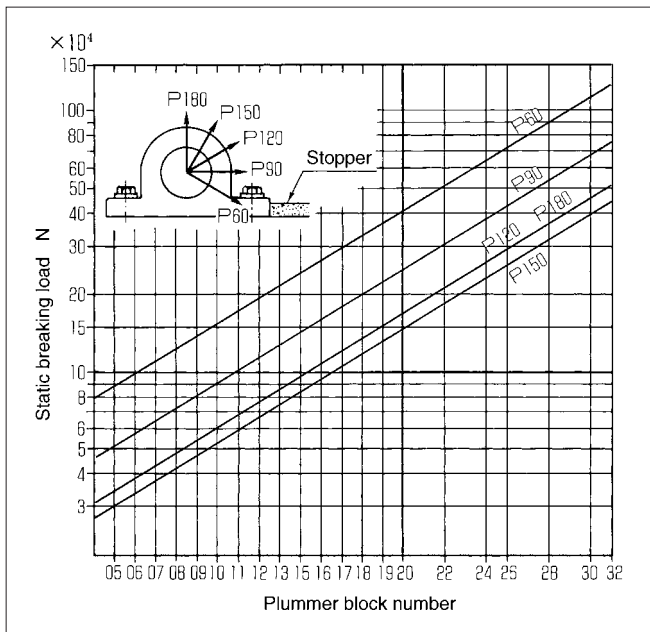


Fig. 5.1 Static disruptive strength of SN5 series

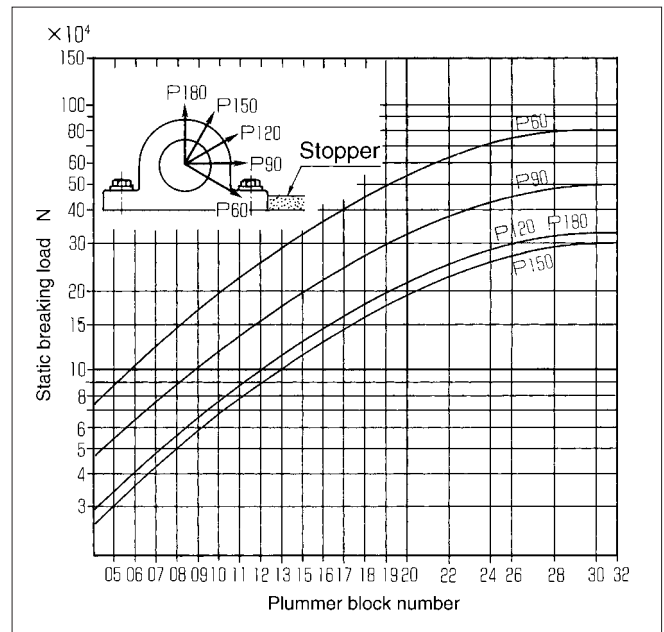


Fig. 5.2 Static disruptive strength of SN6 (S6) series

Strength of Plummer Blocks, and Combination with Bearings

5.2 Combinations of plummer blocks and bearings

The typical plummer block-bearing combinations are listed in **Tables 5.2 (1) and (2)**.

Table 5.2 (1) Plummer blocks and applicable bearings

Bearing series Plummer block series	12	22	13	23	230	231	222	232	213	223
SN5 SN5··F	06SK~22SK	06SK~22SK					08EAKD1*~ 32EAKD1*	18EMKD1*~ 20EMKD1*~ 32EMKD1*		
SN(S)6 SN(S)6··F			06SK~22SK	06SK~22SK					08CK~10CK 11K~22K	08EAKD1*~ 28EAKD1*~ 30EMKD1*~ 32EMKD1*
SN2 SN2··F	06S~22S	06S~22S					08EAD1*~ 32EAD1*	18EMD1*~ 20EMD1*~ 32EMD1*		
SN(S)3 SN(S)3··F			06SK~22SK	06SK~22SK					08C~10C 11~22	08EAD1*~ 28EAD1*~ 30EMD1*~ 32EMD1*
SNZ2 SNZ2··F	06SK~22S	06S~22S					08EAD1*~ 32EAD1*	18EMD1*~ 20EMD1*~ 32EMD1*		08EAD1*~ 28EAD1*~ 30EMD1*~ 32EMD1*
SNZ(S)3 SNZ(S)3··F			06SK~22SK	06SK~22SK					08C~10C 11~22	
SN30					24EAKD1*~ 38EAKD1*					
SN31						22EAKD1*~ 36EMKD1*~ 38EMKD1*				
SD5 SD5··G							34EMD1*~ 64EMD1*			
SD6 SD6··G										34EMKD1*~ 56EMKD1*
SD2 SD2··G							34EMD1*~ 64EMD1*			
SD3 SD3··G										34EMD1*~ 56EMD1*
SD2··D SD2··DG							34EMD1*~ 64EMD1*			
SD3··D SD3··DG										34EMD1*~ 56EMD1*
SD30 SD30··G					34EAKD1*~ 38EAKD1*~ 40EMKD1*~ 76EMKD1*~ 80BK~96BK					
SD31 SD31··G						34EAKD1*~ 36EAKD1*~ 38EMKD1*~ 68EMKD1*~ 72BK~84BK				

- 1) Bearing part numbers with * are **ULTAGE series** and have outer ring oil holes and groove as standard.
 2) "K" indicates bearings have tapered bore with a taper ratio of 1:12.

Strength of Plummer Blocks, and Combination with Bearings

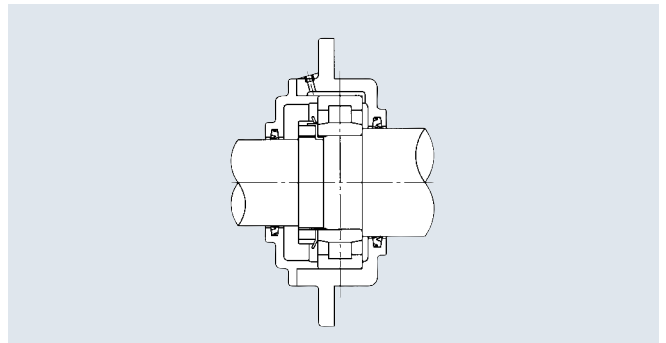
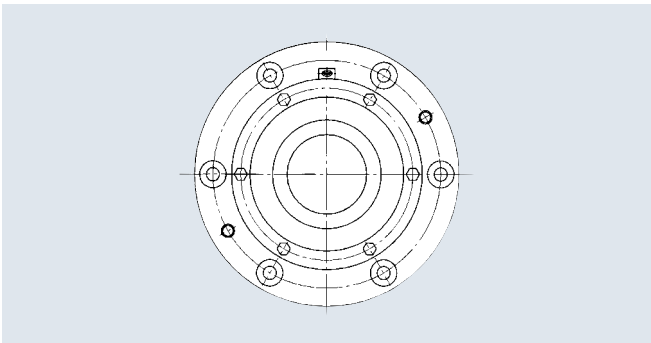
Table 5.2 (2) Plummer blocks and applicable bearings

Bearing series Plummer block series	12	22	13	23	230	231	222	232	213	223
SV5	05SK~22SK	05SK~22SK					08EAKD1*~ 32EAKD1*~ 34EMKD1*~ 64EMKD1*	18EMKD1*~ 20EMKD1*~ 64EMKD1		
SV6			05SK~22SK	05SK~22SK					08CK~10CK 11K~22K	08EAKD1*~ 28EAKD1*~ 30EMKD1*~ 56EMKD1*
SV2	05S~22S	05S~22S					08EKD1*~ 32EKD1*~ 34EMD1*~ 64EKD1*	18EMD1*~ 20EMD1*~ 64EMD1		
SV3			05S~22S	05S~22S					08C~10C 11~22	08EAD1*~ 28EAD1*~ 30EMD1*~ 56EMD1*

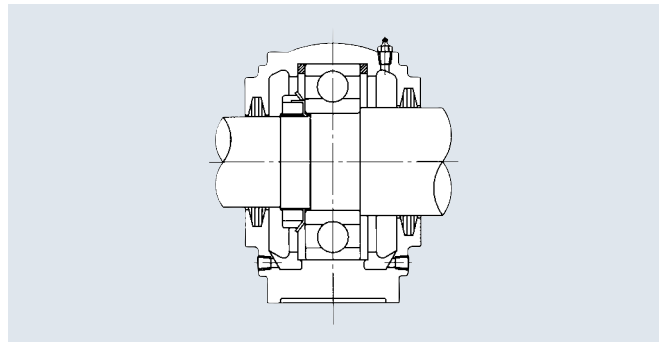
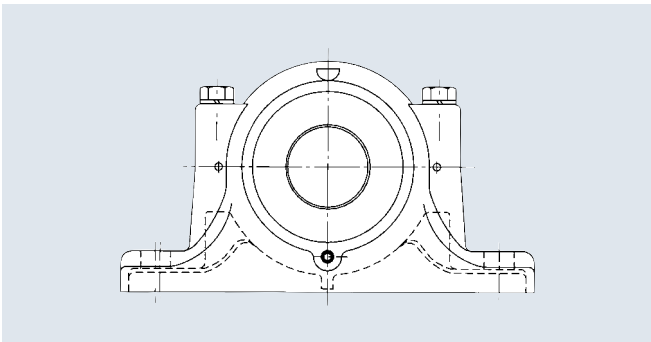
1) Bearing part numbers with * are **ULTAGE series** and have outer ring oil holes and groove as standard.

2) "K" indicates bearings have tapered bore with a taper ratio of 1:12.

Example of application with cylindrical roller bearing



Example of application with deep groove ball bearing



6. Allowable Speed

Greater bearing speed leads to higher bearing temperature owing to friction heat occurring within the bearing. When the bearing is heated beyond a specific limit, a bearing failure such as seizure occurs, and the bearing cannot maintain stable operation any more. The limiting bearing speed where a bearing can operate without developing heat beyond a particular limitation is called allowable speed (min^{-1}). This varies depending on the type and size of bearing, type of cage, as well as loading, lubricating and cooling conditions.

The bearing tables in this brochure summarize the typical allowable bearing speeds either with grease or oil lubrication. However, these values assume that:

- An NTN standard design bearing having correct internal clearance is correctly installed.
- The bearing is lubricated with quality lubricant, and the lubricant is replenished or replaced at correct intervals.
- The bearing is operated under normal loading conditions ($P \leq 0.09C_r$, $F_a/F_r \leq 0.3$), and at a normal operating temperature.

Note, however, that rolling elements may fail to rotate smoothly under a load of $P \leq 0.04C_{Or}$. For advice against this problem, contact NTN Engineering. Also, note that the allowable speed of deep groove ball bearing having a contact seal (type LLU) or low-torque seal (type LLH) is governed by the peripheral speed of the seal. The allowable speed of a bearing that is used under severe

operating conditions can be determined by multiplying the allowable speed of that bearing in a bearing table by an adjustment factor in **Fig. 6.1**.

The allowable speed of a plummer block with a bearing varies depending on the seal type used. For example, in the case of a plummer block having a contact seal, its allowable speed is restricted by the allowable peripheral speed of the seal. **Fig. 6.2** provides a guideline for selecting allowable peripheral speeds of various seals.

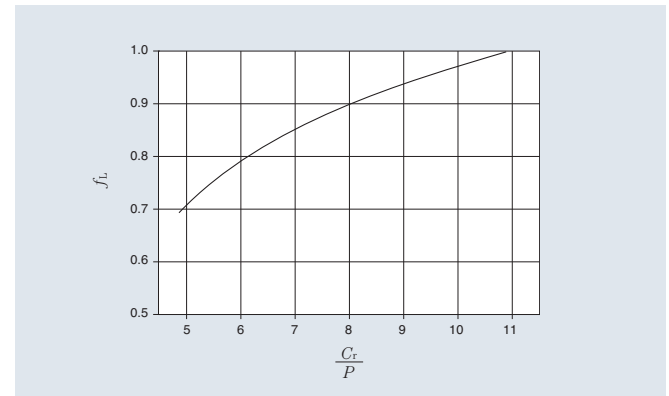


Fig. 6.1 Values of adjustment factor f_L dependent on bearing load

C_r : Basic dynamic load rating N

P : Dynamic equivalent load N

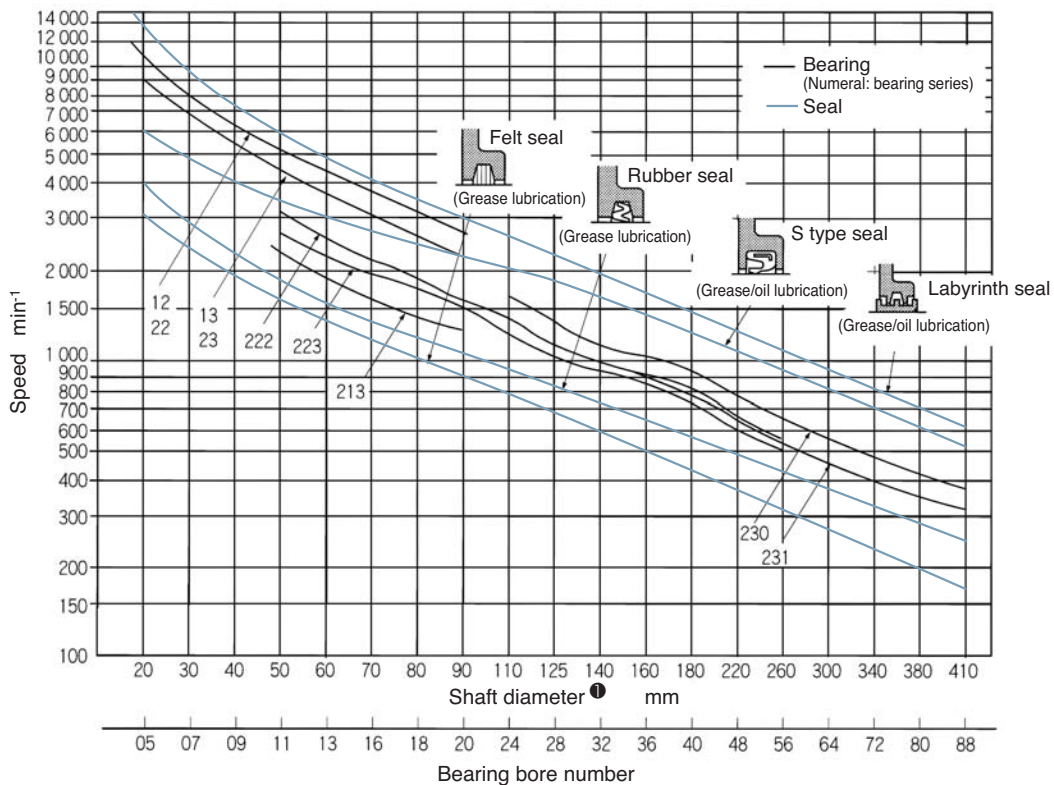


Fig. 6.2 Allowable speed of bearing vs. allowable peripheral speed of seal n_o

- ① Determine the allowable speed of the seal of a cylindrical bore bearing by referring to the shaft diameter at the contact surface of the seal. In the plotting above, the allowable speeds of the seal are indicated as shaft speeds (min^{-1}).

7. Bearing Seals

The purposes of bearing seals are to prevent lubricant from leaking out and to protect the bearing against ingress of dust and moisture.

An appropriate bearing seal is selected considering the lubricant type (grease or oil) and the peripheral speed of the seal.

The seal type of NTN plummer blocks can be either contact or non-contact type. The contact type is available as felt seals and rubber seals, while the non-contact type as labyrinth seals. Also, special combination seals are available for applications under severe operating conditions involving, for example, heavy air-borne dust.

7.1 Contact seals

(1) Rubber seal (Fig. 7.1)

Rubber seals are typically used for grease lubrication, and their allowable peripheral speed, as a guideline, ranges from 5 to 6 m/s.

Usually, the material of rubber seals are nitrile rubber. However, to cope with demanding ambient temperatures, the materials in **Table 7.1** are also available.

(2) Felt seal (Fig. 7.2)

Felt seals are compatible with rubber seals, but must be used for grease lubrication only.

Felt seals are not suitable for dusty or moist environments. Their allowable peripheral speed, as a guideline, is 4m/s. A felt seal can be cut into two pieces that are respectively fitted into the seal grooves on the upper and lower plummer block housings. This feature greatly simplifies the assembly procedure for plummer blocks.

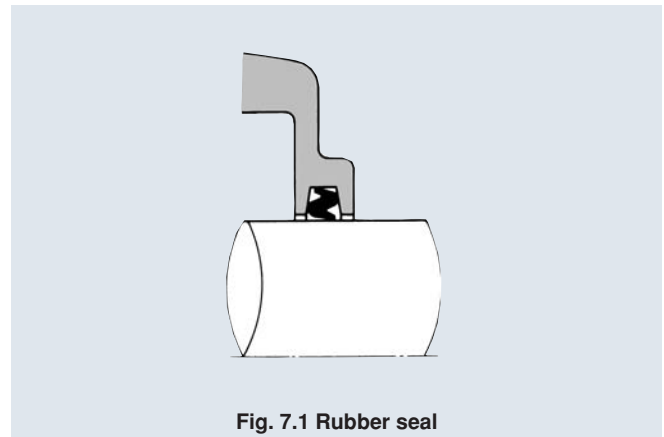


Fig. 7.1 Rubber seal

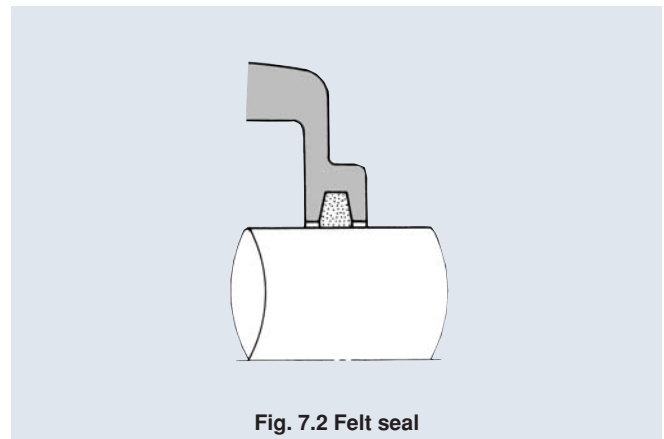


Fig. 7.2 Felt seal

Table 7.1 Types and features of rubber seal materials

Seal material	Wear resistance	Oil resistance	Acid resistance	Alkali resistance	Water resistance	Recommended operating temperature range °C	Features
Nitrile rubber (NBR)	◎	◎	○	○	○	- 25 100	Nitrile rubber (NBR) resists virtually all oil types and also features good wear resistance. Thus, this material is most commonly used as an oil seal material. It can be used in ordinary machinery operating under virtually any normal operating conditions.
Acrylic rubber (ACM)	◎	◎	△	×	△	- 15 130	Boasts excellent heat resistance and oil resistance, but is rather vulnerable to alkali or water. Thus, the scope of its applications is limited.
Silicone rubber (VMQ)	○	○	△	×	○	- 50 220	Boasts excellent heat resistance and cold resistance. However, it cannot be used together with extreme pressure grease or spindle oil.
Fluororubber (FKM)	◎	◎	◎	△	○	- 10 220	Inert to virtually all oil or chemical types. Its properties are well balanced. Therefore, it features wider operating conditions range. To sum up, this is a superior oil seal material.

◎: Excellent, ○: Good, △: Fair, ×: Poor (must not be used)

(3) S grease seal (Fig. 7.3)

The S grease seal (synthetic rubber seal with spring) excels in sealing performance and is well suited for grease or oil lubrication. Custom specification variants can be used in a plummer block.

Its recommended peripheral speed falls within a range of 10 to 12 m/s. The surface roughness and hardness of the shaft in contact with this sealing material necessitates special attention.

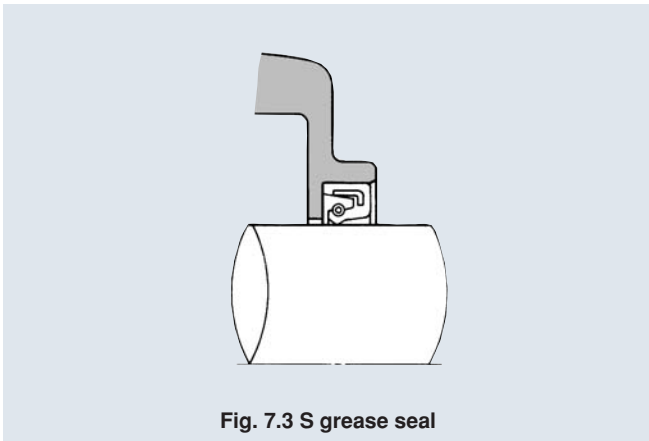


Fig. 7.3 S grease seal

6.2 Non-contact seals

(1) Labyrinth seal (Fig. 7.4)

The labyrinth seal used in the bore of plummer blocks -- SD31...TS and SD32...TS series-- comprise a labyrinth ring that is fitted into the bore of the plummer block. A labyrinth seal is used in clearance fit to a shaft (h9) together with an O-ring so that it can be readily installed and can follow expansion/compression of the shaft.

This seal type excels in sealing performance, and can be used for grease or oil lubrication.

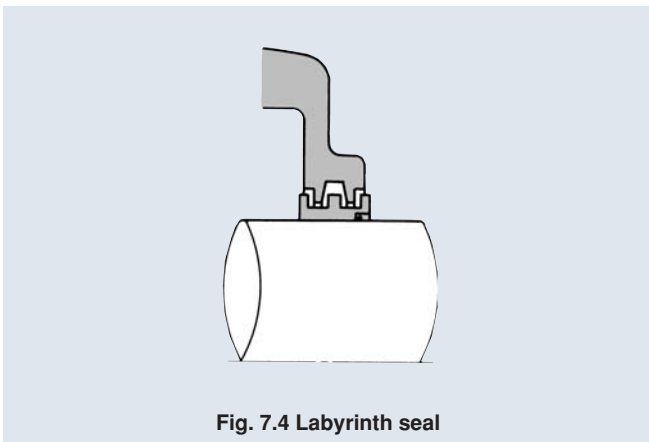


Fig. 7.4 Labyrinth seal

(2) Special labyrinth seal (Fig. 7.5)

The special labyrinth seals such as those in Fig. 7.5 are very useful for applications where heavy soil and dust are present.

The plummer blocks used in conjunction with this seal type are manufactured per custom specifications. For further information, contact NTN Engineering.

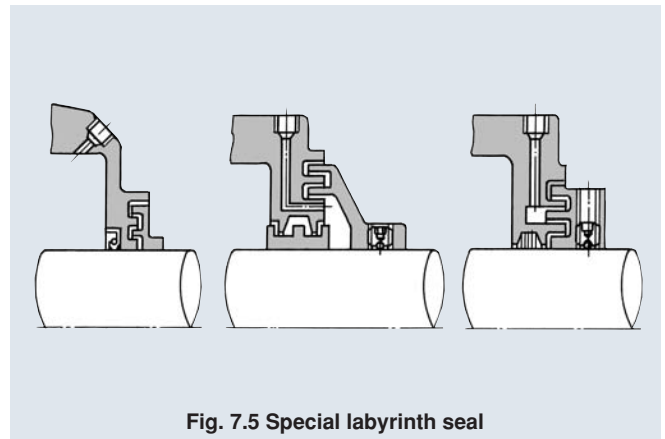


Fig. 7.5 Special labyrinth seal

Shaft design specification for the area in contact with the seal

The quality of a shaft section in contact with the seal lip greatly affects the sealing performance of the seal. Therefore, strictly adhere to the design standard for shafts in Table 7.2.

Table 7.2 Shaft design standard

Criterion	Design standard	Remarks
Hardness	HRC30~40	
Surface roughness	0.8Ra or smaller	The finish surface should be finish-ground without infeed.
Chamfering at end face	The end face to which a seal is fitted must be tapered and the sharp corner must be rounded.	

7.3 Combination seals

The combination seals used for the SBG series are unique seals that comprise both of an oil seal and labyrinth seal and are installed in the bore of a plummer block. They are used in environments where heavy dust and contaminants are present.

For better sealing effect, the labyrinth seal is often filled with grease.

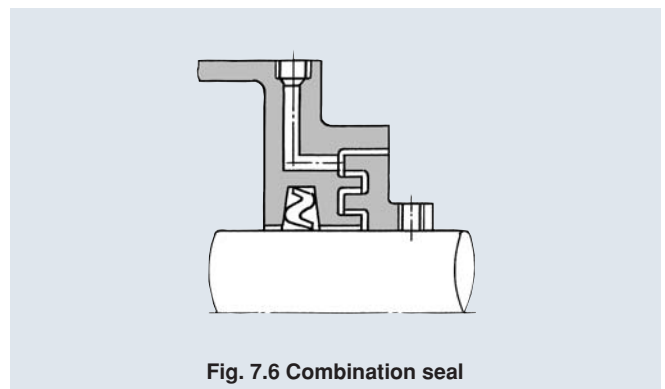


Fig. 7.6 Combination seal

With a continuous or intermittent lubrication scheme, lubricant can tend to leak. Use a seal that positively offers reliable sealing.

8. Shaft Design

8.1 Bearing-to-shaft fit

The tolerance requirements of the shaft outside diameter differs between a bearing with an adapter and a cylindrical bore bearing each mounted to a plummer block. **Tables 8.1(a) and (b)** summarizes the recommended bearing-to-shaft fits.

A bearing with an adapter is installed to a shaft by means of an adapter. A cylindrical bore bearing is usually positioned in interference fit by a shaft shoulder and secured with a nut and washer. For this application, the shaft is provided with threading and washer groove as illustrated in **Fig. 8.1**.

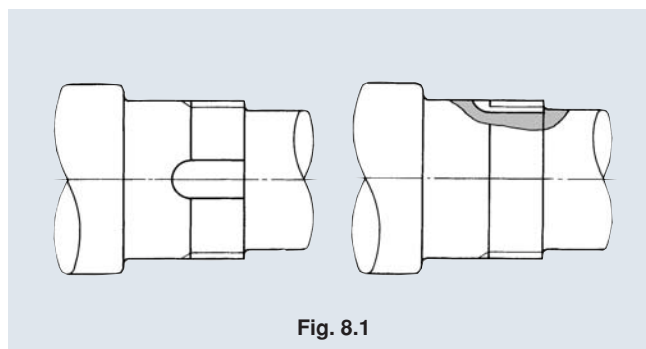


Fig. 8.1

Table 8.1(a) Recommended bearing-to-shaft fit

Bearing bore type	Load condition	Shaft diameter (mm)		Shaft type and tolerance class	Remarks
		Self-aligning ball bearing	Self-aligning roller bearing		
Tapered bore (complete with adapter assembly)	All type of loads	All shaft diameters		h9/IT5	The tolerance class for transmission shafts may be h10/IT7. "IT5" or IT7" means that the shaft form tolerance (circularity, cylidricity, etc.) must satisfy tolerance class IT5 or IT7.
Cylindrical bore	Light load and fluctuating load	over 18, incl. 100 over 100, incl. 200	— —	j6 k6	Light load essentially means a load as small as 6 to 7% the basic dynamic load rating. $P_r \textcircled{1} \leq 0.07C_r$
	Normal load	over 18, incl. 100 over 100, incl. 200 — —	— over 40, incl. 65 over 65, incl. 100 over 100, incl. 140 over 140, incl. 280	k5 m5 m6 n6 p6	Normal load is a load that satisfies $0.06C_r < P_r \leq 0.12C_r$.
	Heavy load and shock load	— — —	over 50, incl. 100 over 100, incl. 140 over 140	n6 p6 r6	Heavy load is a load that satisfies $P_r > 0.12C_r$. For this type of application, use a bearing whose clearance is greater than normal clearance.

① P_r : equivalent radial load

Note : 1. The above table applies to solid steel shafts.

2. Please refer to **Table 8.1(b)** for **ULTAGE series** of spherical roller bearings.

Table 8.1(b) Recommended spherical roller bearings-to-shaft fit (For ULTAGE series)

Bearing bore type	Load condition	Shaft diameter (mm)		Shaft tolerance class	Remarks
		Spherical roller bearings [type EA · EM]			
Tapered bore (complete with adapter assembly)	All type of loads	All shaft diameters		h9/IT5	The tolerance class for transmission shafts may be h10/IT7. "IT5" or IT7" means that the shaft form tolerance (circularity, cylidricity, etc.) must satisfy tolerance class IT5 or IT7.
Cylindrical bore	Light load or Normal load or Varying load	over 18, incl. 25 over 25, incl. 40 over 40, incl. 60 over 60, incl. 100 over 100, incl. 200 over 200, incl. 500	— — — — — —	k5 m5 n5 n6 p6 r6	Light load is a load that satisfies $P_r \textcircled{1} \leq 0.005C_r$ Normal load is a load that satisfies $0.05C_r < P_r \leq 0.10C_r$
	Heavy load or Impact load	over 50, incl. 70 over 70, incl. 140 over 140, incl. 200 ②	— — —	n6 p6 r6	Heavy load is a load that satisfies $P_r > 0.10C_r$. For this type of application, use a bearing whose clearance is greater than normal clearance.

① P_r : equivalent radial load

② When using shaft diameter over 200mm with heavy load or impact load, please contact **NTN Engineering**.

Note : The above table applies to solid steel shafts.

"ULTAGE" (a name created from the combination of "Ultimate," signifying refinement, and "stage," signifying NTN's intention that this series of products be employed in divers eapplications) is the general name for NTN's new generation of bearings that are noted for indusly-leading performance.

8.2 Mounting dimensions

To be able to correctly seat a cylindrical bore bearing to the shaft shoulder, the height and fillet radius r_{as} of the shoulder must be greater than the chamfering $r_{s \min}$ of the bearing as specified in **Table 8.2**.

If the bearing is used on the shaft end, the configuration must be designed such that the shaft end does not interfere with the face of bearing bore. For reference, **Table 8.3** provides the wall thickness values at the bearing bore.

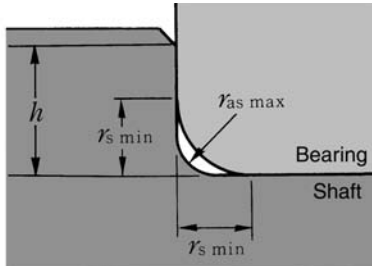


Table 8.2 Fillet radius and shoulder height of shaft

Unit: mm

Chamfer dimension $r_s \min$ mm	Shoulder height h ❶ (min)	Fillet radius $r_{as} \max$
1	2.75	1
1,1	3.5	1
1,5	4.25	1.5
2	5	2
2.1	6	2
2.5	6	2
3	7	2.5
4	9	3
5	11	4
6	14	5
7.5	18	6
9.5	22	8

❶ The shoulder height must be greater than that specified when the shaft is subjected to a greater axial load.

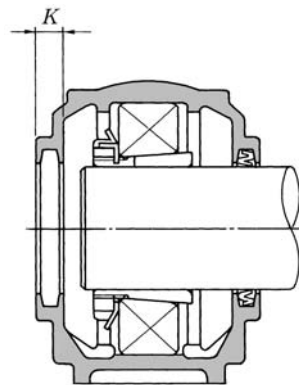


Table 8.3 Wall thickness at the bearing bore

(1) Unit: mm

Bearing number	K	Bearing number	K	Bearing number	K
SN 506	11	SN 606	11	SN 206	11
507	11	607	11	(SNZ) 207	11
508	11	608	11	208	13
509	11	609	11	209	13
SN 510	11	SN 610	11	SN 210	13
511	14	611	14	(SNZ) 211	14
512	14	612	14	212	16
513	14	613	14	213	16
515	14	615	14	214	16
SN 516	16	SN 616	16	SN 215	16
517	16	617	16	(SNZ) 216	17
518	16	618	16	217	17
519	16	619	16	218	18
520	18	620	18	219	18
SN 522	20	SN 622	20	SN 220	20
524	20	624	20	(SNZ) 222	22
526	20	626	20	224	22
528	23	628	23	226	22
530	23	630	23	228	23
SN 532	25	SN 632	25	SN 230	23
				(SNZ) 232	25

Note: The dimensions for model SN3 are the same as those of model SN2.

(2) Unit: mm

Bearing number	K	Bearing number	K	Bearing number	K
SD 534	44	SD3340	44	SN3024	20
536	44	3344	48	3026	20
538	48	3348	48	3028	22
540	48	3352	54	3030	22
544	54	3356	54	3032	22
SD 548	52	SD3360	58	SN3034	24
552	58	3364	58	3036	24
556	58	3368	60	3038	24
560	60	3372	60		
564	60	3376	60		
SD 634	48	SD3440	48	SN3122	20
636	48	3444	48	3124	20
638	54	3448	54	3126	20
640	54	3452	52	3128	22
644	58	3456	58	3130	22
SD 648	58	SD3460	58	SN3132	24
652	60	3464	60	3134	24
656	60	3468	60	3136	24
				3138	24

Note: For SD31TS and SD32TS, $K=37$ mm.

The dimensions for SD30 and SD31 are the same as those of SD33 and SD34.

9. Lubrication

9.1 Grease lubrication

Usually, plunger blocks are lubricated with grease. Grease lubrication leads to good sealing performance and simpler seal design.

(1) Characteristics of grease

Grease is prepared by mixing base oil such as mineral oil or synthetic oil with thickener. The characteristics of grease vary depending on types and combination of various additives.

Depending on the intended application, a grease of appropriate consistency number is used as summarized in **Table 9.1**.

Table 9.1 Grease consistency

NLGI consistency No.	JIS (ASTM) 60 times blend consistency	Applications
0	355~385	For centralized greasing use
1	310~340	For centralized greasing use
2	265~295	For general use and sealed bearing use
3	220~250	For general use and high temperature use
4	175~205	For special use

(2) Grease volume

When grease is packed into a bearing, the inside of the bearing is first filled with grease. During this course, the grease must be also filled into the inside guide way of the bearing cage.

As a guideline, the recommended volume of grease filled in plunger blocks is given below.

General application

.....About 1/3 to 1/2 the empty space

Relatively high speed application

.....About 1/2 the empty space

Low speed application

.....More than 1/2 the empty space

The volume of grease should be carefully selected as it can lead to overheating of the bearing, outward leakage from the seal, or ingress of dust.

The recommended volume of grease commonly filled in the applicable bearings are summarized in **Table 9.2**.

Table 9.2 (1) Volume of grease filled into models SN5 and SN6

Bearing number	Grease volume (g)	Bearing number	Grease volume (g)
SN506	20~ 30	SN606	27~ 41
SN507	30~ 45	SN607	35~ 52
SN508	37~ 55	SN608	50~ 75
SN509	37~ 55	SN609	75~ 110
SN510	47~ 70	SN610	100~ 150
SN511	55~ 80	SN611	110~ 160
SN512	80~ 120	SN612	130~ 190
SN513	100~ 150	SN613	160~ 240
SN515	130~ 190	SN615	230~ 350
SN516	140~ 210	SN616	250~ 380
SN517	170~ 260	SN617	320~ 480
SN518	260~ 390	S618	370~ 550
SN519	250~ 370	S619	470~ 700
SN520	330~ 500	S620	500~ 750
SN522	470~ 700	S622	700~1 000
SN524	550~ 850	S624	950~1 400
SN526	650~ 950	S626	1 100~1 600
SN528	800~1 200	S628	1 300~2 000
SN530	1 100~1 600	S630	1 600~2 400
SN532	1 300~2 000	S632	1 800~2 700

Table 9.2 (2) Volume of grease filled into model SD

Bearing number	Grease volume (g)	Bearing number	Grease volume (g)
SD3340	1 400~ 2 100	SD534	1 500~ 2 300
SD3344	1 700~ 2 600	SD536	1 800~ 2 700
SD3348	2 000~ 3 000	SD538	1 900~ 2 900
SD3352	2 700~ 4 000	SD540	2 300~ 3 400
SD3356	3 400~ 5 100	SD544	3 000~ 4 500
SD3360	3 500~ 5 700	SD548	3 700~ 5 600
SD3364	4 300~ 6 400	SD552	4 800~ 7 200
SD3368	5 600~ 8 400	SD556	6 000~ 9 000
SD3372	6 300~ 9 400	SD560	6 700~10 000
SD3376	6 600~ 9 900	SD564	9 300~14 000
SD3440	1 500~ 2 200	SD634	1 900~ 2 900
SD3444	2 300~ 3 400	SD636	2 500~ 3 700
SD3448	2 300~ 3 500	SD638	2 700~ 4 000
SD3452	2 700~ 4 000	SD640	3 300~ 5 000
SD3456	3 200~ 4 800	SD644	3 800~ 5 700
SD3460	4 400~ 6 600	SD648	5 400~ 8 100
SD3464	5 100~ 7 700	SD652	6 500~ 9 800
SD3468	6 700~1 0000	SD656	8 700~13 000

Table 9.2 (3) Volume of grease filled into models SN30 and SN31

Bearing number	Grease volume (g)	Bearing number	Grease volume (g)
SN3024	260~ 390	SN3122	260~ 380
SN3026	370~ 550	SN3124	350~ 550
SN3028	420~ 650	SN3126	400~ 600
SN3030	490~ 750	SN3128	470~ 700
SN3032	650~1 000	SN3130	700~1 000
SN3034	800~1 200	SN3132	850~1 300
SN3036	1 000~1 500	SN3134	950~1 400
SN3038	1 000~1 500	SN3136	1 100~1 700
		SN3138	1 300~2 000

10. Handling the Plummer Blocks and Bearings

Rolling bearings are precision components. To maintain their accuracies, they must be handled very carefully. In particular, they must be kept clean, not be subjected to strong impact, and be protected against possible rusting.

Plummer blocks also need similar handling practices.

10.1 Inspection before installation

Before installing a bearing and a plummer block, the following points must be thoroughly checked and inspected.

- (1) Prepare installation tools, measuring instruments, oil stone, lubricant and factory cloth. Before the installation work, remove dust and impurities from these tools. (Fig. 10.1)



Fig. 10.1

- (2) Make sure that the shaft is free from bends or other damages and that it has been dimensioned and formed as specified. (Fig. 10.2)

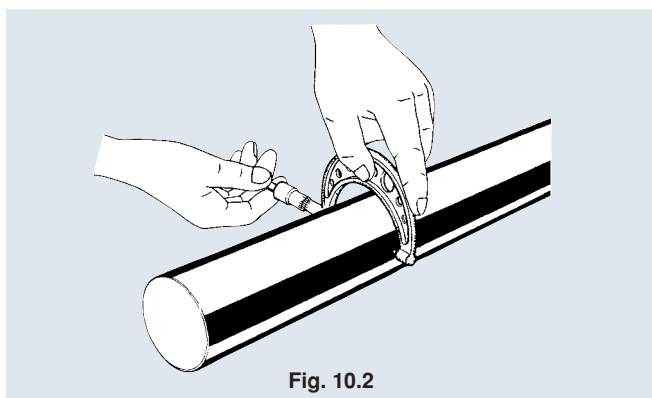


Fig. 10.2

- (3) Remove dent marks (even though very small) from the mating faces with an oil stone or fine emery paper. Check that the contact face to the seal has specified surface roughness (0.8Ra). Wipe dust away from the shaft with clean factory cloth.
- (4) Remove possible dust and metal chips from the inside of plummer block. (Fig. 10.3)

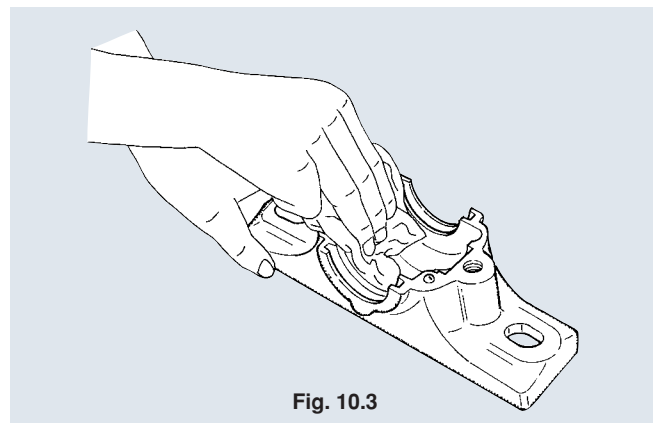


Fig. 10.3

- (5) Check the flatness of the mounting face of the plummer block. (When placed on a frame, the plummer block must be stably seated.)

9.2 Preparation for installing the bearing

- (1) Unpack the bearing just before the installation work.
- (2) If the bearing is to be grease-lubricated, the rust-proof coating on it may remain unremoved. If it is to be oil-lubricated, remove the coating with benzene or kerosene.
- (3) For a bearing with an adapter, check its radial clearance before the installation work. To do so, place it on a flat work bench, and fit a thickness gage between the uppermost roller and the raceway surface on the outer ring to measure the clearance (Fig. 10.4). Do not force the thickness gage in or turn the bearing. Otherwise, the resultant clearance measurement will be greater than the actual clearance.

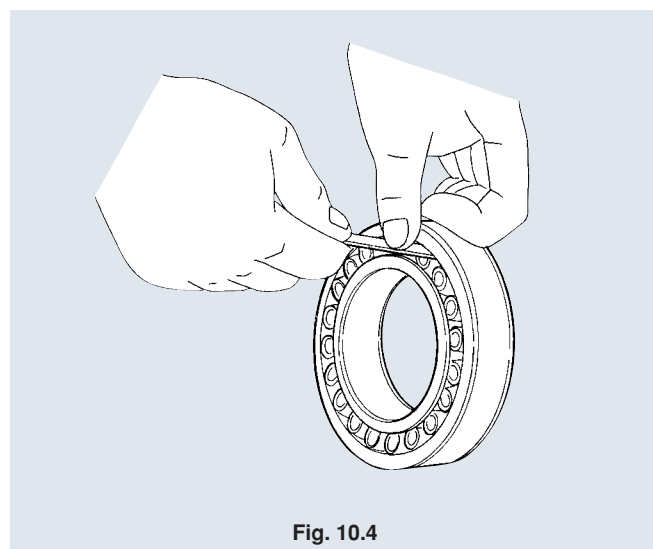


Fig. 10.4

10.3 Installation of the bearing and associated components

Once careful checking is complete, install the bearing and associated components. For the positional relationship, see **Fig. 10.5**.

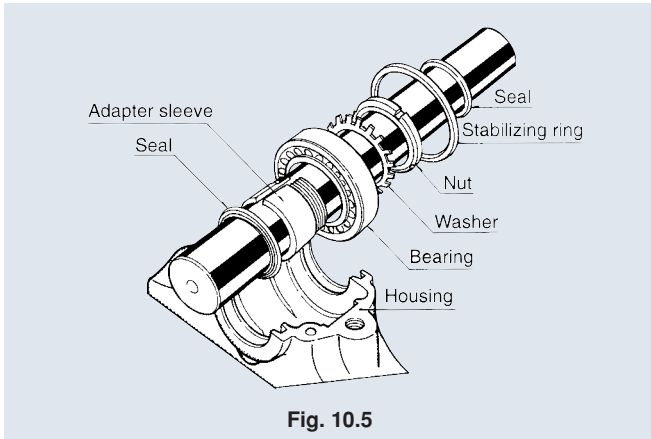


Fig. 10.5

When a bearing is installed onto a shaft or into a housing, do not directly hit its end face with a hammer or drift as shown in **Fig. 10.6**. Otherwise, its design performance can be lost. Always evenly exert force around the entire bearing ring face. Also, do not apply force to one bearing ring (for example, outer ring) as in **Fig. 10.7** to convey the force via the rolling elements to the other bearing ring (inner ring) to install the latter. Otherwise, a dent mark or other damage can occur on either or both rings.

When installing a cylindrical bore bearing, whose interference is relatively small, its whole inner ring can be uniformly press-fitted at an ordinary temperature as illustrated in **Fig. 10.8**. Usually, the inner ring is press-fitted by tapping the sleeve with a hammer. However, when many bearings must be installed at a time, a mechanical or hydraulic press will be helpful.

When installing a non-separable bearing to the shaft and housing at a time, apply a press-fitting force to both the inner and outer rings by using a pressure distribution pad as in **Fig. 10.9**.

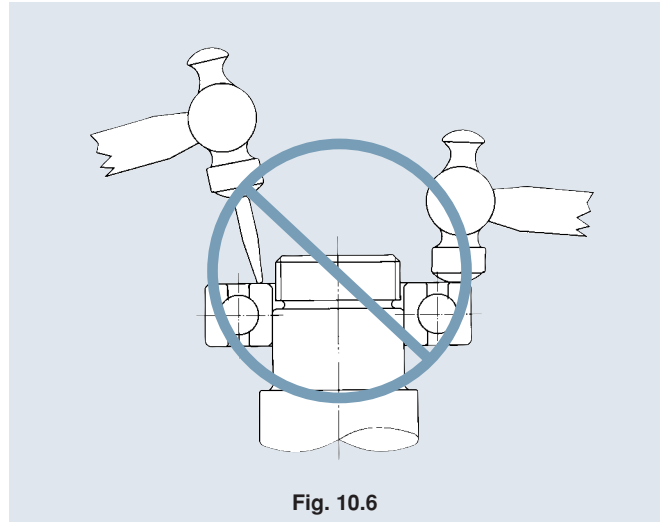


Fig. 10.6

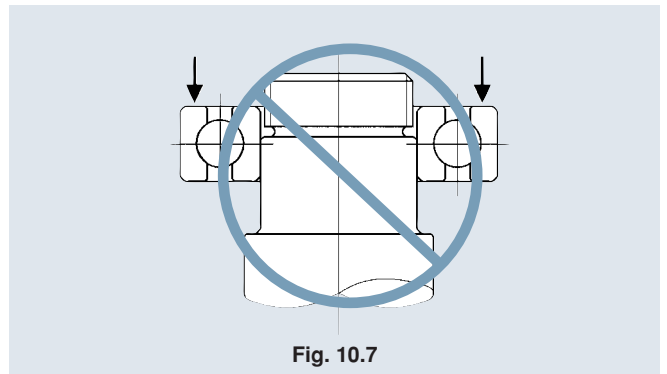


Fig. 10.7

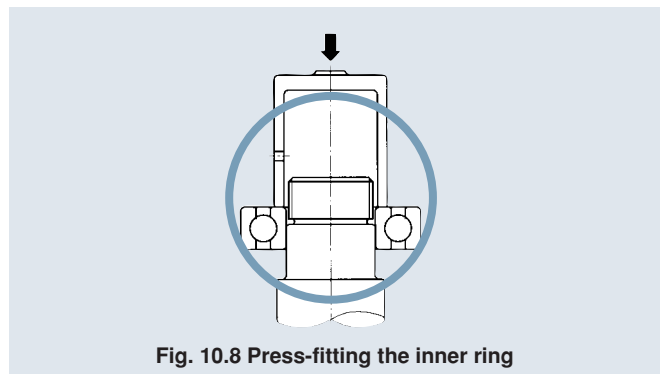


Fig. 10.8 Press-fitting the inner ring

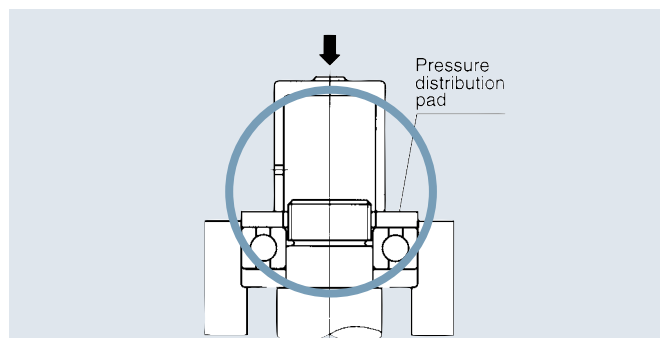
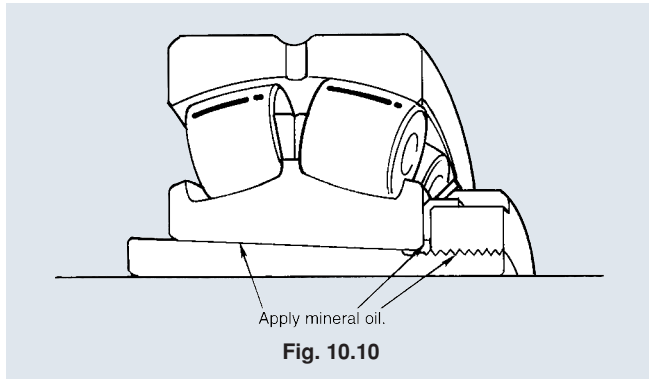


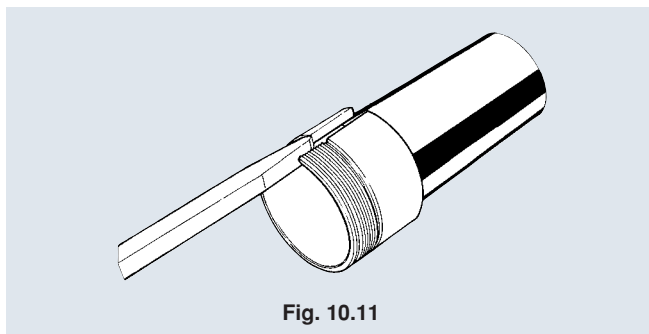
Fig. 10.9 Simultaneous press-fitting of the inner and outer rings

10.3.1 Bearing with an adapter

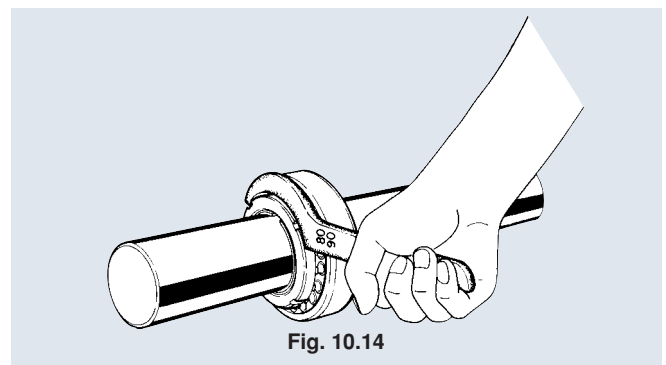
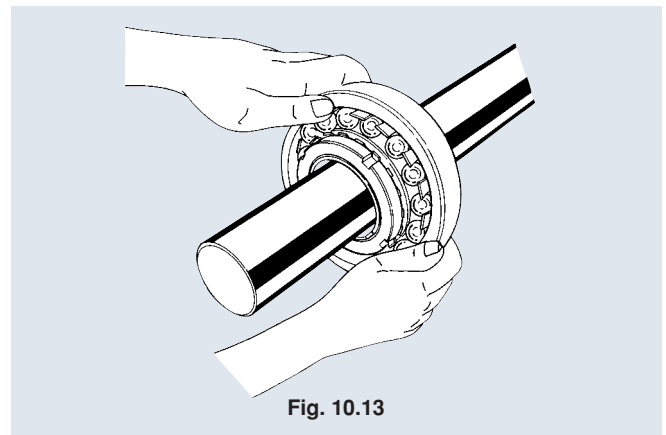
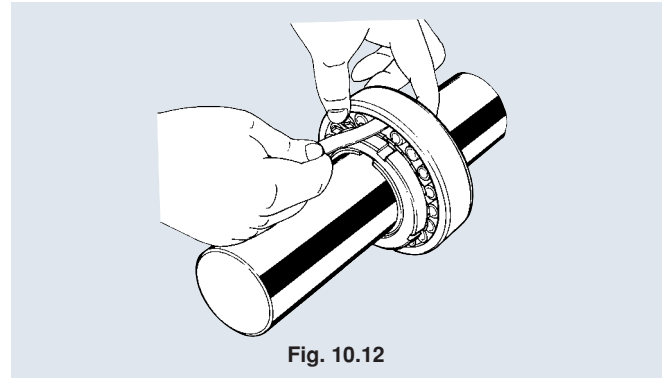
- (1) Thinly apply highly viscous mineral oil to the taper, threading and the chamfered face of the nut (see **Fig. 10.10**) before press-fitting. In particular, apply molybdenum bisulfide paste to these areas on a large bearing. This prevents scuffing, and allows easy bearing removal. Before the installation work, remove oil from the shaft and the bore face of sleeve with a clean factory cloth.



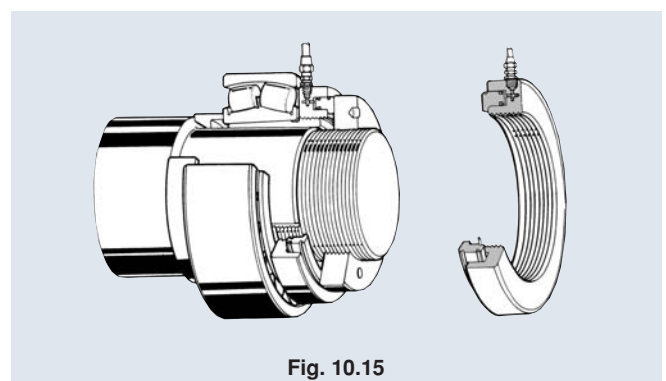
- (2) Mount the adapter to a correct position considering the dimension B_1 , B_2 or B_3 in the bearing table. When fitting the adapter sleeve onto the shaft, open the slit with a flat-blade screwdriver for easy fitting. (See **Fig. 10.11**.)



- (3) Fit the bearing over the adapter sleeve on the shaft as tight as possible, so that the bearing inner ring is fully seated onto the taper on adapter sleeve.
- (4) Lightly tighten the nut until the sleeve is seated on the shaft.
- (5) When fully tightening a self-aligning ball bearing, make sure that its radial clearance becomes approximately 1/2 that before fitting. For a spherical roller bearing, tighten the nut while measuring its radial clearance with a thickness gage so that the reduction of radial internal clearance value in **Table 10.1** is reached. Make sure that an installed self-aligning ball bearing can turn smoothly by hand (see **Figs. 10.12 and 10.13**).
- (6) To tighten the nut, use a spanner wrench illustrated in **Fig. 10.14**. When tightening the nut with a hammer and a drift, be sure that the chip from the drift does not enter the bearing.



- (7) If it is difficult to tighten a large bearing by manual force, use a hydraulic nut or ram for easier assembly. (See **Fig. 10.15**.)



- (8) Make sure the bearing clearance is as specified, then bend one tab on the washer that corresponds with the cutout on the circumference of the nut to maintain the adjustment (**Fig. 10.16**). Do not loosen the nut to allow the cutout to match the tab.
- (9) When a large bearing is installed to a shaft, its outer ring will be deformed by its own weight into an elliptical form. The clearance measurement at the lowest point on a deformed bearing will be greater than a true clearance. Remember that a radial clearance value measurement at this point will result in excessively large tightening allowance.

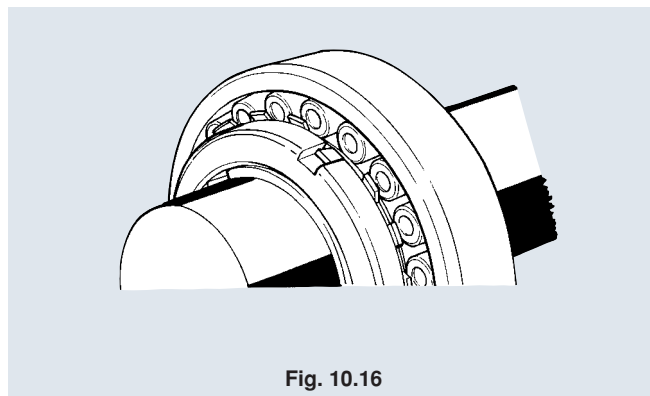


Fig. 10.16

Table 10.1 (a) Installation of tapered bore spherical roller bearings (installation of ULTAGE type)

Units: mm

Nominal bearing bore diameter		Reduction of radial internal clearance		Axial displacement drive up				Minimum allowable residual clearance		
				Taper, 1:12		Taper, 1:30				
over d	incl.	min	max	min	max	min	max	CN	C3	C4
24	30	0.01	0.015	0.15	0.2	—	—	0.015	0.025	0.04
30	40	0.015	0.02	0.25	0.3	—	—	0.015	0.03	0.045
40	50	0.02	0.025	0.35	0.4	—	—	0.02	0.035	0.055
55	65	0.025	0.03	0.4	0.45	—	—	0.025	0.045	0.065
65	80	0.035	0.04	0.5	0.6	—	—	0.03	0.055	0.08
80	100	0.04	0.05	0.6	0.7	—	—	0.03	0.06	0.09
100	120	0.055	0.065	0.8	0.9	1.8	2.3	0.035	0.07	0.105
120	140	0.065	0.075	0.9	1	1.95	2.7	0.045	0.085	0.125
140	160	0.075	0.09	1	1.2	2.35	3.1	0.04	0.09	0.14
160	180	0.08	0.1	1.1	1.4	2.8	3.55	0.04	0.1	0.16
180	200	0.09	0.11	1.2	1.5	3.2	3.95	0.05	0.11	0.18
200	225	0.11	0.13	1.5	1.8	3.85	4.6	0.05	0.12	0.19
225	250	0.12	0.14	1.6	1.9	4.2	4.95	0.06	0.13	0.21
250	280	0.13	0.16	1.6	2.1	4.25	5.4	0.06	0.14	0.23
280	315	0.15	0.18	1.9	2.4	4.45	5.7	0.06	0.15	0.25
315	355	0.16	0.19	2.1	2.5	5.1	6.1	0.08	0.17	0.28
355	400	0.18	0.22	2.3	3.0	5.75	7.5	0.08	0.18	0.3
400	450	0.21	0.25	3.0	3.6	—	—	0.08	0.19	0.32

Table 10.1 (b) Installation of tapered bore spherical roller bearings (non ULTAGE type)

Units: mm

Nominal bearing bore diameter		Reduction of radial internal clearance		Axial displacement drive up				Minimum allowable residual clearance		
				Taper, 1:12		Taper, 1:30				
over d	incl.	min	max	min	max	min	max	CN	C3	C4
30	40	0.02	0.025	0.35	0.4	—	—	0.015	0.025	0.04
40	50	0.025	0.03	0.4	0.45	—	—	0.02	0.03	0.05
50	65	0.03	0.035	0.45	0.6	—	—	0.025	0.035	0.055
65	80	0.04	0.045	0.6	0.7	—	—	0.025	0.04	0.07
80	100	0.045	0.055	0.7	0.8	1.75	2.25	0.035	0.05	0.08
100	120	0.05	0.06	0.75	0.9	1.9	2.25	0.05	0.065	0.1
120	140	0.065	0.075	1.1	1.2	2.75	3	0.055	0.08	0.11
140	160	0.075	0.09	1.2	1.4	3	3.75	0.055	0.09	0.13
160	180	0.08	0.1	1.3	1.6	3.25	4	0.06	0.1	0.15
180	200	0.09	0.11	1.4	1.7	3.5	4.25	0.07	0.1	0.16
200	225	0.1	0.12	1.6	1.9	4	4.75	0.08	0.12	0.18
225	250	0.11	0.13	1.7	2	4.25	5	0.09	0.13	0.2
250	280	0.12	0.15	1.9	2.4	4.75	6	0.1	0.14	0.22
280	315	0.13	0.16	2	2.5	5	6.25	0.11	0.15	0.24
315	355	0.15	0.18	2.4	2.8	6	7	0.12	0.17	0.26
355	400	0.17	0.21	2.6	3.3	6.5	8.25	0.13	0.19	0.29
400	450	0.2	0.24	3.1	3.7	7.75	9.25	0.13	0.2	0.31
450	500	0.21	0.26	3.3	4	8.25	10	0.16	0.23	0.35

- (10) The adapter used on a large bearing whose bore number is 44 or greater is a lock plate type (**Fig. 10.17**). For this arrangement, first tighten the nut, then fit the lock plate into the cutout on the nut. In this case too, do not loosen the nut to allow the cutout to match the lock plate. Once the lock plate is seated in the cutout, secure the adjustment with a spring washer and a hexagonal nut.

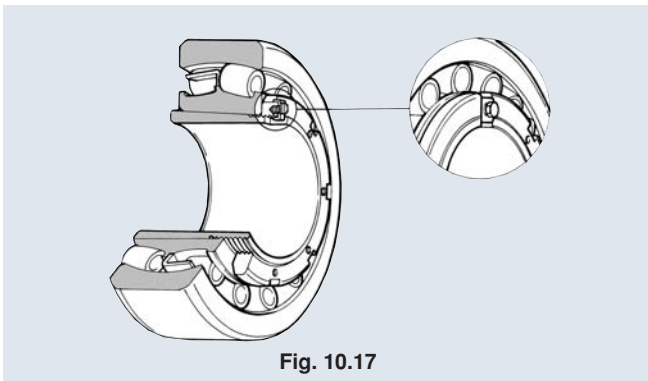


Fig. 10.17

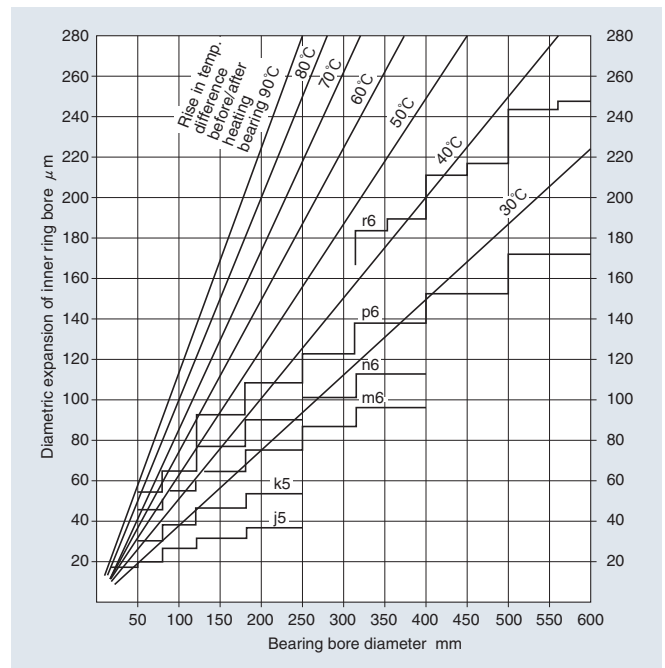


Fig. 10.19

10.3.2 Cylindrical bore bearing

(1) Press-fitting

- It is recommended that a small bearing of smaller tightening allowance be press-fitted by forcing a press-fitting jig onto the end face of inner ring. (See **Fig. 10.18**.)
- For easy fitting, apply mineral oil or molybdenum bisulfide lubricant to fitting surfaces on the shaft and bearing. During the press-fitting work, make sure that the bearing inner ring is not tilted.

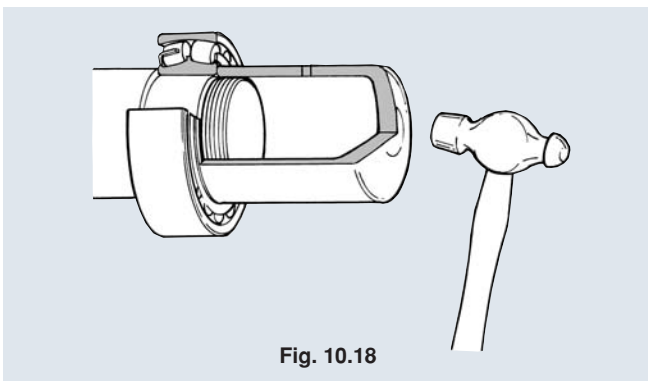


Fig. 10.18

(2) Shrink-fitting

- To install a medium or large bearing, a shrink-fitting technique can be conveniently employed. The heating temperature for shrink-fitting can be selected from **Fig. 10.19** based on the bearing dimensions and tightening allowance requirements. Remember the temperature of the bearing must not exceed 120°C.
- Usually, the bearing is heated in oil (**Fig. 10.20**). However, it may be heated in a heater.
- The oil used as a heating medium is clean

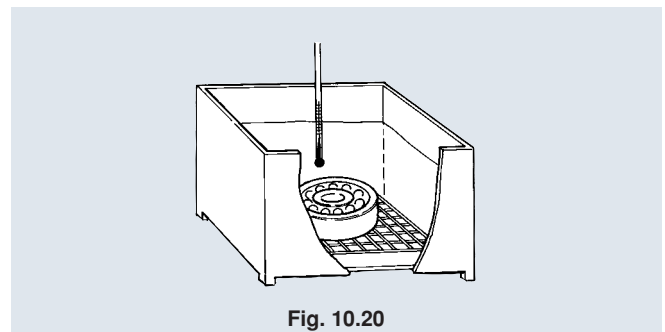


Fig. 10.20

machine oil #1 or transformer oil #1.

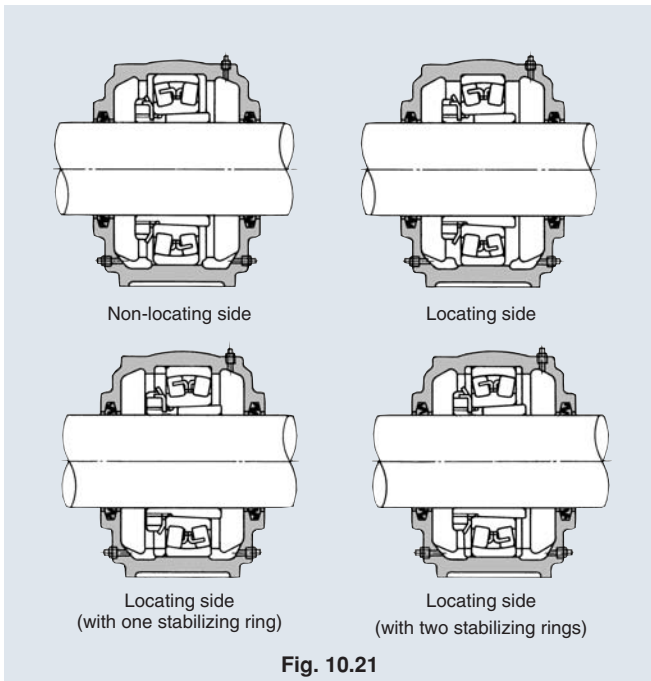
The heating oil bath must be amply sized and contain sufficient amount of oil. Be careful not to allow the bearing to directly contact the vessel.

- After fitting the bearing onto a shaft, allow it to cool off. Note that the bearing will also shrink in the axial direction. To avoid gap occurrence between the bearing face and the shaft shoulder, force the bearing against the shaft shoulder until the bearing and shaft have fully cooled down. Alternatively, tap the bearing several times in the axial direction through a jig to bring the bearing in close contact with the shaft before the bearing and shaft have fully cooled down.
- Make sure the bearing is fully seated on the shaft shoulder. Then, insert the washer and nut over the shaft, and secure the bearing by tightening the nut. Once the nut has been fully tightened, bend a tab on the washer and fit it into the cutout on the nut. If a tab cannot be readily fitted into the cutout, further turn the nut until the tab meets the cutout.

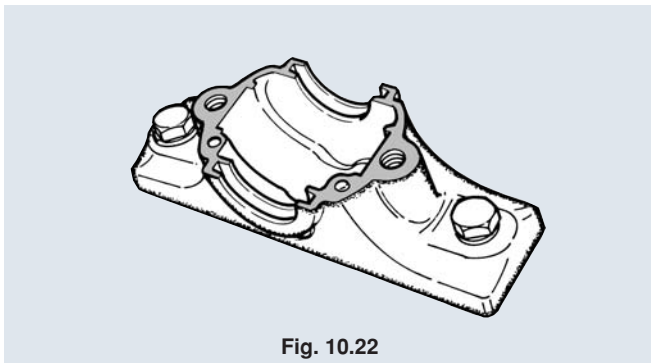
10.4 Assembling the plummer blocks

When installing two or more plummer blocks on a shaft, use one block to locate the outer ring of a bearing in the axial direction, and arrange the other block (s) so that the outer ring (s) of bearing (s) in the latter block (s) can move freely in the axial direction. (See **Fig. 10.21.**)

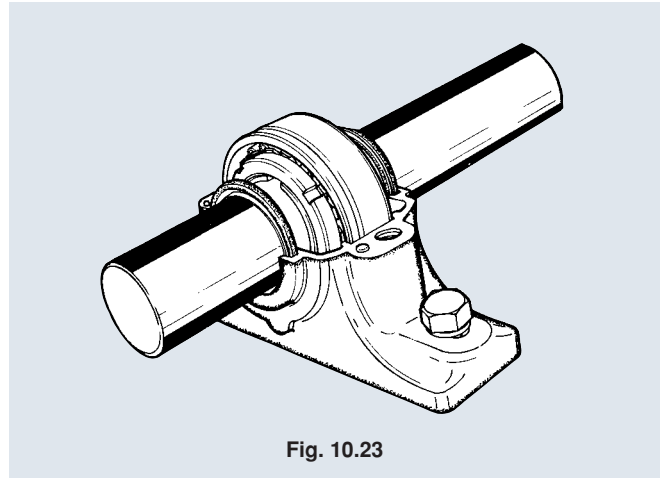
Once the bearing has been installed to the shaft and the associated components have been inserted over the shaft, assemble the plummer blocks according to the following procedure.



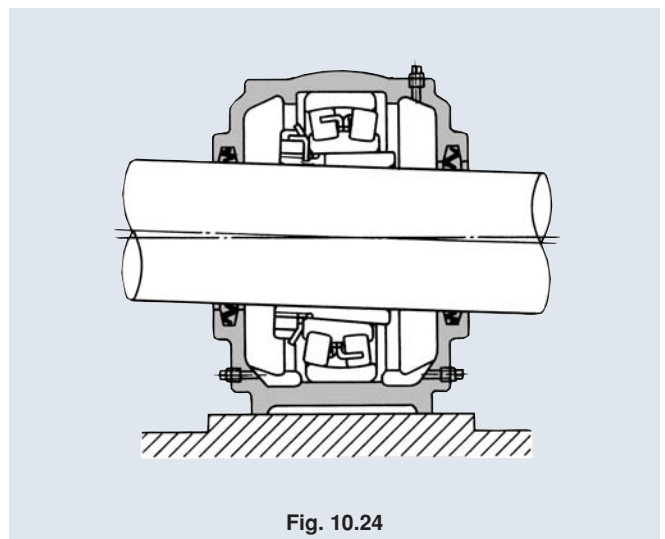
- (1) Temporarily install the lower plummer block housing to the frame. (See **Fig. 10.22.**)



- (2) Fit the locating bearing into the lower plummer block housing, together with the seal and stabilizing ring. (See **Fig. 10.23.**)



- (3) Adjust the position of the plummer block of the non-locating bearing to center the bearing to the bearing seating. If the plummer block is to be used in a high temperature environment, carefully position the bearing considering the thermal expansion of the shaft.
- (4) Once the bearing is correctly located, check the squareness of the plummer block relative to the shaft (make sure the face of bearing inner ring is parallel with that of the outer ring). Only then, fully tighten the nut. Remember a larger mounting error can cause the seal to fail or the shaft to interfere with the bearing bore, leading to non-smooth running (**Fig. 10.24**). If such a problem occurs, correct the mounting seat, and then, install the lower plummer block housing.



- (5) If the bearing is lubricated with grease, fill the bearing interior with grease, and apply grease to the mating surfaces of the upper and lower plummer block housings. Also, apply grease to the sliding surface of the seal. In the case of a self-aligning roller bearing, incline the outer ring to allow a sufficient volume of grease to be packed into the gaps between the rollers and the cage. (For the volume of grease, refer to Section 11.)
- (6) In the case of oil-lubricated bearings, fill the oil up to the center of the lowest rolling element. (See **Fig. 10.25**.)

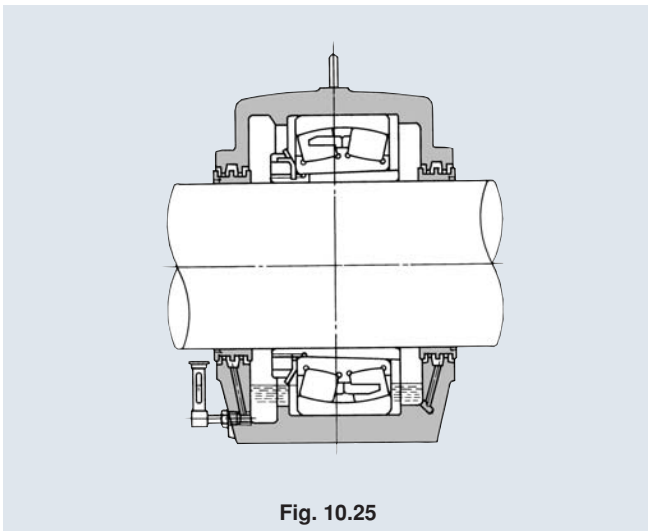


Fig. 10.25

- (7) After filling with lubricant, check the mating surfaces between the upper and lower plummer block housings are stably in contact with each other. Remember to apply grease to the mating surfaces on the plummer block housings to ensure reliable sealing and rust-proofing. Then, fully tighten the tightening bolt. (See **Fig. 10.26**.)

Note that either the upper or lower housing of a particular plummer block is incompatible with the lower or upper housing of another plummer block. Do not confuse the like housings.

Knock pin seats (**Fig. 10.27**) are provided at the corners of the bed so locking knock pins can be driven into these seats. Use these seats when intending to install a plummer block with utmost precision.

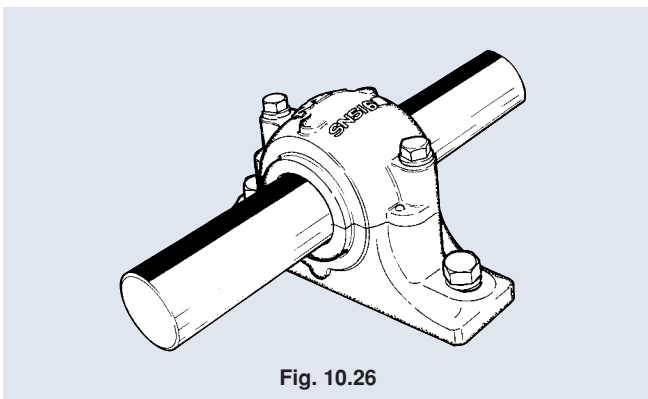


Fig. 10.26

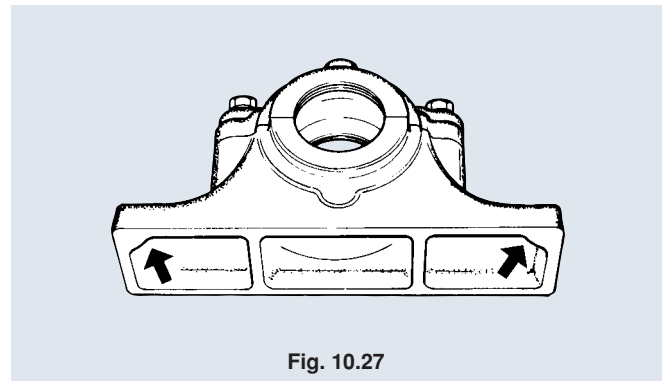


Fig. 10.27

9.5 Running inspection

Once the bearing arrangement has been assembled, make sure the assembly work has been correctly achieved by following the procedure below.

- (1) First, turn the bearing by hand to check that the bearing and seal are free from any irregularities.
 - a. Non-smooth touch: Trapped dust or scratch
 - b. Irregular torque: Abnormal interference
 - c. Excessively large running torque:
 - Too small bearing clearance, poor flatness of mounting seat
- (2) Next, run the bearing by power. Begin with no load and at lower speed.
 - a. Abnormal noise:
 - Dust, dent mark, or poor lubrication
 - b. Vibration:
 - Greater misalignment, or excessively large residual clearance
- (3) Run the bearing under normal operating conditions to check for temperature rise on the bearing. The possible causes to abnormal temperature rise with bearings are as follows:
 - a. Allowable speed has been exceeded.
 - b. Overloading
 - c. Too small residual clearance
 - d. Negative clearance owing to excessive expansion or compression with the shaft
 - e. Warped plummer block owing to poor flatness with the mounting seat
 - f. Poor lubrication (excessive or insufficient lubricant, inappropriate lubrication method of lubricant)
 - g. Too great tightening allowance for the contact seal, or interference with rotating components such as those around the labyrinth seal

If any irregularity is found as a result of running inspection, determine and remove the cause. Then, reperform the running inspection to make sure the bearing runs normally.

10.6 Maintenance and inspection

To be able to use a bearing to its design life and avoid any accident, check the following points at regular intervals.

- (1) Running sound on bearing
- (2) Temperature on bearing or plummer block
- (3) Vibration on shaft
- (4) Leaking grease or worn oil seal
- (5) Loose tightening and mounting bolts
- (6) Trouble-free operation of the lubrication system, and loosening or leakage with piping

If the bearing arrangement must be inspected while it is at a standstill, check it for the following points:

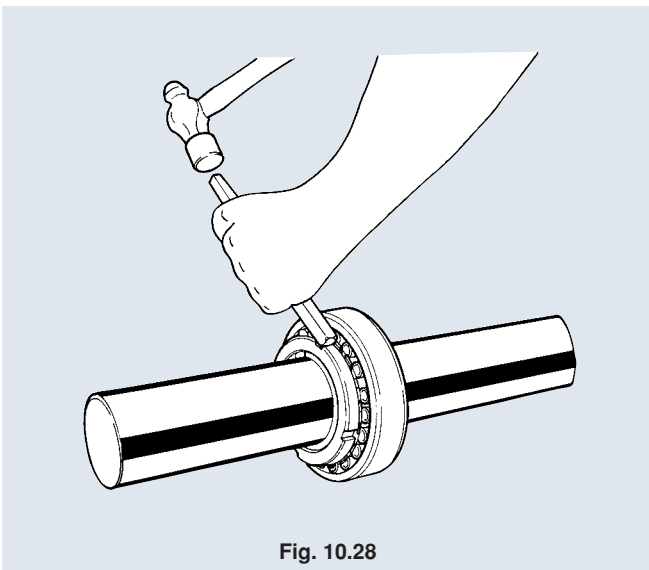
- (1) Check appearance the of bearing for any irregularity.
- (2) Fouling of grease, or contaminants (dust or steel dust) in grease
- (3) Loose adapter sleeve
- (4) Worn or damaged seal

10.7 Bearing disassembly

10.7.1 Bearing with adapter

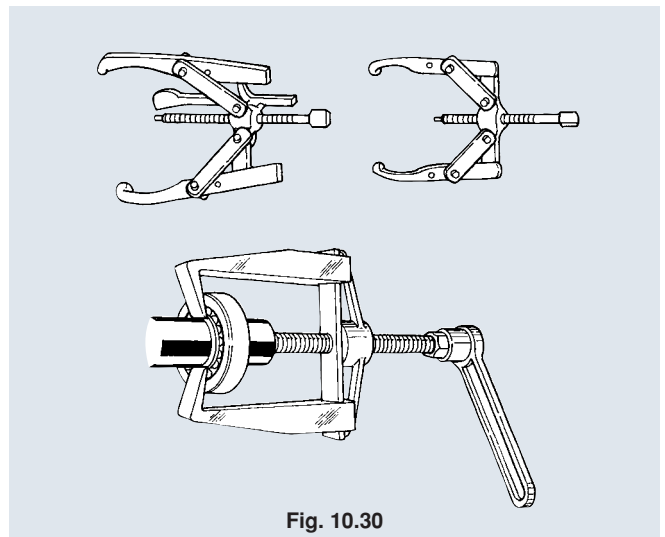
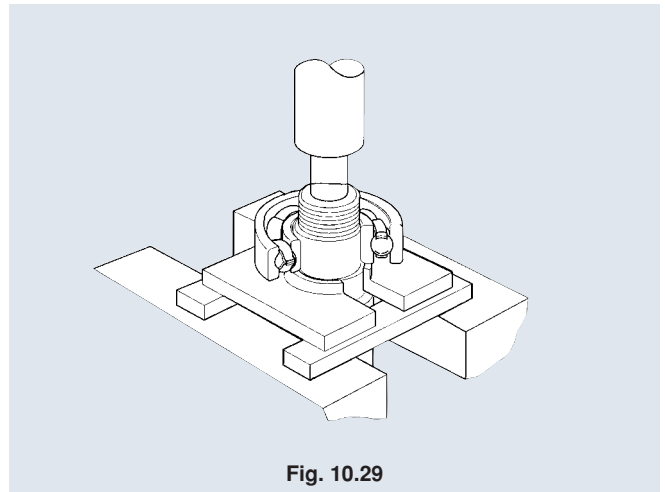
Straighten the bent tab on the washer, and loosen the nut by two to three turns. Place a drift to a face of the nut. Lightly tap the drift to turn the sleeve (**Fig. 10.28**). Once the sleeve is shifted in the axial direction, the bearing can be easily removed.

Note, however, when the nut has been excessively loosened and only a few ridges remain engaged, and if the nut is further tapped, the threading on the sleeve or nut may be stripped.



10.7.2 Cylindrical bore bearing

Usually, a cylindrical bore bearing is interference-fitted. Thus, the bearing is simply drawn out by placing a jig to the face of the inner ring and exerting a force as illustrated in **Fig. 10.29** with a hand press. However, be careful not to apply a force to the outer ring. A puller such as that shown in **Fig. 10.30** is often used. When using this tool, make sure that the jig is fully engaged with the face of the inner ring.



10.8 Cleaning the bearing

Clean the removed bearing with diesel oil or kerosene. Use two vessels: one for rough cleaning and the other for finish cleaning. Prepare a cleaning station that has a metal screen as illustrated in **Fig. 10.31** so that the bearing does not directly contact the fouling on the bottom of vessel. In rough cleaning, virtually all oil and foreign matters should be removed from the bearing which should be immediately transferred to the finish vessel. The finish vessel must be provided with a filter unit to maintain the cleaning agent clean.

Once cleaned, the bearing must be immediately rust-proofed.

The bearings (which have been carefully removed) must be checked whether they can be reused. The judging criterion for reuse should be determined considering the following criteria through a trial-and-error basis.

- (1) Scheduled operating duration to next regular inspection
- (2) Importance of the machine that uses the bearing in question
- (3) Operating conditions such as loading and bearing speed
- (4) Severity of damage on the rolling contact surface
- (5) Tendency of increasing bearing clearance and wear on the cage
- (6) Loss in accuracy, etc.

10.9 Storing the bearing

When storing a bearing, pay particular attention to rust prevention. Note that the rust-proofing grease in the bearing will run away at a temperature of 50 to 60°C. Therefore, store a bearing in a dry, cool location at a height at least 30 cm above the floor. Remember that wooden crate attracts moisture. Thus, immediately unpack the delivered bearings, and store them on shelves.

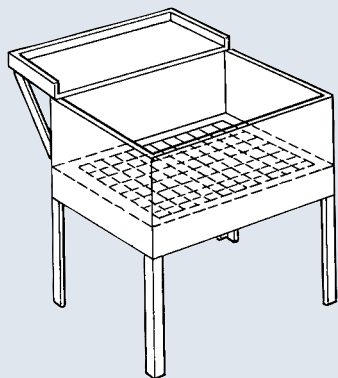


Fig. 10.31

Index of Bearing Tables

Split type

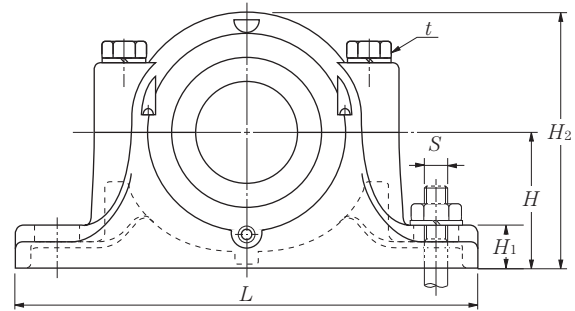
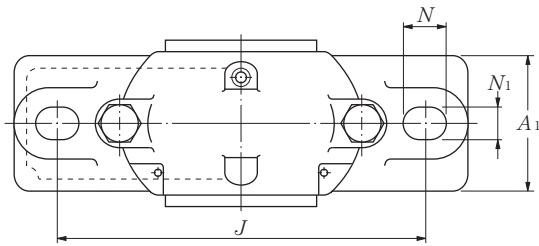
SN5	34
SN6·S6	36
SN30·SN31	38
SNZ2	40
SNZ3·SZ3	42
SD5·SD5G·SD6·SD6G	44
SD30·SD30G	46
SD31·SD31G	48
SD2·SD2G·SD3·SD3G	50

Unit type

SV5	52
SV2	56

Plummer Blocks SN5

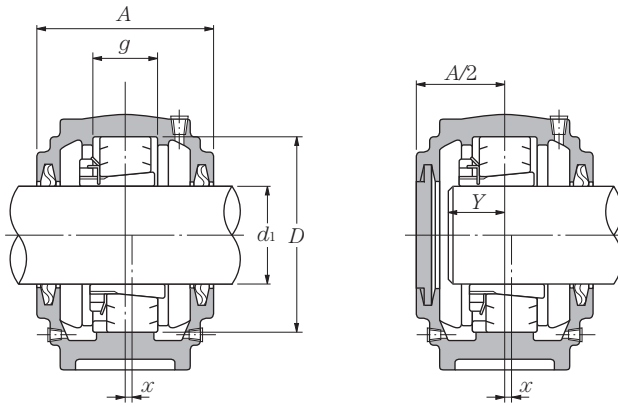
Standard type / For bearing with adapter assembly



d_1 25~140mm

Shaft dia. mm d_1	Bearing numbers	Abutment and fillet dimensions											Approx. S nominal number	Mass kg (approx.)	
		D	H	J	N	N ₁	A	L	A ₁	H ₁	H ₂	g			t nominal number
25	SN506	62	50	150	15	20	77	185	52	22	90	30	M8	M12	1.7
30	SN507	72	50	150	15	20	82	185	52	22	95	33	M10	M12	2.2
35	SN508	80	60	170	15	20	85	205	60	25	110	33	M10	M12	2.6
40	SN509	85	60	170	15	20	85	205	60	25	112	31	M10	M12	2.8
45	SN510	90	60	170	15	20	90	205	60	25	115	33	M10	M12	3.0
50	SN511	100	70	210	18	23	95	255	70	28	130	33	M12	M16	4.0
55	SN512	110	70	210	18	23	105	255	70	30	135	38	M12	M16	4.5
60	SN513	120	80	230	18	23	110	275	80	30	150	43	M12	M16	5.6
65	SN515	130	80	230	18	23	115	280	80	30	155	41	M12	M16	6.0
70	SN516	140	95	260	22	27	120	315	90	32	175	43	M16	M20	9.0
75	SN517	150	95	260	22	27	125	320	90	32	185	46	M16	M20	9.3
80	SN518	160	100	290	22	27	145	345	100	35	195	62.4	M16	M20	12
85	SN519	170	112	290	22	27	140	345	100	35	210	53	M16	M20	14
90	SN520	180	112	320	26	32	160	380	110	40	218	70.3	M20	M24	17
100	SN522	200	125	350	26	32	175	410	120	45	240	80	M20	M24	20
110	SN524	215	140	350	26	32	185	410	120	45	270	86	M20	M24	23
115	SN526	230	150	380	28	36	190	445	130	50	290	90	M24	M24	29
125	SN528	250	150	420	33	42	205	500	150	50	305	98	M24	M30	37
135	SN530	270	160	450	33	42	220	530	160	60	325	106	M24	M30	42
140	SN532	290	170	470	33	42	235	550	160	60	345	114	M24	M30	48

- ① The numeral in nominal number of the setting ring represents the outside diameter and width dimension.
- ② Dimension Y is an approximate distance from the bearing center to the shaft end for shaft end configuration.



Nominal number								Approx. mm Y ²⁾	Seal number	shaft dia. mm d ₁
Combination with self-aligning ball bearings				Combination with spherical roller bearings						
Self-aligning ball bearings	Adapter	Setting washer ¹⁾	Number	Spherical roller bearings	Adapter	Setting washer ¹⁾	Number			
1206SK 2206SK	H206X H306X	SR 62X 7 SR 62X10	2 1	—	—	—	—	18 20	ZF 6	25
1207SK 2207SK	H207X H307X	SR 72X 8 SR 72X10	2 1	—	—	—	—	19 22	ZF 7	30
1208SK 2208SK	H208X H308X	SR 80X 7.5 SR 80X10	2 1	22208EAKD1	H308X	SR 80X10	— 1	21 23	ZF 8	35
1209SK 2209SK	H209X H309X	SR 85X 6 SR 85X 8	2 1	22209EAKD1	H309X	SR 85X 8	— 1	22 24	ZF 9	40
1210SK 2210SK	H210X H310X	SR 90X 6.5 SR 90X10	2 1	22210EAKD1	H310X	SR 90X10	— 1	24 25	ZF10	45
1211SK 2211SK	H211X H311X	SR100X 6 SR100X 8	2 1	22211EAKD1	H311X	SR100X 8	— 1	25 27	ZF11	50
1212SK 2212SK	H212X H312X	SR110X 8 SR110X10	2 1	22212EAKD1	H312X	SR110X10	— 1	26 29	ZF12	55
1213SK 2213SK	H213X H313X	SR120X10 SR120X12	2 1	22213EAKD1	H313X	SR120X12	— 1	28 32	ZF13	60
1215SK 2215SK	H215X H315X	SR130X 8 SR130X10	2 1	22215EAKD1	H315X	SR130X10	— 1	30 33	ZF15	65
1216SK 2216SK	H216X H316X	SR140X 8.5 SR140X10	2 1	22216EAKD1	H316X	SR140X10	— 1	32 36	ZF16	70
1217SK 2217SK	H217X H317X	SR150X 9 SR150X10	2 1	22217EAKD1	H317X	SR150X10	— 1	34 38	ZF17	75
1218SK 2218SK	H218X H318X	SR160X16.2 SR160X11.2	2 2 —	22218EAKD1 23218EMKD1	H318X H2318X	SR160X11.2 SR160X10	— 2 1	35 40 46	ZF18	80
1219SK 2219SK	H219X H319X	SR170X10.5 SR170X10	2 1	22219EAKD1	H319X	SR170X10	— 1	37 43	ZF19	85
1220SK 2220SK	H220X H320X	SR180X18.1 SR180X12.1	2 2 —	22220EAKD1 23220EMKD1	H320X H2320X	SR180X12.1 SR180X10	— 2 1	39 45 52	ZF20	90
1222SK 2222SK	H222X H322X	SR200X21 SR200X13.5	2 2 —	22222EAKD1 23222EMKD1	H322X H2322X	SR200X13.5 SR200X10	— 2 1	42 50 58	ZF22	100
—	—	—	—	22224EAKD1 23224EMKD1	H3124X H2324X	SR215X14 SR215X10	2 1	53 62	ZF24	110
—	—	—	—	22226EAKD1 23226EMKD1	H3126 H2326	SR230X13 SR230X10	2 1	57 65	ZF26	115
—	—	—	—	22228EAKD1 23228EMKD1	H3128 H2328	SR250X15 SR250X10	2 1	60 70	ZF28	125
—	—	—	—	22230EAKD1 23230EMKD1	H3130 H2330	SR270X16.5 SR270X10	2 1	65 76	ZF30	135
—	—	—	—	22232EAKD1 23232EMKD1	H3132 H2332	SR290X17 SR290X10	2 1	71 83	ZF32	140

NOTE: 1) Sizes SN524 and greater are equipped with lifting eye bolts.

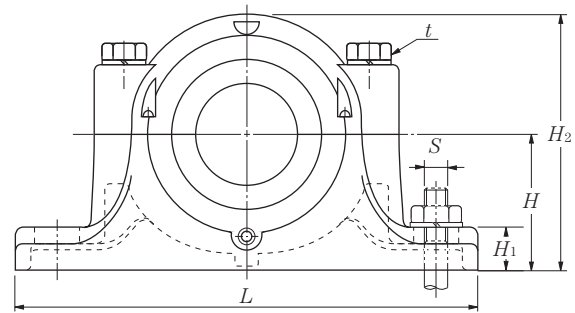
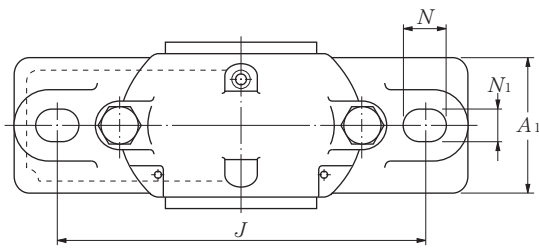
2) Fill and drain plugs size : SN506-SN520.....PT1/8
SN522-SN532.....PT1/4

3) Dimension X indicates a deviation of the bearing center relative to the plummer block center, and its value is 1/2 the width of the setting washer.

4) As an adaptor for bearing series 12, series H2 as well as series H3 can be used.

Plummer Blocks SN6·S6

Standard type / For bearing with adapter assembly

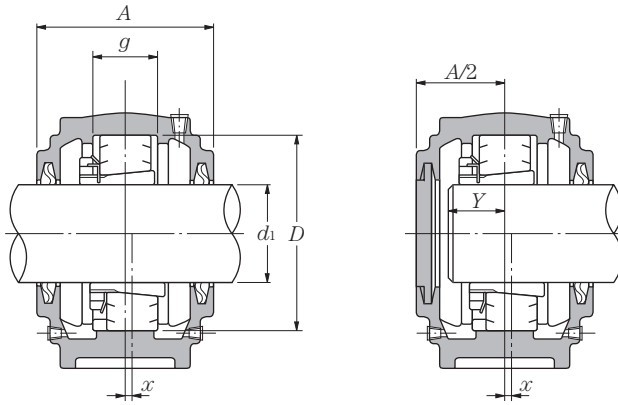


d_1 25~140mm

Shaft dia. mm d_1	Bearing numbers	Abutment and fillet dimensions											Approx. ① S nominal number	Mass kg (approx.)
		D	H	J	N	N_1	A	L	A_1	H_1	H_2	t nominal number		
25	SN606	72	50	150	15	20	82	185	52	22	95	37	M10	2.3
30	SN607	80	60	170	15	20	90	205	60	25	110	41	M10	3.0
35	SN608	90	60	170	15	20	95	205	60	25	115	43	M10	3.1
40	SN609	100	70	210	18	23	105	255	70	28	130	46	M12	4.4
45	SN610	110	70	210	18	23	115	255	70	30	135	50	M12	5.0
50	SN611	120	80	230	18	23	120	275	80	30	150	53	M12	5.8
55	SN612	130	80	230	18	23	125	280	80	30	155	56	M12	7.7
60	SN613	140	95	260	22	27	130	315	90	32	175	58	M16	9.8
65	SN615	160	100	290	22	27	140	345	100	35	195	65	M16	12
70	SN616	170	112	290	22	27	145	345	100	35	212	68	M16	15
75	SN617	180	112	320	26	32	155	380	110	40	218	70	M20	17
80	S618	190	112	320	26	35	160	400	110	33	230	74	M20	21
85	S619	200	125	350	26	35	170	420	120	36	245	77	M20	24
90	S620	215	140	350	26	35	175	420	120	38	280	83	M20	29
100	S622	240	150	390	28	38	190	460	130	40	300	90	M24	38
110	S624	260	160	450	33	42	205	540	160	50	325	96	M24	47
115	S626	280	170	470	33	42	215	560	160	50	350	103	M24	54
125	S628	300	180	520	35	45	235	630	170	55	375	112	M30	70
135	S630	320	190	560	35	45	245	680	180	55	395	118	M30	75
140	S632	340	200	580	42	52	255	710	190	60	415	124	M30	80

① The numeral in nominal number of the setting ring represents the outside diameter and width dimension.

② Dimension Y is an approximate distance from the bearing center to the shaft end for shaft end configuration.



Nominal number								Approx. mm Y ²⁾	Seal number	shaft dia. mm d ₁
Combination with self-aligning ball bearings				Combination with spherical roller bearings						
Self-aligning ball bearings	Adapter	Setting washer ¹⁾	Number	Spherical roller bearings	Number	Setting washer ¹⁾	Number			
1306SK 2306SK	H306X H2306X	SR 72X 9 SR 72X10	2 1	—	—	—	—	19 23	ZF 6	25
1307SK 2307SK	H307X H2307X	SR 80X10 SR 80X10	2 1	—	—	—	—	21 26	ZF 7	30
1308SK 2308SK	H308X H2308X	SR 90X10 SR 90X10	2 1	21308CK 22308EAKD1	H308X H2308X	SR 90X10 SR 90X10	2 1	23 28	ZF 8	35
1309SK 2309SK	H309X H2309X	SR100X10.5 SR100X10	2 1	21309CK 22309EAKD1	H309X H2309X	SR100X10.5 SR100X10	2 1	25 31	ZF 9	40
1310SK 2310SK	H310X H2310X	SR110X11.5 SR110X10	2 1	21310CK 22310EAKD1	H310X H2310X	SR110X11.5 SR110X10	2 1	27 34	ZF10	45
1311SK 2311SK	H311X H2311X	SR120X12 SR120X10	2 1	21311K 22311EAKD1	H311X H2311X	SR120X12 SR120X10	2 1	29 36	ZF11	50
1312SK 2312SK	H312X H2312X	SR130X12.5 SR130X10	2 1	21312K 22312EAKD1	H312X H2312X	SR130X12.5 SR130X10	2 1	31 39	ZF12	55
1313SK 2313SK	H313X H2313X	SR140X12.5 SR140X10	2 1	21313K 22313EAKD1	H313X H2313X	SR140X12.5 SR140X10	2 1	33 40	ZF13	60
1315SK 2315SK	H315X H2315X	SR160X14 SR160X10	2 1	21315K 22315EAKD1	H315X H2315X	SR160X14 SR160X10	2 1	36 45	ZF15	65
1316SK 2316SK	H316X H2316X	SR170X14.5 SR170X10	2 1	21316K 22316EAKD1	H316X H2316X	SR170X14.5 SR170X10	2 1	39 48	ZF16	70
1317SK 2317SK	H317X H2317X	SR180X14.5 SR180X10	2 1	21317K 22317EAKD1	H317X H2317X	SR180X14.5 SR180X10	2 1	41 50	ZF17	75
1318SK 2318SK	H318X H2318X	SR190X15.3 SR190X 9.5	2 1	21318K 22318EAKD1	H318X H2318X	SR190X15.3 SR190X 9.5	2 1	42 52	ZF18	80
1319SK 2319SK	H319X H2319X	SR200X15.8 SR200X 9.5	2 1	21319K 22319EAKD1	H319X H2319X	SR200X15.8 SR200X 9.5	2 1	44 55	ZF19	85
1320SK 2320SK	H320X H2320X	SR215X17.8 SR215X 9.5	2 1	21320K 22320EAKD1	H320X H2320X	SR215X17.8 SR215X 9.5	2 1	46 59	ZF20	90
1322SK 2322SK	H322X H2322X	SR240X19.8 SR240X 9.5	2 1	21322K 22322EAKD1	H322X H2322X	SR240X19.8 SR240X 9.5	2 1	48 63	ZF22	100
—	—	—	—	22324EAKD1	H2324X	SR260X 9.5	1	67	ZF24	110
—	—	—	—	22326EAKD1	H2326	SR280X 9.5	1	72	ZF26	115
—	—	—	—	22328EAKD1	H2328	SR300X 9.5	1	77	ZF28	125
—	—	—	—	22330EMKD1	H2330	SR320X 9.5	1	82	ZF30	135
—	—	—	—	22332EMKD1	H2332	SR340X 9.5	1	88	ZF32	140

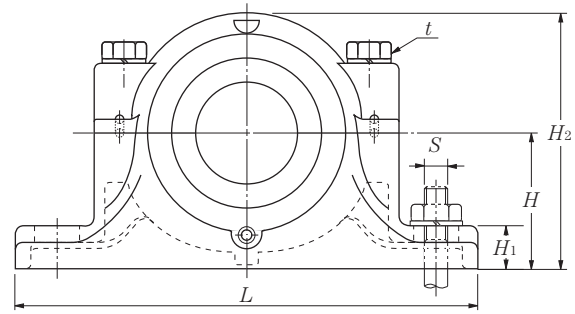
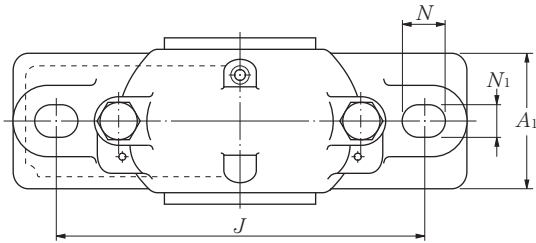
NOTE: 1) Sizes S618 and greater are equipped with lifting eye bolts.

2) Fill and drain plugs size : SN606-SN617.....PT1/8
S618-S632PT1/4

3) Dimension X indicates a deviation of the bearing center relative to the plummer block center, and its value is 1/2 the width of the setting washer.

Plummer Blocks SN30·SN31

Standard type / For bearing with adapter assembly

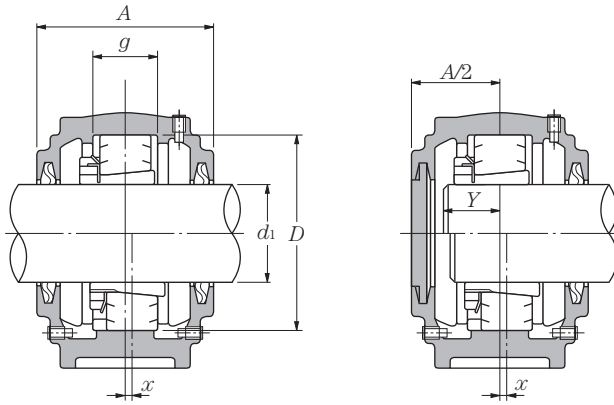


d_1 110~170mm

Shaft dia. mm d_1	Bearing numbers	Abutment and fillet dimensions											Approx. S nominal number	
		D	H	J	N	N_1	A	L	A_1	H_1	H_2	g		t nominal number
110	SN3024	180	112	320	26	32	150	380	110	40	217	56	M20	M24
115	SN3026	200	125	350	26	32	160	410	120	45	240	62	M20	M24
125	SN3028	210	140	350	26	32	170	410	120	45	260	63	M20	M24
135	SN3030	225	150	380	28	36	175	445	130	50	283	66	M24	M24
140	SN3032	240	150	390	28	36	190	460	130	50	290	70	M24	M24
150	SN3034	260	160	450	33	42	200	530	160	60	310	77	M24	M30
160	SN3036	280	170	470	33	42	210	550	160	60	330	84	M24	M30
170	SN3038	290	170	470	33	42	210	550	160	60	335	85	M24	M30

100	SN3122	180	112	320	26	32	155	380	110	40	217	66	M20	M24
110	SN3124	200	125	350	26	32	165	410	120	45	240	72	M20	M24
115	SN3126	210	140	350	26	32	170	410	120	45	260	74	M20	M24
125	SN3128	225	150	380	28	36	180	445	130	50	283	78	M24	M24
135	SN3130	250	150	420	33	42	200	500	150	50	295	90	M24	M30
140	SN3132	270	160	450	33	42	215	530	160	60	315	96	M24	M30
150	SN3134	280	170	470	33	42	220	550	160	60	330	98	M24	M30
160	SN3136	300	180	520	33	42	230	610	170	70	355	106	M30	M30
170	SN3138	320	190	560	33	42	240	650	180	70	375	114	M30	M30

- ① The numeral in nominal number of the setting ring represents the outside diameter and width dimension.
- ② Dimension Y is an approximate distance from the bearing center to the shaft end for shaft end configuration.



Mass kg (approx.)	Nominal number Combination with self-aligning ball bearings			Approx. mm Y ²⁾	Seal number	shaft dia. mm d_1	
	Self-aligning ball bearings	Adapter	Setting washer ¹⁾ Number				
17	23024EAKD1	H3024X	SR180X10	1	47	ZF24	110
20	23026EAKD1	H3026	SR200X10	1	51	ZF26	115
25	23028EAKD1	H3028	SR210X10	1	53	ZF28	125
30	23030EAKD1	H3030	SR225X10	1	56	ZF30	135
33	23032EAKD1	H3032	SR240X10	1	61	ZF32	140
46	23034EAKD1	H3034	SR260X10	1	66	ZF34	150
52	23036EAKD1	H3036	SR280X10	1	70	ZF36	160
52	23038EAKD1	H3038	SR290X10	1	72	ZF38	170

18	23122EAKD1	H3122X	SR180X10	1	51	ZF22	100
21	23124EAKD1	H3124X	SR200X10	1	55	ZF24	110
26	23126EAKD1	H3126	SR210X10	1	57	ZF26	115
32	23128EAKD1	H3128	SR225X10	1	60	ZF28	125
40	23130EAKD1	H3130	SR250X10	1	68	ZF30	135
45	23132EAKD1	H3132	SR270X10	1	74	ZF32	140
51	23134EAKD1	H3134	SR280X10	1	76	ZF34	150
63	23136EAKD1	H3136	SR300X10	1	81	ZF36	160
76	23138EMKD1	H3138	SR320X10	1	86	ZF38	170

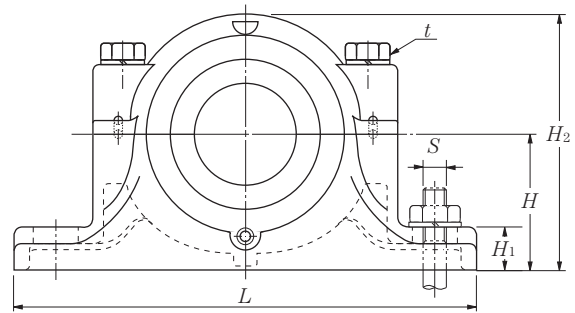
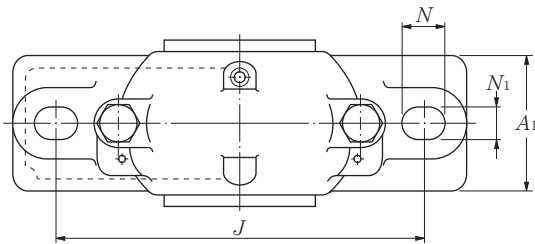
NOTE: 1) Sizes SN3028 and greater and sizes SN3126 and greater are equipped with lifting eye bolts.

2) Fill and drain plugs size : PT1/4

3) Dimension X indicates a deviation of the bearing center relative to the plummer block center, and its value is 1/2 the width of the setting washer.

Plummer Blocks SNZ2

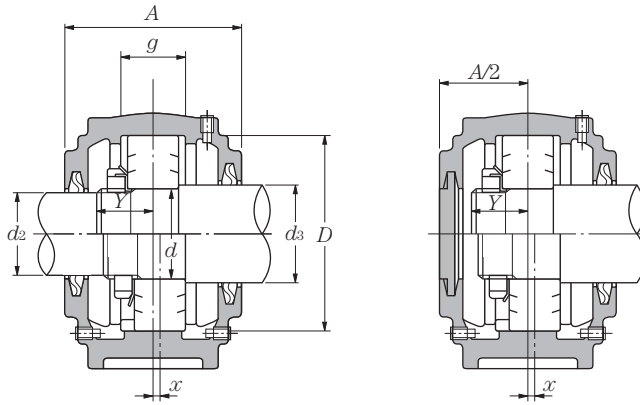
Stepped bore type / For cylindrical bore bearing



d_1 30~160mm

Shaft dia.			Bearing numbers	Abutment and fillet dimensions												Approx.	Mass
mm				mm													
d	d_2	d_3		D	H	J	N	N_1	A	L	A_1	H_1	H_2	g	t nominal number	S nominal number	(approx.)
30	25	35	SNZ206	62	50	150	15	20	77	185	52	22	90	30	M 8	M12	1.8
35	30	45	SNZ207	72	50	150	15	20	82	185	52	22	95	33	M10	M12	2.2
40	35	50	SNZ208	80	60	170	15	20	85	205	60	25	110	33	M10	M12	2.9
45	40	55	SNZ209	85	60	170	15	20	85	205	60	25	112	31	M10	M12	3.2
50	45	60	SNZ210	90	60	170	15	20	90	205	60	25	115	33	M10	M12	3.4
55	50	65	SNZ211	100	70	210	18	23	95	255	70	28	130	33	M12	M16	4.5
60	55	70	SNZ212	110	70	210	18	23	105	255	70	30	135	38	M12	M16	5.4
65	60	75	SNZ213	120	80	230	18	23	110	275	80	30	150	43	M12	M16	6.2
70	60	80	SNZ214	125	80	230	18	23	115	275	80	30	155	44	M12	M16	6.7
75	65	85	SNZ215	130	80	230	18	23	115	280	80	30	155	41	M12	M16	7.6
80	70	90	SNZ216	140	95	260	22	27	120	315	90	32	175	43	M16	M20	9.4
85	75	95	SNZ217	150	95	260	22	27	125	320	90	32	185	46	M16	M20	10
90	80	100	SNZ218	160	100	290	22	27	145	345	100	35	195	62.4	M16	M20	13
95	85	110	SNZ219	170	112	290	22	27	140	345	100	35	210	53	M16	M20	16
100	90	115	SNZ220	180	112	320	26	32	160	380	110	40	218	70.3	M20	M24	18
110	100	125	SNZ222	200	125	350	26	32	175	410	120	45	240	80	M20	M24	23
120	110	135	SNZ224	215	140	350	26	32	185	410	120	45	270	86	M20	M24	25
130	115	145	SNZ226	230	150	380	28	36	190	445	130	50	290	90	M24	M24	32
140	125	155	SNZ228	250	150	420	33	42	205	500	150	50	305	98	M24	M30	41
150	135	165	SNZ230	270	160	450	33	42	220	530	160	60	325	106	M24	M30	49
160	140	175	SNZ232	290	170	470	33	42	235	550	160	60	345	114	M24	M30	57

- ① The numeral in nominal number of the setting ring represents the outside diameter and width dimension.
- ② Dimension Y is an approximate distance from the bearing center to the shaft end for shaft end configuration.



Combination with self-aligning ball bearings		Nominal number Combination with spherical roller bearings				Lock nuts	Lock washers	Approx. mm Y ²⁾	Seal number		shaft dia. mm d
Self-aligning ball bearings	Setting washer ¹⁾ Number	Spherical roller bearings	Setting washer ¹⁾ Number	Lock nuts	Lock washers				(d ₂)	(d ₃)	
1206S 2206S	SR 62X 7 SR 62X10	2 1	—	—	—	AN06	AW06	18 20	ZF 6	ZF 8	30
1207S 2207S	SR 72X 8 SR 72X10	2 1	—	—	—	AN07	AW07	19 22	ZF 7	ZF10	35
1208S 2208S	SR 80X 7.5 SR 80X10	2 1	22208EAD1	SR 80X10	1	AN08	AW08	21 23	ZF 8	ZF11	40
1209S 2209S	SR 85X 6 SR 85X 8	2 1	22209EAD1	SR 85X 8	1	AN09	AW09	22 24	ZF 9	ZF12	45
1210S 2210S	SR 90X 6.5 SR 90X10	2 1	22210EAD1	SR 90X10	1	AN10	AW10	24 25	ZF10	ZF13	50
1211S 2211S	SR100X 6 SR100X 8	2 1	22211EAD1	SR100X 8	1	AN11	AW11	25 27	ZF11	ZF15	55
1212S 2212S	SR110X 8 SR110X10	2 1	22212EAD1	SR110X10	1	AN12	AW12	26 29	ZF12	ZF16	60
1213S 2213S	SR120X10 SR120X12	2 1	22213EAD1	SR120X12	1	AN13	AW13	28 32	ZF13	ZF17	65
1214S 2214S	SR125X10 SR125X13	2 1	22214EAD1	SR125X13	1	AN14	AW14	28 32	ZF13	ZF18	70
1215S 2215S	SR130X 8 SR130X10	2 1	22215EAD1	SR130X10	1	AN15	AW15	30 33	ZF15	ZF19	75
1216S 2216S	SR140X 8.5 SR140X10	2 1	22216EAD1	SR140X10	1	AN16	AW16	32 36	ZF16	ZF20	80
1217S 2217S	SR150X 9 SR150X10	2 1	22217EAD1	SR150X10	1	AN17	AW17	34 38	ZF17	ZF21	85
1218S 2218S	SR160X16.2 SR160X11.2	2 2	22218EAD1 23218EMD1	SR160X11.2 SR160X10	2 1	AN18	AW18	35 40 46	ZF18	ZF22	90
1219S 2219S	SR170X10.5 SR170X10	2 1	22219EAD1	SR170X10	1	AN19	AW19	37 43	ZF19	ZF24	95
1220S 2220S	SR180X18.1 SR180X12.1	2 2	22220EAD1 23220EMD1	SR180X12.1 SR180X10	2 1	AN20	AW20	39 45 52	ZF20	ZF26	100
1222S 2222S	SR200X21 SR200X13.5	2 2	22222EAD1 23222EMD1	SR200X13.5 SR200X10	2 1	AN22	AW22	42 50 58	ZF22	ZF28	110
—	—	—	22224EAD1 23224EMD1	SR215X14 SR215X10	2 1	AN24	AW24	53 62	ZF24	ZF30	120
—	—	—	22226EAD1 23226EMD1	SR230X13 SR230X10	2 1	AN26	AW26	57 65	ZF26	GS33	130
—	—	—	22228EAD1 23228EMD1	SR250X15 SR250X10	2 1	AN28	AW28	60 70	ZF28	GS35	140
—	—	—	22230EAD1 23230EMD1	SR270X16.5 SR270X10	2 1	AN30	AW30	65 76	ZF30	GS37	150
—	—	—	22232EAD1 23232EMD1	SR290X17 SR290X10	2 1	AN32	AW32	71 83	ZF32	GS39	160

NOTE: 1) Sizes SNZ224 and greater are equipped with lifting eye bolts.

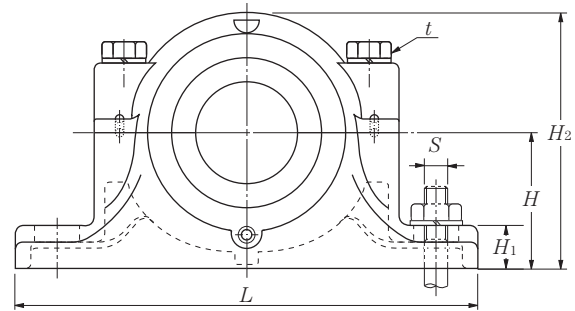
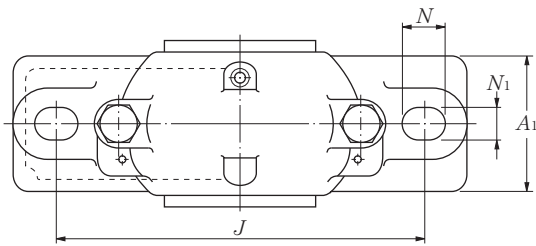
2) Fill and drain plugs size : SNZ206-SNZ220.....PT1/8

SNZ222-SNZ232.....PT1/4

3) Dimension X indicates a deviation of the bearing center relative to the plummer block center, and its value is 1/2 the width of the setting washer.

Plummer Blocks SNZ3·SZ3

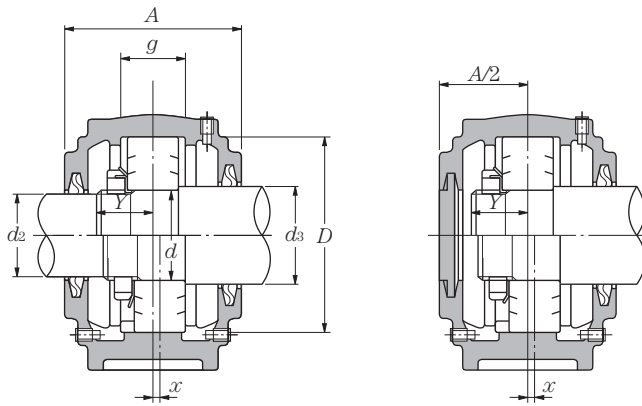
Stepped bore type / For cylindrical bore bearing



d_1 30~160mm

Shaft dia. mm	Bearing numbers	Abutment and fillet dimensions														Approx. S nominal number	Mass kg (approx.)
		d	d_2	d_3	D	H	J	N	N_1	A	L	A_1	H_1	H_2	g		
30	25	35	SNZ306	72	50	150	15	20	82	185	52	22	95	37	M10	M12	2.1
30	25	40	SNZ306X	72	50	150	15	20	82	185	52	22	95	37	M10	M12	2.1
35	30	45	SNZ307	80	60	170	15	20	90	205	60	25	110	41	M10	M12	3.1
40	35	50	SNZ308	90	60	170	15	20	95	205	60	25	115	43	M10	M12	3.5
45	40	55	SNZ309	100	70	210	18	23	105	255	70	28	130	46	M12	M16	4.8
50	45	60	SNZ310	110	70	210	18	23	115	255	70	30	135	50	M12	M16	5.6
55	50	65	SNZ311	120	80	230	18	23	120	275	80	30	150	53	M12	M16	6.6
60	55	70	SNZ312	130	80	230	18	23	125	280	80	30	155	56	M12	M16	7.9
65	60	75	SNZ313	140	95	260	22	27	130	315	90	32	175	58	M16	M20	11
70	60	80	SNZ314	150	95	260	22	27	130	320	90	32	185	61	M16	M20	12
75	65	85	SNZ315	160	100	290	22	27	140	345	100	35	195	65	M16	M20	13
80	70	90	SNZ316	170	112	290	22	27	145	345	100	35	212	68	M16	M20	16
85	75	95	SNZ317	180	112	320	26	32	155	380	110	40	218	70	M20	M24	18
85	75	100	SNZ317X	180	112	320	26	32	155	380	110	40	218	70	M20	M24	18
90	80	100	SZ318	190	112	320	26	35	160	400	110	33	230	74	M20	M24	21
90	80	105	SZ318X	190	112	320	26	35	160	400	110	33	230	74	M20	M24	21
95	85	110	SZ319	200	125	350	26	35	170	420	120	36	245	77	M20	M24	23
100	90	115	SZ320	215	140	350	26	35	175	420	120	38	280	83	M20	M24	32
110	100	125	SZ322	240	150	390	28	38	190	460	130	40	300	90	M24	M24	42
120	110	135	SZ324	260	160	450	33	42	205	540	160	50	325	96	M24	M30	61
130	115	150	SZ326	280	170	470	33	42	215	560	160	50	350	103	M24	M30	68
140	125	160	SZ328	300	180	520	35	45	235	630	170	55	375	112	M30	M30	95
150	135	170	SZ330	320	190	560	35	45	245	680	180	55	395	118	M30	M30	110
160	140	180	SZ332	340	200	580	42	52	255	710	190	60	415	124	M30	M36	130

① The numeral in nominal number of the setting ring represents the outside diameter and width dimension.
 ② Dimension Y is an approximate distance from the bearing center to the shaft end for shaft end configuration.



Combination with self-aligning ball bearings			Nominal number				Approx. mm	Seal number		shaft dia. mm	
Self-aligning ball bearings	Setting washer ①	Number	Spherical roller bearings	Setting washer ①	Number	Lock nuts		Lock washers	(d ₂)		(d ₃)
								Y ②		d	
1306S 2306S	SR 72X 9 SR 72X10	2 1	—	—	—	AN06	AW06	19 23	ZF 6	ZF 8	30
1306S 2306S	SR 72X 9 SR 72X10	2 1	—	—	—	AN06	AW06	19 23	ZF 6	ZF 9	30
1307S 2307S	SR 80X10 SR 80X10	2 1	—	—	—	AN07	AW07	21 26	ZF 7	ZF10	35
1308S 2308S	SR 90X10 SR 90X10	2 1	21308C 22308EAD1	SR 90X10 SR 90X10	2 1	AN08	AW08	23 28	ZF 8	ZF11	40
1309S 2309S	SR100X10.5 SR100X10	2 1	21309C 22309EAD1	SR100X10.5 SR100X10	2 1	AN09	AW09	25 31	ZF 9	ZF12	45
1310S 2310S	SR110X11.5 SR110X10	2 1	21310C 22310EAD1	SR110X11.5 SR110X10	2 1	AN10	AW10	27 34	ZF10	ZF13	50
1311S 2311S	SR120X12 SR120X10	2 1	21311 22311EAD1	SR120X12 SR120X10	2 1	AN11	AW11	29 36	ZF11	ZF15	55
1312S 2312S	SR130X12.5 SR130X10	2 1	21312 22312EAD1	SR130X12.5 SR130X10	2 1	AN12	AW12	31 39	ZF12	ZF16	60
1313S 2313S	SR140X12.5 SR140X10	2 1	21313 22313EAD1	SR140X12.5 SR140X10	2 1	AN13	AW13	33 40	ZF13	ZF17	65
1314S 2314S	SR150X13 SR150X10	2 1	21314 22314EAD1	SR150X13 SR150X10	2 1	AN14	AW14	34 42	ZF13	ZF18	70
1315S 2315S	SR160X14 SR160X10	2 1	21315 22315EAD1	SR160X14 SR160X10	2 1	AN15	AW15	36 45	ZF15	ZF19	75
1316S 2316S	SR170X14.5 SR170X10	2 1	21316 22316EAD1	SR170X14.5 SR170X10	2 1	AN16	AW16	39 48	ZF16	ZF20	80
1317S 2317S	SR180X14.5 SR180X10	2 1	21317 22317EAD1	SR180X14.5 SR180X10	2 1	AN17	AW17	41 50	ZF17	ZF21	85
1317S 2317S	SR180X14.5 SR180X10	2 1	21317 22317EAD1	SR180X14.5 SR180X10	2 1	AN17	AW17	41 50	ZF17	ZF22	85
1318S 2318S	SR190X15.3 SR190X 9.5	2 1	21318 22318EAD1	SR190X15.3 SR190X 9.5	2 1	AN18	AW18	42 52	ZF18	ZF22	90
1318S 2318S	SR190X15.3 SR190X 9.5	2 1	21318 22318EAD1	SR190X15.3 SR190X 9.5	2 1	AN18	AW18	42 52	ZF18	ZF23	90
1319S 2319S	SR200X15.8 SR200X 9.5	2 1	21319 22319EAD1	SR200X15.8 SR200X 9.5	2 1	AN19	AW19	44 55	ZF19	ZF24	95
1320S 2320S	SR215X17.8 SR215X 9.5	2 1	21320 22320EAD1	SR215X17.8 SR215X 9.5	2 1	AN20	AW20	46 59	ZF20	ZF26	100
1322S 2322S	SR240X19.8 SR240X 9.5	2 1	21322 22322EAD1	SR240X19.8 SR240X 9.5	2 1	AN22	AW22	48 63	ZF22	ZF28	110
—	—	—	22324EAD1	SR260X 9.5	1	AN24	AW24	67	ZF24	ZF30	120
—	—	—	22326EAD1	SR280X 9.5	1	AN26	AW26	72	ZF26	ZF34	130
—	—	—	22328EAD1	SR300X 9.5	1	AN28	AW28	77	ZF28	ZF36	140
—	—	—	22330EMD1	SR320X 9.5	1	AN30	AW30	82	ZF30	ZF38	150
—	—	—	22332EMD1	SR340X 9.5	1	AN32	AW32	88	ZF32	ZF40	160

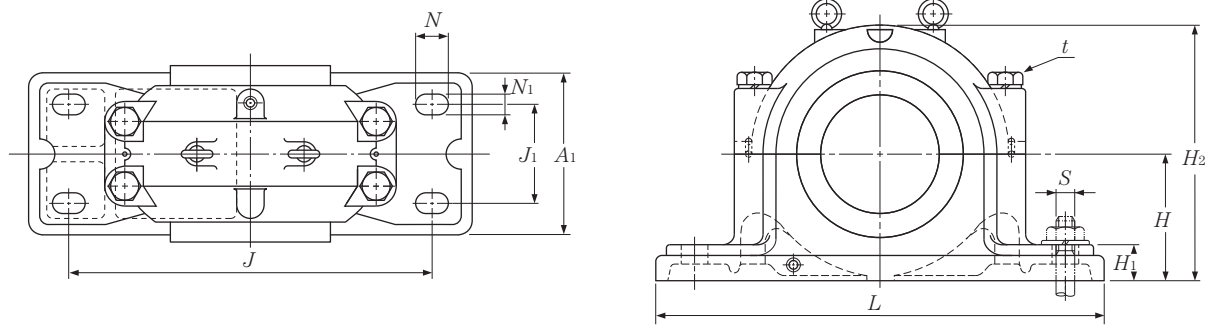
NOTE: 1) Sizes SZ318 and greater are equipped with lifting eye bolts.

2) Fill and drain plugs size : SNZ306-SNZ317.....PT1/8
SZ318-SZ332.....PT1/4

3) Dimension X indicates a deviation of the bearing center relative to the plummer block center, and its value is 1/2 the width of the setting washer.

Plummer Blocks SD5·SD5G·SD6·SD6G

For heavy load, double rubber sealed type / For bearing with adapter assembly

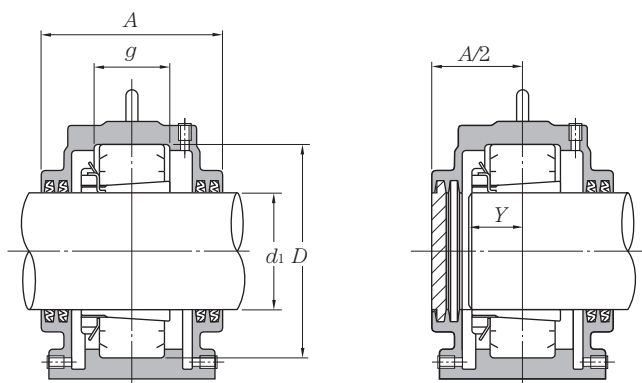


d_1 150~300mm

Shaft dia. mm	Bearing numbers		Abutment and fillet dimensions													Approx.
	free side	fixed side	mm													
d_1			D	H	J	J_1	N	N_1	A	L	A_1	H_1	H_2	g ①	t nominal number	S nominal number
150	SD534	SD534G	310	180	510	140	32	52	270	620	230	60	360	96	M24	M30
160	SD536	SD536G	320	190	540	150	32	52	280	650	240	60	380	96	M24	M30
170	SD538	SD538G	340	200	570	160	35	55	290	700	260	65	400	102	M30	M30
180	SD540	SD540G	360	210	610	170	35	55	300	740	270	65	420	108	M30	M30
200	SD544	SD544G	400	240	680	190	40	60	330	820	300	70	475	118	M30	M36
220	SD548	SD548G	440	260	740	200	42	62	340	880	310	85	515	130	M36	M36
240	SD552	SD552G	480	280	790	210	42	62	370	940	340	85	560	140	M36	M36
260	SD556	SD556G	500	300	830	230	50	70	390	990	370	100	590	140	M36	M42
280	SD560	SD560G	540	325	890	250	50	70	410	1060	390	100	640	150	M36	M42
300	SD564	SD564G	580	355	930	270	57	77	440	1110	420	110	690	160	M42	M48

150	SD634	SD634G	360	210	610	170	35	55	300	740	270	65	420	130	M30	M30
160	SD636	SD636G	380	225	640	180	40	60	320	780	290	70	450	136	M30	M36
170	SD638	SD638G	400	240	680	190	40	60	330	820	300	70	475	142	M30	M36
180	SD640	SD640G	420	250	710	200	42	62	350	860	320	85	500	148	M36	M36
200	SD644	SD644G	460	280	770	210	42	62	360	920	330	85	550	155	M36	M36
220	SD648	SD648G	500	300	830	230	50	70	390	990	370	100	590	165	M36	M42
240	SD652	SD652G	540	325	890	250	50	70	410	1 060	390	100	640	175	M36	M42
260	SD656	SD656G	580	355	930	270	57	77	440	1 110	420	110	690	185	M42	M48

① Dimension g represents the bearing seat width for free-side bearing. Dimension for fixed-side (code G) is 0.5 mm greater than the bearing width dimension.
 ② Dimension Y is an approximate distance from the bearing center to the shaft end for shaft end configuration.



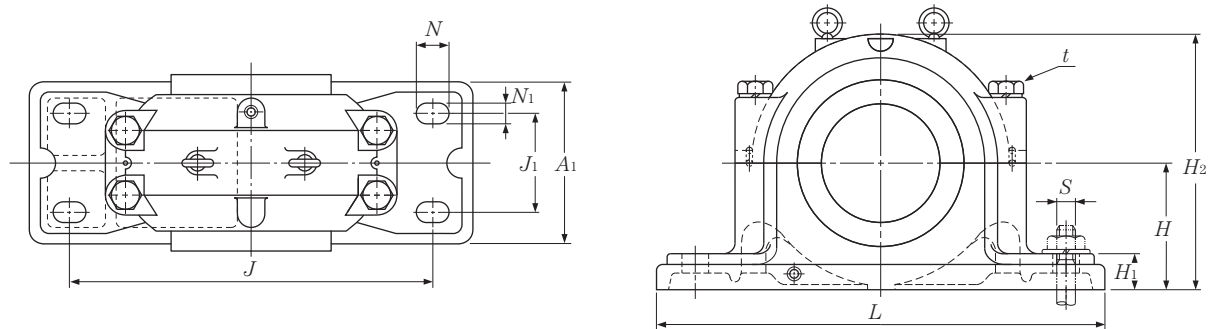
Mass kg (approx.)	Nominal number Combination with spherical roller bearings		Approx. mm Y ②	Seal number	shaft dia. mm d_1
	Spherical roller bearings	Adapter			
95	22234EMKD1	H3134	75	ZF34	150
110	22236EMKD1	H3136	76	ZF36	160
130	22238EMKD1	H3138	80	ZF38	170
150	22240EMKD1	H3140	84	ZF40	180
210	22244EMKD1	H3144	90	ZF44	200
240	22248EMKD1	H3148	98	ZF48	220
320	22252EMKD1	H3152	105	ZF52	240
370	22256EMKD1	H3156	107	ZF56	260
460	22260EMKD1	H3160	114	ZF60	280
560	22264EMKD1	H3164	122	ZF64	300

150	22334EMKD1	H2334	92	ZF34	150
180	22336EMKD1	H2336	96	ZF36	160
210	22338EMKD1	H2338	100	ZF38	170
240	22340EMKD1	H2340	104	ZF40	180
300	22344EMKD1	H2344	109	ZF44	200
370	22348EMKD1	H2348	116	ZF48	220
460	22352EMKD1	H2352	123	ZF52	240
560	22356EMKD1	H2356	130	ZF56	260

NOTE: Fill and drain plugs size : PT3/8

Plummer Blocks SD30·SD30G

For heavy load, double rubber sealed type / For bearing with adapter assembly



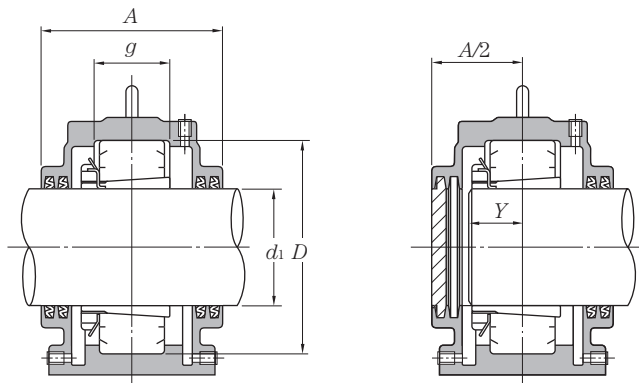
d_1 150~450mm

Shaft dia. mm d_1	Bearing numbers ①		Abutment and fillet dimensions													Approx. S nominal number
	free side	fixed side	mm													
			D	H	J	J_1	N	N_1	A	L	A_1	H_1	H_2	g ②	t nominal number	
150	SD3034	SD3034G	260	160	450	110	32	42	230	540	200	50	320	77	M24	M30
160	SD3036	SD3036G	280	170	470	120	32	42	250	560	220	50	340	84	M24	M30
170	SD3038	SD3038G	290	170	470	120	32	42	250	560	220	50	345	85	M24	M30
180	SD3040	SD3040G	310	180	510	140	32	52	270	620	250	60	360	92	M24	M30
200	SD3044	SD3044G	340	200	570	160	35	55	290	700	280	65	400	100	M30	M30
220	SD3048	SD3048G	360	210	610	170	35	55	300	740	290	65	420	102	M30	M30
240	SD3052	SD3052G	400	240	680	190	40	60	340	820	320	70	475	114	M30	M36
260	SD3056	SD3056G	420	250	710	200	42	62	350	860	340	85	500	116	M36	M36
280	SD3060	SD3060G	460	280	770	210	42	62	360	920	350	85	550	128	M36	M36
300	SD3064	SD3064G	480	280	790	210	42	62	380	940	360	85	560	131	M36	M36
380	SD3080	SD3080G	600	365	960	270	57	77	430	1 140	420	120	710	158	M42	M48
400	SD3084	SD3084G	620	375	980	270	57	77	430	1 160	420	120	735	160	M42	M48
410	SD3088	SD3088G	650	390	1 040	280	57	77	460	1 220	450	125	765	167	M42	M48
430	SD3092	SD3092G	680	405	1 040	310	57	77	470	1 220	460	130	790	173	M42	M48
450	SD3096	SD3096G	700	415	1 100	320	57	77	485	1 280	470	130	820	175	M42	M48

① SD3068, SD3072 and SD3076 are respectively identical to SD3368, SD3372 and SD3376 in terms of dimensions. For this reason, specify "SD3368," "SD3372" or "SD3376" when ordering SD3068, SD3072 or SD3076.

② Dimension g represents the bearing seat width for free-side bearing. Dimension for fixed-side (code G) is 0.5 mm greater than the bearing width dimension.

③ Dimension Y is an approximate distance from the bearing center to the shaft end for shaft end configuration.

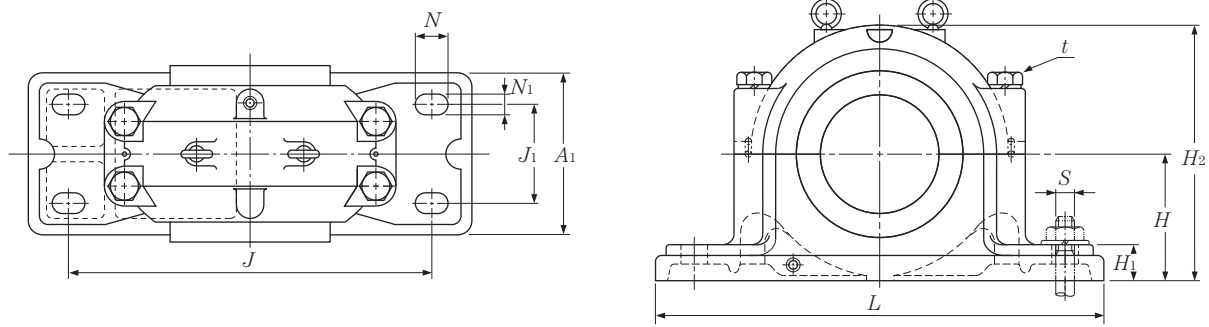


Mass kg (approx.)	Nominal number Combination with spherical roller bearings		Approx. mm Y ^②	Seal number	shaft dia. mm d ₁
	Spherical roller bearings	Adapter			
70	23034EAKD1	H3034	66	ZF34	150
80	23036EAKD1	H3036	70	ZF36	160
85	23038EAKD1	H3038	72	ZF38	170
100	23040EMKD1	H3040	76	ZF40	180
130	23044EMKD1	H3044	79	ZF44	200
150	23048EMKD1	H3048	84	ZF48	220
210	23052EMKD1	H3052	90	ZF52	240
240	23056EMKD1	H3056	95	ZF56	260
300	23060EMKD1	H3060	105	ZF60	280
320	23064EMKD1	H3064	108	ZF64	300
620	23080BK	H3080	131	GS80	380
690	23084BK	H3084	132	GS84	400
800	23088BK	H3088	144	GS88	410
870	23092BK	H3092	147	GS92	430
980	23096BK	H3096	148	GS96	450

NOTE: Fill and drain plugs size : PT3/8

Plummer Blocks SD31·SD31G

For heavy load, double sealed type / For bearing with adapter assembly



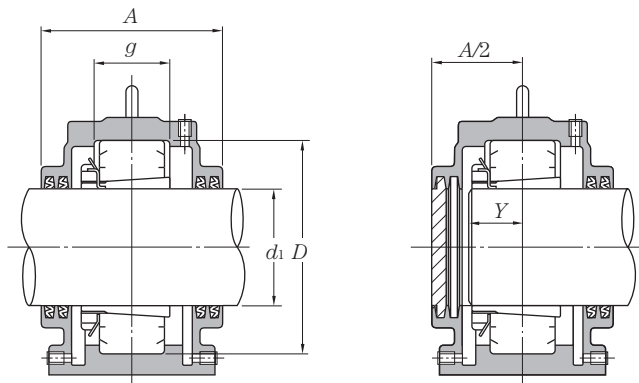
d_1 150~400mm

Shaft dia. mm d_1	Bearing numbers ①		Abutment and fillet dimensions													Approx. S nominal number
	free side	fixed side	mm													
			D	H	J	J_1	N	N_1	A	L	A_1	H_1	H_2	g ②	t nominal number	
150	SD3134	SD3134G	280	170	470	120	35	42	250	560	220	50	340	98	M24	M30
160	SD3136	SD3136G	300	180	520	140	35	52	270	630	250	55	365	106	M30	M30
170	SD3138	SD3138G	320	190	560	140	35	55	310	680	270	55	385	114	M30	M30
180	SD3140	SD3140G	340	200	570	160	35	55	310	700	280	65	400	122	M30	M30
200	SD3144	SD3144G	370	225	640	180	40	60	320	780	310	70	450	130	M30	M36
220	SD3148	SD3148G	400	240	680	190	40	60	330	820	320	70	475	138	M30	M36
240	SD3152	SD3152G	440	260	740	200	42	62	360	880	350	85	515	154	M36	M36
260	SD3156	SD3156G	460	280	770	210	42	62	360	920	350	85	550	156	M36	M36
280	SD3160	SD3160G	500	300	830	230	50	70	390	990	380	100	590	170	M36	M42
300	SD3164	SD3164G	540	325	890	250	50	70	430	1 060	400	100	640	186	M36	M42
340	SD3172	SD3172G	600	365	960	310	57	77	470	1 140	460	120	710	202	M42	M48
360	SD3176	SD3176G	620	375	980	320	57	77	500	1 160	490	120	735	204	M42	M48
380	SD3180	SD3180G	650	390	1 040	340	57	77	520	1 220	510	125	765	210	M42	M48
400	SD3184	SD3184G	700	420	1 070	380	57	77	560	1 250	550	135	820	234	M42	M48

① SD3168 is identical to SD3468 in terms of dimensions. For this reason, specify "SD3468" when ordering SD3168.

② Dimension g represents the bearing seat width for free-side bearing. Dimension for fixed-side (code G) is 0.5 mm greater than the bearing width dimension.

③ Dimension Y is an approximate distance from the bearing center to the shaft end for shaft end configuration.

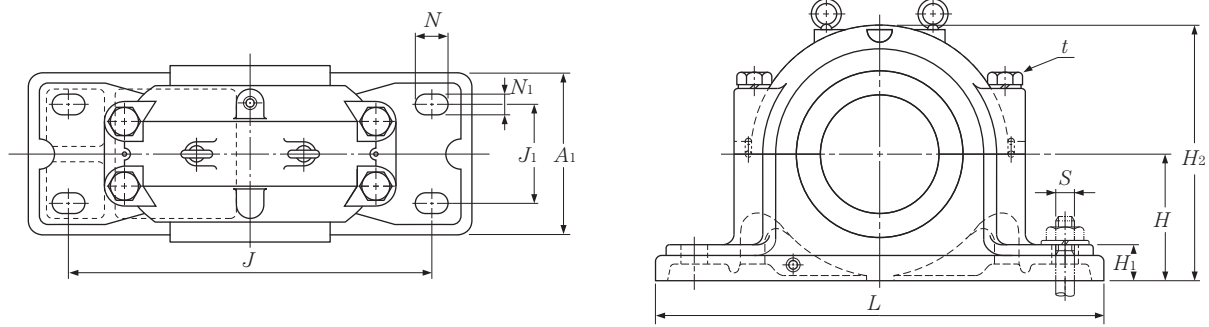


Mass kg (approx.)	Nominal number Combination with spherical roller bearings		Approx. mm Y ③	Seal number	shaft dia. mm d_1
	Spherical roller bearings	Adapter			
75	23134EAKD1	H3134	76	ZF34	150
94	23136EAKD1	H3136	81	ZF36	160
110	23138EMKD1	H3138	86	ZF38	170
130	23140EMKD1	H3140	91	ZF40	180
180	23144EMKD1	H3144	96	ZF44	200
210	23148EMKD1	H3148	102	ZF48	220
240	23152EMKD1	H3152	112	ZF52	240
310	23156EMKD1	H3156	115	ZF56	260
400	23160EMKD1	H3160	124	ZF60	280
480	23164EMKD1	H3164	135	ZF64	300
630	23172BK	H3172	159	GS72	340
850	23176BK	H3176	162	GS76	360
960	23180BK	H3180	167	GS80	380
1 080	23184BK	H3184	187	GS84	400

NOTE: Fill and drain plugs size : PT3/8

Plummer Blocks SD2·SD2G·SD3·SD3G

Heavy load, stepped bore type / For cylindrical bore bearing

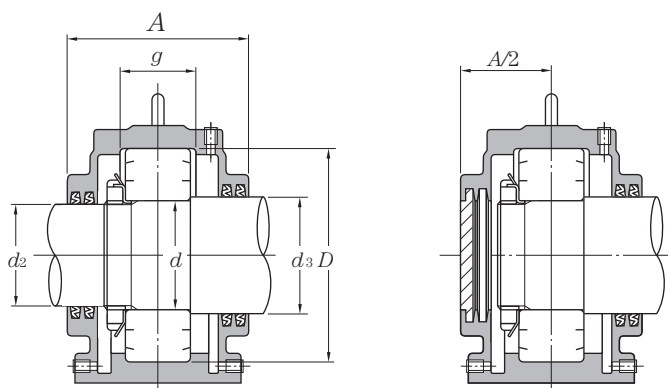


d_1 170~320mm

Shaft dia. mm			Bearing numbers		Abutment and fillet dimensions													Approx.
d	d_2	d_3	free side	fixed side	mm													S nominal number
					D	H	J	J_1	N	N_1	A	L	A_1	H_1	H_2	g ①	t nominal number	
170	160	190	SD234	SD234G	310	180	510	140	32	52	270	620	230	60	360	96	M24	M30
180	170	200	SD236	SD236G	320	190	540	150	32	52	280	650	240	60	380	96	M24	M30
190	180	210	SD238	SD238G	340	200	570	160	35	55	290	700	260	65	400	102	M30	M30
200	190	220	SD240	SD240G	360	210	610	170	35	55	300	740	270	65	420	108	M30	M30
220	210	240	SD244	SD244G	400	240	680	190	40	60	330	820	300	70	475	118	M30	M36
240	230	260	SD248	SD248G	440	260	740	200	42	62	340	880	310	85	515	130	M36	M36
260	250	280	SD252	SD252G	480	280	790	210	42	62	370	940	340	85	560	140	M36	M36
280	260	300	SD256	SD256G	500	300	830	230	50	70	390	990	370	100	590	140	M36	M42
300	280	320	SD260	SD260G	540	325	890	250	50	70	410	1 060	390	100	640	150	M36	M42
320	300	340	SD264	SD264G	580	355	930	270	57	77	440	1 110	420	110	690	160	M42	M48

170	160	190	SD334	SD334G	360	210	610	170	35	55	300	740	270	65	420	130	M30	M30
180	170	200	SD336	SD336G	380	225	640	180	40	60	320	780	290	70	450	136	M30	M36
190	180	210	SD338	SD338G	400	240	680	190	40	60	330	820	300	70	475	142	M30	M36
200	190	220	SD340	SD340G	420	250	710	200	42	62	350	860	320	85	500	148	M36	M36
220	210	240	SD344	SD344G	460	280	770	210	42	62	360	920	330	85	550	155	M36	M36
240	230	260	SD348	SD348G	500	300	830	230	50	70	390	990	370	100	590	165	M36	M42
260	250	280	SD352	SD352G	540	325	890	250	50	70	410	1 060	390	100	640	175	M36	M42
280	260	300	SD356	SD356G	580	355	930	270	57	77	440	1 110	420	110	690	185	M42	M48

① Dimension g represents the bearing seat width for free-side bearing. Dimension for fixed-side (code G) is 0.5 mm greater than the bearing width dimension.
 ② Dimension Y is an approximate distance from the bearing center to the shaft end for shaft end configuration.



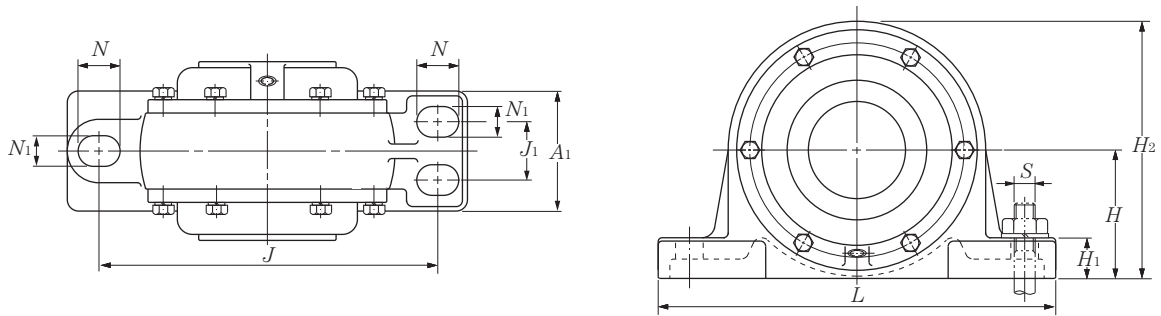
Mass kg (approx.)	Nominal number			Approx. mm Y ②	Seal number		shaft dia. mm d
	Combination with spherical roller bearings Spherical roller bearings	Lock nuts	Lockwashers Lockplate		(d_2)	(d_3)	
95	22234EMD1	AN34	AW34	75	ZF36	ZF42	170
110	22236EMD1	AN36	AW36	76	ZF38	ZF44	180
130	22238EMD1	AN38	AW38	80	ZF40	ZF46	190
150	22240EMD1	AN40	AW40	84	ZF42	ZF48	200
210	22244EMD1	AN44	AL44	90	ZF46	ZF52	220
240	22248EMD1	AN48	AL44	98	GS50S	ZF56	240
320	22252EMD1	AN52	AL52	105	ZF54	ZF60	260
370	22256EMD1	AN56	AL52	107	ZF56	ZF64	280
460	22260EMD1	AN60	AL60	114	ZF60	ZF68	300
560	22264EMD1	AN64	AL64	122	ZF64	GS72	320

150	22334EMD1	AN34	AW34	92	ZF36	ZF42	170
180	22336EMD1	AN36	AW36	96	ZF38	ZF44	180
210	22338EMD1	AN38	AW38	100	ZF40	ZF46	190
240	22340EMD1	AN40	AW40	104	ZF42	ZF48	200
300	22344EMD1	AN44	AL44	109	ZF46	ZF52	220
370	22348EMD1	AN48	AL44	116	GS50S	ZF56	240
460	22352EMD1	AN52	AL52	123	ZF54	ZF60	260
560	22356EMD1	AN56	AL52	130	ZF56	ZF64	280

NOTE: Fill and drain plugs size : PT3/8

Plummer Blocks SV5

Unit type standard / For bearing with adapter assembly

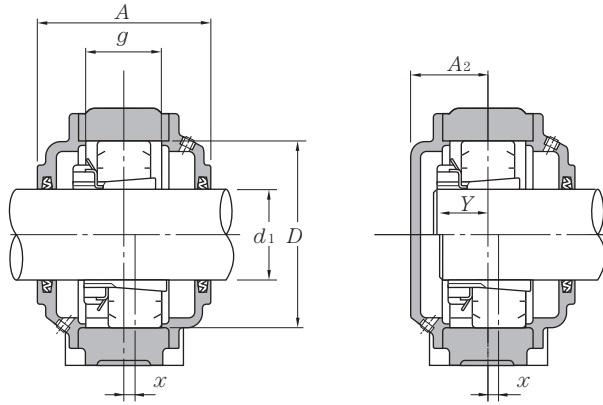


d_1 20~135mm

Shaft dia. mm d_1	Bearing numbers	BAS code ①		Nominal number		Abutment and fillet dimensions								
		main body	cover	self-aligning ball bearings	spherical roller bearings	D	H	J	J_1	mm N_1 N		L	A	A_1
20	SV505	V052	052C	1205SK 2205K	—	52	45	130	—	16	20	165	73	46
25	SV506	V062	062C	1206K 2206K	—	62	50	150	—	16	20	185	80	52
30	SV507	V072	072C	1207K 2207K	—	72	56	150	—	16	20	185	85	52
35	SV508	V080	080C	1208K 2208K	— 22208EAKD1	80	60	170	—	16	20	205	95	60
40	SV509	V085	085C	1209K 2209K	— 22209EAKD1	85	63	170	—	16	23	205	98	60
45	SV510	V090	090C	1210K 2210K	— 22210EAKD1	90	67	170	—	16	23	205	100	60
50	SV511	V100	100C	1211K 2211K	— 22211EAKD1	100	71	210	—	16	23	255	106	70
55	SV512	V110	110C	1212K 2212K	— 22212EAKD1	110	80	210	—	21	25	255	112	70
60	SV513	V120	120C	1213K 2213K	— 22213EAKD1	120	85	230	—	21	25	275	118	80
65	SV515	V130	130C	1215K 2215K	— 22215EAKD1	130	90	230	—	21	25	280	118	80
70	SV516	V140	140C	1216K 2216K	— 22216EAKD1	140	100	260	—	25	30	315	136	90
75	SV517	V150	150C	1217K 2217K	— 22217EAKD1	150	100	260	—	25	30	315	140	90
80	SV518	V160	160C	1218K 2218K	— 22218EAKD1 23218EMKD1	160	112	290	—	25	30	345	150	100
85	SV519	V170	170C	1219K 2219K	— 22219EAKD1	170	112	290	—	25	30	345	165	100
90	SV520	V180	180C	1220K 2220K	— 22220EAKD1 23220EMKD1	180	125	320	56	23	32	380	170	110
100	SV522	V200	200C	1222K 2222K	— 22222EAKD1 23222EMKD1	200	132	350	60	23	32	410	190	120
110	SV524	V215	215C		22224EAKD1 23224EMKD1	215	140	350	60	23	32	410	190	120
115	SV526	V230	230C		22226EAKD1 23226EMKD1	230	150	380	65	23	32	450	200	130
125	SV528	V250	250C		22228EAKD1 23228EMKD1	250	160	420	80	23	32	500	218	150
135	SV530	V270	270C		22230EAKD1 23230EMKD1	270	170	450	92	29	42	540	236	160

- ① The Japan Bearing Industrial Association Standard
- ② The numeral in nominal number of the setting ring represents the outside diameter and width dimension.
- ③ Dimension Y is an approximate distance from the bearing center to the shaft end for shaft end configuration.

NOTE: 1) Sizes SV520 and greater are equipped with lifting eye bolts.
2) Fill and drain plugs size: SV505-SV520.....PT1/8
SV522-SV532.....PT1/4



Abutment and fillet dimensions					Approx. S nominal number	Mass kg (approx.)	Adapter	Nominal number		Approx. mm Y ³⁾	Seal number	shaft dia. mm d ₁
g	mm		H ₁	H ₂				setting washer ²⁾	number			
27	31	22	85	M14	2	2.1	H205X H305X	SR 52X 6 SR 52X 9	2 1	17 19	ZF5	20
30	34	22	95	M14	2	2.7	H206X H306X	SR 62X 7 SR 62X10	2 1	18 20	ZF6	25
33	37.5	22	106	M14	2	3.3	H207X H307X	SR 72X 8 SR 72X10	2 1	19 22	ZF7	30
37	40.5	25	118	M14	2	4.5	H208X H308X	SR 80X 9.5 SR 80X 7	2 2	21 23	ZF8	35
39	42.5	25	125	M14	2	4.5	H209X H309X	SR 85X10 SR 85X 8	2 2	22 24	ZF9	40
39	42.5	25	128	M14	2	4.8	H210X H310X	SR 90X 9.5 SR 90X 8	2 2	24 25	ZF10	45
42	47	28	140	M14	2	5.8	H211X H311X	SR100X10.5 SR100X 8.5	2 2	25 27	ZF11	50
46	47	30	155	M18	2	6.8	H212X H312X	SR110X12 SR110X 9	2 2	26 29	ZF12	55
49	50	30	165	M18	2	9.5	H213X H313X	SR120X13 SR120X 9	2 2	28 32	ZF13	60
50	50	30	175	M18	2	10	H215X H315X	SR130X12.5 SR130X 9.5	2 2	30 33	ZF15	65
56	58	32	195	M22	2	14	H216X H316X	SR140X15 SR140X11.5	2 2	32 36	ZF16	70
56	60	32	195	M22	2	15	H217X H317X	SR150X14 SR150X10	2 2	34 38	ZF17	75
62	65	35	224	M22	2	20	H218X H318X H2318X	SR160X16 SR160X11 SR160X 9.6	2 2 1	35 40 46	ZF18	80
62	72.5	35	224	M22	2	20	H219X H319X	SR170X15 SR170X 9.5	2 2	37 43	ZF19	85
70	75	40	243	M20	4	26	H220X H320X H2320X	SR160X18 SR180X12 SR180X 9.7	2 2 1	39 45 52	ZF20	90
82	82	45	265	M20	4	30	H222X H322X H2322X	SR200X22 SR200X14.5 SR200X12.2	2 2 1	42 50 58	ZF22	100
82	82	45	280	M20	4	36	H3124X H2324X	SR215X12 SR215X 6	2 1	53 62	ZF24	110
86	87	50	300	M20	4	45	H3126 H2326	SR230X11 SR230X 6	2 1	57 65	ZF26	115
94	96	50	315	M20	4	53	H3128 H2328	SR250X13 SR250X 6	2 1	60 70	ZF28	125
103	105	60	335	M24	4	63	H3130 H2330	SR270X15 SR270X 7	2 1	65 76	ZF30	135

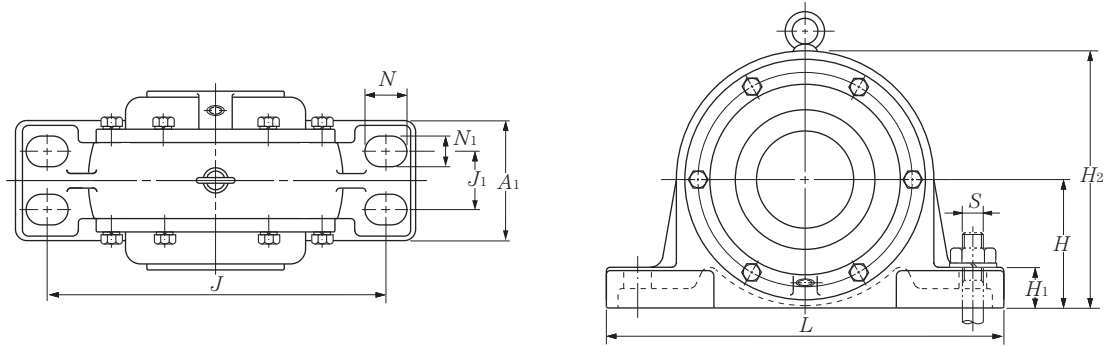
3) Dimension X indicates a deviation of the bearing center relative to the plummer block center, and its value is 1/2 the width of the setting washer.

4) An adaptor for bearing series 12, series H2 as well as series H3 can be used.

5) When wanting a plummer block whose bore at the shaft end side is closed, add code M1 after the plummer block nominal number.

Plummer Blocks SV5

Unit type standard / For bearing with adapter assembly

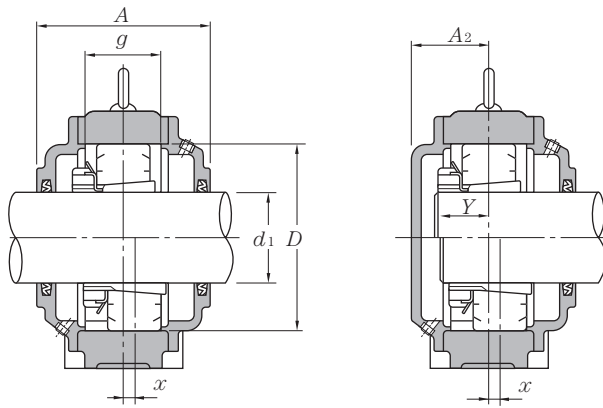


d_1 140~300mm

Shaft dia. mm d_1	Bearing numbers	BAS code ①		Nominal number		Abutment and fillet dimensions								
		main body	cover	self-aligning ball bearings	spherical roller bearings	D	H	J	J_1	mm N_1 N		L nominal number	A nominal number	A_1
140	SV532	V290	290C		22232EAKD1 23232EMKD1	290	190	470	92	29	50	560	250	170
150	SV534	V310	310C		22234EMKD1 23234EMKD1	310	200	560	92	29	50	660	258	180
160	SV536	V320	320C		22236EMKD1 23236EMKD1	320	200	560	92	29	50	660	258	180
170	SV538	V340	340C		22238EMKD1 23238EMKD1	340	212	580	104	33	54	680	300	190
180	SV540	V360	360C		22240EMKD1 23240EMKD1	360	224	610	130	33	54	740	300	224
200	SV544	V400	400C		22244EMKD1 23244EMKD1	400	250	680	148	36	60	820	330	250
220	SV548	V440	440C		22248EMKD1 23248EMKD1	440	280	740	166	40	66	880	340	280
240	SV552	V480	480C		22252EMKD1 23252EMKD1	480	300	790	180	43	72	940	370	300
260	SV556	V500	500C		22256EMKD1 23256EMKD1	500	315	830	190	43	72	990	390	315
280	SV560	V540	540C		22260EMKD1 23260EMKD1	540	335	890	200	46	78	1 060	410	335
300	SV564	V580	580C		22264EMKD1 23264EMKD1	580	355	930	215	49	84	1 110	440	355

- ① The Japan Bearing Industrial Association Standard
- ② The numeral in nominal number of the setting ring represents the outside diameter and width dimension.
- ③ Dimension Y is an approximate distance from the bearing center to the shaft end for shaft end configuration.

NOTE: 1) Sizes SV520 and greater are equipped with lifting eye bolts.
2) Fill and drain plugs size: SV505-SV520.....PT1/8
SV522-SV532.....PT1/4



Abutment and fillet dimensions					Approx. S nominal number	Mass kg (approx.)	Adapter	Nominal number		Approx. mm Y ³⁾	Seal number	shaft dia. mm d_1
g	mm		H_1	H_2				setting washer ²⁾	number			
113	112	60	375	M24	4	76	H3132 H2332	SR290X16.5 SR290X 9	2 1	71 83	ZF32	140
122	116	65	405	M24	4	89	H3134 H2334	SR310X18 SR310X12	2 1	75 87	ZF34	150
122	116	65	405	M24	4	100	H3136 H2336	SR320X18 SR320X10	2 1	76 89	ZF36	160
130	137	65	425	M27	4	110	H3138 H2338	SR340X19 SR340X10	2 1	80 94	ZF38	170
138	136	85	450	M27	4	130	H3140 H2340	SR360X20 SR360X10	2 1	84 99	ZF40	180
154	151	95	500	M30	4	196	H3144 H2344	SR400X23 SR400X10	2 1	90 108	ZF44	200
170	156	100	560	M33	4	260	H3148 H2348	SR440X25 SR440X10	2 1	98 118	ZF48	220
184	173	105	600	M36	4	318	H3152 H2352	SR480X27 SR480X10	2 1	105 127	ZF52	240
186	185	110	630	M36	4	336	H3156 H2356	SR500X28 SR500X10	2 1	107 130	ZF56	260
202	196	115	670	M39	4	433	H3160 H2360	SR540X31 SR540X10	2 1	114 160	ZF60	280
218	211	120	710	M42	4	507	H3164 H2364	SR580X34 SR580X10	2 1	122 151	ZF64	300

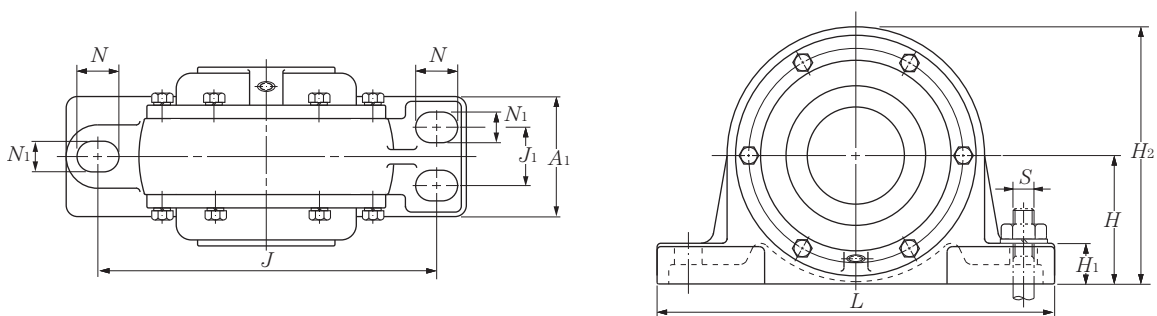
3) Dimension X indicates a deviation of the bearing center relative to the plummer block center, and its value is 1/2 the width of the setting washer.

4) An adaptor for bearing series 12, series H2 as well as series H3 can be used.

5) When wanting a plummer block whose bore at the shaft end side is closed, add code M1 after the plummer block nominal number.

Plummer Blocks SV2

Unit type, stepped bore type / For cylindrical bore bearing

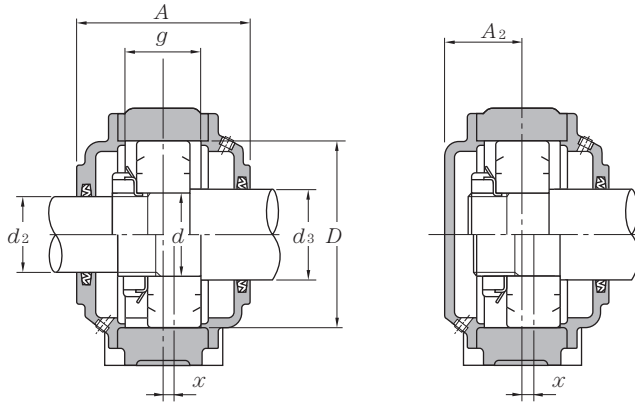


d_1 25~110mm

Shaft dia.			Bearing numbers	BAS code ①		Nominal number		Abutment and fillet dimensions								
mm	d_2	d_3		main body	cover	Self-aligning ball bearings	spherical roller bearings	D	H	J	J_1	mm	N_1	N	L	A
25	20	30	SV205	V052	052C	1205S 2205S	—	52	45	130	—	16	20	165	73	46
30	25	35	SV206	V062	062C	1206S 2206S	—	62	50	150	—	16	20	185	80	52
35	30	45	SV207	V072	072C	1207S 2207S	—	72	56	150	—	16	20	185	85	52
40	35	50	SV208	V080	080C	1208S 2208S	— 22208EAD1	80	60	170	—	16	20	205	95	60
45	40	55	SV209	V085	085C	1209S 2209S	— 22209EAD1	85	63	170	—	16	23	205	98	60
50	45	60	SV210	V090	090C	1210S 2210S	— 22210EAD1	90	67	170	—	16	23	205	100	60
55	50	65	SV211	V100	100C	1211S 2211S	— 22211EAD1	100	71	210	—	16	23	255	106	70
60	55	70	SV212	V110	110C	1212S 2212S	— 22212EAD1	110	80	210	—	21	25	255	112	70
65	60	75	SV213	V120	120C	1213S 2213S	— 22213EAD1	120	85	230	—	21	25	275	118	80
70	60	80	SV214	V125	125C	1214S 2214S	— 22214EAD1	125	90	230	—	21	25	280	118	80
75	65	85	SV215	V130	130C	1215S 2215S	— 22215EAD1	130	90	230	—	21	25	280	118	80
80	70	90	SV216	V140	140C	1216S 2216S	— 22216EAD1	140	100	260	—	25	30	315	136	90
85	75	95	SV217	V150	150C	1217S 2217S	— 22217EAD1	150	100	260	—	25	30	315	140	90
90	80	100	SV218	V160	160C	1218S 2218S	— 22218EAD1 23218EMD1	160	112	290	—	25	30	345	150	100
95	85	110	SV219	V170	170C	1219S 2219S	— 22219EAD1	170	112	290	—	25	30	345	165	100
100	90	115	SV220	V180	180C	1220S 2220S	— 22220EAD1 23220EMD1	180	125	320	56	23	32	380	170	110
110	100	125	SV222	V200	200C	1222S 2222S	— 22222EAD1 23222EMD1	200	132	350	60	23	32	410	190	120

- ① The Japan Bearing Industrial Association Standard
- ② The numeral in nominal number of the setting ring represents the outside diameter and width dimension.
- ③ Dimension Y is an approximate distance from the bearing center to the shaft end for shaft end configuration.

NOTE: 1) Sizes SV220 and greater are equipped with lifting eye bolts.
2) Fill and drain plugs size: SV205-SV220.....PT1/8
SV222-SV232.....PT1/4



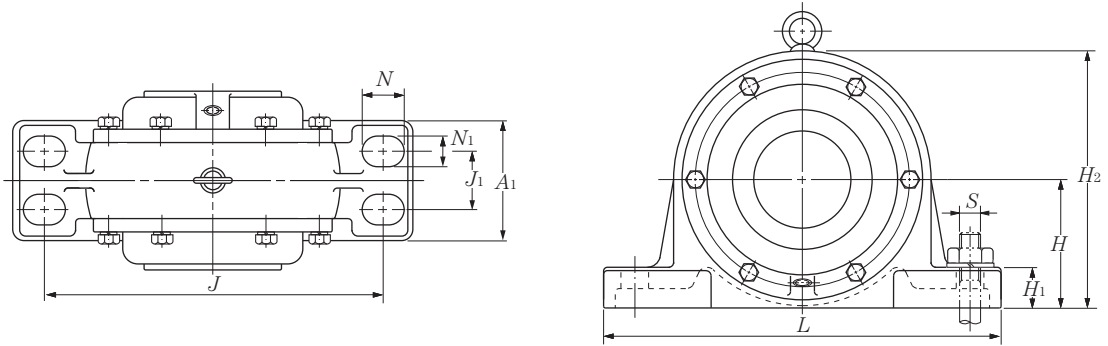
Abutment and fillet dimensions					Approx. S nominal number	Mass kg (approx.)	Nominal number				Approx. mm Y ³⁾	Seal number		shaft dia. mm d ₁
g	mm			setting washer ²⁾			number	nut	washer	(d ₂)		(d ₃)		
27	31	22	85	M14	2	2.0	SR 52X 6 SR 52X 9	2 1	AN05	AW05	17 19	ZF 5	ZF 7	25
30	34	22	95	M14	2	2.6	SR 62X 7 SR 62X10	2 1	AN06	AW06	18 20	ZF 6	ZF 8	30
33	37.5	22	106	M14	2	3.1	SR 72X 8 SR 72X10	2 1	AN07	AW07	19 22	ZF 7	ZF10	35
37	40.5	25	118	M14	2	4.3	SR 80X 9.5 SR 80X 7	2 2	AN08	AW08	21 23	ZF 8	ZF11	40
39	42.5	25	125	M14	2	4.3	SR 85X10 SR 85X 8	2 2	AN09	AW09	22 24	ZF 9	ZF12	45
39	42.5	25	128	M14	2	4.6	SR 90X 9.5 SR 90X 8	2 2	AN10	AW10	24 25	ZF10	ZF13	50
42	47	28	140	M14	2	5.5	SR100X10.5 SR100X 8.5	2 2	AN11	AW11	25 27	ZF11	ZF15	55
46	47	30	155	M18	2	6.5	SR110X12 SR110X 9	2 2	AN12	AW12	26 29	ZF12	ZF16	60
49	50	30	165	M18	2	9.5	SR120X13 SR120X 9	2 2	AN13	AW13	28 32	ZF13	ZF17	65
50	50	30	175	M18	2	10	SR125X13 SR125X 9.5	2 2	AN14	AW14	28 32	ZF13	ZF18	70
50	50	30	175	M18	2	10	SR130X12.5 SR130X 9.5	2 2	AN15	AW15	30 33	ZF15	ZF19	75
56	58	32	195	M22	2	14	SR140X15 SR140X11.5	2 2	AN16	AW16	32 36	ZF16	ZF20	80
56	60	32	195	M22	2	15	SR150X14 SR150X10	2 2	AN17	AW17	34 38	ZF17	ZF21	85
62	65	35	224	M22	2	20	SR160X16 SR160X11 SR160X 9.6	2 2 1	AN18	AW18	35 40 46	ZF18	ZF22	90
62	72.5	35	224	M22	2	20	SR170X15 SR170X 9.5	2 2	AN19	AW19	37 43	ZF19	ZF24	95
70	75	40	243	M20	4	26	SR180X18 SR180X12 SR180X 9.7	2 2 1	AN20	AW20	39 45 52	ZF20	ZF26	100
82	82	45	265	M20	4	30	SR200X22 SR200X14.5 SR200X12.2	2 2 1	AN22	AW22	42 50 58	ZF22	ZF28	110

3) Dimension X indicates a deviation of the bearing center relative to the plummer block center, and its value is 1/2 the width of the setting washer.

4) When wanting a plummer block whose bore at the shaft end side is closed, add code M1 after the plummer block nominal number.

Plummer Blocks SV2

Unit type, stepped bore type / For cylindrical bore bearing

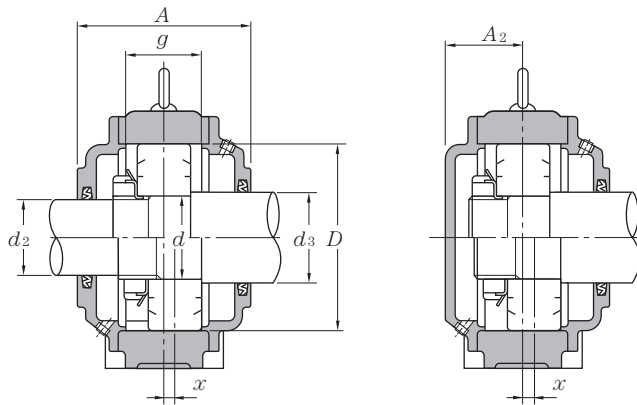


d_1 120~320mm

Shaft dia.			Bearing numbers	BAS code ①		Nominal number		Abutment and fillet dimensions								
mm	d_2	d_3		main body	cover	Self-aligning ball bearings	spherical roller bearings	D	H	J	J_1	mm		L	A	A_1
d											N_1	N				
120	110	135	SV224	V215	215C	—	22224EAD1 23224EMD1	215	140	350	60	23	32	410	190	120
130	115	145	SV226	V230	230C	—	22226EAD1 23226EMD1	230	150	380	65	23	32	450	200	130
140	125	155	SV228	V250	250C	—	22228EAD1 23228EMD1	250	160	420	80	23	32	500	218	150
150	135	165	SV230	V270	270C	—	22230EAD1 23230EMD1	270	170	450	92	29	42	540	236	160
160	140	175	SV232	V290	290C	—	22232EAD1 23232EMD1	290	190	470	92	29	50	560	250	170
170	150	190	SV234	V310	310C	—	22234EMD1 23234EMD1	310	200	560	92	29	50	660	258	180
180	160	200	SV236	V320	320C	—	22236EMD1 23236EMD1	320	200	560	92	29	50	660	258	180
190	170	210	SV238	V340	340C	—	22238EMD1 23238EMD1	340	212	580	104	33	54	680	300	190
200	180	230	SV240	V360	360C	—	22240EMD1	360	224	610	130	33	54	740	300	224
220	200	250	SV244	V400	400C	—	22244EMD1	400	250	680	148	36	60	820	330	250
240	220	260	SV248	V440	440C	—	22248EMD1	440	280	740	166	40	66	880	340	280
260	240	280	SV252	V480	480C	—	22252EMD1	480	300	790	180	43	72	940	370	300
280	260	300	SV256	V500	500C	—	22256EMD1	500	315	830	190	43	72	990	390	315
300	280	320	SV260	V540	540C	—	22260EMD1	540	335	890	200	46	78	1 060	410	335
320	300	340	SV264	V580	580C	—	22264EMD1	580	355	930	215	49	84	1 110	440	355

- ① The Japan Bearing Industrial Association Standard
- ② The numeral in nominal number of the setting ring represents the outside diameter and width dimension.
- ③ Dimension Y is an approximate distance from the bearing center to the shaft end for shaft end configuration.

NOTE: 1) Sizes SV220 and greater are equipped with lifting eye bolts.
 2) Fill and drain plugs size: SV205-SV220……PT1/8
 SV222-SV232……PT1/4

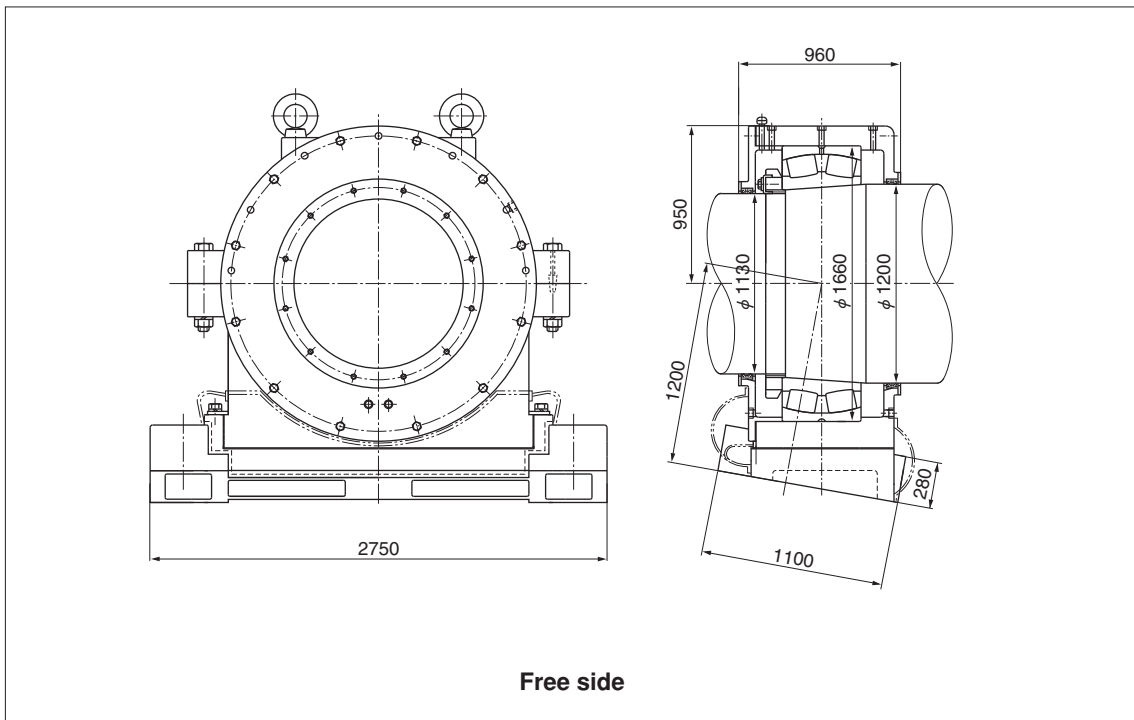
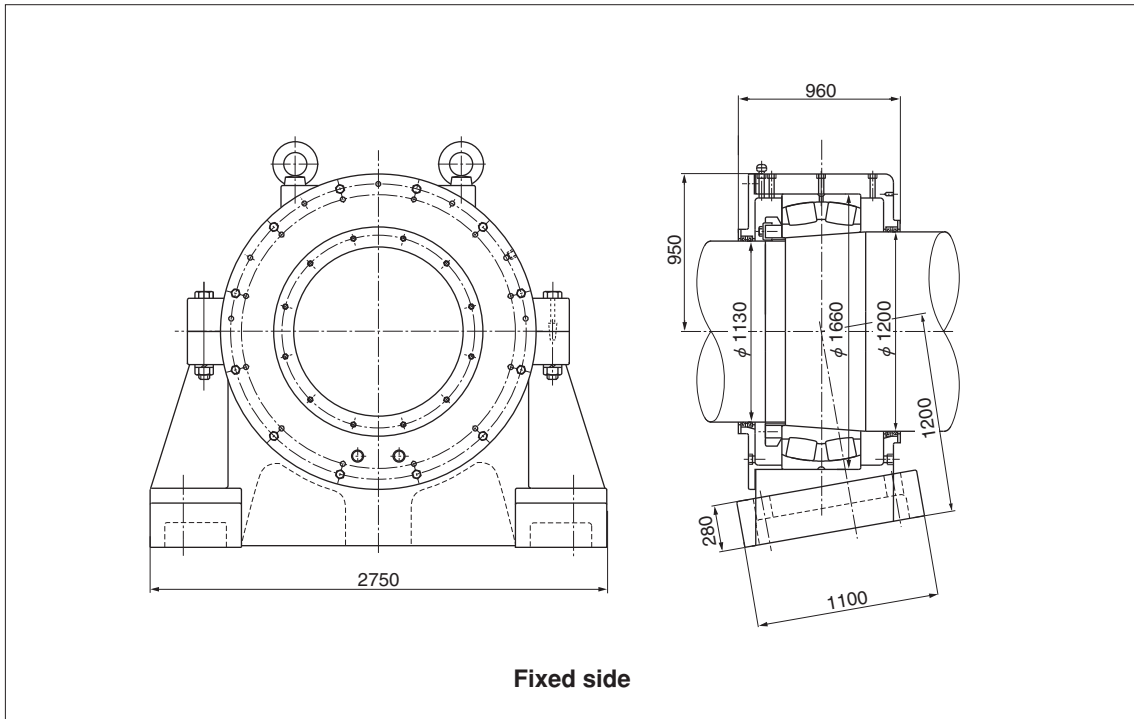


Abutment and fillet dimensions					Approx. S nominal number	Mass kg (approx.)	Nominal number				Approx. mm Y ^③	Seal number		shaft dia. mm d ₁
g	mm A ₂ H ₁ H ₂		setting washer ^② number				nut	washer	(d ₂)	(d ₃)				
82	82	45	280	M20	4	36	SR215X12 SR215X 6	2 1	AN24	AW24	53 62	ZF24	ZF30	120
86	87	50	300	M20	4	44	SR230X11 SR230X 6	2 1	AN26	AW26	57 65	ZF26	GS33	130
94	96	50	315	M20	4	52	SR250X13 SR250X 6	2 1	AN28	AW28	60 70	ZF28	GS35	140
103	105	60	335	M24	4	62	SR270X15 SR270X 7	2 1	AN30	AW30	65 76	ZF30	GS37	150
113	112	60	375	M24	4	75	SR290X16.5 SR290X 9	2 1	AN32	AW32	71 83	ZF32	GS39	160
122	116	65	405	M24	4	87	SR310X18 SR310X12	2 1	AN34	AW34	75 87	ZF34	ZF42	170
122	116	65	405	M24	4	98	SR320X18 SR320X10	2 1	AN36	AW36	76 89	ZF36	ZF44	180
130	137	65	425	M27	4	110	SR340X19 SR340X10	2 1	AN38	AW38	80 94	ZF38	ZF46	190
138	136	85	450	M27	4	130	SR360X20	2	AN40	AW40	84	ZF40	GS50	200
154	151	95	500	M30	4	196	SR400X23	2	AN44	AL44	90	ZF44	ZF54	220
170	156	100	560	M33	4	260	SR440X25	2	AN48	AL44	98	ZF48	ZF56	240
184	173	105	600	M36	4	318	SR480X27	2	AN52	AL52	105	ZF52	ZF60	260
186	185	110	630	M36	4	336	SR500X28	2	AN56	AL52	107	ZF56	ZF64	280
202	196	115	670	M39	4	433	SR540X31	2	AN60	AL60	114	ZF60	ZF68	300
218	211	120	710	M42	4	507	SR580X34	2	AN64	AL64	122	ZF64	GS72	320

3) Dimension X indicates a deviation of the bearing center relative to the plummer block center, and its value is 1/2 the width of the setting washer.

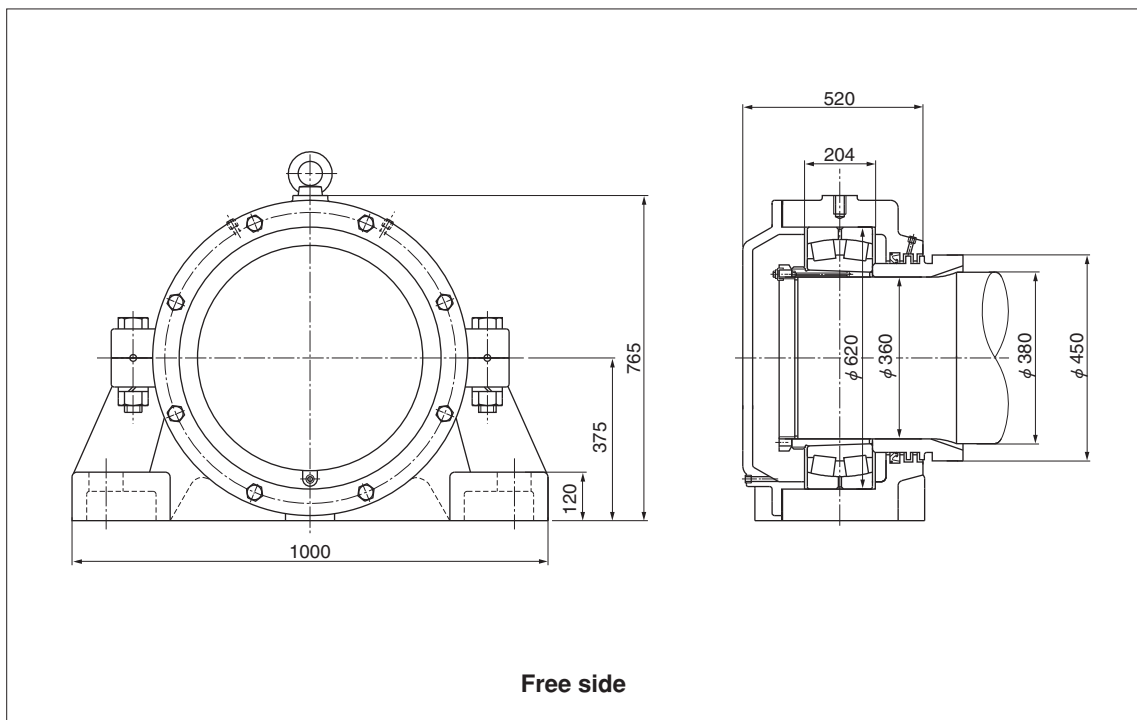
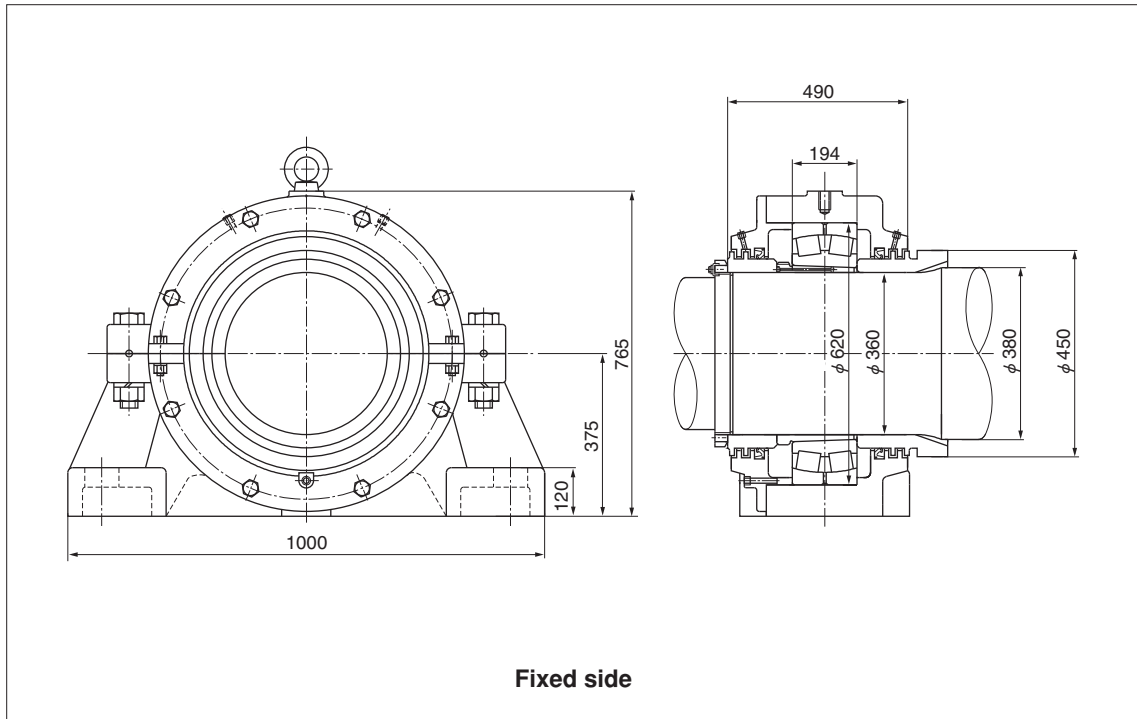
4) When wanting a plummer block whose bore at the shaft end side is closed, add code M1 after the plummer block nominal number.

Specialized Plummer Block



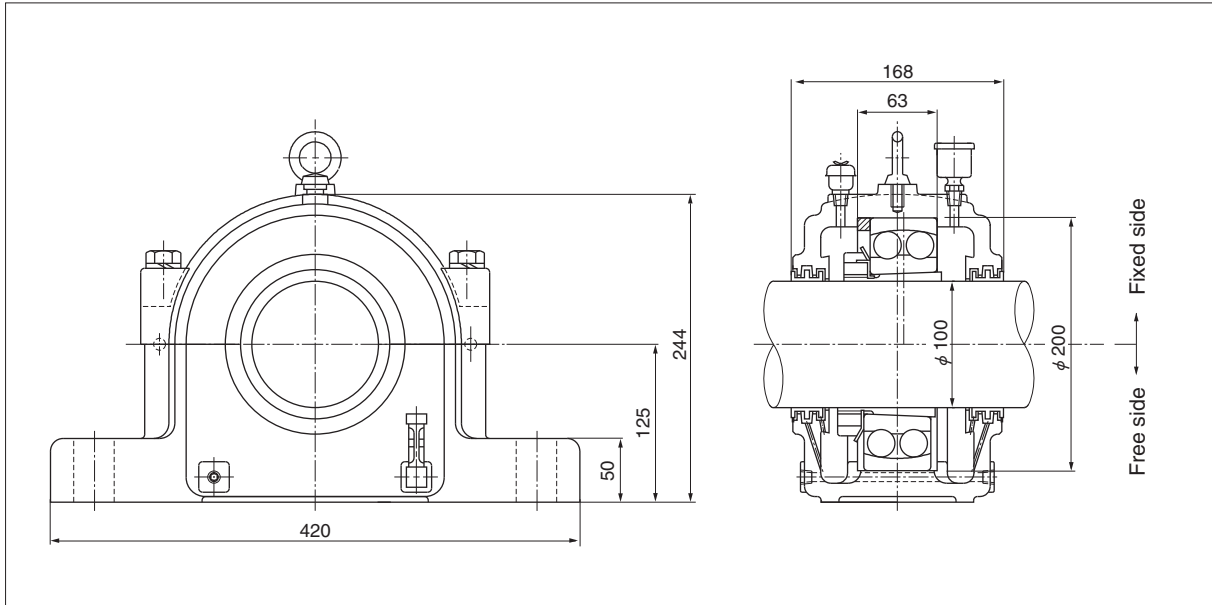
Number	Fixed side: 0S23601GN1Y545ZX1 Free side: 0S23602N1Y545ZX1
Bearing	240/1180BK30
Application	Tube dryer
Shaft speed	6~12min ⁻¹
Lubricating system	Circulating oil

Specialized Plummer Block

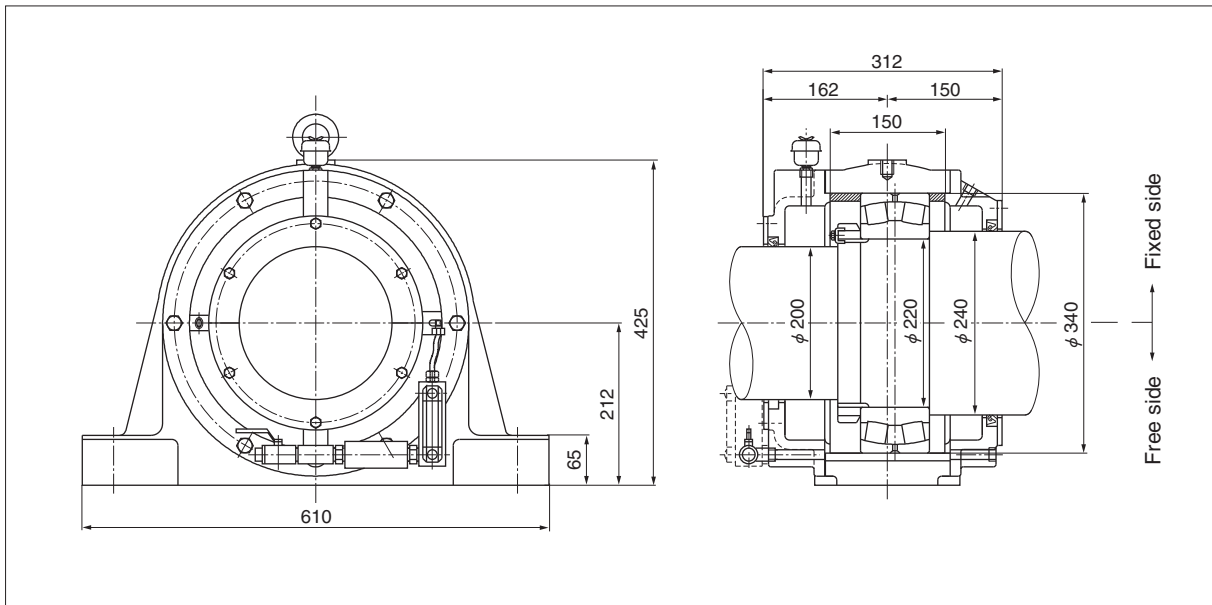


Number	Fixed side: 1S7642GY851ZX1 Free side: 1S7642M1Y851ZX1
Bearing	23176BK+AH3176H
Application	Sintering m
Shaft speed	3~4min ⁻¹
Lubricating system	Grease lubrication

Specialized Plummer Block

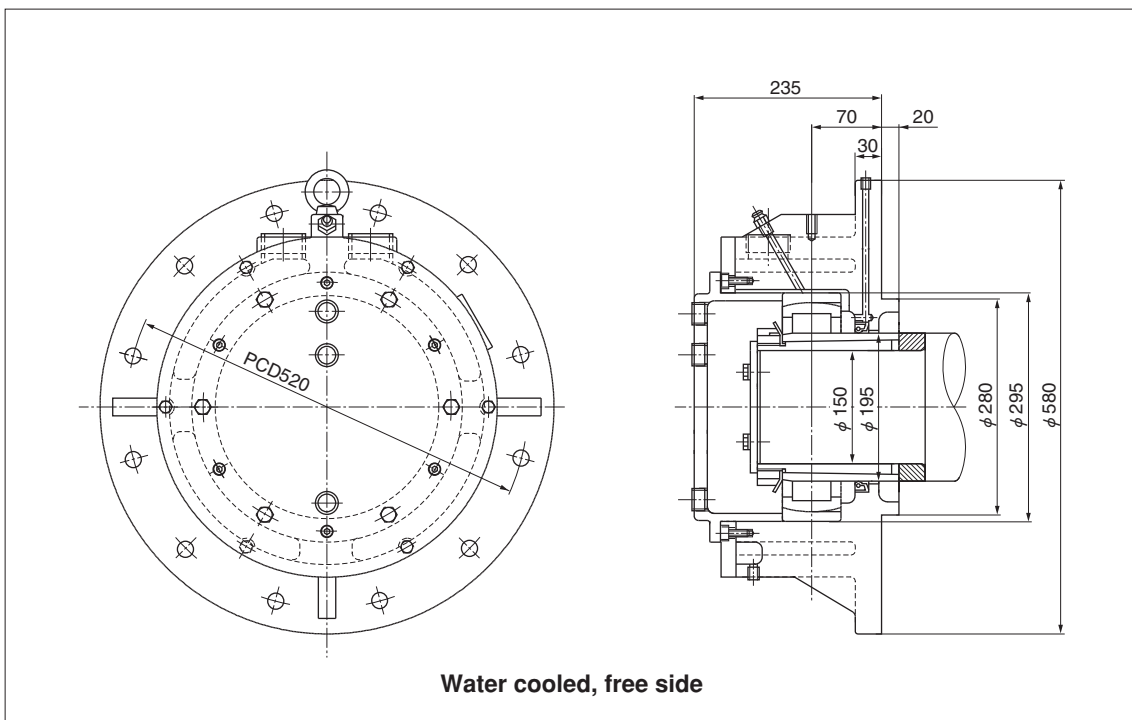
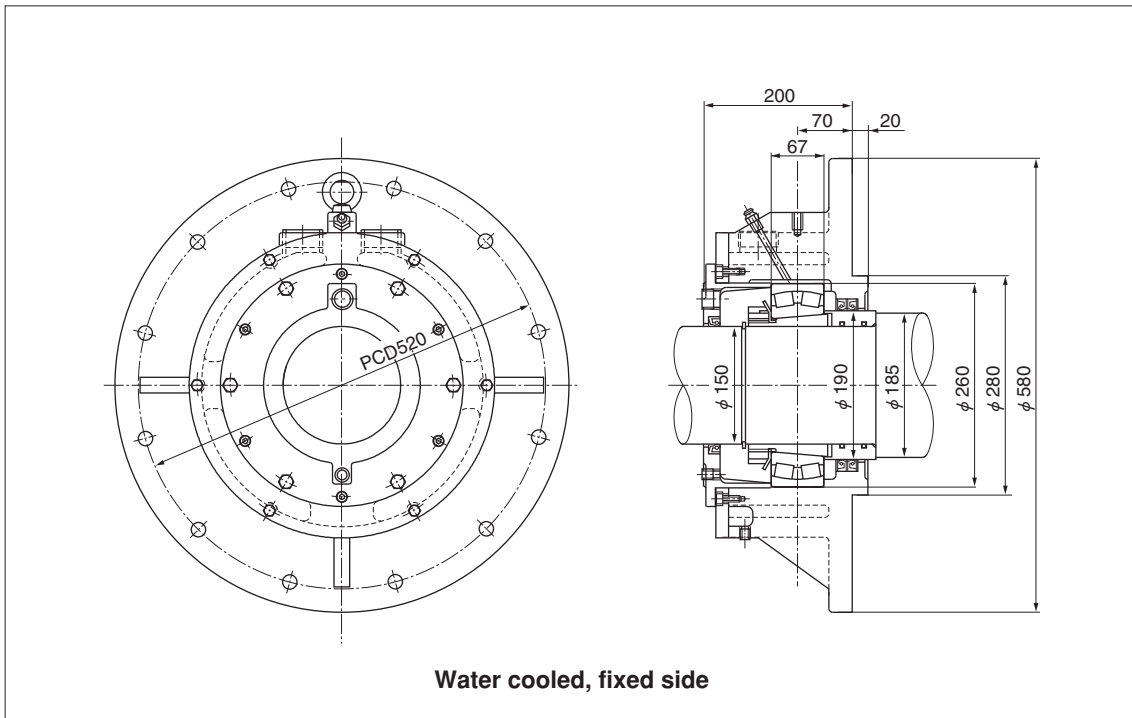


Number	Fixed side: 2S22B32GX1 Free Side: 2S22B32
Bearing	2222SKC3+H322X
Application	Pump flywheel
Shaft speed	1 480min ⁻¹
Lubricating system	Oil bath



Number	Fixed side: 0S4483Y892GX1ZX1 Free side: 0S4483Y892ZX1
Bearing	TS3-23044BF3C4+ANL44, ALL44
Application	ID dryer
Shaft speed	8min ⁻¹ (MAX)
Lubricating system	Oil bath

Specialized Plummer Block



Number	Fixed side: FY3475GY133ZX1 Free side: FY3460M1Y133ZX1
Bearing	Fixed side: TS3-23034BKC4+H3034 Free side: TS2-R3431K30C4+H9180
Application	CAPL
Shaft speed	90min ⁻¹
Lubricating system	Grease lubrication