

## 2. General information of rolling bearing

### 2.1 Bearing designations

The bearing designations of rolling bearing represent its structure, main dimensions, material, clearance and its configuration. Typical bearing designations consist of combinations of prefix, basic designation and suffix.

The boundary dimensions of rolling bearings comply with ISO General Plans for rolling bearings. Please contact UBC if any request for special dimensions.

The detail coding rules of UBC bearings please refer to Table 2-1, Table 2-2 for prefixes, Table 2-3 for basic designations and for suffixes please refer to (Table 2-4 for internal structure, Table 2-5 for seals, shields and transmutation rings, Table 2-6 for cage and its material, Table 2-7 for bearing material, Table 2-8 for tolerance and fitness, Table 2-9 for bearing clearance, Table 2-10 for bearing arrangement, Table 2-11 for other coding rules).

Table 2-1

Bearing designations											
Prefix	Basic designation			Suffix							
	Types	Dimension series	Size codes	Internal structure	Seals Shields ring changes	Cage and its material	Bearing material	Tolerance	Clearance	Conjugations	Others
Bearing components											

Table 2-2

Bearing components	
Code	Definition
F	Ball bearing with flange on outer ring
GS	Housing for thrust cylinder roller bearing
L	Separable bearing inner ring or outer ring
LR	Separable bearing inner ring, outer ring or roller assembly
KOW-	Thrust bearing without shaft sleeve
KIW-	Thrust bearing without housing sleeve
R	Bearing with non-separable inner ring or outer ring
	Needle bearing without inner ring
WS	Thrust cylinder roller bearing and shaft sleeve

Table 2-3

Type code		Dimension series code		Size Code	
Code	Definition	Code	Definition	Code	Definition
					Size(mm)
0	Double row angularcontact ball bearing	Refer Table 2-1 and Table 2-2	1	1	
1	Self-aligning ball bearing		2	2	
2	Self-aligning roller bearing		3	3	
	Self-aligning thrust roller bearing		:	:	
3	Taper roller bearing		:	:	

Type code		Dimension series code		Size Code	
Code	Definition		Definition	Code	Definition Size(mm)
4	S Double row deep groove ball bearing	As above		9	9
5	Thrust ball bearing			00	10
6	Deep groove ball bearing			01	12
7	Angular contact ball bearing			02	15
8	Thrust roller bearing			03	17
N	Cylinder roller bearing			04	20
U	Ball bearing with spherical outer ring			/22	22
QJ	Four point angular contact ball bearing			05	25
				/28	28
				06	30
				/32	32
				07	35
				08	40
				09	45
				:	:
				88	440
			92	460	
			96	480	
			/500	500	
			/530	530	
			/560	560	

Table 2-4

Internal Structure	
Code	Definition
A	1. Double row angular contact ball bearing or deep groove ball bearing without filling slots
	2. Deep groove ball bearing of linear motion
	3. Needle roller bearing with 2 locking rings on outer ring (d>9mm, FW<12mm)
	4. Enhanced internal structure
B	1. Angular contact ball bearing with a contact angle 40°
	2. Taper roller bearing with increased contact angle
C	1. Angular contact ball bearing with a contact angle 15°
	2. Self-aligning roller bearing with enhanced design, flangeless inner ring with centered guide ring, press steel cage and symmetrical roller
D	1. Middle split bearing
	2. Double row angular contact ball bearing with double inner ring and a contact angle of 45°
E	Enhanced design

Internal Structure	
Code	Definition
AC	Angular contact ball bearing with a contact angle 25°
CA	Self-aligning roller bearing C design with flanged inner ring and centered guide ring, one-piece cage
CC	Self-aligning roller bearing C design with enhanced roller guide
CAB	Self-aligning roller bearing CA design with holed roller and pin type cage
CABC	Self-aligning roller bearing CAB design with enhanced roller guide
CAC	Self-aligning roller bearing CA design with enhanced roller guide

Table 2-5

Seals, Shields and transmutation rings	
Code	Definition
K	Tapered bore, taper 1:12
K30	Tapered bore, taper 1:30
R	Integral flange on outer ring
N	Snap ring groove in the outer ring
NR	Snap ring groove in the outer ring with appropriate snap ring
RS	Contact seal of acrylonitrile-butadiene rubber on one side
2RS	Contact seal of acrylonitrile-butadiene rubber on both side
RL	RS with seal groove on inner ring and slight contact
2RL	2RS with seal groove on inner ring and slight contact
RZ	Sheet steel reinforced low friction seal of acrylonitrile-butadiene rubber on one side, non-contact seal
2RZ	RZ low friction seal of acrylonitrile-butadiene rubber on both side, non-contact seal
	High temperature fluorin-rubber seal
Z	Shield of pressed sheet steel on one side
2Z	Shield of pressed sheet steel on both sides
RSZ	Combination Seals of RS and Z
ZN	Shield of pressed sheet steel on one side with snap groove on outer ring on other side
ZNR	Shield of pressed sheet steel on one side and with snap groove and snap ring on outer ring on other side
ZNB	Shield of pressed sheet steel on one side with snap groove on outer ring on other side
2ZN	Shield of pressed sheet steel on both sides with snap groove on outer ring
PP	Soft rubber seal on both sides
2K	Double tapered bores, taper 1:12
D	1. Double row angular contact ball bearing with double inner ring
	2. Double row taper roller bearing without intermediate space ring, non-grinded side surface
DC	Double row angular contact ball bearing with double outer ring
D1	Double row taper roller bearing without intermediate space ring, grinded side surface
DH	Thrust bearing with double housing sleeve
DS	Thrust bearing with double shaft sleeve

Seals, Shields and transmutation rings	
Code	Definition
P	Self-aligning roller bearing with split outer rings
PR	P design with space rings between split outer rings
S	1. Bearing with spherical outer ring (exclude spherical ball bearing)
	2. Needle bearing with adjustable clearance
WB	Wide width inner ring at both sides; WB1: one side wide width inner ring
WC	Wide width outer ring
N1	Outer ring with one locating groove
N2	Outer ring with two locating grooves
N4	N1+N2 with one snap groove at other side
N6	N1+N2 with one snap groove at same side
X	Needle bearing with cylinder outer ring

Table 2-6

Cage and its material	
Code	Definition
Cage material	
F	Steel, cast iron or powder metallic cage
Q	Machined one piece bronze cage
M	Machined one piece brass cage
L	Machined light alloy cage
T	Winder-type cage of fabric reinforced phenol resin
TH	Snap-type cage of fabric reinforced phenol resin
TN	Injection molded cage of polyamide
J	Pressed steel cage
Y	Pressed brass cage
Cage structure and surface process (Jointed with above code)	
W	Weld cage
R	Riveted cage for large size bearings
E	Phosphite cage
D	Cemented and hydrogen sulfide cage
D1	Cemented cage
D2	Nitride cage
C	Coated cage (C1: Silver coated)
A	Outer ring guide
B	Inner ring guide
No cages	
V	Full complement roller bearing

Table 2-7

Bearing material	
Code	Definition
/HV	Ring, roller and cage or ring and roller are harden stainless steel
/HC	Ring and roller or only ring are cementite steel
/HQ	Ring and roller are non-metal material
/CS	Bearing components are made of carbon steel

Table 2-8

Tolerance table	
Code	Definition
/P0	Dimensional and running accuracy to ISO tolerance class 0
/P6	Dimensional and running accuracy to ISO tolerance class 6
/P6X	Dimensional and running accuracy to ISO tolerance class 6x
/P5	Dimensional and running accuracy to ISO tolerance class 5
/P4	Dimensional and running accuracy to ISO tolerance class 4
/P2	Dimensional and running accuracy to ISO tolerance class 2
/SP	Dimensional accuracy close to P5, running accuracy close to P4
/UP	Dimensional and running accuracy close to P4

Table 2-9

Bearing clearance	
Code	Definition
/C1	Bearing internal clearance smaller than C2
/C2	Bearing internal clearance smaller than Normal
C0 (CN)	Normal internal clearance
/C3	Bearing internal clearance bigger than Normal
/C4	Bearing internal clearance bigger than C3
/C5	Bearing internal clearance bigger than C4
/C9	Bearing internal clearance different with current standard
/CM	Deep groove ball bearing internal clearance for motor

Table 2-10

Bearing arrangement	
Code	Definition
/DB	Paired bearing in a back-to-back arrangement
/DF	Paired bearing in a face-to-face arrangement
/DT	Paired bearing in a tandem arrangement
/TBT	3 bearings with two in a tandem and one in back-to-back arrangement
/TFT	3 bearings with two in a tandem and one in face-to-face arrangement
/TT	3 bearings in a tandem arrangement
/QBC	4 bearings in a tandem and back-to-back arrangement
/QFC	4 bearings in a tandem and face-to-face arrangement
/QT	4 bearings in a tandem arrangement
/QBT	4 bearings with 3 in a tandem and 1 in back-to-back arrangement
/QFT	4 bearings with 3 in a tandem and 1 in face-to-face arrangement

Preload for bearing arrangement	
G	Special preload with a number for preload level
GA	Light preload
GB	Middle preload
GC	High preload

Table 2-11

Other Codes	
Code	Definition
/Z	Groups of maximum vibration acceleration with additional number to represent different maximum value
	Z1: The maximum acceleration value in Z1 group
	Z2: The maximum acceleration value in Z2 group
	Z3: The maximum acceleration value in Z3 group
	Z4: The maximum acceleration value in Z4 group
/V	Groups of maximum vibration velocity with additional number to represent different maximum value
	V1: The maximum velocity value in V1 group
	V2: The maximum velocity value in V2 group
	V3: The maximum velocity value in V3 group
	V4: The maximum velocity value in V4 group
EMQ6	Low running noise
EMQ5	Very low running noise
/S0	Tempered rings with maximum running temperature of 150° C
/S1	Tempered rings with maximum running temperature of 200° C
/S2	Tempered rings with maximum running temperature of 250° C
/S3	Tempered rings with maximum running temperature of 300° C
/S4	Tempered rings with maximum running temperature of 350° C
/W20	3 lubrication holes in outer ring
/W33	Annular groove with 3 lubrication holes in outer ring
/LHT	Grease fill for low and high temperatures(-40 to +120°C)
	LHT1: -40 to +150°C
	LHT2: -40 to +200°C
	LHT3: -40 to +250°C
	LHT4: -40 to +300°C
/Y	Combination of Y and other letter or number to identify the special designs which can not be represented by available suffixes
	YA: Changed structure
	YA1: The outer ring surface is different with standard design
	YA2: The bearing bore is different with standard design
	YA3: The ring side surface is different with standard design

Code	Definition
/Y	YA4: The raceway is different with standard design
	YA5: The roller is different with standard design
	YB: Changed technical conditions
	YB1: Coated rings
	YB2: Changed dimension and tolerance
	YB3: Changed surface roughness
	YB4: Changed heating process i.e. Hardness

Bearing width series

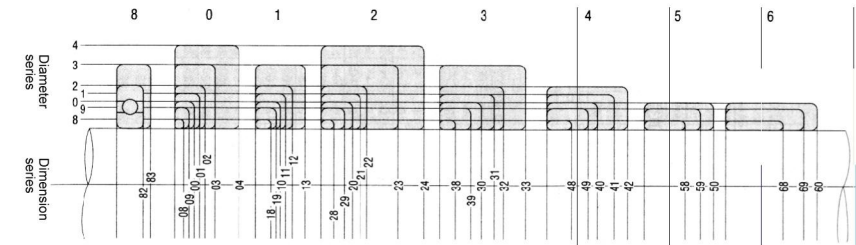


Figure 2-1 Dimension series of radial bearings (excluding TRB)

Bearing height series

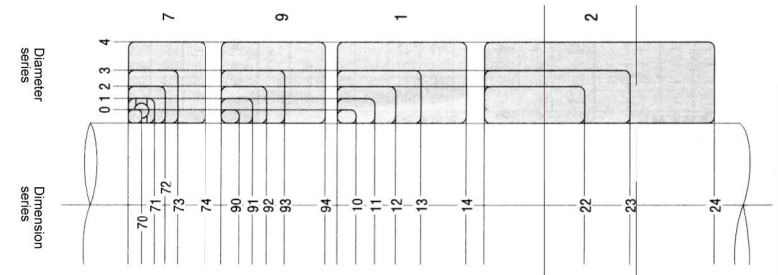


Figure 2-1 Dimension series of thrust bearings