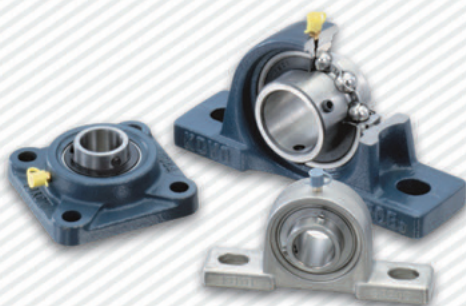
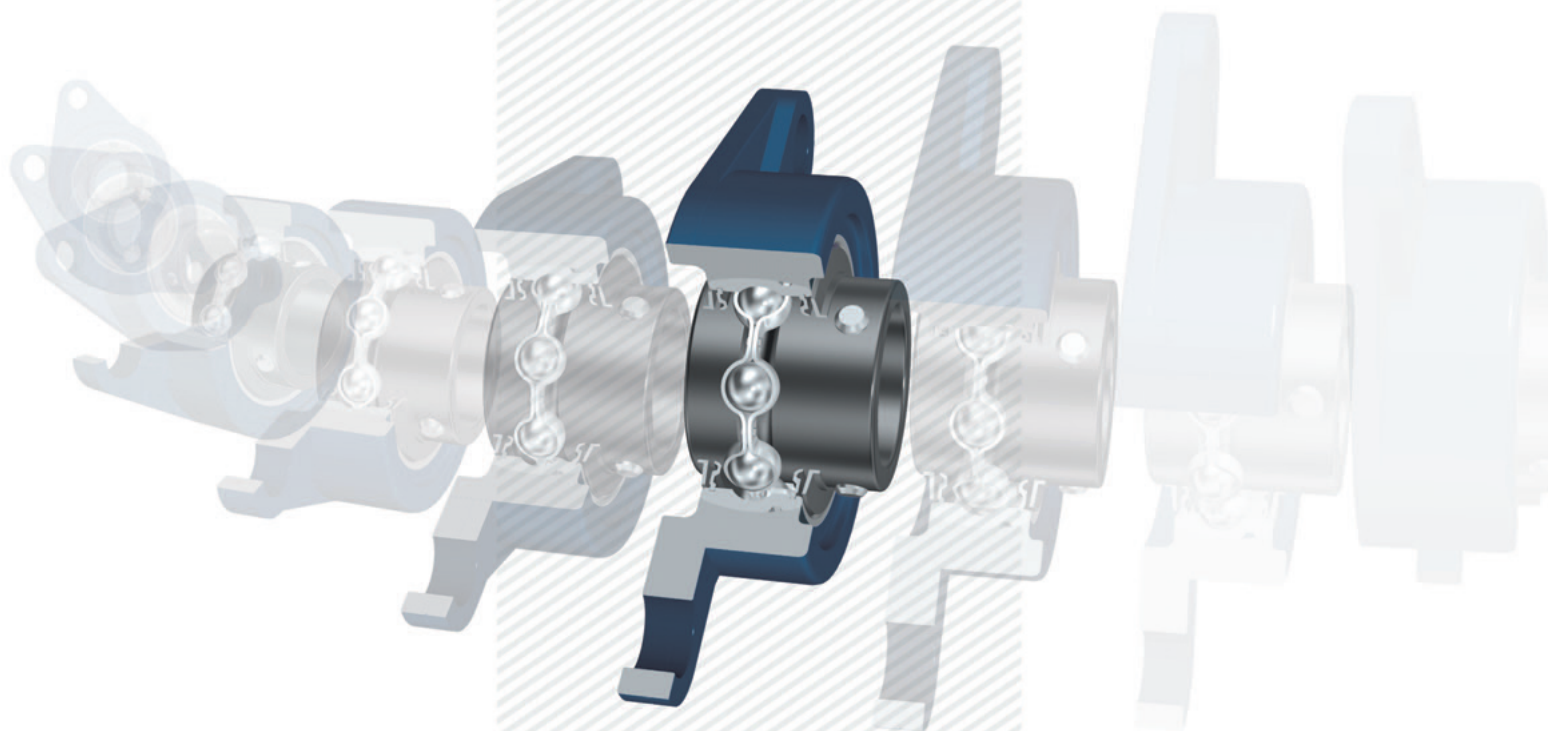


# BALL BEARING UNITS



**JTEKT**

JTEKT CORPORATION

**JTEKT**  
Koyo | TOYODA









# Ball Bearing Units (contents)

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# **BALL BEARING UNITS**

**CAT. NO. B2007E-1**

**Value & Technology**



# Publication of New **Koyo** Ball Bearing Units Catalog

In recent years, needs in industrial world for machineries and equipment highly developed in all aspects have been increased more than ever. Therefore, high technology covering from superior technical advantages including longer service life and maintenance free to higher reliability even under extraordinary conditions such as high and low temperatures and rotation at a high speed is required for ball bearing units.

This catalog completely includes results of technical examinations and abundant research and development.

In the first half of this catalog, technical descriptions referring from the selection to the handling of Koyo Ball Bearing units are mentioned, while a lot of dimensional tables with types and dimensions are included in the last half. Varied technical information is provided at the last of this catalog. We trust this catalog will help you to select and use Koyo Ball Bearing units appropriately.

JTEKT keeps trying to get ideas from the market, step up persistent efforts of technical research and development, and provide the best technologies, quality, and services.

JTEKT is grateful for your patronage and look forward to continuing to serve you in the future.

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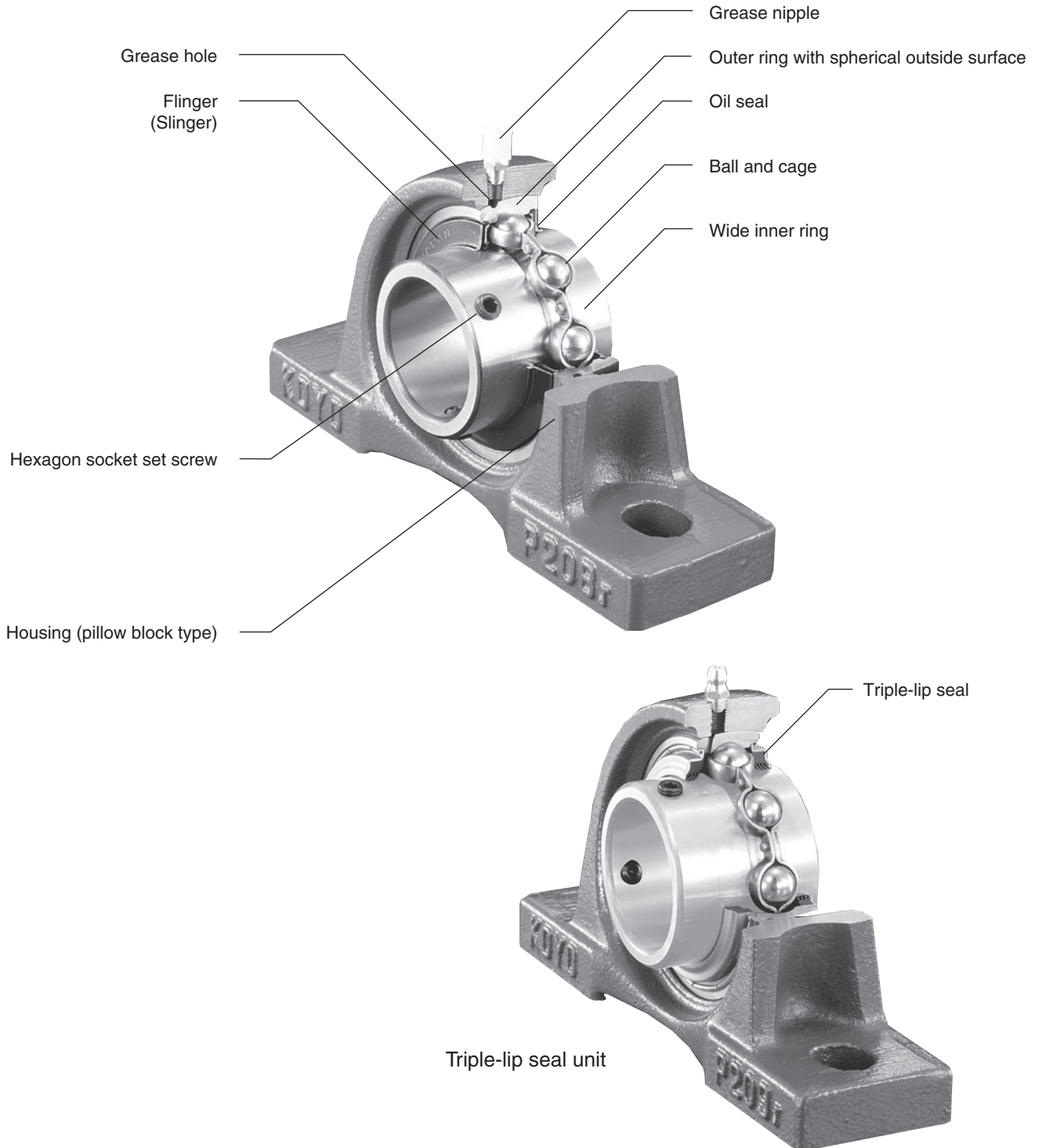


# 1 Structure and features

Koyo Ball Bearing Units are highly precise bearing units comprising grease sealed deep groove ball bearings and housings in various forms. The ball bearing units allow easy handling and installation by followings: direct installation to machines and equipment with some bolts, self-aligning, and greasing.

## 1.1 Structure

Koyo Ball Bearing Unit comprises the ball bearing for unit with spherical outside surface and the housing with spherical bearing seat (Fig. 1.1).



**Fig. 1.1 Structure of ball bearing units (representative example)**

# 1 Structure and features

## 1.2 Features

Koyo Ball Bearing Units, having many features, are available in various types. Select the bearing unit optimal for your purpose among the types with unique features.

### 1 Supreme load capacity and accuracy

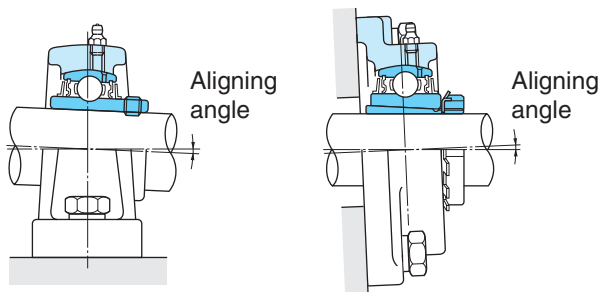
Koyo Ball Bearings for bearing unit, featuring the internal structure identical to single row deep groove ball bearings, bear axial load in both directions, as well as great radial load. The tolerance is equal to that of a standard bearing. They feature high rotation accuracy and high speed rotation.

### 2 Rational self aligning mechanism and optimal fit

Koyo Ball Bearing Units have self aligning mechanism by the spherical outside surface bearing and the housing with and spherical bearing seat. Because of this mechanism, deviation of the shaft center caused by warp of the shaft flexion of axis (shaft) or offset is automatically adjusted to eliminate abnormal load onto the bearing, leading to guarantee of original service life of the bearing.

Since the spherical outside surface of the bearing is ground and the spherical bearing seat of the housing is machined by a boring machine with high accuracy, optimal fitting of the bearing and the housing can be obtained, as well as superior aligning performance.

The allowable aligning angle of standard ball bearing unit is 3°, while that of ball bearing unit with cover is 1°.



**Fig. 1.2 Allowable aligning angle of ball bearing unit**

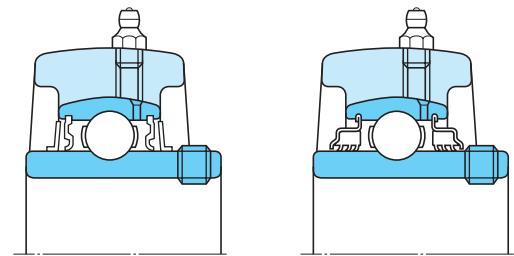
### 3 Superior sealing performance

Koyo Ball Bearing Units can prevent leak of grease in the bearing to the outside, as well as ingress of dusts and water from the outside into the inside of the bearing by the synergetic effect of the oil seal installed to the outer ring of the bearing and the flinger (slinger) installed to the inner ring of the bearing.

The oil seal is made of synthetic rubber featuring supreme oil proof. Its lip contacts with the inner ring of the bearing with optimal tension (radial load of lip).

When using in environments with many dusts or high humidity, the triple-lip seal unit (supplementary code : L3) or the unit with cover (supplementary code : C, CD, FC, FD) is optimal.

The triple-lip seal unit or unit with cover strongly prevents ingress of water and dusts from the outside, and guarantees a longer service life of the bearing.



**Standard type**

**Triple-lip seal type**  
(Supplementary code : L3)

	Pressed steel cover type	Cast iron cover type
Open ends type	 (Supplementary code : C)	 (Supplementary code : C, FC)
Closed end type	 (Supplementary code : CD)	 (Supplementary code : CD, FCD)

**Unit with cover**

**Fig. 1.3 Sealing mechanism of ball bearing unit**

#### 4 Simple greasing

Because of the grease nipple on the housing of Koyo Ball Bearing Unit, fresh grease can be easily supplied to the bearing being operated. If the bearing is used in severe environments that are exposed to many dusts or high humidity or that is high temperature, supply fresh grease at a regular interval. Then, the lubrication status of the bearing is kept to the best, and the service life of the bearing can be extended.

When greasing to the bearing unit with the centralized lubricating system, use the socket for lubricating installed to the grease nipple tapped hole on the housing.

#### 5 Highly rigid and strong housing

Koyo Ball Bearing Unit housing is designed so that it is optimal for reduction of deformation due to centralization of stress and load. After the selection of good material, it is produced by highly advanced casting technique or press working technique.

Since any abnormal load onto the bearing is eliminated by the highly rigid and strong housing, the service life of the bearing can be extended. Baking finish on the surface of the housing keeps good surface status for a long time.

#### 6 Simple installation and handling

Koyo Ball Bearing Units of many types can be installed to any of machine or equipment with some bolts, and can be used in the status as it is. Clearance fit is used for the inner ring of bearing and the shaft, as a rule.

Therefore, Koyo Ball Bearing Unit does not need any work such as filling of lubricant or installation of sealing unit required for standard bearings. As a result, the total of manpower can be drastically reduced.

As for the fixing method of bearing to shaft, three methods, (1) set screw mounted to the cylindrical bore wide inner ring, (2) adapter installed to the tapered bore inner ring, and (3) eccentric locking collar installed to the cylindrical bore wide inner ring are available.

Fixing of bearing to shaft can be executed easily and securely by adopting any of these method.

#### 7 Various types

Koyo Ball Bearing Units are available in various types.

Reliability of machine or equipment used together with the units can be improved by selecting and using bearing units optimal for the purpose and operating conditions.

## 2 Types

### 2.1 Type list

Table 2.1 and Table 2.2 show the types of Koyo Ball Bearing Units and ball bearing for unit.

Koyo Ball Bearing Units are available in various types.

**Table 2.1 Koyo Ball Bearing Units types**

Type	Bearing bore dia. Surface (fixing to shaft)	Type code	Shaft dia.		Dimension table	
			(inch)	(mm)		
1 Pillow block type	(1) Standard	Cylindrical bore (with set screws)	UCP	1/2 – 4	12 – 140	P.72
		Cylindrical bore (with eccentric locking collar)	NAP	1/2 – 2 15/16	12 – 75	P.78
			NAPK	1/2 – 2 15/16	12 – 75	P.80
		Tapered bore (with adapter)	UKP	3/4 – 4 1/2	20 – 125	P.82
	(2) Cast steel type	Cylindrical bore (with set screws)	UCP-SC	7/8 – 4	25 – 140	P.88
		Tapered bore (with adapter)	UKP-SC	3/4 – 4 1/2	20 – 125	P.92
	(3) Thick section type	Cylindrical bore (with set screws)	UCIP	1 1/2 – 4	40 – 140	P.96
		Tapered bore (with adapter)	UKIP	1 1/4 – 4 1/2	35 – 125	P.98
	(4) Tapped-base type	Cylindrical bore (with set screws)	UCPA	1/2 – 2	12 – 50	P.100
(5) Higher centerheight type	Cylindrical bore (with set screws)	UCPH	1/2 – 2	12 – 50	P.102	
(6) Light duty type	Cylindrical bore (with set screws)	BLP	1/2 – 1 9/16	12 – 40	P.104	
	Cylindrical bore (with eccentric locking collar)	ALP				
(7) "Compact" series	Cylindrical bore (with set screws)	UP	N/A	10 – 30	P.106	
(8) Stainless-series	Cylindrical bore (with set screws)	UCSP-H1S6	N/A	20 – 50	P.108	
		UCSPA-H1S6	N/A	20 – 40	P.110	
		USP-S6	N/A	10 – 30	P.112	
(9) Pressed steel type	Cylindrical bore (with set screws)	SBPP	1/2 – 1 1/4	12 – 30	P.114	
	Cylindrical bore (with eccentric locking collar)	SAPP				
2 Square-flanged type	(1) Standard	Cylindrical bore (with set screws)	UCF	1/2 – 4	12 – 140	P.116
		Cylindrical bore (with eccentric locking collar)	UCF-E	1/2 – 3 7/16	12 – 85	P.122
			NANF	1/2 – 2 7/16	12 – 60	P.126
		Tapered bore (with adapter)	UKF	3/4 – 4 1/2	20 – 125	P.128
	(2) With spigot joint	Cylindrical bore (with set screws)	UCFS	1 – 4	25 – 140	P.134
		Tapered bore (with adapter)	UKFS	3/4 – 4 1/2	20 – 125	P.136
(3) Stainless-series	Cylindrical bore (with set screws)	UCSF-H1S6	N/A	20 – 50	P.138	
3 Oval flange type	(1) Rhombic-flanged type	Cylindrical bore (with set screws)	UCFL	1/2 – 4	12 – 130	P.140
			UCFL-E	1/2 – 3 1/4	12 – 85	P.146
		Cylindrical bore (with eccentric locking collar)	NANFL	1/2 – 2 3/16	12 – 55	P.150
		Tapered bore (with adapter)	UKFL	3/4 – 4 1/2	20 – 115	P.152
	(2) Adjustable rhombic-flanged type	Cylindrical bore (with set screws)	UCFA	1/2 – 2 3/16	12 – 55	P.156
	(3) Three-bolt type	Cylindrical bore (with set screws)	UCFB	1/2 – 2	12 – 50	P.158
	(4) Light duty rhombic-flanged type	Cylindrical bore (with set screws)	BLF	1/2 – 1 7/16	12 – 35	P.160
Cylindrical bore (with eccentric locking collar)		ALF				
(5) "Compact" series rhombic-flanged type	Cylindrical bore (with set screws)	UFL	N/A	8 – 30	P.162	
	(6) Stainless-series rhombic-flanged type	Cylindrical bore (with set screws)	UCSFL-H1S6	N/A	20 – 50	P.164
		USFL-S6	N/A	10 – 30	P.166	
4 Round-flanged type with spigot joint	Cylindrical bore (with set screws)	UCFC	1/2 – 4	12 – 100	P.168	
		UCFCX-E	1 – 4	25 – 100	P.172	
		UKFC	3/4 – 3 1/2	20 – 90	P.174	
5 Pressed steel flange type	(1) Round-flanged type	Cylindrical bore (with set screws)	SBPF	1/2 – 1 7/16	12 – 35	P.178
		Cylindrical bore (with eccentric locking collar)	SAPF			
	(2) Rhombic-flanged type	Cylindrical bore (with set screws)	SBPFL	1/2 – 1 7/16	12 – 35	P.180
		Cylindrical bore (with eccentric locking collar)	SAPFL			

**Table 2.1 Koyo Ball Bearing Units types (continued)**

Type	Bearing bore dia. Surface (fixing to shaft)	Type code	Shaft dia.		Dimension table	
			(inch)	(mm)		
6 Take-up type	(1) Standard	Cylindrical bore (with set screws)	UCT	$\frac{1}{2} - 4$	12 - 140	P.182
		Tapered bore (with adapter)	UCT-E UKT	$\frac{1}{2} - 3 \frac{7}{16}$ $\frac{3}{4} - 4 \frac{1}{2}$	12 - 85 20 - 125	P.188 P.192
	(2) Stainless-series	Cylindrical bore (with set screws)	UCST-H1S6	N/A	20 - 50	P.198
	(3) Section steel frame type	Cylindrical bore (with set screws)	UCTH	$\frac{1}{2} - 2 \frac{1}{2}$	12 - 65	P.200
	(4) Channel steel frame type	Cylindrical bore (with set screws)	UCTL UCTU	N/A N/A	20 - 45 40 - 90	P.202 P.204
(5) Pressed steel frame type	Cylindrical bore (with set screws)	SBPTH	N/A	12 - 25	P.208	
		SBNPTH	N/A	12 - 25	P.210	
7 Cartridge type	Cylindrical bore (with set screws) Tapered bore (with adapter)	UCC	$\frac{1}{2} - 4$	12 - 140	P.212	
		UKC	$\frac{3}{4} - 4 \frac{1}{2}$	20 - 125	P.216	
8 Hanger type	Cylindrical bore (with set screws)	UCHA	$\frac{1}{2} - 3$	12 - 75	P.218	

**Table 2.2 Types of ball bearing for Koyo Ball Bearing Unit**

Type	Bearing bore dia. Surface (fixing to shaft)	Type code	Shaft dia.		Dimension table	
			(inch)	(mm)		
Ball bearing for units	(1) Standard	Cylindrical bore (with set screws)	UC	$\frac{1}{2} - 4$	12 - 140	P.220
	(2) Standard	Tapered bore (with adapter)	UK	$\frac{3}{4} - 4 \frac{1}{2}$	20 - 125	P.228
	(3) Standard	Cylindrical bore (with eccentric locking collar)	NA	$\frac{1}{2} - 3$	12 - 75	P.234
	(4) Light duty	Cylindrical bore (with set screws)	SB	$\frac{1}{2} - 1 \frac{1}{2}$	12 - 40	P.220
	(5) Light duty	Cylindrical bore (with eccentric locking collar)	SA	$\frac{1}{2} - 1 \frac{9}{16}$	12 - 40	P.234
			SA-F	$\frac{1}{2} - 2 \frac{3}{16}$	12 - 55	
	(6) "Compact"	Cylindrical bore (with set screws)	SU	N/A	8 - 30	P.220
	(7) Stainless steel	Cylindrical bore (with set screws)	UC-S6	N/A	20 - 50	P.226
			SU-S6	N/A	10 - 30	
	(8) Cylindrical outside surface (with lubricating mechanism and snap ring)	Cylindrical bore (with set screws)	ER	$\frac{1}{2} - 2 \frac{7}{16}$	12 - 60	P.238
(9) Cylindrical outside surface	Cylindrical bore (with set screws)	RB	$\frac{1}{2} - 1 \frac{9}{16}$	12 - 40	P.238	
(10) Adapter assembly		H300X	$\frac{3}{4} - 3$	20 - 80	P.240	
		H2300X	$\frac{3}{4} - 4 \frac{1}{2}$	20 - 125		

2.2 Types and features

Koyo Ball Bearing Units are available in various types by combinations of bearings and housings.

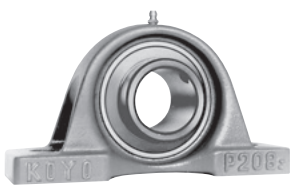
Types and features of the Ball Bearing Units are shown below.

1 Pillow block type units

1 Pillow block type units

Remark) Descriptions of codes for unit with cover are shown in the table below. (common to all the types)

Diameter series	Code	Descriptions
2	C, CD	Pressed steel cover type
	FC, FCD	Cast iron cover type
X	C, CD	From X05 to X17 : pressed steel cover type X18 and X20 : cast iron cover type
	C, CD	Cast iron cover type



UCP



UKP

Cylindrical bore (with set screws)...Bearing **UC2 (X, 3)** series are used.

**UCP2 (X, 3)** : Standard type, **L3** : Triple-lip seal type, **C, CD (FC, FCD)** : Pressed steel cover type or cast iron cover type

**UCP2 (3) SC** : Cast steel housing, **L3** : Triple-lip seal type, **C, CD (FC, FCD)** : Cast iron cover type

Cylindrical bore (with eccentric locking collar) ...Bearing **NA2** series are used.

**NAP2, NAPK2** : Standard type, **L3** : Triple-lip seal type

Tapered bore (with adapter)...Bearing **UK2 (X, 3)** series are used.

**UKP2 (X, 3)** : Standard type, **L3** : Triple-lip seal type, **C, CD (FC, FCD)** : Pressed steel cover type or cast iron cover type

**UKP2 (3) SC** : Cast steel housing, **L3** : Triple-lip seal type, **C, CD (FC, FCD)** : Cast iron cover type

NAP

NAPK

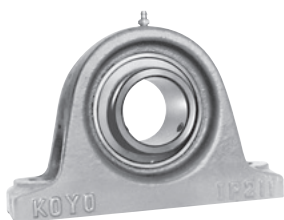
This is the most typical type ball bearing unit. The rib at the bottom of the housing mounting section allows the highly strong structure which withstands against loads applied from all the directions.

The bearing units (UCPsc, UKPsc) with cast steel housings are also available in series, and are used for purposes with severe load conditions.

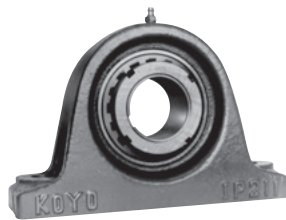
The housing can be installed to a machine with two bolts. As for the tapered bore (UKP) type, nominal number of adapter assembly which follows the nominal number of unit should be added.

Applications : Transmission devices, general industrial equipment

2 Thick section pillow block type units



UCIP



UKIP

Cylindrical bore (with set screws)...Bearing **UC2 (3)** series are used.

**UCIP2 (3)** : Standard type, **L3** : Triple-lip seal type, **C, CD (FC, FCD)** : Pressed steel cover type or cast iron cover type

Tapered bore (with adapter)...Bearing **UK2 (3)** series are used.

**UKIP2 (3)** : Standard type, **L3** : Triple-lip seal type, **C, CD (FC, FCD)** : Pressed steel cover type or cast iron cover type

This pillow block type unit is applicable for use with a great load. The thick and highly rigid housing is suitable to environment exposed to a great load, vibration, and impact. The mounting bolt holes are drilled, and the housing can be installed to the exact location with two bolts.

Applications : Crane, heavy object conveyor, quarrying plant, ships



### 3 Tapped-base pillow block type unit



UCPA

Cylindrical bore (with set screws)...Bearing **UC2** series are used.  
**UCPA2** : Standard type, **L3** : Triple-lip seal type

This pillow block type unit is designed so that the mounting space is reduced. It is installed to machines with the two tapped holes on the housing mounting bottom.

Applications : Roller conveyor, purpose with small mounting space

### 4 Higher centerheight pillow block type unit



UCPH

Cylindrical bore (with set screws)...Bearing **UC2** series are used.  
**UCPH2** : Standard type, **L3** : Triple-lip seal type

This unit, designed as the higher centerheight pillow block type unit, has high strength against impact load. It is suitable for the machine that the distance from the mounting bottom to the shaft center is long. The housing can be installed to machines with two bolts.

Applications : Printing machine, spinneret

### 5 Light duty pillow block type unit



BLP

ALP

Cylindrical bore (with set screws)...Bearing **SB2** series are used.  
**BLP2**

Cylindrical bore (with eccentric locking collar)

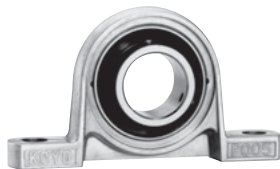
...Bearing **SA2** series are used.

**ALP2**

This pillow block type unit is designed for the aim of lightweight. The housing can be installed to machines with two bolts.

Applications : Machinery for general purposes aiming at lightweight

### 6 "Compact" series pillow block type unit



UP

Cylindrical bore (with set screws)...Bearing **SU0** series are used.  
**UP0**

**C, CD** : Rubber coating cover type

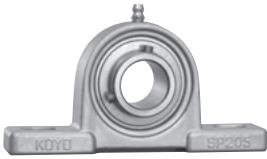
The small and lightweight pillow block type unit, comprising the ball bearing for unit for light load and the special lightweight alloy housing, needs not to be lubricated additionally.

The housing can be installed to machines with two bolts.  
 Applications : Machineries for light load

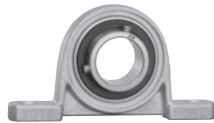
## 2 Types

### (1 Pillow block type units)

#### 7 Stainless-series pillow block type units



UCSP-H1S6



USP-S6

UCSPA-H1S6

Cylindrical bore (with set screws)  
Standard... Bearing **UC2-S6** series are used.

#### UCSP2-H1S6

**C, CD** : Pressed stainless steel cover type

Tapped base... Bearing **UC2-S6** series are used.

#### UCSPA-H1S6

**C, CD** : Pressed stainless steel cover type

Compact... Bearing **SU0-S6** series are used.

#### USP0-S6

**C, CD** : Pressed stainless steel cover type

This superior anticorrosion pillow block type unit comprises the bearing and housing made of stainless steel. The unit is thinner than standard UCP series units, leading to downsizing of machinery. The housing can be installed to machines with two bolts.

Applications : Food machinery, agricultural machinery

#### 8 Pressed steel pillow block type unit



SBPP

SAPP

Cylindrical bore (with set screws)... Bearing **SB2** series are used.  
**SBPP2**

Cylindrical bore (with eccentric locking collar)

... Bearing **SA2** series are used.

#### SAPP2

This lightweight pillow block type unit for light load comprises the ball bearing for lightweight unit and the pressed steel plate housing.

The housing can be installed to machines with two bolts.

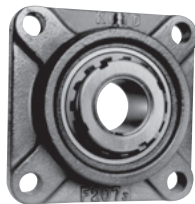
Applications : Light duty conveyor, environment exposed to light load and low speed rotation

### 2 Square-flanged type units

#### 1 Square-flanged type units



UCF, UCF-E



UKF

Cylindrical bore (with set screws)... Bearing **UC2 (X, 3)** series are used.

**UCF2 (X, 3)** : Standard type, **L3** : Triple-lip seal type,

**C, D (FC, FD)** : Pressed steel cover type or cast iron cover type

**UCF2 (X) -E** : Standard type, **L3** : Triple-lip seal type

Cylindrical bore (with eccentric locking collar)

... Bearing **NA2** series are used.

**NANF2** : Standard type, **L3** : Triple-lip seal type

Tapered bore (with adapter)... Bearing **UK2 (X, 3)** series are used.

**UKF2 (X, 3)** : Standard type, **L3** : Triple-lip seal type,

**C, D (FC, FD)** : Pressed steel cover type or cast iron cover type

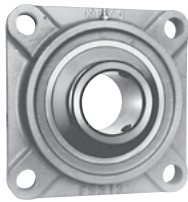
NANF

This bearing unit comprises the ball bearing for unit and the housing with square flange. It is suitable to use on a vertical surface, such as the side of machinery.

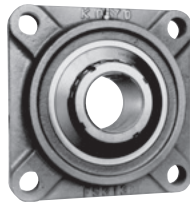
The housing can be installed to machines with four bolts.



## 2 Square-flanged types with spigot joint



UCFS



UKFS

Cylindrical bore (with set screws)...Bearing **UC3** series are used.

**UCFS3** : Standard type, **L3** : Triple-lip seal type,  
**C, D** : Cast iron cover type

Tapered bore (with adapter)...Bearing **UK3** series are used.

**UKFS3** : Standard type, **L3** : Triple-lip seal type,  
**C, D** : Cast iron cover type

This bearing unit comprises the ball bearing for unit, square flange, and the housing with spigot joint on the mounting surface. The housing can be installed to a machine by fitting the spigot joint into the mounting hole of it, and using four bolts.

The housing can be installed to the exact location by fitting the spigot joint into the mounting hole.

Applications : Rotating drum, rotating roller, purposes excellent mounting accuracy is required

## 3 Stainless-series square-flanged type unit

Cylindrical bore (with set screws)...Bearing **UC2-S6** series are used.

**UCSF2-H1S6**

**C, D** : Pressed stainless steel cover type

UCSF-H1S6

In this superior waterproof and anticorrosion square-flanged type unit, bearing and housing are made of stainless steel. The unit is thinner than standard UCF series units, leading to downsizing of machinery. The housing can be installed to machines with four bolts.

Applications : Food machinery, agricultural machinery

## 3 Oval flange type units

### 1 Rhombic-flanged type units



UCFL, UCFL-E



UKFL

Cylindrical bore (with set screws)...Bearing **UC2 (X, 3)** series are used.

**UCFL2 (X, 3)** : Standard type, **L3** : Triple-lip seal type,  
**C, D (FC, FD)** : Pressed steel cover type or cast iron cover type

**UCFL2 (X) -E** : Standard type, **L3** : Triple-lip seal type,

Cylindrical bore (with eccentric locking collar)

...Bearing **NA2** series are used.

**NANFL2** : Standard type, **L3** : Triple-lip seal type

Tapered bore (with adapter)...Bearing **UK2 (X, 3)** series are used.

**UKFL2 (X, 3)** : Standard type, **L3** : Triple-lip seal type,  
**C, D (FC, FD)** : Pressed steel cover type or cast iron cover type

NANFL

This bearing unit comprises the ball bearing for unit and the housing with rhombic flange. It is suitable to use on a vertical surface, such as the side of machinery. Compared to the square-flanged type unit, it requires less mounting space, and the unit weight is also reduced.

Since the pitches of the center of two mounting bolt holes on the rhombic-flanged type housing are the same as those of the center of bolt holes located opposite each other on the square-flanged housing, they are compatible.

The housing can be installed to machines with two bolts.  
Applications : Roller conveyor, environment the mounting dimensions are small

(3 Oval flange type units)

2 Adjustable rhombic-flanged type unit



UCFA

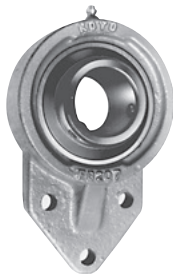
Cylindrical bore (with set screws)...Bearing **UC2** series are used.  
**UCFA2** : Standard type, **L3** : Triple-lip seal type

This rhombic-flanged type unit allows angle adjustment with a supporting point as the shaft center. Therefore, when the bearing unit is installed, fine adjustment of supporting location for the shaft center is enabled.

Since the pitches of the center of mounting bolt holes on the housing are the same as those of the square-flanged type unit and rhombic-flanged type unit, they are compatible.

The housing can be installed to machines with two bolts.

3 Three-bolt flange type unit



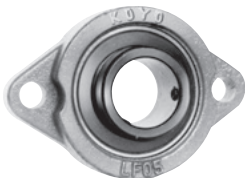
UCFB

Cylindrical bore (with set screws)...Bearing **UC2** series are used.  
**UCFB2** : Standard type, **L3** : Triple-lip seal type,

The housing of this unit has the one-side oval flange, and the unit is suitable to use on a vertical surface and in a limited space, such as the side of machinery.

The housing can be installed to machines with three bolts.

4 Light duty rhombic-flanged type units



BLF

ALF

Cylindrical bore (with set screws)...Bearing **SB2** series are used.  
**BLF2**

Cylindrical bore (with eccentric locking collar)

...Bearing **SA2** series are used.

**ALF2**

This rhombic-flanged type unit is designed for the aim of lightweight. The housing can be installed to machines with two bolts.

5 "Compact" series rhombic-flanged type unit



UFL

Cylindrical bore (with set screws)...Bearing **SU0** series are used.  
**UFL0**

**C, D** : Rubber coating cover type

The small and lightweight rhombic-flanged type unit, comprising the ball bearing for unit for light load and the special lightweight alloy housing, needs not to be lubricated additionally.

The housing can be installed to machines with two bolts.

Applications : Machineries for light load

## 6 Stainless-series rhombic-flanged type units



UCSFL-H1S6



USFL-S6

Cylindrical bore (with set screws)

Standard... Bearing **UC2X (2) -S6** series are used.

**UCSFL2X (2) -H1S6**

**C, D** : Pressed stainless steel cover type

Compact... Bearing **SU0-S6** series are used.

**USFL0-S6**

**C, D** : Rubber coating cover type

This superior anticorrosion rhombic-flanged type unit comprises the bearing and housing made of stainless steel. The unit is thinner than standard UCFL series units, leading to downsizing of machinery.

The housing can be installed to machines with two bolts.

Applications : Food machinery, agricultural machinery

## 4 Round-flanged types with spigot joint

### Round-flanged types with spigot joint



UCFC, UCFC-E



UKFC

Cylindrical bore (with set screws)... Bearing **UC2 (X)** series are used.

**UCFC2 (X)** : Standard type, **L3** : Triple-lip seal type,

**C, D (FC, FD)** : Pressed steel cover or cast iron cover type

**UCFCX-E** : Standard type, **L3** : Triple-lip seal type

Tapered bore (with adapter)... Bearing **UK2 (X)** series are used.

**UKFC2(X)** : Standard type, **L3** : Triple-lip seal type,

**C, D (FC, FD)** : Pressed steel cover or cast iron cover type

This bearing unit comprises the ball bearing for unit, round flange, and the housing with spigot joint on the mounting surface. The housing can be installed to machines by fitting the spigot joint into the mounting hole of machinery, and using four bolts.

The housing can be installed to the exact location by fitting the spigot joint into the mounting hole.

Applications : Rotating drum, rotating roller, purposes excellent mounting accuracy is required.

## 5 Pressed steel flange type units

### 1 Pressed steel round-flanged type units



SBPF

SAPF

Cylindrical bore (with set screws)... Bearing **SB2** series are used.

**SBPF2**

Cylindrical bore (with eccentric locking collar)

... Bearing **SA2** series are used.

**SAPF2**

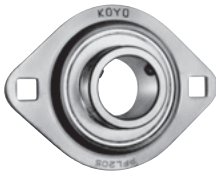
This lightweight round-flanged type unit for light load comprises the ball bearing for lightweight unit and the pressed steel plate housing.

The housing can be installed to machines with three bolts.

Applications : Light duty conveyor, environment exposed to light load and low speed rotation

(5 Pressed steel flange type units)

2 Pressed steel rhombic-flanged type units



SBPFL

SAPFL

Cylindrical bore (with set screws)...Bearing **SB2** series are used.  
**SBPFL2**

Cylindrical bore (with eccentric locking collar)  
...Bearing **SA2** series are used.

**SAPFL2**

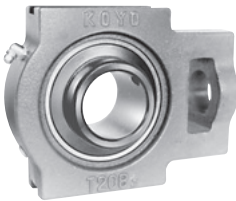
This lightweight rhombic-flanged type unit for light load comprises the ball bearing for lightweight unit and the pressed steel plate housing. Compared to the pressed steel round-flanged type unit, less mounting space is required.

The housing can be installed to machines with two bolts.

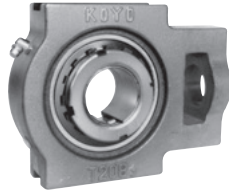
Applications : Light duty conveyor, environment exposed to light load and low speed rotation

6 Take-up type units

1 Take-up type units



UCT, UCT-E



UKT

Cylindrical bore (with set screws)...Bearing **UC2 (X, 3)** series are used.

**UCT2 (X, 3)** : Standard type, **L3** : Triple-lip seal type,  
**C, CD (FC, FCD)** : Pressed steel cover or cast iron cover type

**UCT2 (X) -E** : Standard type, **L3** : Triple-lip seal type

Tapered bore (with adapter)...Bearing **UK2 (X, 3)** series are used.

**UKT2(X, 3)** : Standard type, **L3** : Triple-lip seal type,  
**C, CD (FC, FCD)** : Pressed steel cover or cast iron cover type

The bearing unit comprises the ball bearing for unit and the housing with slide groove. This unit allows angle adjustment with a supporting point of the shaft center by moving the housing in radial direction along the slide groove.

Applications : Belt conveyor, use the supporting point of the shaft center must be adjusted

2 Stainless-series take-up type unit

Cylindrical bore (with set screws)...bearing **UC2-S6** series are used.

**UCT2-H1S6**

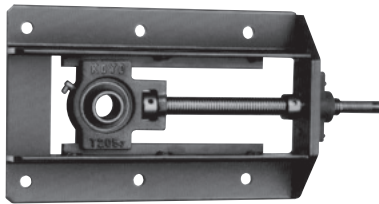
**C, CD** : Pressed stainless steel cover type

This superior anticorrosion take-up type unit comprises the bearing and the housing made of stainless steel. The unit is thinner than standard UCT series units, leading to downsizing of machinery.

Applications : Conveyor of food machinery, agricultural machinery

UCST-H1S6

### 3 Section steel frame take-up type unit



**UCTH**

Cylindrical bore (with set screws)...Bearing **UC2** series are used.

**UCTH2** : Standard type, **L3** : Triple-lip seal type,

**C, CD (FC, FCD)** : Pressed steel or cast iron cover type

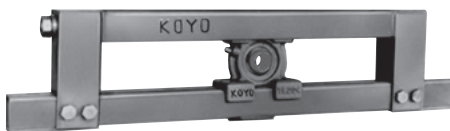
This unit comprises the take-up type unit, the section steel frame, adjuster bolt, and so on.

This unit allows adjustment of the supporting point of the shaft center by moving the housing in radial direction with the adjuster bolt on the unit.

The housing can be installed to machines with six bolts.

Applications : Belt conveyor, use the supporting point of the shaft center must be adjusted

### 4 Channel steel frame take-up type unit



**UCTL**

Cylindrical bore (with set screws)...Bearing **UC2 (3)** series are used.

**UCTL2** : Standard type, **L3** : Triple-lip seal type,

**C, CD (FC, FCD)** : Pressed steel cover or cast iron cover type

**UCTU2 (3)** : Standard type, **L3** : Triple-lip seal type,

**C, CD (FC, FCD)** : Pressed steel cover or cast iron cover type

This unit comprises the take-up type unit, the channel steel frame, adjuster bolt, and so on. This unit allows adjustment of the supporting point of the shaft center by moving the housing in radial direction with the adjuster bolt in the frame.

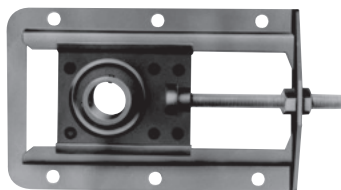
Since this unit is installed with the frame stood, the mounting space is reduced.

The TL lightweight type unit is made of light channel steel, and the TU highly rigid type unit is made of channel steel. The housing can be installed to machines with two or four bolts.

Tapered bore (with adapter) unit is also available (examples of nominal number : UKTL 207J-100, UKTU208J-500).

Applications : Belt conveyor, use the supporting point of the shaft center must be adjusted

### 5 Pressed steel frame take-up type unit



**SBPTH**

Cylindrical bore (with set screws)...Bearing **SB2** series are used.

**SBPTH2**

**SBNPTH2**

This unit comprises the pressed steel take-up type unit, the pressed steel frame, adjuster bolt, and so on. This unit allows adjustment of the supporting point of the shaft center by moving the housing in radial direction with the adjuster bolt in the frame.

Since the housing and the frame are made of pressed steel, the unit is compact and lightweight. The housing can be installed to machines with four or six bolts.

Applications : Small belt conveyor for lightload, use the supporting point of the shaft center must be adjusted

7 Other units

1 Cartridge type units



UCC



UKC

Cylindrical bore (with set screws)... Bearing **UC2 (X, 3)** series are used.

**UC2 (X, 3)** : Standard type, **L3** : Triple-lip seal type

Tapered bore (with adapter)... Bearing **UK2 (X, 3)** series are used.

**UK2 (X, 3)** : Standard type, **L3** : Triple-lip seal type

This unit comprises the ball bearing for unit and the housing with the cylindrical outside surface. The housing, having the grounded cylindrical outer surface, can be fit to the cylindrical bore of a machine.

The cartridge type unit, moving in axial direction, is used as the bearing for free side when a shaft is expanded or contracted.

The cylindrical outside surface and the automatic aligning mechanism allow handling similar to standard automatic aligning type bearing.

2 Hanger type unit



UCHA

Cylindrical bore (with set screws)... Bearing **UC2** series are used.

**UCHA2** : Standard type, **L3** : Triple-lip seal type

The bearing unit comprises the ball bearing for unit and the housing with parallel thread for pipe on one side. The compact housing is installed to machinery with suspended with steel pipe.

Applications : Intermediate bearing of screw conveyor

8 Ball bearings for units

1 UC type bearing



UC

Cylindrical bore (with set screws)

**UC2 (X, 3)**...Standard type

**UC2 (X, 3) L3**...Triple-lip seal type

**UC2-S6**...Stainless steel series

This grease sealed type deep groove ball bearing incorporates the outer ring with the spherical outside surface and lubricating mechanism and wide inner ring with cylindrical bore set screw. Two types, standard type (oil seal and flinger are included) and triple-lip seal type (supplementary code : L3), are available, depending on the type of sealing device.

It can be fixed to shaft with two set screws on the inner ring. It is the most typical type in ball bearings for unit.

The UC2-S6 series are superior waterproof and anticorrosive ball bearings for unit. The bearing is made of stainless steel, and the series are used for stainless-series units.

As for the types and features of set screw for UC type bearing, see "14 Handling".



## 2 UK type bearing



UK

Tapered bore (with adapter)

**UK2 (X, 3)**...Standard type

**UK2 (3) L3**...Triple-lip seal type

This grease sealed type deep groove ball bearing incorporates the outer ring with the spherical outside surface and lubricating mechanism and wide inner ring with tapered bore. Two types, standard type (oil seal and flinger are included) and triple-lip seal type (supplementary code : L3), are available, depending on the type of sealing device.

It can be fixed to shaft with the adapter. The UK type bearing (with adapter) is optimal for use of long shaft.

As for the UK type bearing, applicable adapter assembly number should be added to the bearing number.

## 3 NA type ball bearing



NA

Cylindrical bore (with eccentric locking collar)

**NA2**

This type is based on the UC type bearing having set screw, but equipped with the eccentric locking collar. The grease sealed type deep groove ball bearing incorporates the spherical outside surface outer ring with lubricating mechanism and the cylindrical bore, wide inner ring, and eccentric locking collar with eccentric section on one side. The sealing device is equipped with the oil seal and flinger.

When fixing the bearing to shaft, fit the eccentric recessed section of the eccentric locking collar to the eccentric section of the inner ring, turn the eccentric locking collar to fix it to shaft, and tighten the set screw of the eccentric locking collar to shaft.

## 4 SB type bearing



SB

Cylindrical bore (with set screws)

**SB2**

This is the lightweight UC type bearing. The non-lubricating type grease sealed deep groove ball bearing incorporates the spherical outside surface outer ring and the wide inner ring with cylindrical bore set screw. When fixing it to shaft, use the two set screws on the inner ring.

It is used for lightweight unit or pressed steel unit.

## 5 SA type bearing



SA

SA-F

Cylindrical bore (with eccentric locking collar)

**SA2, SA2-F**

This type is based on the SB type bearing having set screw, but equipped with the eccentric locking collar. The non-lubricating type grease sealed type deep groove ball bearing incorporates the spherical outside surface outer ring and the cylindrical bore, wide inner ring, and eccentric locking collar with eccentric section on one side.

When fixing the bearing to shaft, fit the eccentric recessed section of the eccentric locking collar to the eccentric section of the inner ring, turn the eccentric locking collar to fix it to shaft, and tighten the set screw of the eccentric locking collar to shaft.

(SA-F type bearing has lubricating mechanism on outer ring.)

It is used for lightweight unit or pressed steel unit.

### (8 Ball bearing for units)

#### 6 SU type bearing (“compact” series)



SU

Cylindrical bore (with set screws)

**SU0...**Standard type

**SU0-S6...**Stainless steel

The bearing series intended for light load is suitable for downsizing and weight saving.

The non-lubricating type grease sealed deep groove ball bearing incorporates the spherical outside surface outer ring and the wide inner ring with cylindrical bore set screw. When fixing it to shaft, use the two set screws on the inner ring.

The SU0-S6 type bearing for unit, made of stainless steel, is superior in corrosion resistance, and used for stainless-series units.

#### 7 ER type bearing



ER

Cylindrical bore (with set screws), cylindrical outside surface, lubricating mechanism, locating snap ring and snap ring groove

**ER2**

The grease sealed type deep groove ball bearing incorporates the spherical outside surface with lubricating mechanism and set screw, the wide inner ring with cylindrical bore set screw. When fixing it to shaft, use the two set screws on the inner ring.

It features lubricating mechanism, set screw (easy to locate bearing), clearance fit of inner ring and shaft (easy to install). Therefore, it can be used for various purposes in a similar way to standard bearings.

#### 8 RB type bearing



RB

Cylindrical bore (with set screws), cylindrical outside surface

**RB2**

This bearing is based on the ER type bearing, but without the lubricating mechanism and locating snap ring and snap ring groove. The grease sealed deep groove ball bearing incorporates the spherical outside surface outer ring and the wide inner ring with cylindrical bore set screw. When fixing it to shaft, use the two set screws on the inner ring.

Since clearance fit may be used for installation of the inner ring to shaft (easy to install), it can be used for various purposes in a similar way to standard bearings.



## 2.3 Unit for special use

To meet with requests for varied and special purposes, JTEKT supplies ball bearing series for special use with various features, as well as standard types. If you use ball bearing units under special environment or conditions, select optimal type among ball bearing units for special use.

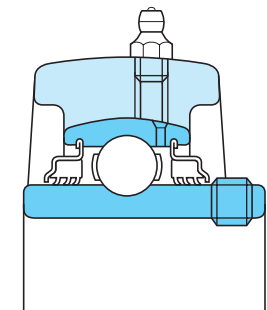
JTEKT produces bearing units in various forms and specifications, other than units for special use. Contact JTEKT, if you need them.

### 1 Triple-lip seal unit (supplementary code : L3)

Triple-lip seal has the structure in which the triple-lip oil seal is glued to the pressed steel shield plate with vulcanized adhesive. The triple-lip eliminates ingress of dusts and mud water into bearing to ensure long service life of the bearing even under severe environmental conditions.

Since the triple-lip seal is fit to the outer ring of the bearing, the triple-lip seal bearing unit can be handled in the same manner as the standard types. The triple-lip seal unit does not lead to uneven contact of the shaft with seal while the bearing is aligned unlike the unit with cover, and maintains stable sealing performance for a long time.

The triple-lip seal unit is the outstanding product that defects of conventional dust and water preventive unit are improved to realize energy-saving and low cost. The triple-lip seal is applicable to the UC type bearing and the UK type bearing.

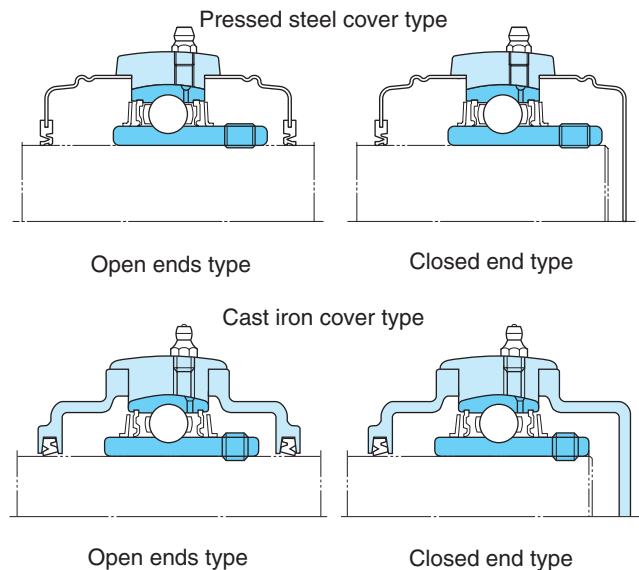


**Fig. 2.1 Structure of triple-lip seal unit**

### 2 Unit with cover (supplementary code : C, D, FC, FD)

The unit with cover is equipped with the standard type housing and the pressed steel cover or cast iron cover, and features the double sealing structure of bearing and housing. The unit ensures a long service life of bearing even under severe environmental conditions such as dusts and mud water.

The unit with cover is available in two types : open ends type C type, FC type, closed end type D type, and FD type (for pillow block type unit, CD type or FCD type).



**Fig. 2.2 Type and structure of unit with cover**

### 3 Heat resistant unit (special code : D1K2) and Cold resistant unit (special code : D2K2)

The operating temperature range of a ball bearing unit depends on the performance of grease and oil seal (rubber) used for the bearing. The operating temperature range of Koyo Ball Bearing unit (standard type) ranges from  $-20^{\circ}\text{C}$  to  $100^{\circ}\text{C}$ .

If you use bearing units in the higher or lower temperature range beyond the operating temperature range of standard type, select the heat resistant (special code : D1K2) or the cold resistant unit (special code : D2K2).

Specifications of the heat resistant unit and the cold resistant unit are shown in **Table 2.3**.

**Table 2.3 Specifications of heat resistant unit and cold resistant unit**

Category	Special code	Operating temperature range ( $^{\circ}\text{C}$ )	Grease	Oil seal rubber material	Bearing internal clearance	
					UC type	UK type
Standard	(no code)	$-20$ to $100$	Alvania No. 2 or equivalence (lithium soap)	Nitrile	CN	C3
Heat resistant	D1K2	$-40$ to $180$	SH44M (lithium soap)	Silicone	C4	C5
Cold resistant	D2K2	$-50$ to $120$	SH33M (lithium soap)	Silicone	CN	C3

### 4 High speed unit (special code : K3)

The high speed unit (special code : K3) is the product that has been developed for intention of high speed and less heat. For the high speed unit bearing, the non-contact type oil seal optimal for high speed rotation and low torque is used.

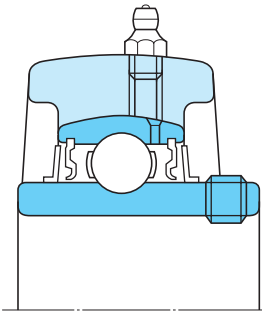
This unit is intended for the purposes high speed rotation, low torque, and less heat are required, such as textile machinery and printing machinery.

### 5 Unit for blower (special code : S5)

The ball bearing unit for blower must meet requests for high speed rotation, less heat, less vibration, and low noise.

To meet with these requests for performance, JTEKT supplies the series of unit for blower (special code : S5) that the non-contact type oil seal is used, as well as improves the machining accuracy.

This unit is intended for the purposes high speed rotation, less heat, less vibration, low noise are required, such as a blower.



**Fig. 2.3 Structure of bearing unit for blower**

### 6 “Compact” series unit

For downsizing of machinery in facilities, the set screw method facilitating installation of the shaft is adopted for this unit.

The unit comprises the compact bearing and the special alloy housing.

Since the cover surface is coated with rubber, it contacts close with the housing well, and features superior dustproof and waterproof performance.

Operating temperature range : Standard temperature

### 7 Stainless-series unit (special code : S6)

The ball bearing units used for food machinery need waterproof performance.

For this purpose, JTEKT has released a series of Ball Bearing units of which bearings and housings are made of stainless steel in order to satisfy the required performance.

We can also provide bearing units packing grease applicable to use related to food certified by USDA (US Agriculture Department) H1.

Operating temperature range : From  $-20\text{ }^{\circ}\text{C}$  to  $+100\text{ }^{\circ}\text{C}$

\* If you use this unit for machines splashed with water or in the environment that the operating temperature exceeds  $50\text{ }^{\circ}\text{C}$ , it is recommended you use UC-S6 to be able to be lubricated for SU-S6.

### 3 Selection of unit

#### 3.1 Outline of selection

Koyo Ball Bearing Units are available in various types and series. Therefore, to select the bearing unit optimal for design of machinery, various factors including the structure of machinery, operating conditions, performance required

for bearing unit, specifications relative to the unit, marketability, and economic efficiency, must be comprehensively taken into consideration. Service life of the bearing greatly depends on the quality of selection.

Procedures of selection of standard ball bearing units are shown in **Table 3.1**.

**Table 3.1 Procedures of selection of standard ball bearing units**

Procedures of selection	Items to be examined	Operating conditions to be considered	Reference
<b>1 Selection of type</b>	<ul style="list-style-type: none"> <li>· Pillow block type</li> <li>· Flange type</li> <li>· Take-up type</li> <li>· Cartridge type</li> <li>· Hanger type</li> </ul>	Structure of machinery, mounting space, mounting dimensions	2 Types (P.10)
<b>2 Selection of shaft dia. and dia. series</b>	<ul style="list-style-type: none"> <li>· Bearing bore dia. : From 10 to 140 mm</li> <li>· Dia. series : 0, 2, X, 3</li> </ul>	Rating life of bearings required, load applied to bearings, rotational speed	4 Life of bearing (P.28) 5 Bearing load (P.31) 6 Allowable rotational speed (P.38)
<b>3 Selection against atmosphere</b>	<ul style="list-style-type: none"> <li>· L3 type</li> <li>· Cover type</li> <li>· Stainless steel series</li> <li>· For high speed use</li> <li>· For blower</li> </ul>	Environment (dusts, mud water, high humidity, chemicals), rotational speed	2 Types (P.10) (P.23) 6 Allowable rotational speed (P.38)
<b>4 Selection against temperature</b>	<ul style="list-style-type: none"> <li>· Heat resistant type</li> <li>· Cold resistant type</li> <li>· Measures against expansion and contraction of shaft</li> <li>· Grease supply</li> </ul>	Bearing temperature	2 Types (P.10) (P.23) 7 Operating temperature and bearing specifications (P.39) 9 Design of shaft and base (P.45) 14 Handling (P.61)
<b>5 Selection of installing to shaft</b>	<ul style="list-style-type: none"> <li>· Set screw</li> <li>· Adapter</li> <li>· Eccentric locking collar</li> </ul>	Rotational speed, load conditions, handling	2 Types (P.10) 14 Handling (P.61)
<b>6 Selection of shafts</b>	<ul style="list-style-type: none"> <li>· Dimensional tolerance</li> <li>· Adoption of shouldered shaft</li> <li>· Provision of set screw for shaft</li> <li>· Measures against expansion and contraction of shaft</li> </ul>	Rotational speed, load conditions, bearing temperature	2 Types (P.10) (P.23) 6 Allowable rotational speed (P.38) 9 Design of shaft and base (P.45) 14 Handling (P.61)
<b>7 Selection of strength of housings</b>	<ul style="list-style-type: none"> <li>· Cast iron</li> <li>· Cast steel</li> <li>· Pressed steel</li> </ul>	Load conditions, load directions, presence of impact	8 Strength of housing (P.40)
<b>8 Selection of lubrication</b>	<ul style="list-style-type: none"> <li>· Lubricating type</li> <li>· Non-lubricating type</li> <li>· Centralized lubricating type</li> <li>· Greasing interval</li> </ul>	Environment, importance of machine, bearing temperature, grease life	14 Handling (P.61)
<b>9 Selection of maintenance and check</b>	<ul style="list-style-type: none"> <li>· Periodic inspection</li> <li>· Grease supply</li> </ul>	Environment, importance of machine, bearing temperature, grease life	14 Handling (P.61)

### 3 Selection of unit

#### 3.2 Selection of type and specifications

Koyo Ball Bearing Units series are available in various types and specifications applicable to your purposes. Therefore, when selecting types and specifications of

bearing unit, structure of machine, operating conditions, and environment must be fully taken into consideration for comprehensive examination.

Outline of selection of ball bearing unit types and specifications are shown in **Table 3.2**.

**Table 3.2 (1) Outline of selection of ball bearing unit types and specifications**

○ : Acceptable or Yes, × : Unacceptable or No

Category	Performance required		Bearing specifications			Applicable housing
	Operating conditions	Fixing to shaft	Sealing structure	Type code	Lubrication	
Bearing	Standard	Set screw Adapter	Oil seal and flinger	UC UK	○	C, F, FA, FB, FC, FL, FS, HA, IP, P, PA, PH, T, TH, TL, TU
		Eccentric locking collar		NA		
	Dustproof and waterproof	Set screw Adapter	Triple-lip seal	UC-L3 UK-L3	○	C, F, FA, FB, FC, FL, FS, HA, IP, P, PA, PH, T, TH, TL, TU
	Lightweight	Set screw	Oil seal	SB	×	LF, LP, PF, PFL, PP, PTH, NPTH FL0, P0
	"Compact"	Set screw		SU		
	Anticorrosion	Set screw	Oil seal and flinger	UC-S6	○	SFL-H1, SP-H1
	Anticorrosion and compact		Oil seal	SU-S6	×	SFL0, SP0
	Heat resistant Cold resistant For high speed For blower	Set screw Adapter	Oil seal and flinger	UC UK	○	C, F, FA, FB, FC, FL, FS, HA, IP, P, PA, PH, T

**Table 3.2 (2) Outline of selection of ball bearing unit types and specifications**

Category	Performance required		Housing specifications				Applicable bearing	
	Type	Operating conditions	Type code	Material	Presence of cover	Lubrication		
Housing	Pillow block type	Standard	P	Cast iron			UC (-L3), UK (-L3)	
		Cast steel (highly strong)	Psc	Cast steel	○	○		
		Thick section (highly strong)	IP	Cast iron				
		Tapped-base	PA				○	UC (-L3)
		Higher centerheight	PH	Cast iron		×	○	UC (-L3)
		Light duty	LP				×	SB
		"Compact"	P0	Special light alloy			×	SU
		Anticorrosion	SP-H1	Stainless steel	○		○	UC-S6
		Anticorrosion and compact	SP0	Stainless steel			×	SU-S6
	Pressed steel	PP	Pressed steel		×	×	SB	
	Flange type	Square	F					UC (-L3), UK (-L3)
		With spigot joint (square)	FS	Cast iron		○	○	
		(round)	FC					
		Oval	FL					UC (-L3)
		Shaft alignment (adjustable oval)	FA	Cast iron		×	○	
Cantilever (deformed)		FB						
Light duty (oval)		LF	Cast iron		×	×	SB	
"Compact" (oval)	FL0	Special light alloy		○	×	SU		
Anticorrosion (oval)	SFL-H1	Stainless steel		○	○	UC-S6		
Anticorrosion and compact (oval)	SFL0	Stainless steel		○	×	SU-S6		

**Table 3.2 (2) Outline of selection of ball bearing unit types and specifications**

Category	Performance required		Housing specifications				Applicable bearing
	Type	Operating conditions	Type code	Material	Presence of cover	Lubrication	
Housing	Flange type	Pressed steel (round) (oval)	PF PFL	Pressed steel	×	×	SB
	Take-up type	Standard	T	Cast iron	○	○	UC (-L3), UK (-L3)
		Section steel frame type	TH	Cast iron	○	○	UC (-L3)
		Channel steel frame type	TL	Cast iron	○	○	UC (-L3), UK (-L3)
			TU				
	Pressed steel frame type	PTH NPTH	Pressed steel	×	×	SB	
	Cartridge type	Standard	C	Cast iron	×	○	UC (-L3), UK (-L3)
Hanger type	Standard	HA	Cast iron	×	○	UC (-L3)	

### 3.3 Selection from a maintenance standpoint

Koyo Ball Bearing Units need not to be maintained or checked for standard purposes during operation, because of their structures. However, they must be periodically maintained or checked if they are used for important machines or under special environment.

Thus, it is important that intervals of periodic maintenance or check during operation are extended or ball bearing units optimal for purposes or operating conditions are selected in order to reduce the manpower required for maintenance and check.

For your purposes, various factors must be fully examined. In the environment exposed to vibration or impact, increase in safety factor of service life of the bearing, and strength of the housing must be fully examined. In the environment exposed to great axial load, use of shouldered shaft, in the environment exposed to dusts or mud water, use of the triple-lip seal type or covered type, in the environment exposed to high or low temperature, material of oil seal and grease brand must be fully taken into consideration.

## 4 Life of bearing

If a ball bearing unit is installed to a machine or device and operated, vibration or noise from the unit may be increased or seizure may occur, after a certain period has passed, even under appropriate conditions. The period of bearing operation until the unit cannot be used due to these causes is called the life of ball bearing unit.

Life of a ball bearing unit is caused by two reasons, fatigue of bearing material (fatigue service life) and degradation of grease leading to faulty lubrication, and inability of continuous use. Each of them can be found as the rating life of bearing and grease life.

The life of ball bearing unit depends on the shorter one, between the rating life of bearing and grease life. Since the lubricating system is adopted for the Koyo Ball Bearing Unit, the grease life can be extended to the rating life of bearing by appropriate lubrication. If the bearing unit is used without lubrication, the shorter period, the rating life of bearing or grease life, is the life of the bearing unit.

However, a ball bearing unit is actually installed to a machine or device and operated, the unit cannot be used due to causes other than the rating life of bearing or grease service life (wear, dent, crack, seizure, etc.). They can be prevented by full examination of the selection, handling, installation, and lubrication of the ball bearing unit.

### 4.1 Basic rating life and basic rating load

#### 4.1.1 Basic rating life

While a bearing is rotated under load, the raceways surfaces of the inner and outer rings of bearing and the rolling surfaces of rolling element are exposed to load continuously. Thus, damages like scales appear on the raceway surfaces or rolling surfaces due to fatigue of material (flaking or peel-off). The total number of revolution until the damages appear is called as “(Fatigue) service life” of bearing. Fatigue service life of bearing may be greatly varied even if the bearings having the same structure, dimensions, materials, and machining methods, are operated under the same operating conditions.

To solve this problem, if a group of the same bearings are operated under the same conditions, the total number of revolution of 90% of the bearings without damage due to rotating fatigue (life of 90% reliability) is called as the “Basic rating life of bearing”.

#### 4.1.2 Basic rating load

Basic rating load indicates the withstanding strength against rolling fatigue of a bearing, that is to say, loading capacity. It is the pure radial load of a certain level and direction (for radial bearing) or central axial load (for thrust bearing) that a million times of rotations can be obtained as the basic rating life if the inner ring of bearing is rotated while the outer ring is stopped (or the outer ring is rotated while the inner ring is stopped).

They are called as the **basic dynamic radial load rating** ( $C_r$ ) for radial bearing or the **basic dynamic axial load rating** ( $C_a$ ) for axial bearings.

In the ball bearing for ball bearing unit, it is indicated as the basic dynamic radial load rating ( $C_r$ ), and the value is shown in the dimensional table.

### 4.2 Calculation of rating life

Relation between the basic rating life, basic dynamic load rating, and the dynamic equivalent load of the ball bearing for ball bearing unit can be indicated as the **Formula (4.1)**. If the ball bearing unit is used at a fixed rotational speed, it is convenient that the life is indicated as time, as shown in the **Formula (4.2)**.

$$\text{(Total revolution)} \quad L_{10} = \left(\frac{C_r}{P_r}\right)^3 \dots\dots\dots (4.1)$$

$$\text{(Time)} \quad L_{10h} = \frac{10^6}{60n} \left(\frac{C_r}{P_r}\right)^3 \dots\dots\dots (4.2)$$

Whereas,

$L_{10}$ : Basic rating life	$10^6$ rotations
$L_{10h}$ : Basic rating life	h
$C_r$ : Basic dynamic load rating	N
$P_r$ : Dynamic equivalent load	N
(see “5 Bearing load”)	
$n$ : Rotational speed	$\text{min}^{-1}$

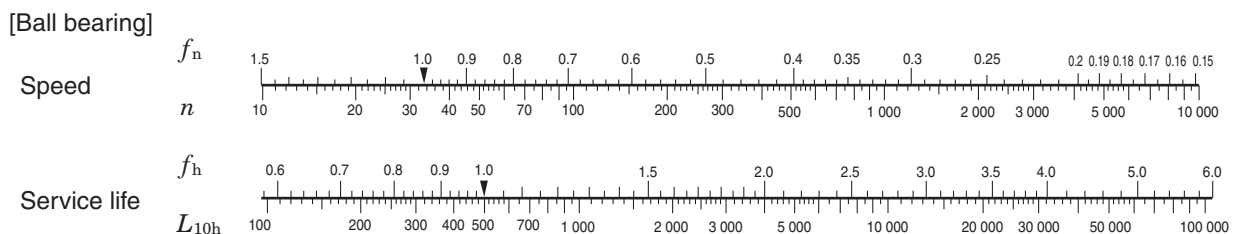
Calculation of the basic rating life with using the life factor ( $f_h$ ) and the speed factor ( $f_n$ ) in the **Formula (4.2)** are shown below.

$$L_{10h} = 500 f_n^3 \dots\dots\dots (4.3)$$

$$\text{Life factor} \quad f_h = f_n \cdot \frac{C_r}{P_r} \dots\dots\dots (4.4)$$

$$\begin{aligned} \text{Speed factor} \quad f_n &= \left(\frac{10^6}{500 \times 60n}\right)^{1/3} \\ &= (0.03n)^{-1/3} \dots\dots\dots (4.5) \end{aligned}$$

Values of  $f_n$ ,  $f_h$  and  $L_{10h}$  can be easily found by the nomogram of **Fig. 4.1**.



**Fig. 4.1** Rotational speed ( $n$ ) and its coefficients ( $f_n$ ), and service life coefficient ( $f_h$ ) and basic rating life ( $L_{10h}$ )



### 4.2.1 Correction of basic rating load for high temperature use

If a ball bearing unit is used at a high temperature, structure of bearing material is changed, leading to decreased hardness, and the basic dynamic load rating is reduced than that of the use at standard temperature. Once the structure of bearing material is changed, it will not be restored even if the temperature returns to standard level.

Therefore, when using a ball bearing unit at 150 °C or more, the basic rating load must be corrected by multiplying the basic dynamic load rating shown in dimensional table by the temperature factor shown in **Table 4.1**.

If the ball bearing unit has been used for a long period at 120 °C or more, fluctuations in dimensions of the bearing may be increased. If you use it under such conditions, contact JTEKT.

**Table 4.1 Temperature factor**

Bearing temperature, °C	125	150	175	200	250
Temperature factor	1	1	0.95	0.90	0.75

### 4.2.2 Corrected rating life

Although the basic rating life ( $L_{10}$ ) shown in **Formula (4.1)** is the fatigue life of bearing with 90% reliability, service life with 90% or more reliability is required, depending on the purposes. The bearing life may be extended by adoption of special material. Furthermore, operating conditions including lubrication may give influence on the bearing life.

The corrected rating life, obtained by correcting the basic rating life taking these points into consideration, can be found by **Formula (4.6)**.

$$L_{na} = a_1 a_2 a_3 L_{10} \quad (4.6)$$

Whereas,

$L_{na}$  : Corrected rating life  $10^6$  rotations

Life that characteristics of bearing and operating conditions are taken into consideration with reliability 100- $n$ % (the probability of failure occurrence is expressed by  $n$ )

$L_{10}$  : Basic rating load  $10^6$  rotations  
(Life with 90% reliability)

$a_1$  : Reliability factor ..... see (1)

$a_2$  : Bearing characterization factor ..... see (2)

$a_3$  : Operating condition factor ..... see (3)

### (1) Reliability factor $a_1$

Values of reliability factor  $a_1$  required in order to find the corrected rating life of bearing with 90% or more reliability (failure occurrence probability : 10% or less) are shown in **Table 4.2**.

**Table 4.2 Reliability factor  $a_1$**

Reliability, %	$L_{na}$	$a_1$
90	$L_{10a}$	1
95	$L_{5a}$	0.62
96	$L_{4a}$	0.53
97	$L_{3a}$	0.44
98	$L_{2a}$	0.33
99	$L_{1a}$	0.21

### (2) Bearing characterization factor $a_2$

Bearing characterization relative to the life of bearing may depend on the bearing material (type of steel, quality), production procedure, and design. In such a case, correct the basic rating life of bearing by the bearing characterization factor  $a_2$ .

For Koyo Ball Bearing for ball bearing unit, high quality vacuum-degassed bearing steel is used as the standard material, and it causes a longer service life of bearing. In Koyo Ball Bearing for ball bearing unit, bearing characterization factor  $a_2$  is 1 ( $a_2 = 1$ ).

As for the bearing special material used for longer fatigue limit, bearing characterization factor  $a_2$  larger than 1 ( $a_2 > 1$ ) can be used.

### (3) Operating condition factor $a_3$

If a bearing is operated under the operating conditions that may directly influence on the life of bearing (especially, appropriate or inappropriate lubrication), the basic rating life should be corrected with the operating condition factor  $a_3$ .

If lubrication is appropriate, the operating condition factor should be as follows :  $a_3 = 1$ . If it is excellently good, following condition should be applied :  $a_3 > 1$ .

If any of the operating conditions shown below is satisfied, following condition should be applied :  $a_3 < 1$ .

- (1) Kinematical viscosity of lubricant during operation is low ..... Ball bearing : 13 mm<sup>2</sup>/s or less,
- (2) Rotational speed is low .....  $d_m n$  : 10 000 or less  
[Remark]  $d_m$  (Pitch dia. of ball set)  $\times$   $n$  (Rotational speed)
- (3) Foreign matters are mixed in lubricant

Even if the bearing characterization factor is as follows with using special material :  $a_2 > 1$ , the value satisfying the following condition cannot be adopted if lubricant is inappropriate :  $a_2 \times a_3 > 1$ . Therefore, if the operating condition factor is smaller than 1 ( $a_3 < 1$ ), the following condition seems to be satisfied, in general :  $a_2 \leq 1$ .

4.2.3 Recommended service life of bearing

Excessively long life of ball bearing unit does not lead to economic operation. Setup of the recommended service life of bearing unit depending on the type of machine the ball bearing unit is used together and operating conditions is required.

Recommended service life of ball bearing unit empirically adopted is shown in **Table 4.3**.

**Table 4.3 Recommended service life of ball bearing unit (reference)**

Operating conditions	Application	Recommended service life, h
Operated in short period or intermittently	Home electric appliances, electric tool, agricultural machinery, hoist, etc.	4 000 – 8 000
Discontinuously but for a long period	Factory motor, general gear, etc.	12 000 – 20 000
Always operated for 8 hours or longer a day or operated continuously for a long period	General machinery, blower, etc.	20 000 – 30 000
Operated continuously for 24 hours, no fault is allowed	Electric power plant facility, mine drainage facility, etc.	100 000 –200 000

4.3 Grease life

Grease life of a ball bearing for ball bearing unit is influenced by the level of load, rotational speed of bearing, and operating temperature.

Grease life of a ball bearing for unit used under appropriate operating conditions can be found by the formula shown below.

$$\log L = 6.10 - 4.40 \times 10^{-6} d_m n - 2.50 \left( \frac{P_r}{C_r} - 0.05 \right) - (0.021 - 1.80 \times 10^{-8} d_m n) T \dots\dots\dots (4.7)$$

Whereas,

*L* : Grease life h

*d<sub>m</sub>* : Pitch dia. of ball set mm

$$d_m = \frac{(D + d)}{2}$$

( *D* : Nominal bearing outer dia.,  
*d* : Nominal bearing bore dia. )

*n* : Rotational speed of bearing min<sup>-1</sup>

*P<sub>r</sub>* : Dynamic equivalent radial load N  
(see “5 Bearing load”)

*C<sub>r</sub>* : Basic dynamic radial load rating of bearing N

*T* : Operating temperature of bearing °C

Applicable conditions for the **Formula (4.7)** are shown below.

1) Operating temperature of bearing : *T* °C

To be applied if the following condition is satisfied :  
*T* ≤ 100

( If *T* is smaller than 50 (*T* < 50),  
following condition should be applied : *T* = 50. )

If *T* is larger than 100 (*T* > 100), contact JTEKT.

2) Rotational speed of bearing : *d<sub>m</sub>n*

To be applied if the following condition is satisfied :  
*d<sub>m</sub>n* ≤ 30 × 10<sup>4</sup>

( If *d<sub>m</sub>n* is smaller than 12.5 × 10<sup>4</sup> (*d<sub>m</sub>n* < 12.5 × 10<sup>4</sup>),  
following condition should be applied :  
*d<sub>m</sub>n* = 12.5 × 10<sup>4</sup> )

If *d<sub>m</sub>n* is larger than 30 × 10<sup>4</sup> (*d<sub>m</sub>n* > 30 × 10<sup>4</sup>),  
contact JTEKT.

3) Load condition of bearing :  $\frac{P_r}{C_r}$

To be applied if the following condition is satisfied :  
 $\frac{P_r}{C_r} \leq 0.2$

( If  $\frac{P_r}{C_r}$  is smaller than 0.05 ( $\frac{P_r}{C_r} < 0.05$ ),  
following condition should be applied :  $\frac{P_r}{C_r} = 0.05$  )

If  $\frac{P_r}{C_r}$  is larger than 0.2 ( $\frac{P_r}{C_r} > 0.2$ ), contact JTEKT.

Reference figure of grease life obtained by the **Formula (4.7)** is shown in **Fig. 4.2**.



## 5 Bearing load

As for the loads applied to a bearing, load caused by weight of object supported by the bearing, transmitting force of gears and belts, load generated in the machine operated are included. In many cases, these loads cannot be found out by simple calculation.

Because the loads are not fixed but fluctuated, and it is difficult to fix the level and direction of the fluctuations.

Therefore, in general, to find the loads applied to a bearing, the following steps are adopted : multiply the load to be able to be found theoretically by various factors obtained empirically.

### 5.1 Loads applied to bearing

#### 5.1.1 Load factor

Even if radial load and axial load to be applied to a bearing can be found by standard dynamical calculation, loads actually applied to the bearing are greater than the calculated values because of vibration and impact generated while machine is being operated.

To find the loads actually applied to a bearing, multiply the theoretically found values by load factor.

$$F = f_w \cdot F_c \quad \dots \dots \dots (5.1)$$

Whereas,

$F$  : Load actually applied to bearing N

$F_c$  : Theoretically calculated load N

$f_w$  : Load factor (see **Table 5.1**)

**Table 5.1 Load factor  $f_w$**

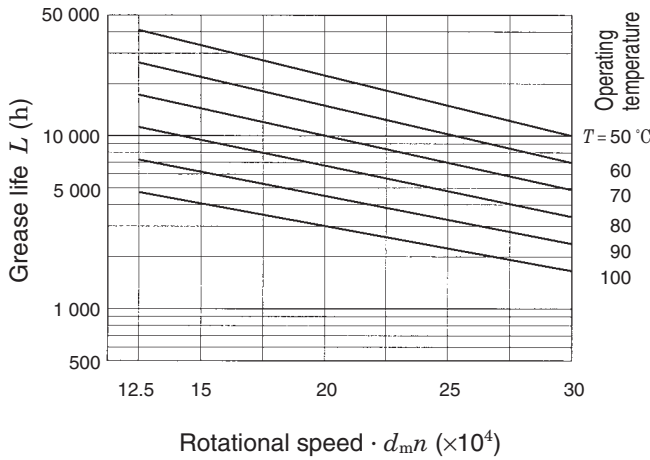
Operating conditions	Applications	$f_w$
Virtually no vibration or impact	Electric machines and instruments	1 - 1.2
Standard operation (weak impact)	Agricultural machines and blower	1.2 - 2
Great vibration and impact	Constructive machines and grinder	2 - 3

#### 5.1.2 Loads in case of belt or chain transmission

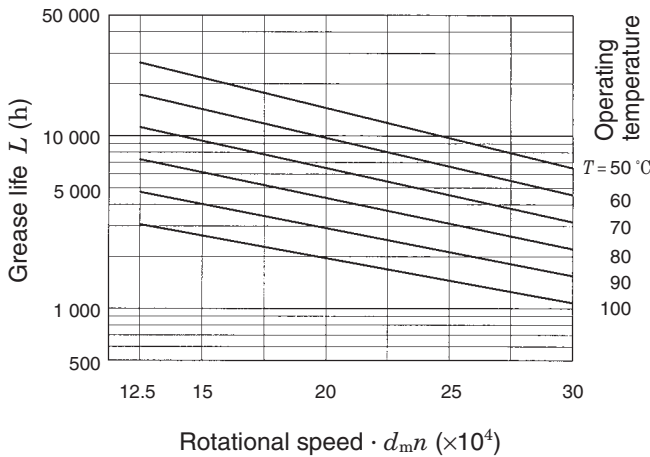
As for belt transmission, theoretical load applied to the pulley shaft can be found by effective transmission force of belt. Actually, the effective transmission force must be multiplied by load factor ( $f_w$ ) obtained with taking vibration and impact generated while machine is being operated into consideration and belt factor ( $f_b$ ) with taking belt tension into consideration.

As for chain transmission, factor equivalent to the belt factor for belt transmission must be multiplied.

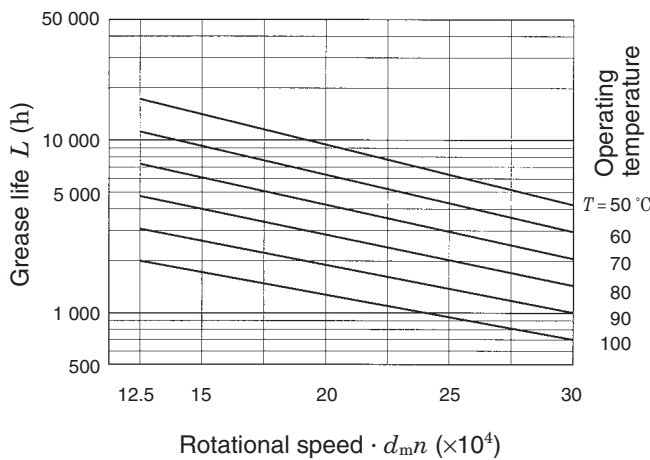
(1) Bearing load  $\cdot \frac{P_r}{C_r} = 0.05$



(2) Bearing load  $\cdot \frac{P_r}{C_r} = 0.125$



(3) Bearing load  $\cdot \frac{P_r}{C_r} = 0.2$



**Fig. 4.2 Relation of grease life to bearing load, rotational speed, and operating temperature (reference)**

## 5 Bearing load

$$F_b = \frac{2M}{D_p} \cdot f_w \cdot f_b$$

$$= \frac{19.1 \times 10^6 W}{D_p \cdot n} \cdot f_w \cdot f_b \quad \dots\dots\dots (5.2)$$

Whereas,

- $F_b$  : Load actually applied to pulley shaft or sprocket shaft N
- $M$  : Torque applied to pulley or sprocket mN · m
- $W$  : Transmitted power kW
- $D_p$  : Pitch circle dia. of pulley or sprocket mm
- $n$  : Rotational speed min<sup>-1</sup>
- $f_w$  : Load factor (see **Table 5.1**)
- $f_b$  : Belt factor (see **Table 5.2**)

**Table 5.2 Belt factor  $f_b$**

Belt type	$f_b$
Toothed belt	1.3 – 2
V belt	2 – 2.5
Flat belt (with tension pulley)	2.5 – 3
Flat belt	4 – 5
Chain	1.2 – 1.5

### 5.1.3 Load in case of gear transmission

As for gear transmission, load in tangential direction ( $K_t$ ), load in radial direction ( $K_r$ ), and axial load ( $K_a$ ) are included as the theoretical loads applied to a gear. They can be dynamically found by transmission force and gear type.

The followings show the example of standard flat gear (as for flat gear, no axial load applied is expected.).

- (1) Load applied to gear in tangential direction (tangential line force)

$$K_t = \frac{2M}{D_p} = \frac{19.1 \times 10^6 W}{D_p n} \quad \dots\dots\dots (5.3)$$

- (2) Load applied to gear in radial direction (separating force)

$$K_r = K_t \tan \alpha \quad \dots\dots\dots (5.4)$$

- (3) Synthetic load applied to gear

$$K_g = \sqrt{K_t^2 + K_r^2} = K_t \sec \alpha \quad \dots\dots\dots (5.5)$$

Whereas,

- $K_t$  : Load applied to gear in tangential direction (tangential line force) N
- $K_r$  : Load applied to gear in radial direction (separating force) N
- $K_g$  : Synthetic load applied to gear N
- $M$  : Torque applied to gear mN · m
- $D_p$  : Pitch circle dia. of gear mm
- $W$  : Transmission power kW
- $n$  : Rotational speed min<sup>-1</sup>
- $\alpha$  : Pressure angle of gear deg

Note that the actual gear load must be found by multiplying the theoretical load by load factor ( $f_w$ ) obtained with taking vibration and impact generated while machine is being operated into consideration and gear factor ( $f_g$ ) with taking accuracy and finish of gear into consideration.

$$F_g = f_w \cdot f_g \cdot K_g \quad \dots\dots\dots (5.6)$$

Whereas,

- $F_g$  : Load actually applied to gear N
- $K_g$  : Theoretically synthetic load applied to gear N
- $f_w$  : Load factor (see **Table 5.1**)
- $f_g$  : Gear factor (see **Table 5.3**)

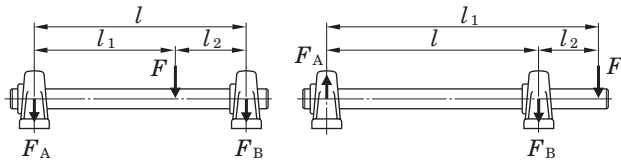
**Table 5.3 Gear factor  $f_g$**

Gear type	$f_g$
Precision gear (both pitch error and tooth profile error should be 0.02 mm or less)	1 – 1.1
Standard gear (both pitch error and tooth profile error should be 0.1 mm or less)	1.1 – 1.3

### 5.2 Distribution of load to bearing

To distribute the load applied to the shaft system into the bearing which supports the shaft, find the radial component force of each load, and calculate the vector sum in accordance with the direction of load. **Fig. 5.1** shows the example of distribution of radial load.

In many cases, a bearing bears radial load as well as axial load, leading to synthetic loads. In such a case, convert it into dynamic equivalent load, and consider it as the bearing load.



$$F_A = \frac{l_2}{l} \cdot F \dots\dots\dots (5.7)$$

$$F_B = \frac{l_1}{l} \cdot F \dots\dots\dots (5.8)$$

**Fig. 5.1** Distribution of load to bearing

### 5.3 Dynamic equivalent load

In many cases, a bearing is exposed to the synthetic load of radial load and axial load, and it is used under various conditions, including fluctuated load thus, the load actually applied to the bearing cannot be directly compared to the basic dynamic load rating.

In such a case, find the load running the bearing center in a fixed level and direction that allows the same bearing life as the actual bearing load and rotational speed. Then, compare it with the basic dynamic load rating.

The converted virtual load is called dynamic equivalent load (*P*).

#### 5.3.1 Calculation of dynamic equivalent load

The dynamic equivalent radial load (*P<sub>r</sub>*) of a radial bearing (ball bearing for unit is included) that bears the synthetic load in a fixed level and direction can be found by the formula shown below.

$$P_r = XF_r + YF_a \dots\dots\dots (5.9)$$

Whereas,

- P<sub>r</sub>* : Dynamic equivalent radial load                    N
- F<sub>r</sub>* : Radial load    N
- F<sub>a</sub>* : Axial load    N
- X* : Radial load factor (see **Table 5.4**)
- Y* : Axial load factor (see **Table 5.4**)

**Table 5.4** Radial load factor (*X*) and axial load factor (*Y*)

$\frac{f_0 F_a}{C_{0r}}$	<i>e</i>	$F_a / F_r \leq e$		$F_a / F_r > e$	
		<i>X</i>	<i>Y</i>	<i>X</i>	<i>Y</i>
0.172	0.19	1	0	0.56	2.30
0.345	0.22				1.99
0.689	0.26				1.71
1.03	0.28				1.55
1.38	0.30				1.45
2.07	0.34				1.31
3.45	0.38				1.15
5.17	0.42				1.04
6.89	0.44				1.00

- [Remarks] 1. *C<sub>0r</sub>* (basic static radial load rating) and *f<sub>0</sub>* (factor) are shown in the dimensional tables.  
 2. If  $f_0 F_a / C_{0r}$  does not conform to the table above, find by interpolation.

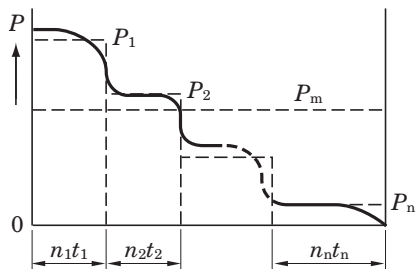
**5.3.2 Mean dynamic equivalent load in case of fluctuated load**

If level or direction of the load applied to a bearing is fluctuated, it is necessary to find the mean dynamic equivalent load to allow the same bearing life as that under actual fluctuated conditions.

**Table 5.5** shows the method of finding the mean dynamic equivalent load under various fluctuated conditions.

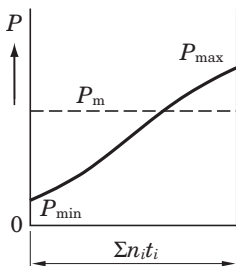
**Table 5.5 Calculation of mean dynamic equivalent load in case of fluctuated load**

**(1) Staged fluctuation**



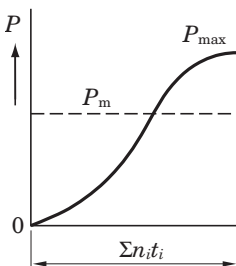
$$P_m = \sqrt[p]{\frac{P_1^p n_1 t_1 + P_2^p n_2 t_2 + \dots + P_n^p n_n t_n}{n_1 t_1 + n_2 t_2 + \dots + n_n t_n}} \quad \dots \dots \dots (5.10)$$

**(2) Stageless fluctuation**



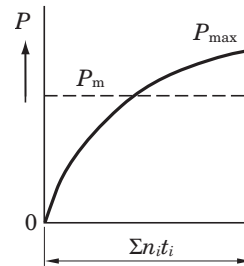
$$P_m = \frac{P_{min} + 2 P_{max}}{3} \quad \dots \dots \dots (5.11)$$

**(3) Sine curve fluctuation**



$$P_m = 0.68 P_{max} \quad \dots \dots \dots (5.12)$$

**(4) Sine curve fluctuation (upper half of sine curve)**



$$P_m = 0.75 P_{max} \quad \dots \dots \dots (5.13)$$

Whereas,

- $P_m$  : Mean dynamic equivalent load N
- $P_1$  : Dynamic equivalent load acting for  $t_1$  hours at rotational speed of  $n_1$  N
- $P_2$  : Dynamic equivalent load acting for  $t_2$  hours at rotational speed of  $n_2$  N
- 
- 
- 
- $P_n$  : Dynamic equivalent load acting for  $t_n$  hours at rotational speed of  $n_n$  N
- $P_{min}$  : Minimum dynamic equivalent load N
- $P_{max}$  : Maximum dynamic equivalent load N
- $\Sigma n_i t_i$  : Total rotating frequency for  $t_1$  to  $t_i$  hours

**5.4 Basic static load rating and static equivalent load**

**5.4.1 Basic static load rating**

If a bearing is exposed to excessive static load or impact load even under extra low rotational speed, partial permanent deformation occurs to the contact surface of the raceway of bearing with the rolling element. The permanent deformation increases with the increase of load, and when it exceeds a fixed level, smooth rotation of the bearing is interfered.

Basic static load rating of a bearing is the static load to generate the calculated contact stress shown below at the center of contact surface of the raceway the maximum load is applied and the rolling element.

- (1) Self-aligning ball bearing ..... 4 600 MPa
- (2) Other ball bearings  
(ball bearing for unit is included) ..... 4 200 MPa
- (3) Roller bearing ..... 4 000 MPa

The total permanent deformation of bearing raceway and rolling element to be generated under these contact stresses are 0.000 1 times of the diameter of rolling element.

In the ball bearing for unit, it is indicated as the **basic static radial load rating** ( $C_{0r}$ ), and the values are shown in the dimensional tables.

### 5.4.2 Static equivalent load

Static equivalent load is the virtual load converted into the level that allows the generation of the same contact stress at the contact face of the raceway of bearing and rolling element that are exposed to the maximum stress as the contact stress under the actual load conditions, when a bearing is stopped or rotated at extra low speed.

Static equivalent radial load ( $P_{or}$ ) of the ball bearing for unit can be calculated by the formula below (use greater value).

$$P_{or} = 0.6 F_r + 0.5 F_a \quad \dots\dots\dots (5.14)$$

$$P_{or} = F_r \quad \dots\dots\dots (5.15)$$

Whereas,

$P_{or}$  : Static equivalent radial load N

$F_r$  : Radial load N

$F_a$  : Axial load N

### 5.4.3 Safety factor

The static equivalent load allowed by a bearing depends on the basic static load rating of the bearing, and the limitation of use of bearing by the permanent deformation (partial dent) of the bearing depends on the performance required for the bearing or operating conditions.

Therefore, in order to examine the safety of the basic static load rating of the bearing, safety factor is defined taking conventional experiences into consideration.

$$f_s = \frac{C_{or}}{P_{or}} \quad \dots\dots\dots (5.16)$$

Whereas,

$f_s$  : Safety factor (see **Table 5.6**)

$C_{or}$  : Basic static radial load rating N

$P_{or}$  : Static equivalent radial load N

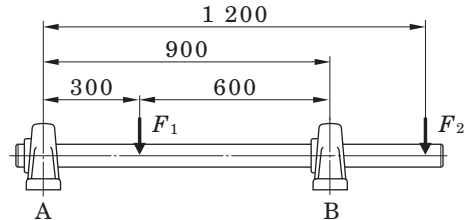
**Table 5.6 Safety factor  $f_s$  (recommended)**

Operating conditions		$f_s$ (Min.)
Being rotated	High rotating accuracy is required	2
	Standard operating conditions	1
	Impact	1.5
Not always being rotated (sometimes oscillated)	Standard operating conditions	0.5
	Impact, unevenly distributed load	1

### 5.5 Example of applied calculation

#### Example 1 Distributing load

Find the load applied to the bearing A and bearing B, if the radial load  $F_1$  ( $F_1 = 1.5$  kN) and  $F_2$  ( $F_2 = 4.5$  kN) are applied.



- (1) Find the radial load  $F_{1A}$  applied to the bearing A by  $F_1$ , with **Formulas (5.7)** and **(5.8)**.

$$F_{1A} = \frac{600}{900} \times 1.5 = 1.0 \text{ (kN)}$$

In a similar manner, find the radial load  $F_{2A}$  applied to the bearing A by  $F_2$ .

$$F_{2A} = - \frac{1\,200 - 900}{900} \times 4.5 = -1.5 \text{ (kN)}$$

[Remark] Negative load is the upward load.

Radial load  $F_A$  applied to the bearing A :

$$F_A = F_{1A} + F_{2A} = 1.0 + (-1.5) = -0.5 \text{ (kN)}$$

- (2) In a similar manner to (1), find the radial load  $F_B$  applied to the bearing B.

$$F_{1B} = \frac{300}{900} \times 1.5 = 0.5 \text{ (kN)}$$

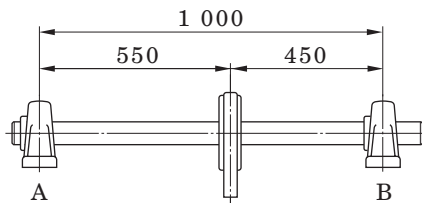
$$F_{2B} = \frac{1\,200}{900} \times 4.5 = 6.0 \text{ (kN)}$$

$$F_B = F_{1B} + F_{2B} = 0.5 + 6.0 = 6.5 \text{ (kN)}$$

## 5 Bearing load

### Example 2 Calculating load by V-belt transmission

Find the load applied to the bearing A and bearing B when the shaft is driven by the V-belt, transmission power  $W$  is 7.5 kW ( $W = 7.5 \text{ kW}$ ), rotational speed  $n$  is 300  $\text{min}^{-1}$  ( $n = 300 \text{ min}^{-1}$ ), effective diameter of pulley  $D_p$  is 300 mm ( $D_p = 300 \text{ mm}$ ).



- (1) Find the load actually applied to the pulley shaft  $F_b$  with **Formula (5.2)**.

From **Table 5.1**, load factor  $f_w$  is 1.2 ( $f_w = 1.2$ ), and the belt factor  $f_b$  is 2.5 ( $f_b = 2.5$ ), from **Table 5.2**.

$$F_b = \frac{19.1 \times 10^6 W}{D_p \cdot n} \cdot f_w \cdot f_b$$

$$= \frac{19.1 \times 10^6 \times 7.5}{300 \times 300} \times 1.2 \times 2.5 = 4.78 \text{ (kN)}$$

- (2) Find the load actually applied to the bearing A and bearing B ( $F_A$  and  $F_B$ ) with **Formulas (5.7) and (5.8)**.

$$F_A = \frac{450}{1000} \times 4.78 = 2.15 \text{ (kN)}$$

$$F_B = \frac{550}{1000} \times 4.78 = 2.63 \text{ (kN)}$$

### Example 3 Calculating dynamic equivalent radial load

Find the dynamic equivalent radial load  $P_r$  when the radial load  $F_r$ , 1.5 kN ( $F_r = 1.5 \text{ kN}$ ), and the axial load  $F_a$ , 0.85 kN, ( $F_a = 0.85 \text{ kN}$ ) are applied to the pillow block type unit UCP306J (bearing UC306).

- (1) Find the radial load factor ( $X$ ) and the axial load factor ( $Y$ ) with using the static radial load rating  $C_{0r}$  of UCP306J (bearing UC306), 15.0 kN ( $C_{0r} = 15.0 \text{ kN}$ ), and **Table 5.4**.

$$\frac{f_0 F_a}{C_{0r}} = \frac{13.3 \times 0.85}{15.0} = 0.754, e = 0.264$$

$$\frac{F_a}{F_r} = \frac{0.85}{1.5} = 0.567 > e (0.264)$$

Therefore,  $X = 0.56$ ,  $Y = 1.68$

- (2) Find the dynamic equivalent radial load  $P_r$  with **Formula (5.9)**.

$$P_r = XF_r + YF_a = 0.56 \times 1.5 + 1.68 \times 0.85$$

$$= 2.27 \text{ (kN)}$$

### Example 4 Calculating bearing life

Under the conditions shown in the **Example 3**, find the bearing life  $L_{10h}$  when a bearing is used for a blower of the rotational speed  $n$ , 1 000  $\text{min}^{-1}$ .

- (1) Select the load factor  $f_w$  is 1.2 ( $f_w = 1.2$ ) from **Table 5.1**, and find the bearing load  $P_r$ .

$$P_r = f_w \cdot F = 1.2 \times 2.27 = 2.72 \text{ (kN)}$$

- (2) The dynamic radial load rating of UCP306J (bearing UC306),  $C_r$ , is 26.7 kN ( $C_r = 26.7 \text{ kN}$ ), and calculate the bearing life  $L_{10h}$  with the **Formula (4.2)**.

$$L_{10h} = \frac{10^6}{60n} \cdot \left(\frac{C_r}{P_r}\right)^3 = \frac{10^6}{60 \times 1000} \times \left(\frac{26.7}{2.72}\right)^3$$

$$\doteq 15\,800 \text{ (h)}$$

- (3) Calculate bearing life  $L_{10h}$  with the nomogram shown in **Fig. 4.1**.

When the rotational speed  $n$  is 1 000  $\text{min}^{-1}$  ( $n = 1\,000 \text{ min}^{-1}$ ), rotational factor  $f_n$  is 0.32 ( $f_n = 0.32$ ). next, find the life factor  $f_h$  by speed factor  $f_n$ , dynamic radial load rating of bearing  $C_r$ , and the bearing load  $P_r$ .

$$\text{Life factor } f_h = f_n \cdot \frac{C_r}{P_r} = 0.32 \times \frac{26.7}{2.72}$$

$$= 3.14$$

From life factor  $f_h$ , bearing life  $L_{10h} \doteq 16\,000$  hours.

### Example 5 Selecting ball bearing unit

If a bearing is operated under the following conditions, select the flange type unit (UCF) with at least two years (5 000 hours) or longer service life : rotational speed of shaft  $n$  is 1 500  $\text{min}^{-1}$  ( $n = 1\,500 \text{ min}^{-1}$ ), and radial load  $F_r$  is 5 kN ( $F_r = 5 \text{ kN}$ ). The radial load  $F_r$  includes the load factor and gear factor.

- (1) From the nomogram shown in **Fig. 4.1**, when life time  $L_h$  is 5 000 h ( $L_h = 5\,000 \text{ h}$ ), life factor  $f_h$  can be found as 2.16 ( $f_h \doteq 2.16$ ), and speed factor  $f_n$  can be found as 0.28 ( $f_n \doteq 0.28$ ) when the rotational speed  $n$  is 1 500  $\text{min}^{-1}$  ( $n = 1\,500 \text{ min}^{-1}$ ).

$$\text{Dynamic radial load rating } C_r = F_r \cdot \frac{f_h}{f_n} = 5 \times \frac{2.16}{0.28}$$

$$\doteq 38.6 \text{ (kN)}$$

- (2) Find the flange type unit that meets the following condition : dynamic radial load rating  $C_r$  is 38.6 kN ( $C_r = 38.6 \text{ kN}$ ). As for the diameter series 2, UCF211J (dynamic radial load rating  $C_r$  is 43.4 kN ( $C_r = 43.4 \text{ kN}$ )) can be selected.

### Example 6 Selecting pillow block type unit for low speed

If a bearing is used for a dolly under the following conditions, select the pillow block type unit (UCP) with 10 000 hours service life : radial load  $F_r$  is 12 kN ( $F_r = 12$  kN), and rotational speed is  $8 \text{ min}^{-1}$ .

- (1) Find the required dynamic radial load rating  $C_r$  with using **Formulas (4.4) and (4.5)**.

$$\text{Speed factor } f_n = (0.03n)^{-1/p} = (0.03 \times 8)^{-1/3} \doteq 1.61$$

$$\text{Life factor } f_h = \left(\frac{L_{10h}}{500}\right)^{1/p} = \left(\frac{10\,000}{500}\right)^{1/3} \doteq 2.71$$

$$\begin{aligned} \text{Dynamic radial load rating } C_r &= P_r \cdot \frac{f_h}{f_n} = 12 \times \frac{2.71}{1.61} \\ &\doteq 20.2 \text{ (kN)} \end{aligned}$$

- (2) From **Table 5.6**, define safe factor  $f_s$  as 2 ( $f_s = 2$ ), and find the static radial load rating of bearing required  $C_{0r}$ .

$$C_{0r} = f_s \cdot P_r = 2 \times 12 = 24 \text{ (kN)}$$

- (3) The unit is used for a dolly, and vibration or impact may occur. Thus, select UCP308J ( $C_r = 40.7$  kN,  $C_{0r} = 24.0$  kN).

### Example 7 Calculating bearing life in case of use at high temperature

Find the bearing life if the heat resistant pillow block type unit (UCP215JD1K2) is operated under the following conditions : operating temperature is  $175^\circ\text{C}$ , radial load  $F_r$  is 4 kN ( $F_r = 4$  kN), and the rotational speed  $n$  is  $800 \text{ min}^{-1}$  ( $n = 800 \text{ min}^{-1}$ ). Note that the radial load  $F_r$  includes load factor and gear factor.

- (1) From **Table 4.1**, find the dynamic load rating  $C_r$  with in the case that a bearing is used at  $175^\circ\text{C}$ .

$$C_r = 67.4 \times 0.95 = 64.0 \text{ (kN)}$$

Find the bearing life  $L_{10h}$  with using **Formula (4.2)**.

$$\begin{aligned} L_{10h} &= \frac{10^6}{60n} \cdot \left(\frac{C_r}{P_r}\right)^3 = \frac{10^6}{60 \times 800} \times \left(\frac{64.0}{4}\right)^3 \\ &\doteq 85\,000 \text{ (h)} \end{aligned}$$

- (2) If a bearing unit is operated at  $175^\circ\text{C}$ , grease is degraded faster, and it cannot be used without lubrication. Supply grease at intervals specified in **Table 14.4**.
- (3) If the shaft is extended excessively, install a bearing unit on the identical shaft on the fixed side (positioning of shaft), and install another bearing unit on the free side (see “**9 Design of shaft and base**”).

### Example 8 Calculating grease life

Find the grease life in the case that pillow block type unit UCP204J (bearing UC204) under the following conditions : radial load  $F_r$  is 1 kN ( $F_r = 1$  kN), and rotational speed  $n$  is  $800 \text{ min}^{-1}$  ( $n = 800 \text{ min}^{-1}$ ). Note that the radial load  $F_r$  includes load factor and belt factor. Operating temperature of the bearing should be  $40^\circ\text{C}$ .

Find the grease life  $L$  with using **Formula (4.7)**.

$$\begin{aligned} \log L &= 6.10 - 4.40 \times 10^{-6} d_{mn} - 2.50 \left(\frac{P_r}{C_r} - 0.05\right) \\ &\quad - (0.021 - 1.80 \times 10^{-8} d_{mn}) T \\ &= 6.10 - 4.40 \times 10^{-6} \times 12.5 \times 10^4 \\ &\quad - 2.50 \left(\frac{1}{12.8} - 0.05\right) \\ &\quad - (0.021 - 1.80 \times 10^{-8} \times 12.5 \times 10^4) \times 50 \\ &= 4.542 \\ L &\doteq 34\,800 \text{ (h)} \end{aligned}$$

### Example 9 Calculating life of bearing unit in case of non-lubrication

Find the life of a bearing unit in the case that it is operated under the conditions shown in **Example 8**, but without lubrication.

- (1) Find the rating life of bearing  $L_{10h}$  with using **Formula (4.2)**.

$$\begin{aligned} L_{10h} &= \frac{10^6}{60n} \cdot \left(\frac{C_r}{P_r}\right)^3 = \frac{10^6}{60 \times 800} \times \left(\frac{12.8}{1}\right)^3 \\ &\doteq 43\,700 \text{ (h)} \end{aligned}$$

- (2) Compare the grease life  $L$  shown in **Example 8** to the rating life of bearings  $L_h$ . Then, grease life  $L$  is shorter than the bearing rating life. Therefore, life of a bearing unit should be the same as the grease life  $L$ , 34 800 hours ( $L = 34\,800$  hours).



## 6 Allowable rotational speed

### 6 Allowable rotational speed

#### 6.1 Allowable rotational speed

The rotational speed of a bearing is normally affected by friction heat generated in the bearing. If the heat exceeds a certain amount, seizure or other failures occur, thus causing rotation to be discontinued.

The allowable rotational speed is the highest speed at

which a bearing can continuously operate without generating such critical heat.

Allowable rotational speed of a ball bearing unit depends on the dimensions of the bearing, type of oil seal, and fitting conditions of bearing inner ring and shaft.

**Table 6.1** shows the standard allowable rotational speeds of ball bearing units.

**Table 6.1 Allowable rotational speed of ball bearing units (standard value)**

Unit : min<sup>-1</sup>

Bore diameter No.	UC type bearing, UC-S6 type bearing, UK type bearing, NA type bearing, ER, RB type bearing										SA type bearing SB type bearing	SU type bearing SU-S6 type bearing
	Standard type, cold resistant type (D2K2)			Triple-lip sealed (L3)			Heat resistant type (D1K2)	Heat resistant type (K3), for blower (S5)				
	Diameter series			Diameter series			Diameter series	Diameter series				
	2	X	3	2	X	3	2, X, 3	2	X	3		
8												10 000
00	–			–			–	–			–	10 000
01	5 800			2 300			3 800	8 700			6 800	8 000
02	5 800			2 300			3 800	8 700			6 800	6 600
03	5 800			2 300			3 800	8 700			6 800	5 800
04	5 800	–	–	2 300	–		3 800	8 700	–	–	5 800	5 000
05	5 100	4 300	4 600	2 100	960		3 000	7 700	6 400	6 700	5 100	4 000
06	4 300	3 700	3 900	960	830	–	2 500	6 400	5 500	5 800	4 300	3 300
07	3 700	3 300	3 400	830	750	770	2 100	5 500	5 000	5 100	3 700	–
08	3 300	3 100	3 100	750	690	690	1 900	5 000	4 600	4 600	3 300	
09	3 100	2 800	2 700	690	640	620	1 700	4 600	4 300	4 100	3 100	
10	2 800	2 500	2 400	640	570	550	1 500	4 300	3 800	3 700	2 800	
11	2 500	2 300	2 300	570	520	510	1 400	3 800	3 500	3 400		
12	2 300	2 200	2 100	520	490	470	1 300	3 500	3 200	3 100		
13	2 200	2 100	1 900	490	460	440	1 200	3 200	3 100	2 900		
14	2 100	2 000	1 800	460	440	410	1 100	3 100	2 900	2 700		
15	2 000	1 800	1 700	440	410	380	1 000	2 900	2 700	2 600		
16	1 800	1 700	1 600	410	380	360	940	2 700	2 600	2 400		
17	1 700	1 600	1 500	380	360	340	880	2 600	2 400	2 300		
18	1 600	1 500	1 400	360	340	320	830	2 400	2 300	2 100		
19	–	–	1 400	–	–	310	790	–	–	2 000		
20		1 300	1 300		300	280	750		2 000	1 900		
21		–	1 200		–	–	710		–	1 800		
22			1 100			250	680			1 700		
24			1 100			240	630			1 600		
26			1 000			220	580			1 500		
28			910			200	540			1 400		

[Remarks] 1. Allowable rotational speed of the units with covers is 80% of the value shown in the table above.

2. If a bearing unit is used with excessively loose fitting, allowable rotational speed must be corrected by multiplying it by the fitting factor  $f_c$  shown in **Table 6.2**.



## 7 Operating temperature and bearing specifications

### 6.2 Correction of allowable rotational speed by fitting

For easier installation of a ball bearing unit to a shaft, clearance fit is used for a bearing inner ring and shaft, in general. Size of fitting clearance between the bearing inner ring and the shaft is related to the allowable rotational speed of the bearing unit. As the rotational speed is increased, the fitting clearance between the bearing inner ring and the shaft should be decreased.

**Table 6.2** shows the fitting factors to correct the allowable rotational speed depending on the types of fitting of the bearing inner ring to the shaft.

As for the bearings with set screws, allowable rotational speed must be corrected by multiplying the allowable rotational speed (standard value) by fitting factor, depending on the tolerance class of the shaft used. For the bearings with adapter, shafts of h8 or h9 tolerance class are recommended, while shafts of h5 or j5 tolerance class are recommended for the bearings with eccentric locking collar.

**Table 6.2 Fitting factor of ball bearing unit  $f_c$  (recommended)**

Type of ball bearing unit	Fitting factor $f_c$					
	Shaft tolerance class					
	h5, j5	j6	h6	h7	h8	h9
<b>With set screw</b>						
Standard type	–	1.0	1.0	0.8	0.5	0.2
Triple-lip seal type (Supplementary code L3)	–	–	–	1.0	1.0	0.9
Heat resistant type (Special code D1K2)	–	–	–	1.0	1.0	0.7
Cold resistant type (Special code D2K2)	–	–	–	1.0	1.0	0.7
For high speed (Special code K3)	–	1.0	0.8	0.6	–	–
For blower (Special code S5)	1.0	–	0.8	0.6	–	–
<b>With adapter</b>	–	–	–	–	1.0	1.0
<b>With eccentric locking collar</b>	1.0	–	–	–	–	–

### 7.1 Operating temperature range

Operating temperature range of a ball bearing unit depends on the type of grease used for the bearing, oil seal rubber material, and the internal clearance of the bearing.

Koyo Ball Bearing Units are available in heat resistant unit (special code : D1K2) and cold resistant unit (special code : D2K2) series, as well as standard types, to allow selection optimal for the operating temperature (see **Table 2.3**).

Even though the bearing unit suitable for temperature is used, grease must be fed in accordance with the specified standards, since grease life greatly depends on temperature.

### 7.2 Operating temperature and internal clearance of bearing

If the temperature of transmission heat to the shaft is high or hot steam enters the hollow bore of the shaft, difference between the temperatures of the bearing inner and outer rings is increased and the internal clearance of the bearing is decreased, leading to breakage at early stages of the bearing service life.

Decrease in the internal clearance of the bearing depending on the difference in the temperatures of the bearing inner ring and the bearing outer ring can be found by **Formula (7.1)**.

Under these conditions, decrease in the internal clearance must be calculated, and the internal clearance of bearing needs to be selected properly.

$$S_{t1} = \alpha \cdot D_e \cdot \Delta t \quad \text{..... (7.1)}$$

Whereas,

$S_{t1}$  : Decrease in the internal clearance of bearing depending on the difference in the temperatures of the bearing inner ring and the bearing outer ring mm

$\alpha$  : Line expansion factor of bearing steel  $12.5 \times 10^{-6}$

$D_e$  : Raceway dia. of bearing outer ring mm  
 Diameter series 2, X .....  $D_e \doteq 0.92 D$   
 Diameter series 3 .....  $D_e \doteq 0.9 D$

$D$  : Nominal bearing outer dia. mm

$\Delta t$  : Difference in temperatures of bearing inner ring and outer ring °C

If a ball bearing unit is used at a high temperature, abnormal axial load may be applied to the bearing due to axial extension of the shaft caused by high temperature, leading to breakage at early stages of the bearing service life. This fact must be taken into consideration, as well as the internal clearance of the bearing for use of the bearing at a high temperature.

The shaft of free side unit or the unit needs to be able to be moved axially, as the countermeasure against this problem.

(See “9 Design of shaft and base”)

## 8 Strength of housing

The housing for Koyo Ball Bearing Unit reliably withstands use under standard operating conditions, because of selection of good material and the highly tough design suitable to the load capacity of the bearing. However, if a great or impact loads occurs at a low rotational speed, strength of the bearing must be examined in advance, for the purpose safety is especially required.

Although the form of the housing is designed so that it is applicable to various purposes, destruction strength varies depending on the direction of load. Therefore, mounting direction of the bearing unit must be fully examined, as well as the strength of the housing.

At this time, setting of fixing device to support the housing is required depending on the direction or level of load.

Rigidity of the base and flatness of the mounting surface give influence on the strength of the housing. Note that the load applied to the ball bearing unit is recommended to be basically examined by the calculation result of bearing life even if the strength of the housing is satisfied.

### 8.1 Strength of cast iron housing

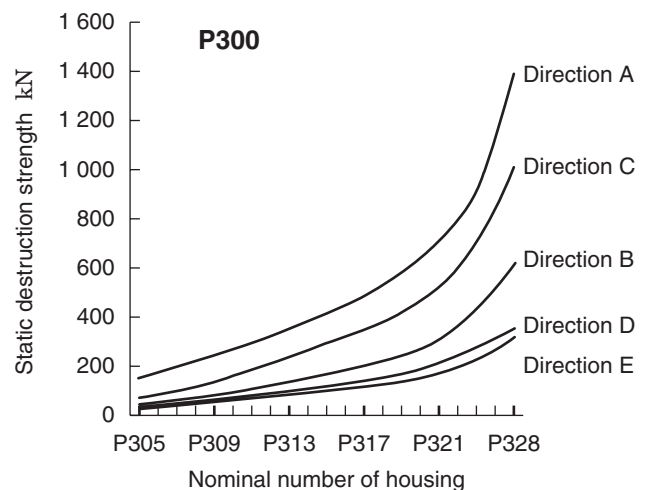
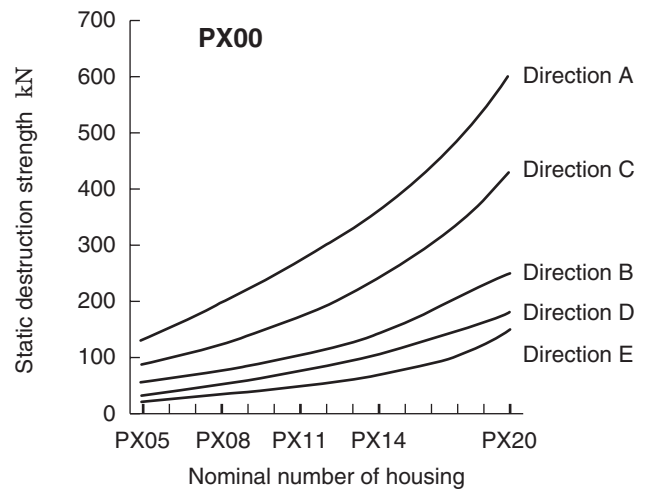
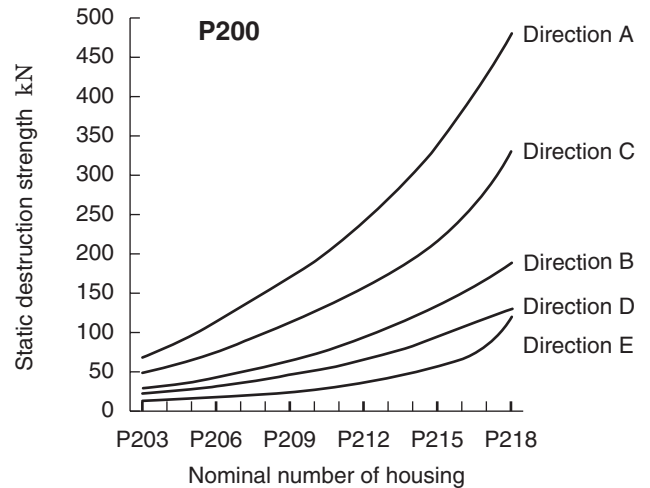
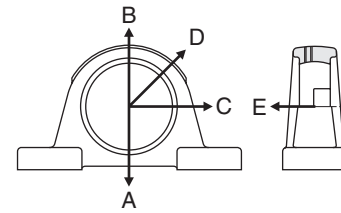
Though gray cast iron has many superior features as machine parts material, it is fragile against impact load. Therefore, prior to use of it, level, direction, and property of load applied to it must be fully examined.

Allowable load of gray cast iron housing can be found by using static destruction strength of the housing, taking safety factor into consideration.

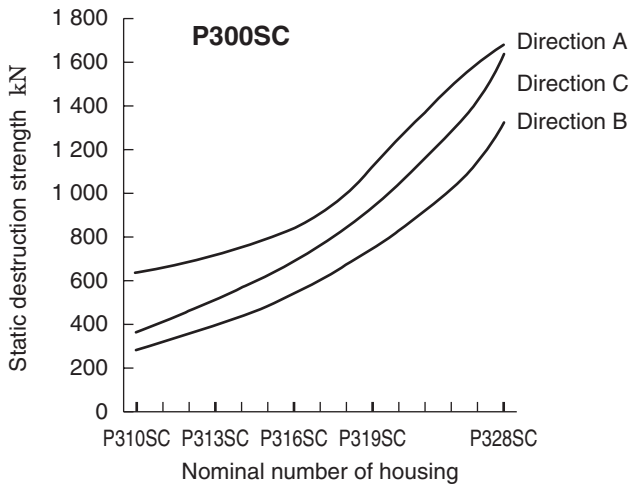
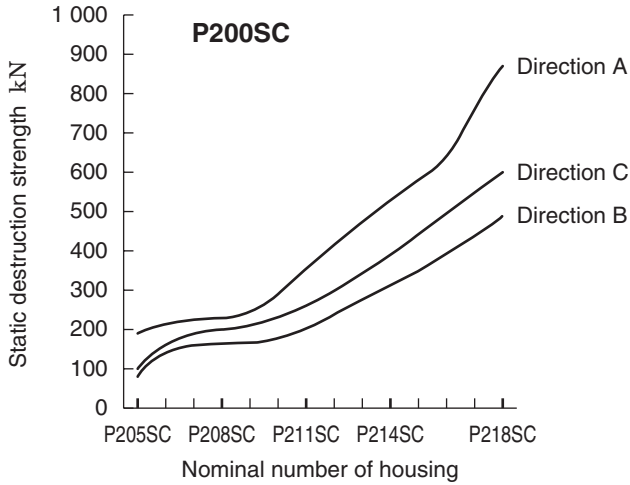
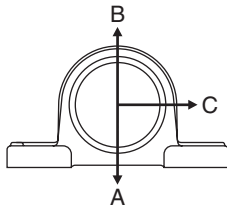
Table 8.1 shows the safety factor of gray cast iron products against load, and Fig. 8.1 to Fig. 8.8 show the outline values of static destruction strength of pillow block type, flanged type and take-up type housings.

**Table 8.1 Safety factor of gray cast iron products (recommended)**

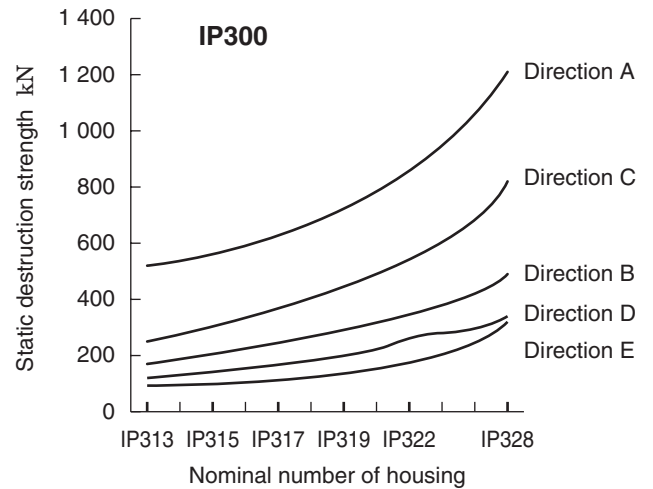
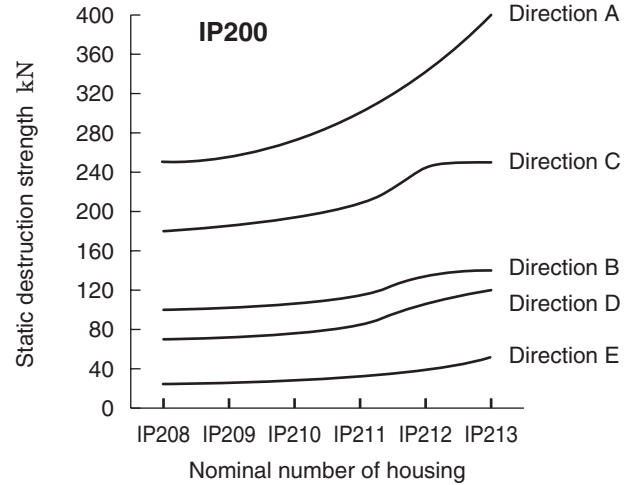
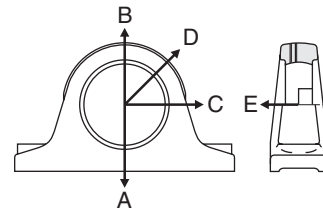
Property of load	Safety factor of gray cast iron
Static load	4
With vibration	10
With impact	15



**Fig. 8.1 Static destruction strength of pillow block type housing (P)**



**Fig. 8.2** Static destruction strength of cast steel pillow block type housing (Psc)



**Fig. 8.3** Static destruction strength of thick section pillow block type housing (IP)

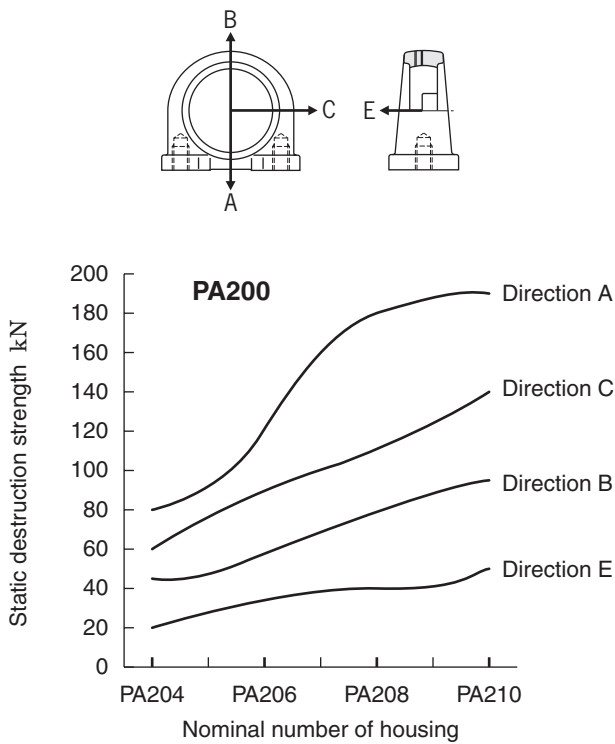


Fig. 8.4 Static destruction strength of tapped-base pillow block type housing (PA)

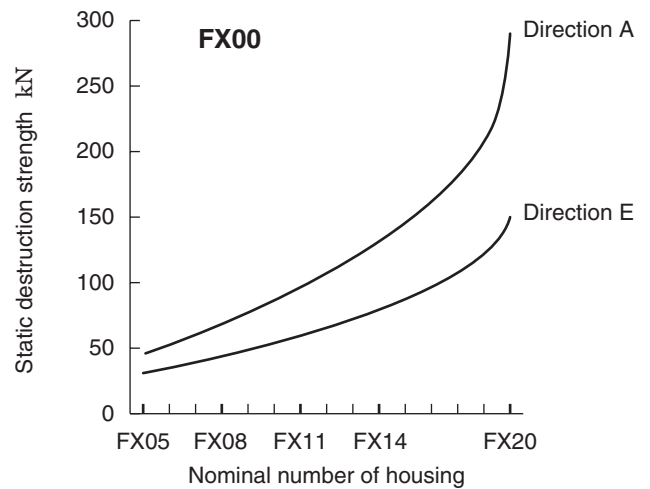
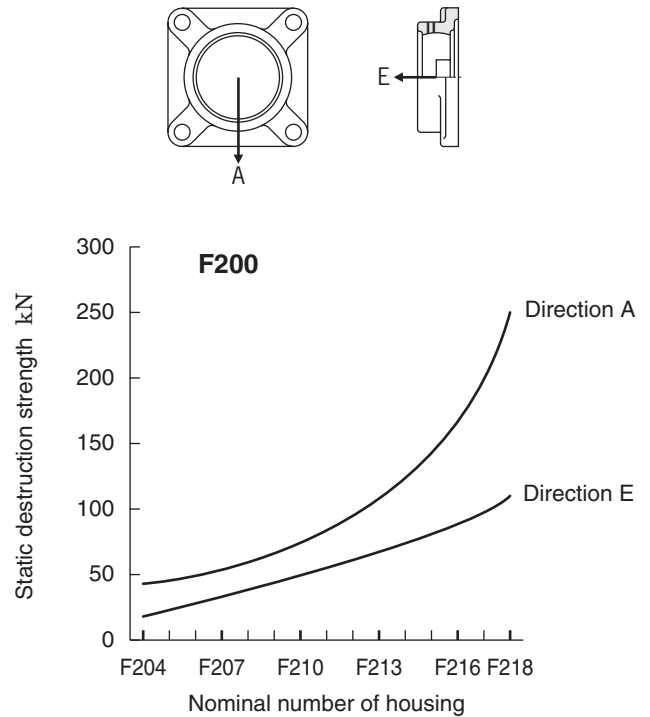


Fig. 8.6 Static destruction strength of square-flanged type housing (F)

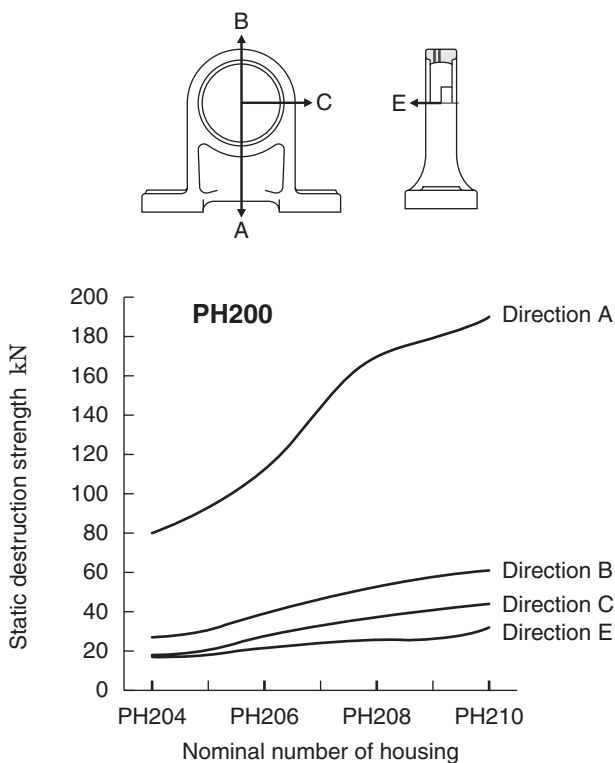
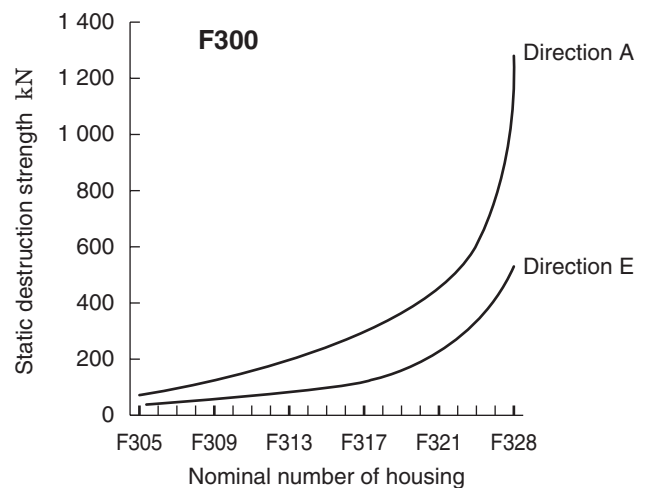
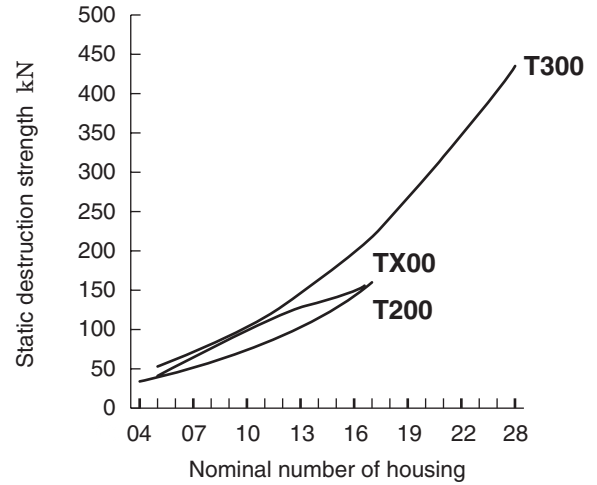
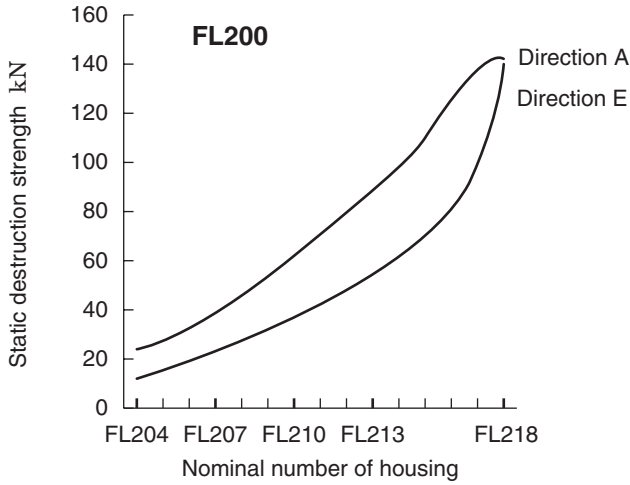
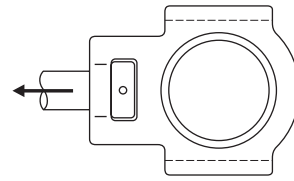
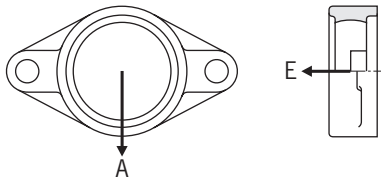
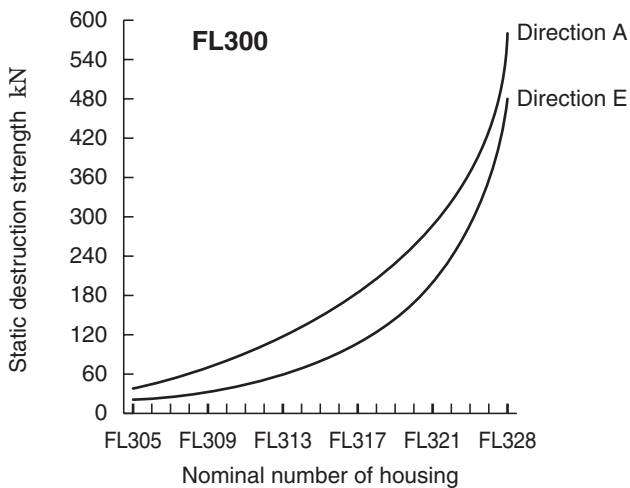
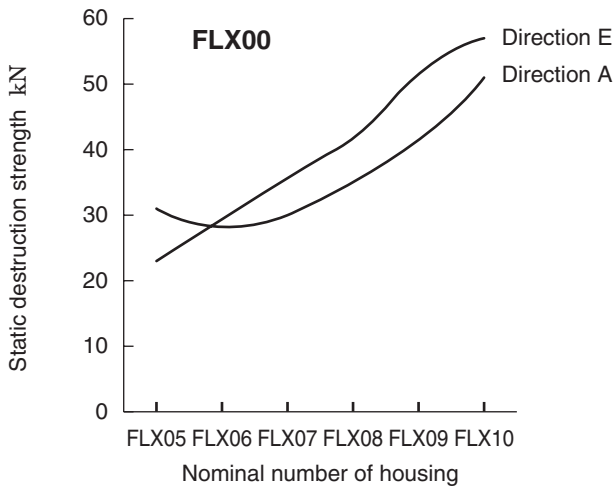


Fig. 8.5 Static destruction strength of higher centerheight pillow block type housing (PH)





**Fig. 8.8** Static destruction strength of take-up type housing (T)



**Fig. 8.7** Static destruction strength of rhombic-flanged type housing (FL)

8.2 Strength of cast steel housing

If highly strong housing for ball bearing unit is needed, select the cast steel housing with high destruction strength and superior resistance against impact.

JTEKT supplies the cast steel pillow block type housing (P200sc, P300sc) series.

To find the allowable load of a cast steel housing, use the static destruction strength of a housing, taking safety factor into consideration.

Table 8.2 shows the safety factors for the load of cast steel products, and Fig. 8.2 shows the outline values of the static destruction strength of a cast steel pillow block type housing.

Table 8.2 Safety factor of cast steel products (recommended)

Property of load	Safety factor of cast steel product
Static load	3
With vibration	5
With impact	10

8.3 Strength of steel housing

The precisely pressed steel housing is highly rigid, but great deformation occurs when load is applied until it is broken. Thus, allowable load of the pressed steel housing must be the value deformation of the housing caused by load does not influence on actual use.

Table 8.3 shows the allowable load of the pressed steel housing.

Table 8.3 Allowable load of pressed steel housing (recommended)

Load direction	Allowable load of pressed steel housing
Radial	Approx. 1/6 of basic dynamic radial load rating of bearing ( $C_r$ )
Axial	Approx. 1/18 of basic dynamic radial load rating of bearing ( $C_r$ )

8.4 Strength of stainless steel housing

To find the allowable load of a stainless steel housing, use the static destruction strength of a housing, taking safety factor into consideration.

Table 8.4 shows the safety factors for stainless steel products. As for the basic values of the static destruction strength of SP200H1, SPA200H1, SF200H1, SFL200H1, ST200H1 type housings, apply P200 of Fig. 8.1, PA200 of Fig. 8.4, F200 of Fig. 8.6, FL200 of Fig. 8.7 and T200 of Fig. 8.8. For the basic values of the static destruction strength of the SP000 and SFL000 type housings, see P000 of Fig. 8.9 and FL000 of Fig. 8.10 and multiply them by 1.5 respectively.

Table 8.4 Safety factor of stainless steel products

Property of load	Safety factor of stainless steel products
Static load	3
With vibration	5
With impact	10

8.5 Strength of “compact” series housing

The “compact” series housing is made of zinc alloy die-cast, but great deformation occurs when load is applied until it is broken.

Table 8.5 shows safety factor for zinc alloy die-cast, and Fig. 8.9 and 8.10 show the outline values of the static destruction strength of the zinc alloy die-cast housing.

Table 8.5 Safety factor of zinc alloy die-cast products

Property of load	Safety factor of die-cast products
Static load	8
With vibration	15
With impact	20

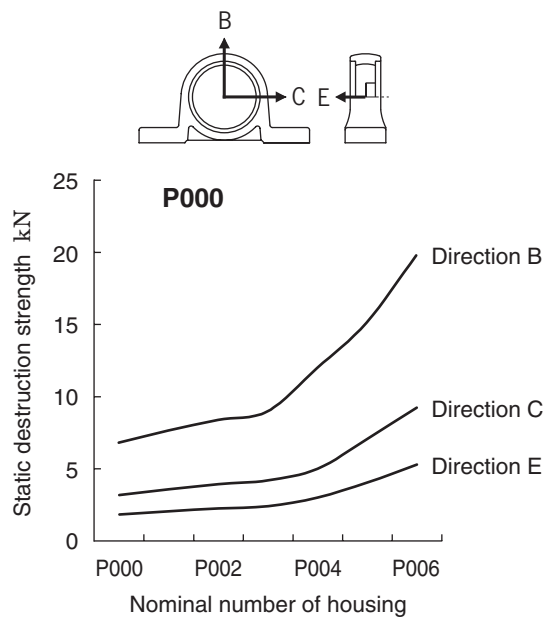


Fig. 8.9 Static destruction strength of “compact” housing (P)

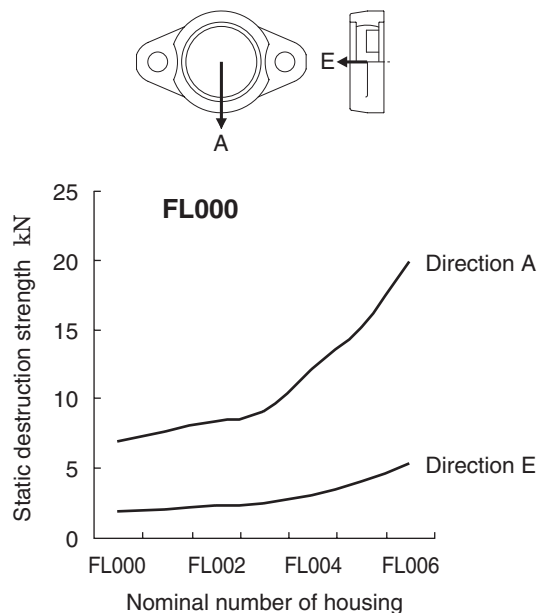


Fig. 8.10 Static destruction strength of “compact” housing (FL)

## 9 Design of shaft and base

### 9.1 Design of shaft

For intrinsic performance of a ball bearing unit and maintenance of it for a long time, selection of the shaft optimal for operating conditions is important. Use the shaft with enough rigidity but free from bend, scratch, or burr.

#### 9.1.1 Tolerance of shaft

##### (1) Tolerance of shaft used for cylindrical bore bearing with set screws

For the cylindrical bore bearing with set screws, use the shaft of the tolerance class leading to relatively loose fitting to simplify the mounting procedures. The fitting clearance between the bearing inner ring and the shaft should be decreased as the rotational speed of the shaft

is increased.

**Table 9.1** shows the guideline for the tolerance class of the rotational speed of the cylindrical bore bearing with set screws and the shaft used.

If the cylindrical bore bearing with set screws is exposed to heavy load ( $P_r/C_r > 0.12$ ), vibration, or impact, use shaft of the tolerance class leading to relatively tight fitting to prevent creep or fretting to be occurred to the fitting surface of the bearing inner ring and the shaft.

To use tight fitting of the cylindrical bore bearing with set screws, see **Table 9.2** showing the guideline for the tolerance class of the shaft used.

**Table 9.3** shows the recommended deviation from circular and cylindrical forms of the shaft used.

**Table 9.1 Tolerance of shaft used for cylindrical bore bearing with set screws (recommended) (clearance fitting or transition fitting)**

Unit :  $\mu\text{m}$

Shaft diameter (mm)		Tolerance of shaft							
		j6		h6		h7		h8	
over	up to	upper	lower	upper	lower	upper	lower	upper	lower
6	10	+ 7	- 2	0	- 9	0	-15	0	-22
10	18	+ 8	- 3	0	-11	0	-18	0	-27
18	30	+ 9	- 4	0	-13	0	-21	0	-33
30	50	+11	- 5	0	-16	0	-25	0	-39
50	80	+12	- 7	0	-19	0	-30	0	-46
80	120	+13	- 9	0	-22	0	-35	0	-54
120	180	+14	-11	0	-25	0	-40	0	-63
<b>Applicable rotational speed <math>dn^{1)}</math></b>		Over 120 000		Over 100 000, up to 120 000		Over 60 000, up to 100 000		up to 60 000	

Note 1)  $dn = d$  (bearing bore, mm)  $\times n$  (rotational speed,  $\text{min}^{-1}$ )

**Table 9.2 Tolerance of shaft used for cylindrical bore bearing with set screws (recommended) (transition fitting or interference fitting)**

Unit :  $\mu\text{m}$

Shaft diameter (mm)		Tolerance of shaft					
		k6		k7		m6	
over	up to	upper	lower	upper	lower	upper	lower
6	10	+10	+1	+16	+1	+15	+ 6
10	18	+12	+1	+19	+1	+18	+ 7
18	30	+15	+2	+23	+2	+21	+ 8
30	50	+18	+2	+27	+2	+25	+ 9
50	80	+21	+2	+32	+2	+30	+11
80	120	+25	+3	+38	+3	+35	+13
120	180	+28	+3	+43	+3	+40	+15

**Table 9.3 Tolerance of shaft used for ball bearing units (recommended)**

Unit :  $\mu\text{m}$

Shaft diameter (mm)		Deviation from circular and cylindrical forms
6	10	6
10	18	8
18	30	9
30	50	11
50	80	13
80	120	15
120	180	18



**(2) Tolerance of shaft used for bearing for blower (cylindrical bore with set screws)**

In the bearing for blower (special code S5), smaller internal clearance of bearing (C2) and once-class-higher bearing tolerance reduce vibration and noise during high-speed rotation.

Therefore, use of the shaft in the tolerance class shown in **Table 9.4** as the bearing for blower (cylindrical bore with set screws) used is recommended.

**Table 9.4 Tolerance of shaft used for bearing for blower (cylindrical bore with set screws) (recommended)**

Unit :  $\mu\text{m}$

Shaft diameter (mm)		Tolerance of shaft			
		h5		j5	
over	up to	upper	lower	upper	lower
10	18	0	- 8	+5	- 3
18	30	0	- 9	+5	- 4
30	50	0	-11	+6	- 5
50	80	0	-13	+6	- 7
80	120	0	-15	+6	- 9
120	180	0	-18	+7	-11

**(3) Tolerance of shaft used for tapered bore bearing (with adapter)**

Since the tapered bore bearing is fixed to a shaft with the adapter, the shaft in the tolerance class allowing relatively loose fitting should be selected, for easier mounting.

**Table 9.5** shows the tolerance of shaft used for the tapered bore bearing (with adapter).

**Table 9.5 Tolerance of shaft used for tapered bore bearing (with adapter) (recommended)**

Unit :  $\mu\text{m}$

Shaft diameter (mm)		Tolerance of shaft			
		h8		h9	
over	up to	upper	lower	upper	lower
18	30	0	-33	0	- 52
30	50	0	-39	0	- 62
50	80	0	-46	0	- 74
80	120	0	-54	0	- 87
120	180	0	-63	0	-100

**(4) Tolerance of shaft used for cylindrical bore bearing with eccentric locking collar**

As for the cylindrical bore bearing with eccentric locking collar, if the fitting clearance between the bearing inner ring and the shaft is great, the shaft may be installed with being tilted because of its structure.

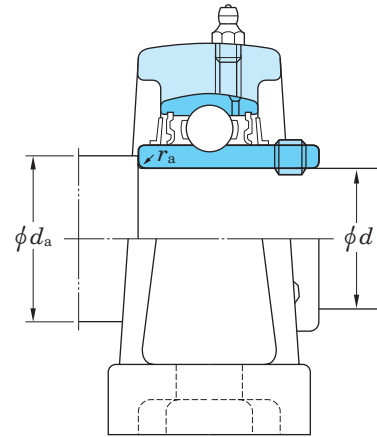
Therefore, for cylindrical bore bearing with eccentric locking collar, use of the shaft in the same tolerance class (h5 or j5) as that used with the bearing for blower (special code S5) is recommended (see **Table 9.4**).

**9.1.2 Dimensions of shouldered shaft**

When using the cylindrical bore bearing in the environment exposed to a great axial load, excessive vibration, or impact, adopt the shouldered shaft, and tighten the bearing inner ring with the nut.

**Table 9.6** shows the shoulder diameter and the fillet radius of the shouldered shaft.

**Table 9.6 Shoulder diameter and fillet radius of shouldered shaft (recommended)**



Unit : mm

Bore dia. No.	Nominal bearing bore dia. $d$	UC200, UCX00		UC300	
		Shoulder dia. $d_a$	Fillet radius $r_a$ (max.)	Shoulder dia. $d_a$	Fillet radius $r_a$ (max.)
01	12	17	0.6		
02	15	20	0.6		
03	17	22	0.6		
04	20	30	1	-	-
05	25	35	1	35	1
06	30	40	1	40	1
07	35	45	1	45	1.5
08	40	50	1	50	1.5
09	45	55	1	55	1.5
10	50	60	1	60	2
11	55	65	1.5	65	2
12	60	70	1.5	75	2
13	65	75	1.5	80	2
14	70	80	1.5	85	2
15	75	85	1.5	90	2
16	80	90	2	95	2
17	85	95	2	100	2.5
18	90	100	2	105	2.5
19	95	-	-	110	2.5
20	100	115	2	115	2.5
21	105	-	-	120	2.5
22	110			125	2.5
24	120			135	2.5
26	130			150	3
28	140			160	3

### 9.1.3 Countermeasures against heat

In general, two or more ball bearing units are used for a shaft. If installation distance for the ball bearings is small or expansion and contraction of the shaft due to temperature are a little, install each of the bearing unit to the fixed side.

However, if installation distance is great and the shaft is exposed to heat, the shaft to be installed should be positioned with a bearing unit to be on the fixed side, and another bearing unit should be installed with it to be on the free side.

Because, if the shaft is exposed to heat, it is expanded in the axial direction, leading to a great axial load to the bearing, and it causes premature breakage of the bearing. Therefore, expansion of the shaft is absorbed by the bearing unit on the free side.

**Formula (9.1)** shows the relation of temperature increase to expansion of the shaft.

$$\Delta l = \alpha \cdot \Delta t \cdot l \dots\dots\dots (9.1)$$

Whereas,

$\Delta l$ : Expansion of shaft	mm
$\alpha$ : Linear expansion coefficient of shaft	
in the case of standard steel	11~12 × 10 <sup>-6</sup>
$\Delta t$ : Temperature increase	°C
$l$ : Installation distance of unit	mm

Countermeasures against great expansion of shaft as a result of exposure to heat are shown below.

#### (1) Installation with full dog point set screw on the free side

If the shaft is exposed to heat and expanded in axial direction, the bearing unit must be installed so that it or the shaft can freely move in axial direction.

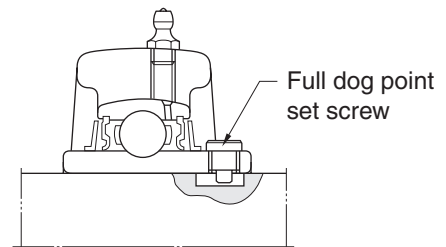
If the rotational speed is relatively slow, provide the shaft with key groove, attach the full dog point set screw (special code G6) to the bearing, and use it as the free side unit. Fit the tip on the dog point of the set screw to the key groove on the shaft to guide the move of the shaft in axial direction.

**Fig. 9.1** shows the structure example of bearing unit with key groove on shaft and full dog point set screw and use as free side unit. **Table 9.7** shows the dimensions of key groove for the full dog point set screw.

If a bearing unit is used as the free side bearing unit by adopting this method, h7 is recommended as the tolerance class of the shaft to be used.

If temperature of the shaft is higher than that in the bearing, the shaft in the tolerance class allowing a greater fitting clearance must be used.

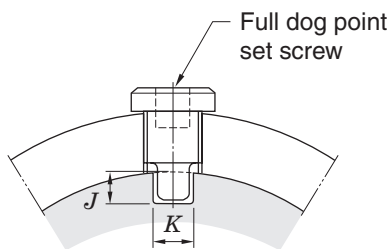
If a bearing unit is used as the free side unit by adopting the above method, fretting corrosion may occur to the fitting surface between the bearing inner ring and the shaft. In order to prevent fretting corrosion, application of grease onto the bore surface of the bearing when the bearing unit is installed.



**Fig. 9.1** Use on free side with full dog point set screw

**Table 9.7** Dimensions of key groove for full dog point set screw (use on free side)

Nominal size of set screw	Dimensions of key groove (mm)		Applicable nominal bearing number		
	J	K (Min.)	UC200	UCX00	UC300
M6 × 0.75	5	4	201~206	X05	305, 306
M8 × 1	6	6	207~209	X06~X08	307
M10 × 1.25	6.5	7	210~212	X09~X11	308, 309
M12 × 1.5	7	9	213~218	X12~X17	310~314
M14 × 1.5	7	10		X18	315, 316
M16 × 1.5	8	12		X20	317~319
M18 × 1.5	8	13			320~324
M20 × 1.5	8	15			326, 328



Allowable tolerance of key groove dimension "K" (Recommended value : 0~+0.2)

(2) Use of cartridge type unit on free side

In the environment the rotational speed is relatively high or the bearing unit is exposed to vibration, use of the cartridge type unit as the free side unit and move of the bearing unit between the mounting bore on a machine and the outside surface of the housing in axial direction are recommended.

Fig. 9.2 shows the example of structure of the cartridge type unit as the free side unit.

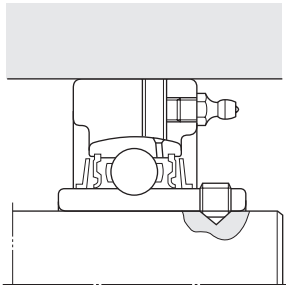


Fig. 9.2 Use of cartridge type unit on free side

If a ball bearing unit is exposed to heat, countermeasures against expansion of the shaft in axial direction as well as calculation of decrease in the internal clearance of the bearing to select the internal clearance of the bearing appropriately (see “7 Operating temperature and bearing specifications”).

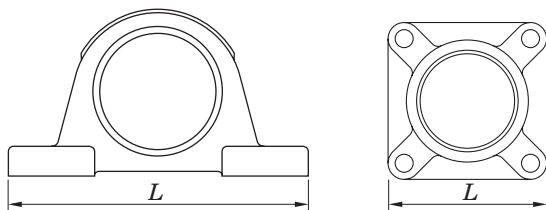
9.2 Design of base

9.2.1 Rigidity of base and flatness of mounting surface

If rigidity of the base that a ball bearing unit is to be installed is low or the flatness of the mounting surface is poor, vibration or abnormal noise may occur to the bearing unit during operation, leading to premature breakage or lower strength of the housing.

Therefore, the base that the ball bearing unit is to be installed must have enough rigidity, and the mounting surface must be finished with accuracy allowing elimination of deformation on the bearing or housing.

Fig. 9.3 shows the recommended values for flatness of the mounting surface of the base that the ball bearing unit is to be installed.



Max. :  $L / 1\,000$  mm

Fig. 9.3 Flatness of mounting surface of base (recommended)

9.2.2 Mounting bore of cartridge type unit

The cartridge type unit is directly fit to the cylindrical bore of the base.

Under the standard operating conditions, select H7 as the tolerance class of cylindrical hole on the base that the cartridge type unit is to be installed. For such purposes that the shaft and the bearing inner ring are hot, select G7 as the tolerance class of cylindrical bore on the base.

In the environment the bearing unit is exposed to vibration or impact, selection of the tolerance class allowing smaller fitting clearance between the cylindrical bore of the base and the bearing unit is recommended.

Table 9.8 shows the tolerance of cylindrical bore of the base that the cartridge type unit is to be installed.

Table 9.8 Tolerance of cylindrical bore for mounting cartridge type unit (recommended)

Unit :  $\mu\text{m}$

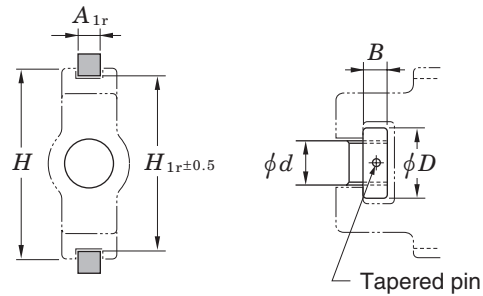
Nominal bore dia. of cylindrical bore (mm)		Tolerance of cylindrical bore			
		H7		G7	
over	up to	upper	lower	upper	lower
50	80	+30	0	+40	+10
80	120	+35	0	+47	+12
120	180	+40	0	+54	+14
180	250	+46	0	+61	+15
250	315	+52	0	+69	+17
315	400	+57	0	+75	+18

9.2.3 Dimensions relative to installation of take-up type unit

The take-up type unit is incorporated between the two guide rails on the base side, and enables adjustment of the support position with the shaft center by the adjuster bolt.

Table 9.9 shows the dimensions of the guide rail, adjuster bolt, and round nut to install the take-up type unit to the base.

**Table 9.9** Dimensions relative to installation of take-up type unit (recommended)



Unit : mm

Nominal housing No.	Dimensions of guide rail			Dimensions of adjuster bolt and round nut		
	$A_{1r}$	$H_{1r}$	$H$ (Reference)	$d$	$D$	$B$
T204 T205	11	77	89	16	28	14
T206 T207	11	90	102	18	32	14
T208	15	103	114	24	42	16
T209 T210	15	103	117	24	42	16
T211 T212	20	131	146	30	55	20 27
T213 T214 T215	24	152	167	36	60	27
T216	24	166	184	36	60	27
T217	28	174	198	42	60	30
TX05 TX06	11	90	102	18	32	14
TX07	15	103	114	24	42	16
TX08 TX09	15	103	117	24	42	16
TX10 TX11	20	131	146	30	55	20 27
TX12 TX13 TX14	24	152	167	36	60	27
TX15	26	166	184	36	60	27
TX16 TX17	26	174	198	42	60	30

Unit : mm

Nominal housing No.	Dimensions of guide rail			Dimensions of adjuster bolt and round nut		
	$A_{1r}$	$H_{1r}$	$H$ (Reference)	$d$	$D$	$B$
T305	11	81	89	22	32	12
T306 T307	15	91 101	100 111	24 26	36 40	14
T308 T309	16	113 126	124 138	28 30	45 50	16 18
T310	18	141	151	32	55	20
T311 T312	20	151 161	163 178	34 36	60 65	22 24
T313 T314 T315	24	171 181 193	190 202 216	38 40 40	65 80 80	26 28 28
T316	28	205	230	46	90	34
T317 T318	30	216 230	240 255	46 50	90 95	34 38
T319	32	242	270	50	95	38
T320 T321	32	262	290	52	100	40
T322	36	287	320	55	110	44
T324	42	322	355	60	120	50
T326 T328	47	352 382	385 415	65 70	130 140	55 60

### 9.3 Machining dimensions of holes for housing dowel pins

The pillow block type, square-flanged type, and rhombic-flanged type housing have the dowel pin seat. If accurate positioning of the housing is required, install it with the dowel pin.

As for the position of the pin for fixing the housing and pin diameter, see the **Appendix 5** at the end of this catalogue.

## 10 Unit number

Nominal number of Koyo Ball Bearing Unit conform to JIS B1557, and comprise the bearing unit type number (comprising bearing type code and housing type code),

diameter series code, bore dia. number, supplementary code, and special code.

**UC P 207 J L3**

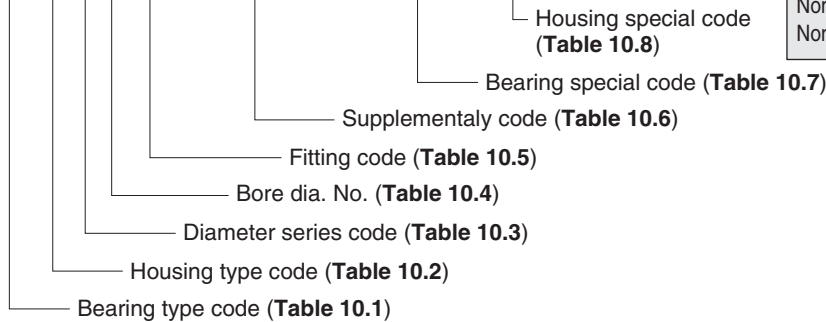
Nominal bearing number	UC207L3
Nominal housing number	P207J

**UK P 209 J CD + H309X**

Nominal bearing number	UK209+H309X
Nominal housing number	P209JE1
Nominal pressed steel cover number	(Through type) C-9x40 (Closed type) D-9

**UC F 209 J L3 FD D1K2 G6 A1**

Nominal bearing number	UC209L3D1K2G6
Nominal housing number	F209JA1E3
Nominal cast iron cover number	(Closed type) 209FD



[Remark] The above number shows an example of nominal number structure. It may depend on the bearing unit type.

**Table 10.1 Bearing type code**

Bearing type code	Details
UC	Cylindrical bore, with set screws
UC-S6	Cylindrical bore, with set screws (stainless-series)
UK	Tapered bore (for adapter)
NA	Cylindrical bore, with eccentric locking collar
SB	Cylindrical bore, with set screws (light duty type)
SU	Cylindrical bore, with set screws ("compact" series)
SU-S6	Cylindrical bore, with set screws (stainless-series)
ER	Cylindrical bore, with set screws, cylindrical outer diameter, Lubricating mechanism
RB	Cylindrical bore, with set screws, cylindrical outer diameter

**Table 10.2 Housing type code (continued)**

Housing type code	Details
SP	Pillow block type (stainless-series)
PP	Cast steel pillow block type
F	Square-flanged type
FL	Rhombic-flanged type
FA	Adjustable rhombic-flanged type
FB	Three-bolt flange type
FC	Round-flanged type with spigot joint
FS	Square-flanged type
FL	Rhombic-flanged type ("compact" series)
SF-H1	Square-flanged type (stainless-series)
SFL-H1	Rhombic-flanged type (stainless-series)
SFL	Rhombic-flanged type (stainless-series)
PF	Pressed steel round-flanged type
PFL	Pressed steel rhombic-flanged type
T	Take-up type
ST-H1	Take-up type (stainless-series)
TH	Section steel frame take-up type
TL	Light channel steel frame take-up type
TU	Channel steel frame take-up type
PTH	Pressed steel frame take-up type
NPTH	Pressed steel frame take-up type
C	Cartridge type
HA	Hanger type

**Table 10.2 Housing type code**

Housing type code	Details
P	Pillow block type
P-SC	Cast steel pillow block type
IP	Thick section pillow block type
PA	Tapped-base pillow block type
PH	Higher centerheight pillow block type
LP	Light duty pillow block type
P	Pillow block type ("compact" series)
SP-H1	Pillow block type (stainless-series)
SPA-H1	Tapped-base pillow (stainless-series)

**Table 10.3 Diameter series code**

Diameter series code	Details
0	For light duty
2	For medium duty
X	For medium duty
3	For heavy duty

**Table 10.4 Bore dia. number**

Bore dia. No.	Details
8	Nominal bearing bore dia. 8 mm
00	Nominal bearing bore dia. 10 mm
01	Nominal bearing bore dia. 12 mm
02	Nominal bearing bore dia. 15 mm
03	Nominal bearing bore dia. 17 mm
04 or more	(Bore dia. No.) × 5 = Nominal bearing bore dia. (mm)
01-8	– (bore dia. No.) /16 = nominal bearing bore dia. (inch) (in this case, 8/16 = 1/2 inch = 12.7 mm)

**Table 10.5 Fitting code**

Fitting code	Details
J	Tolerance class of spherical bore of the housing is J7 (not shown on the bearing that the spherical bore diameter exceeds 120 mm)
H	Tolerance class of spherical bore of the housing is H7
K	Tolerance class of spherical bore of the housing is K7

**Table 10.6 Supplementary code**

Supplementary code	Details
C <sup>1)</sup>	Cover, open type
D <sup>1)</sup>	Cover, closed type
FC	Cast iron cover, open type
FD	Cast iron cover, closed type
L3	Triple-lip seal type

Note 1) Standard specifications of codes C and D are as shown below.

201-218, X05-X17 .....Pressed steel cover

X18-X20, 305-328 .....Cast iron cover

**Table 10.7 Bearing special code**

Item	Bearing special code	Details
Grease	None	Alvania No.2 or equivalents
	D1	SH44M
	D2	SH33M
	D9	Demnum L-200
Set Screw	None	Bullet Point
	G4	Pointed tip
	G6	With full dog point
Oil seal	None	Nitrile rubber
	K2	Silicone rubber
	K3	Non-contact type
Sealing Device	None	With oil seal and flinger (slinger) (UC, UK, NA, ER and RB types) With oil seal (SB, SA and SU types)
	P3	Without oil seal, flinger (slinger)
	P4	Without oil seal
	Others	S5
S6		Stainless steel bearing

**Table 10.8 Housing special code**

Item	Housing special code	Details
Grease Nipple Thread Bore dia.	None	As shown in dimensional table
	A1	PT1/8 tube thread
	A2	PF1/8 tube thread
	A3	PT1/4 tube thread
	A4	PF1/4 tube thread
Grease Nipple Thread Bore Position	None	As shown in dimensional table
	B1	Right
	B2	Left
	B3	45°
	B5	30°
	B7	Both right and left
	Machining	None
E1		Pressed steel
E3		Cast iron cover mounting groove (diameter series 2, X, 3)
E4		Non-lubricating type
Material		None
	H1	Stainless steel cast steel model (SCS13)
	H5	Rolled steel for general purpose (SS400)
	SC	Carbon steel cast steel model (SC450)
	Grease Nipple	None
N1		B type (67.5°)
N2		C type (90°)



## 11 Tolerances and internal clearance

Tolerances of a ball bearing unit is specified in JIS B 1558 (ball bearing for ball bearing unit) and JIS B 1559 (housing for ball bearing unit). JTEKT produces products conforming to these standards.

### 11.1 Tolerances of bearing

Table 11.1 to Table 11.4 show the tolerance of a ball bearing for ball bearing unit.

Ball bearings for blower unit (special code S5) are produced with higher accuracy than standard types (see Table 11.3).

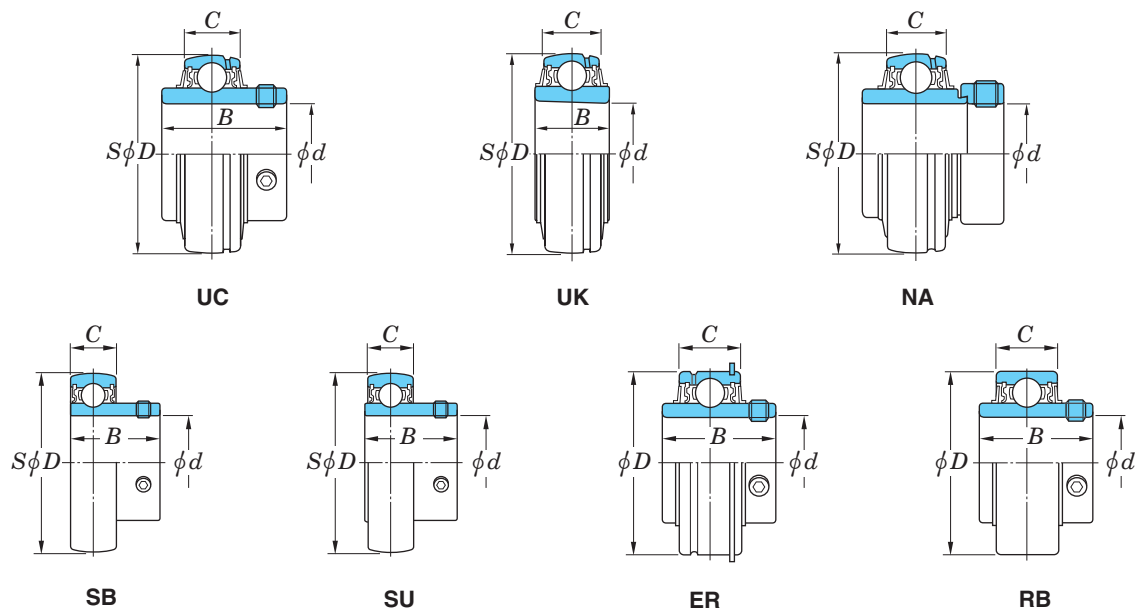
Table 11.5 shows the permissible values for chamfer dimensions of cylindrical bore bearing inner ring.

**Table 11.2 Tolerances and permissible values of outer ring of ball bearing for ball bearing unit**

Unit :  $\mu\text{m}$

Nominal bearing outer dia. $D$ (mm)		Mean outside diameter deviation $\Delta D_m$		Radial runout of assembled bearing outer ring $K_{ea}$
over	up to	upper	lower	max.
18	30	0	-9	15
30	50	0	-11	20
50	80	0	-13	25
80	120	0	-15	35
120	150	0	-18	40
150	180	0	-25	45
180	250	0	-30	50
250	315	0	-35	60

[Remark] Values in Italics are prescribed in JTEKT standards.



**Table 11.1 Tolerances and permissible values of inner rings of ball bearings for ball bearing units**

Unit :  $\mu\text{m}$

Nominal bearing bore dia. $d$ (mm)		Single plane mean bore diameter deviation $\Delta d_{mp}$		Single plane bore diameter variation $V_{dsp}$	eccentricity deviation of eccentric surface of inner ring and eccentric locking collar $\Delta H_s$		Single inner (outer) ring width deviation $\Delta B_s (\Delta C_s)$		Radial runout of assembled bearing inner ring $K_{ia}$
over	up to	upper	lower	max.	upper	lower	upper	lower	max.
-	10	+15	0	10	+100	-100	0	-120	10
10	18	+15	0	10	+100	-100	0	-120	15
18	31.75	+18	0	12	+100	-100	0	-120	18
31.75	50.8	+21	0	14	+100	-100	0	-120	20
50.8	80	+24	0	16	+100	-100	0	-150	25
80	120	+28	0	19	+100	-100	0	-200	30
120	180	+33	0	22	+100	-100	0	-250	35

[Remark] Values in Italics are prescribed in JTEKT standards.



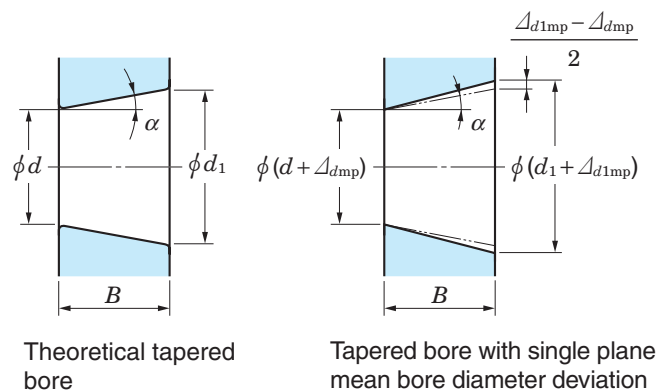
**Table 11.3 Tolerances and permissible values of inner ring of ball bearing for blower unit (S5)**

Unit :  $\mu\text{m}$

Nominal bearing bore dia. $d$ (mm)		Single plane mean bore diameter deviation $\Delta_{dmp}$		Single plane bore diameter variation $V_{dsp}$	Radial runout of assembled bearing inner ring $K_{ia}$
over	up to	upper	lower	max.	max.
10 <sup>1)</sup>	18	+13	0	6	7
18	31.75	+13	0	6	8
31.75	50.8	+13	0	10	10
50.8	80	+15	0	10	10
80	120	+18	0	14	13
120	180	+23	0	14	18

Note 1) 10 mm should be included in this category.

**Table 11.4 Tolerances and permissible values for tapered bore of bearing**



Theoretical tapered bore

Tapered bore with single plane mean bore diameter deviation

Unit :  $\mu\text{m}$

Nominal bearing bore dia. $d$ , mm		$\Delta_{dmp}$		$\Delta_{d1mp} - \Delta_{dmp}$		$V_{dsp}$ <sup>1)</sup>
over	up to	upper	lower	upper	lower	max.
18	30	+33	0	+21	0	13
30	50	+39	0	+25	0	16
50	80	+46	0	+30	0	19
80	120	+54	0	+35	0	22
120	180	+63	0	+40	0	40

Note 1) To be applied to all the radial planes of tapered bore

[Remarks] 1. Applicable range

Applicable to tapered bore of inner ring of tapered bore radial bearing that standard value of taper ratio is 1/12

2. Amount code

$d_1$  : Standard diameter at theoretical large end of tapered bore  $d_1 = d + \frac{1}{12} B$

$\Delta_{dmp}$  : Single plane mean bore diameter deviation at theoretical small end of tapered bore

$\Delta_{d1mp}$  : Single plane mean bore diameter deviation at theoretical large end of tapered bore

$V_{dsp}$  : Single plane bore diameter variation (a tolerance for the diameter variation given by a maximum value applying in any radial plane of the bore)

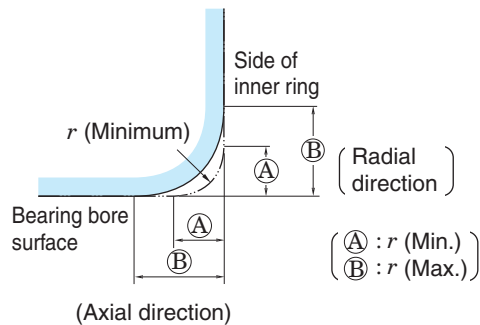
$B$  : Nominal inner ring width

$\alpha$  : 1/2 of nominal tapered angle of tapered bore

$$\begin{aligned} \alpha &= 2^\circ 23' 9.4'' \\ &= 2.38594^\circ \\ &= 0.041643 \text{ rad} \end{aligned}$$

# 11 Tolerances and internal clearance

**Table 11.5 Permissible values for chamfer dimensions of inner ring of bearing with cylindrical bore**



Unit : mm

$r$ (Min.)	$r$ (Max.)	
	Radial direction	Axial direction
0.6	1	2
1	1.5	3
1.1	2	3.5
1.5	2.3	4
2	3	4.5
2.1	4	6.5
2.5	3.8	6
3	5	8
4	6.5	9

[Remark] There shall be no specification for the accuracy of the shape of the chamfer surface, but its outline in the axial plane shall not be situated outside of the imaginary circle arc with a radius of  $r_{\min}$  or  $r_{1\min}$  which contacts the inner ring side face and bore, or the outer ring side face and outside surface.

## 11.2 Tolerances of housing

As the tolerance of the housing for a ball bearing unit, tolerance of the diameter of spherical bearing seat fit to the bearing, and tolerance and permissible value of dimensions relative to installation of the housing are specified.

Table 11.6 shows the tolerance of diameter of the spherical bearing seat of housing. Usually, select tolerance class J7 that allows transition fitting of the housing and the bearing.

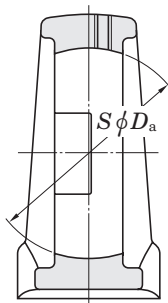
If priority should be given to operability in installation to a machine, select tolerance class H7 allowing clearance fitting. The unit conforming JIS of tolerance class H7 is equipped with the detent to the outer ring to prevent turning of the outer ring.

If rotating outer ring load occurs or the bearing is rotated while the shaft is stopped, select the tolerance K7 allowing interference fit.

Fig. 11.1 shows the representative example of dimensions relative to installation of the housing with tolerance and permissible value. Respective dimensional tables show the tolerance and permissible values of dimensions relative to installation of the housing.

**Table 11.6 Tolerances of spherical bearing seat diameter of housing**

Unit :  $\mu\text{m}$



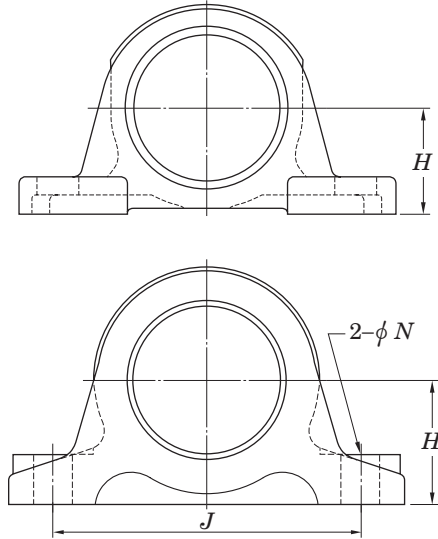
Nominal dia. of spherical bearing seat $D_a$ (mm)		Tolerance class H7		Tolerance class J7		Tolerance class K7	
		Deviation of spherical bearing seat dia. $\Delta D_{\text{am}}$		Deviation of spherical bearing seat dia. $\Delta D_{\text{am}}$		Deviation of spherical bearing seat dia. $\Delta D_{\text{am}}$	
over	up to	upper	lower	upper	lower	upper	lower
18	30	+21	0	+12	-9	+6	-15
30	50	+25	0	+14	-11	+7	-18
50	80	+30	0	+18	-12	+9	-21
80	120	+35	0	+22	-13	+10	-25
120	180	+40	0	+26	-14	+12	-28
180	250	+46	0	+30	-16	+13	-33
250	315	+52	0	+36	-16	+16	-36

[Remark] JTEKT generally applies class J to housing designs.

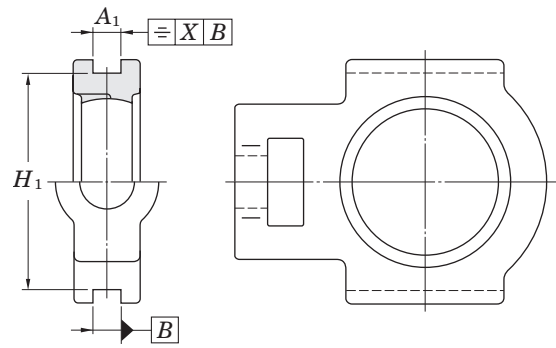
Class H and class K can also be applied depending on the application.

Fig. 11.1 Dimensions relative to installation of housing with tolerance and permissible value (representative example)

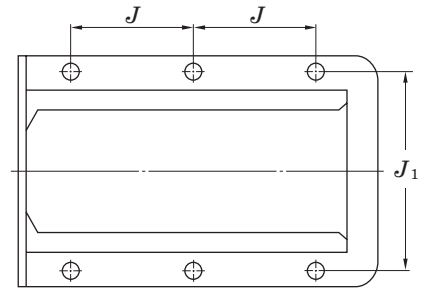
**Pillow block type housing**



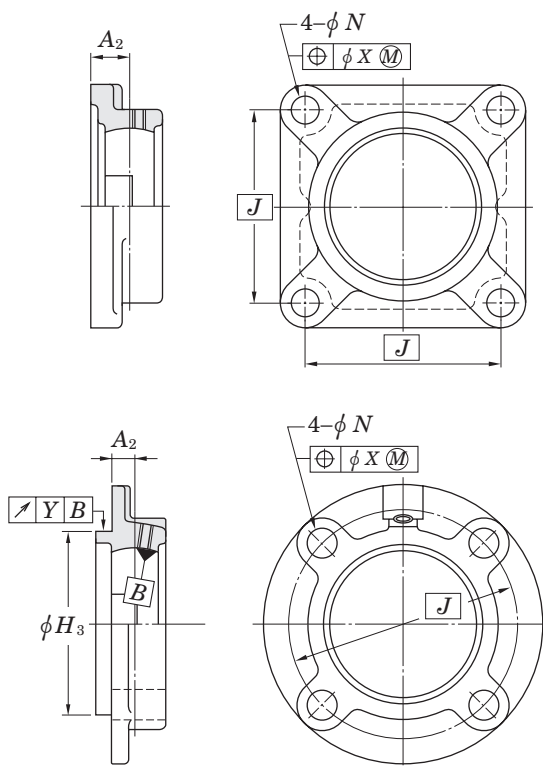
**Take-up type housing**



**Frame for take-up type unit**



**Flange type housing**



**Cartridge type housing**

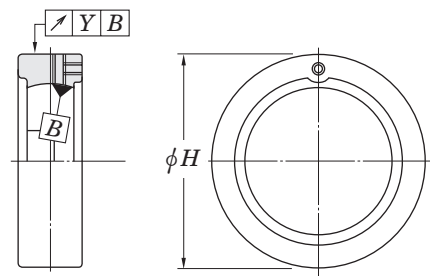


Table 11.7 shows standard tolerance of cut or cast portions not specified in this catalogue.

**Table 11.7 Standard tolerance not specified respectively**

Item	Standard No.	Class
Cutting	JIS B 0405	Medium
Casting of cast iron	JIS B 0403	Standard
Casting of cast steel	JIS B 0403	Standard

[Remark] Respective tolerances and permissible values for housing are shown in dimensional tables.

## 11 Tolerances and internal clearance

### 11.3 Bearing internal clearance

Ball bearing internal clearance for ball bearing unit is specified by the move at the time the inner ring or outer ring is moved in the radial direction (radial internal clearance). Value of internal clearance during operation (to be called operation clearance) gives a great influence on rolling fatigue life of the bearing, heat, noise, and vibration.

If the bearing inner ring is installed to the shaft with interference, the internal clearance of bearing must be fixed taking expansion of the bearing inner ring into consideration. If transmission heat to the shaft is high or hot steam runs through the hollow of the shaft, calculate the decrease of internal clearance, and appropriately select the internal clearance of bearing (see “7 Operating temperature and bearing specifications”).

Table 11.8 shows the internal clearance applicable to specifications of ball bearing for Koyo Ball Bearing Unit, and Table 11.9 shows the standard values of bearing internal clearance.

**Table 11.8 Internal clearance applicable to types of ball bearing for ball bearing unit**

Type	Applicable internal clearance	
	Bearing with cylindrical bore	Bearing with tapered bore
Standard type	CN	C3
Stainless steel type	C3	–
Heat resistant type (special code : D1K2)	C4	C5
Cold resistant type (special code : D2K2)	CN	C3
High speed type (special code : K3)	CN	C3
For blower (special code : S5)	C2	C3

[Remark] For the bearings that the internal clearance in this table is applied, no clearance code is indicated.

**Table 11.9 Standard values for internal clearance of ball bearing for ball bearing unit**

Unit :  $\mu\text{m}$

Nominal bearing bore dia. $d$ (mm)		Internal clearance											
		C2		CN		GN		C3		C4		C5	
over	up to	lower	upper	lower	upper	lower	upper	lower	upper	lower	upper	lower	upper
6	10	0	7	2	13	–	–	8	23	14	29	20	37
10	18	0	9	3	18	10	25	11	25	18	33	25	45
18	24	0	10	5	20	12	28	13	28	20	36	28	48
24	30	1	11	5	20	12	28	13	28	23	41	30	53
30	40	1	11	6	20	13	33	15	33	28	46	40	64
40	50	1	11	6	23	14	36	18	36	30	51	45	73
50	65	1	15	8	28	18	43	23	43	38	61	55	90
65	80	1	15	10	30	20	51	25	51	46	71	65	105
80	100	1	18	12	36	24	58	30	58	53	84	75	120
100	120	2	20	15	41	28	66	36	66	61	97	90	140
120	140	2	23	18	48	33	81	41	81	71	114	105	160

- [Remarks] 1. Radial internal clearance in this table conforms to JIS B 1558 (ball bearing for ball bearing unit).  
 2. Increase in radial internal clearance generated by measured load conforms to the table below.  
 Smaller correction of C2 clearance is applicable to the lower clearance, while larger correction is applicable to the upper clearance.

Unit :  $\mu\text{m}$

Nominal bearing bore dia. $d$ (mm)		Measured load	Correction of clearance				
over	up to		N	C2	CN	GN, C3	C4
2.5	18	24.5	3 – 4	4		4	
18	50	49	4 – 5	5		6	
50	280	147	6 – 8	8		9	

## 12 Materials

### 12.1 Materials of bearing

Ball bearings for ball bearing unit are made of the following materials : bearing rings (outer and inner rings) and rolling elements (balls) are made of steel, and cages are made of pressed steel.

These bearing materials need the features shown below.

- (1) Higher elastic limit is required, since high contact stress occurs partially.
- (2) Higher rolling fatigue strength is required, since great contact load occurs repeatedly.
- (3) Superior hardness
- (4) Superior wear resistance
- (5) Superior toughness against impact load
- (6) Superior stability of dimensions

As the material of bearing rings (outer and inner rings) and rolling elements (balls) of the ball bearing for Koyo Ball Bearing Unit, high carbon chromium bearing steel specified in JIS is used.

For more reliability of bearing, vacuum degassing is executed against high carbon chromium bearing steel to reduce non-metallic inclusion and included oxygen. After the materials of bearing are made into the specified form, quench-and-temper is executed until its hardness is 60HRC.

**Table 12.1** shows the chemical components of high carbon chromium bearing steel. As the material of bearing rings and rolling elements of the ball bearings for stainless-series unit (special code : S6), stainless steel with superior corrosion resistance is used. Cages are made of cold-reduced carbon steel sheets and strips specified in JIS.

**Table 12.2** shows the chemical compositions of cold-reduced carbon steel sheets and strips specified in JIS.

### 12.2 Materials of housing

A housing for ball bearing unit is mainly made of gray iron casting products, carbon steel casting products, structural steel, cold-reduced carbon steel sheets and strips.

Gray iron casting is the most popular as the material of housing for ball bearing unit, featuring absorption of vibration, damping superior to other materials, easy and varied forming by casting, appropriate strength, and excellent heat property.

**Table 12.3** shows the mechanical properties of gray iron casting.

If superior strength is required for the housing for ball bearing unit, select carbon steel casting products with higher rupture strength, carbon steel casting, or general structural rolled steel with higher strength against impact.

For the material of housings of the “compact” series unit, zinc alloy die-cast is used, and corrosion-resistant cast steel products are used for housings of the stainless series unit. Cold-reduced carbon steel sheets and strips are used as the material of housings for the pressed steel unit.

**Table 12.4** to **12.8** show the mechanical properties of these housing materials.

Spheroidal graphite iron casting (FCD450-10 of JIS G 5502) may be used, as well as these materials.

**Table 12.1 Chemical compositions of high carbon chromium bearing steel (JIS G 4805)**

Code	Chemical components (%)						
	C	Si	Mn	P	S	Cr	Mo
SUJ 2	0.95– 1.10	0.15– 0.35	0.50 or less	0.025 or less	0.025 or less	1.30– 1.60	0.08 or less

**Table 12.2 Chemical compositions of cold-reduced carbon steel sheets and strips (SPCC) (JIS G 3141)**

Code	Chemical components (%)						
	C	Si	Mn	P	S	Ni	Cr
SPCC	0.12 or less	–	0.50 or less	0.040 or less	0.045 or less	–	–

**Table 12.3 Mechanical properties of gray iron casting (FC200) (JIS G 5501)**

Type code	Tensile strength N/mm <sup>2</sup>	Hardness HB
FC200	200 or more	223 or less

**Table 12.4 Mechanical properties of carbon steel casting (SC450) (JIS G 5101)**

Type code	Yielding point or bearing force N/mm <sup>2</sup>	Tensile strength N/mm <sup>2</sup>	Extension %	Construc- tion %
SC450	225 or more	450 or more	19 or more	30 or more

**Table 12.5 Mechanical properties of general structural rolled steel (SS400) (JIS G 3101)**

Type code	Yielding point or bearing force N/mm <sup>2</sup>			Tensile strength MPa	Thickness of steel mm	Tensile test piece	Elongation %	Bendability		
	Thickness of steel mm							Bending angle	Inside dia.	Test piece
	incl. 16	Over 16 incl. 40	Over 40							
SS400	245 or more	235 or more	215 or more	400– 510	Over 5, 16 max.	No.1A	17 or more	180°	1.5 times of thickness	No.1
					Over 16, 40 max.	No.1A	21 or more			
					Over 40	No.4	23 or more			

**Table 12.6 Mechanical properties of zinc alloy die-cast (ZDC02) (JIS H 5301) (Reference)**

Code	Tensile strength MPa	Elongation %	Impact MJ/m <sup>2</sup>	Hardness HB
ZDC2	285	10	1.4	82

**Table 12.7 Mechanical properties of corrosion-resistant cast steel (SCS13) (JIS G 5121)**

Type code	Bearing force MPa	Tensile strength MPa	Elongation %	Hardness HB
SCS13	185 or more	440 or more	30 or more	183 or more

**Table 12.8 Mechanical properties of cold-reduced carbon steel sheets and strips (SPCC) (JIS G 3141)**

Type code	Tensile strength MPa	Elongation %
SPCC	270 or more	34 or more

### 12.3 Materials of parts and accessories

Table 12.9 shows materials of parts and accessories of a ball bearing unit.

**Table 12.9 Materials of parts and accessories of ball bearing units**

Designations	Materials	Standard code
Oil seal (standard type)	Nitrile rubber	–
Oil seal (heat resistant, cold resistant)	Silicone rubber	–
Flinger (slinger)	Cold-reduced carbon steel sheets and strips	JIS G 3141
Stainless steel Flinger (slinger)	Cold rolled stainless steel plate and steel strip	JIS G 4305
Pressed steel cover	Cold-reduced carbon steel sheets and strips	JIS G 3141
Pressed stainless steel cover	Cold rolled stainless steel plate and steel strip	JIS G 4305
Cast iron cover	Gray casting iron products	JIS G 5501
Hexagon socket set screw	Chrome molybdenum steel	JIS G 4053
Stainless steel hexagon socket set screw	Stainless bar steel	JIS G 4303
Adapter sleeve for bearing	Mechanical structural carbon steel	JIS G 4051
Lock nut for bearing	Mechanical structural carbon steel	JIS G 4051
Washer for bearing	Cold-reduced carbon steel sheets and strips	JIS G 3141
Eccentric locking collar	Mechanical structural carbon steel	JIS G 4051
Grease nipple	Free cutting carbon steels	JIS G 4804

## 13 Performance

### 13.1 Friction torque of bearing

Friction torque of a ball bearing for ball bearing unit is the synthesis of rolling friction between the rolling elements (balls) and the bearing rings (outer and inner rings), sliding friction between the rolling elements and the cages, agitating resistance of lubricants, and friction resistance of oil seal.

Greatness of friction torque is influenced by the type, dimensions, load, and rotational speed of bearing, and lubricating conditions.

For the ball bearing unit, oil seals with especially superior dustproof performance are adopted to improve sealing performance of the bearing. Thus, friction resistance of the oil seal greatly depends on the friction torque of the bearing.

Friction torque of the ball bearing for ball bearing unit can be found by the Formulas below.

$$M = M_p + M_k \dots\dots\dots (13.1)$$

$$M_p = \mu \cdot P \cdot \frac{d}{2} \dots\dots\dots (13.2)$$

Whereas,

$M$ :	Friction torque of bearing	mN · m
$M_p$ :	Friction torque of sections changed by load	mN · m
$M_k$ :	Friction torque of sections changed by rotational speed	mN · m
$\mu$ :	Friction coefficient (0.001 5 to 0.002)	
$P$ :	Load applied to bearing	N
$d$ :	Nominal bearing bore dia.	mm

Note that the agitating resistance of lubricants and the friction resistance of oil seal are difficult to be calculated, since they are fluctuated by rotational speed.

Fig. 13.1 shows the result of measurement of friction torque of the typical ball bearing unit.

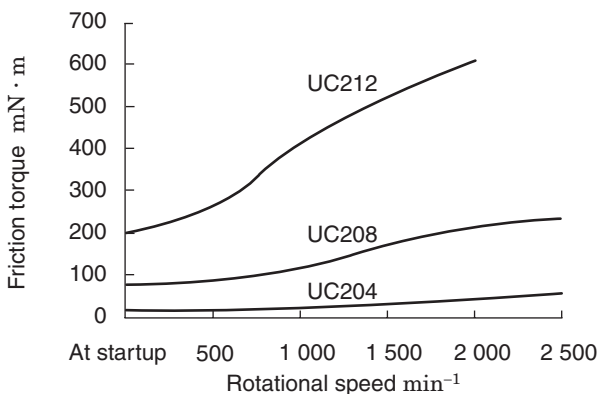


Fig. 13.1 Example of measurement result of ball bearing unit

### 13.2 Increase in temperature of bearing

Increase in temperature of the ball bearing for ball bearing unit is indicated as heat energy converted from the friction torque in the bearing during operation. Temperature of the bearing during operation increases in proportion to the greatness of friction torque and rotational speed (friction torque increases in proportion to the greatness of load).

Increase in temperature of the ball bearing for ball bearing unit depends on the heating value generated by friction in the bearing and that discharged outside from the surface of the bearing and housing. Therefore, increase in temperature of the ball bearing for ball bearing unit is influenced by the environmental conditions of the location that the ball bearing unit is installed (quality of heat radiation environment).

Temperature of the ball bearing unit is increased gradually after the startup of operation, and reaches the maximum level after one or two hours, if no abnormality occurs. Then, it is decreased a little, and enters the steady-state (see Fig. 13.2).

In this manner, if the operating conditions are not changed, bearing temperature is virtually constant, and therefore, measurement of temperature and assumption of the status of bearing are enabled.

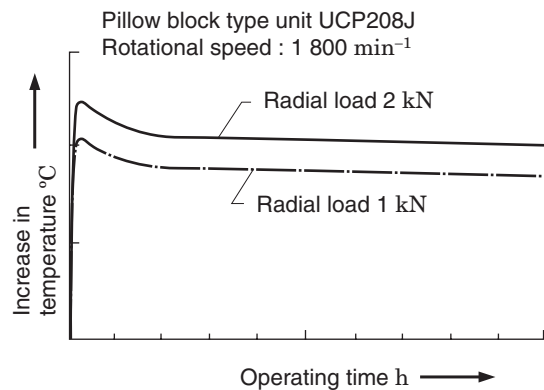


Fig. 13.2 Example of temperature measurement during operation of pillow block type unit

Increase in temperature during operation of the ball bearing unit depends on the type of oil seal used for the bearing as well as friction torque.

Increase in temperature of the triple-lip seal type (supplementary code L3) is greater than the standard type, and that of the non-contact seal type (special code K3, S5) is smaller than the standard type.

The bearing units for high speed and blower are equipped with the non-contact type oil seals for high speed use and reduction of heat, vibration, and noise.



### 13.3 Dustproof and waterproof performance

JTEKT executes various tests to check dustproof and waterproof performance of the ball bearing unit. Representative test results are shown below.

#### 13.3.1 Dust sprinkle rotating test (dust preventive performance)

Use the drum type dust sprinkle rotating test machine for this test. Directly sprinkle dusts onto the ball bearing unit while it is being operated, and then, judge the dust preventive performance of the product.

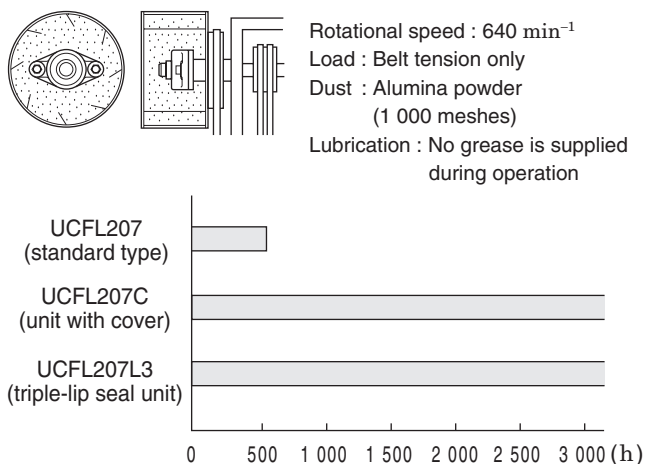


Fig. 13.3 Example of result of dust sprinkle rotating test (dust preventive performance)

In the case of the standard type, abnormal noise occurred about 500 hours after operation was started, and ingress of dusts was recognized.

On the other hand, no abnormality was found in the triple-lip seal type (supplementary code L3) and the covered type (supplementary code C) even after about 3 000 hours after operation was started, and superior dust proof performance was recognized.

#### 13.3.2 Dust bury rotating test (dust preventive performance)

Bury the ball bearing unit into dusts, and run it with the impeller installed to the shaft while stirring dusts, and judge the dust preventive performance of the product. This test is executed under the severest conditions among the operating conditions of the ball bearing unit.

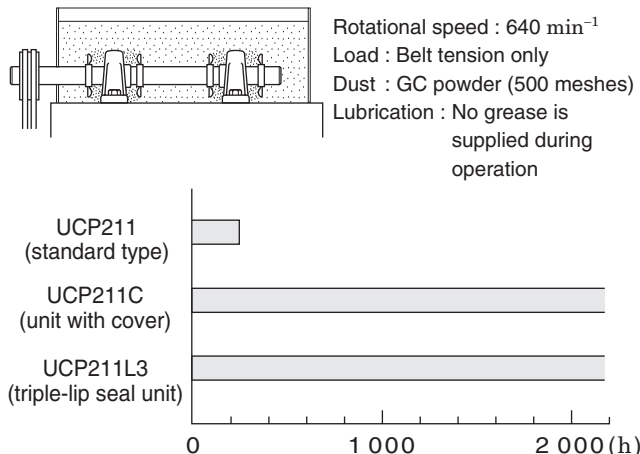


Fig. 13.4 Example of result of dust bury rotating test (dust preventive performance)

In the case of the standard type, abnormal noise occurred about 200 hours after operation was started, and ingress of dusts was recognized.

On the other hand, no abnormality was found in the triple-lip seal type (supplementary code L3) and the covered type (supplementary code C) even after about 2 000 hours after operation was started, and superior dust preventive performance was recognized.

#### 13.3.3 Waterproof performance test

In this test, water is splashed directly impellers installed on the shaft.

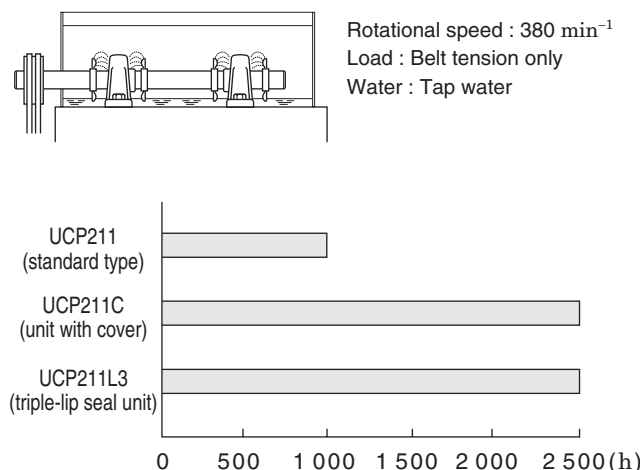


Fig. 13.5 Example result of waterproof performance test

In the case of the standard type, rust was found on the balls and raceway surface (outer and inner rings) about 1 000 hours after operation was started.

On the other hand, rust of equal level to the standard type was found in the triple-lip seal type (supplementary code L3) and the covered type (supplementary code C) after about 2 500 hours after operation was started.

## 14 Handling

The most significant feature of the ball bearing unit is simplicity of handling and installation. However, if handling or installation is wrong, premature breakage may occur to the ball bearing unit.

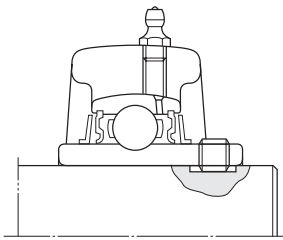
Therefore, handle and install it appropriately for genuine performance of the ball bearing unit.

### 14.1 Installation

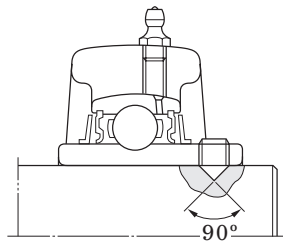
#### 14.1.1 Installation of unit with set screws

When installing the unit to the shaft with the set screws, it is enough to tighten the two set screws of the bearing inner ring with the specified torque.

However, if the environment is exposed to impact or vibration, the shaft is rotated in normal and reverse directions, or the machine is started and stopped frequently and repeatedly, grind the surface of the shaft where the set screw contacts with a file so that the flat seat (**Fig. 14.1**) or drilled seat (**Fig. 14.2**) is provided. It improves the tightening effect of the set screw substantially.



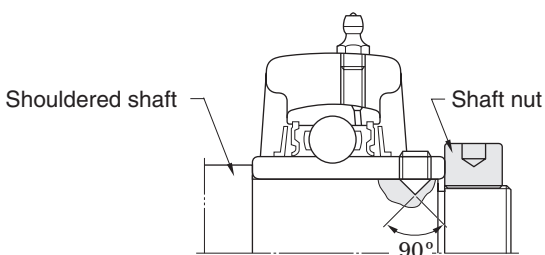
**Fig. 14.1 Flat seat provided for shaft**  
(for improvement in set screw tightening effect)



**Fig. 14.2 Drilled seat provided for shaft**  
(for improvement in set screw tightening effect)

If the environment is exposed to a great axial load or excessive vibration, use the shouldered shaft, and tighten the bearing inner ring with the nut (**Fig. 14.3**).




As for the dimensions of the shouldered shaft, see “9 Design of shaft and base”.



**Fig. 14.3 Example of installation with using shouldered shaft and nut**

The standard Koyo Ball Bearing Unit is equipped with the Bullet Point set screw featuring secure tightening to shaft. Other set screws are also available depending on your purposes and operating conditions (see **Table 14.1**).

**Table 14.1 Set screw of ball bearing for unit**

Designations (code)	Details
Bullet Point (no indication)    *Bullet Point is developed by NIPPON PILLOW BLOCK CO., LTD. (FYH).	The tip of the Bullet Point setscrew has a ball shape, and it is designed to firmly grip the shaft by expanding its threads outward against the threads of the inner ring of the bearing as it is tightened.  When shock or vibration are problems, the Bullet Point setscrew can remain affixed to the shaft longer than other set screw styles including double point, ball point, or others.
Pointed (G4)  	The cone point set screw has a 90° angle and fits a drilled cone seat in the shaft. It allows correct positioning on the shaft and prevents shaft movement in an axial direction.
Full dog point cap (G6)  	The full dog point set screw fits into the key groove in the shaft and allows for expansion and contraction of the shaft.

Procedures for installation of the ball bearing unit with set screw are shown below.

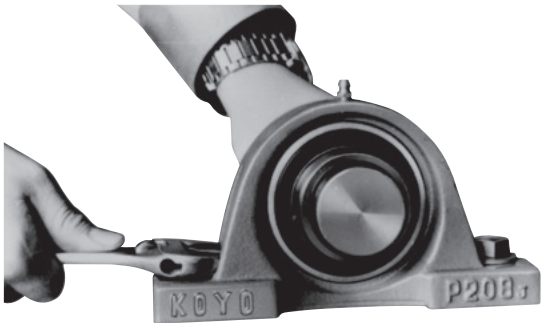
- (1) Inspect the unit to ensure that the rigidity of the base, flatness of the mounting surface, variation of tolerance of the shaft meet the standards. Check for bend, flaw, or burr on the shaft.
- (2) Make sure that the tip of the set screw does not exceed the bearing bore diameter surface.
- (3) Fit the bearing unit to the shaft, and place it to the specified position. To fit it to the shaft with tight fitting, press-fit the bearing unit to the shaft with a press, cold-fit by cooling the shaft, or shrink-fit the bearing unit by warming it with air bath (100 °C or less).

Avoid hitting the side of the bearing inner ring with a hammer to press-fit the bearing to the shaft.

- (4) Place the bearing unit to the specified position on the base, and fix it with bolts (**Fig. 14.4**).

Tighten the mounting bolt of the housing with the specified torque by a torque wrench. As for the tighten-

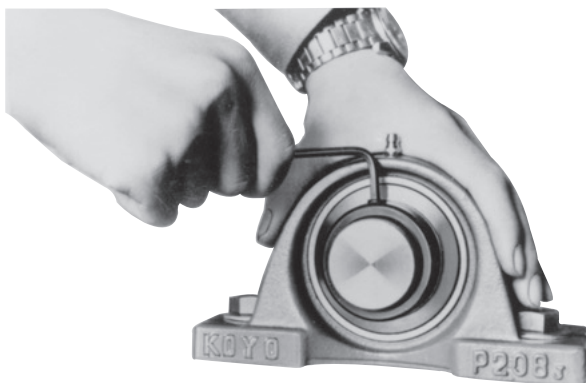
ing torque of the mounting bolt, see the **Appendix table 2** at the end of this catalogue.



**Fig. 14.4** Fixing ball bearing unit to base

(5) Tighten the set screws (two) of a bearing inner ring with the specified tightening torque evenly (**Fig. 14.5**).

As for the tightening torque of the set screw, see the **Appendix table 3** at the end of this catalogue.



**Fig. 14.5** Tightening of set screw

(6) Turn the shaft with your hands, and tighten the set screws (two) of another bearing inner ring with the specified torque.

(7) At last, turn the shaft with your hands, and check for abnormality in turning status of the bearing.

### 14.1.2 Installation of unit with adapter

To install the bearing with tapered bore to the shaft, set the adapter assembly (sleeve, locknut and washer) between the bearing bore diameter and the shaft. The bearing can be securely fixed even in the environment exposed to excessive vibration or impact.

If tightening of the locknut is loose, fitting to the shaft may be loosened during operation, and slippage occurs to the fitting surface, leading to wear on the shaft or parts. On the contrary, if tightening of the locknut is excessive, the bearing inner ring is expanded, and internal clearance of the bearing is too small, causing abnormal heat or premature breakage. Therefore, pay close attention to installation of the bearing with adapter.

Procedures for installation of the ball bearing unit with adapter assembly are shown below.

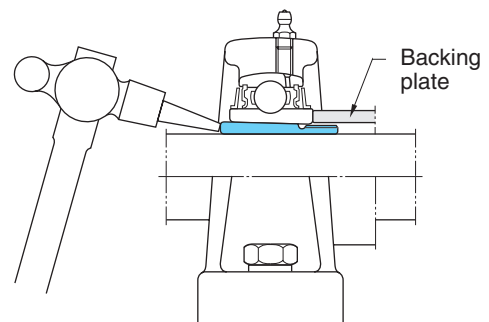
(1) Inspect the unit to ensure that the rigidity of the base, flatness of the installing surface, and variation of tolerance of the shaft meet the standards. Check for bend, flaw, or burr on the shaft.

(2) Fit the adapter sleeve to the shaft, and move the adapter sleeve to the installing position of the bearing unit.

If the fitting is too tight to insert the adapter sleeve, put a screwdriver into the cutout of the adapter sleeve, and expand the cutout for easier fitting.

(3) Fit the bearing unit to the shaft.

Then, place the cylindrical backing plate to the whole side of the bearing inner ring that the locknut is to be attached, and tap all around the large diameter side end face to fit the bore diameter surface of the bearing inner ring to the tapered surface of the adapter sleeve closely (**Fig. 14.6**).



**Fig. 14.6** Fitting adapter sleeve to bearing with tapered bore

(4) Fit the washer and locknut to the adapter sleeve, and tighten the locknut with your hands.

(5) Place the bearing unit to the specified position of the base, and fix it with the bolts.

Tighten the mounting bolt of the housing with the specified torque by a torque wrench.

As for the tightening torque of the set screw, see the **Appendix table 2** at the end of this catalogue.

(6) Tighten the locknut of the adapter.

When tightening the locknut, tighten it with a wrench for tightening, or place a jig onto the cutout of the locknut outer surface, and tap the jig with a hammer and turn the locknut by 1/4 to 1/3 turn (**Fig. 14.7**).

As for the tightening torque of the locknut, see the **Appendix table 4** at the end of this catalogue.



**Fig. 14.7 Tightening locknut**

- (7A) For the pillow block type unit, loosen the mounting bolts on a housing, adjust the position of the bearing unit in the axial direction while turning the shaft by your hands, and then, tighten the mounting bolt on the housing with the specified torque again.
- (7B) For the flange type unit, positions of the bearing and housing in the axial direction must be fit completely. Therefore, pay close attention and tighten the locknut to prevent any error of the position of bearing inner ring.
- (8) Bend the outer tab on a washer that fits to the position of cutout on the outer surface of the locknut, and lock the locknut (**Fig. 14.8**).



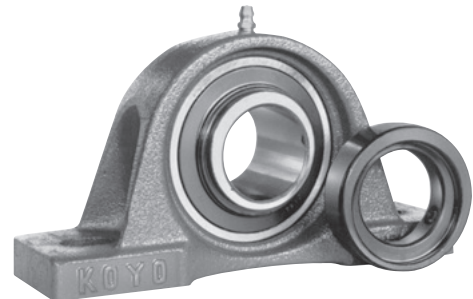
**Fig. 14.8 Bending outer tab of washer (Locking locknut)**

- (9) At last, turn the shaft with your hands, and check for abnormality in the rotating status of the bearing.

### 14.1.3 Installing unit with eccentric locking collar

When installing the bearing to the shaft with the eccentric ring, fit the eccentric section of the end outside surface of the bearing inner ring to the eccentric recessed section provided on the eccentric locking collar, turn the eccentric locking collar, and tighten the set screw of the eccentric locking collar to fix the bearing to the shaft.

Since the rotating force of the shaft increases the tightening force of the eccentric ring to the shaft, the unit with eccentric locking collar allows secure fixing of the bearing (**Fig. 14.9**).



**Fig. 14.9 Ball bearing unit with eccentric locking collar**

Procedures for installation of the ball bearing unit with eccentric locking collar are shown below.

- (1) Inspect the unit to ensure that the rigidity of the base, flatness of the mounting surface, and variation of tolerance of the shaft meet the standards. Check for bend, flaw, or burr on the shaft.
- (2) Fit the bearing unit to the shaft, and place it on the specified position.
- (3) Install the bearing unit to the specified position of the base, and fix it with the bolts.

Tighten the mounting bolts for the housing with the specified torque with a torque wrench.

For the tightening torque of the mounting bolt, see the **Appendix table 2** at the end of this catalogue.

- (4) Fit the eccentric section of the bearing inner ring to the eccentric recessed section provided on the eccentric locking collar, turn the eccentric locking collar in the shaft turning direction, and tighten the set screw of the eccentric locking collar with the specified torque (**Fig. 14.10**).

For the tightening torque of the set screw, see the **Appendix table 3** at the end of this catalogue.



**Fig. 14.10 Installing eccentric locking collar**



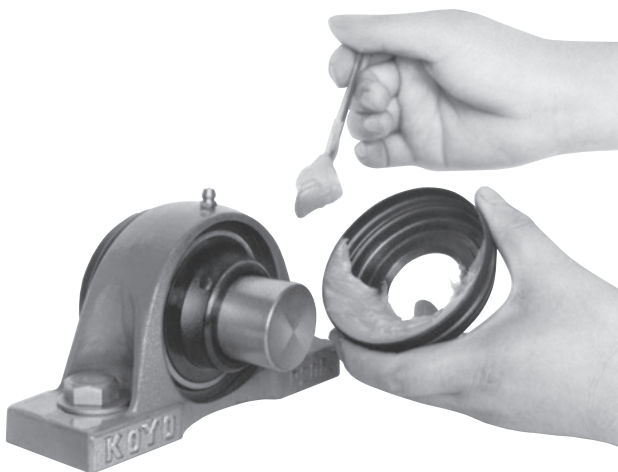
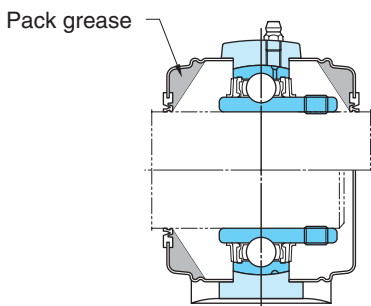
- (5) Turn the shaft with your hands. Then, fix the eccentric locking collar of another bearing unit to the bearing inner ring, and tighten the set screw of the eccentric locking collar with the specified torque.
- (6) At last, turn the shaft with your hands, and check for abnormality in the rotating status of the bearing.

### 14.1.4 Installing unit with cover

Covers for ball bearing unit are available in two types, pressed steel and cast iron. Install both the covers at last after installation of the bearing and housing is complete.

Procedures for installation of the ball bearing unit with cover are shown below.

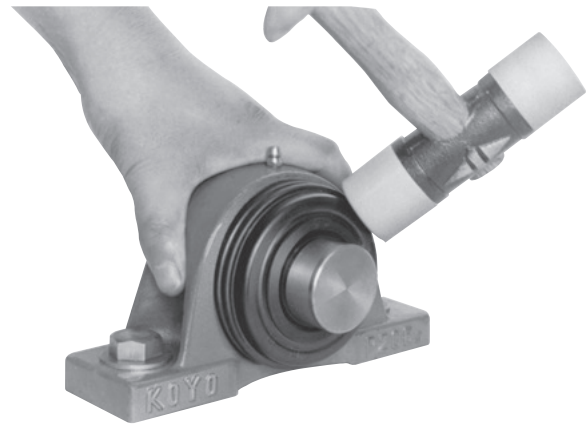
- (1) Apply grease all around the seal lip of the cover, and pack the internal space of the cover with grease (approximately 1/3 to 1/2 of the space capacity) (Fig. 14.11).



**Fig. 14.11 Packing grease in internal space and seal lip of cover**

- (2) Put a cover through the shaft, and then, fit the bearing unit to the shaft.
- (3) Fit the cover through the shaft to the cover groove on the housing, and fix it.
- (4A) For the pressed steel cover, tap all around the cover evenly with a synthetic resin hammer to prevent deformation, and install it to the housing (Fig. 14.12).

To remove the pressed steel cover, put a screwdriver into the groove on the periphery of the cover, and slightly pry it.



**Fig. 14.12 Installing steel plate cover**

- (4B) When installing the cast iron cover, fit the cover to the cover groove of the housing, and fix it with the bolt. For the tightening torque of the cast iron cover mounting bolt, see the **Appendix table 2** at the end of this catalogue.
- (5) Install another cover to the housing in a similar manner.
- (6) Check for abnormality of the installed cover.
- (7) At last, turn the shaft with your hands, and check for abnormality in the rotating status of the bearing.

## 14.2 Test run inspection

After installation of the ball bearing unit is complete, execute the test run inspection to ensure that it is done appropriately.

The test run inspection should be executed by following the procedures below. Check for abnormality in the bearing unit.

- (1) Turn the shaft with your hands, and make sure that the bearing is rotated smoothly. If any jam, vibration, great rotation torque (heavy), or uneven rotation is found, the bearing is judged to be faulty.
- (2) Execute power run with no load and at a low speed, and check for abnormal noise and vibration.
- (3) Carry out power run under the specified conditions, and check for abnormal noise, vibration, and temperature increase.

**Table 14.2** shows the main faults that may occur during the test run inspection of the ball bearing unit and causes.

**Table 14.2 Main faults occurred during test run inspection and their causes**

Faults	Causes
Excessively great torque, uneven rotating torque	(1) Faulty installation, leading to preload onto bearing in axial direction (2) Inappropriate handling or installation, leading to interference of oil seal with flinger (slinger) (3) Excessive tightening of locknut (adapter), leading to too small internal clearance of bearing
Abnormal noise, abnormal vibration	(1) Insufficient tightening of set screw of bearing inner ring or mounting bolt of housing (2) Excessively large internal clearance of bearing (3) Bend on shaft, deviation of shaft center of shouldered shaft (4) Faulty accuracy of shaft (5) Insufficient rigidity or faulty flatness of base
Abnormal temperature increase	(1) Excessively small internal clearance of bearing (2) Inappropriate installation, leading to preload onto bearing in axial direction (3) Great load applied (4) Allowable rotational speed is exceeded (5) Faulty flatness of base (6) Inappropriate handling or installation, leading to interference of oil seal with flinger (slinger)

### 14.3 Periodic inspection

Koyo Ball Bearing Units do not need to be inspected, as well as standard sealed bearings. However, for especially important purposes, periodic inspection must be executed with appropriate intervals for safe operation of the bearing unit.

Since a ball bearing unit cannot be disassembled for inspection of internal status, check the appearance and operating status as shown below, and ensure that the bearing unit is free from fault or not.

- (1) Appearance
- (2) Looseness of set screw of bearing inner ring or mounting bolt of housing
- (3) Vibration, noise
- (4) Temperature
- (5) Grease supply interval, check of supplied amount

**Table 14.3** shows the main faults found during the periodic inspection of ball bearing unit and their causes.

If any fault is found in the ball bearing unit during the periodic inspection, immediately provide countermeasures against them, and carry out them. If the unit is judged to be difficult to be used, replace the bearing unit. It is important to replace the bearing unit to prevent expanding damage to other parts.

**Table 14.3 Main faults found during periodic inspection and their causes**

Faults	Causes
Excessively great torque (heavy)	(1) Degraded grease (2) Interference of oil seal with flinger (slinger) due to excessive supply of grease (3) Deformation of flinger (slinger), leading to interference with oil seal (4) Abnormal load due to expansion of shaft
Abnormal noise, abnormal vibration	(1) Insufficient tightening of set screw of bearing inner ring or mounting bolt of housing (2) Wear on fitting surface of shaft and bearing inner ring due to creep or fretting (3) Ingress of foreign matters into bearing (4) Damage to raceway surface or rolling contact surface of rolling element by rolling fatigue (5) Dent on raceway surface or rolling contact surface of rolling element by excessive load (6) Excessive warp or bend of shaft
Abnormal temperature increase	(1) Degraded grease (2) Interference of oil seal with flinger (slinger) due to excessive supply of grease (3) Deformation of flinger (slinger), leading to interference with oil seal (4) Looseness of set screw or locknut (adapter) of bearing inner ring (5) Abnormal load due to expansion of shaft (6) Damage to raceway surface or rolling contact surface of rolling element by rolling fatigue

### 14.4 Supply of grease

In Koyo Ball Bearing Unit, grease of good quality is packed with high quality oil seal. Therefore, grease life is long under standard operating conditions, and use without lubrication is enabled.

If the operating temperature is high or the unit is used in the environment exposed to dusts or high humidity, grease may be degraded faster, leading to faulty lubrication in a short period.

Since Koyo Ball Bearing Units are lubricated type bearings, fresh grease must be periodically supplied to the bearings, if they are used for such purposes that premature degradation of grease is expected.

The ball bearing units can maintain normal lubricated status and longer service life by supplying fresh grease.

14.4.1 Grease life and supply intervals

Grease life of a packed grease ball bearing, like a ball bearing unit, can be found by **Formula (4. 7)** in page 30. It is recommended to supply grease with the intervals of 1/4 to 1/3 of grease life found by the calculation shown above to ball bearing units, taking peculiarity of lubricating method and safety of bearing unit into consideration.

If the bearing unit is used under severe environmental conditions, including much dust and high humidity, the greasing intervals must be further shortened, taking these influences into consideration.

If operating conditions of the ball bearing unit are not clear or the unit is operated under standard conditions, consider the greasing intervals shown in **Table 14.4** as the guideline.

14.4.2 Greasing amount

Initial greasing amount of Koyo Ball Bearing Unit is approximately 30 to 35% of the internal space capacity of the bearing. If amount of grease supplied in the bearing is excessive, agitating resistance of grease increases, leading to abnormal heat or grease leak. DO NOT exceed the initial greasing amount.

**Table 14.5** shows the recommended values of greasing amount of Koyo Ball Bearing Unit.

If the unit is used at a low speed, supply grease of double amount of that shown in **Table 14.5** is recommended to increase dust preventive performance.

- [Remarks] 1. For greasing amount of the UK type bearing, use this table, too.  
 2. For greasing amount of the triple-lip seal type, 1.5 times of the values shown in this table are recommended.  
 3. Values shown in this table are applicable to standard grease (specific gravity : 0.9 g/ml). If you use greases of other specific gravity, adopt values converted with the same volume.

**Table 14.5 Greasing amount of ball bearing unit (recommended)**

Bore dia. No.	Greasing amount, g		
	UC200	UCX00	UC300
01	1.8		
02	1.8		
03	1.8		
04	1.8	–	–
05	1.8	3.3	4.2
06	3.3	4.5	5.9
07	4.5	5.6	8.1
08	5.6	6.5	10.1
09	6.5	7.7	12.6
10	7.7	10.3	18.1
11	10.3	13.2	25
12	13.2	14.9	31
13	14.9	18.2	39
14	18.2	21	47
15	21	25	56
16	25	31	65
17	31	38	78
18	38	48	90
19	–	–	108
20		69	141
21		–	165
22			198
24			237
26			291
28			337

**Table 14.4 Greasing intervals of ball bearing unit (recommended)**

Operating temperature, °C		Grease Intervals			Bearing used	Grease supplied
over	up to	Substantially clean	Much dust	Much dust and muddy water		
	50	(3 months) not necessary	(2 months) 1 year	(1 month) 4 months	(Low temperature D2K2) <sup>1)</sup>	(Lithium) Lithium
50	70	1 year	4 months	1 month	Standard bearing	
70	100	6 months	2 months	2 weeks		
100	120	2 months	2 weeks	5 days	High temperature D1K2	Lithium
120	150	2 weeks	5 days	2 days		
150	180	1 week	2 days	1 day		

Note 1) Greasing intervals in parentheses are applicable to the cold resistant type (D2K2).

[Remark] Greasing intervals shown in this table are applicable to the unit to be operated for 8 to 10 hours a day. If operating hour is out of this range, find the greasing interval proportionally by this table.



### 14.4.3 Types of grease supplied

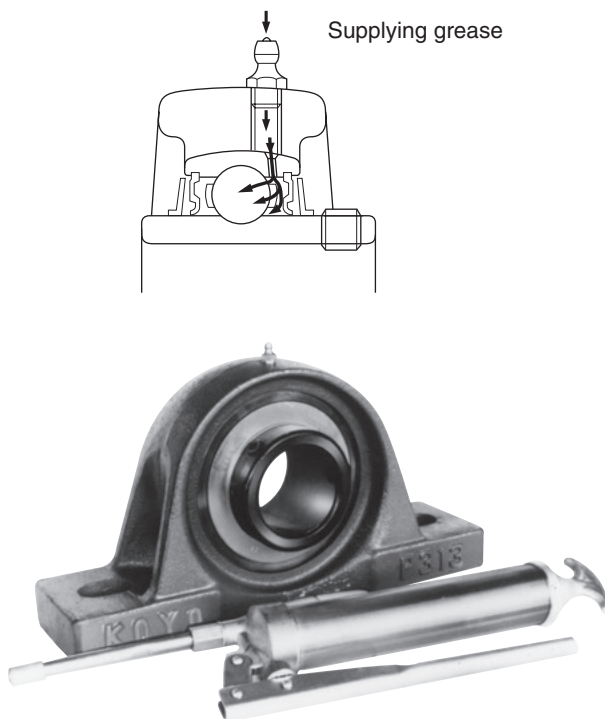
Though various types of greases used for ball bearing units are available, if dissimilar grease, especially grease of which soap base is different, is mixed, lubricating performance may be significantly degraded.

Therefore, the same grease to be supplied as the initially packed grease must be used, and avoid use of dissimilar grease.

It is recommended to supply the same grease to Koyo Ball Bearing Unit as the initially packed grease (see **Table 2.3**). If you have no choice but to use other greases, you have to use grease of the same type (thickener) as the initially packed grease, if not the worst.

### 14.4.4 Supplying grease

When supplying grease to a ball bearing unit, use the grease nipple and grease gun installed to the housing (**Fig. 14.13**).



**Fig. 14.13** Supplying grease to ball bearing unit

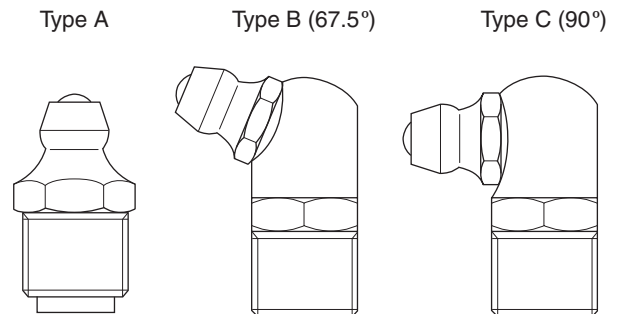
- (1) Clean the grease nipple and area around it to prevent ingress of foreign matters.
- (2) Clean the grease gun, and pack clean grease.
- (3) Supply grease.

When supplying grease to the ball bearing unit, turning of the shaft with your hands or turning of the bearing unit at a low speed is recommended.

It allows appropriate discharge of old grease and even supply of fresh grease into the bearing.

If the grease supply with the grease nipple of the standard type (type A) is difficult because of the structure of the machine, grease nipples of the type B or type C are also available. Contact JTEKT.

**Fig. 14.14** shows the types of grease nipples.



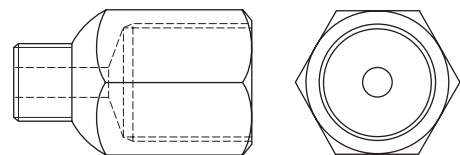
**Fig. 14.14** Types of grease nipple for ball bearing unit

When supplying many ball bearing units with the centralized lubricating device, use soft grease with consistency from about 300 to 380, and provide piping appropriately so that grease of the specified amount is supplied.

Piping to the ball bearing unit should be provided with the tapped hole of the grease nipple of the housing. However, if size of the tapped hole on the housing differs from that of thread of the piping, use the reducing socket.

**Fig. 14.15** shows the structure of the reducing socket for centralized lubricating.

When executing centralized lubricating, it is effective for the lubricating surface of the bearing to supply grease of the amount shown in **Table 14.5** by dividing into several times.



**Fig. 14.15** Reducing socket for centralized lubricating

For details of grease nipples and reducing sockets, see “16 Parts and accessory”.

### 14.5 Replacing bearing

Since the bearings and the housings of Koyo ball bearing units are compatible, if a bearing is faulty, it can be replaced and used continuously.

Replacing procedures of the bearing of the ball bearing unit are shown below.

- (1) Remove the bearing unit from the shaft and the base.
- (2) Screw in the set screw so that the head of the set screw does not project out from the outside diameter surface of the inner ring of the bearing.  
Head of the set screw may be hooked on the housing when the bearing is tilted.
- (3) Turn the bearing by 90° with a handle of a hammer until the bearing is horizontal.
- (4) Take out the bearing from the bearing groove of the housing.

To fit a new bearing to the housing, reverse the removing procedures.

# **15 Specification tables of ball bearing units**



## 15 Specification tables of ball bearing units (contents)

### 1 Pillow block type

#### Pillow block type

UCP ( <i>d</i> 12 ~ 140) .....	72
NAP ( <i>d</i> 12 ~ 75) .....	78
NAPK ( <i>d</i> 12 ~ 75) .....	80
UKP ( <i>d</i> <sub>1</sub> 20 ~ 125) .....	82
UCP-SC ( <i>d</i> 25 ~ 140) .....	88
UKP-SC ( <i>d</i> <sub>1</sub> 20 ~ 125) .....	92

#### Thick section pillow block type

UCIP ( <i>d</i> 40 ~ 140) .....	96
UKIP ( <i>d</i> <sub>1</sub> 35 ~ 125) .....	98

#### Tapped-base pillow block type

UCPA ( <i>d</i> 12 ~ 50) .....	100
--------------------------------	-----

#### Higher centerheight pillow block type

UCPH ( <i>d</i> 12 ~ 50) .....	102
--------------------------------	-----

#### Light duty pillow block type

BLP, ALP ( <i>d</i> 12 ~ 40) .....	104
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#### “Compact” series pillow block type

UP ( <i>d</i> 10 ~ 30) .....	106
------------------------------	-----

#### Stainless-series pillow block type

UCSP-H1S6 ( <i>d</i> 20 ~ 50) .....	108
UCSPA-H1S6 ( <i>d</i> 20 ~ 40) .....	110
USP-S6 ( <i>d</i> 10 ~ 30) .....	112

#### Pressed steel pillow block type

SBPP, SAPP ( <i>d</i> 12 ~ 30) .....	114
--------------------------------------	-----

### 2 Square-flanged type

#### Square-flanged type

UCF ( <i>d</i> 12 ~ 140) .....	116
UCF-E ( <i>d</i> 12 ~ 85) .....	122
NANF ( <i>d</i> 12 ~ 60) .....	126
UKF ( <i>d</i> <sub>1</sub> 20 ~ 125) .....	128

#### Square-flanged type with spigot joint

UCFS ( <i>d</i> 25 ~ 140) .....	134
UKFS ( <i>d</i> <sub>1</sub> 20 ~ 125) .....	136

#### Stainless-series square-flanged type

UCSF-H1S6 ( <i>d</i> 20 ~ 50) .....	138
-------------------------------------	-----

### 3 Oval flange type

#### Rhombic-flanged type

UCFL ( <i>d</i> 12 ~ 130) .....	140
UCFL-E ( <i>d</i> 12 ~ 85) .....	146
NANFL ( <i>d</i> 12 ~ 55) .....	150
UKFL ( <i>d</i> <sub>1</sub> 20 ~ 115) .....	152

#### Adjustable rhombic-flanged type

UCFA ( <i>d</i> 12 ~ 55) .....	156
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#### Three-bolt flange type

UCFB ( <i>d</i> 12 ~ 50) .....	158
--------------------------------	-----

#### Light duty rhombic-flanged type

BLF, ALF ( <i>d</i> 12 ~ 35) .....	160
------------------------------------	-----

#### “Compact” series rhombic-flanged type

UFL ( <i>d</i> 8 ~ 30) .....	162
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#### Stainless-series rhombic-flanged type

UCSFL-H1S6 ( <i>d</i> 20 ~ 50) .....	164
USFL-S6 ( <i>d</i> 10 ~ 30) .....	166

### 4 Round-flanged type with spigot joint

UCFC ( <i>d</i> 12 ~ 100) .....	168
UCFCX-E ( <i>d</i> 25 ~ 100) .....	172
UKFC ( <i>d</i> <sub>1</sub> 20 ~ 90) .....	174

### 5 Pressed steel flange type

#### Pressed steel round-flanged type

SBPF, SAPF ( <i>d</i> 12 ~ 35) .....	178
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#### Pressed steel rhombic-flanged type

SBPFL, SAPFL ( <i>d</i> 12 ~ 35) .....	180
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### 6 Take-up type

#### Take-up type

UCT ( <i>d</i> 12 ~ 140) .....	182
UCT-E ( <i>d</i> 12 ~ 85) .....	188
UKT ( <i>d</i> <sub>1</sub> 20 ~ 125) .....	192

#### Stainless-series take-up type

UCST-H1S6 ( <i>d</i> 20 ~ 50) .....	198
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#### Section steel frame take-up type

UCTH ( <i>d</i> 12 ~ 65) .....	200
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#### Channel steel frame take-up type

UCTL ( <i>d</i> 20 ~ 45) .....	202
UCTU ( <i>d</i> 40 ~ 90) .....	204

#### Pressed steel frame take-up type

SBPTH ( <i>d</i> 12 ~ 25) .....	208
SBNPTH ( <i>d</i> 12 ~ 25) .....	210

### 7 Other units

#### Cartridge type

UCC ( <i>d</i> 12 ~ 140) .....	212
UKC ( <i>d</i> <sub>1</sub> 20 ~ 125) .....	216

#### Hanger type

UCHA ( <i>d</i> 12 ~ 75) .....	218
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### 8 Ball bearings for units

#### Cylindrical bore (with set screws)

UC, SB, SU ( <i>d</i> 8 ~ 140) .....	220
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#### Stainless-series,

#### Cylindrical bore (with set screws)

UC-S6, SU-S6 ( <i>d</i> 10 ~ 50) .....	226
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#### Tapered bore (with adapter)

UK ( <i>d</i> <sub>1</sub> 20 ~ 125) .....	228
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#### Cylindrical bore

#### (with eccentric locking collar)

SA, SA-F, NA ( <i>d</i> 12 ~ 75) .....	234
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#### Cylindrical bore (with set screws),

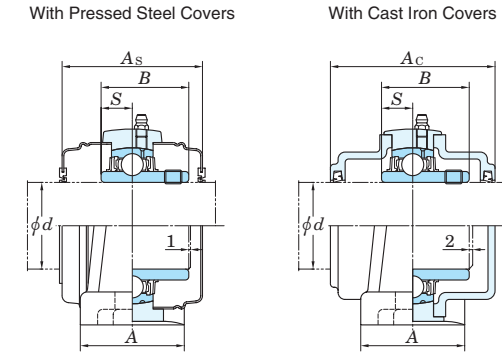
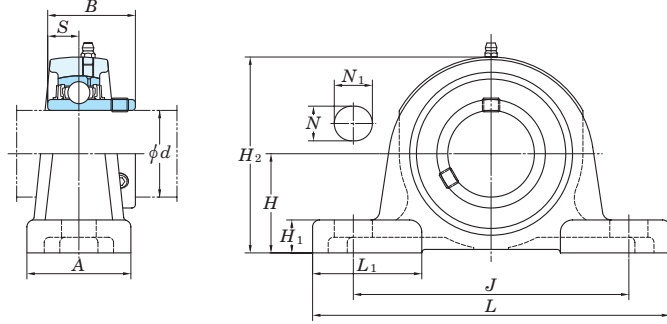
#### Cylindrical outside surface

ER, RB ( <i>d</i> 12 ~ 60) .....	238
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### 9 Adapter assemblies

H300X, H2300X ( <i>d</i> <sub>1</sub> 20 ~ 125) .....	240
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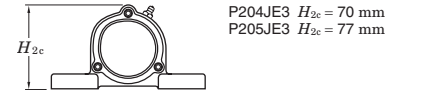
**UCP**  
Cylindrical bore (with set screws)  
*d* 12 ~ (45) mm



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ ) Unit : mm

Housing No.	$\Delta H_s$
P203~P210	±0.15
P211~P218	±0.2
PX20	±0.3
P305~P310	±0.15
P311~P318	±0.2
P319~P328	±0.3

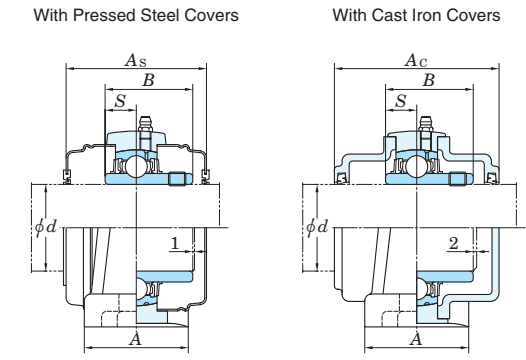
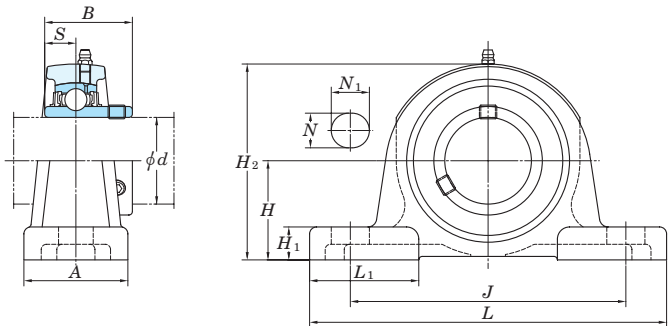
Forms and dimensions of  $H_{2c}$  of P204JE3 and P205JE3 (housing with cast iron covers) are shown below.



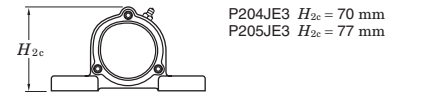
Shaft Dia. mm inch <i>d</i>	Dimensions inch mm												Bolt Size inch mm	Standard			Mass kg	Basic Load Ratings kN		Factor $f_0$	With Pressed Steel Covers				With Cast Iron Covers				
	<i>H</i>	<i>L</i>	<i>A</i>	<i>J</i>	<i>N</i>	<i>N</i> <sub>1</sub>	<i>H</i> <sub>1</sub>	<i>H</i> <sub>2</sub>	<i>L</i> <sub>1</sub>	<i>B</i>	<i>S</i>	Unit No.		Housing No.	Bearing No.	$C_r$		$C_{0r}$	Unit No.		Dimension mm inch		Mass kg	Unit No.		Dimension mm inch		Mass kg	
																			Open Ends Type		Closed End Type	<i>A</i> <sub>s</sub>		<i>A</i> <sub>c</sub>	Open Ends Type	Closed End Type	<i>A</i> <sub>s</sub>		<i>A</i> <sub>c</sub>
12 15 17	1/2 5/8	1 3/16	5	1 1/2	3 3/4	1/2	23/32	15/32	2 3/8	1 1/2	1.220	0.500	3/8	M10	UC201 UC201-8 UC202 UC202-10 UC203	12.8	6.65	13.2	UCP201C	UCP201CD	44	1 23/32	0.63	-	-	-	-		
		-	-	-	-	-	-	-	-	-	-	-																	
		UCP202C	UCP202CD	44	1 23/32	0.61	-	-	-	-	-	-																	
20	3/4	1 5/16	5	1 1/2	3 3/4	1/2	23/32	1/2	2 17/32	1 1/2	1.220	0.500	3/8	M10	UC204-12 UC204	12.8	6.65	13.2	UCP203C	UCP203CD	44	1 23/32	0.60	-	-	-	-		
		-	-	-	-	-	-	-	-	-	-	-																	
		UCP204C	UCP204CD	44	1 23/32	0.66	UCP204FC	UCP204FCD	62	2 7/16	0.96	-							-	-	-								
25	7/8 15/16	1 7/16	5 1/2	1 1/2	4 1/8	1/2	23/32	1/2	2 25/32	1 11/16	1.343	0.563	3/8	M10	UC205-14 UC205-15 UC205 UC205-16	14.0	7.85	13.9	UCP205C	UCP205CD	48	1 7/8	0.80	UCP205FC	UCP205FCD	66	2 19/32	1.2	
		-	-	-	-	-	-	-	-	-	-	-																	
		UCP205C	UCP205CD	48	1 7/8	0.80	-	-	-	-	-	-																	
1	1	1 3/4	6 1/4	2	4 11/16	21/32	31/32	5/8	3 3/8	1 27/32	1.500	0.626	1/2	M14	UCX05 UCX05-16	19.5	11.3	13.9	UCPX05C	UCPX05CD	52	2 1/16	1.5	-	-	-	-		
		-	-	-	-	-	-	-	-	-	-	-																	
		UCPX05C	UCPX05CD	52	2 1/16	1.5	-	-	-	-	-	-																	
1	1	1 49/64	6 7/8	1 3/4	5 3/16	21/32	25/32	5/8	3 11/32	2 5/32	1.496	0.591	1/2	M14	UC305 UC305-16	21.2	10.9	12.6	-	-	-	-	-	UCP305C	UCP305CD	76	3	2.3	
		-	-	-	-	-	-	-	-	-	-	-																	
		-	-	-	-	-	-	-	-	-	-	-																	
1 1/8	1 3/16 1 1/4	1 11/16	6 1/2	1 7/8	4 3/4	21/32	13/16	19/32	3 5/16	2 3/32	1.500	0.626	1/2	M14	UC206-18 UC206 UC206-19 UC206-20	19.5	11.3	13.9	UCP206C	UCP206CD	52	2 1/16	1.3	UCP206FC	UCP206FCD	70	2 3/4	1.8	
		-	-	-	-	-	-	-	-	-	-	-																	
		-	-	-	-	-	-	-	-	-	-	-																	
1 3/16 1 1/4	1 3/16 1 1/4	1 7/8	6 7/8	2 1/4	5	21/32	31/32	21/32	3 21/32	2 5/32	1.689	0.689	1/2	M14	UCX06 UCX06-19 UCX06-20	25.7	15.4	13.9	UCPX06C	UCPX06CD	59	2 5/16	2.1	-	-	-	-		
		-	-	-	-	-	-	-	-	-	-	-																	
		-	-	-	-	-	-	-	-	-	-	-																	
1	1	1 31/32	7 3/32	1 31/32	5 1/2	21/32	25/32	21/32	3 3/4	2 3/32	1.693	0.669	1/2	M14	UC306	26.7	15.0	13.3	-	-	-	-	-	UCP306C	UCP306CD	82	3 7/32	2.8	
		-	-	-	-	-	-	-	-	-	-	-																	
		-	-	-	-	-	-	-	-	-	-	-																	
1 1/4 1 5/16 1 3/8	1 3/8	1 7/8	6 9/16	1 7/8	5	21/32	13/16	5/8	3 21/32	2	1.689	0.689	1/2	M14	UC207-20 UC207-21 UC207-22 UC207 UC207-23	25.7	15.4	13.9	-	-	-	-	-	-	-	-	-		
		-	-	-	-	-	-	-	-	-	-	-																	
		UCP207C	UCP207CD	59	2 5/16	1.6	UCP207FC	UCP207FCD	78	3 1/16	2.3																		
1 7/16	1 3/8	2 1/8	8	2 1/4	5 11/16	21/32	1 3/16	3/4	4 1/8	2 17/32	1.937	0.748	1/2	M14	UCX07-22 UCX07 UCX07-23	29.1	17.8	14.0	UCPX07C	UCPX07CD	68	2 11/16	2.7	-	-	-	-		
		-	-	-	-	-	-	-	-	-	-	-																	
		-	-	-	-	-	-	-	-	-	-	-																	
1 1/2 1 9/16	1 9/16	1 15/16	7 1/4	2 1/8	5 13/32	21/32	13/16	21/32	3 27/32	2 1/4	1.937	0.748	1/2	M14	UC208-24 UC208-25 UC208	29.1	17.8	14.0	-	-	-	-	-	-	-	-			
		-	-	-	-	-	-	-	-	-	-	-																	
		UCP208C	UCP208CD	68	2 11/16	2.0	UCP208FC	UCP208FCD	86	3 3/8	2.8																		
1 1/2	1 1/2	2 5/16	8 3/4	2 5/8	6 1/8	25/32	1 1/4	13/16	4 1/2	2 25/32	1.937	0.748	5/8	M16	UCX08-24 UCX08	34.1	21.3	14.0	UCPX08C	UCPX08CD	68	2 11/16	3.5	-	-	-	-		
		-	-	-	-	-	-	-	-	-	-	-																	
		-	-	-	-	-	-	-	-	-	-	-																	
1 1/2	1 1/2	2 23/64	8 21/32	2 3/8	6 11/16	21/32	1 1/16	3/4	4 21/32	2 9/16	2.047	0.748	1/2	M14	UC308-24 UC308	40.7	24.0	13.2	-	-	-	-	-	UCP308C	UCP308CD	96	3 25/32	4.8	
		-	-	-	-	-	-	-	-	-	-	-																	
		-	-	-	-	-	-	-	-	-	-	-																	
1 5/8	1 11/16 1 3/4	2 1/8	7 15/32	2 1/8	5 3/4	21/32	13/16	21/32	4 3/16	2 3/8	1.937	0.748	1/2	M14	UC209-26 UC209-27 UC209-28 UC209	34.1	21.3	14.0	-	-	-	-	-	-	-	-			
		-	-	-	-	-	-	-	-	-	-	-																	
		UCP209C	UCP209CD	68	2 11/16	2.2	UCP209FC	UCP209FCD	88	3 15/32	3.0																		
1 3/4	1 3/4	2 5/16	8 3/4	2 5/8	6 1/8	25/32	1 5/16	13/16	4 9/16	2 25/32	2.031	0.748	5/8	M16	UCX09-28 UCX09	35.1	23.3	14.4	UCPX09C	UCPX09CD	73	2 7/8	3.7	-	-	-	-		
		-	-	-	-	-	-	-	-	-	-	-																	
		-	-	-	-	-	-	-	-	-	-	-																	

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
2. Part No. of applicable grease nipples are shown below.  
A-1/4-28UNF..... 201~210, X05~X09, 305~308  
A-PT1/8..... 211~218, X10~X20, 309~328

3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (or L2) follows the Part No. of unit or bearing. (Example of Part No. : UCP206JL3, UC206L3)  
4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.  
5. Representative examples of the forms of housing are indicated.

**Pillow block type****UCP  
Cylindrical bore (with set screws)  
 $d$  (45) ~ (75) mm**Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ ) Unit : mm

Housing No.			$\Delta H_s$
P203-P210	PX05-PX10	P305-P310	$\pm 0.15$
P211-P218	PX11-PX18	P311-P318	$\pm 0.2$
	PX20	P319-P328	$\pm 0.3$

Forms and dimensions of  $H_{2c}$  of P204JE3 and P205JE3 (housing with cast iron covers) are shown below.

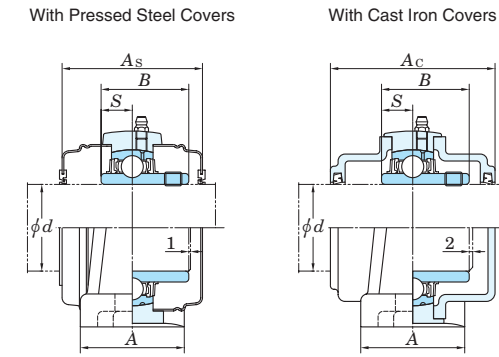
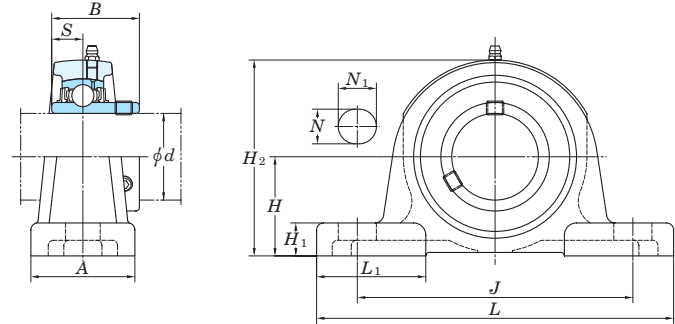
Shaft Dia. mm inch	Dimensions												Bolt Size inch mm	Standard			Mass kg	Basic Load Ratings kN		Factor $f_0$	With Pressed Steel Covers				With Cast Iron Covers					
	$H$	$L$	$A$	$J$	$N$	$N_1$	$H_1$	$H_2$	$L_1$	$B$	$S$	Unit No.		Housing No.	Bearing No.	$C_r$		$C_{0r}$	Unit No. Open Ends Type		Unit No. Closed End Type	Dimension mm inch $A_s$	Mass kg	Unit No. Open Ends Type	Unit No. Closed End Type	Dimension mm inch $A_c$	Mass kg			
45 $1 \frac{3}{4}$	$2 \frac{41}{64}$	$9 \frac{21}{32}$	$2 \frac{5}{8}$	$7 \frac{15}{32}$	$2 \frac{5}{16}$	$1 \frac{3}{16}$	$1 \frac{3}{16}$	$5 \frac{3}{16}$	$2 \frac{15}{16}$	2.244	0.866	$\frac{5}{8}$	UCP309-28 UCP309	P309	UC309-28 UC309	4.9	48.9	29.5	13.3	--	--	--	--	--	--	--	--	--	--	
	67	245	67	190	20	30	21	132	75	57	22	M16	UCP210-30 UCP210-31 UCP210 UCP210-32	P210	UC210-30 UC210-31 UC210 UC210-32	2.9 2.9 2.9 2.9	35.1	23.3	14.4	UCP210C	UCP210CD	73	$2 \frac{7}{8}$	2.9	UCP210FC	UCP210FCD	97	$3 \frac{13}{16}$	3.9	
50 $1 \frac{15}{16}$	$2 \frac{1}{2}$	$9 \frac{1}{2}$	$2 \frac{7}{8}$	$6 \frac{23}{32}$	$2 \frac{5}{16}$	$1 \frac{13}{32}$	$\frac{7}{8}$	$4 \frac{31}{32}$	3	2.189	0.874	$\frac{5}{8}$	UCPX10-31 UCPX10 UCPX10-32	PX10	UCX10-31 UCX10 UCX10-32	4.6 4.6 4.6	43.4	29.4	14.4	UCPX10C	UCPX10CD	75	$2 \frac{15}{16}$	4.6	--	--	--	--	--	
	63.5	241	73	171	20	36	22	126	76	55.6	22.2	M16	UCP310	P310	UC310	4.6	62.0	38.3	13.2	--	--	--	--	--	--	--	--	--	--	
	75	275	75	212	20	35	24	148	88	61	22	M16	UCP211-32 UCP211-34 UCP211 UCP211-35	P211	UC211-32 UC211-34 UC211 UC211-35	3.6 3.6 3.6 3.6	43.4	29.4	14.4	UCP211C	UCP211CD	75	$2 \frac{15}{16}$	3.6	UCP211FC	UCP211FCD	99	$3 \frac{29}{32}$	4.8	
55 $2 \frac{3}{16}$	$2 \frac{3}{4}$	$10 \frac{1}{4}$	$3 \frac{1}{8}$	$7 \frac{1}{4}$	$3 \frac{1}{16}$	$1 \frac{13}{32}$	$1 \frac{3}{32}$	$5 \frac{15}{32}$	$3 \frac{9}{32}$	2.563	1.000	$\frac{3}{4}$	UCPX11 UCPX11-35 UCPX11-36	PX11	UCX11 UCX11-35 UCX11-36	6.5 6.5 6.5	52.4	36.2	14.4	UCPX11C	UCPX11CD	88	$3 \frac{15}{32}$	6.5	--	--	--	--	--	
	69.8	260	79	184	25	36	28	139	83	65.1	25.4	M20	UCP311-32 UCP311	P311	UC311-32 UC311	7.9 7.9	71.6	45.0	13.2	--	--	--	--	--	--	--	--	--		
	2	$3 \frac{5}{32}$	$12 \frac{7}{32}$	$3 \frac{5}{32}$	$9 \frac{9}{32}$	$2 \frac{5}{16}$	$1 \frac{1}{2}$	$1 \frac{1}{16}$	$6 \frac{7}{32}$	$3 \frac{17}{32}$	2.598	0.984	$\frac{5}{8}$	UCP212-36 UCP212 UCP212-38 UCP212-39	P212	UC212-36 UC212 UC212-38 UC212-39	4.9 4.9 4.9 4.9	52.4	36.2	14.4	UCP212C	UCP212CD	88	$3 \frac{15}{32}$	4.9	UCP212FC	UCP212FCD	114	$4 \frac{1}{2}$	6.4
	80	310	80	236	20	38	27	158	90	66	25	M16	UCPX12 UCPX12-39	PX12	UCX12 UCX12-39	7.7 7.7	57.2	40.1	14.4	UCPX12C	UCPX12CD	88	$3 \frac{15}{32}$	7.7	--	--	--	--	--	
60 $2 \frac{3}{8}$	$2 \frac{3}{4}$	$9 \frac{1}{2}$	$2 \frac{3}{4}$	$7 \frac{1}{4}$	$2 \frac{5}{16}$	$1 \frac{9}{16}$	$1 \frac{3}{32}$	$5 \frac{31}{32}$	$3 \frac{15}{32}$	2.563	1.000	$\frac{3}{4}$	UCP312	P312	UC312	9.5	81.9	52.2	13.2	--	--	--	--	--	--	--	--	--	--	
	76.2	286	83	203	25	40	28	152	88	65.1	25.4	M20	UCP213-40 UCP213	P213	UC213-40 UC213	5.9 5.9	57.2	40.1	14.4	--	--	--	--	--	--	--	--	--		
	85	330	85	250	25	38	29	167	103	71	26	M20	UCPX13-40 UCPX13	PX13	UCX13-40 UCX13	8.1 8.1	62.2	44.1	14.5	UCPX13C	UCPX13CD	98	$3 \frac{27}{32}$	8.1	--	--	--	--	--	
65 $2 \frac{1}{2}$	$3 \frac{35}{64}$	$13 \frac{3}{8}$	$3 \frac{17}{32}$	$10 \frac{1}{4}$	$3 \frac{1}{16}$	$1 \frac{1}{2}$	$1 \frac{1}{4}$	$6 \frac{15}{16}$	$4 \frac{11}{32}$	2.953	1.181	$\frac{3}{4}$	UCP214-44 UCP214	P214	UC214-44 UC214	6.8 6.8	62.2	44.1	14.5	UCP214C	UCP214CD	98	$3 \frac{27}{32}$	6.8	UCP214FC	UCP214FCD	124	$4 \frac{7}{8}$	8.7	
	90	340	90	260	25	38	32	176	110	75	30	M20	UCPX14-44 UCPX14	PX14	UCX14-44 UCX14	10.2 10.2	67.4	48.3	14.5	--	--	--	--	--	--	--	--	--		
	95	360	90	280	27	40	35	186	110	78	33	M22	UCP313-40 UCP313	P313	UC313-40 UC313	10.7 10.7	92.7	59.9	13.2	--	--	--	--	--	--	--	--	--		
70 $2 \frac{3}{4}$	$3 \frac{1}{8}$	$10 \frac{15}{32}$	$2 \frac{27}{32}$	$8 \frac{9}{32}$	$3 \frac{1}{16}$	$1 \frac{3}{16}$	$1 \frac{3}{32}$	$6 \frac{5}{32}$	$3 \frac{1}{16}$	2.937	1.189	$\frac{3}{4}$	UCP314-44 UCP314	P314	UC314-44 UC314	12.4 12.4	104	68.2	13.2	--	--	--	--	--	--	--	--	--		
	79.4	266	72	210	25	30	28	156	78	74.6	30.2	M20	UCP215-47 UCP215	P215	UC215-47 UC215	7.4 7.4	67.4	48.3	14.5	UCP215C	UCP215CD	98	$3 \frac{27}{32}$	7.4	UCP215FC	UCP215FCD	124	$4 \frac{7}{8}$	9.3	
	88.9	330	89	229	27	50	32	171	98	77.8	33.3	M22	UCPX15-47 UCPX15	PX15	UCX15-47 UCX15	10.8 10.8	72.7	53.0	14.6	--	--	--	--	--	--	--	--	--		
75 $2 \frac{15}{16}$	$3 \frac{1}{4}$	$10 \frac{13}{16}$	$2 \frac{29}{32}$	$8 \frac{17}{32}$	$3 \frac{1}{16}$	$1 \frac{3}{16}$	$1 \frac{3}{32}$	$6 \frac{3}{8}$	$3 \frac{3}{32}$	3.063	1.311	$\frac{3}{4}$	UCP315-48 UCP315	P315	UC315-48 UC315	10.8 10.8	72.7	53.0	14.6	UCP315C	UCP315CD	108	$4 \frac{1}{4}$	10.8	--	--	--	--	--	
	82.6	275	74	217	25	30	28	162	80	77.8	33.3	M20	UCP315-48 UCP315	P315	UC315-48 UC315	10.8 10.8	72.7	53.0	14.6	UCP315C	UCP315CD	108	$4 \frac{1}{4}$	10.8	--	--	--	--	--	

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
 2. Part No. of applicable grease nipples are shown below.  
 A-1/4-28UNF..... 201-210, X05-X09, 305-308  
 A-PT1/8..... 211-218, X10-X20, 309-328

3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (or L2) follows the Part No. of unit or bearing. (Example of Part No. : UCP206JL3, UC206L3)  
 4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.  
 5. Representative examples of the forms of housing are indicated.



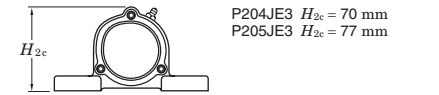
**UCP**  
**Cylindrical bore (with set screws)**  
*d* (75) ~ 140 mm



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ ) Unit: mm

Housing No.			$\Delta H_s$
P203~P210	PX05~PX10	P305~P310	±0.15
P211~P218	PX11~PX18	P311~P318	±0.2
	PX20	P319~P328	±0.3

Forms and dimensions of  $H_{2c}$  of P204JE3 and P205JE3 (housing with cast iron covers) are shown below.



P204JE3  $H_{2c} = 70$  mm  
 P205JE3  $H_{2c} = 77$  mm

Shaft Dia. mm inch  <i>d</i>	Dimensions inch mm												Bolt Size inch mm	Standard			Mass kg	Basic Load Ratings kN		Factor <i>f</i> <sub>0</sub>	With Pressed Steel Covers				With Cast Iron Covers									
	<i>H</i>	<i>L</i>	<i>A</i>	<i>J</i>	<i>N</i>	<i>N</i> <sub>1</sub>	<i>H</i> <sub>1</sub>	<i>H</i> <sub>2</sub>	<i>L</i> <sub>1</sub>	<i>B</i>	<i>S</i>	Unit No.		Housing No.	Bearing No.	<i>C</i> <sub>r</sub>		<i>C</i> <sub>0r</sub>	Unit No.		Dimension mm inch	Mass kg	Unit No.		Dimension mm inch	Mass kg								
																			Open Ends Type				Closed End Type	Open Ends Type			Closed End Type							
75 2 15/16 3	3 15/16	14 31/32	3 15/16	11 13/32	1 1/16	1 9/16	1 3/8	7 25/32	4 7/32	3.228	1.260	7/8	UCP315-47 UCP315 UCP315-48	P315	UC315-47 UC315 UC315-48	14.8 14.8 14.8	113 77.2	13.2	--	--	--	--	--	--	UCP315C	UCP315CD	134	5 9/32	17.3					
	80 3 1/8	3 1/2	11 1/2	3 1/16	9 1/8	3 1/32	1 3/8	1 1/4	6 27/32	3 3/8	3.252	1.311	3/4	UCP216-50 UCP216	P216	UC216-50 UC216	9.0 9.0	72.7 53.0	14.6	--	--	--	--	--	UCP216C	UCP216CD	108	4 1/4	9.0	UCP216FC	UCP216FCD	138	5 7/16	11.4
		4	15	4	11 1/8	1 1/16	2 9/32	1 11/32	7 11/16	4 9/16	3.374	1.343	7/8	UCPX16	PX16	UCX16	15.3	84.0	61.9	14.5	--	--	--	--	--	UCPX16C	UCPX16CD	112	4 13/32	15.3	--	--	--	--
4 11/64		15 3/4	4 11/32	11 13/16	1 1/16	1 9/16	1 3/8	8 7/32	4 23/32	3.386	1.339	7/8	UCP316	P316	UC316	18.5	123	86.7	13.3	--	--	--	--	--	UCP316C	UCP316CD	138	5 7/16	21.4	--	--	--	--	
85 3 1/4	3 3/4	12 7/32	3 9/32	9 23/32	3 1/32	1 9/16	1 1/4	7 9/32	3 17/32	3.374	1.343	3/4	UCP217-52 UCP217	P217	UC217-52 UC217	10.8 10.8	84.0 61.9	14.5	--	--	--	--	--	--	UCP217C	UCP217CD	112	4 13/32	10.8	UCP217FC	UCP217FCD	142	5 19/32	13.5
	4	15	4	11 1/8	1 1/16	2 3/8	1 11/32	7 7/8	4 9/16	3.780	1.563	7/8	UCPX17	PX17	UCX17	16.1	96.1	71.5	14.5	--	--	--	--	--	UCPX17C	UCPX17CD	122	4 13/16	16.1	--	--	--	--	
	4 13/32	16 17/32	4 11/32	12 19/32	1 5/16	1 25/32	1 9/16	8 21/32	4 23/32	3.780	1.575	1	UCP317	P317	UC317	20.3	133	96.8	13.3	--	--	--	--	--	UCP317C	UCP317CD	146	5 3/4	23.6	--	--	--	--	
90 3 1/2	4	12 7/8	3 15/32	10 5/16	1 1/16	1 25/32	1 11/32	7 29/32	4 23/32	3.780	1.563	7/8	UCP218-56 UCP218	P218	UC218-56 UC218	13.9 13.9	96.1 71.5	14.5	--	--	--	--	--	--	UCP218C	UCP218CD	122	4 13/16	13.9	UCP218FC	UCP218FCD	152	6	17.0
	4	15	4 3/8	11 1/8	1 1/16	2 3/8	1 1/2	8 1/32	4 9/16	4.094	1.689	7/8	UCPX18	PX18	UCX18	19.1	109	81.9	14.4	--	--	--	--	--	UCPX18C	UCPX18CD	158	6 7/32	19.1	--	--	--	--	
	4 41/64	16 15/16	4 11/32	13	1 5/16	1 25/32	1 9/16	9 7/32	4 29/32	3.780	1.575	1	UCP318-56 UCP318	P318	UC318-56 UC318	22.8 22.8	143 107	13.3	--	--	--	--	--	UCP318C	UCP318CD	150	5 29/32	22.8	--	--	--	--		
95	4 59/64	18 1/2	4 23/32	14 3/16	1 13/32	1 31/32	1 13/16	9 3/4	4 29/32	4.055	1.614	1 1/8	UCP319	P319	UC319	29.0	153	119	13.3	--	--	--	--	--	UCP319C	UCP319CD	162	6 3/8	33.3	--	--	--	--	
	125	470	120	360	36	50	46	248	125	103	41	M30																						
100 3 15/16 4	5	17	4 3/4	13 1/4	1 5/16	2 9/16	1 25/32	9 21/32	4 31/32	4.626	1.937	1	UCPX20 UCPX20-63 UCPX20-64	PX20	UCX20 UCX20-63 UCX20-64	30.4 30.4 30.4	133 105	14.4	--	--	--	--	--	UCPX20C	UCPX20CD	186	7 5/16	34.9	--	--	--	--		
	5 33/64	19 9/32	4 23/32	14 31/32	1 13/32	1 31/32	1 13/16	10 3/4	5 1/2	4.252	1.654	1 1/8	UCP320	P320	UC320	35.1	173	141	13.2	--	--	--	--	--	UCP320C	UCP320CD	174	6 27/32	40.7	--	--	--	--	
	140	490	120	380	36	50	46	273	140	108	42	M30																						
105	5 33/64	19 9/32	4 23/32	14 31/32	1 13/32	1 31/32	1 13/16	10 15/16	5 1/2	4.409	1.732	1 1/8	UCP321	P321	UC321	37.6	184	153	13.2	--	--	--	--	--	UCP321C	UCP321CD	178	7	43.6	--	--	--	--	
	140	490	120	380	36	50	46	278	140	112	44	M30																						
110	5 29/32	20 15/32	5 1/2	15 3/4	1 9/16	2 5/32	1 31/32	11 21/32	5 29/32	4.606	1.811	1 1/4	UCP322	P322	UC322	44.0	205	180	13.2	--	--	--	--	--	UCP322C	UCP322CD	188	7 13/32	50.8	--	--	--	--	
	150	520	140	400	40	55	50	296	150	117	46	M33																						
120	6 19/64	22 7/16	5 1/2	17 23/32	1 9/16	2 5/32	1 31/32	12 7/16	6 5/16	4.961	2.008	1 1/4	UCP324	P324	UC324	55.4	207	185	13.5	--	--	--	--	--	UCP324C	UCP324CD	196	7 23/32	64.9	--	--	--	--	
	160	570	140	450	40	55	50	316	160	126	51	M33																						
130	7 3/32	23 5/8	5 1/2	18 29/32	1 9/16	2 5/32	1 31/32	13 21/32	7 11/16	5.315	2.126	1 1/4	UCP326	P326	UC326	72.1	229	214	13.6	--	--	--	--	--	UCP326C	UCP326CD	214	8 7/16	84.2	--	--	--	--	
	180	600	140	480	40	55	50	355	195	135	54	M33																						
140	7 7/8	24 13/32	5 1/2	19 11/16	1 9/16	2 5/32	2 3/8	15 15/32	7 9/32	5.709	2.323	1 1/4	UCP328	P328	UC328	92.5	253	246	13.6	--	--	--	--	--	UCP328C	UCP328CD	222	8 3/4	108	--	--	--	--	
	200	620	140	500	40	55	60	393	185	145	59	M33																						

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.

A-1/4-28UNF ..... 201-210, X05-X09, 305-308

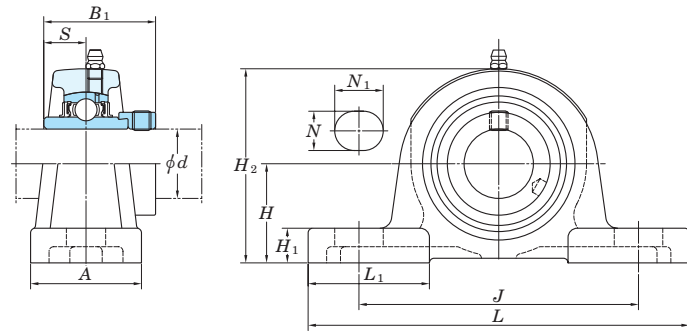
A-PT1/8 ..... 211-218, X10-X20, 309-328

3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (or L2) follows the Part No. of unit or bearing. (Example of Part No. : UCP206JL3, UC206L3)

4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

5. Representative examples of the forms of housing are indicated.

**NAP**  
**Cylindrical bore**  
**(with eccentric locking collar)**  
**d 12 ~ 75 mm**



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ )

Housing No.	$\Delta H_s$
P203-P210	±0.15
P211-P215	±0.2

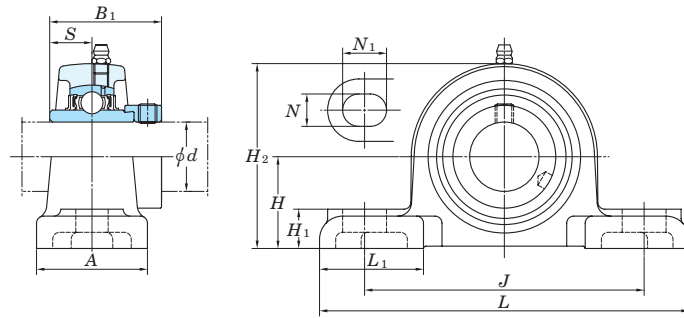
Unit : mm

Shaft Dia. mm inch  d	Dimensions inch mm												Bolt Size inch mm	Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor $f_0$	Mass kg
	H	L	A	J	N	N <sub>1</sub>	H <sub>1</sub>	H <sub>2</sub>	L <sub>1</sub>	B <sub>1</sub>	S	C <sub>r</sub>					C <sub>0r</sub>			
12 1/2	1 3/16	5	1 1/2	3 3/4	1/2	23/32	15/32	2 3/8	1 1/2	1.720	0.673	3/8	NAP201 NAP201-8 NAP202 NAP202-10 NAP203	P203	NA201 NA201-8 NA202 NA202-10 NA203	12.8	6.65	13.2	0.71 0.69 0.66	
15 5/8	30.2	127	38	95	13	18	12	60	38	43.7	17.1	M10								
17																				
20 3/4	1 5/16	5	1 1/2	3 3/4	1/2	23/32	1/2	2 17/32	1 1/2	1.720	0.673	3/8	NAP204-12 NAP204	P204	NA204-12 NA204	12.8	6.65	13.2	0.73	
25 7/8 15/16	1 7/16	5 1/2	1 1/2	4 1/8	1/2	23/32	1/2	2 25/32	1 11/16	1.748	0.689	3/8	NAP205-14 NAP205-15 NAP205 NAP205-16	P205	NA205-14 NA205-15 NA205 NA205-16	14.0	7.85	13.9	0.87	
30 1 1/8	1 11/16	6 1/2	1 7/8	4 3/4	21/32	13/16	19/32	3 5/16	2 3/32	1.906	0.720	1/2	NAP206-18 NAP206 NAP206-19 NAP206-20	P206	NA206-18 NA206 NA206-19 NA206-20	19.5	11.3	13.9	1.4	
35 1 3/16 1 1/4	1 7/8	6 9/16	1 7/8	5	21/32	13/16	5/8	3 21/32	2	2.012	0.740	1/2	NAP207-20 NAP207-21 NAP207-22 NAP207 NAP207-23	P207	NA207-20 NA207-21 NA207-22 NA207 NA207-23	25.7	15.4	13.9	1.8	
40 1 1/2 1 9/16	1 15/16	7 1/4	2 1/8	5 13/32	21/32	13/16	21/32	3 27/32	2 1/4	2.217	0.843	1/2	NAP208-24 NAP208-25 NAP208	P208	NA208-24 NA208-25 NA208	29.1	17.8	14.0	2.1	
45 1 5/8 1 11/16 1 3/4	2 1/8	7 15/32	2 1/8	5 3/4	21/32	13/16	21/32	4 3/16	2 3/8	2.217	0.843	1/2	NAP209-26 NAP209-27 NAP209-28 NAP209	P209	NA209-26 NA209-27 NA209-28 NA209	34.1	21.3	14.0	2.4	
50 1 7/8 1 15/16 2	2 1/4	8 1/8	2 3/8	6 1/4	25/32	7/8	3/4	4 7/16	2 15/32	2.469	0.969	5/8	NAP210-30 NAP210-31 NAP210 NAP210-32	P210	NA210-30 NA210-31 NA210 NA210-32	35.1	23.3	14.4	3.1	
55 2 2 3/16	2 1/2	8 5/8	2 3/8	6 23/32	25/32	7/8	3/4	4 29/32	2 3/4	2.811	1.094	5/8	NAP211-32 NAP211-34 NAP211 NAP211-35	P211	NA211-32 NA211-34 NA211 NA211-35	43.4	29.4	14.4	3.9	
60 2 3/8 2 7/16	2 3/4	9 1/2	2 3/4	7 1/4	25/32	31/32	7/8	5 7/16	3	3.063	1.220	5/8	NAP212-36 NAP212 NAP212-38 NAP212-39	P212	NA212-36 NA212 NA212-38 NA212-39	52.4	36.2	14.4	5.2	
65 2 1/2	3	10 7/16	2 3/4	8	31/32	1 3/16	31/32	5 29/32	3 1/16	3.374	1.343	3/4	NAP213-40 NAP213	P213	NA213-40 NA213	57.2	40.1	14.4	6.5	
70 2 3/4	3 1/8	10 15/32	2 27/32	8 9/32	31/32	1 3/16	1 3/32	6 5/32	3 1/16	3.374	1.343	3/4	NAP214-44 NAP214	P214	NA214-44 NA214	62.2	44.1	14.5	7.7	
75 2 15/16	3 1/4	10 13/16	2 29/32	8 17/32	31/32	1 3/16	1 3/32	6 3/8	3 5/32	3.626	1.469	3/4	NAP215-47 NAP215	P215	NA215-47 NA215	67.4	48.3	14.5	7.9	

Remarks 1. In Part No. of unit, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
 2. Part No. of applicable grease nipples are shown below.  
 A-1/4-28UNF..... 201~210  
 A-PT1/8..... 211~215

3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (or L2) follows the Part No. of unit or bearing. (Example of Part No. : NAP206JL3, NA206L3)  
 4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.  
 5. Representative examples of the forms of housing are indicated.

**NAPK**  
**Cylindrical bore**  
**(with eccentric locking collar)**  
*d* 12 ~ 75 mm



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ )

Housing No.	$\Delta H_s$
PK204-PK210	±0.15
PK211-PK215	±0.2

Unit : mm

Shaft Dia mm <i>d</i>	inch	Dimensions inch mm											Bolt Size inch	Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor <i>f</i> <sub>0</sub>	Mass kg	
		<i>H</i>	<i>L</i>	<i>A</i>	<i>J</i>	<i>N</i>	<i>N</i> <sub>1</sub>	<i>H</i> <sub>1</sub>	<i>H</i> <sub>2</sub>	<i>L</i> <sub>1</sub>	<i>B</i> <sub>1</sub>	<i>S</i>					<i>C</i> <sub>r</sub>	<i>C</i> <sub>0r</sub>			
12	1/2													3/8	NAPK201 NAPK201-8 NAPK202 NAPK202-10 NAPK203 NAPK204-12 NAPK204	PK204	NA201 NA201-8 NA202 NA202-10 NA203 NA204-12 NA204	12.8	6.65	13.2	0.82
15	5/8	1 1/4	5 1/4	1 5/8	3 27/32	7/16	9/16	9/16	2 15/32	1 25/32	1.72	0.673									
17	3/4	31.8	133	41	98	11	14	14	63	45	43.7	17.1									
20	7/8												3/8	NAPK205-14 NAPK205-15 NAPK205 NAPK205-16	PK205	NA205-14 NA205-15 NA205 NA205-16	14.0	7.85	13.9	1	
25	15/16	1 5/16	5 1/2	1 23/32	4 1/8	7/16	9/16	5/8	2 11/16	1 25/32	1.748	0.689									
	1	33.3	140	44	105	11	14	16	68	45	44.4	17.5									
30	1 1/8												1/2	NAPK206-18 NAPK206 NAPK206-19 NAPK206-20	PK206	NA206-18 NA206 NA206-19 NA206-20	19.5	11.3	13.9	1.4	
	1 3/16	1 9/16	6 5/16	1 7/8	4 3/4	9/16	3/4	2 1/32	3 5/32	1 25/32	1.906	0.72									
	1 1/4	39.7	160	48	121	14	19	17	80	45	48.4	18.3									
35	1 1/4												1/2	NAPK207-20 NAPK207-21 NAPK207-22 NAPK207 NAPK207-23	PK207	NA207-20 NA207-21 NA207-22 NA207 NA207-23	25.7	15.4	13.9	2	
	1 5/16	1 13/16	6 9/16	1 7/8	5	9/16	3/4	3/4	3 5/8	1 25/32	2.012	0.74									
	1 3/8	46	167	48	127	14	19	19	92	45	51.1	18.8									
40	1 1/2												1/2	NAPK208-24 NAPK208-25 NAPK208	PK208	NA208-24 NA208-25 NA208	29.1	17.8	14.0	2.5	
	1 9/16	1 15/16	7 1/8	2 1/8	5 1/2	9/16	3/4	3/4	3 15/16	1 31/32	2.217	0.843									
		49.2	181	54	140	14	19	19	100	50	56.3	21.4									
45	1 5/8												1/2	NAPK209-26 NAPK209-27 NAPK209-28 NAPK209	PK209	NA209-26 NA209-27 NA209-28 NA209	34.1	21.3	14.0	2.7	
	1 11/16	2 1/16	7 15/32	2 1/8	5 3/4	9/16	3/4	25/32	4 3/16	2 1/16	2.217	0.843									
	1 3/4	52.4	190	54	146	14	19	20	106	52	56.3	21.4									
50	1 7/8												1/2	NAPK210-30 NAPK210-31 NAPK210 NAPK210-32	PK210	NA210-30 NA210-31 NA210 NA210-32	35.1	23.3	14.4	3.2	
	1 15/16	2 3/16	8	2 1/4	6 1/4	9/16	3/4	7/8	4 13/32	25/32	2.469	0.969									
	2	55.6	203	57	159	14	19	22	112	55	62.7	24.6									
55	2												5/8	NAPK211-32 NAPK211-34 NAPK211 NAPK211-35	PK211	NA211-32 NA211-34 NA211 NA211-35	43.4	29.4	14.4	4.6	
	2 1/8	2 7/16	9 1/8	2 3/8	7 1/8	23/32	15/16	31/32	4 7/8	2 19/32	2.811	1.094									
	2 3/16	61.9	232	60	181	18	24	25	124	66	71.4	27.8									
60	2 1/4												5/8	NAPK212-36 NAPK212 NAPK212-38 NAPK212-39	PK212	NA212-36 NA212 NA212-38 NA212-39	52.4	36.2	14.4	5.2	
	2 3/8	2 11/16	9 1/2	2 17/32	7 17/32	23/32	15/16	13/32	5 11/32	2 9/16	3.063	1.22									
	2 7/16	68.3	241	64	191	18	24	28	136	65	77.8	31									
75	2 15/16												3/4	NAPK215-47 NAPK215	PK215	NA215-47 NA215	67.4	48.3	14.5	9.6	
		84.1	304	82	241	22	32	38	165	87	92.1	37.3									

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

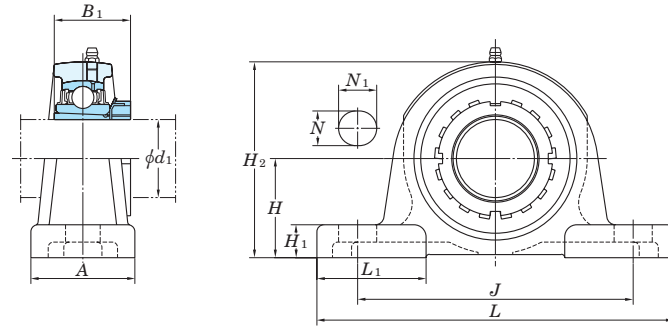
2. Part No. of applicable grease nipples are shown below.

A-1/4-28UNF ..... 201~210

A-PT1/8 ..... 211~215

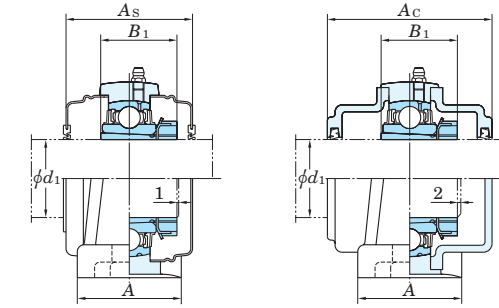
3. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

4. Representative examples of the forms of housing are indicated.

**UKP**
**Tapered bore (with adapter)**
 $d_1$  20 ~ (50) mm


With Pressed Steel Covers

With Cast Iron Covers


 Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ )

Unit : mm

Housing No.			$\Delta H_s$
P205~P210	PX05~PX10	P305~P310	$\pm 0.15$
P211~P218	PX11~PX18	P311~P318	$\pm 0.2$
	PX20	P319~P328	$\pm 0.3$

 Forms and dimensions of  $H_{2c}$  of P205JE3 (housing with cast iron covers) are shown below.


Shaft Dia. mm inch $d_1$	Dimensions inch mm											Bolt Size inch mm	Standard			Adapter <sup>1)</sup> assembly No.	Mass kg	Basic			With Pressed Steel Covers				With Cast Iron Covers			
	H	L	A	J	N	N <sub>1</sub>	H <sub>1</sub>	H <sub>2</sub>	L <sub>1</sub>	B <sub>1</sub> <sup>1)</sup>	Unit No.		Housing No.	Bearing No.	Load Ratings kN			Factor	Unit No.	Dimension mm inch	Mass kg	Unit No.	Dimension mm inch	Mass kg				
20	<sup>3/4</sup> 36.5	1 7/16	5 1/2	1 1/2	4 1/8	1/2	2 25/32	1 11/16	1 5/32(1 3/8)	3/8	UKP205	P205	UK205	HE305X(HE2305X) H305X(H2305X)	0.84 0.84	14.0 7.85	13.9	- -	- -	- -	- -	- -						
		<sup>3/4</sup> 44.4	6 1/4	2	4 11/16	2 1/32	3 1/32	5/8	3 3/8	1 27/32	1 3/8	1/2	UKPX05	PX05	UKX05	HE2305X H2305X	1.5 1.5	19.5 11.3	13.9	UKP205C UKP205CD	48 1 7/8	0.84	UKP205FC UKP205FCD	66 2 19/32	1.3			
			1 49/64	6 7/8	1 3/4	5 3/16	2 1/32	2 5/32	5/8	3 11/32	2 5/32	1 3/8	1/2	UKP305	P305	UK305	HE2305X H2305X	1.7 1.7	21.2 10.9	12.6	UKPX05C UKPX05CD	52 2 1/16	1.5	- -	- -	- -		
25	1	1 11/16	6 1/2	1 7/8	4 3/4	2 1/32	1 3/16	1 9/32	3 5/16	2 3/32	1 7/32(1 1/2)	1/2	UKP206	P206	UK206	H306X(H2306X) HE306X(HE2306X)	1.4 1.4	19.5 11.3	13.9	UKP206C UKP206CD	52 2 1/16	1.4	UKP206FC UKP206FCD	70 2 3/4	1.9			
		1 7/8	6 7/8	2 1/4	5	2 1/32	3 1/32	2 1/32	3 2 1/32	2 5/32	1 1/2	1/2	UKPX06	PX06	UKX06	H2306X HE2306X	2.1 2.1	25.7 15.4	13.9	UKPX06C UKPX06CD	59 2 5/16	2.1	- -	- -	- -			
			1 31/32	7 3/32	1 31/32	5 1/2	2 1/32	2 5/32	2 1/32	3 3/4	2 3/32	1 1/2	1/2	UKP306	P306	UK306	H2306X HE2306X	2.3 2.3	26.7 15.0	13.3	UKPX06C UKPX06CD	- -	- -	UKP306C UKP306CD	82 3 7/32	2.9		
30	1 1/8	1 7/8	6 9/16	1 7/8	5	2 1/32	1 3/16	5/8	3 2 1/32	2	1 3/8(1 11/16)	1/2	UKP207	P207	UK207	HS307X(HS2307X) H307X(H2307X)	1.7 1.7	25.7 15.4	13.9	UKP207C UKP207CD	59 2 5/16	1.7	UKP207FC UKP207FCD	78 3 1/16	2.5			
		2 1/8	8	2 1/4	5 11/16	2 1/32	1 3/16	3/4	4 1/8	2 17/32	1 11/16	1/2	UKPX07	PX07	UKX07	HS2307X H2307X	2.7 2.7	29.1 17.8	14.0	UKPX07C UKPX07CD	68 2 11/16	2.7	- -	- -	- -			
		2 13/64	8 9/32	2 7/32	6 5/16	2 1/32	3 1/32	3/4	4 7/32	2 9/16	1 11/16	1/2	UKP307	P307	UK307	HS2307X H2307X	3.0 3.0	33.4 19.3	13.2	- -	- -	- -	UKP307C UKP307CD	88 3 15/32	3.9			
35	1 1/4	1 15/16	7 1/4	2 1/8	5 13/32	2 1/32	1 3/16	2 1/32	3 2 1/32	2 1/4	1 13/32(1 13/16)	1/2	UKP208	P208	UK208	HE308X(HE2308X) HS308X(HS2308X) H308X(H2308X)	2.0 2.0 2.0	29.1 17.8	14.0	UKP208C UKP208CD	68 2 11/16	2.0	UKP208FC UKP208FCD	86 3 3/8	2.9			
		1 3/8	2 5/16	8 3/4	2 5/8	6 1/8	2 5/32	1 1/4	1 3/16	4 1/2	2 25/32	1 13/16	5/8	UKPX08	PX08	UKX08	HE2308X HS2308X H2308X	3.5 3.5 3.5	34.1 21.3	14.0	UKPX08C UKPX08CD	68 2 11/16	3.5	- -	- -	- -		
			2 23/64	8 2 1/32	2 3/8	6 11/16	2 1/32	1 1/16	3/4	4 2 1/32	2 9/16	1 13/16	1/2	UKP308	P308	UK308	HE2308X HS2308X H2308X	3.8 3.8 3.8	40.7 24.0	13.2	- -	- -	- -	UKP308C UKP308CD	96 3 25/32	5.2		
40	1 1/2	2 1/8	7 15/32	2 1/8	5 3/4	2 1/32	1 3/16	2 1/32	4 3/16	2 3/8	1 17/32(1 31/32)	1/2	UKP209	P209	UK209	HE309X(HE2309X) H309X(H2309X) HS309X(HS2309X)	2.3 2.3 2.3	34.1 21.3	14.0	UKP209C UKP209CD	68 2 11/16	2.3	UKP209FC UKP209FCD	88 3 15/32	3.2			
		1 5/8	2 5/16	8 3/4	2 5/8	6 1/8	2 5/32	1 5/16	1 3/16	4 9/16	2 25/32	1 31/32	5/8	UKPX09	PX09	UKX09	HE2309X H2309X HS2309X	3.7 3.7 3.7	35.1 23.3	14.4	UKPX09C UKPX09CD	73 2 7/8	3.7	- -	- -	- -		
			2 41/64	9 2 1/32	2 5/8	7 15/32	2 5/32	1 3/16	1 3/16	5 3/16	2 15/16	1 31/32	5/8	UKP309	P309	UK309	HE2309X H2309X HS2309X	5.0 5.0 5.0	48.9 29.5	13.3	- -	- -	- -	UKP309C UKP309CD	102 4 1/32	6.3		
45	1 3/4	2 1/4	8 1/8	2 3/8	6 1/4	2 5/32	7/8	3/4	4 7/16	2 15/32	1 2 1/32(2 5/32)	5/8	UKP210	P210	UK210	HE310X(HE2310X) H310X(H2310X)	3.0 3.0	35.1 23.3	14.4	UKP210C UKP210CD	73 2 7/8	3.0	UKP210FC UKP210FCD	97 3 13/16	4.1			
		1 3/4	2 1/2	9 1/2	2 7/8	6 23/32	2 5/32	1 13/32	7/8	4 3 1/32	3	2 5/32	5/8	UKPX10	PX10	UKX10	HE2310X H2310X	4.6 4.6	43.4 29.4	14.4	UKPX10C UKPX10CD	75 2 15/16	4.6	- -	- -	- -		
			2 51/64	10 13/16	2 15/16	8 11/32	2 5/32	1 3/8	1 5/16	5 13/16	3 15/32	2 5/32	5/8	UKP310	P310	UK310	HE2310X H2310X	6.7 6.7	62.0 38.3	13.2	- -	- -	- -	UKP310C UKP310CD	110 4 11/32	8.4		
50	1 7/8	2 1/2	8 5/8	2 3/8	6 23/32	2 5/32	7/8	3/4	4 2 9/32	2 3/4	1 2 5/32(2 5/16)	5/8	UKP211	P211	UK211	HS311X(HS2311X) H311X(H2311X)	3.7 3.7	43.4 29.4	14.4	UKP211C UKP211CD	75 2 15/16	3.7	UKP211FC UKP211FCD	99 3 29/32	5.0			
		2	63.5	219	60	171	20	22	19	125	70	45(59)	M16															

Note 1) Codes shown in parentheses indicate the dimensions and Part No. of applicable adapter (H2300X series) for UK200L3 series (triple-lip seal type).

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.  
 A-1/4-28UNF.....205~210, X05~X09, 305~308  
 A-PT1/8.....211~218, X10~X20, 309~328

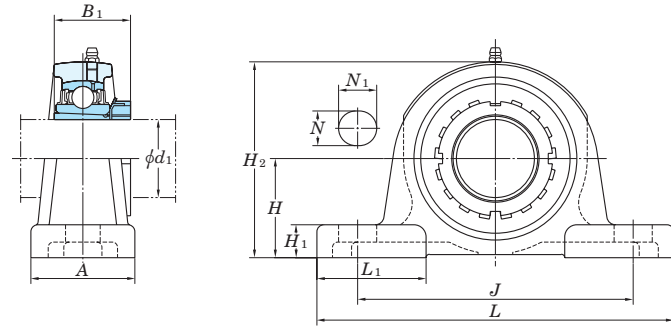
3. In Part No. of unit with adapters and bearing with adapters, Part No. of applicable adapter follow the Part No. shown in the dimensional tables. (Example of Part No. : UKP206J + H306X, UK206 + H306X)

4. As for the triple-lip seal type product (205 is the double-lip seal type product), supplementary code L3 (or L2) follows the Part No. of unit or bearing.  
 5. For the dimensions and forms of applicable bearings and adapters, see the dimensional tables of ball bearing for unit and adapter assemblies.  
 6. Representative examples of the forms of housing are indicated.

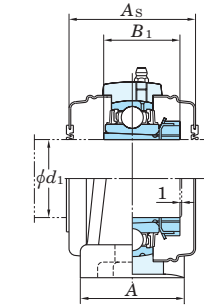


# Pillow block type

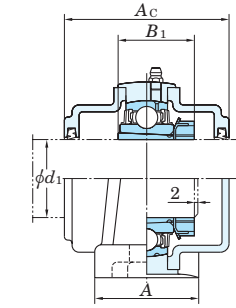
## UKP Tapered bore (with adapter) d<sub>1</sub> (50) ~ 85 mm



With Pressed Steel Covers



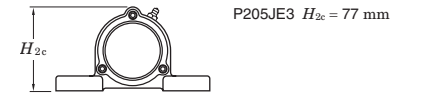
With Cast Iron Covers



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ )

Housing No.	$\Delta H_s$
P205-P210	$\pm 0.15$
P211-P218	$\pm 0.2$
PX05-PX10	$\pm 0.3$
PX11-PX18	$\pm 0.2$
P305-P310	$\pm 0.3$
P311-P318	$\pm 0.2$
P319-P328	$\pm 0.3$

Forms and dimensions of  $H_{2c}$  of P205JE3 (housing with cast iron covers) are shown below.



Shaft Dia. mm inch	Dimensions											Bolt Size inch mm	Standard			Adapter <sup>1)</sup> assembly No.	Mass kg	Basic			With Pressed Steel Covers				With Cast Iron Covers			
	inch mm												Unit No.	Housing No.	Bearing No.			Load Ratings kN	Factor	Unit No.		Dimension mm inch	Mass kg	Unit No.		Dimension mm inch	Mass kg	
d <sub>1</sub>	H	L	A	J	N	N <sub>1</sub>	H <sub>1</sub>	H <sub>2</sub>	L <sub>1</sub>	B <sub>1</sub> <sup>1)</sup>						C <sub>r</sub>	C <sub>0r</sub>	f <sub>0</sub>	Open Ends Type	Closed End Type	A <sub>s</sub>		Open Ends Type	Closed End Type	A <sub>c</sub>			
50	1 7/8	2 3/4	10 1/4	3 1/8	7 1/4	3 1/32	1 13/32	1 3/32	5 15/32	3 9/32	2 5/16	3/4	UKPX11	PX11	UKX11													
	2	69.8	260	79	184	25	36	28	139	83	59	M20																
	1 7/8	3 5/32	12 7/32	3 5/32	9 9/32	25/32	1 1/2	1 1/16	6 7/32	3 17/32	2 5/16	5/8	UKP311	P311	UK311									UKP311C	UKP311CD	114	4 1/2	10.0
55	2 1/8	2 3/4	9 1/2	2 3/4	7 1/4	25/32	3 1/32	7/8	5 7/16	3	1 27/32(2 7/16)	5/8	UKP212	P212	UK212													
	2 1/8	69.8	241	70	184	20	25	22	138	76	47(62)	M16																
	2 1/8	3	11 1/4	3 1/4	8	3 1/32	1 9/16	1 3/32	5 3 1/32	3 15/32	2 7/16	3/4	UKPX12	PX12	UKX12													
60	2 1/8	76.2	286	83	203	25	40	28	152	88	62	M20																
	2 1/8	3 11/32	13	3 11/32	9 27/32	3 1/32	1 1/2	1 5/32	6 9/16	4 1/16	2 7/16	3/4	UKP312	P312	UK312													
	2 1/4	3	10 7/16	2 3/4	8	3 1/32	1 3/16	3 1/32	5 29/32	3 1/16	1 3 1/32(2 9/16)	3/4	UKP213	P213	UK213													
65	2 3/8	76.2	286	83	203	25	40	28	155	88	65	M20																
	2 3/8	3	11 1/4	3 1/4	8	3 1/32	1 9/16	1 3/32	6 3/32	3 15/32	2 9/16	3/4	UKPX13	PX13	UKX13													
	2 1/4	3 35/64	13 3/8	3 17/32	10 1/4	3 1/32	1 1/2	1 1/4	6 15/16	4 1 1/32	2 9/16	3/4	UKP313	P313	UK313													
70	2 1/2	82.6	275	74	217	25	30	28	162	80	55(73)	M20																
	2 1/2	3 1/2	13	3 1/2	9	1 1/16	1 3 1/32	1 1/4	6 7/8	3 29/32	2 7/8	7/8	UKP215	P215	UK215													
	2 1/2	88.9	330	89	229	27	50	32	175	99	73	M22																
75	2 1/2	3 15/16	14 3 1/16	3 15/16	11 13/32	1 1/16	1 9/16	1 3/8	7 25/32	4 7/32	2 7/8	7/8	UKPX15	PX15	UKX15													
	2 1/2	100	380	100	290	27	40	35	198	107	73	M22																
	2 3/4	3 1/2	11 1/2	3 1/16	9 1/8	3 1/32	1 3/8	1 1/4	6 27/32	3 3/8	2 5/16(3 1/16)	3/4	UKP216	P216	UK216													
80	2 3/4	88.9	292	78	232	25	35	32	174	86	59(78)	M20																
	2 3/4	4	15	4	11 1/8	1 1/16	2 9/32	1 11/32	7 11/16	4 9/16	3 1/16	7/8	UKPX16	PX16	UKX16													
	2 3/4	4 1 1/64	15 3/4	4 1 1/32	11 13/16	1 1/16	1 9/16	1 3/8	8 7/32	4 23/32	3 1/16	7/8	UKP316	P316	UK316													
85	3	95.2	310	83	247	25	40	32	185	90	63(82)	M20																
	3	4	15	4	11 1/8	1 1/16	2 3/8	1 11/32	7 7/8	4 9/16	3 7/32	7/8	UKPX17	PX17	UKX17													
	3	4 13/32	16 17/32	4 1 1/32	12 19/32	1 5/16	1 25/32	1 9/16	8 2 1/32	4 23/32	3 7/32	1	UKP317	P317	UK317													
85	3 1/4	101.6	327	88	262	27	45	34	198	104	65(86)	M22																
	3 1/4	4	12 7/8	3 15/32	10 5/16	1 1/16	1 25/32	1 11/32	7 25/32	4 3/32	2 9/16(3 3/8)	7/8	UKP218	P218	UK218													
	3 1/4	101.6	381	111	283	27	60	38	204	116	86	M22																

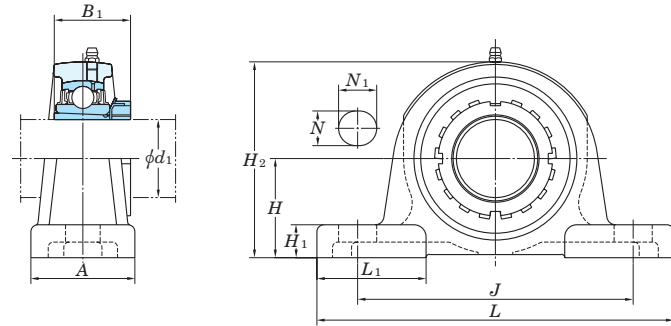
Note 1) Codes shown in parentheses indicate the dimensions and Part No. of applicable adapter (H2300X series) for UK200L3 series (triple-lip seal type).

2. Part No. of applicable grease nipples are shown below.  
A-1/4-28UNF.....205-210, X05-X09, 305-308  
A-PT1/8.....211-218, X10-X20, 309-328

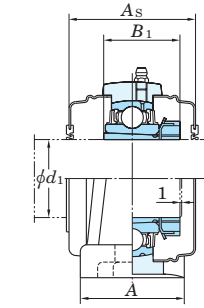
3. In Part No. of unit with adapters and bearing with adapters, Part No. of applicable adapter follow the Part No. shown in the dimensional tables. (Example of Part No. : UKP206J + H306X, UK206 + H306X)  
4. As for the triple-lip seal type product (205 is the double-lip seal type product), supplementary code L3 (or L2) follows the Part No. of unit or bearing.  
5. For the dimensions and forms of applicable bearings and adapters, see the dimensional tables of ball bearing for unit and adapter assemblies.  
6. Representative examples of the forms of housing are indicated.

Pillow block type

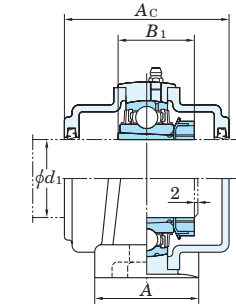
UKP  
Tapered bore (with adapter)  
 $d_1$  90 ~ 125 mm



With Pressed Steel Covers



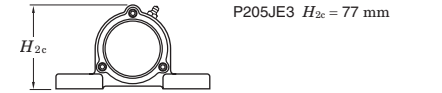
With Cast Iron Covers



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ )

Housing No.			Unit : mm
P205~P210	PX05~PX10	P305~P310	$\pm 0.15$
P211~P218	PX11~PX18	P311~P318	$\pm 0.2$
	PX20	P319~P328	$\pm 0.3$

Forms and dimensions of  $H_{2c}$  of P205JE3 (housing with cast iron covers) are shown below.



Shaft Dia. mm inch	Dimensions inch mm											Bolt Size inch mm	Standard			Adapter <sup>1)</sup> assembly No.	Mass kg	Basic			With Pressed Steel Covers				With Cast Iron Covers			
	H	L	A	J	N	N <sub>1</sub>	H <sub>1</sub>	H <sub>2</sub>	L <sub>1</sub>	B <sub>1</sub> <sup>1)</sup>	Unit No.		Housing No.	Bearing No.	Load Ratings kN			Factor $f_0$	Unit No. Open Ends Type	Unit No. Closed End Type	Dimension mm inch	Mass kg	Unit No. Open Ends Type	Unit No. Closed End Type	Dimension mm inch	Mass kg		
90 3 1/2	5	17	4 3/4	13 1/4	1 5/16	2 9/16	1 25/32	9 21/32	4 31/32	3 13/16	1	UKPX20	PX20	UKX20	133	105	14.4	-	-	-	-	-	-	-	-	-	-	
	127	432	121	337	33	65	45	245	126	97	M27							H2320X	29.3	-	-	-	-	-	-	UKPX20C	UKPX20CD	186
90 3 1/2	5 33/64	19 9/32	4 23/32	14 31/32	1 13/32	1 31/32	1 13/16	10 3/4	5 1/2	3 13/16	1 1/8	UKP320	P320	UK320	173	141	13.2	-	-	-	-	-	-	-	-	-	-	
	140	490	120	380	36	50	46	273	140	97	M30							H2320X	34.8	-	-	-	-	-	-	UKP320C	UKP320CD	174
100 4	5 29/32	20 15/32	5 1/2	15 3/4	1 9/16	2 5/32	1 31/32	11 21/32	5 29/32	4 1/8	1 1/4	UKP322	P322	UK322	205	180	13.2	-	-	-	-	-	-	-	-	-	-	
	150	520	140	400	40	55	50	296	150	105	M33							H2322X	43.9	-	-	-	-	-	-	UKP322C	UKP322CD	188
110 -	6 19/64	22 7/16	5 1/2	17 23/32	1 9/16	2 5/32	1 31/32	12 7/16	6 5/16	4 13/32	1 1/4	UKP324	P324	UK324	207	185	13.5	-	-	-	-	-	-	-	-	-	-	
	160	570	140	450	40	55	50	316	160	112	M33							H2324	55.7	-	-	-	-	-	-	UKP324C	UKP324CD	196
115 4 1/2	7 3/32	23 5/8	5 1/2	18 29/32	1 9/16	2 5/32	1 31/32	13 21/32	7 11/16	4 3/4	1 1/4	UKP326	P326	UK326	229	214	13.6	-	-	-	-	-	-	-	-	-	-	
	180	600	140	480	40	55	50	355	195	121	M33							H2326	71.9	-	-	-	-	-	-	UKP326C	UKP326CD	214
125 -	7 7/8	24 13/32	5 1/2	19 11/16	1 9/16	2 5/32	2 3/8	15 15/32	7 9/32	5 5/32	1 1/4	UKP328	P328	UK328	253	246	13.6	-	-	-	-	-	-	-	-	-	-	
	200	620	140	500	40	55	60	393	185	131	M33							H2328	92.5	-	-	-	-	-	-	UKP328C	UKP328CD	222

Note 1) Codes shown in parentheses indicate the dimensions and Part No. of applicable adapter (H2300X series) for UK200L3 series (triple-lip seal type).

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.

A-1/4-28UNF.....205~210, X05~X09, 305~308  
A-PT1/8.....211~218, X10~X20, 309~328

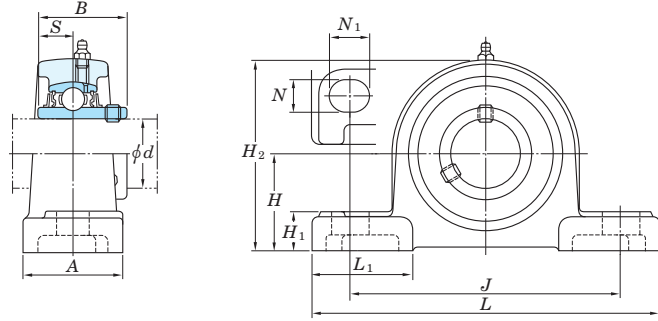
3. In Part No. of unit with adapters and bearing with adapters, Part No. of applicable adapter follow the Part No. shown in the dimensional tables. (Example of Part No. : UKP206J + H306X, UK206 + H306X)

4. As for the triple-lip seal type product (205 is the double-lip seal type product), supplementary code L3 (or L2) follows the Part No. of unit or bearing.

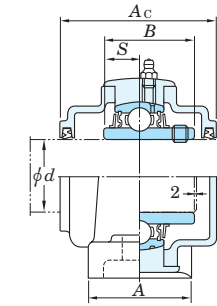
5. For the dimensions and forms of applicable bearings and adapters, see the dimensional tables of ball bearing for unit and adapter assemblies.

6. Representative examples of the forms of housing are indicated.

**UCP-SC**  
**Cylindrical bore (with set screws),**  
**cast steel housing**  
*d* 25 ~ 70 mm



With Cast Iron Covers



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ ) Unit : mm

Housing No.		$\Delta H_s$
P205SC-P210SC	P310SC	±0.15
P211SC-P218SC	P311SC-P318SC	±0.2
	P319SC-P328SC	±0.3

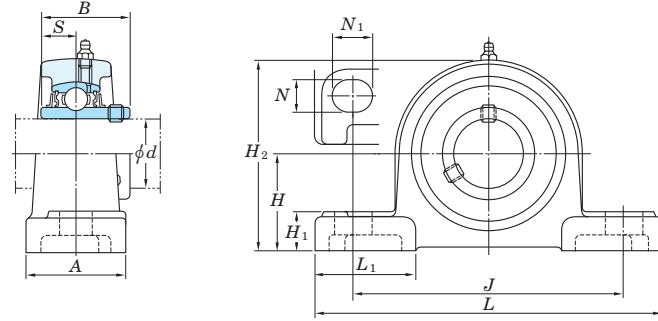
Shaft Dia. mm inch <i>d</i>	Dimensions inch mm												Bolt Size inch mm	Standard			Mass kg	Basic Load Ratings kN		Factor <i>f</i> <sub>0</sub>	With Cast Iron Covers			
	<i>H</i>	<i>L</i>	<i>A</i>	<i>J</i>	<i>N</i>	<i>N</i> <sub>1</sub>	<i>H</i> <sub>1</sub>	<i>H</i> <sub>2</sub>	<i>L</i> <sub>1</sub>	<i>B</i>	<i>S</i>	Unit No.		Housing No.	Bearing No.	<i>C</i> <sub>r</sub>		<i>C</i> <sub>0r</sub>	Unit No. Open Ends Type		Unit No. Closed End Type	Dimension mm inch <i>A</i> <sub>c</sub>	Mass kg	
25 7/8 15/16 1	1 7/16	5 1/2	1 1/2	4 1/8	1/2	23/32	5/8	2 25/32	1 11/16	1.343	0.563	3/8	UCP205-14SC	P205SC	UC205-14	0.90	14.0	7.85	13.9	-	-	-	-	
	36.5	140	38	105	13	18	16	71	43	34.1	14.3	M10	UC205-15		UC205					-	-	-	-	
													UCP205SC		UC205-16					-	-	-	-	
													UCP205-16SC		UC205-16					-	-	-	-	
30 1 1/8 1 3/16 1 1/4	1 11/16	6 1/2	1 7/8	4 3/4	21/32	13/16	23/32	3 3/8	2 3/32	1.500	0.626	1/2	UCP206-18SC	P206SC	UC206-18	1.5	19.5	11.3	13.9	-	-	-	-	
	42.9	165	48	121	17	21	18	86	53	38.1	15.9	M14	UC206		UCP206SCFC					UCP206SCFCD	70	2 3/4	2.0	
													UCP206SC		UC206-19					-	-	-	-	
													UCP206-19SC		UC206-20					-	-	-	-	
35 1 1/4 1 5/16 1 3/8	1 7/8	6 9/16	1 7/8	5	21/32	13/16	3/4	3 25/32	2	1.689	0.689	1/2	UCP207-20SC	P207SC	UC207-20	1.9	25.7	15.4	13.9	-	-	-	-	
	47.6	167	48	127	17	21	19	96	51	42.9	17.5	M14	UC207-21		UC207-21					-	-	-	-	
													UCP207-21SC		UC207-22					-	-	-	-	
													UCP207-22SC		UC207					UCP207SCFC	UCP207SCFCD	78	3 1/16	2.6
40 1 1/2 1 9/16	1 15/16	7 1/4	2 1/8	5 13/32	21/32	13/16	3/4	3 15/16	2 1/4	1.937	0.748	1/2	UCP207-23SC	P208SC	UC207-23	1.9	29.1	17.8	14.0	-	-	-	-	
	49.2	184	54	137	17	21	19	100	57	49.2	19	M14	UC208-24		UC208-24					-	-	-	-	
													UCP208-24SC		UC208-25					-	-	-	-	
													UCP208SC		UC208					UCP208SCFC	UCP208SCFCD	86	3 3/8	3.1
45 1 5/8 1 11/16 1 3/4	2 1/8	7 15/32	2 1/8	5 3/4	21/32	13/16	25/32	4 1/4	2 3/8	1.937	0.748	1/2	UCP209-26SC	P209SC	UC209-26	2.5	34.1	21.3	14.0	-	-	-	-	
	54	190	54	146	17	21	20	108	60	49.2	19	M14	UC209-27		UC209-27					-	-	-	-	
													UCP209-27SC		UC209-28					-	-	-	-	
													UCP209-28SC		UC209					UCP209SCFC	UCP209SCFCD	88	3 15/32	3.3
50 1 7/8 1 15/16 2	2 1/4	8 1/8	2 3/8	6 1/4	25/32	7/8	7/8	4 17/32	2 15/32	2.031	0.748	5/8	UCP210-30SC	P210SC	UC210-30	3.2	35.1	23.3	14.4	-	-	-	-	
	57.2	206	60	159	20	22	22	115	63	51.6	19	M16	UC210-31		UC210-31					-	-	-	-	
													UCP210-31SC		UC210					UCP210SCFC	UCP210SCFCD	97	3 13/16	4.2
													UCP210SC		UC210-32					-	-	-	-	
55 2 2 1/8 2 3/16	2 5/16	10 13/16	2 15/16	8 11/32	25/32	1 3/8	1 1/16	5 13/16	3 15/32	2.402	0.866	5/8	UCP210-32SC	P310SC	UC310	9.2	62.0	38.3	13.2	UCP310SCC	UCP310SCCD	110	4 11/32	10.8
	75	275	75	212	20	35	27	148	88	61	22	M16	UCP211-32SC		UC211-32					-	-	-	-	
													UCP211-34SC		UC211-34					-	-	-	-	
													UCP211SC		UC211					UCP211SCFC	UCP211SCFCD	99	3 29/32	5.2
60 2 1/4 2 3/8 2 7/16	3 5/32	12 7/32	3 5/32	9 9/32	25/32	1 1/2	1 3/16	6 7/32	3 17/32	2.598	0.984	5/8	UCP211-35SC	P311SC	UC311	10.9	71.6	45.0	13.2	UCP311SCC	UCP311SCCD	114	4 1/2	12.7
	80	310	80	236	20	38	30	158	90	66	25	M16	UCP212-36SC		UC212-36					-	-	-	-	
													UCP212SC		UC212					UCP212SCFC	UCP212SCFCD	114	4 1/2	6.7
													UCP212-38SC		UC212-38					-	-	-	-	
65 2 1/2 2 1/2	3 11/32	13	3 11/32	9 27/32	31/32	1 1/2	1 1/4	6 5/8	4 1/16	2.795	1.024	3/4	UCP212-39SC	P312SC	UC312	12.6	81.9	52.2	13.2	UCP312SCC	UCP312SCCD	124	4 7/8	14.9
	85	330	85	250	25	38	32	168	103	71	26	M20	UCP213-40SC		UC213-40					-	-	-	-	
													UCP213SC		UC213					UCP213SCFC	UCP213SCFCD	114	4 1/2	8.1
													UCP213SC		UC313					-	-	-	-	
70 2 3/4 2 3/4	3 35/64	13 3/8	3 17/32	10 1/4	31/32	1 1/2	1 3/8	7	4 11/32	2.953	1.181	3/4	UCP313SC	P313SC	UC313	14.2	92.7	59.9	13.2	UCP313SCC	UCP313SCCD	122	4 13/16	16.3
	90	340	90	260	25	38	35	178	110	75	30	M20	UCP214-44SC		UC214-44					-	-	-	-	
													UCP214SC		UC214					UCP214SCFC	UCP214SCFCD	124	4 7/8	9.0
													UCP214SC		UC314					-	-	-	-	
70 2 3/4 2 3/4	3 47/64	14 3/16	3 17/32	11 1/32	1 1/16	1 9/16	1 1/2	7 13/32	4 11/32	3.071	1.299	7/8	UCP314SC	P314SC	UC314	14.9	104	68.2	13.2	UCP314SCC	UCP314SCCD	124	4 7/8	17.2
	95	360	90	280	27	40	38	188	110	78	33	M22	UCP314SC		UC314					-	-	-	-	

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
 2. Part No. of applicable grease nipples are shown below.  
 A-1/4-28UNF ..... 205-210  
 A-PT1/8 ..... 211-218, 310-328

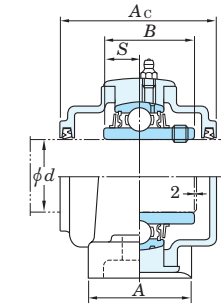
3. As for the triple-lip seal type product (205 is the double-lip seal type product), supplementary code L3 (or L2) follows the Part No. of unit or bearing.  
 (Example of Part No. : UCP206JSL3, UC206L3)  
 4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.



**UCP-SC**  
**Cylindrical bore (with set screws),**  
**cast steel housing**  
**d 75 ~ 140 mm**



With Cast Iron Covers



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ ) Unit : mm

Housing No.		$\Delta H_s$
P205SC-P210SC	P310SC	±0.15
P211SC-P218SC	P311SC-P318SC	±0.2
	P319SC-P328SC	±0.3

Shaft Dia. mm inch  d	Dimensions inch mm												Bolt Size inch mm	Standard			Mass kg	Basic Load Ratings kN		Factor f <sub>0</sub>	With Cast Iron Covers				
	H	L	A	J	N	N <sub>1</sub>	H <sub>1</sub>	H <sub>2</sub>	L <sub>1</sub>	B	S	Unit No.		Housing No.	Bearing No.	C <sub>r</sub>		C <sub>0r</sub>	Unit No. Open Ends Type		Unit No. Closed End Type	Dimension mm inch A <sub>c</sub>	Mass kg		
75 3	2 15/16	3 1/4	10 13/16	2 29/32	8 17/32	3 1/32	1 3/16	1 5/32	6 15/32	3 5/32	3.063	1.311	3/4	UCP215-47SC	P215SC	UC215-47	7.7			-	-	-	-		
	3	82.6	275	74	217	25	30	29	164	80	77.8	33.3	M20	UCP215SC		UC215	7.7	67.4	48.3	14.5	UCP215SCFC	UCP215SCFCD	124	4 7/8	9.6
	2 15/16	3 15/16	14 31/32	3 15/16	11 13/32	1 1/16	1 9/16	1 1/2	7 7/8	4 7/32	3.228	1.260	7/8	UCP315-47SC	P315SC	UC315-47	20.7			-	-	-	-		
80	3	100	380	100	290	27	40	38	200	107	82	32	M22	UCP315SC		UC315	20.7	113	77.2	13.2	UCP315SCC	UCP315SCCD	134	5 9/32	23.2
	3 1/8	3 1/2	11 1/2	3 1/16	9 1/8	3 1/32	1 3/8	1 7/32	6 15/16	3 3/8	3.252	1.311	3/4	UCP216-50SC	P216SC	UC216-50	9.3			-	-	-	-		
	-	4 11/64	15 3/4	4 11/32	11 13/16	1 1/16	1 9/16	1 1/2	8 5/16	4 23/32	3.386	1.339	7/8	UCP316SC	P316SC	UC316	24.2	123	86.7	13.3	UCP316SCC	UCP316SCCD	138	5 7/16	27.1
85	3 1/4	3 3/4	12 7/32	3 9/32	9 23/32	3 1/32	1 9/16	1 5/16	7 13/32	3 17/32	3.374	1.343	3/4	UCP217-52SC	P217SC	UC217-52	11.7			-	-	-	-		
	-	95.2	310	83	247	25	40	38	211	120	86	34	M20	UCP217SC		UC217	11.7	84.0	61.9	14.5	UCP217SCFC	UCP217SCFCD	142	5 19/32	14.4
	3 1/4	4 13/32	16 17/32	4 11/32	12 19/32	1 5/16	1 25/32	1 25/32	8 3/4	4 23/32	3.780	1.575	1	UCP317SC	P317SC	UC317	28.4	133	96.8	13.3	UCP317SCC	UCP317SCCD	146	5 3/4	31.7
90	3 1/2	4	12 7/8	3 15/32	10 5/16	1 1/16	1 25/32	1 3/8	7 7/8	4 3/32	3.780	1.563	7/8	UCP218-56SC	P218SC	UC218-56	13.5			-	-	-	-		
	-	101.6	327	88	262	27	45	35	200	104	96	39.7	M22	UCP218SC		UC218	13.5	96.1	71.5	14.5	UCP218SCFC	UCP218SCFCD	152	6	16.6
	3 1/2	4 41/64	16 15/16	4 11/32	13	1 5/16	1 25/32	1 25/32	9 7/32	4 23/32	3.780	1.575	1	UCP318-56SC	P318SC	UC318-56	30.9			-	-	-	-		
95	-	118	430	110	330	33	45	45	234	120	96	40	M27	UCP318SC		UC318	30.9	143	107	13.3	UCP318SCC	UCP318SCCD	150	5 29/32	34.7
	3 1/4	4 59/64	18 1/2	4 23/32	14 3/16	1 13/32	1 31/32	2	9 3/4	4 29/32	4.055	1.614	1 1/8	UCP319SC	P319SC	UC319	37.9	153	119	13.3	UCP319SCC	UCP319SCCD	162	6 3/8	42.2
	-	125	470	120	360	36	50	51	248	125	103	41	M30												
100	3 15/16	5 33/64	19 9/32	4 23/32	14 31/32	1 13/32	1 31/32	2	10 3/4	5 1/2	4.252	1.654	1 1/8	UCP320SC	P320SC	UC320	45.2			-	-	-	-		
	4	140	490	120	380	36	50	51	273	140	108	42	M30	UCP320-63SC		UC320-63	45.2	173	141	13.2	-	-	-	-	
	-	5 29/32	20 15/32	5 1/2	15 3/4	1 9/16	2 5/32	2 1/4	11 21/32	5 29/32	4.606	1.811	1 1/4	UCP320-64SC		UC320-64	45.2								
110	-	150	520	140	400	40	55	57	296	150	117	46	M33	UCP322SC	P322SC	UC322	53.1	205	180	13.2	UCP322SCC	UCP322SCCD	188	7 13/32	59.9
	3 1/2	6 19/64	22 7/16	5 1/2	17 23/32	1 9/16	2 5/32	2 1/4	12 7/16	6 5/16	4.961	2.008	1 1/4	UCP324SC	P324SC	UC324	69.0	207	185	13.5	UCP324SCC	UCP324SCCD	196	7 23/32	78.5
	-	160	570	140	450	40	55	57	316	160	126	51	M33												
120	-	180	600	140	480	40	55	57	355	195	135	54	M33	UCP326SC	P326SC	UC326	85.6	229	214	13.6	UCP326SCC	UCP326SCCD	214	8 7/16	97.7
	3 3/4	7 3/32	23 5/8	5 1/2	18 29/32	1 9/16	2 5/32	2 1/4	13 21/32	7 11/16	5.315	2.126	1 1/4												
	-	180	600	140	480	40	55	57	355	195	135	54	M33												
140	-	7 7/8	24 13/32	5 1/2	19 11/16	1 9/16	2 5/32	2 3/4	15 15/32	7 9/32	5.709	2.323	1 1/4	UCP328SC	P328SC	UC328	114	253	246	13.6	UCP328SCC	UCP328SCCD	222	8 3/4	129
	4	200	620	140	500	40	55	70	393	185	145	59	M33												

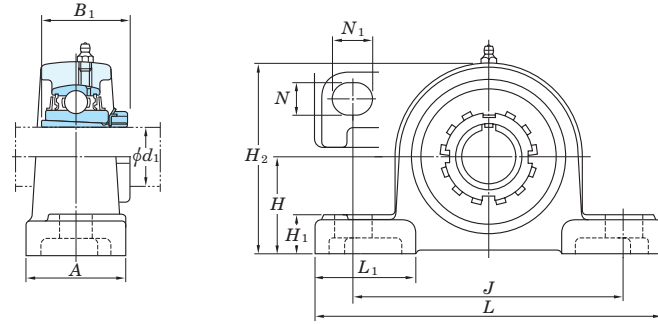
Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
 2. Part No. of applicable grease nipples are shown below.  
 A-1/4-28UNF ..... 205-210  
 A-PT1/8 ..... 211-218, 310-328

3. As for the triple-lip seal type product (205 is the double-lip seal type product), supplementary code L3 (or L2) follows the Part No. of unit or bearing.  
 (Example of Part No. : UCP206JSCL3, UC206L3)  
 4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

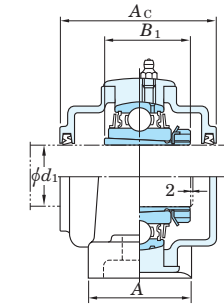


Pillow block type

**UKP-SC**  
Tapered bore (with adapter),  
cast steel housing  
 $d_1$  80 ~ 125 mm



With Cast Iron Covers



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ )

Housing No.		$\Delta H_s$
P205SC-P210SC	P310SC	±0.15
P211SC-P218SC	P311SC-P318SC	±0.2
	P319SC-P328SC	±0.3

Unit : mm

Shaft Dia. mm inch	Dimensions inch mm											Bolt Size inch mm	Standard			Adapter <sup>1)</sup> assembly No.	Mass kg	Basic Load Ratings kN		Factor $f_0$	With Cast Iron Covers		Dimension mm inch	Mass kg	
	$H$	$L$	$A$	$J$	$N$	$N_1$	$H_1$	$H_2$	$L_1$	$B_1^{1)}$	Unit No.		Housing No.	Bearing No.	$C_r$			$C_{0r}$	Open Ends Type		Closed End Type	$A_c$			
80	—	4 101.6	12 7/8 327	3 15/32 88	10 5/16 262	1 1/16 27	1 25/32 45	1 3/8 35	7 7/8 200	4 3/32 104	2 9/16(3 3/8) 65(86)	7/8 M22	UKP218SC	P218SC	UK218	H318X(H2318X)	15.3	96.1	71.5	14.5	UKP218SCFC	UKP218SCFCD	152	6	18.4
	—	4 41/64 118	16 15/16 430	4 11/32 110	13 330	1 5/16 33	1 25/32 45	1 25/32 45	9 7/32 234	4 23/32 120	3 3/8 86	1 M27	UKP318SC	P318SC	UK318	H2318X	31.0	143	107	13.3	UKP318SCC	UKP318SCCD	150	5 29/32	35.2
85	3 1/4	4 59/64 125	18 1/2 470	4 23/32 120	14 3/16 360	1 13/32 36	1 31/32 50	2 51	9 3/4 248	4 29/32 125	3 17/32 90	1 1/8 M30	UKP319SC	P319SC	UK319	HE2319X H2319X	38.2 38.2	153	119	13.3	— UKP319SCC	— UKP319SCCD	— 162	— 6 3/8	— 42.9
		5 33/64 140	19 9/32 490	4 23/32 120	14 31/32 380	1 13/32 36	1 31/32 50	2 51	10 3/4 273	5 1/2 140	3 13/16 97	1 1/8 M30	UKP320SC	P320SC	UK320	HE2320X H2320X	44.9 44.9	173	141	13.2	— UKP320SCC	— UKP320SCCD	— 174	— 6 27/32	— 51.1
100	4	5 29/32 150	20 15/32 520	5 1/2 140	15 3/4 400	1 9/16 40	2 5/32 57	2 1/4 57	11 21/32 296	5 29/32 150	4 1/8 105	1 1/4 M33	UKP322SC	P322SC	UK322	H2322X HE2322X	53.0 53.0	205	180	13.2	— UKP322SCC	— UKP322SCCD	— 188	— 7 13/32	— 59.9
		6 19/64 160	22 7/16 570	5 1/2 140	17 23/32 450	1 9/16 40	2 5/32 57	2 1/4 57	12 7/16 316	6 5/16 160	4 13/32 112	1 1/4 M33	UKP324SC	P324SC	UK324	H2324	69.3	207	185	13.5	UKP324SCC	UKP324SCCD	196	7 23/32	79.6
115	4 1/2	7 3/32 180	23 5/8 600	5 1/2 140	18 29/32 480	1 9/16 40	2 5/32 57	2 1/4 57	13 21/32 355	7 11/16 195	4 3/4 121	1 1/4 M33	UKP326SC	P326SC	UK326	HE2326 H2326	85.4 85.4	229	214	13.6	— UKP326SCC	— UKP326SCCD	— 214	— 8 7/16	— 98.7
		7 7/8 200	24 13/32 620	5 1/2 140	19 11/16 500	1 9/16 40	2 5/32 57	2 3/4 70	15 15/32 393	7 9/32 185	5 9/32 131	1 1/4 M33	UKP328SC	P328SC	UK328	H2328	114	253	246	13.6	UKP328SCC	UKP328SCCD	222	8 3/4	131

Note 1) Codes shown in parentheses indicate the dimensions and Part No. of applicable adapter (H2300X series) for UK200L3 series (triple-lip seal type).

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.  
A-1/4-28UNF.....205~210  
A-PT1/8.....211~218, 310~328

3. In Part No. of unit with adapters and bearing with adapters, Part No. of applicable adapter follow the Part No. shown in the dimensional tables.

(Example of Part No. : UKP206JSC + H306X, UK206 + H306X)

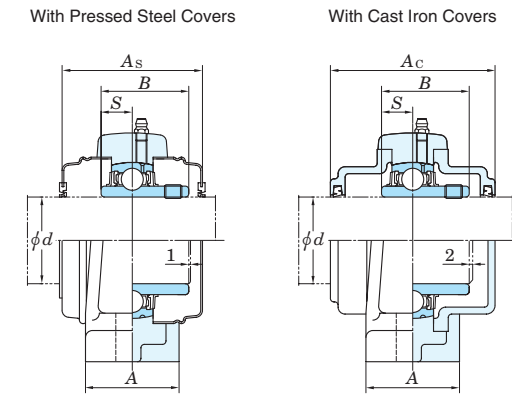
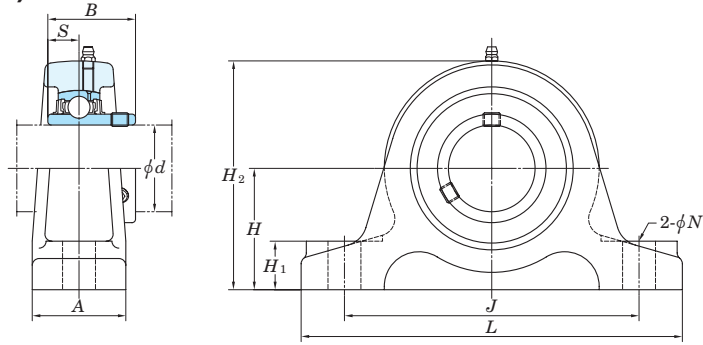
4. As for the triple-lip seal type product (205 is the double-lip seal type product), supplementary code L3 (or L2) follows the Part No. of unit or bearing.

(Example of Part No. : UKP206JSCL3 + H2306X, UK206L3 + H2306X)

5. For the dimensions and forms of applicable bearings and adapters, see the dimensional tables of ball bearing for unit and adapter assemblies.

Thick section pillow block type

UCIP  
Cylindrical bore (with set screws)  
d 40 ~ 140 mm



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ ) and variations of tolerance of distance between centers of bolt holes ( $\Delta J_s$ )

Housing No.	$\Delta H_s$	$\Delta J_s$
IP208-IP210	$\pm 0.15$	$\pm 0.5$
IP211-IP213	$\pm 0.2$	$\pm 0.7$
IP319-IP328	$\pm 0.3$	

Unit : mm

Shaft Dia. mm inch d	Dimensions inch mm										Bolt Size inch mm	Standard			Mass kg	Basic Load Ratings kN		Factor $f_0$	With Pressed Steel Covers				With Cast Iron Covers							
	H	L	A	J	N	H <sub>1</sub>	H <sub>2</sub>	B	S	Unit No.		Housing No.	Bearing No.	Cr		C <sub>0r</sub>	Unit No.		Dimension mm inch A <sub>s</sub>	Mass kg	Unit No.	Dimension mm inch A <sub>c</sub>	Mass kg							
40 1 1/2 1 9/16	2 23/64 60	7 7/8 200	2 3/8 60	5 29/32 150	3/4 19	3 1/32 25	4 17/32 115	1.937 49.2	0.748 19	5/8 M16	IP208	UC208-24 UC208-25 UC208	3.4 3.4 3.4	29.1 17.8	14.0	UCIP208C	UCIP208CD	68	2 11/16	3.4	UCIP208FC	UCIP208FCD	86	3 3/8	4.2					
																UCIP209-26 UCIP209-27 UCIP209-28 UCIP209	IP209	3.9 3.9 3.9 3.9	34.1 21.3	14.0	UCIP209C	UCIP209CD	68	2 11/16	3.9	UCIP209FC	UCIP209FCD	88	3 15/32	4.7
																UCIP210-30 UCIP210-31 UCIP210 UCIP210-32	IP210	4.8 4.8 4.8 4.8	35.1 23.3	14.4	UCIP210C	UCIP210CD	73	2 7/8	4.8	UCIP210FC	UCIP210FCD	97	3 13/16	5.8
50 1 7/8 1 15/16 2	2 3/4 70	8 21/32 220	2 3/8 60	6 11/16 170	3/4 19	1 3/32 28	5 3/16 132	2.031 51.6	0.748 19	5/8 M16	IP211	UC211-32 UC211-34 UC211 UC211-35	5.3 5.3 5.3 5.3	43.4 29.4	14.4	UCIP211C	UCIP211CD	75	2 15/16	5.3	UCIP211FC	UCIP211FCD	99	3 29/32	6.3					
																UCIP212-36 UCIP212 UCIP212-38 UCIP212-39	IP212	7.2 7.2 7.2 7.2	52.4 36.2	14.4	UCIP212C	UCIP212CD	88	3 15/32	7.2	UCIP212FC	UCIP212FCD	114	4 1/2	8.7
																UCIP213-40 UCIP213 UCIP313-40 UCIP313	IP213	8.8 8.8 13.4 13.4	57.2 40.1	14.4	UCIP213C	UCIP213CD	88	3 15/32	8.8	UCIP213FC	UCIP213FCD	114	4 1/2	10.5
60 2 3/8 2 7/16	3 5/32 80	10 1/4 260	2 3/4 70	7 7/8 200	7/8 22	1 3/16 30	6 3/32 155	2.563 65.1	1.000 25.4	3/4 M20	IP213	UC313-40 UC313	13.4 13.4	92.7 59.9	13.2	UCIP313C	UCIP313CD	122	4 13/16	15.5	UCIP314-44 UCIP314	IP314	15.3 15.3	104 68.2	13.2	UCIP314C	UCIP314CD	124	4 7/8	17.6
																UCIP315-47 UCIP315 UCIP315-48	IP315	17.6 17.6 17.6	113 77.2	13.2	UCIP315C	UCIP315CD	134	5 9/32	20.1					
70 2 3/4	4 21/64 110	13 310	2 15/16 75	10 5/8 270	3 1/32 25	1 3/8 35	8 15/32 215	3.071 78	1.299 33	7/8 M22	IP316	UC316	20.3	123 86.7	13.3	UCIP316C	UCIP316CD	138	5 7/16	23.2	UCIP317-56 UCIP317	IP317	25.9	133 96.8	13.3	UCIP317C	UCIP317CD	146	5 3/4	29.2
																UCIP318-56 UCIP318	IP318	28.6 28.6	143 107	13.3	UCIP318C	UCIP318CD	150	5 29/32	32.4					
80 3 1/2	5 1/8 130	14 9/16 370	3 11/32 85	12 13/64 310	3 1/32 25	1 9/16 40	10 1/32 255	3.780 96	1.575 40	7/8 M22	IP319	UC319	31.7	153 119	13.3	UCIP319C	UCIP319CD	162	6 3/8	36.0	UCIP320-63 UCIP320-64	IP320	36.9 36.9 36.9	173 141	13.2	UCIP320C	UCIP320CD	174	6 27/32	42.5
																UCIP322C	UCIP322CD	188	7 13/32	59.2										
90 3 1/2	5 1/8 130	15 3/4 400	3 11/32 85	13 330	1 5/32 29	1 29/32 45	10 1/4 260	3.780 96	1.575 40	1 M27	IP324	UC324	58.7	207 185	13.5	UCIP324C	UCIP324CD	196	7 29/32	68.2	UCIP326 UCIP326	IP326	76.2	229 214	13.6	UCIP326C	UCIP326CD	214	8 7/16	88.3
																UCIP328C	UCIP328CD	222	8 3/4	102										
100 3 15/16 4	5 29/32 150	16 15/16 430	3 11/32 85	14 11/64 360	1 5/32 29	1 29/32 45	11 5/8 295	4.252 108	1.654 42	1 M27	IP326	UC326	76.2	229 214	13.6	UCIP326C	UCIP326CD	214	8 7/16	88.3	UCIP328C	UCIP328CD	222	8 3/4	102					
																UCIP328C	UCIP328CD	222	8 3/4	102										
110 4	6 11/16 170	19 9/32 490	3 15/16 100	16 9/64 410	1 1/4 32	1 31/32 50	13 3/16 335	4.606 117	1.811 46	1 1/8 M30	IP326	UC326	76.2	229 214	13.6	UCIP326C	UCIP326CD	214	8 7/16	88.3	UCIP328C	UCIP328CD	222	8 3/4	102					
																UCIP328C	UCIP328CD	222	8 3/4	102										
120 4	6 11/16 170	20 3/32 510	3 15/16 100	16 59/64 430	1 1/4 32	1 31/32 50	13 19/32 345	4.961 126	2.008 51	1 1/8 M30	IP326	UC326	76.2	229 214	13.6	UCIP326C	UCIP326CD	214	8 7/16	88.3	UCIP328C	UCIP328CD	222	8 3/4	102					
																UCIP328C	UCIP328CD	222	8 3/4	102										
130 4	7 7/8 200	21 21/32 550	4 11/32 110	18 1/2 470	1 1/4 32	1 31/32 50	15 11/32 390	5.315 135	2.126 54	1 1/8 M30	IP326	UC326	76.2	229 214	13.6	UCIP326C	UCIP326CD	214	8 7/16	88.3	UCIP328C	UCIP328CD	222	8 3/4	102					
																UCIP328C	UCIP328CD	222	8 3/4	102										
140 4	7 7/8 200	23 7/32 590	4 11/32 110	19 11/16 500	1 3/8 35	2 5/32 55	15 3/4 400	5.709 145	2.323 59	1 1/4 M33	IP328	UC328	87.0	253 246	13.6	UCIP328C	UCIP328CD	222	8 3/4	102	UCIP328C	UCIP328CD	222	8 3/4	102					
																UCIP328C	UCIP328CD	222	8 3/4	102										

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.

A-1/4-28UNF ..... 208-210

A-PT1/8 ..... 211-213, 313-328

3. As for the triple-lip seal type product, supplementary code L3 follows the Part No. of unit or bearing.

(Example of Part No. : UCIP208JL3, UC208L3)

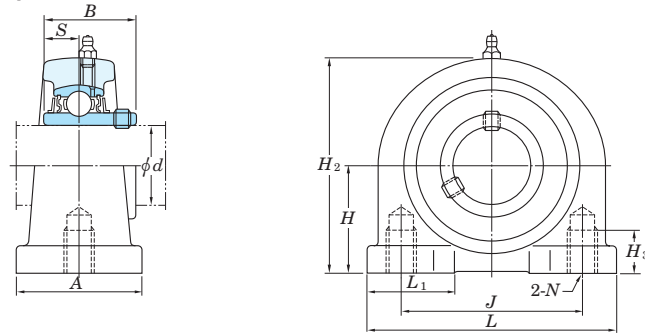
4. As for the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.





Tapped-base pillow block type

UCPA  
Cylindrical bore (with set screws)  
d 12 ~ 50 mm



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_3$ ) and variations of tolerance of distance between centers of bolt holes ( $\Delta J_3$ )

Housing No.	$\Delta H_3$	$\Delta J_3$
PA204-PA210	$\pm 0.15$	$\pm 0.5$

Unit : mm

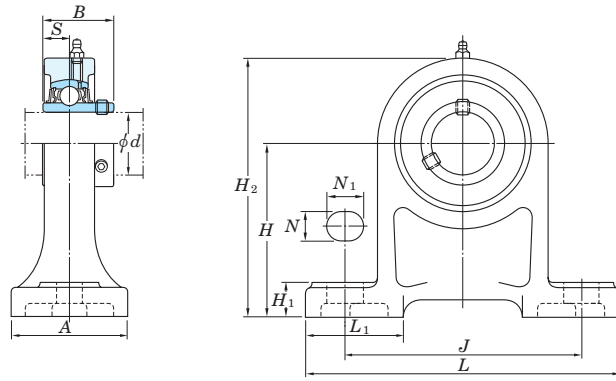
Shaft Dia. mm inch  d	Dimensions inch mm											Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor $f_0$	Mass kg
	H	L	A	J	N	H <sub>2</sub>	H <sub>3</sub>	L <sub>1</sub>	B	S	C <sub>r</sub>				C <sub>0r</sub>			
12 1/2												UCPA201 UCPA201-8		UC201 UC201-8				0.64
15 5/8	1 3/16	3	1 9/16	2 3/64	M10×1.5	2 3/8	1/2	1 1/16	1.220	0.500		UCPA202 UCPA202-10	PA204	UC202 UC202-10	12.8	6.65	13.2	0.62
17 3/4	30.2	76	40	52		60	13	27	31	12.7		UCPA203 UCPA204-12		UC203 UC204-12				0.61
20												UCPA204		UC204				0.59
25 7/8 15/16	1 7/16	3 5/16	1 25/32	2 13/64	M10×1.5	2 25/32	1/2	1 3/16	1.343	0.563		UCPA205-14 UCPA205-15	PA205	UC205-14 UC205-15	14.0	7.85	13.9	0.83
25	36.5	84	45	56		71	13	30	34.1	14.3		UCPA205 UCPA205-16		UC205 UC205-16				
30 1 1/8	1 11/16	3 11/16	1 31/32	2 19/32	M14×2	3 5/16	23/32	1 13/32	1.500	0.626		UCPA206-18 UCPA206	PA206	UC206-18 UC206	19.5	11.3	13.9	1.2
30	42.9	94	50	66		84	18	36	38.1	15.9		UCPA206-19 UCPA206-20		UC206-19 UC206-20				
35 1 1/4 1 5/16 1 3/8	1 7/8	3 11/32	2 5/32	3 5/32	M14×2	3 21/32	25/32	1 5/8	1.689	0.689		UCPA207-20 UCPA207-21	PA207	UC207-20 UC207-21	25.7	15.4	13.9	1.7
35	47.6	110	55	80		93	20	41	42.9	17.5		UCPA207-22 UCPA207 UCPA207-23		UC207-22 UC207 UC207-23				
40 1 1/2 1 9/16	1 15/16	4 9/16	2 9/32	3 5/16	M14×2	3 15/16	25/32	1 5/8	1.937	0.748		UCPA208-24 UCPA208-25	PA208	UC208-24 UC208-25	29.1	17.8	14.0	2.0
40	49.2	116	58	84		100	20	41	49.2	19		UCPA208		UC208				
45 1 5/8 1 11/16 1 3/4	2 9/64	4 23/32	2 3/8	3 35/64	M14×2	4 3/16	31/32	1 21/32	1.937	0.748		UCPA209-26 UCPA209-27	PA209	UC209-26 UC209-27	34.1	21.3	14.0	2.2
45	54.2	120	60	90		106	25	42	49.2	19		UCPA209-28 UCPA209		UC209-28 UC209				
50 1 7/8 1 15/16	2 1/4	5 1/8	2 17/32	3 45/64	M16×2	4 7/16	31/32	1 27/32	2.031	0.748		UCPA210-30 UCPA210-31	PA210	UC210-30 UC210-31	35.1	23.3	14.4	2.8
50	57.2	130	64	94		113	25	47	51.6	19		UCPA210 UCPA210-32		UC210 UC210-32				

Remarks 1. In Part No. of unit, fitting codes follow bore diameter codes. (See Table 10.5 in P.51.)  
 2. Part No. of the applicable grease nipple is A-1/4-28UNF.  
 3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (or L2) follows Part No. of unit or bearing. (Example of Part No. : UCPA206JL3, UC206L3)

4. As for the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.  
 5. Tapered bore (with adapter) type products are also available. (Example of Part No. : UKPA205J + H305X, UK205 + H305X)



**UCPH**  
Cylindrical bore (with set screws)  
 $d$  12 ~ 50 mm



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ )

Housing No.	$\Delta H_s$
PH204-PH210	$\pm 0.15$

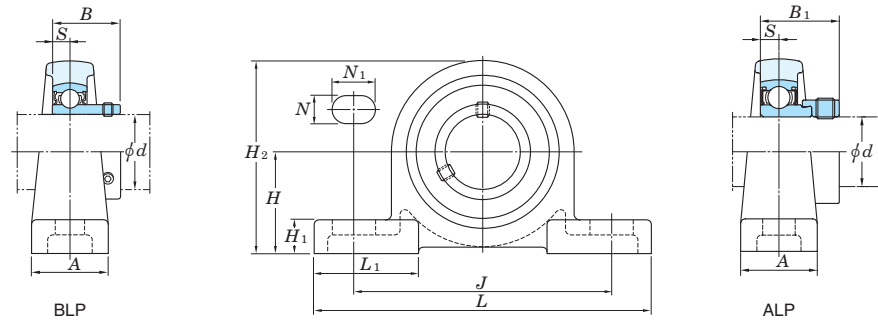
Shaft Dia. mm inch $d$	Dimensions inch mm											Bolt Size inch mm	Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor $f_0$	Mass kg	
	$H$	$L$	$A$	$J$	$N$	$N_1$	$H_1$	$H_2$	$L_1$	$B$	$S$					$C_r$	$C_{or}$			
12 1/2														UCPH201 UCPH201-8	PH204	UC201 UC201-8	12.8	6.65	13.2	0.96
15 5/8	2 3/4	5	1 9/16	3 3/4	1/2	3/4	19/32	3 21/32	1 13/16	1.220	0.500	3/8	UCPH202 UCPH202-10	PH204	UC202 UC202-10	12.8	6.65	13.2	0.94	
17 3/4	70	127	40	95	13	19	15	101	46	31	12.7	M10	UCPH203 UCPH204-12	PH204	UC203 UC204-12	12.8	6.65	13.2	0.93	
20													UCPH204	PH204	UC204	12.8	6.65	13.2	0.91	
25 7/8 15/16	3 5/32	5 1/2	1 31/32	4 1/8	1/2	3/4	5/8	3 1/2	1 15/16	1.343	0.563	3/8	UCPH205-14 UCPH205-15	PH205	UC205-14 UC205-15	14.0	7.85	13.9	1.2	
25	80	140	50	105	13	19	16	114	49	34.1	14.3	M10	UCPH205 UCPH205-16	PH205	UC205 UC205-16	14.0	7.85	13.9	1.2	
30 1 1/8	3 35/64	6 1/2	1 31/32	4 3/4	21/32	13/16	23/32	5 1/8	1 7/32	1.500	0.626	1/2	UCPH206-18 UCPH206	PH206	UC206-18 UC206	19.5	11.3	13.9	1.6	
30	90	165	50	121	17	21	18	130	56	38.1	15.9	M14	UCPH206-19 UCPH206-20	PH206	UC206-19 UC206-20	19.5	11.3	13.9	1.6	
35 1 1/4 1 5/16 1 3/8	3 47/64	6 9/16	2 3/8	5	21/32	13/16	23/32	5 1/2	1 1/8	1.689	0.689	1/2	UCPH207-20 UCPH207-21	PH207	UC207-20 UC207-21	25.7	15.4	13.9	2.0	
35	95	167	60	127	17	21	18	140	54	42.9	17.5	M14	UCPH207-22 UCPH207 UCPH207-23	PH207	UC207-22 UC207 UC207-23	25.7	15.4	13.9	2.0	
40 1 1/2 1 9/16	3 15/16	7 1/4	2 3/4	5 13/32	21/32	13/16	25/32	5 29/32	2 1/4	1.937	0.748	1/2	UCPH208-24 UCPH208-25	PH208	UC208-24 UC208-25	29.1	17.8	14.0	2.7	
40	100	184	70	137	17	21	20	150	57	49.2	19	M14	UCPH208 UCPH208	PH208	UC208 UC208	29.1	17.8	14.0	2.7	
45 1 5/8 1 11/16 1 3/4	4 9/64	7 15/32	2 3/4	5 3/4	21/32	13/16	25/32	6 7/32	2 9/32	1.937	0.748	1/2	UCPH209-26 UCPH209-27	PH209	UC209-26 UC209-27	34.1	21.3	14.0	3.0	
45	105	190	70	146	17	21	20	158	58	49.2	19	M14	UCPH209-28 UCPH209	PH209	UC209-28 UC209	34.1	21.3	14.0	3.0	
50 1 7/8 1 15/16	4 21/64	8 1/8	2 3/4	6 1/4	25/32	7/8	7/8	6 1/2	2 9/16	2.031	0.748	5/8	UCPH210-30 UCPH210-31	PH210	UC210-30 UC210-31	35.1	23.3	14.4	3.5	
50	110	206	70	159	20	22	22	165	65	51.6	19	M16	UCPH210 UCPH210-32	PH210	UC210 UC210-32	35.1	23.3	14.4	3.5	

Remarks 1. In Part No. of unit, fitting codes follow bore diameter codes. (See Table 10.5 in P.51.)  
 2. Part No. of the applicable grease nipple is A-1/4-28UNF.  
 3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (or L2) follows Part No. of unit or bearing. (Example of Part No. : UCPH206JL3, UC206L3)

4. As for the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.  
 5. Tapered bore (with adapter) type products are also available. (Example of Part No. : UKPH205J + H305X, UK205 + H305X)

Light duty pillow block type

**BLP**  
Cylindrical bore  
(with set screws)  
**ALP**  
Cylindrical bore  
(with eccentric locking collar)  
*d* 12 ~ 40 mm



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ )

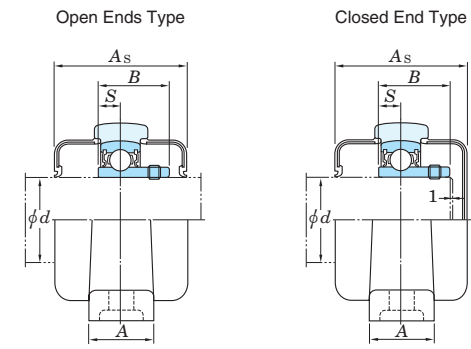
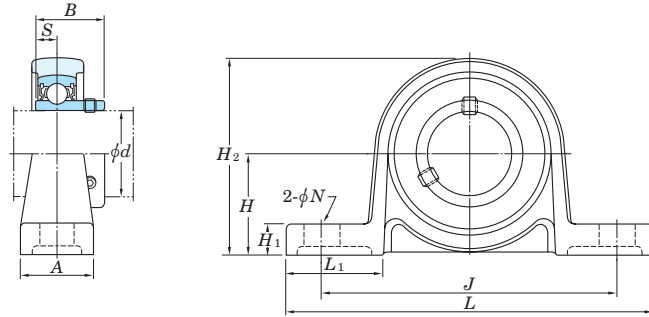
Housing No.	Unit : mm
LP203-LP208	±0.15

Shaft Dia. mm inch	Dimensions inch mm												Bolt Size inch mm	Unit No.	Bearing No.	Unit No.	Bearing No.	Housing No.	Basic Load Ratings kN		Factor <i>f</i> <sub>0</sub>	Mass kg		
	<i>H</i>	<i>L</i>	<i>A</i>	<i>J</i>	<i>N</i>	<i>N</i> <sub>1</sub>	<i>H</i> <sub>1</sub>	<i>H</i> <sub>2</sub>	<i>L</i> <sub>1</sub>	<i>S</i>	BLP <i>B</i>	ALP <i>B</i> <sub>1</sub>							<i>C</i> <sub>r</sub>	<i>C</i> <sub>0r</sub>		BLP	ALP	
12 1/2	1 3/16	4 1/2	3 1/32	3 7/16	7/16	5/8	15/32	2 1/4	1 3/8	0.236	0.866	1.122	3/8	M10	BLP201 BLP201-8 BLP202 BLP202-10 BLP203	SB201 SB201-8 SB202 SB202-10 SB203	ALP201 ALP201-8 ALP202 ALP202-10 ALP203	SA201 SA201-8 SA202 SA202-10 SA203	LP203	9.55	4.80	13.2	0.36	0.39
15 5/8	1 5/16	4 29/32	1 1/16	3 13/16	7/16	5/8	1/2	2 25/32	1 1/2	0.276	0.984	1.161	3/8	M10	BLP204-12 BLP204	SB204-12 SB204	ALP204-12 ALP204	SA204-12 SA204	LP204	12.8	6.65	13.2	0.51	0.51
17 3/4	1 7/16	5 1/8	1 5/32	3 15/16	7/16	5/8	1/2	2 25/32	1 17/32	0.295	1.063	1.201	3/8	M10	BLP205-14 BLP205-15 BLP205 BLP205-16	SB205-14 SB205-15 SB205 SB205-16	ALP205-14 ALP205-15 ALP205 ALP205-16	SA205-14 SA205-15 SA205 SA205-16	LP205	14.0	7.85	13.9	0.57	0.61
20 3/4	1 11/16	6 5/32	1 5/16	4 23/32	9/16	13/16	9/16	3 9/32	1 27/32	0.315	1.181	1.335	1/2	M12	BLP206-18 BLP206 BLP206-19 BLP206-20 BLP207-20	SB206-18 SB206 SB206-19 SB206-20 SB207-20	ALP206-18 ALP206 ALP206-19 ALP206-20 ALP207-20	SA206-18 SA206 SA206-19 SA206-20 SA207-20	LP206	19.5	11.3	13.9	0.69	0.72
25 1 1/8	1 7/8	6 1/2	1 3/8	5	9/16	13/16	5/8	3 21/32	1 31/32	0.335	1.260	1.437	1/2	M12	BLP207-22 BLP207 BLP207-23 BLP208-24	SB207-22 SB207 SB207-23 SB208-24	ALP207-22 ALP207 ALP207-23 ALP208-24	SA207-22 SA207 SA207-23 SA208-24	LP207	25.7	15.4	13.9	0.94	1.0
30 1 3/8	2	7 1/4	1 15/32	5 1/2	9/16	7/8	23/32	4 1/32	2 5/32	0.354	1.339	1.595	1/2	M12	BLP208-24 BLP208	SB208-24 SB208	ALP208-24 ALP208	SA208-24 SA208	LP208	29.1	17.8	14.0	1.8	1.9

Remarks 1. In Part No. of unit, fitting codes follow bore diameter codes. (See Table 10.5 in P.51.)  
 2. Allowable load to housing in radial direction is approximately half of basic load rating of bearing, *C<sub>r</sub>* (when safety factor is 4).  
 3. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

“Compact” series pillow block type

UP  
Cylindrical bore (with set screws)  
d 10 ~ 30 mm



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ ) and variations of tolerance of distance between centers of bolt holes ( $\Delta J_s$ )

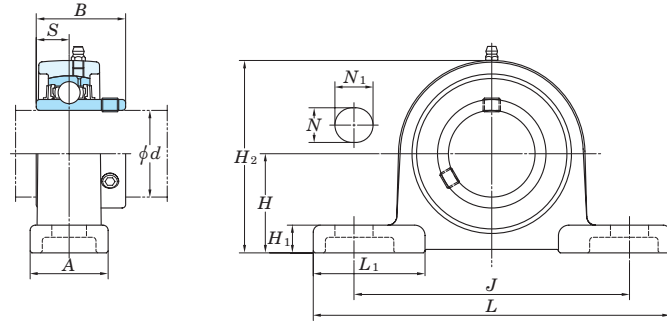
Housing No.	$\Delta H_s$	$\Delta J_s$
P000-P006	$\pm 0.15$	$\pm 0.3$

Unit : mm

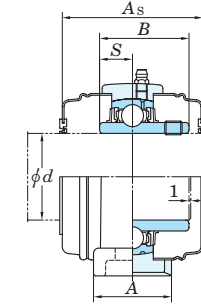
Shaft Dia. mm  d	Dimensions inch mm										Bolt Size inch mm	Standard			Mass kg	Basic Load Ratings kN		Factor f <sub>0</sub>	With Rubber Coated Covers			
	H	L	A	J	N	H <sub>1</sub>	H <sub>2</sub>	L <sub>1</sub>	B	S		Unit No.	Housing No.	Bearing No.		C <sub>r</sub>	C <sub>0r</sub>		Unit No.		Dimension mm inch	Mass kg
																			Open Ends Type	Closed End Type		
10	<sup>45</sup> / <sub>64</sub> 18	2 <sup>5</sup> / <sub>8</sub> 67	<sup>5</sup> / <sub>8</sub> 16	2 <sup>3</sup> / <sub>32</sub> 53	<sup>9</sup> / <sub>32</sub> 7	<sup>1</sup> / <sub>4</sub> 6	1 <sup>3</sup> / <sub>8</sub> 35	<sup>23</sup> / <sub>32</sub> 18	0.591 15	0.197 5	<sup>1</sup> / <sub>4</sub> M6	UP000	P000	SU000	4.55	1.95	12.3	UP000C	UP000CD	29 1 <sup>5</sup> / <sub>32</sub>	0.070	
12	<sup>3</sup> / <sub>4</sub> 19	2 <sup>25</sup> / <sub>32</sub> 71	<sup>5</sup> / <sub>8</sub> 16	2 <sup>13</sup> / <sub>64</sub> 56	<sup>9</sup> / <sub>32</sub> 7	<sup>1</sup> / <sub>4</sub> 6	1 <sup>1</sup> / <sub>2</sub> 38	<sup>3</sup> / <sub>4</sub> 19	0.591 15	0.197 5	<sup>1</sup> / <sub>4</sub> M6	UP001	P001	SU001	5.10	2.40	13.2	UP001C	UP001CD	29 1 <sup>5</sup> / <sub>32</sub>	0.090	
15	<sup>55</sup> / <sub>64</sub> 22	3 <sup>5</sup> / <sub>32</sub> 80	<sup>5</sup> / <sub>8</sub> 16	2 <sup>31</sup> / <sub>64</sub> 63	<sup>9</sup> / <sub>32</sub> 7	<sup>9</sup> / <sub>32</sub> 7	1 <sup>11</sup> / <sub>16</sub> 43	<sup>13</sup> / <sub>16</sub> 21	0.650 16.5	0.217 5.5	<sup>1</sup> / <sub>4</sub> M6	UP002	P002	SU002	5.60	2.85	13.9	UP002C	UP002CD	31 1 <sup>7</sup> / <sub>32</sub>	0.11	
17	<sup>15</sup> / <sub>16</sub> 24	3 <sup>11</sup> / <sub>32</sub> 85	<sup>23</sup> / <sub>32</sub> 18	2 <sup>41</sup> / <sub>64</sub> 67	<sup>9</sup> / <sub>32</sub> 7	<sup>9</sup> / <sub>32</sub> 7	1 <sup>27</sup> / <sub>32</sub> 47	<sup>13</sup> / <sub>16</sub> 21	0.689 17.5	0.236 6	<sup>1</sup> / <sub>4</sub> M6	UP003	P003	SU003	6.00	3.25	14.4	UP003C	UP003CD	33 1 <sup>5</sup> / <sub>16</sub>	0.15	
20	1 <sup>7</sup> / <sub>64</sub> 28	3 <sup>15</sup> / <sub>16</sub> 100	<sup>25</sup> / <sub>32</sub> 20	3 <sup>5</sup> / <sub>32</sub> 80	<sup>13</sup> / <sub>32</sub> 10	<sup>11</sup> / <sub>32</sub> 9	2 <sup>5</sup> / <sub>32</sub> 55	<sup>31</sup> / <sub>32</sub> 25	0.827 21	0.276 7	<sup>5</sup> / <sub>16</sub> M8	UP004	P004	SU004	9.40	5.05	13.9	UP004C	UP004CD	38 1 <sup>1</sup> / <sub>2</sub>	0.23	
25	1 <sup>17</sup> / <sub>64</sub> 32	4 <sup>13</sup> / <sub>32</sub> 112	<sup>25</sup> / <sub>32</sub> 20	3 <sup>35</sup> / <sub>64</sub> 90	<sup>13</sup> / <sub>32</sub> 10	<sup>13</sup> / <sub>32</sub> 10	2 <sup>7</sup> / <sub>16</sub> 62	1 <sup>3</sup> / <sub>32</sub> 28	0.866 22	0.276 7	<sup>5</sup> / <sub>16</sub> M8	UP005	P005	SU005	10.1	5.85	14.5	UP005C	UP005CD	40 1 <sup>9</sup> / <sub>16</sub>	0.28	
30	1 <sup>27</sup> / <sub>64</sub> 36	5 <sup>3</sup> / <sub>16</sub> 132	1 <sup>1</sup> / <sub>32</sub> 26	4 <sup>11</sup> / <sub>64</sub> 106	<sup>1</sup> / <sub>2</sub> 13	<sup>7</sup> / <sub>16</sub> 11	2 <sup>3</sup> / <sub>4</sub> 70	1 <sup>11</sup> / <sub>32</sub> 34	0.965 24.5	0.295 7.5	<sup>3</sup> / <sub>8</sub> M10	UP006	P006	SU006	13.2	8.25	14.7	UP006C	UP006CD	44 1 <sup>23</sup> / <sub>32</sub>	0.42	

- Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter codes. (See Table 10.5 in P.51.)  
 2. Housing is made from special light alloy.  
 3. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

**UCSP-H1S6**  
**Cylindrical bore (with set screws)**  
*d* 20 ~ 50 mm



With Pressed Stainless Steel Covers



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ ) and variations of tolerance of distance between centers of bolt holes ( $\Delta J_s$ )

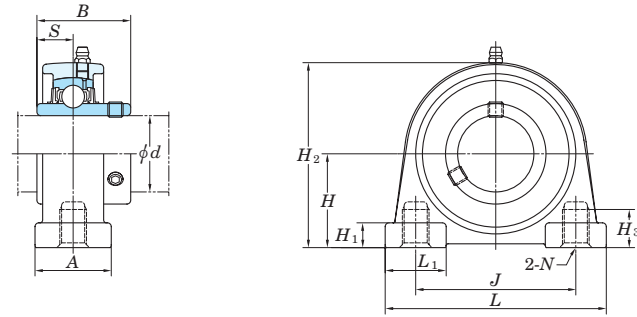
Housing No.	$\Delta H_s$	$\Delta J_s$
SP204H1-SP210H1	±0.15	±0.3

Unit : mm

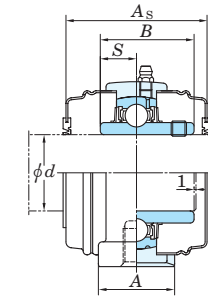
Shaft Dia. mm <i>d</i>	Dimensions												Bolt Size inch mm	Standard			Mass kg	Basic Load Ratings kN			Factor <i>f</i> <sub>0</sub>	With Pressed Stainless Steel Covers		
	<i>H</i>	<i>L</i>	<i>A</i>	<i>J</i>	<i>N</i>	<i>N</i> <sub>1</sub>	<i>H</i> <sub>1</sub>	<i>H</i> <sub>2</sub>	<i>L</i> <sub>1</sub>	<i>B</i>	<i>S</i>	Unit No.		Housing No.	Bearing No.	<i>C</i> <sub>r</sub>		<i>C</i> <sub>0r</sub>	Open Ends Type	Closed End Type		Dimension mm inch <i>A</i> <sub>s</sub>	Mass kg	
20	1 5/16	5	1 3/16	3 3/4	1/2	23/32	7/16	2 15/32	1 21/32	1.220	0.500	3/8	UCSP204H1S6	SP204H1	UC204S6	10.9	5.35	13.2	UCSP204H1CS6	UCSP204H1CDS6	45	1 25/32	0.54	
	33.3	127	30	95	13	18	11	63	42	31	12.7	M10												
25	1 7/16	5 1/2	1 3/16	4 1/8	1/2	3/4	15/32	2 23/32	1 13/16	1.343	0.563	3/8	UCSP205H1S6	SP205H1	UC205S6	11.9	6.3	13.9	UCSP205H1CS6	UCSP205H1CDS6	49	1 15/16	0.70	
	36.5	140	30	105	13	19	12	69	46	34.1	14.3	M10												
30	1 11/16	6 1/2	1 13/32	4 3/4	21/32	13/16	1/2	3 3/16	2 1/8	1.500	0.626	1/2	UCSP206H1S6	SP206H1	UC206S6	16.5	9.05	13.9	UCSP206H1CS6	UCSP206H1CDS6	53	2 3/32	1.0	
	42.9	165	36	121	17	21	13	81	54	38.1	15.9	M14												
35	1 7/8	6 9/16	1 1/2	5	21/32	13/16	9/16	3 19/32	2	1.689	0.689	1/2	UCSP207H1S6	SP207H1	UC207S6	21.8	12.3	13.9	UCSP207H1CS6	UCSP207H1CDS6	60	2 3/8	1.4	
	47.6	167	38	127	17	21	14	91	51	42.9	17.5	M14												
40	1 15/16	7 1/4	1 9/16	5 13/32	21/32	13/16	9/16	3 13/16	2 3/8	1.937	0.748	1/2	UCSP208H1S6	SP208H1	UC208S6	24.8	14.3	14.0	UCSP208H1CS6	UCSP208H1CDS6	69	2 23/32	1.7	
	49.2	184	40	137	17	21	14	97	60	49.2	19	M14												
45	2 1/8	7 15/32	1 9/16	5 3/4	21/32	13/16	19/32	4 3/32	2 13/32	1.937	0.748	1/2	UCSP209H1S6	SP209H1	UC209S6	27.8	16.2	14.0	UCSP209H1CS6	UCSP209H1CDS6	69	2 23/32	1.8	
	54	190	40	146	17	21	15	104	61	49.2	19	M14												
50	2 1/4	8 1/8	1 25/32	6 1/4	25/32	7/8	5/8	4 3/8	2 9/16	2.031	0.748	5/8	UCSP210H1S6	SP210H1	UC210S6	29.8	18.6	14.4	UCSP210H1CS6	UCSP210H1CDS6	74	2 29/32	2.3	
	57.2	206	45	159	20	22	16	111	65	51.6	19	M16												

- Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter codes. (See Table 10.5 in P.51.)  
 2. Part No. of the applicable grease nipple is A-1/4-28UNFN12.  
 3. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

**UCSPA-H1S6**  
**Cylindrical bore (with set screws)**  
*d* 20 ~ 40 mm



With Pressed Stainless Steel Covers



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ ) and variations of tolerance of distance between centers of bolt holes ( $\Delta J_s$ )

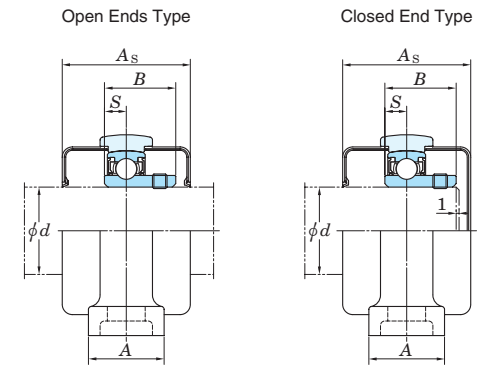
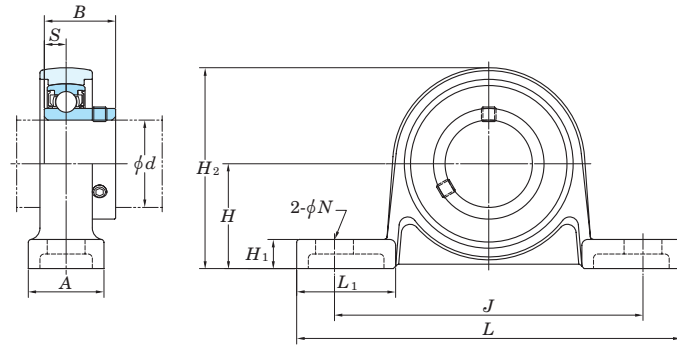
Housing No.	$\Delta H_s$	$\Delta J_s$
SPA204H1-SPA208H1	±0.15	±0.5

Unit : mm

Shaft Dia. mm <i>d</i>	Dimensions											Standard			Mass kg	Basic Load Ratings kN		Factor <i>f</i> <sub>0</sub>	With Pressed Stainless Steel Covers		Mass kg	
	<i>H</i>	<i>L</i>	<i>A</i>	<i>J</i>	<i>N</i>	<i>H</i> <sub>1</sub>	<i>H</i> <sub>2</sub>	<i>H</i> <sub>3</sub>	<i>L</i> <sub>1</sub>	<i>B</i>	<i>S</i>	Unit No.	Housing No.	Bearing No.		<i>C</i> <sub>r</sub>	<i>C</i> <sub>0r</sub>		Open Ends Type	Closed End Type		Dimension mm <i>A</i> <sub>s</sub>
20	1 3/16	3	1 3/16	2 3/64	M10×1.5	13/32	2 3/8	1/2	7/8	1.220	0.500	UCSPA204H1S6	SPA204H1	UC204S6	10.9	5.35	13.2	UCSPA204H1CS6	UCSPA204H1CDS6	45	1 25/32	0.46
	30.2	76	30	52		10	60	13	22	31	12.7											
25	1 7/16	3 5/16	1 3/16	2 13/64	M10×1.5	15/32	2 23/32	1/2	15/16	1.343	0.563	UCSPA205H1S6	SPA205H1	UC205S6	11.9	6.3	13.9	UCSPA205H1CS6	UCSPA205H1CDS6	49	1 15/16	0.63
	36.5	84	30	56		12	69	13	24	34.1	14.3											
30	1 11/16	3 11/16	1 13/32	2 19/32	M14×2	15/32	3 3/16	23/32	1 3/32	1.500	0.626	UCSPA206H1S6	SPA206H1	UC206S6	16.5	9.05	13.9	UCSPA206H1CS6	UCSPA206H1CDS6	53	2 3/32	0.91
	42.9	94	36	66		12	81	18	28	38.1	15.9											
35	1 7/8	3 11/32	1 1/2	3 5/32	M14×2	1/2	3 19/32	25/32	1 3/16	1.689	0.689	UCSPA207H1S6	SPA207H1	UC207S6	21.8	12.3	13.9	UCSPA207H1CS6	UCSPA207H1CDS6	60	2 3/8	1.3
	47.6	110	38	80		13	91	20	30	42.9	17.5											
40	1 15/16	4 9/16	1 9/16	3 5/16	M14×2	1/2	3 13/16	25/32	1 1/4	1.937	0.748	UCSPA208H1S6	SPA208H1	UC208S6	24.8	14.3	14.0	UCSPA208H1CS6	UCSPA208H1CDS6	69	2 23/32	1.5
	49.2	116	40	84		13	97	20	32	49.2	19											

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter codes. (See Table 10.5 in P.51.)  
 2. Part No. of the applicable grease nipple is A-1/4-28UNFN12.  
 3. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

**USP-S6**  
Cylindrical bore (with set screws)  
 $d$  10 ~ 30 mm



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ ) and variations of tolerance of distance between centers of bolt holes ( $\Delta J_s$ )

Housing No.	$\Delta H_s$	$\Delta J_s$
SP000-SP006	$\pm 0.15$	$\pm 0.3$

Unit : mm

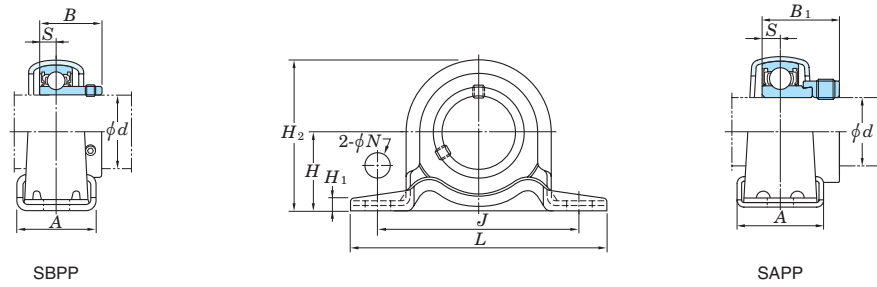
Shaft Dia. mm $d$	Dimensions inch mm										Bolt Size inch mm	Standard			Mass kg	Basic Load Ratings kN		Factor $f_0$	With Rubber Coated Covers				
	$H$	$L$	$A$	$J$	$N$	$H_1$	$H_2$	$L_1$	$B$	$S$		Unit No.	Housing No.	Bearing No.		$C_r$	$C_{0r}$		Unit No.	Dimension mm inch	Mass kg		
10	$45/64$	$2\ 5/8$	$5/8$	$2\ 3/32$	$9/32$	$3/16$	$1\ 3/8$	$23/32$	0.591	0.197	$1/4$	USP000S6	SP000	SU000S6	0.076	4.55	3.9	1.55	USP000CS6	USP000CDS6	29	$1\ 5/32$	0.076
	18	67	16	53	7	5	35	18	15	5	M6												
12	$3/4$	$2\ 25/32$	$5/8$	$2\ 7/32$	$9/32$	$3/16$	$1\ 15/32$	$23/32$	0.591	0.197	$1/4$	USP001S6	SP001	SU001S6	0.08	5.10	4.3	1.9	USP001CS6	USP001CDS6	29	$1\ 5/32$	0.08
	19	71	16	56	7	5	37	18.5	15	5	M6												
15	$55/64$	$3\ 5/32$	$5/8$	$2\ 15/32$	$9/32$	$1/4$	$1\ 11/16$	$13/16$	0.650	0.217	$1/4$	USP002S6	SP002	SU002S6	0.11	5.60	4.7	2.25	USP002CS6	USP002CDS6	31	$1\ 7/32$	0.11
	22	80	16	63	7	6	42.5	20.5	16.5	5.5	M6												
17	$15/16$	$3\ 11/32$	$23/32$	$2\ 5/8$	$9/32$	$1/4$	$1\ 13/16$	$13/16$	0.689	0.236	$1/4$	USP003S6	SP003	SU003S6	0.14	6.00	5.1	2.6	USP003CS6	USP003CDS6	33	$1\ 5/16$	0.14
	24	85	18	67	7	6	46	21	17.5	6	M6												
20	$1\ 7/64$	$3\ 15/16$	$25/32$	$3\ 5/32$	$13/32$	$5/16$	$2\ 5/32$	$31/32$	0.827	0.276	$5/16$	USP004S6	SP004	SU004S6	0.23	9.40	7.9	4	USP004CS6	USP004CDS6	38	$1\ 1/2$	0.23
	28	100	20	80	10	8	54.5	25	21	7	M8												
25	$1\ 17/64$	$4\ 13/32$	$25/32$	$3\ 17/32$	$13/32$	$11/32$	$2\ 13/32$	$1\ 3/32$	0.866	0.276	$5/16$	USP005S6	SP005	SU005S6	0.28	10.1	8.5	4.65	USP005CS6	USP005CDS6	40	$1\ 9/16$	0.28
	32	112	20	90	10	9	61	27.5	22	7	M8												
30	$1\ 27/64$	$5\ 3/16$	$1\ 1/32$	$4\ 3/16$	$1/2$	$13/32$	$2\ 23/32$	$1\ 11/32$	0.965	0.295	$3/8$	USP006S6	SP006	SU006S6	0.43	13.2	11.2	6.6	USP006CS6	USP006CDS6	44	$1\ 23/32$	0.43
	36	132	26	106	13	10	69	34	24.5	7.5	M10												

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter codes. (See Table 10.5 in P.51.)  
2. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.



Pressed steel pillow block type

**SBPP**  
Cylindrical bore  
(with set screws)  
**SAPP**  
Cylindrical bore  
(with eccentric locking collar)  
 $d$  12 ~ 30 mm



Variations of tolerance of distance between centers of bolt holes ( $\Delta J_s$ ) and variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

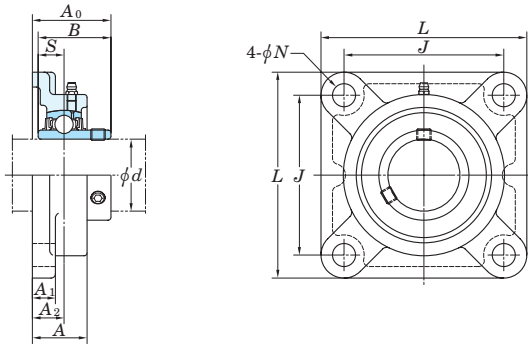
Housing No.	$\Delta J_s$	$\Delta N_s$
PP203-PP206	$\pm 0.4$	$\pm 0.5$

Unit : mm

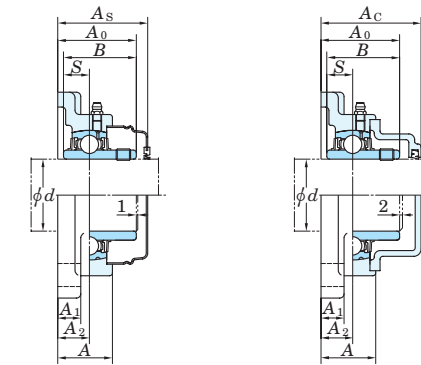
Shaft Dia mm inch $d$	Dimensions inch mm									Bolt Size inch mm	Unit No.	Bearing No.	Unit No.	Bearing No.	Housing No.	Basic Load Ratings kN		Factor $f_0$	Mass kg		
	$H$	$L$	$A$	$J$	$N$	$H_1$	$H_2$	$S$	SBPP $B$							SAPP $B_1$	$C_r$		$C_{0r}$	SBPP	SAPP
12 1/2	7/8	3 3/8	31/32	2 43/64	3/8	1/8	1 23/32	0.236	0.866	1.122	5/16 M8	SBPP201 SBPP201-8 SBPP202 SBPP202-10 SBPP203	SB201 SB201-8 SB202 SB202-10 SB203	SAPP201 SAPP201-8 SAPP202 SAPP202-10 SAPP203	SA201 SA201-8 SA202 SA202-10 SA203	PP203	9.55	4.80	13.2	0.16	0.19
15 5/8	1	3 27/32	1 1/4	2 63/64	3/8	1/8	2	0.276	0.984	1.161	5/16 M8	SBPP204-12 SBPP204	SB204-12 SB204	SAPP204-12 SAPP204	SA204-12 SA204	PP204	12.8	6.65	13.2	0.23	0.23
17	7/8	4 1/4	1 1/4	3 25/64	29/64	5/32	2 7/32	0.295	1.063	1.201	3/8 M10	SBPP205-14 SBPP205-15 SBPP205 SBPP205-16	SB205-14 SB205-15 SB205 SB205-16	SAPP205-14 SAPP205-15 SAPP205 SAPP205-16	SA205-14 SA205-15 SA205 SA205-16	PP205	14.0	7.85	13.9	0.28	0.32
20 3/4	1 5/16	4 19/32	1 1/2	3 3/4	29/64	5/32	2 5/8	0.315	1.181	1.335	3/8 M10	SBPP206-18 SBPP206 SBPP206-19 SBPP206-20	SB206-18 SB206 SB206-19 SB206-20	SAPP206-18 SAPP206 SAPP206-19 SAPP206-20	SA206-18 SA206 SA206-19 SA206-20	PP206	19.5	11.3	13.9	0.47	0.50

Remark For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

**UCF**  
Cylindrical bore (with set screws)  
d 12 ~ (45) mm



With Pressed Steel Cover      With Cast Iron Cover



Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ) and tolerance of position of bolt hole (X)

Housing No.			$\Delta A_{2s}$	X
F204-F210	FX05-FX10	F305-F310	$\pm 0.5$	0.7
F211-F218	FX11-FX20	F311-F328	$\pm 0.8$	1

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

Housing No.			$\Delta N_s$
F204-F218	FX05-FX18	F305-F315	$\pm 0.2$
	FX20	F316-F328	$\pm 0.3$

Shaft Dia. mm    inch	Dimensions										Bolt Size inch mm	Standard			Mass kg	Basic Load Ratings kN		Factor $f_0$	With Pressed Steel Cover				With Cast Iron Cover				
	inch mm											Unit No.	Housing No.	Bearing No.		Unit No.	Dimension mm    inch		Mass kg	Unit No.	Dimension mm    inch	Mass kg					
d	L	A	J	N	A <sub>1</sub>	A <sub>2</sub>	A <sub>0</sub>	B	S									Open End Type	Closed End Type	A <sub>s</sub>	kg	Open End Type	Closed End Type	A <sub>c</sub>	kg		
12												UCF201		UC201	0.64			UCF201C	UCF201D	37	1 15/32	0.64	-	-	-	-	
15												UCF201-8		UC201-8	0.64			-	-	-	-	-	-	-	-	-	
17												UCF202	F204	UC202	0.62	12.8	6.65	UCF202C	UCF202D	37	1 15/32	0.62	-	-	-	-	
20												UCF202-10		UC202-10	0.62			-	-	-	-	-	-	-	-	-	
												UCF203		UC203	0.61			UCF203C	UCF203D	37	1 15/32	0.61	-	-	-	-	
												UCF204-12		UC204-12	0.61			-	-	-	-	-	-	-	-	-	
												UCF204		UC204	0.59			UCF204C	UCF204D	37	1 15/32	0.59	UCF204FC	UCF204FD	46	1 13/16	0.74
25												UCF205-14		UC205-14	0.83			-	-	-	-	-	-	-	-	-	
												UCF205-15		UC205-15	0.83	14.0	7.85	-	-	-	-	-	-	-	-	-	
												UCF205	F205	UC205	0.83			UCF205C	UCF205D	40	1 9/16	0.83	UCF205FC	UCF205FD	49	1 15/16	1.0
												UCF205-16		UC205-16	0.83			-	-	-	-	-	-	-	-	-	
												UCFX05	FX05	UCX05	1.2	19.5	11.3	UCFX05C	UCFX05D	44	1 23/32	1.2	-	-	-	-	
												UCFX05-16		UCX05-16	1.2			-	-	-	-	-	-	-	-	-	
												UCF305	F305	UC305	1.3	21.2	10.9	-	-	-	-	-	UCF305C	UCF305D	54	2 1/8	1.6
												UCF305-16		UC305-16	1.3			-	-	-	-	-	-	-	-	-	
30												UCF206-18		UC206-18	1.1			-	-	-	-	-	-	-	-	-	
												UCF206	F206	UC206	1.1	19.5	11.3	UCF206C	UCF206D	44	1 23/32	1.1	UCF206FC	UCF206FD	53	2 3/32	1.4
												UCF206-19		UC206-19	1.1			-	-	-	-	-	-	-	-	-	
												UCF206-20		UC206-20	1.1			-	-	-	-	-	-	-	-	-	
												UCFX06	FX06	UCX06	1.6	25.7	15.4	UCFX06C	UCFX06D	49	1 15/16	1.6	-	-	-	-	
												UCFX06-19		UCX06-19	1.6			-	-	-	-	-	-	-	-	-	
												UCFX06-20		UCX06-20	1.6			-	-	-	-	-	-	-	-	-	
												UCF306	F306	UC306	1.9	26.7	15.0	-	-	-	-	-	UCF306C	UCF306D	59	2 5/16	2.2
35												UCF207-20		UC207-20	1.5			-	-	-	-	-	-	-	-	-	
												UCF207-21		UC207-21	1.5	25.7	15.4	-	-	-	-	-	-	-	-	-	
												UCF207-22	F207	UC207-22	1.5			-	-	-	-	-	-	-	-	-	
												UCF207		UC207	1.5			UCF207C	UCF207D	49	1 15/16	1.5	UCF207FC	UCF207FD	58	2 9/32	1.9
												UCF207-23		UC207-23	1.5			-	-	-	-	-	-	-	-	-	
												UCFX07-22		UCX07-22	2.0			-	-	-	-	-	-	-	-	-	
												UCFX07	FX07	UCX07	2.0	29.1	17.8	UCFX07C	UCFX07D	55	2 5/32	2.0	-	-	-	-	
												UCFX07-23		UCX07-23	2.0			-	-	-	-	-	-	-	-	-	
												UCF307	F307	UC307	2.3	33.4	19.3	-	-	-	-	-	UCF307C	UCF307D	64	2 17/32	2.7
40												UCF208-24		UC208-24	1.9			-	-	-	-	-	-	-	-	-	
												UCF208-25		UC208-25	1.9	29.1	17.8	-	-	-	-	-	-	-	-	-	
												UCF208	F208	UC208	1.9			UCF208C	UCF208D	55	2 5/32	1.9	UCF208FC	UCF208FD	64	2 17/32	2.3
												UCFX08-24		UCX08-24	2.4	34.1	21.3	-	-	-	-	-	-	-	-	-	
												UCFX08	FX08	UCX08	2.4			UCFX08C	UCFX08D	56	2 7/32	2.4	-	-	-	-	
												UCF308-24		UC308-24	3.1	40.7	24.0	-	-	-	-	-	-	-	-	-	
												UCF308	F308	UC308	3.1			-	-	-	-	-	UCF308C	UCF308D	71	2 25/32	3.6
45												UCF209-26		UC209-26	2.2			-	-	-	-	-	-	-	-	-	
												UCF209-27		UC209-27	2.2	34.1	21.3	-	-	-	-	-	-	-	-	-	
												UCF209-28		UC209-28	2.2			-	-	-	-	-	-	-	-	-	
												UCF209	F209	UC209	2.2			UCF209C	UCF209D	56	2 7/32	2.2	UCF209FC	UCF209FD	66	2 19/32	2.6
												UCFX09-28		UCX09-28	2.7	35.1	23.3	-	-	-	-	-	-	-	-	-	
												UCFX09	FX09	UCX09	2.7			UCFX09C	UCFX09D	60	2 3/8	2.7	-	-	-	-	

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.

A-1/4-28UNF ..... 201~210, X05~X09, 305~308

A-PT1/8 ..... 211~218, X10~X20, 309~328

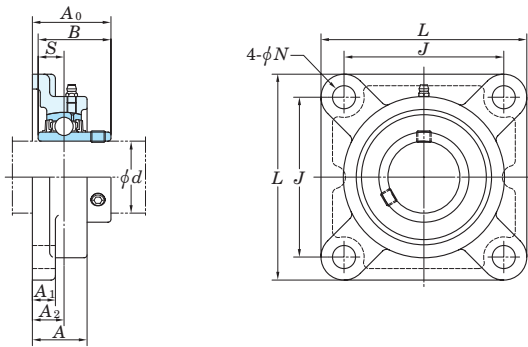
3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (L2) follows the Part No. of unit or bearing. (Example of Part No. : UCF206JL3, UC206L3)

4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.



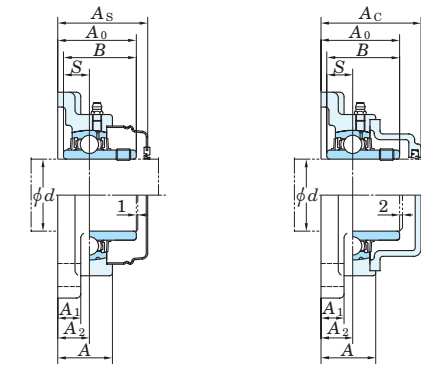
Square-flanged type

UCF  
Cylindrical bore (with set screws)  
d (75) ~ 140 mm



With Pressed Steel Cover

With Cast Iron Cover



Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ) and tolerance of position of bolt hole (X)

Housing No.			$\Delta A_{2s}$	X
F204-F210	FX05-FX10	F305-F310	$\pm 0.5$	0.7
F211-F218	FX11-FX20	F311-F328	$\pm 0.8$	1

Unit : mm

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

Housing No.			$\Delta N_s$
F204-F218	FX05-FX18	F305-F315	$\pm 0.2$
	FX20	F316-F328	$\pm 0.3$

Unit : mm

Shaft Dia. mm inch	Dimensions inch mm	Bolt Size inch mm	Standard			Mass kg	Basic Load Ratings kN		Factor $f_0$	With Pressed Steel Cover				With Cast Iron Cover			
			Unit No.	Housing No.	Bearing No.		Unit No.	Dimension mm inch		Mass kg	Unit No.	Dimension mm inch	Mass kg				
$d$	$L$ $A$ $J$ $N$ $A_1$ $A_2$ $A_0$ $B$ $S$					$C_r$	$C_{0r}$		Open End Type	Closed End Type	$A_s$		Open End Type	Closed End Type	$A_c$		
75 3	2 15/16 9 9/32	236	2 19/32 66	7 1/4 184	63/64 25	31/32 25	1 17/32 39	3 1/2 89	3.228 82	1.260 32	7/8 M22						
80 -	3 1/8 8 3/16	208	2 9/32 58	6 1/2 165	29/32 23	7/8 22	1 11/32 34	3 3/32 83.3	3.252 82.6	1.311 33.3	3/4 M20						
85 -	3 1/4 8 7/16	220	2 15/32 63	6 5/16 175	29/32 23	15/16 24	1 13/32 36	3 7/16 87.6	3.374 85.7	1.343 34.1	3/4 M20						
90 -	3 1/2 9 1/4	235	2 11/16 68	7 23/64 187	29/32 23	31/32 25	1 9/16 40	3 25/32 96.3	3.780 96	1.563 39.7	3/4 M20						
95 -	3 1/2 11 1/32	280	3 76	8 1/2 216	1 3/8 35	1 3/16 30	1 47/64 44	3 15/16 100	3.780 96	1.575 40	1 1/8 M30						
100 4	3 15/16 10 9/16	268	3 13/16 97	8 5/16 211	1 7/32 31	1 3/32 28	2 21/64 59	5 127.3	4.626 117.5	1.937 49.2	1 M27						
105 -	3 1/2 12 7/32	310	3 11/16 94	9 17/32 242	1 1/2 38	1 1/4 32	2 21/64 59	5 127	4.409 112	1.732 44	1 1/4 M33						
110 -	3 1/2 13 3/8	340	3 25/32 96	10 15/32 266	1 39/64 41	1 3/8 35	2 23/64 60	5 3/32 131	4.606 117	1.811 46	1 3/8 M36						
120 -	3 1/2 14 9/16	370	4 11/32 110	11 27/64 290	1 39/64 41	1 9/16 40	2 9/16 65	5 1/2 140	4.961 126	2.008 51	1 3/8 M36						
130 -	3 1/2 16 3/32	410	4 17/32 115	12 19/32 320	1 39/64 41	1 25/32 45	2 9/16 65	5 3/4 146	5.315 135	2.126 54	1 3/8 M36						
140 -	3 1/2 17 23/32	450	4 29/32 125	13 25/32 350	1 39/64 41	2 5/32 55	2 61/64 75	6 11/32 161	5.709 145	2.323 59	1 3/8 M36						

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.

A-1/4-28UNF ..... 201-210, X05-X09, 305-308

A-PT1/8 ..... 211-218, X10-X20, 309-328

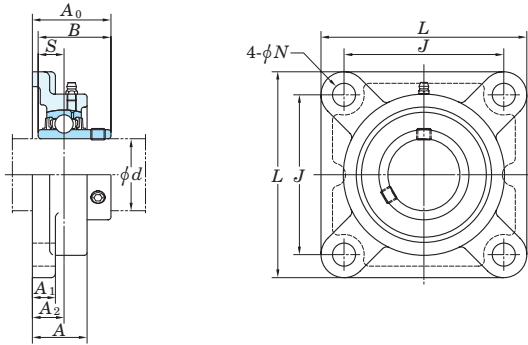
3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (L2) follows the Part No. of unit or bearing. (Example of Part No. : UCF206JL3, UC206L3)

4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.



Square-flanged type

UCF-E  
Cylindrical bore (with set screws)  
d 12 ~ 55 mm



Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ) and tolerance of position of bolt hole (X)

Housing No.		$\Delta A_{2s}$	X
F204E-F210E	FX05E-FX10E	$\pm 0.5$	0.7
F211E-F217E	FX11E-FX17E	$\pm 0.8$	1

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

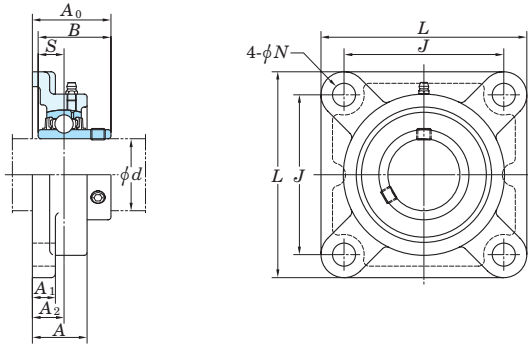
Housing No.		$\Delta N_s$
F204E-F217E	FX05E-FX17E	$\pm 0.2$

Shaft Dia. mm inch	Dimensions inch mm	Bolt Size inch	Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor $f_0$	Mass kg
						$C_r$	$C_{0r}$		
12			UCF201E		UC201				0.64
15			UCF201-8E		UC201-8				0.62
			UCF202E		UC202				0.61
17			UCF202-10E	F204E	UC202-10	12.8	6.65	13.2	0.59
			UCF203E		UC203				
			UCF204-12E		UC204-12				
20			UCF204E		UC204				
25			UCF205-14E		UC205-14				
			UCF205-15E	F205E	UC205-15	14.0	7.85	13.9	0.83
			UCF205E		UC205				
			UCF205-16E		UC205-16				
			UCFX05E	FX05E	UCX05	19.5	11.3	13.9	1.2
			UCFX05-16E		UCX05-16				
30			UCF206-18E		UC206-18				
			UCF206E	F206E	UC206	19.5	11.3	13.9	1.1
			UCF206-19E		UC206-19				
			UCF206-20E		UC206-20				
			UCFX06E	FX06E	UCX06	25.7	15.4	13.9	1.6
			UCFX06-19E		UCX06-19				
			UCFX06-20E		UCX06-20				
35			UCF207-20E		UC207-20				
			UCF207-21E	F207E	UC207-21	25.7	15.4	13.9	1.5
			UCF207-22E		UC207-22				
			UCF207E		UC207				
			UCF207-23E		UC207-23				
			UCFX07-22E	FX07E	UCX07-22	29.1	17.8	14.0	2.0
			UCFX07E		UCX07				
			UCFX07-23E		UCX07-23				
40			UCF208-24E		UC208-24				
			UCF208-25E	F208E	UC208-25	29.1	17.8	14.0	1.9
			UCF208E		UC208				
			UCFX08-24E	FX08E	UCX08-24	34.1	21.3	14.0	2.4
			UCFX08E		UCX08				
45			UCFX09-28E	FX09E	UCX09-28	35.1	23.3	14.4	2.7
			UCFX09E		UCX09				
50			UCFX10-31E		UCX10-31				
			UCFX10E	FX10E	UCX10	43.4	29.4	14.4	3.7
			UCFX10-32E		UCX10-32				
55			UCF211-32E		UC211-32				
			UCF211-34E	F211E	UC211-34	43.4	29.4	14.4	3.4
			UCF211E		UC211				
			UCF211-35E		UC211-35				
			UCFX11E	FX11E	UCX11	52.4	36.2	14.4	4.9
			UCFX11-35E		UCX11-35				
			UCFX11-36E		UCX11-36				

Remarks 1. In Part No. of unit, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
2. Part No. of applicable grease nipples are shown below.  
A-1/4-28UNF..... 201~208, X05~X09  
A-PT1/8..... 211~217, X10~X17

3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (L2) follows the Part No. of unit or bearing. (Example of Part No. : UCF206EJL3, UC206L3)  
4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

**UCF-E**  
**Cylindrical bore (with set screws)**  
 d 60 ~ 85 mm



Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ) and tolerance of position of bolt hole (X)

Housing No.		$\Delta A_{2s}$	X
F204E-F210E	FX05E-FX10E	$\pm 0.5$	0.7
F211E-F217E	FX11E-FX17E	$\pm 0.8$	1

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

Housing No.		$\Delta N_s$
F204E-F217E	FX05E-FX17E	$\pm 0.2$

Shaft Dia. mm inch  d	Dimensions inch mm										Bolt Size inch	Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor $f_0$	Mass kg	
	L	A	J	N	A <sub>1</sub>	A <sub>2</sub>	A <sub>0</sub>	B	S	C <sub>r</sub>					C <sub>0r</sub>				
60	2 1/4	6 7/8	1 7/8	5 5/8	43/64	23/32	1 9/64	2 23/32	2.563	1.000	5/8	UCF212-36E UCF212E UCF212-38E UCF212-39E	F212E	UC212-36 UC212 UC212-38 UC212-39	52.4	36.2	14.4	4.2	
	2 3/8	175	48	143	17	18	29	68.7	65.1	25.4		9/16	UCFX12E UCFX12-39E	FX12E	UCX12 UCX12-39	57.2	40.1	14.4	5.7
	2 7/16	7 3/8	2 5/16	5 55/64	21/32	13/16	1 11/32	2 29/32	2.563	1.000	5/8		UCF213-40E UCF213E	F213E	UC213-40 UC213	57.2	40.1	14.4	5.2
	2 7/16	187	59	149	16.5	21	34	73.7	65.1	25.4		9/16	UCFX13-40E UCFX13E	FX13E	UCX13-40 UCX13	62.2	44.1	14.5	6.3
65	2 1/2	7 3/8	1 31/32	5 55/64	43/64	7/8	1 3/16	2 3/4	2.563	1.000	5/8	UCF213-40E UCF213E	F213E	UC213-40 UC213	57.2	40.1	14.4	5.2	
	2 1/2	187	50	149	17	22	30	69.7	65.1	25.4		9/16	UCFX13-40E UCFX13E	FX13E	UCX13-40 UCX13	62.2	44.1	14.5	6.3
70	2 3/4	7 3/4	2 3/8	5 63/64	25/32	7/8	1 29/64	3 7/32	3.063	1.331	11/16	UCFX14-44E UCFX14E	FX14E	UCX14-44 UCX14	67.4	48.3	14.5	7.0	
	2 15/16	197	60	152	20	22	37	81.5	77.8	33.3		11/16	UCFX15-47E UCFX15E UCFX15-48E	FX15E	UCX15-47 UCX15 UCX15-48	72.7	53.0	14.6	8.4
75	3	7 3/4	2 11/16	5 63/64	25/32	15/16	1 9/16	3 17/32	3.252	1.311	11/16		UCFX15-47E UCFX15E UCFX15-48E	FX15E	UCX15-47 UCX15 UCX15-48	72.7	53.0	14.6	8.4
	3 1/8	8 3/16	2 9/32	6 1/2	3/4	7/8	1 11/32	3 9/32	3.252	1.311		11/16	UCF216-50E UCF216E	F216E	UC216-50 UC216	72.7	53.0	14.6	7.3
	-	208	58	165	19	22	34	83.3	82.6	33.3			11/16	UCFX16E	FX16E	UCX16	84.0	61.9	14.5
80	3 1/8	8 7/16	2 3/4	6 47/64	25/32	15/16	1 9/16	3 19/32	3.374	1.343	11/16	UCF217-52E UCF217E	F217E	UC217-52 UC217	84.0	61.9	14.5	8.9	
	-	214	70	171	20	24	40	91.6	85.7	34.1		11/16	UCFX17E UCFX17-55E	FX17E	UCX17 UCX17-55	96.1	71.5	14.5	10.8
	3 1/4	8 21/32	2 15/32	6 57/64	3/4	15/16	1 13/32	3 7/16	3.374	1.343			11/16	UCF217-52E UCF217E	F217E	UC217-52 UC217	84.0	61.9	14.5
85	220	63	175	19	24	36	87.6	85.7	34.1	11/16	UCFX17E UCFX17-55E	FX17E	UCX17 UCX17-55	96.1	71.5	14.5	10.8		
	3 7/16	214	70	171	20	24	40	96.3	96		39.7	11/16	UCFX17E UCFX17-55E	FX17E	UCX17 UCX17-55	96.1	71.5	14.5	10.8

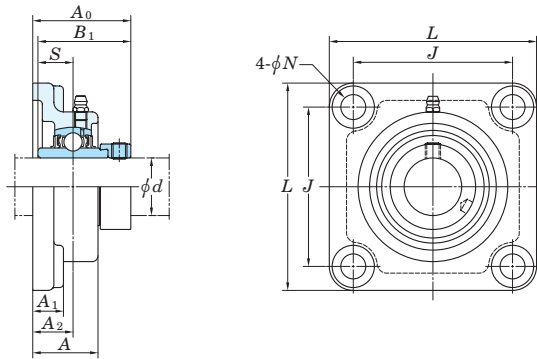
Remarks 1. In Part No. of unit, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
 2. Part No. of applicable grease nipples are shown below.  
 A-1/4-28UNF ..... 201~208, X05~X09  
 A-PT1/8 ..... 211~217, X10~X17

3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (L2) follows the Part No. of unit or bearing. (Example of Part No. : UCF206EJL3, UC206L3)  
 4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.



Square-flanged type

**NANF**  
Cylindrical bore  
(with eccentric locking collar)  
 $d$  12 ~ 60 mm



Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ) and tolerance of center position of bolt hole ( $X$ )

Housing No.	$\Delta A_{2s}$	$X$
NF204~NF210	$\pm 0.5$	0.7
NF211~NF212	$\pm 0.8$	1

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

Housing No.	$\Delta N_s$
NF204~NF212	$\pm 0.2$

Shaft Dia mm inch $d$	Dimensions inch mm										Bolt Size inch	Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor $f_0$	Mass kg
	$L$	$A$	$J$	$N$	$A_1$	$A_2$	$A_0$	$B_1$	$S$	$C_r$					$C_{0r}$			
12 15 17 20	$3 \frac{3}{8}$ 86	$1 \frac{5}{32}$ 29.5	$2 \frac{33}{64}$ 64	$7/16$ 11	$19/32$ 15	$3/4$ 19	$1 \frac{25}{32}$ 45.6	1.720 43.7	0.673 17.1	$3/8$	NANF201 NANF201-8 NANF202 NANF202-10 NANF203 NANF204-12 NANF204	NF204	NA201 NA201-8 NA202 NA202-10 NA203 NA204-12 NA204	12.8	6.65	13.2	0.73	
25	$3 \frac{3}{4}$ 95	$1 \frac{7}{32}$ 31	$2 \frac{3}{4}$ 70	$29/64$ 11.5	$19/32$ 15	$25/32$ 20	$1 \frac{27}{32}$ 46.9	1.748 44.4	0.689 17.5	$3/8$	NANF205-14 NANF205-15 NANF205 NANF205-16	NF205	NA205-14 NA205-15 NA205 NA205-16	14.0	7.85	13.9	0.95	
30	$4 \frac{1}{4}$ 108	$1 \frac{11}{32}$ 34	$3 \frac{17}{64}$ 83	$33/64$ 13	$5/8$ 16	$53/64$ 21	2 51.1	1.906 48.4	0.720 18.3	$7/16$	NANF206-18 NANF206 NANF206-19 NANF206-20	NF206	NA206-18 NA206 NA206-19 NA206-20	19.5	11.3	13.9	1.4	
35	$4 \frac{19}{32}$ 117	$1 \frac{7}{16}$ 36.5	$3 \frac{5}{8}$ 92	$33/64$ 13	$21/32$ 17	$27/32$ 21.5	$2 \frac{1}{8}$ 53.8	2.012 51.1	0.740 18.8	$7/16$	NANF207-20 NANF207-21 NANF207-22 NANF207 NANF207-23	NF207	NA207-20 NA207-21 NA207-22 NA207 NA207-23	25.7	15.4	13.9	1.8	
40	$5 \frac{1}{8}$ 130	$1 \frac{17}{32}$ 39	$4 \frac{1}{64}$ 102	$35/64$ 14	$21/32$ 17	$15/16$ 24	$2 \frac{5}{16}$ 58.9	2.217 56.3	0.843 21.4	$1/2$	NANF208-24 NANF208-25 NANF208	NF208	NA208-24 NA208-25 NA208	29.1	17.8	14.0	2.2	
45	$5 \frac{13}{32}$ 137	$1 \frac{9}{16}$ 40	$4 \frac{9}{64}$ 105	$5/8$ 16	$23/32$ 18	$15/16$ 24	$2 \frac{5}{16}$ 58.9	2.217 56.3	0.843 21.4	$9/16$	NANF209-26 NANF209-27 NANF209-28 NANF209	NF209	NA209-26 NA209-27 NA209-28 NA209	34.1	21.3	14.0	2.6	
50	$5 \frac{5}{8}$ 143	$1 \frac{27}{32}$ 46.5	$4 \frac{3}{8}$ 111	$5/8$ 16	$25/32$ 20	$1 \frac{1}{8}$ 28.5	$2 \frac{5}{8}$ 66.6	2.469 62.7	0.969 24.6	$9/16$	NANF210-30 NANF210-31 NANF210 NANF210-32	NF210	NA210-30 NA210-31 NA210 NA210-32	35.1	23.3	14.4	3	
55	$6 \frac{3}{8}$ 162	$1 \frac{31}{32}$ 50	$5 \frac{1}{8}$ 130	$43/64$ 17	$13/16$ 21	$1 \frac{17}{64}$ 32	$2 \frac{31}{32}$ 75.6	2.811 71.4	1.094 27.8	$5/8$	NANF211-32 NANF211-34 NANF211 NANF211-35	NF211	NA211-32 NA211-34 NA211 NA211-35	43.4	29.4	14.4	4.1	
60	$6 \frac{7}{8}$ 175	$2 \frac{5}{32}$ 55	$5 \frac{5}{8}$ 143	$43/64$ 17	$13/16$ 21	$1 \frac{27}{64}$ 36	$3 \frac{1}{4}$ 82.8	3.063 77.8	1.220 31	$5/8$	NANF212-36 NANF212 NANF212-38 NANF212-39	NF212	NA212-36 NA212 NA212-38 NA212-39	52.4	36.2	14.4	4.9	

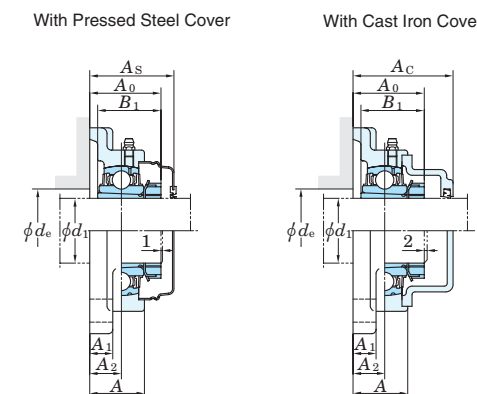
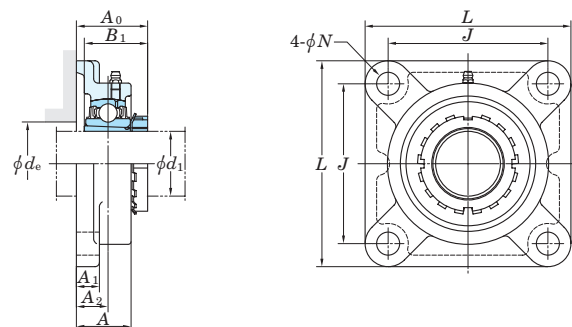
Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.

- A-1/4-28UNF ..... 201~210
- A-PT1/8 ..... 211~212

3. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

**UKF**  
Tapered bore (with adapter)  
d<sub>1</sub> 20 ~ (50) mm



Variations of tolerance of distance from mounting surface to center of spherical bore (ΔA<sub>2s</sub>) and tolerance of position of bolt hole (X)

Unit : mm

Housing No.	F205-F210	FX05-FX10	F305-F310	F305-F315	F311-F328	ΔA <sub>2s</sub>	X
F205-F210	FX05-FX10	F305-F310	F305-F315	F311-F328		±0.5	0.7
F211-F218	FX11-FX20	F311-F328				±0.8	1

Variations of tolerance of bolt hole diameter (ΔN<sub>s</sub>)

Unit : mm

Housing No.	F205-F218	FX05-FX18	F305-F315	F316-F328	ΔN <sub>s</sub>
F205-F218	FX05-FX18	F305-F315	F316-F328		±0.2
	FX20	F316-F328			±0.3

Shaft Dia. mm inch	Dimensions inch mm										Bolt Size inch mm	Standard			Adapter <sup>1)</sup> assembly No.	Mass kg	Basic			Factor	With Pressed Steel Cover				With Cast Iron Cover								
	d <sub>1</sub>	L	A	J	N	A <sub>1</sub>	A <sub>2</sub>	A <sub>0</sub> <sup>1)</sup>	B <sub>1</sub> <sup>1)</sup>	d <sub>e</sub> (min.)		Unit No.	Housing No.	Bearing No.			C <sub>r</sub>	C <sub>0r</sub>	f <sub>0</sub>		Unit No.	Dimension mm inch	Mass kg	Unit No.	Dimension mm inch	Mass kg							
20	3/4	3 3/4	1 1/16	2 3/4	15/32	1/2	5/8	1 11/32(1 13/32)	1 5/32(1 3/8)	1 3/16	3/8	UKF205	F205	UK205	HE305X(HE2305X) H305X(H2305X)	0.87 0.87	14.0	7.85	13.9	-	-	-	-	-	-	-	-	-	-	-	-		
		95	27	70	12	13	16	34.5(36)	29(35)	30	M10	UKFX05	FX05	UKX05	HE2305X H2305X	1.2 1.2	19.5	11.3	13.9	UKF205C	UKF205D	40	1 9/16	0.87	UKF205FC	UKF205FD	49	1 15/16	1.1				
		108	30	83	12	13	18	37.5	35	30	M10	UKF305	F305	UK305	HE2305X H2305X	1.4 1.4	21.2	10.9	12.6	-	-	-	-	-	-	-	-	-	-	-	-		
25	1	4 1/4	1 7/32	3 17/64	15/32	1/2	5/8	1 15/32(1 9/16)	1 7/32(1 1/2)	1 13/32	3/8	UKF206	F206	UK206	H306X(H2306X) HE306X(HE2306X)	1.3 1.3	19.5	11.3	13.9	UKF206C	UKF206D	44	1 23/32	1.3	UKF206FC	UKF206FD	53	2 3/32	1.6				
		117	34	92	12	13	18	37.5(39.5)	31(38)	36	M10	UKFX06	FX06	UKX06	H2306X HE2306X	1.6 1.6	25.7	15.4	13.9	UKFX06C	UKFX06D	49	1 15/16	1.6	-	-	-	-	-	-	-		
		125	32	95	12	13	19	40	38	36	M14	UKF306	F306	UK306	H2306X HE2306X	1.9 1.9	26.7	15.0	13.3	-	-	-	-	-	-	-	-	-	-	-	-	-	
30	1 1/8	4 1/8	1 1/4	3 5/8	35/64	19/32	3/4	1 5/8(1 11/16)	1 3/8(1 11/16)	1 5/8	7/16	UKF207	F207	UK207	HS307X(HS2307X) H307X(H2307X)	1.6 1.6	25.7	15.4	13.9	UKF207C	UKF207D	49	1 15/16	1.6	UKF207FC	UKF207FD	58	2 9/32	2.0				
		117	34	92	14	15	19	41(43)	35(43)	41	M12	UKFX07	FX07	UKX07	HS2307X H2307X	2.0 2.0	29.1	17.8	14.0	-	-	-	-	-	-	-	-	-	-	-	-	-	
		130	38	102	14	15	21	43.5	43	41	M14	UKF307	F307	UK307	HS2307X H2307X	2.3 2.3	33.4	19.3	13.2	-	-	-	-	-	-	-	-	-	-	-	-	-	
35	1 1/4	5 1/8	1 13/32	4 1/64	5/8	19/32	53/64	1 3/4(1 7/8)	1 13/32(1 13/16)	1 13/16	1/2	UKF208	F208	UK208	HE308X(HE2308X) HS308X(HS2308X) H308X(H2308X)	1.9 1.9 1.9	29.1	17.8	14.0	UKF208C	UKF208D	55	2 5/32	1.9	UKF208FC	UKF208FD	64	2 17/32	2.3				
		130	36	102	16	15	21	44.5(48)	36(46)	46	M14	UKFX08	FX08	UKX08	HE2308X HS2308X H2308X	2.3 2.3 2.3	34.1	21.3	14.0	-	-	-	-	-	-	-	-	-	-	-	-	-	
		137	40	105	19	14	22	46.5	46	46	M16	UKF308	F308	UK308	HE2308X HS2308X H2308X	3.1 3.1 3.1	40.7	24.0	13.2	UKFX08C	UKFX08D	56	2 7/32	2.3	-	-	-	-	-	-	-		
40	1 1/2	5 13/32	1 1/2	4 9/64	5/8	5/8	55/64	1 7/8(2)	1 17/32(1 31/32)	2 1/16	1/2	UKF209	F209	UK209	HE309X(HE2309X) H309X(H2309X) HS309X(HS2309X)	2.3 2.3 2.3	34.1	21.3	14.0	UKF209C	UKF209D	56	2 7/32	2.3	UKF209FC	UKF209FD	66	2 19/32	2.8				
		137	38	105	16	16	22	47.5(51)	39(50)	52	M14	UKFX09	FX09	UKX09	HE2309X H2309X HS2309X	2.7 2.7 2.7	35.1	23.3	14.4	-	-	-	-	-	-	-	-	-	-	-	-		
		143	40	111	19	14	23	48.5	50	52	M16	UKF309	F309	UK309	HE2309X H2309X HS2309X	4.1 4.1 4.1	48.9	29.5	13.3	UKFX09C	UKFX09D	60	2 3/8	2.7	-	-	-	-	-	-	-		
45	1 3/4	6 5/16	1 23/32	4 59/64	3/4	23/32	63/64	2 5/32	1 31/32	-	5/8	UKF210	F210	UK210	HE310X(HE2310X) H310X(H2310X)	2.6 2.6	35.1	23.3	14.4	-	-	-	-	-	-	-	-	-	-	-	-		
		143	40	111	16	16	22	48.5(52)	42(55)	58	M14	UKFX10	FX10	UKX10	HE2310X H2310X	3.6 3.6	43.4	29.4	14.4	UKF210C	UKF210D	59	2 5/16	2.6	UKF210FC	UKF210FD	70.5	2 25/32	3.1				
		162	44	130	19	20	26	53.5	55	58	M16	UKF310	F310	UK310	HE2310X H2310X	5.1 5.1	62.0	38.3	13.2	UKFX10C	UKFX10D	64	2 17/32	3.6	-	-	-	-	-	-	-		
50	1 7/8	6 7/8	1 7/8	5 13/64	29/32	3/4	1 7/64	2 3/8	2 5/32	-	3/4	UKF211	F211	UK211	HS311X(HS2311X) H311X(H2311X) HE311X(HE2311X)	3.5 3.5 3.5	43.4	29.4	14.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		162	43	130	19	18	25	52.5(57)	45(59)	64	M16	UKF211C	UKF211D	63	2 15/32	3.5	UKF211FC	UKF211FD	74.5	2 15/16	4.1												

Note 1) Codes shown in parentheses indicate the dimensions and Part No. of applicable adapter (H2300X series) for UK200L3 series (triple-lip seal type).

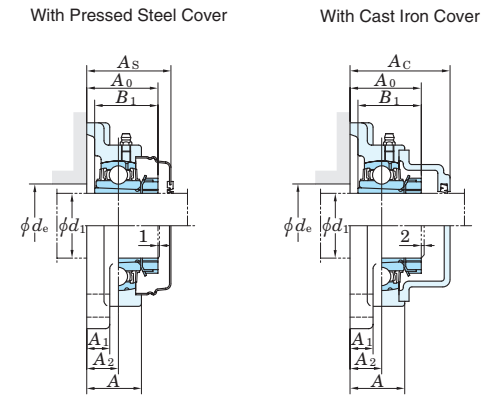
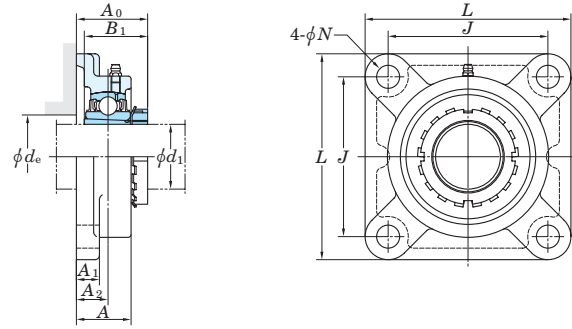
Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.  
A-1/4-28UNF.....205-210, X05-X09, 305-308  
A-PT1/8.....211-218, X10-X20, 309-328

3. In Part No. of unit with adapters and bearing with adapters, Part No. of applicable adapter follow the Part No. shown in the dimensional tables. (Example of Part No. : UKF206J + H306X, UK206 + H306X)  
4. As for the triple-lip seal type product (205 is the double-lip seal type product), supplementary code L3 (L2) follows the Part No. of unit or bearing. (Example of Part No. : UKF206JL3 + H2306X, UK206L3 + H2306X)  
5. For the dimensions and forms of applicable bearings and adapters, see the dimensional tables of ball bearing for unit and adapter assemblies.

Square-flanged type

UKF  
Tapered bore (with adapter)  
d<sub>1</sub> (50) ~ 85 mm



Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ) and tolerance of position of bolt hole (X)

Housing No.			$\Delta A_{2s}$	X
F205-F210	FX05-FX10	F305-F310	$\pm 0.5$	0.7
F211-F218	FX11-FX20	F311-F328	$\pm 0.8$	1

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

Housing No.			$\Delta N_s$
F205-F218	FX05-FX18	F305-F315	$\pm 0.2$
	FX20	F316-F328	$\pm 0.3$

Shaft Dia. mm inch	Dimensions inch mm										Bolt Size inch mm	Standard			Adapter <sup>1)</sup> assembly No.	Mass kg	Basic		Factor $f_0$	With Pressed Steel Cover				With Cast Iron Cover			
	d <sub>1</sub>	L	A	J	N	A <sub>1</sub>	A <sub>2</sub>	A <sub>0</sub> <sup>1)</sup>	B <sub>1</sub> <sup>1)</sup>	d <sub>e</sub> (min.)		Unit No.	Housing No.	Bearing No.			Load Ratings kN C <sub>r</sub> C <sub>0r</sub>	Unit No. Open End Type Closed End Type		Dimension mm inch A <sub>s</sub>	Mass kg	Unit No. Open End Type Closed End Type	Dimension mm inch A <sub>c</sub>	Mass kg			
50 1 7/8 2	6 7/8	1 15/16	5 5/8	3/4	25/32	1 9/64	2 1/4	2 5/16	2 17/32	5/8	UKFX11	FX11	UKX11	52.4 36.2	— —	73 2 7/8	4.6	— —	— —	— —							
	7 9/32	2 1/16	5 33/64	29/32	25/32	1 3/16	2 1/2	2 5/16	—	3/4	UKF311	F311	UK311	71.6 45.0	— —	— —	— —	UKF311C UKF311D	87 3 7/16	6.8							
	185	52	140	23	20	30	63.5	59	—	M20																	
55 2 1/8	6 7/8	1 7/8	5 5/8	3/4	23/32	1 9/64	2 5/16(2 19/32)	1 27/32(2 7/16)	2 23/32	5/8	UKF212	F212	UK212	52.4 36.2	— —	73 2 7/8	4.1	— —	— —	— —							
	7 3/8	2 5/16	5 55/64	3/4	13/16	1 11/32	2 9/16	2 7/16	2 23/32	5/8	UKFX12	FX12	UKX12	57.2 40.1	— —	— —	— —	— —	— —	— —							
	187	59	149	19	21	34	65	62	69	M16																	
60 2 3/8	7 11/16	2 7/32	5 29/32	29/32	7/8	1 19/64	2 3/4	2 7/16	—	3/4	UKF312	F312	UK312	81.9 52.2	— —	— —	— —	— —	— —	— —							
	195	56	150	23	22	33	69.5	62	—	M20																	
	2 1/4	7 3/8	1 31/32	5 55/64	3/4	7/8	1 3/16	2 7/16(2 21/32)	1 31/32(2 9/16)	2 29/32	5/8	UKF213	F213	UK213	57.2 40.1	— —	74 2 29/32	5.1	— —	— —	— —						
65 2 3/8	7 3/8	2 5/16	5 55/64	3/4	13/16	1 11/32	2 11/16	2 9/16	2 29/32	5/8	UKFX13	FX13	UKX13	62.2 44.1	— —	— —	— —	— —	— —	— —							
	187	59	149	19	21	34	68	65	74	M16																	
	2 1/4	8 3/16	2 9/32	6 17/32	29/32	7/8	1 19/64	2 13/16	2 9/16	—	3/4	UKF313	F313	UK313	92.7 59.9	— —	— —	— —	— —	— —	— —						
70 2 3/4	7 7/8	2 7/32	6 17/64	3/4	7/8	1 11/32	2 23/32(2 15/16)	2 5/32(2 7/8)	3 11/32	5/8	UKF215	F215	UK215	67.4 48.3	— —	— —	— —	— —	— —	— —							
	7 3/4	2 11/16	5 63/64	29/32	15/16	1 9/16	3	2 7/8	3 11/32	3/4	UKFX15	FX15	UKX15	72.7 53.0	— —	— —	— —	— —	— —	— —							
	197	68	152	23	24	40	76	73	85	M20																	
75 2 3/4	9 9/32	2 19/32	7 1/4	63/64	31/32	1 17/32	3 7/32	2 7/8	—	7/8	UKF315	F315	UK315	113 77.2	— —	— —	— —	— —	— —	— —							
	236	66	184	25	25	39	81.5	73	—	M22																	
	2 3/4	8 3/16	2 9/32	6 1/2	29/32	7/8	1 11/32	2 27/32(3 3/32)	2 5/16(3 1/16)	3 17/32	3/4	UKF216	F216	UK216	72.7 53.0	— —	— —	— —	— —	— —							
80 2 3/4	208	58	165	23	22	34	72(78.5)	59(78)	90	M20																	
	2 3/4	8 7/16	2 3/4	6 47/64	29/32	15/16	1 9/16	3 1/8	3 1/16	3 17/32	3/4	UKFX16	FX16	UKX16	84.0 61.9	— —	— —	— —	— —	— —							
	214	70	171	23	24	40	79	78	90	M20																	
85 3 1/4	9 27/32	2 11/16	7 23/32	1 7/32	1 1/16	1 1/2	3 1/4	3 1/16	—	1	UKF316	F316	UK316	123 86.7	— —	— —	— —	— —	— —	— —							
	250	68	196	31	27	38	82.5	78	—	M27																	
	2 3/4	8 21/32	2 15/32	6 57/64	29/32	15/16	1 13/32	3(3 1/4)	2 15/32(3 7/32)	3 25/32	3/4	UKF217	F217	UK217	84.0 61.9	— —	— —	— —	— —	— —							
75 3	220	63	175	23	24	36	76(82.5)	63(82)	96	M20																	
	3	8 7/16	2 3/4	6 47/64	29/32	15/16	1 9/16	3 7/32	3 25/32	3/4	UKFX17	FX17	UKX17	96.1 71.5	— —	— —	— —	— —	— —	— —							
	214	70	171	23	24	40	82	82	96	M20																	
80 3	10 1/4	2 29/32	8 1/32	1 7/32	1 1/16	1 47/64	3 5/8	3 7/32	—	1	UKF317	F317	UK317	133 96.8	— —	— —	— —	— —	— —	— —							
	260	74	204	31	27	44	92	82	—	M27																	
	3	9 1/4	2 11/16	7 23/64	29/32	31/32	1 9/16	3 7/32(3 17/32)	2 9/16(3 3/8)	4 1/32	3/4	UKF218	F218	UK218	96.1 71.5	— —	— —	— —	— —	— —							
85 3 1/4	235	68	187	23	25	40	82(89.5)	65(86)	102	M20																	
	3	8 7/16	3	6 47/64	29/32	15/16	1 49/64	3 15/32	3 3/8	4 1/32	3/4	UKFX18	FX18	UKX18	109 81.9	— —	— —	— —	— —	— —							
	214	76	171	23	24	45	88	86	102	M20																	
85 3 1/4	3	11 1/32	3	8 1/2	1 3/8	1 3/16	1 47/64	3 5/8	3 3/8	—	1 1/8	UKF318	F318	UK318	143 107	— —	— —	— —	— —	— —							
	280	76	216	35	30	44	92	86	—	M30																	
	3 1/4	11 13/32	3 11/16	8 31/32	1 3/8	1 3/16	2 21/64	4 3/8	3 17/32	—	1 1/8	UKF319	F319	UK319	153 119	— —	— —	— —	— —	— —							
85 3 1/4	290	94	228	35	30	59	111	90	—	M30																	
	3 1/4	11 13/32	3 11/16	8 31/32	1 3/8	1 3/16	2 21/64	4 3/8	3 17/32	—	1 1/8	UKF319	F319	UK319	153 119	— —	— —	— —	— —	— —							
	3 1/4	11 13/32	3 11/16	8 31/32	1 3/8	1 3/16	2 21/64	4 3/8	3 17/32	—	1 1/8	UKF319	F319	UK319	153 119	— —	— —	— —	— —	— —							

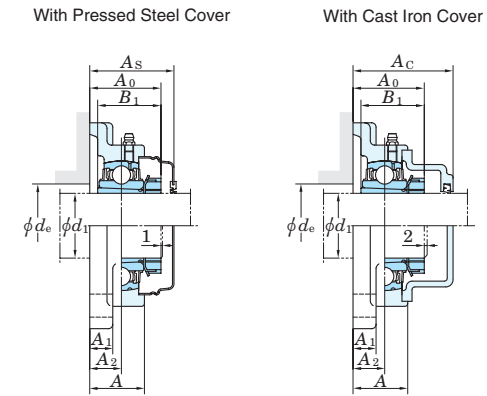
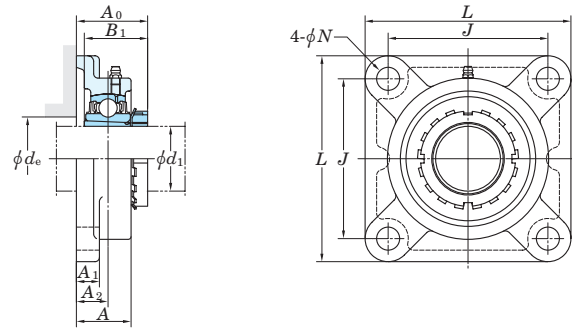
Note 1) Codes shown in parentheses indicate the dimensions and Part No. of applicable adapter (H2300X series) for UK200L3 series (triple-lip seal type).

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.  
A-1/4-28UNF.....205~210, X05~X09, 305~308  
A-PT1/8.....211~218, X10~X20, 309~328

3. In Part No. of unit with adapters and bearing with adapters, Part No. of applicable adapter follow the Part No. shown in the dimensional tables. (Example of Part No. : UKF206J + H306X, UK206 + H306X)  
4. As for the triple-lip seal type product (205 is the double-lip seal type product), supplementary code L3 (L2) follows the Part No. of unit or bearing. (Example of Part No. : UKF206JL3 + H2306X, UK206L3 + H2306X)  
5. For the dimensions and forms of applicable bearings and adapters, see the dimensional tables of ball bearing for unit and adapter assemblies.

**UKF**  
**Tapered bore (with adapter)**  
 $d_1$  90 ~ 125 mm



Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ) and tolerance of position of bolt hole (X)

Housing No.			$\Delta A_{2s}$	X
F205-F210	FX05-FX10	F305-F310	$\pm 0.5$	0.7
F211-F218	FX11-FX20	F311-F328	$\pm 0.8$	1

Unit : mm

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

Housing No.			$\Delta N_s$
F205-F218	FX05-FX18	F305-F315	$\pm 0.2$
	FX20	F316-F328	$\pm 0.3$

Unit : mm

Shaft Dia. mm inch	Dimensions										Bolt Size inch mm	Standard			Adapter <sup>1)</sup> assembly No.	Mass kg	Basic			Factor $f_0$	With Pressed Steel Cover				With Cast Iron Cover						
	inch mm											Unit No.	Housing No.	Bearing No.			Load Ratings kN $C_r$ $C_{0r}$	Unit No.			Dimension mm inch	Mass kg	Unit No.		Dimension mm inch	Mass kg					
	$d_1$	L	A	J	N	A <sub>1</sub>	A <sub>2</sub>	A <sub>0</sub> <sup>1)</sup>	B <sub>1</sub> <sup>1)</sup>	$d_e$ (min.)								Open End Type	Closed End Type				Open End Type	Closed End Type							
90	3 1/2	10 9/16	3 13/16	8 5/16	1 7/32	1 3/32	2 21/64	4 3/16	3 13/16	4 13/32	1	UKFX20	FX20	UKX20	HE2320X	18.4	133	105	14.4	-	-	-	-	-	-	-	-	-	-	-	-
	3 1/2	268	97	211	31	28	59	106	97	112	M27	UKF320	F320	UK320	H2320X	18.4	173	141	13.2	-	-	-	-	-	UKFX20C	UKFX20D	152	5 31/32	20.9		
100	4	12 7/32	3 11/16	9 17/32	1 1/2	1 1/4	2 21/64	4 7/16	3 13/16	-	1 1/4	UKF322	F322	UK322	HE2320X	25.4	173	141	13.2	-	-	-	-	-	UKF320C	UKF320D	146	5 3/4	28.5		
	4	310	94	242	38	32	59	113	97	-	M33	UKF322	F322	UK322	H2322X	25.4	205	180	13.2	-	-	-	-	-	UKF322C	UKF322D	154	6 1/16	38.7		
110	-	13 3/8	3 25/32	10 15/32	1 39/64	1 3/8	2 23/64	4 23/32	4 1/8	-	1 3/8	UKF324	F324	UK324	HE2322X	35.2	205	180	13.2	-	-	-	-	-	-	-	-	-	-	-	
	-	340	96	266	41	35	60	120	105	-	M36	UKF324	F324	UK324	H2324	47.6	207	185	13.5	-	-	-	-	-	UKF324C	UKF324D	163	6 13/32	52.7		
115	4 1/2	14 9/16	4 11/32	11 27/64	1 39/64	1 9/16	2 9/16	5 1/8	4 13/32	-	1 3/8	UKF326	F326	UK326	HE2326	65.3	229	214	13.6	-	-	-	-	-	-	-	-	-	-	-	
	4 1/2	370	110	290	41	40	65	130.5	112	-	M36	UKF326	F326	UK326	H2326	65.3	229	214	13.6	-	-	-	-	-	UKF326C	UKF326D	172	6 25/32	71.9		
125	-	16 5/32	4 17/32	12 19/32	1 39/64	1 25/32	2 9/16	5 3/16	4 3/4	-	1 3/8	UKF328	F328	UK328	HE2328	93.4	253	246	13.6	-	-	-	-	-	-	-	-	-	-	-	
	-	410	115	320	41	45	65	131.5	121	-	M36	UKF328	F328	UK328	H2328	93.4	253	246	13.6	-	-	-	-	-	UKF328C	UKF328D	186	7 5/16	102		

Note 1) Codes shown in parentheses indicate the dimensions and Part No. of applicable adapter (H2300X series) for UK200L3 series (triple-lip seal type).

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.

A-1/4-28UNF.....205-210, X05-X09, 305-308  
 A-PT1/8.....211-218, X10-X20, 309-328

3. In Part No. of unit with adapters and bearing with adapters, Part No. of applicable adapter follow the Part No. shown in the dimensional tables. (Example of Part No. : UKF206J + H306X, UK206 + H306X)

4. As for the triple-lip seal type product (205 is the double-lip seal type product), supplementary code L3 (L2) follows the Part No. of unit or bearing. (Example of Part No. : UKF206JL3 + H2306X, UK206L3 + H2306X)

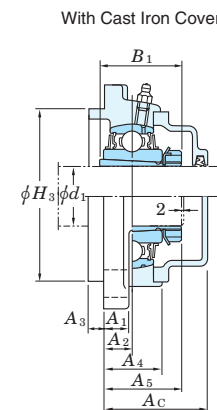
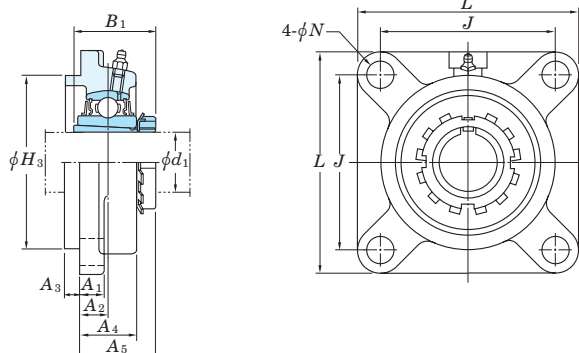
5. For the dimensions and forms of applicable bearings and adapters, see the dimensional tables of ball bearing for unit and adapter assemblies.





Square-flanged type with spigot joint

UKFS  
Tapered bore (with adapter)  
d<sub>1</sub> 20 ~ 125 mm



Variations of tolerance of spigot joint outside diameter ( $\Delta H_{3a}$ ), variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2a}$ ), tolerance of position of bolt hole (X), and tolerance of circumferential runout of spigot joint (Y)

Variations of tolerance of bolt hole diameter ( $\Delta N_b$ )

Housing No.	$\Delta H_{3a}$	$\Delta A_{2a}$	Unit : mm	
			X	Y
FS305	0 -0.046	±0.5	0.7	0.2
FS306-FS308	0 -0.054			
FS309-FS310	0 -0.063			
FS311-FS313	0 -0.072	±0.8	1	0.3
FS315-FS319	0 -0.081			~FS318 FS319-
FS320-FS322	0 -0.089			0.4
FS324-FS328	0 -0.089			

Housing No.	$\Delta N_b$
FS305-315	±0.2
FS316-328	±0.3

Shaft Dia. mm inch	Dimensions inch mm	Bolt Size inch mm	Standard			Adapter assembly No.	Mass kg	Basic Load Ratings kN		Factor $f_0$	With Cast Iron Cover		
			Unit No.	Housing No.	Bearing No.			Unit No.			Dimension mm inch	Mass kg	
								Open End Type	Closed End Type				$C_r$
20 3/4	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	1/2 M14	UKFS305	FS305	UK305	HE2305X H2305X	1.4 1.4	21.2 10.9	12.6	-	-	-	-
	UKFS305C UKFS305D									47 1 27/32	1.7		
25 1	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	1/2 M14	UKFS306	FS306	UK306	H2306X HE2306X	1.9 1.9	26.7 15.0	13.3	-	-	-	-
	UKFS306C UKFS306D									51 2	2.2		
30 1 1/8	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	M16	UKFS307	FS307	UK307	HS2307X H2307X	2.4 2.4	33.4 19.3	13.2	-	-	-	-
	UKFS307C UKFS307D									55 2 5/32	2.9		
35 1 1/4 1 3/8	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	M16	UKFS308	FS308	UK308	HE2308X HS2308X H2308X	3.4 3.4 3.4	40.7 24.0	13.2	-	-	-	-
	UKFS308C UKFS308D									61 2 13/32	3.9		
40 1 1/2 1 5/8	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	M16	UKFS309	FS309	UK309	HE2309X H2309X HS2309X	4.4 4.4 4.4	48.9 29.5	13.3	-	-	-	-
	UKFS309C UKFS309D									65 2 9/16	5.0		
45 1 3/4	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	M20	UKFS310	FS310	UK310	HE2310X H2310X	5.3 5.3	62.0 38.3	13.2	-	-	-	-
	UKFS310C UKFS310D									71 2 25/32	6.1		
50 1 7/8 2	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	M20	UKFS311	FS311	UK311	HS2311X H2311X HE2311X	6.3 6.3 6.3	71.6 45.0	13.2	-	-	-	-
	UKFS311C UKFS311D									74 2 29/32	7.2		
55 2 1/8	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	M20	UKFS312	FS312	UK312	HS2312X H2312X	7.3 7.3	81.9 52.2	13.2	-	-	-	-
	UKFS312C UKFS312D									81 3 3/16	8.5		
60 2 3/8	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	M20	UKFS313	FS313	UK313	HE2313X H2313X HS2313X	8.9 8.9 8.9	92.7 59.9	13.2	-	-	-	-
	UKFS313C UKFS313D									76 3	10.0		
65 2 1/2	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	M22	UKFS315	FS315	UK315	HE2315X H2315X	13.4 13.4	113 77.2	13.2	-	-	-	-
	UKFS315C UKFS315D									88 3 15/32	14.8		
70 2 3/4	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	M27	UKFS316	FS316	UK316	HE2316X H2316X	15.1 15.1	123 86.7	13.3	-	-	-	-
	UKFS316C UKFS316D									87 3 7/16	16.7		
75 3	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	M27	UKFS317	FS317	UK317	H2317X HE2317X	17.1 17.1	133 96.8	13.3	-	-	-	-
	UKFS317C UKFS317D									97 3 13/16	18.9		
80 -	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	M30	UKFS318	FS318	UK318	H2318X	21.4	143 107	13.3	-	-	-	-
	UKFS318C UKFS318D									99 3 29/32	23.5		
85 3 1/4	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	M30	UKFS319	FS319	UK319	HE2319X H2319X	24.8 24.8	153 119	13.3	-	-	-	-
	UKFS319C UKFS319D									120 4 23/32	26.2		
90 3 1/2	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	M33	UKFS320	FS320	UK320	HE2320X H2320X	29.1 29.1	173 141	13.2	-	-	-	-
	UKFS320C UKFS320D									126 4 31/32	32.2		
100 4	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	M36	UKFS322	FS322	UK322	H2322X HE2322X	38.6 38.6	205 180	13.2	-	-	-	-
	UKFS322C UKFS322D									129 5 3/32	42.1		
110 -	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	M36	UKFS324	FS324	UK324	H2324	50.9	207 185	13.5	-	-	-	-
	UKFS324C UKFS324D									133 5 1/4	56.0		
115 4 1/2	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	M36	UKFS326	FS326	UK326	HE2326 H2326	67.5 67.5	229 214	13.6	-	-	-	-
	UKFS326C UKFS326D									142 5 29/32	74.1		
125 -	L H <sub>3</sub> J N A <sub>1</sub> A <sub>2</sub> A <sub>3</sub> A <sub>4</sub> A <sub>5</sub> B <sub>1</sub>	M36	UKFS328	FS328	UK328	H2328	94.0	253 246	13.6	-	-	-	-
	UKFS328C UKFS328D									156 6 5/32	102		

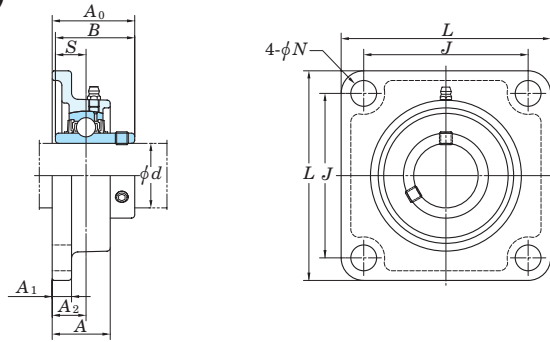
Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
2. Part No. of applicable grease nipples are shown below.  
A-1/4-28UNF ..... 305-308  
A-PT1/8 ..... 309-328

3. In Part No. of unit with adapters and bearing with adapters, Part No. of applicable adapter follow the Part No. shown in the dimensional tables.  
(Example of Part No. : UKFS307J + H2307X, UK307 + H2307X)  
4. As for the triple-lip seal type product, supplementary code L3 follows the Part No. of unit or bearing.  
(Example of Part No. : UKFS307JL3 + H2307X, UK307L3 + H2307X)  
5. For the dimensions and forms of applicable bearings and adapters, see the dimensional tables of ball bearing for unit and adapter assemblies.

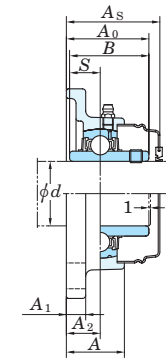


Stainless-series square-flanged type

UCSF-H1S6  
Cylindrical bore (with set screws)  
d 20 ~ 50 mm



With Pressed Stainless Steel Cover



Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ) and tolerance of position of bolt hole (X)

Housing No.	$\Delta A_{2s}$	X
SF204 H1-210 H1	$\pm 0.5$	0.7

Unit : mm

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

Housing No.	$\Delta N_s$
SF204 H1-210 H1	$\pm 0.2$

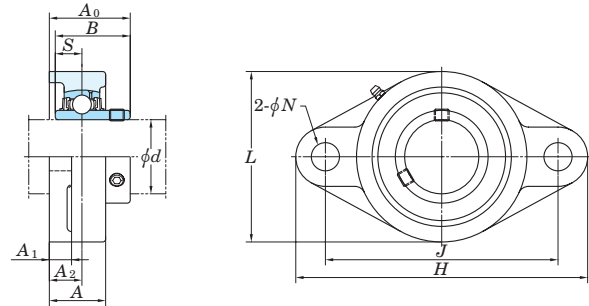
Unit : mm

Shaft Dia. mm  d	Dimensions										Bolt Size  inch mm	Unit No.	Standard Housing No.	Bearing No.	Mass  kg	Basic Load Ratings kN  $C_r$ $C_{0r}$	Factor  $f_0$	With Pressed Stainless Steel Cover				
	inch mm																	Open End Type	Closed End Type	Dimension		Mass  kg
	L	A	J	N	A <sub>1</sub>	A <sub>2</sub>	A <sub>0</sub>	B	S	A <sub>s</sub>										mm	inch	
20	3 3/8 86	1 1/32 26	2 33/64 64	15/32 12	13/32 10	19/32 15	1 5/16 33.3	1.220 31	0.500 12.7	3/8 M10	UCSF204H1S6	SF204H1	UC204S6	0.5	10.9	5.35	13.2	UCSF204H1CS6	UCSF204H1DS6	38	1 1/2	0.5
25	3 3/4 95	1 3/32 27.5	2 3/4 70	15/32 12	13/32 10	5/8 16	1 13/32 35.8	1.343 34.1	0.563 14.3	3/8 M10	UCSF205H1S6	SF205H1	UC205S6	0.85	11.9	6.3	13.9	UCSF205H1CS6	UCSF205H1DS6	40	1 9/16	0.85
30	4 1/4 108	1 7/32 31	3 17/64 83	15/32 12	13/32 10	45/64 18	1 19/32 40.2	1.500 38.1	0.626 15.9	3/8 M10	UCSF206H1S6	SF206H1	UC206S6	1.1	16.5	9.05	13.9	UCSF206H1CS6	UCSF206H1DS6	45	1 25/32	1.1
35	4 19/32 117	1 11/32 34	3 5/8 92	35/64 14	7/16 11	3/4 19	1 3/4 44.4	1.689 42.9	0.689 17.5	7/16 M12	UCSF207H1S6	SF207H1	UC207S6	1.5	21.8	12.3	13.9	UCSF207H1CS6	UCSF207H1DS6	49	1 15/16	1.5
40	5 1/8 130	1 13/32 36	4 1/64 102	5/8 16	15/32 12	53/64 21	2 1/32 51.2	1.937 49.2	0.748 19	1/2 M14	UCSF208H1S6	SF208H1	UC208S6	1.7	24.8	14.3	14.0	UCSF208H1CS6	UCSF208H1DS6	56	2 7/32	1.7
45	5 13/32 137	1 1/2 38	4 9/64 105	5/8 16	1/2 13	55/64 22	2 1/16 52.2	1.937 49.2	0.748 19	1/2 M14	UCSF209H1S6	SF209H1	UC209S6	1.9	27.8	16.2	14.0	UCSF209H1CS6	UCSF209H1DS6	57	2 1/4	1.9
50	5 5/8 143	1 9/16 40	4 3/8 111	5/8 16	1/2 13	55/64 22	2 5/32 54.6	2.031 51.6	0.748 19	1/2 M14	UCSF210H1S6	SF210H1	UC210S6	2.4	29.8	18.6	14.4	UCSF210H1CS6	UCSF210H1DS6	59	2 5/16	2.4

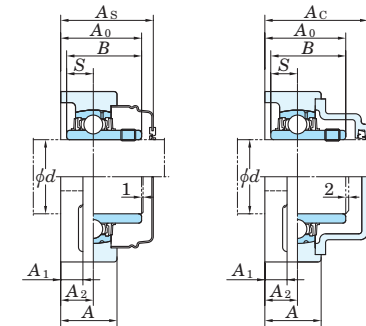
- Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter codes. (See Table 10.5 in P.51.)  
 2. Part No. of the applicable grease nipple is A-1/4-28UNFN12.  
 3. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

Rhombic-flanged type

UCFL  
Cylindrical bore (with set screws)  
d 12 ~ (45) mm



With Pressed Steel Cover With Cast Iron Cover



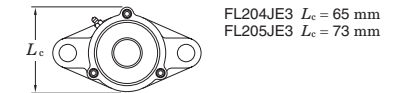
Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2a}$ ) and tolerance of position of bolt hole (X) Unit : mm

Housing No.	$\Delta A_{2a}$	X		
FL204-FL210	FLX05-FLX10	FL305-FL310	±0.5	0.7
FL211-FL218	FL311-FL326		±0.8	1

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ ) Unit : mm

Housing No.	$\Delta N_s$		
FL204-FL218	FLX05-FLX10	FL305-FL311	±0.2
		FL312-FL326	±0.3

Forms and dimensions of  $L_c$  of FL204JE3 and FL205JE3 (housing with cast iron cover) are shown below.



Shaft Dia. mm inch	Dimensions											Bolt Size inch mm	Standard			Mass kg	Basic Load Ratings kN		Factor $f_0$	With Pressed Steel Cover				With Cast Iron Cover			
	inch mm												Unit No.	Housing No.	Bearing No.		Unit No.	Dimension mm inch		Mass kg	Unit No.	Dimension mm inch	Mass kg				
d	H	L	A	J	N	A <sub>1</sub>	A <sub>2</sub>	A <sub>0</sub>	B	S					C <sub>r</sub>	C <sub>0r</sub>		Open End Type	Closed End Type	A <sub>s</sub>		Open End Type	Closed End Type	A <sub>c</sub>			
12	1/2													UCFL201				UCFL201C	UCFL201D	37	1 15/32	0.50	-	-	-	-	
15	5/8	4 7/16	2 3/8	1	3 35/64	15/32	7/16	19/32	1 5/16	1.220	0.500			UCFL201-8				UCFL202C	UCFL202D	37	1 15/32	0.48	-	-	-	-	
17	3/4	113	60	25.5	90	12	11	15	33.3	31	12.7			UCFL202	FL204	UC202-10		UCFL203C	UCFL203D	37	1 15/32	0.47	-	-	-	-	
20														UCFL203		UC204-12		UCFL204C	UCFL204D	37	1 15/32	0.45	UCFL204FC	UCFL204FD	46	1 13/16	0.6
25	7/8													UCFL205-14		UC205-14		-	-	-	-	-	-	-	-	-	
	15/16	5 1/8	2 11/16	1 1/16	3 57/64	5/8	1/2	5/8	1 13/32	1.343	0.563			UCFL205-15	FL205	UC205-15		-	-	-	-	-	-	-	-	-	
	1	130	68	27	99	16	13	16	35.8	34.1	14.3			UCFL205		UC205		UCFL205C	UCFL205D	40	1 9/16	0.64	UCFL205FC	UCFL205FD	49	1 15/16	0.83
														UCFL205-16		UC205-16		-	-	-	-	-	-	-	-	-	
30	1 1/8													UCFLX05		UCX05		UCFLX05C	UCFLX05D	44	1 23/32	1.1	-	-	-	-	
	1 3/16	5 9/16	3 3/32	1 3/16	4 39/64	15/32	1/2	45/64	1 19/32	1.500	0.626			UCFLX05-16	FLX05	UCX05-16		-	-	-	-	-	-	-	-		
	1 1/4	141	83	30	117	12	13	18	40.2	38.1	15.9			UCFL305		UC305		-	-	-	-	-	-	-	-		
														UCFL305-16	FL305	UC305-16		UCFL305C	UCFL305D	54	2 1/8	1.4	-	-	-	-	
35	1 1/8													UCFL206-18		UC206-18		-	-	-	-	-	-	-	-		
	1 3/16	5 13/16	3 3/32	1 7/32	4 39/64	5/8	1/2	45/64	1 19/32	1.500	0.626			UCFL206	FL206	UC206		UCFL206C	UCFL206D	44	1 23/32	0.93	UCFL206FC	UCFL206FD	53	2 3/32	1.2
	1 1/4	148	80	31	117	16	13	18	40.2	38.1	15.9			UCFL206-19		UC206-19		-	-	-	-	-	-	-	-		
														UCFL206-20		UC206-20		-	-	-	-	-	-	-	-		
40	1 3/16	6 5/32	3 3/4	1 11/32	5 1/8	5/8	9/16	3/4	1 3/4	1.689	0.689			UCFLX06		UCX06		UCFLX06C	UCFLX06D	49	1 15/16	1.5	-	-	-	-	
	1 1/4	156	95	34	130	16	14	19	44.4	42.9	17.5			UCFLX06-19	FLX06	UCX06-19		-	-	-	-	-	-	-			
														UCFLX06-20		UCX06-20		-	-	-	-	-	-	-			
														UCFL306	FL306	UC306		UCFL306C	UCFL306D	59	2 5/16	1.8	-	-	-	-	
45	1 1/4													UCFL207-20		UC207-20		-	-	-	-	-	-	-	-		
	1 5/16	6 11/32	3 17/32	1 11/32	5 1/8	5/8	9/16	3/4	1 3/4	1.689	0.689			UCFL207-21	FL207	UC207-21		-	-	-	-	-	-	-			
	1 3/8	161	90	34	130	16	14	19	44.4	42.9	17.5			UCFL207-22		UC207-22		UCFL207C	UCFL207D	49	1 15/16	1.2	UCFL207FC	UCFL207FD	58	2 9/32	1.6
														UCFL207-23		UC207-23		-	-	-	-	-	-	-			
45	1 7/16													UCFLX07-22		UCX07-22		-	-	-	-	-	-	-			
	1 3/8	6 23/32	4 1/8	1 1/2	5 43/64	5/8	9/16	53/64	2 1/32	1.937	0.748			UCFLX07	FLX07	UCX07		UCFLX07C	UCFLX07D	55	2 5/32	1.9	-	-	-		
	1 7/16	171	105	38	144	16	14	21	51.2	49.2	19			UCFL307	FL307	UC307		-	-	-	-	-	-				
														UCFL307		UC307		UCFL307C	UCFL307D	64	2 17/32	2.2	-	-	-		
45	1 1/2													UCFL208-24		UC208-24		-	-	-	-	-	-	-			
	1 9/16	6 7/8	3 15/16	1 13/32	5 43/64	5/8	9/16	53/64	2 1/32	1.937	0.748			UCFL208-25	FL208	UC208-25		-	-	-	-	-	-				
		175	100	36	144	16	14	21	51.2	49.2	19			UCFL208		UC208		UCFL208C	UCFL208D	55	2 5/32	1.6	UCFL208FC	UCFL208FD	64	2 17/32	2.0
														UCFLX08-24	FLX08	UCX08-24		-	-	-	-	-	-				
45	1 1/2	7 1/16	4 3/8	1 9/16	5 53/64	5/8	9/16	55/64	2 1/16	1.937	0.748			UCFLX08		UCX08		UCFLX08C	UCFLX08D	56	2 7/32	2.1	-	-	-		
		179	111	40	148	16	14	22	52.2	49.2	19			UCFL308-24	FL308	UC308-24		-	-	-	-	-					
	1 1/2	200	112	40	158	23	17	23	56	52	19			UCFL308		UC308		UCFL308C	UCFL308D	71	2 25/32	3.0	-	-	-		
														UCFL209-26		UC209-26		-	-	-	-	-					
45	1 5/8													UCFL209-27	FL209	UC209-27		-	-	-	-	-					
	1 11/16	7 13/32	4 1/4	1 1/2	5 53/64	3/4	19/32	55/64	2 1/16	1.937	0.748			UCFL209-28		UC209-28		-	-	-	-						
	1 3/4	188	108	38	148	19	15	22	52.2	49.2	19			UCFL209		UC209		UCFL209C	UCFL209D	56	2 7/32	1.9	UCFL209FC	UCFL209FD	66	2 19/32	2.3
														UCFLX09-28	FLX09	UCX09-28		-	-	-	-						
	1 3/4	7 7/16	4 9/16	1 9/16	6 3/16	5/8	9/16	29/32	2 3/16	2.031	0.748			UCFLX09		UCX09		UCFLX09C	UCFLX09D	60	2 3/8	2.4	-	-	-		

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.

A-1/4-28UNF ..... 201-210, X05-X09, 305-308

A-PT1/8 ..... 211-218, X10, 309-326

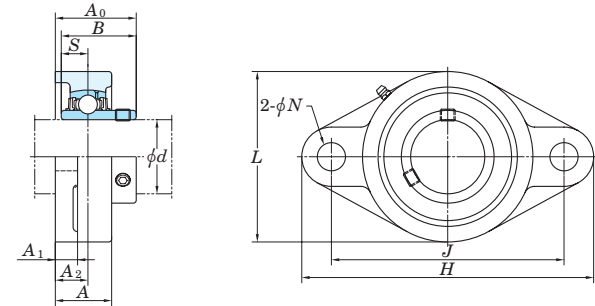
3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (or L2) follows the Part No. of unit or bearing. (Example of Part No. : UCFL206JL3, UC206L3)

4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

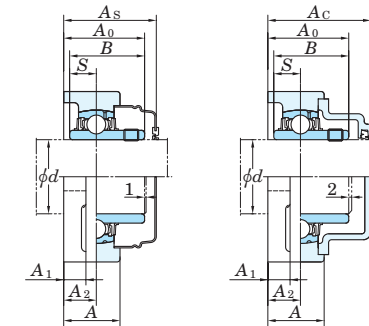


Rhombic-flanged type

UCFL  
Cylindrical bore (with set screws)  
d (90) ~ 130 mm



With Pressed Steel Cover With Cast Iron Cover



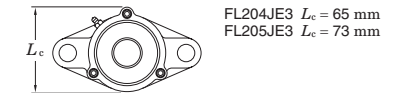
Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2a}$ ) and tolerance of position of bolt hole (X) Unit : mm

Housing No.	$\Delta A_{2a}$	X
FL204-FL210	±0.5	0.7
FL211-FL218	±0.8	1

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ ) Unit : mm

Housing No.	$\Delta N_s$
FL204-FL218	±0.2
FL311-FL326	±0.3

Forms and dimensions of  $L_c$  of FL204JE3 and FL205JE3 (housing with cast iron cover) are shown below.



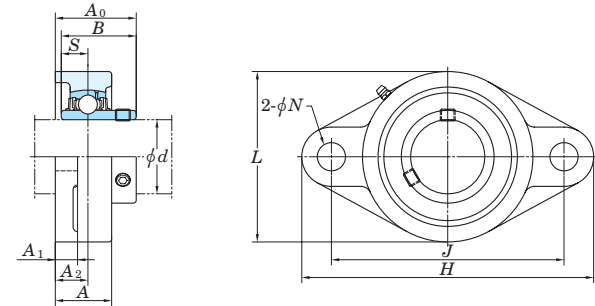
Shaft Dia. mm inch  d	Dimensions											Bolt Size inch mm	Standard			Mass kg	Basic Load Ratings kN		Factor $f_0$	With Pressed Steel Cover				With Cast Iron Cover						
	inch mm												Unit No.	Housing No.	Bearing No.		Open End Type	Closed End Type		Dimension		Mass kg	Open End Type	Closed End Type	Dimension		Mass kg			
	H	L	A	J	N	A <sub>1</sub>	A <sub>2</sub>	A <sub>0</sub>	B	S	mm									mm	inch				inch	mm		inch	mm	inch
90 3 1/2	15 5/32	9 1/4	3	12 13/32	1 1/2	1 13/32	1 47/64	3 15/16	3.780	1.575	1 1/4	UCFL318-56 UCFL318	FL318	UC318-56 UC318	19.0 19.0	143	107	13.3	-	-	-	-	-	-	-	-	-	-	-	-
	385	235	76	315	38	36	44	100	96	40	M33								UCFL318C	UCFL318D	119	4 11/16	20.9							
95 -	15 15/16	9 27/32	3 11/16	13	1 39/64	1 9/16	2 21/64	4 3/4	4.055	1.614	1 3/8	UCFL319	FL319	UC319	24.6	153	119	13.3	-	-	-	-	-	-	-	-	-	-	-	
	405	250	94	330	41	40	59	121	103	41	M36								UCFL319C	UCFL319D	140	5 1/2	26.8							
100 3 15/16 4	17 5/16	10 5/8	3 11/16	14 11/64	1 47/64	1 9/16	2 21/64	4 29/32	4.252	1.654	1 1/2	UCFL320 UCFL320-63 UCFL320-64	FL320	UC320 UC320-63 UC320-64	29.4 29.4 29.4	173	141	13.2	-	-	-	-	-	-	-	-	-	-	-	
	440	270	94	360	44	40	59	125	108	42	M39								UCFL320C	UCFL320D	146	5 3/4	32.2							
	470	300	96	390	44	42	60	131	117	46	M39								-	-	-	-	-	-	-	-	-	-	-	
110 -	18 1/2	11 13/16	3 25/32	15 23/64	1 47/64	1 21/32	2 23/64	5 9/32	4.606	1.811	1 1/2	UCFL322	FL322	UC322	36.2	205	180	13.2	-	-	-	-	-	-	-	-	-	-	-	
	470	300	96	390	44	42	60	131	117	46	M39								UCFL322C	UCFL322D	154	6 1/16	39.6							
120 -	20 15/32	13	4 11/32	16 59/64	1 27/32	1 7/8	2 9/16	5 1/2	4.961	2.008	1 5/8	UCFL324	FL324	UC324	51.6	207	185	13.5	-	-	-	-	-	-	-	-	-	-	-	
	520	330	110	430	47	48	65	140	126	51	M42								UCFL324C	UCFL324D	163	6 13/32	56.4							
130 -	21 21/32	14 3/16	4 17/32	18 7/64	1 27/32	1 31/32	2 9/16	5 3/4	5.315	2.126	1 5/8	UCFL326	FL326	UC326	61.6	229	214	13.6	-	-	-	-	-	-	-	-	-	-	-	
	550	360	115	460	47	50	65	146	135	54	M42								UCFL326C	UCFL326D	172	6 25/32	67.7							

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
2. Part No. of applicable grease nipples are shown below.  
A-1/4-28UNF ..... 201~210, X05~X09, 305~308  
A-PT1/8 ..... 211~218, X10, 309~326

3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (or L2) follows the Part No. of unit or bearing. (Example of Part No. : UCFL206JL3, UC206L3)  
4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

Rhombic-flanged type

UCFL-E  
Cylindrical bore (with set screws)  
d 12 ~ 75 mm



Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ) and tolerance of position of bolt hole (X)

Housing No.	$\Delta A_{2s}$	X
FL203E-FL210E	$\pm 0.5$	0.7
FL211E-FL217E	$\pm 0.8$	1

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

Housing No.	$\Delta N_s$
FL203E-FL217E	$\pm 0.2$

Shaft Dia. mm inch  d	Dimensions inch mm										Bolt Size inch	Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor $f_0$	Mass kg
	H	L	A	J	N	A <sub>1</sub>	A <sub>2</sub>	A <sub>0</sub>	B	S					C <sub>r</sub>	C <sub>0r</sub>		
12 1/2	3 7/32	2 7/32	1	3	25/64	7/16	19/32	1 5/16	1.220	0.500	5/16	UCFL201E UCFL201-8E UCFL202E UCFL202-10E UCFL203E	FL203E	UC201 UC201-8 UC202 UC202-10 UC203	12.8	6.65	13.2	0.42 0.4 0.39
15 5/8	98	56	25.5	76.2	10	11	15	33.3	31	12.7	5/16	UCFL204-12E UCFL204E	FL204E	UC204-12 UC204	12.8	6.65	13.2	0.48
17																		
20 3/4	4 7/16	2 3/8	1	3 17/32	25/64	7/16	19/32	1 5/16	1.220	0.500	5/16	UCFL205-14E UCFL205-15E UCFL205E UCFL205-16E	FL205E	UC205-14 UC205-15 UC205 UC205-16	14.0	7.85	13.9	0.64
25 7/8 15/16	5 1/8	2 11/16	1 1/16	3 57/64	15/32	1/2	5/8	1 13/32	1.343	0.563	3/8	UCFL206-18E UCFL206E UCFL206-19E UCFL206-20E	FL206E	UC206-18 UC206 UC206-19 UC206-20	19.5	11.3	13.9	0.93
30 1 1/8	5 13/16	3 5/32	1 7/32	4 19/32	15/32	1/2	45/64	1 19/32	1.500	0.626	3/8	UCFL207-20E UCFL207-21E UCFL207-22E UCFL207E UCFL207-23E	FL207E	UC207-20 UC207-21 UC207-22 UC207 UC207-23	3	15.4	13.9	1.2
35 1 1/4 1 5/16 1 3/8	6 11/32	3 17/32	1 11/32	5 1/8	33/64	9/16	3/4	1 3/4	1.689	0.689	7/16	UCFL208-24E UCFL208-25E UCFL208E	FL208E	UC208-24 UC208-25 UC208	29.1	17.8	14.0	1.6
40 1 1/2 1 9/16	6 7/8	3 15/16	1 13/32	5 21/32	33/64	9/16	53/64	2 1/32	1.937	0.748	7/16	UCFL209-26E UCFL209-27E UCFL209-28E UCFL209E	FL209E	UC209-26 UC209-27 UC209-28 UC209	34.1	21.3	14.0	1.9
45 1 5/8 1 11/16 1 3/4	7 13/32	4 1/4	1 1/2	5 27/32	19/32	19/32	55/64	2 1/16	1.937	0.748	1/2	UCFL210-30E UCFL210-31E UCFL210E UCFL210-32E	FL210E	UC210-30 UC210-31 UC210 UC210-32	35.1	23.3	14.4	2.2
50 1 7/8 1 15/16	7 3/4	4 17/32	1 9/16	6 3/16	19/32	19/32	55/64	2 5/32	2.031	0.748	1/2	UCFL211-32E UCFL211-34E UCFL211E UCFL211-35E	FL211E	UC211-32 UC211-34 UC211 UC211-35	43.4	29.4	14.4	3.3
55 2 1/8 2 3/16	8 13/16	5 1/8	1 11/16	7 1/4	21/32	23/32	63/64	2 5/16	2.189	0.874	9/16	UCFL212-36E UCFL212E UCFL212-38E UCFL212-39E	FL212E	UC212-36 UC212 UC212-38 UC212-39	52.4	36.2	14.4	4.2
60 2 1/4 2 3/8 2 7/16	9 27/32	5 1/2	1 7/8	7 61/64	21/32	23/32	1 9/64	2 23/32	2.563	1.000	9/16	UCFL213-40E UCFL213E	FL213E	UC213-40 UC213	57.2	40.1	14.4	5.2
65 2 1/2	10 5/32	6 3/32	1 31/32	8 17/64	21/32	25/32	1 3/16	2 3/4	2.563	1.000	9/16	UCFL214-44E UCFL214E	FL214E	UC214-44 UC214	62.2	44.1	14.5	5.7
70 2 3/4	10 7/16	6 5/16	2 1/8	8 1/2	21/32	25/32	1 7/32	2 31/32	2.937	1.189	9/16	UCFL215-47E UCFL215E UCFL215-48E	FL215E	UC215-47 UC215 UC215-48	67.4	48.3	14.5	6.4
75 2 15/16 3	10 13/16	6 1/2	2 7/32	8 55/64	3/4	25/32	1 11/32	3 3/32	3.063	1.311	11/16							

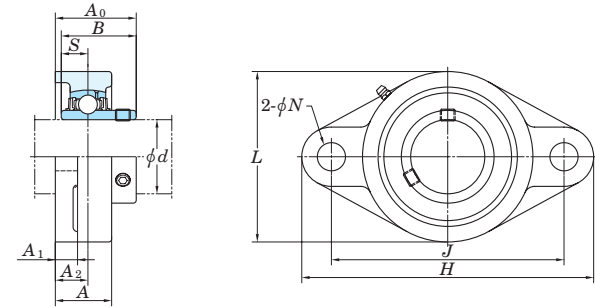
Remarks 1. In Part No. of unit, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
2. Part No. of applicable grease nipples are shown below.  
A-1/4-28UNF ..... 201~210  
A-PT1/8 ..... 211~217

3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (or L2) follows the Part No. of unit or bearing. (Example of Part No.: UCFL206EJL3, UC206L3)  
4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.



Rhombic-flanged type

**UCFL-E**  
**Cylindrical bore (with set screws)**  
*d* 80 ~ 85 mm



Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ) and tolerance of position of bolt hole ( $X$ )

Housing No.	$\Delta A_{2s}$	$X$
FL203E-FL210E	$\pm 0.5$	0.7
FL211E-FL217E	$\pm 0.8$	1

Unit : mm

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

Housing No.	$\Delta N_s$
FL203E-FL217E	$\pm 0.2$

Unit : mm

Shaft Dia. mm inch	Dimensions											Bolt Size inch	Unit No.	Housing No.	Bearing No.	Basic Load Ratings		Factor $f_0$	Mass kg
	$H$	$L$	$A$	$J$	$N$	$A_1$	$A_2$	$A_0$	$B$	$S$	$C_r$					$C_{0r}$			
<b>80</b> 3 1/8	11 13/32	7 3/32	2 9/32	9 11/64	3/4	25/32	1 11/32	3 9/32	3.252	1.311	11/16	UCFL216-50E UCFL216E	FL216E	UC216-50 UC216	72.7	53.0	14.6	7.8	
	290	180	58	233	19	20	34	83.3	82.6	33.3									
<b>85</b> 3 1/4	12	7 15/32	2 15/32	9 49/64	3/4	7/8	1 27/64	3 7/16	3.374	1.343	11/16	UCFL217-52E UCFL217E	FL217E	UC217-52 UC217	84.0	61.9	14.5	9.8	
	305	190	63	248	19	22	36	87.6	85.7	34.1									

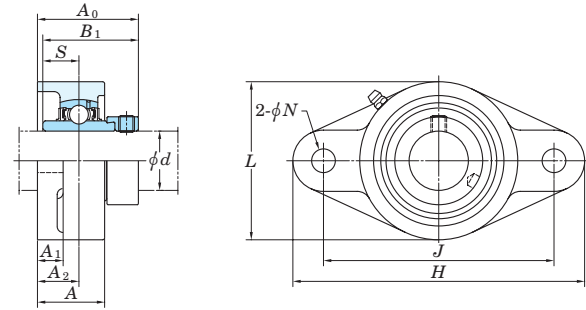
- Remarks 1. In Part No. of unit, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
 2. Part No. of applicable grease nipples are shown below.  
 A-1/4-28UNF..... 201~210  
 A-PT1/8..... 211~217

3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (or L2) follows the Part No. of unit or bearing. (Example of Part No. : UCFL206EJL3, UC206L3)  
 4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.



Rhombic-flanged type

**NANFL**  
Cylindrical bore  
(with eccentric locking collar)  
 $d$  12 ~ 55 mm



Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta_{A2s}$ ) and tolerance of position of bolt hole ( $X$ )

Housing No.	$\Delta_{A2s}$	$X$
NFL204-NFL210	$\pm 0.5$	0.7
NFL211	$\pm 0.8$	1

Variations of tolerance of bolt hole diameter ( $\Delta_{Ns}$ )

Housing No.	$\Delta_{Ns}$
NFL204-NFL211	$\pm 0.2$

Shaft Dia mm inch $d$	Dimensions inch mm										Bolt Size inch	Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor $f_0$	Mass kg
	$H$	$L$	$A$	$J$	$N$	$A_1$	$A_2$	$A_0$	$B_1$	$S$					$C_r$	$C_{0r}$		
12 1/2												NANFL201 NANFL201-8 NANFL202 NANFL202-10 NANFL203 NANFL204-12 NANFL204	NFL204	NA201 NA201-8 NA202 NA202-10 NA203 NA204-12 NA204	12.8	6.65	13.2	0.59
15 5/8	4 7/16	2 3/8	1 5/32	3 17/32	25/64	7/16	3/4	1 25/32	1.720	0.673	5/16							
17 3/4	113	60	29.5	89.7	10	11	19	45.6	43.7	17.1								
20												NANFL205-14 NANFL205-15 NANFL205 NANFL205-16	NFL205	NA205-14 NA205-15 NA205 NA205-16	14.0	7.85	13.9	0.9
25 7/8 15/16	5 1/8	2 11/16	1 7/32	3 57/64	15/32	1/2	25/32	1 27/32	1.748	0.689	3/8							
25	130	68	31	98.8	12	13	20	46.9	44.4	17.5								
30 1 1/8	5 13/16	3 5/32	1 11/32	4 19/32	15/32	1/2	53/64	2	1.906	0.720	3/8							
30	148	80	34	116.7	12	13	21	51.1	48.4	18.3								
35 1 1/4 1 5/16 1 3/8	6 11/32	3 17/32	1 7/16	5 1/8	33/64	9/16	27/32	2 1/8	2.012	0.740	7/16							
35	161	90	36.5	130.2	13	14	21.5	53.8	51.1	18.8								
40 1 1/2 1 9/16	6 7/8	3 15/16	1 17/32	5 21/32	33/64	9/16	15/16	2 5/16	2.217	0.843	7/16							
40	175	100	39	143.7	13	14	24	58.9	56.3	21.4								
45 1 5/8 1 11/16 1 3/4	7 13/32	4 1/4	1 9/16	5 27/32	19/32	9/16	15/16	2 5/16	2.217	0.843	1/2							
45	188	108	40	148.4	15	14	24	58.9	56.3	21.4								
50 1 7/8 1 15/16	7 3/4	4 17/32	1 27/32	6 3/16	19/32	9/16	1 1/8	2 5/8	2.469	0.969	1/2							
50	197	115	46.5	157	15	14	28.5	66.6	62.7	24.6								
55 2 2 1/8 2 3/16	8 13/16	5 1/8	1 31/32	7 1/4	21/32	25/32	1 17/64	2 31/32	2.811	1.094	9/16							
55	224	130	50	184	16.5	20	32	75.6	71.4	27.8								

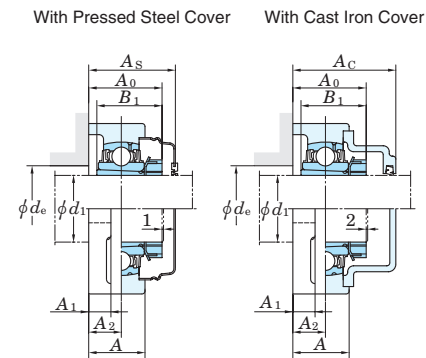
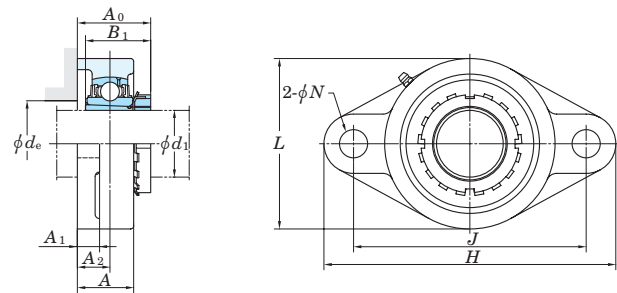
Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.

- A-1/4-28UNF ..... 201~210
- A-PT1/8 ..... 211

3. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

**UKFL**  
Tapered bore (with adapter)  
 $d_1$  20 ~ (50) mm



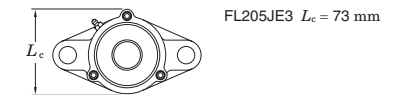
Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2a}$ ) and tolerance of position of bolt hole (X) Unit : mm

Housing No.	$\Delta A_{2a}$	X		
FL205-FL210	FLX05-FLX10	FL305-FL310	±0.5	0.7
FL211-FL218	FL311-FL326		±0.8	1

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ ) Unit : mm

Housing No.	$\Delta N_s$		
FL205-FL218	FLX05-FLX10	FL305-FL311	±0.2
	FL312-FL326		±0.3

Forms and dimensions of  $L_c$  of FL205JE3 (housing with cast iron cover) are shown below.



Shaft Dia. mm inch	Dimensions										Bolt Size inch mm	Standard			Adapter <sup>1)</sup> assembly No.	Mass kg	Basic			With Pressed Steel Cover				With Cast Iron Cover			
	$d_1$	H	L	A	J	N	A <sub>1</sub>	A <sub>2</sub>	A <sub>0</sub> <sup>1)</sup>	B <sub>1</sub> <sup>1)</sup>		$d_e$ (min.)	Unit No.	Housing No.			Bearing No.	Load Ratings kN	Factor	Open End Type	Closed End Type	Dimension mm inch	Mass kg	Open End Type	Closed End Type	Dimension mm inch	Mass kg
20	3/4	5 1/8	2 11/16	1 1/16	3 57/64	5/8	1/2	5/8	1 11/32(1 13/32)	1 5/32(1 3/8)	1 3/16	1/2	FL205	UK205	HE305X(HE2305X) H305X(H2305X)	0.68 0.68	14.0	7.85	13.9	UKFL205C	UKFL205D	40 1 9/16	0.68	UKFL205FC	UKFL205FD	49 1 15/16	0.89
		141	83	30	117	12	13	18	37.5	35	30	M10	FLX05	UKX05	HE2305X H2305X	1.0 1.0	19.5	11.3	13.9	UKFLX05C	UKFLX05D	44 1 23/32	1.0				
	3/4	150	80	29	113	19	13	16	37.5	35		M16	FL305	UK305	HE2305X H2305X	1.1 1.1	21.2	10.9	12.6					UKFL305C	UKFL305D	54 2 1/8	1.4
25	1	5 13/16	3 5/32	1 7/32	4 39/64	5/8	1/2	45/64	1 15/32(1 9/16)	1 7/32(1 1/2)	1 13/32	3/8	FL206	UK206	H306X(H2306X) HE306X(HE2306X)	0.97 0.97	19.5	11.3	13.9	UKFL206C	UKFL206D	44 1 23/32	0.97	UKFL206FC	UKFL206FD	53 2 3/32	1.2
		156	95	34	130	16	14	19	40	38	36	M14	FLX06	UKX06	H2306X HE2306X	1.5 1.5	25.7	15.4	13.9	UKFLX06C	UKFLX06D	49 1 15/16	1.5				
	1	180	90	32	134	23	15	18	41	38		M20	FL306	UK306	H2306X HE2306X	1.5 1.5	26.7	15.0	13.3					UKFL306C	UKFL306D	59 2 5/16	1.8
30	1 1/8	6 11/32	3 17/32	1 11/32	5 1/8	5/8	9/16	3/4	1 5/8(1 11/16)	1 3/8(1 11/16)	1 5/8	3/8	FL207	UK207	HS307X(HS2307X) H307X(H2307X)	1.3 1.3	25.7	15.4	13.9	UKFL207C	UKFL207D	49 1 15/16	1.3	UKFL207FC	UKFL207FD	58 2 9/32	1.7
		171	105	38	144	16	14	21	43.5	43	41	M14	FLX07	UKX07	HS2307X H2307X	1.8 1.8	29.1	17.8	14.0	UKFLX07C	UKFLX07D	55 2 5/32	1.8				
	1 1/8	185	100	36	141	23	16	20	45.5	43		M20	FL307	UK307	HS2307X H2307X	1.9 1.9	33.4	19.3	13.2					UKFL307C	UKFL307D	64 2 17/32	2.4
35	1 1/4	6 7/8	3 15/16	1 13/32	5 43/64	5/8	9/16	53/64	1 3/4(1 7/8)	1 13/32(1 13/16)	1 13/16	3/8	FL208	UK208	HE308X(HE2308X) HS308X(HS2308X) H308X(H2308X)	1.6 1.6 1.6	29.1	17.8	14.0	UKFL208C	UKFL208D	55 2 5/32	1.6	UKFL208FC	UKFL208FD	64 2 17/32	2.0
		179	111	40	148	16	14	22	46.5	46	46	M14	FLX08	UKX08	HE2308X HS2308X H2308X	2.1 2.1 2.1	34.1	21.3	14.0	UKFLX08C	UKFLX08D	56 2 7/32	2.1				
	1 1/4	200	112	40	158	23	17	23	50.5	46		M20	FL308	UK308	HE2308X HS2308X H2308X	2.5 2.5 2.5	40.7	24.0	13.2					UKFL308C	UKFL308D	71 2 25/32	3.0
40	1 1/2	7 13/32	4 1/4	1 1/2	5 53/64	3/4	19/32	55/64	1 7/8(2)	1 17/32(1 31/32)	2 1/16	5/8	FL209	UK209	HE309X(HE2309X) H309X(H2309X) HS309X(HS2309X)	2.0 2.0 2.0	34.1	21.3	14.0	UKFL209C	UKFL209D	56 2 7/32	2.0	UKFL209FC	UKFL209FD	66 2 19/32	2.5
		189	116	40	157	16	14	23	48.5	50	52	M14	FLX09	UKX09	HE2309X H2309X HS2309X	2.5 2.5 2.5	35.1	23.3	14.4	UKFLX09C	UKFLX09D	60 2 3/8	2.5				
	1 1/2	230	125	44	177	25	18	25	55	50		M22	FL309	UK309	HE2309X H2309X HS2309X	3.6 3.6 3.6	48.9	29.5	13.3					UKFL309C	UKFL309D	76 3	4.2
45	1 3/4	7 3/4	4 17/32	1 9/16	6 3/16	3/4	19/32	55/64	1 29/32(2 1/16)	1 21/32(2 5/32)	2 9/32	5/8	FL210	UK210	HE310X(HE2310X) H310X(H2310X)	2.3 2.3	35.1	23.3	14.4	UKFL210C	UKFL210D	59 2 5/16	2.3	UKFL210FC	UKFL210FD	70.5 2 25/32	2.8
		216	133	44	184	19	20	26	53.5	55	58	M16	FLX10	UKX10	HE2310X H2310X	3.7 3.7	43.4	29.4	14.4	UKFLX10C	UKFLX10D	64 2 17/32	3.7				
	1 3/4	240	140	48	187	25	19	28	60	55		M22	FL310	UK310	HE2310X H2310X	4.4 4.4	62.0	38.3	13.2					UKFL310C	UKFL310D	83 3 3/32	5.2
50	2	8 13/16	5 1/8	1 11/16	7 1/4	3/4	23/32	63/64	2 1/16(2 1/4)	1 25/32(2 5/16)	2 17/32	5/8	FL211	UK211	HS311X(HS2311X) H311X(H2311X) HE311X(HE2311X)	3.3 3.3 3.3	43.4	29.4	14.4	UKFL211C	UKFL211D	63 2 15/32	3.3	UKFL211FC	UKFL211FD	74.5 2 15/16	3.9

Note 1) Codes shown in parentheses indicate the dimensions and Part No. of applicable adapter (H2300X series) for UK200L3 series (triple-lip seal type).

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.  
A-1/4-28UNF.....205-210, X05-X09, 305-308  
A-PT1/8.....211-218, X10, 309-326

3. In Part No. of unit with adapters and bearing with adapters, Part No. of applicable adapter follow the Part No. shown in the dimensional tables. (Example of Part No. : UKFL206J + H306X, UK206 + H306X)

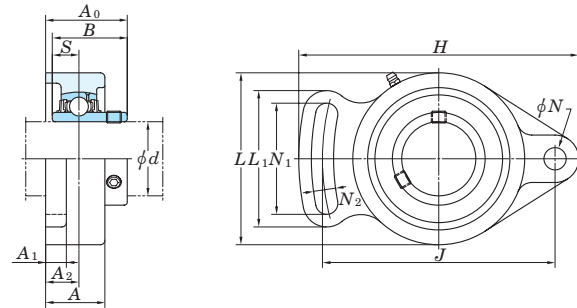
4. As for the triple-lip seal type product (205 is the double-lip seal type product), supplementary code L3 (or L2) follows the Part No. of unit or bearing. (Example of Part No. : UKFL206JL3 + H2306X, UK206L3 + H2306X)

5. For the dimensions and forms of applicable bearings and adapters, see the dimensional tables of ball bearing for unit and adapter assemblies.



Adjustable rhombic-flanged type

UCFA  
Cylindrical bore (with set screws)  
d 12 ~ 55 mm



Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ )

Housing No.	$\Delta A_{2s}$
FA204-FA210	$\pm 0.5$
FA211	$\pm 0.8$

Variations of tolerance of bolt hole diameter ( $\Delta N_b$ )

Housing No.	$\Delta N_b$
FA204-FA211	$\pm 0.2$

Shaft Dia. mm inch  d	Dimensions inch mm													Bolt Size inch mm	Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor $f_0$	Mass kg	
	H	L	A	J	N	N <sub>1</sub>	N <sub>2</sub>	L <sub>1</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>0</sub>	B	S					C <sub>r</sub>	C <sub>0r</sub>			
12 1/2																UCFA201 UCFA201-8		UC201 UC201-8				0.47
15 5/8	3 27/32	2 5/16	1 5/16	3 5/64	2 5/64	1 9/16	1 3/32	1 31/32	7/16	3 5/64	1 1/4	1.220	0.500		5/16	UCFA202 UCFA202-10	FA204	UC202 UC202-10	12.8	6.65	13.2	0.45
17 3/4	98	59	24	78	10	40	10	50	11	13.8	32.1	31	12.7		M8	UCFA203 UCFA204-12 UCFA204	UC203 UC204-12 UC204				0.44	
20																UCFA205-14 UCFA205-15 UCFA205 UCFA205-16	FA205	UC205-14 UC205-15 UC205 UC205-16	14.0	7.85	13.9	0.68
25 1	4 7/8	2 3/4	1 1/16	3 55/64	7/16	1 15/16	7/16	2 17/32	1/2	5/8	1 13/32	1.343	0.563		3/8	UCFA206-18 UCFA206 UCFA206-19 UCFA206-20	FA206	UC206-18 UC206 UC206-19 UC206-20	19.5	11.3	13.9	1.0
30 1 1/8	5 9/16	3 9/32	1 3/16	4 39/64	7/16	2 7/32	1 5/32	2 11/16	1/2	4 5/64	1 9/16	1.500	0.626		3/8	UCFA207-20 UCFA207-21 UCFA207-22 UCFA207 UCFA207-23	FA207	UC207-20 UC207-21 UC207-22 UC207 UC207-23	25.7	15.4	13.9	1.5
35 1 1/4 1 5/16 1 3/8	6 3/32	3 25/32	1 11/32	5 1/8	3 3/64	2 15/32	1/2	2 15/16	9/16	4 7/64	1 23/32	1.689	0.689		7/16	UCFA208-24 UCFA208-25 UCFA208	FA208	UC208-24 UC208-25 UC208	29.1	17.8	14	1.9
40 1 1/2 1 9/16	6 23/32	4 1/8	1 1/2	5 43/64	3 3/64	2 3/4	1/2	3 5/16	9/16	1 3/16	2	1.937	0.748		7/16	UCFA209-26 UCFA209-27 UCFA209-28 UCFA209	FA209	UC209-26 UC209-27 UC209-28 UC209	34.1	21.3	14	1.7
45 1 5/8 1 11/16 1 3/4	7 1/16	4 3/8	1 9/16	5 53/64	1 9/32	2 27/32	1 9/32	3 15/32	9/16	5 5/64	2 1/16	1.937	0.748		1/2	UCFA210-30 UCFA210-31 UCFA210 UCFA210-32	FA210	UC210-30 UC210-31 UC210 UC210-32	35.1	23.3	14.4	2.0
50 1 7/8 1 15/16 2	7 7/16	4 9/16	1 9/16	6 3/16	1 9/32	2 15/16	1 9/32	3 5/8	9/16	5 7/64	2 5/32	2.031	0.748		1/2	UCFA211-32 UCFA211-34 UCFA211 UCFA211-35	FA211	UC211-32 UC211-34 UC211 UC211-35	43.4	29.4	14.4	3.6
55 2 2 1/8 2 3/16	8 1/2	5 1/4	1 23/32	7 1/4	5/8	3 3/8	5/8	4 1/32	2 5/32	1 1/64	2 5/16	2.189	0.874		1/2				43.4	29.4	14.4	3.6

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.  
A-1/4-28UNF.....201~210  
A-PT1/8.....211

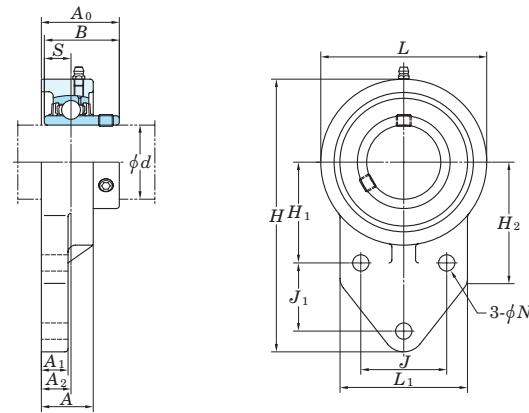
3. As for triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (or L2) follows Part No. of unit or bearing. (Example of Part No. : UCFA206JL3, UC206L3)

4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

5. Tapered bore (with adapter) type products are also available. (Example of Part No. : UKFA205J + H305X, UK205 + H305X)

Three-bolt flange type

**UCFB**  
Cylindrical bore (with set screws)  
d 12 ~ 50 mm



Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ), variations of tolerance of distance between centers of bolt holes ( $\Delta J_n, \Delta J_{1n}$ ), variations of tolerance of distance between both grooves ( $\Delta H_{1n}$ )

Housing No.	$\Delta A_{2s}$	$\Delta J_n$	$\Delta J_{1n}$	$\Delta H_{1n}$	Unit : mm
FB204-FB210					±0.5

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

Housing No.	$\Delta N_s$	Unit : mm
FB204-FB210		±0.2

Shaft Dia. mm inch  d	Dimensions inch mm															Bolt Size inch mm	Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor f <sub>0</sub>	Mass kg
	H	L	A	J	J <sub>1</sub>	N	H <sub>1</sub>	H <sub>2</sub>	L <sub>1</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>0</sub>	B	S	C <sub>r</sub>					C <sub>0r</sub>			
12 1/2																5/16	UCFB201 UCFB201-8 UCFB202 UCFB202-10 UCFB203 UCFB204-12 UCFB204	FB204	UC201 UC201-8 UC202 UC202-10 UC203 UC204-12 UC204	12.8 6.65	13.2	0.64 0.62 0.61 0.59	
15 5/8	4 11/32	2 7/16	1 9/16	1 17/64	1 11/16	3/8	1 21/32	2 1/16	2 1/16	1/2	17/32	1 1/4	1.220	0.500		5/16	UCFB205-14 UCFB205-15 UCFB205 UCFB205-16	FB205	UC205-14 UC205-15 UC205 UC205-16	14.0 7.85	13.9	0.68	
17 3/4	110	62	24	32	27	9.5	42	52	52	13	13.5	31.8	31	12.7		M8	UCFB206-18 UCFB206 UCFB206-19 UCFB206-20	FB206	UC206-18 UC206 UC206-19 UC206-20	19.5 11.3	13.9	0.92	
20																UCFB207-20 UCFB207-21 UCFB207-22 UCFB207 UCFB207-23	FB207	UC207-20 UC207-21 UC207-22 UC207 UC207-23	25.7 15.4	13.9	1.3		
25 7/8 15/16	4 9/16	2 11/16	1 1/32	1 11/32	1 1/16	3/8	1 49/64	2 1/16	2 7/32	1/2	19/32	1 3/8	1.343	0.563		5/16	UCFB208-24 UCFB208-25 UCFB208	FB208	UC208-24 UC208-25 UC208	29.1 17.8	14.0	1.8	
30 1 1/8	5 1/8	3 1/16	1 5/32	1 37/64	1 9/64	3/8	1 31/32	2 5/32	2 9/16	1/2	43/64	1 17/32	1.500	0.626		5/16	UCFB209-26 UCFB209-27 UCFB209-28 UCFB209	FB209	UC209-26 UC209-27 UC209-28 UC209	34.1 21.3	14.0	2.0	
35 1 1/4 1 5/16 1 3/8	5 21/32	3 17/32	1 5/16	1 13/16	1 17/64	3/8	2 11/64	2 7/16	2 3/4	19/32	3/4	1 3/4	1.689	0.689		5/16	UCFB210-30 UCFB210-31 UCFB210	FB210	UC210-30 UC210-31 UC210	35.1 23.3	14.4	2.3	
40 1 1/2 1 9/16	6 15/32	3 15/16	1 11/32	1 31/32	1 39/64	7/16	2 23/64	2 27/32	3 1/16	5/8	25/32	1 31/32	1.937	0.748		3/8							
45 1 5/8 1 11/16 1 3/4	6 27/32	4 3/16	1 11/32	2 1/8	1 11/16	7/16	2 9/16	3	3 5/32	23/32	25/32	1 31/32	1.937	0.748		M10							
50 1 7/8 1 15/16 2	7 1/4	4 13/32	1 3/8	2 9/32	1 13/16	7/16	2 43/64	3 7/32	3 3/8	23/32	25/32	2 1/16	2.031	0.748		M10							

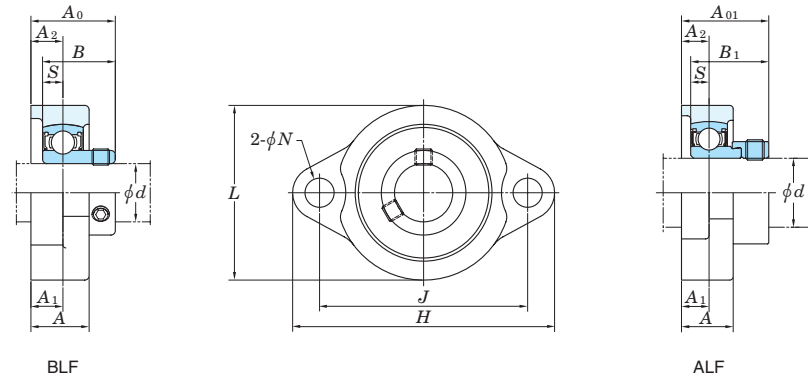
Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter codes. (See Table 10.5 in P.51.)  
 2. Part No. of applicable grease nipple is A-1/4-28UNF.  
 3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (or L2) follows Part No. of unit or bearing. (Example of Part No. : UCFB206JL3, UC206L3)

4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.  
 5. Tapered bore (with adapter) type products are also available. (Example of Part No. : UKFB205J + H305X, UK205 + H305X)



Light duty rhombic-flanged type

**BLF**  
Cylindrical bore  
(with set screws)  
**ALF**  
Cylindrical bore  
(with eccentric locking collar)  
*d* 12 ~ 35 mm



Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ) and variations of tolerance of distance between centers of bolt holes ( $\Delta J_s$ )

Housing No.	$\Delta A_{2s}$	$\Delta J_s$
LF203-LF207	$\pm 0.5$	$\pm 0.7$

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

Housing No.	$\Delta N_s$
LF203-LF207	$\pm 0.2$

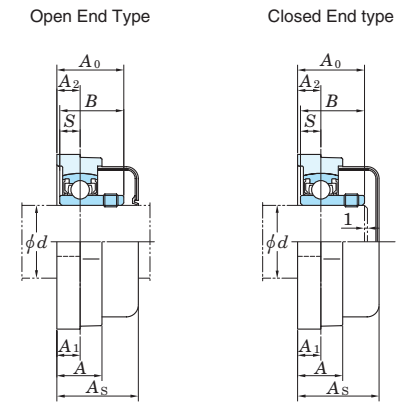
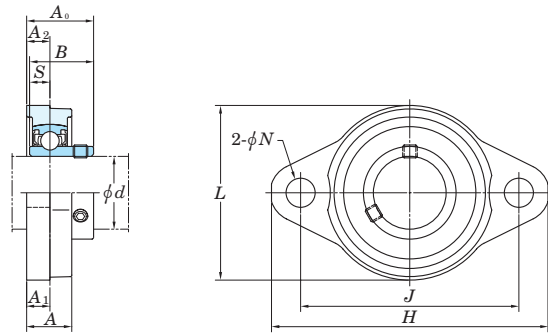
Shaft Dia. mm inch	Dimensions													Bolt Size inch mm	Unit No.	Bearing No.	Unit No.	Bearing No.	Housing No.	Basic Load Ratings kN		Factor $f_0$	Mass kg	
	inch mm																			$C_r$	$C_{0r}$		BLF	ALF
<i>d</i>	<i>H</i>	<i>L</i>	<i>A</i>	<i>J</i>	<i>N</i>	<i>A</i> <sub>1</sub>	<i>A</i> <sub>2</sub>	<i>S</i>	BLF		ALF													
12 1/2	3 3/16	2 1/16	23/32	2 1/2	5/16	3/8	3/8	0.236	1	0.866	1 1/4	1.122	1/4	BLF201	SB201	ALF201	SA201							
15 5/8	81	52	18	63.5	8	9.5	9.5	6	25.5	22	32	28.5	M6	BLF201-8	SB201-8	ALF201-8	SA201-8	LF203	9.55	4.80	13.2	0.25	0.28	
17														BLF202	SB202	ALF202	SA202							
20 3/4	3 17/32	2 3/8	25/32	2 13/16	25/64	7/16	7/16	0.276	1 5/32	0.984	1 5/16	1.161	5/16	BLF202-10	SB202-10	ALF202-10	SA202-10							
	90	60	20	71.5	10	11	11	7	29	25	33.5	29.5	M8	BLF203	SB203	ALF203	SA203	LF204	12.8	6.65	13.2	0.33	0.33	
														BLF204-12	SB204-12	ALF204-12	SA204-12							
25 7/8	3 3/4	2 17/32	25/32	2 63/64	25/64	7/16	7/16	0.295	1 3/16	1.063	1 11/32	1.201	5/16	BLF205-14	SB205-14	ALF205-14	SA205-14							
	95	64	20	76	10	11	11	7.5	30.5	27	34	30.5	M8	BLF205-15	SB205-15	ALF205-15	SA205-15	LF205	14.0	7.85	13.9	0.38	0.42	
														BLF205	SB205	ALF205	SA205							
														BLF205-16	SB205-16	ALF205-16	SA205-16							
30 1 1/8	4 7/16	3	7/8	3 9/16	15/32	15/32	15/32	0.315	1 11/32	1.181	1 1/2	1.335	3/8	BLF206-18	SB206-18	ALF206-18	SA206-18							
	113	76	22.5	90.5	12	12	12	8	34	30	37.9	33.9	M10	BLF206	SB206	ALF206	SA206	LF206	19.5	11.3	13.9	0.57	0.60	
														BLF206-19	SB206-19	ALF206-19	SA206-19							
														BLF206-20	SB206-20	ALF206-20	SA206-20							
35 1 1/4	4 13/16	3 1/2	15/16	3 15/16	15/32	1/2	33/64	0.335	1 7/16	1.260	1 5/8	1.437	3/8	BLF207-20	SB207-20	ALF207-20	SA207-20							
	122	89	24	100	12	13	13	8.5	36.5	32	41	36.5	M10	BLF207-22	SB207-22	ALF207-22	SA207-22	LF207	25.7	15.4	13.9	0.77	0.85	
														BLF207	SB207	ALF207	SA207							
														BLF207-23	SB207-23	ALF207-23	SA207-23							

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter codes. (See Table 10.5 in P.51.)  
 2. Allowable load to housing in radial direction is approximately half of basic load rating of bearing,  $C_r$  (when safety factor is 4).  
 3. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.



“Compact” series rhombic-flanged type

**UFL**  
Cylindrical bore (with set screws)  
d 8 ~ 30 mm



Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ) and variations of tolerance of distance between centers of bolt holes ( $\Delta J_s$ )

Housing No.	$\Delta A_{2s}$	$\Delta J_s$
FL08	±0.5	±0.3
FL000-FL006		

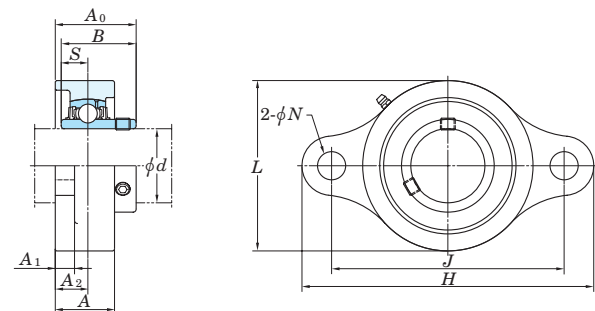
Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

Housing No.	$\Delta N_s$
FL08	±0.2
FL000-FL006	

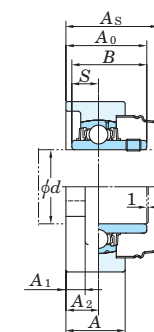
Shaft Dia. mm  d	Dimensions										Bolt Size  inch mm	Standard Unit No.	Standard Housing No.	Standard Bearing No.	Mass  kg	Basic Load Ratings kN  C <sub>r</sub> C <sub>0r</sub>	Factor  f <sub>0</sub>	With Rubber Coated Cover					
	inch mm																	Unit No.	Dimension mm inch	Mass  kg			
	H	L	A	J	N	A <sub>1</sub>	A <sub>2</sub>	A <sub>0</sub>	B	S											Open End Type	Closed End Type	A <sub>s</sub>
8	1 7/8 48	1 1/16 27	1 1/32 8.5	1 29/64 37	3/16 4.8	5/32 4	5/32 4	1/2 12.5	0.472 12	0.1378 3.5	No.8 M4	UFL08	FL08	SU08	0.030	3.27	1.37	12.4	-	-	-	-	-
10	2 3/8 60	1 13/32 36	15/32 12	1 49/64 45	9/32 7	1/4 6	15/64 6	5/8 16	0.591 15	0.197 5	1/4 M6	UFL000	FL000	SU000	0.050	4.55	1.95	12.3	UFL000C	UFL000D	20.5	13/16	0.050
12	2 15/32 63	1 1/2 38	15/32 12	1 57/64 48	9/32 7	1/4 6	15/64 6	5/8 16	0.591 15	0.197 5	1/4 M6	UFL001	FL001	SU001	0.065	5.10	2.40	13.2	UFL001C	UFL001D	20.5	13/16	0.065
15	2 5/8 67	1 21/32 42	1/2 13	2 3/32 53	9/32 7	1/4 6.5	1/4 6.5	11/16 17.5	0.650 16.5	0.217 5.5	1/4 M6	UFL002	FL002	SU002	0.085	5.60	2.85	13.9	UFL002C	UFL002D	22	7/8	0.085
17	2 25/32 71	1 13/16 46	9/16 14	2 13/64 56	9/32 7	9/32 7	9/32 7	23/32 18.5	0.689 17.5	0.236 6	1/4 M6	UFL003	FL003	SU003	0.11	6.00	3.25	14.4	UFL003C	UFL003D	23.5	15/16	0.11
20	3 17/32 90	2 5/32 55	5/8 16	2 51/64 71	13/32 10	5/16 8	5/16 8	7/8 22	0.827 21	0.276 7	5/16 M8	UFL004	FL004	SU004	0.18	9.40	5.05	13.9	UFL004C	UFL004D	27	1 1/16	0.18
25	3 3/4 95	2 3/8 60	5/8 16	2 61/64 75	13/32 10	5/16 8	5/16 8	29/32 23	0.866 22	0.276 7	5/16 M8	UFL005	FL005	SU005	0.23	10.1	5.85	14.5	UFL005C	UFL005D	28	1 3/32	0.23
30	4 13/32 112	2 3/4 70	23/32 18	3 11/32 85	1/2 13	11/32 9	11/32 9	23/64 26	1 1/32 24.5	0.965 7.5	3/8 M10	UFL006	FL006	SU006	0.31	13.2	8.25	14.7	UFL006C	UFL006D	31	1 7/32	0.31

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter codes. (See Table 10.5 in P.51.)  
2. Housing is made from special light alloy.  
3. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

**UCSFL-H1S6**  
**Cylindrical bore (with set screws)**  
 d 20 ~ 50 mm



With Pressed Stainless Steel Covers



Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ) and variations of tolerance of distance between centers of bolt holes ( $\Delta J_s$ )

Housing No.	$\Delta A_{2s}$	$\Delta J_s$
SFL204H1-SFL210H1	±0.5	0.3

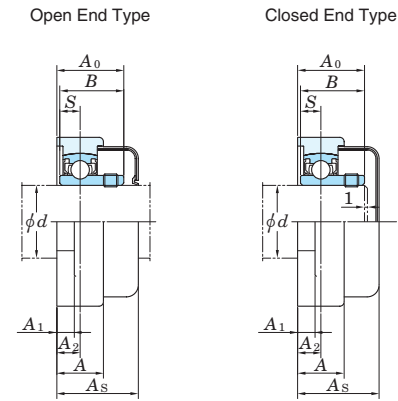
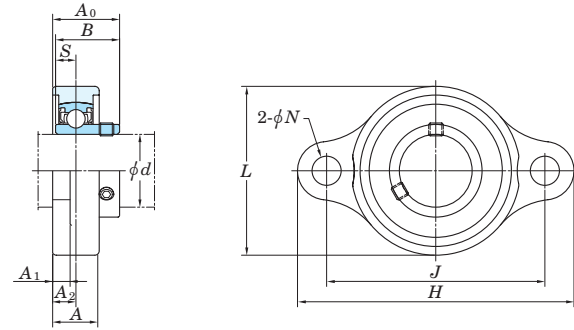
Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

Housing No.	$\Delta N_s$
SFL204H1-SFL210H1	±0.2

Shaft Dia. mm  d	Dimensions										Bolt Size  inch mm	Standard			Mass  kg	Basic Load Ratings kN		Factor  f <sub>0</sub>	With Pressed Stainless Steel Covers		Mass  kg
	inch mm											Unit No.	Housing No.	Bearing No.		C <sub>r</sub>	C <sub>0r</sub>		Open End Type	Closed End Type	
20	4 7/16	2 3/8	1 1/32	3 35/64	15/32	13/32	19/32	1 5/16	1.220	0.500	3/8	UCSFL204H1S6	SFL204H1	UC204S6	0.43	10.9	5.35	13.2	UCSFL204H1CS6	UCSFL204H1DS6	38 1 1/2
	113	60	26	90	12	10	15	33.3	31	12.7	M10										
25	5 1/8	2 11/16	1 3/32	3 57/64	5/8	13/32	5/8	1 13/32	1.343	0.563	1/2	UCSFL205H1S6	SFL205H1	UC205S6	0.60	11.9	6.30	13.9	UCSFL205H1CS6	UCSFL205H1DS6	40 1 9/16
	130	68	27.5	99	16	10	16	35.8	34.1	14.3	M14										
30	5 13/16	3 5/32	1 7/32	4 39/64	5/8	13/32	45/64	1 19/32	1.500	0.626	1/2	UCSFL206H1S6	SFL206H1	UC206S6	0.86	16.5	9.05	13.9	UCSFL206H1CS6	UCSFL206H1DS6	45 1 15/32
	148	80	31	117	16	10	18	40.2	38.1	15.9	M14										
35	6 11/32	3 11/32	1 11/32	5 1/8	5/8	7/16	3/4	1 3/4	1.689	0.689	1/2	UCSFL207H1S6	SFL207H1	UC207S6	1.1	21.8	12.3	13.9	UCSFL207H1CS6	UCSFL207H1DS6	49 1 15/16
	161	85	34	130	16	11	19	44.4	42.9	17.5	M14										
40	6 7/8	3 11/16	1 13/32	5 43/64	5/8	15/32	53/64	2 1/32	1.937	0.748	1/2	UCSFL208H1S6	SFL208H1	UC208S6	1.5	24.8	14.3	14.0	UCSFL208H1CS6	UCSFL208H1DS6	56 2 7/32
	175	94	36	144	16	12	21	51.2	49.2	19	M14										
45	7 13/32	3 15/16	1 1/2	5 53/64	3/4	1/2	55/64	2 1/16	1.937	0.748	5/8	UCSFL209H1S6	SFL209H1	UC209S6	1.8	27.8	16.2	14.0	UCSFL209H1CS6	UCSFL209H1DS6	57 1 1/4
	188	100	38	148	19	13	22	52.2	49.2	19	M16										
50	7 3/4	4 3/16	1 9/16	6 3/16	3/4	1/2	55/64	2 5/32	2.031	0.748	5/8	UCSFL210H1S6	SFL210H1	UC210S6	2.1	29.8	18.6	14.4	UCSFL210H1CS6	UCSFL210H1DS6	59 2 5/16
	197	106	40	157	19	13	22	54.6	51.6	19	M16										

- Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter codes. (See Table 10.5 in P.51.)  
 2. Part No. of applicable grease nipple is A-1/4-28UNFN12.  
 3. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

**USFL-S6**  
Cylindrical bore (with set screws)  
 $d$  10 ~ 30 mm



Variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ) and variations of tolerance of distance between centers of bolt holes ( $\Delta J_s$ )

Housing No.	$\Delta A_{2s}$	$\Delta J_s$
SFL000-SFL006	$\pm 0.5$	$\pm 0.3$

Unit : mm

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

Housing No.	$\Delta N_s$
SFL000-SFL006	$\pm 0.2$

Unit : mm

Shaft Dia. mm $d$	Dimensions										Bolt Size inch mm	Standard			Mass kg	Basic Load Ratings kN		Factor $f_0$	With Rubber Coated Cover			
	inch mm											Unit No.	Housing No.	Bearing No.		$C_r$	$C_{0r}$		Unit No.		Dimension mm inch	Mass kg
	$H$	$L$	$A$	$J$	$N$	$A_1$	$A_2$	$A_0$	$B$	$S$									Open End Type	Closed End Type		
<b>10</b>	2 3/8 60	1 11/32 34	15/32 12	1 49/64 45	9/32 7	3/16 5	15/64 6	5/8 16	0.591 15	0.197 5	1/4 M6	<b>USFL000S6</b>	SFL000	SU000S6	0.076	3.9	1.55	12.3	USFL000CS6	USFL000DS6	20.5 13/16	0.076
<b>12</b>	2 15/32 63	1 13/32 36	15/32 12	1 57/64 48	9/32 7	3/16 5	15/64 6	5/8 16	0.591 15	0.197 5	1/4 M6	<b>USFL001S6</b>	SFL001	SU001S6	0.080	4.3	1.9	13.2	USFL001CS6	USFL001DS6	20.5 13/16	0.080
<b>15</b>	2 5/8 67	1 5/8 41	1/2 13	2 3/32 53	9/32 7	1/4 6	1/4 6.5	11/16 17.5	0.650 16.5	0.217 5.5	1/4 M6	<b>USFL002S6</b>	SFL002	SU002S6	0.1	4.7	2.25	13.9	USFL002CS6	USFL002DS6	22 7/8	0.1
<b>17</b>	2 25/32 71	1 23/32 44	9/16 14	2 13/64 56	9/32 7	1/4 6	9/32 7	23/32 18.5	0.689 17.5	0.236 6	1/4 M6	<b>USFL003S6</b>	SFL003	SU003S6	0.13	5.1	2.6	14.4	USFL003CS6	USFL003DS6	23.5 15/16	0.13
<b>20</b>	3 19/32 91	2 3/32 53	5/8 16	2 51/64 71	13/32 10	1/4 6	5/16 8	7/8 22	0.827 21	0.276 7	5/16 M8	<b>USFL004S6</b>	SFL004	SU004S6	0.21	7.9	4	13.9	USFL004CS6	USFL004DS6	27 1 1/16	0.21
<b>25</b>	3 3/4 95	2 9/32 58	5/8 16	2 51/64 75	13/32 10	1/4 6	5/16 8	29/32 23	0.866 22	0.276 7	5/16 M8	<b>USFL005S6</b>	SFL005	SU005S6	0.23	8.5	4.65	14.5	USFL005CS6	USFL005DS6	28 1 3/32	0.23
<b>30</b>	4 11/32 110	2 19/32 66	23/32 18	3 11/32 85	1/2 13	9/32 7	23/64 9	1 1/32 26	0.965 24.5	0.295 7.5	3/8 M10	<b>USFL006S6</b>	SFL006	SU006S6	0.33	11.2	6.6	14.7	USFL006CS6	USFL006DS6	31 1 7/32	0.33

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter codes. (See Table 10.5 in P.51.)  
2. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

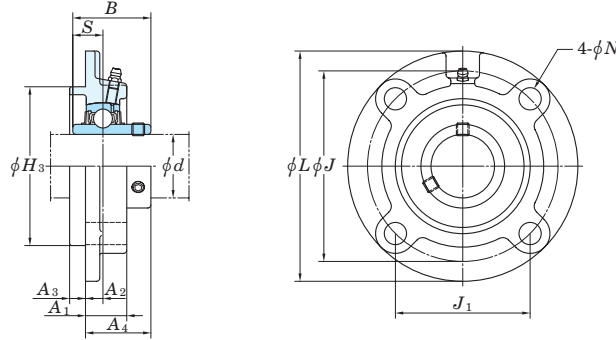






Round-flanged type with spigot joint

UCFCX-E  
Cylindrical bore (with set screws)  
d 25 ~ 100 mm



Shaft Dia. mm inch  d	Dimensions inch mm											Bolt Size inch mm	Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor f <sub>0</sub>	Mass kg
	L	H <sub>3</sub>	J	J <sub>1</sub>	N	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	B	S					C <sub>r</sub>	C <sub>0r</sub>		
25 1	4 3/8	3.000	3 5/8	2 9/16	3/8	15/16	25/64	15/64	1 9/32	1.500	0.626	5/16	UCFCX05E UCFCX05-16E	FCX05E	UCX05 UCX05-16	19.5	11.3	13.9	1.2
	111	76.2	92	65	9.5	24	10	6	32.2	38.1	15.9	M8							
30 1 3/16 1 1/4	5	3.375	4 9/64	2 59/64	15/32	7/8	5/16	3/8	1 5/16	1.689	0.689	3/8	UCFCX06E UCFCX06-19E UCFCX06-20E	FCX06E	UCX06 UCX06-19 UCX06-20	25.7	15.4	13.9	1.5
	127	85.725	105	74.2	12	22.5	8	9.5	33.4	42.9	17.5	M10							
35 1 3/8 1 7/16	5 1/4	3.625	4 3/8	3 3/32	15/32	1 1/32	23/64	7/16	1 17/32	1.937	0.748	3/8	UCFCX07E UCFCX07-22E UCFCX07-23E	FCX07E	UCX07 UCX07-22 UCX07-23	29.1	17.8	14.0	1.9
	133	92.075	111	78.5	12	26	9	11	39.2	49.2	19	M10							
40 1 1/2	5 1/4	3.625	4 3/8	3 3/32	15/32	1 1/32	23/64	7/16	1 17/32	1.937	0.748	3/8	UCFCX08E UCFCX08E	FCX08E	UCX08-24 UCX08	34.1	21.3	14.0	2.0
	133	92.075	111	78.5	12	26	9	11	39.2	49.2	19	M10							
45 1 3/4	6 3/32	4.250	5 1/8	3 5/8	35/64	31/32	5/16	15/32	1 19/32	2.031	0.748	7/16	UCFCX09E UCFCX09E	FCX09E	UCX09-28 UCX09	35.1	23.3	14.4	2.6
	155	107.95	130	91.9	14	25	8	12	40.6	51.6	19	M12							
50 1 15/16 2	6 3/8	4.5	5 23/64	3 25/32	35/64	31/32	9/32	5/8	1 19/32	2.189	0.874	7/16	UCFCX10E UCFCX10E UCFCX10-32E	FCX10E	UCX10-31 UCX10 UCX10-32	43.4	29.4	14.4	3.2
	162	114.3	136	96.2	14	25	7	16	40.4	55.6	22.2	M12							
60 2 7/16	7 5/8	5.500	6 1/2	4 19/32	5/8	1 5/16	7/16	25/32	2	2.563	1.000	1/2	UCFCX12E UCFCX12-39E	FCX12E	UCX12 UCX12-39	57.2	40.1	14.4	5.3
	194	139.7	165	116.7	16	33	11	20	50.7	65.1	25.4	M14							
65 2 1/2	7 5/8	5.500	6 1/2	4 19/32	5/8	1 5/16	7/16	25/32	2 3/16	2.937	1.189	1/2	UCFCX13E UCFCX13E	FCX13E	UCX13-40 UCX13	62.2	44.1	14.5	5.7
	194	139.7	165	116.7	16	33	11	20	55.4	74.6	30.2	M14							
70 2 3/4	8 3/4	6.375	7 31/64	5 9/32	3/4	1 13/32	35/64	25/32	2 5/16	3.063	1.331	5/8	UCFCX14E UCFCX14E	FCX14E	UCX14-44 UCX14	67.4	48.3	14.5	7.3
	222	161.925	190	134.3	19	36	14	20	58.5	77.8	33.3	M16							
75 2 15/16 3	8 3/4	6.375	7 31/64	5 9/32	3/4	1 3/8	15/32	55/64	2 13/32	3.252	1.311	5/8	UCFCX15E UCFCX15E UCFCX15-48E	FCX15E	UCX15-47 UCX15 UCX15-48	72.7	53.0	14.6	8.0
	222	161.925	190	134.3	19	35	12	22	61.3	82.6	33.3	M16							
80 —	10 1/4	7.375	8 5/8	6 3/32	29/32	1 13/32	25/64	63/64	2 7/16	3.374	1.343	3/4	UCFCX16E	FCX16E	UCX16	84.0	61.9	14.5	11.3
	260	187.325	219	154.8	23	36	10	25	61.6	85.7	34.1	M20							
85 3 7/16	10 1/4	7.375	8 5/8	6 3/32	29/32	1 13/32	25/64	63/64	2 5/8	3.780	1.563	3/4	UCFCX17E UCFCX17-55E	FCX17E	UCX17 UCX17-55	96.1	71.5	14.5	12.9
	260	187.325	219	154.8	23	36	10	25	66.3	96	39.7	M20							
90 —	10 1/4	7.375	8 5/8	6 3/32	29/32	1 11/16	15/32	1 7/64	2 7/8	4.094	1.689	3/4	UCFCX18E	FCX18E	UCX18	109	81.9	14.4	13.5
	260	187.325	219	154.8	23	43	12	28	73.1	104	42.9	M20							
100 3 15/16 4	10 7/8	8.125	9 3/8	6 5/8	29/32	2 19/32	55/64	1 7/64	3 9/16	4.626	1.937	3/4	UCFCX20E UCFCX20-63E UCFCX20-64E	FCX20E	UCX20 UCX20-63 UCX20-64	133	105	14.4	18.2
	276	206.375	238	168.3	23	66	22	28	90.3	117.5	49.2	M20							

Variations of tolerance of spigot joint outside diameter ( $\Delta H_{3s}$ ), variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ), tolerance of position of bolt hole (X), and tolerance of circumferential runout of spigot joint (Y)

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

Housing No.	$\Delta H_{3s}$	$\Delta A_{2s}$	Unit : mm	
			X	Y
FCX05E	0 -0.046	±0.5	0.7	0.2
FCX06E-FCX10E	0 -0.054			
FCX12E-FCX15E	0 -0.063	±0.8	1	0.3
FCX16E-FCX18E	0 -0.072			
FCX20E	0 -0.072			

Housing No.	Unit : mm	
	$\Delta N_s$	
FCX05E-FCX20E	±0.2	

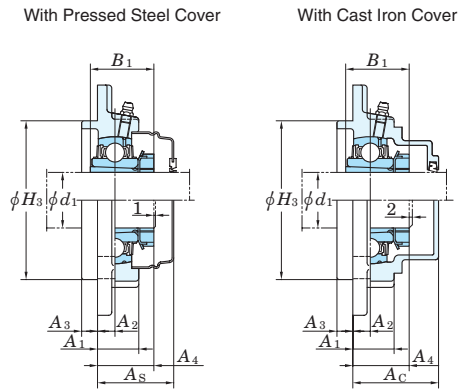
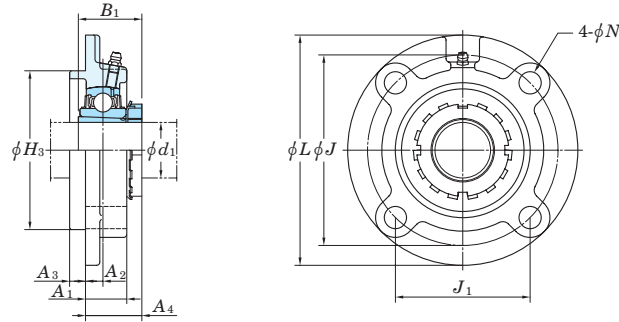
Remarks 1. In Part No. of unit, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
2. Part No. of applicable grease nipples are shown below.  
A-1/4-28UNF ..... X05-X09  
A-PT1/8 ..... X10-X20

3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (L2) follows the Part No. of unit or bearing. (Example of Part No. : UCFCX06EL3, UCX06L3)  
4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.



# Round-flanged type with spigot joint

## UKFC Tapered bore (with adapter) d<sub>1</sub> 20 ~ (65) mm



Variations of tolerance of spigot joint outside diameter ( $\Delta H_{3s}$ ), variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ), tolerance of position of bolt hole (X), and tolerance of circumferential runout of spigot joint (Y)

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

Housing No.		$\Delta H_{3s}$	$\Delta A_{2s}$	X	Y
FC205-FC206	FCX05	0 -0.046	±0.5	0.7	0.2
FC207-FC210	FCX06-FCX10	0 -0.054			
FC211-FC217	FCX11-FCX15	0 -0.063	±0.8	1	0.3
FC218	FCX16-FCX18	0			
	FCX20	-0.072			

Housing No.		$\Delta N_s$
FC204-FC218	FCX05-FCX20	±0.2

Shaft Dia. mm inch  d <sub>1</sub>	Dimensions inch mm											Bolt Size inch mm	Standard			Adapter <sup>1)</sup> assembly No.	Mass kg	Basic Load Ratings kN		Factor f <sub>0</sub>	With Pressed Steel Cover				With Cast Iron Cover						
	L	H <sub>3</sub>	J	J <sub>1</sub>	N	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub> <sup>1)</sup>	B <sub>1</sub> <sup>1)</sup>	Unit No.		Housing No.	Bearing No.	Unit No.			Dimension mm inch	Mass kg		Open End Type	Closed End Type	Unit No.	Dimension mm inch	Mass kg	Open End Type	Closed End Type				
20	3/4	4 17/32	2.7559	3 35/64	2 1/2	15/32	13/16	25/64	15/64	1 1/8(1 3/16)	1 5/32(1 3/8)	3/8	UKFC205	FC205	UK205	HE305X(HE2305X) H305X(H2305X)	0.99 0.99	14.0 7.85	13.9	-	-	-	-	-	-	-	-	-	-	-	-
	3/4	4 3/8	2.9921	3 5/8	2 9/16	3/8	15/16	25/64	15/64	1 1/8	1 3/8	5/16	UKFCX05	FCX05	UKX05	HE2305X H2305X	1.2 1.2	19.5 11.3	13.9	UKFCX05C	UKFCX05D	34	1 11/32	0.99	UKFC205FC	UKFC205FD	42	1 21/32	1.2		
25	1	4 29/32	3.1496	3 15/16	2 25/32	15/32	29/32	25/64	5/16	1 5/32(1 1/4)	1 7/32(1 1/2)	3/8	UKFC206	FC206	UK206	H306X(H2306X) HE306X(HE2306X)	1.3 1.3	19.5 11.3	13.9	UKFC206C	UKFC206D	36	1 13/32	1.3	UKFC206FC	UKFC206FD	45	1 25/32	1.6		
	1	5	3.3465	4 9/64	2 59/64	15/32	7/8	5/16	3/8	1 5/32	1 1/2	3/8	UKFCX06	FCX06	UKX06	H2306X HE2306X	1.5 1.5	25.7 15.4	13.9	UKFCX06C	UKFCX06D	38	1 1/2	1.5	-	-	-	-	-	-	
30	1 1/8	5 9/16	3.5433	4 21/64	3 1/16	35/64	1 1/32	7/16	5/16	1 5/16(1 3/8)	1 3/8(1 11/16)	7/16	UKFC207	FC207	UK207	HS307X(HS2307X) H307X(H2307X)	1.7 1.7	25.7 15.4	13.9	UKFC207C	UKFC207D	41	1 5/8	1.7	UKFC207FC	UKFC207FD	50	1 31/32	2.1		
	1 1/8	5 1/4	3.6220	4 3/8	3 3/32	15/32	1 1/32	23/64	7/16	1 1/4	1 11/16	3/8	UKFCX07	FCX07	UKX07	HS2307X H2307X	1.9 1.9	29.1 17.8	14.0	UKFCX07C	UKFCX07D	43	1 11/16	1.9	-	-	-	-	-	-	
35	1 1/4	5 23/32	3.9370	4 23/32	3 11/32	35/64	1 1/32	7/16	25/64	1 11/32(1 1/2)	1 13/32(1 13/16)	7/16	UKFC208	FC208	UK208	HE308X(HE2308X) HS308X(HS2308X) H308X(H2308X)	2.0 2.0 2.0	29.1 17.8	14.0	UKFC208C	UKFC208D	45	1 25/32	2.0	UKFC208FC	UKFC208FD	54	2 1/8	2.4		
	1 3/8	5 1/4	3.6220	4 3/8	3 3/32	15/32	1 1/32	23/64	7/16	1 5/16	1 13/16	3/8	UKFCX08	FCX08	UKX08	HE2308X HS2308X H2308X	1.9 1.9 1.9	34.1 21.3	14.0	UKFCX08C	UKFCX08D	43	1 11/16	1.9	-	-	-	-	-	-	
40	1 1/2	6 5/16	4.1339	5 13/64	4 43/64	5/8	1 1/32	25/64	15/32	1 13/32(1 17/32)	1 17/32(1 31/32)	1/2	UKFC209	FC209	UK209	HE309X(HE2309X) H309X(H2309X) HS309X(HS2309X)	2.7 2.7 2.7	34.1 21.3	14.0	UKFC209C	UKFC209D	44	1 23/32	2.7	UKFC209FC	UKFC209FD	54	2 1/8	3.2		
	1 5/8	6 3/32	4.2520	5 1/8	3 5/8	35/64	31/32	5/16	15/32	1 5/16	1 31/32	7/16	UKFCX09	FCX09	UKX09	HE2309X H2309X HS2309X	2.6 2.6 2.6	35.1 23.3	14.4	UKFCX09C	UKFCX09D	45	1 25/32	2.6	-	-	-	-	-		
45	1 3/4	6 1/2	4.3307	5 7/16	3 27/32	5/8	1 3/32	25/64	15/32	1 7/16(1 9/16)	1 21/32(2 5/32)	1/2	UKFC210	FC210	UK210	HE310X(HE2310X) H310X(H2310X)	3.0 3.0	35.1 23.3	14.4	UKFC210C	UKFC210D	47	1 27/32	3.0	UKFC210FC	UKFC210FD	58.5	2 5/16	3.5		
	1 3/4	6 3/8	4.6457	5 23/64	3 25/32	35/64	31/32	9/32	5/8	1 11/32	2 5/32	7/16	UKFCX10	FCX10	UKX10	HE2310X H2310X	3.1 3.1	43.4 29.4	14.4	UKFCX10C	UKFCX10D	45	1 25/32	3.1	-	-	-	-	-		
50	1 7/8	7 9/32	4.9213	5 29/32	4 11/64	3/4	1 7/32	33/64	15/32	1 19/32(1 25/32)	1 25/32(2 5/16)	5/8	UKFC211	FC211	UK211	HS311X(HS2311X) H311X(H2311X) HE311X(HE2311X)	4.3 4.3 4.3	43.4 29.4	14.4	UKFC211C	UKFC211D	51	2	4.3	UKFC211FC	UKFC211FD	62.5	2 15/32	4.9		
	2	7 3/32	5	5 63/64	4 15/64	5/8	1 1/32	5/32	55/64	1 9/32	2 5/16	1/2	UKFCX11	FCX11	UKX11	HS2311X H2311X HE2311X	4.0 4.0 4.0	52.4 36.2	14.4	UKFCX11C	UKFCX11D	48	1 7/8	4.0	-	-	-	-	-		
55	2 1/8	7 11/16	5.3150	6 19/64	4 29/64	3/4	1 13/32	43/64	15/32	1 27/32(2 3/32)	1 27/32(2 7/16)	5/8	UKFC212	FC212	UK212	HS312X(HS2312X) H312X(H2312X)	4.9 4.9	52.4 36.2	14.4	UKFC212C	UKFC212D	61	2 13/32	4.9	UKFC212FC	UKFC212FD	74	2 29/32	5.7		
	2 1/8	7 5/8	5.5118	6 1/2	4 19/32	5/8	1 5/16	7/16	25/32	1 21/32	2 7/16	1/2	UKFCX12	FCX12	UKX12	HS2312X H2312X	5.1 5.1	57.2 40.1	14.4	UKFCX12C	UKFCX12D	55	2 5/32	5.1	-	-	-	-	-		
60	2 1/4	8 1/16	5.7087	6 11/16	4 47/64	3/4	1 13/32	5/8	35/64	1 7/8(2 3/32)	1 31/32(2 9/16)	5/8	UKFC213	FC213	UK213	HE313X(HE2313X) H313X(H2313X) HS313X(HS2313X)	5.5 5.5 5.5	57.2 40.1	14.4	UKFC213C	UKFC213D	60	2 3/8	5.5	UKFC213FC	UKFC213FD	73	2 7/8	6.4		
	2 3/8	7 5/8	5.5118	6 1/2	4 19/32	5/8	1 5/16	7/16	25/32	1 25/32	2 9/16	1/2	UKFCX13	FCX13	UKX13	HE2313X H2313X HS2313X	5.3 5.3 5.3	62.2 44.1	14.5	UKFCX13C	UKFCX13D	60	2 3/8	5.3	-	-	-	-	-		
65	2 1/2	8 21/32	6.2992	7 1/4	5 1/8	3/4	1 9/16	45/64	5/8	2 3/32(2 5/16)	2 5/32(2 7/8)	5/8	UKFC215	FC215	UK215	HE315X(HE2315X) H315X(H2315X)	7.4 7.4	67.4 48.3	14.5	UKFC215C	UKFC215D	67	2 5/8	7.4	UKFC215FC	UKFC215FD	80	3 5/32	8.4		

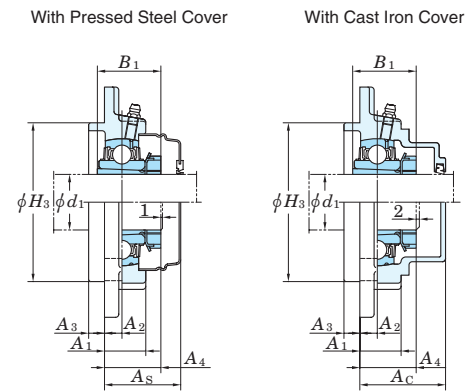
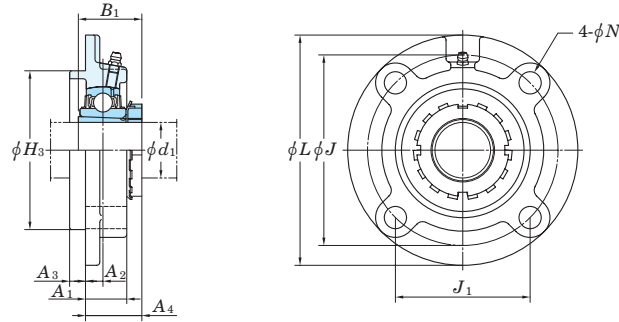
Note 1) Codes shown in parentheses indicate the dimensions and Part No. of applicable adapter (H2300X series) for UK200L3 series (triple-lip seal type).

2. Part No. of applicable grease nipples are shown below.  
A-1/4-28UNF.....205-210, X05-X09  
A-PT1/8.....211-218, X10-X20

3. In Part No. of unit with adapters and bearing with adapters, Part No. of applicable adapter follow the Part No. shown in the dimensional tables.  
(Example of Part No. : UKFC206J + H306X, UK206 + H306X)  
4. As for the triple-lip seal type product (205 is the double-lip seal type product), supplementary code L3 (or L2) follows the Part No. of unit or bearing.  
(Example of Part No. : UKFC206JL3 + H2306X, UK206L3 + H2306X)  
5. For the dimensions and forms of applicable bearings and adapters, see the dimensional tables of ball bearing for unit and adapter assemblies.

Round-flanged type with spigot joint

UKFC  
Tapered bore (with adapter)  
d<sub>1</sub> (65) ~ 90 mm



Variations of tolerance of spigot joint outside diameter ( $\Delta H_{3s}$ ), variations of tolerance of distance from mounting surface to center of spherical bore ( $\Delta A_{2s}$ ), tolerance of position of bolt hole (X), and tolerance of circumferential runout of spigot joint (Y)

Housing No.		$\Delta H_{3s}$	$\Delta A_{2s}$	X	Y
FC205-FC206	FCX05	0 -0.046	±0.5	0.7	0.2
FC207-FC210	FCX06-FCX10	0 -0.054			
FC211-FC217	FCX11-FCX15	0 -0.063	±0.8	1	0.3
FC218	FCX16-FCX18	0			
	FCX20	-0.072			

Variations of tolerance of bolt hole diameter ( $\Delta N_s$ )

Housing No.		$\Delta N_s$
FC204-FC218	FCX05-FCX20	±0.2

Shaft Dia. mm inch	Dimensions inch mm											Bolt Size inch mm	Standard			Adapter <sup>1)</sup> assembly No.	Mass kg	Basic Load Ratings kN		Factor f <sub>0</sub>	With Pressed Steel Cover			With Cast Iron Cover					
	d <sub>1</sub>	L	H <sub>3</sub>	J	J <sub>1</sub>	N	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub> <sup>1)</sup>	B <sub>1</sub> <sup>1)</sup>		Unit No.	Housing No.	Bearing No.			Unit No.	Dimension mm inch		Mass kg	Unit No.	Dimension mm inch	Mass kg					
65	2 1/2	8 3/4	6.4567	7 31/64	5 9/32	3/4	1 3/8	15/32	55/64	1 7/8	2 7/8	5/8	UKFCX15	FCX15	UKX15	HE2315X	7.7	72.7	53.0	14.6	-	-	-	-	-	-	-	-	-
		222	164	190	134.3	19	35	12	22	48	73	M16				H2315X	7.7				UKFCX15C	UKFCX15D	66	2 19/32	7.7				
70	2 3/4	9 7/16	6.6929	7 7/8	5 9/16	29/32	1 31/32	45/64	5/8	2 7/32(2 15/32)	2 5/16(3 1/16)	3/4	UKFC216	FC216	UK216	HE316X(HE2316X)	9.0	72.7	53.0	14.6	-	-	-	-	-	-	-	-	-
		240	170	200	141.4	23	42	18	16	56(62.5)	59(78)	M20				H316X(H2316X)	9.0				UKFC216C	UKFC216D	72	2 27/32	9.0	UKFC216FC	UKFC216FD	87	3 7/16
75	3	10 1/4	7.3228	8 5/8	6 3/32	29/32	1 13/32	25/64	63/64	1 15/16	3 1/16	3/4	UKFCX16	FCX16	UKX16	HE2316X	11.4	84.0	61.9	14.5	-	-	-	-	-	-	-	-	-
		260	186	219	154.8	23	36	10	25	49	78	M20				H2316X	11.4				UKFCX16C	UKFCX16D	66	2 19/32	11.4				
75	3	9 27/32	7.0866	8 3/16	5 51/64	29/32	1 25/32	45/64	45/64	2 9/32(3 17/32)	2 15/32(3 7/32)	3/4	UKFC217	FC217	UK217	H317X(H2317X)	10.4	84.0	61.9	14.5	-	-	-	-	-	-	-	-	-
		250	180	208	147.1	23	45	18	18	58(64.5)	63(82)	M20				HE317X(HE2317X)	10.4				UKFC217C	UKFC217D	74	2 29/32	10.4	UKFC217FC	UKFC217FD	89	3 1/2
80	3	10 1/4	7.3228	8 5/8	6 3/32	29/32	1 13/32	25/64	63/64	2 1/16	3 7/32	3/4	UKFCX17	FCX17	UKX17	H2317X	12.6	96.1	71.5	14.5	-	-	-	-	-	-	-	-	-
		260	186	219	154.8	23	36	10	25	52	82	M20				HE2317X	12.6				UKFCX17C	UKFCX17D	71	2 25/32	12.6				
80	3	10 7/16	7.4803	8 21/32	6 1/8	29/32	1 31/32	55/64	45/64	2 17/32(2 13/16)	2 9/16(3 3/8)	3/4	UKFC218	FC218	UK218	H318X(H2318X)	13.3	96.1	71.5	14.5	-	-	-	-	-	-	-	-	-
		265	190	220	155.5	23	50	22	18	64(71.5)	65(86)	M20									UKFC218C	UKFC218D	83	3 9/32	13.3	UKFC218FC	UKFC218FD	98	3 27/32
90	3 1/2	10 1/4	7.3228	8 5/8	6 3/32	29/32	1 11/16	15/32	1 7/64	2 5/32	3 3/8	3/4	UKFCX18	FCX18	UKX18	H2318X	13.0	109	81.9	14.4	-	-	-	-	-	-	-	-	-
		276	206	238	168.3	23	66	22	28	55	86	M20									UKFCX18C	UKFCX18D	92	3 5/8	15.1				
90	3 1/2	10 7/8	8.1102	9 3/8	6 5/8	29/32	2 19/32	55/64	1 7/64	2 23/32	3 13/16	3/4	UKFCX20	FCX20	UKX20	HE2320X	17.1	133	105	14.4	-	-	-	-	-	-	-	-	-
		276	206	238	168.3	23	66	22	28	69	97	M20				H2320X	17.1				UKFCX20C	UKFCX20D	116	4 9/16	19.9				

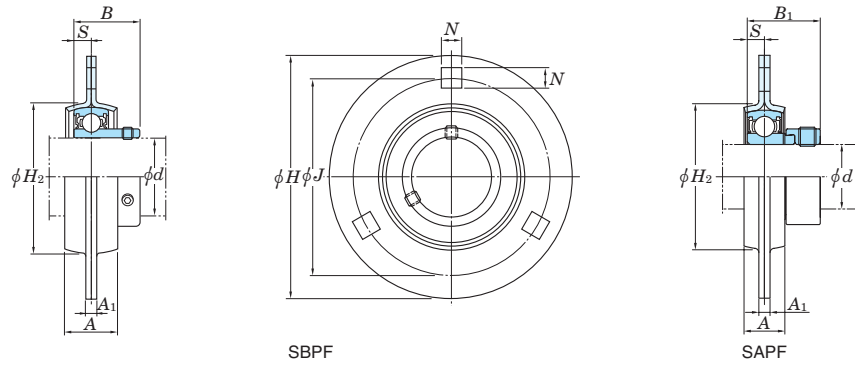
Note 1) Codes shown in parentheses indicate the dimensions and Part No. of applicable adapter (H2300X series) for UK200L3 series (triple-lip seal type).

2. Part No. of applicable grease nipples are shown below.  
A-1/4-28UNF.....205-210, X05-X09  
A-PT1/8.....211-218, X10-X20

3. In Part No. of unit with adapters and bearing with adapters, Part No. of applicable adapter follow the Part No. shown in the dimensional tables. (Example of Part No. : UKFC206J + H306X, UK206 + H306X)  
4. As for the triple-lip seal type product (205 is the double-lip seal type product), supplementary code L3 (or L2) follows the Part No. of unit or bearing. (Example of Part No. : UKFC206JL3 + H2306X, UK206L3 + H2306X)  
5. For the dimensions and forms of applicable bearings and adapters, see the dimensional tables of ball bearing for unit and adapter assemblies.

Pressed steel round-flanged type

**SBPF**  
Cylindrical bore  
(with set screws)  
**SAPF**  
Cylindrical bore  
(with eccentric locking collar)  
*d* 12 ~ 35 mm



Variations of tolerance of distance between centers of bolt holes ( $\Delta J_b$ ) Unit : mm

Housing No.	$\Delta J_b$
PF203~PF207	±0.4

Variations of tolerance of bolt hole diameter ( $\Delta N_b$ ) Unit : mm

Housing No.	$\Delta N_b$
PF203~PF207	±0.25

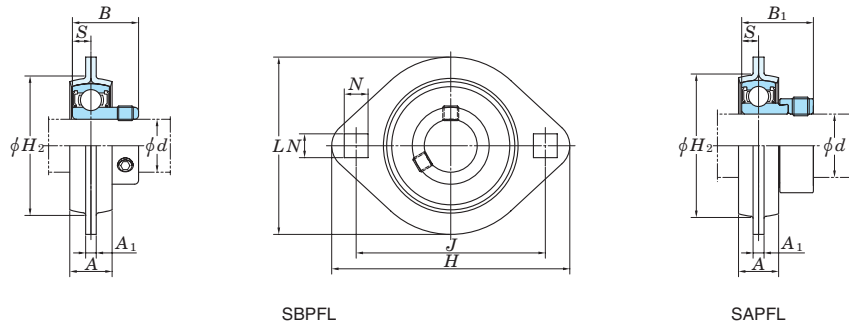
Shaft Dia mm inch <i>d</i>	Dimensions inch mm								Bolt Size inch mm	Unit No.	Bearing No.	Unit No.	Bearing No.	Housing No.	Basic Load Ratings kN		Factor <i>f</i> <sub>0</sub>	Mass kg		
	<i>H</i>	<i>A</i>	<i>A</i> <sub>1</sub>	<i>J</i>	<i>N</i>	<i>H</i> <sub>2</sub>	<i>S</i>	SBPF <i>B</i>							SAPF <i>B</i> <sub>1</sub>	<i>C</i> <sub>r</sub>		<i>C</i> <sub>0r</sub>	SBPF	SAPF
12 1/2	3 3/16	9/16	5/32	2 1/2	9/32	1 15/16	0.236	0.866	1.122	1/4	SBPF201 SBPF201-8 SBPF202 SBPF202-10 SBPF203	SB201 SB201-8 SB202 SB202-10 SB203	SAPF201 SAPF201-8 SAPF202 SAPF202-10 SAPF203	SA201 SA201-8 SA202 SA202-10 SA203	PF203	9.55	4.80	13.2	0.27	0.3
15 5/8	3 17/32	5/8	5/32	2 13/16	23/64	25/32	0.276	0.984	1.161	5/16	SBPF204-12 SBPF204	SB204-12 SB204	SAPF204-12 SAPF204	SA204-12 SA204	PF204	12.8	6.65	13.2	0.33	0.33
17																				
20 3/4	3 3/4	23/32	5/32	2 63/64	23/64	2 3/8	0.295	1.063	1.201	5/16	SBPF205-14 SBPF205-15 SBPF205 SBPF205-16	SB205-14 SB205-15 SB205 SB205-16	SAPF205-14 SAPF205-15 SAPF205 SAPF205-16	SA205-14 SA205-15 SA205 SA205-16	PF205	14.0	7.85	13.9	0.38	0.42
25 1	4 7/16	3/4	13/64	3 9/16	7/16	2 25/32	0.315	1.181	1.335	3/8	SBPF206-18 SBPF206 SBPF206-19 SBPF206-20 SBPF207-20	SB206-18 SB206 SB206-19 SB206-20 SB207-20	SAPF206-18 SAPF206 SAPF206-19 SAPF206-20 SAPF207-20	SA206-18 SA206 SA206-19 SA206-20 SA207-20	PF206	19.5	11.3	13.9	0.62	0.65
30 1 1/8	4 13/16	7/8	13/64	3 15/16	7/16	3 3/16	0.335	1.260	1.437	3/8	SBPF207-22 SBPF207 SBPF207-23	SB207-22 SB207 SB207-23	SAPF207-21 SAPF207-22 SAPF207 SAPF207-23	SA207-21 SA207-22 SA207 SA207-23	PF207	25.7	15.4	13.9	0.82	0.9
35 1 1/4																				

Note 1) *H*<sub>2</sub> is the minimum size of the mounting hole.

Remark For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

Pressed steel rhombic-flanged type

**SBPFL**  
Cylindrical bore  
(with set screws)  
**SAPFL**  
Cylindrical bore  
(with eccentric locking collar)  
*d* 12 ~ 35 mm



Variations of tolerance of distance between centers of bolt holes ( $\Delta J_b$ )  
Unit : mm

Housing No.	$\Delta J_b$
PFL203-PFL207	$\pm 0.4$

Variations of tolerance of bolt hole diameter ( $\Delta N_b$ )  
Unit : mm

Housing No.	$\Delta N_b$
PFL203-PFL207	$\pm 0.25$

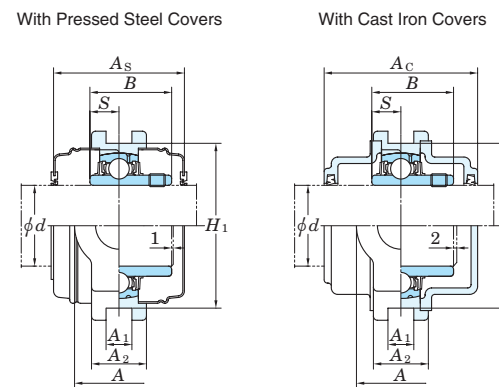
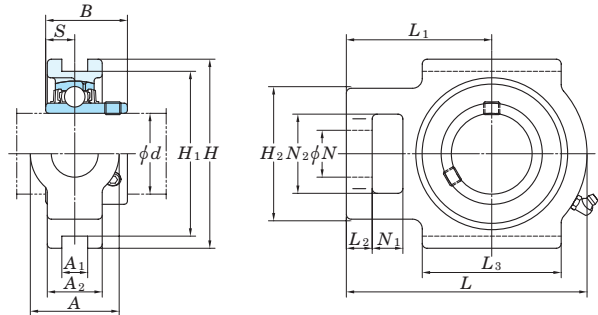
Shaft Dia mm inch <i>d</i>	Dimensions inch mm								SBPFL <i>B</i>	SAPFL <i>B</i> <sub>1</sub>	Bolt Size inch mm	Unit No.	Bearing No.	Unit No.	Bearing No.	Housing No.	Basic Load Ratings kN		Factor <i>f</i> <sub>0</sub>	Mass kg	
	<i>H</i>	<i>L</i>	<i>A</i>	<i>A</i> <sub>1</sub>	<i>J</i>	<i>N</i>	<i>H</i> <sub>2</sub>	<i>S</i>									<i>C</i> <sub>r</sub>	<i>C</i> <sub>0r</sub>		SBPFL	SAPFL
12 1/2	3 3/16	2 5/16	9/16	5/32	2 1/2	9/32	1 15/16	0.236	0.866	1.122	1/4	SBPFL201 SBPFL201-8	SB201 SB201-8	SAPFL201 SAPFL201-8	SA201 SA201-8	PFL203	9.55	4.80	13.2	0.19	0.22
15 5/8	81	59	14	4	63.5	7.1	49	6	22	28.5	M6	SBPFL202 SBPFL202-10	SB202 SB202-10	SAPFL202 SAPFL202-10	SA202 SA202-10						
17												SBPFL203	SB203	SAPFL203	SA203						
20 3/4	3 17/32	2 5/8	5/8	5/32	2 13/16	23/64	25/32	0.276	0.984	1.161	5/16	SBPFL204-12 SBPFL204	SB204-12 SB204	SAPFL204-12 SAPFL204	SA204-12 SA204	PFL204	12.8	6.65	13.2	0.24	0.24
25 7/8 15/16	3 3/4	2 25/32	23/32	5/32	2 63/64	23/64	2 3/8	0.295	1.063	1.201	5/16	SBPFL205-14 SBPFL205-15 SBPFL205	SB205-14 SB205-15 SB205	SAPFL205-14 SAPFL205-15 SAPFL205	SA205-14 SA205-15 SA205	PFL205	14.0	7.85	13.9	0.28	0.32
	95	71	18	4	76	9	60	7.5	27	30.5	M8	SBPFL205-16	SB205-16	SAPFL205-16	SA205-16						
1												SBPFL206-18 SBPFL206	SB206-18 SB206	SAPFL206-18 SAPFL206	SA206-18 SA206						
30 13/16 1 1/4	4 7/16	3 5/16	3/4	13/64	3 9/16	7/16	2 25/32	0.315	1.181	1.335	3/8	SBPFL206-19 SBPFL206-20	SB206-19 SB206-20	SAPFL206-19 SAPFL206-20	SA206-19 SA206-20	PFL206	19.5	11.3	13.9	0.38	0.41
1 1/4	113	84	19	5.2	90.5	11	71	8	30	33.9	M10	SBPFL207-20	SB207-20	SAPFL207-20	SA207-20						
35 15/16 1 3/8 1 7/16	4 13/16	3 11/16	7/8	13/64	3 15/16	7/16	3 3/16	0.335	1.260	1.437	3/8	SBPFL207-22 SBPFL207	SB207-22 SB207	SAPFL207-21 SAPFL207-22 SAPFL207	SA207-21 SA207-22 SA207	PFL207	25.7	15.4	13.9	0.66	0.74
1 7/16	122	94	22	5.2	100	11	81	8.5	32	36.5	M10	SBPFL207-23	SB207-23	SAPFL207-23	SA207-23						

Note 1) *H*<sub>2</sub> is the minimum size of the mounting hole.

Remark For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.



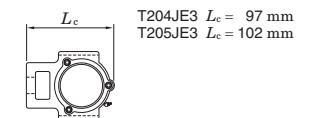
UCT Cylindrical bore (with set screws) d 12 ~ (45) mm



Variations of tolerance of groove width (ΔA1s), variations of tolerance of distance between both grooves (ΔH1s), and tolerance of symmetry of both groove sides (X)

Table with 5 columns: Housing No., ΔA1s, ΔH1s, X, and Unit: mm. Rows include T204-T210, T211-T217, and T324-T328.

Form and dimensions of Lc of T204JE3 and T205JE3 (housing with cast iron covers) are shown below.



Main technical table with columns: Shaft Dia., Dimensions, Standard, Bearing, Mass, Basic Load Ratings, Factor, With Pressed Steel Covers, and With Cast Iron Covers.

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.

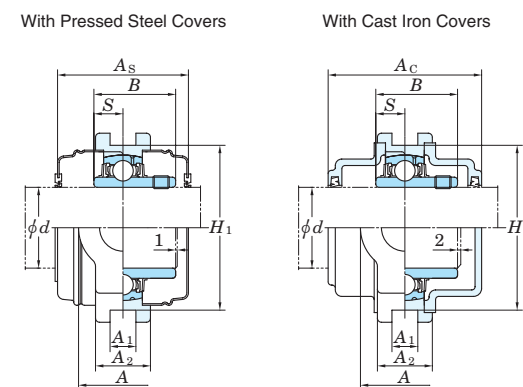
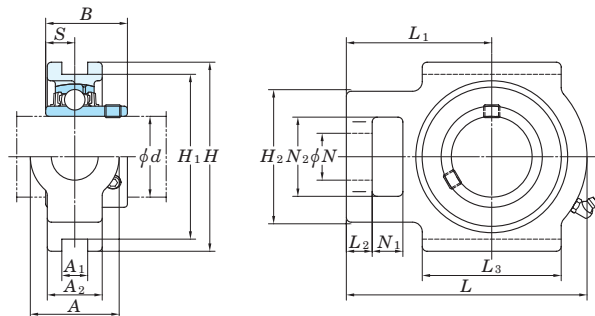
B-1/4-28UNF ..... 201-210, X05-X09, 305-308

B-PT1/8 ..... 211-217, X10-X17, 309-328

3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (L2) follows the Part No. of unit or bearing. (Example of Part No.: UCT206JL3, UC206L3)

4. As for the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

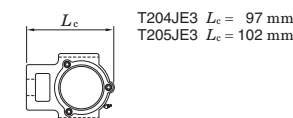
**UCT**  
Cylindrical bore (with set screws)  
d (45) ~ (75) mm



Variations of tolerance of groove width ( $\Delta A_{1s}$ ), variations of tolerance of distance between both grooves ( $\Delta H_{1s}$ ), and tolerance of symmetry of both groove sides (X)

Housing No.		$\Delta A_{1s}$	$\Delta H_{1s}$	X	Unit : mm
T204-T210	TX05-TX10	T305-T310	+0.2 0	0 -0.5	0.5
T211-T217	TX11-TX17	T311-T318	+0.3 0	0 -0.8	0.6 0.7 0.8

Form and dimensions of  $L_c$  of T204JE3 and T205JE3 (housing with cast iron covers) are shown below.



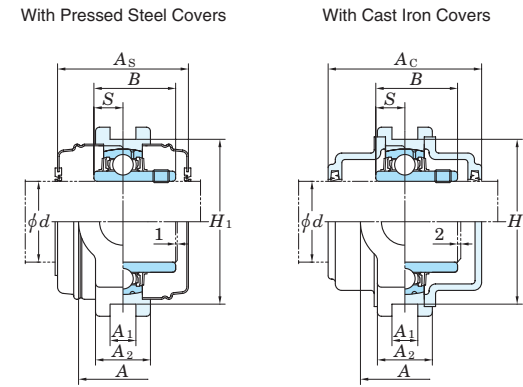
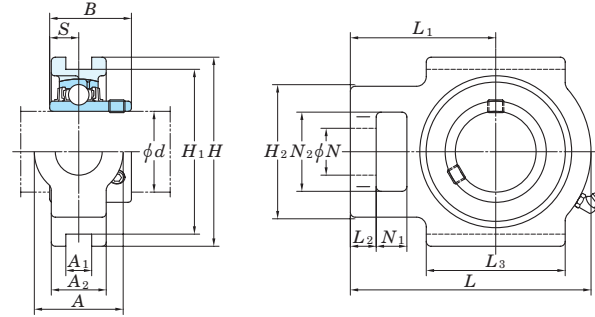
Shaft Dia. mm inch  d	Dimensions inch mm																Standard		Bearing No.	Mass kg	Basic			With Pressed Steel Covers				With Cast Iron Covers				
	A	A <sub>1</sub>	A <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	N	N <sub>1</sub>	N <sub>2</sub>	B	S	Unit No.	Housing No.	Load Ratings kN C <sub>r</sub> C <sub>0r</sub>			Factor f <sub>0</sub>	Unit No. Open Ends Type	Unit No. Closed End Type	Dimension mm inch A <sub>s</sub>	Mass kg	Unit No. Open Ends Type	Unit No. Closed End Type	Dimension mm inch A <sub>c</sub>	Mass kg			
45 1 3/4	2 5/32	45/64	1 1/2	5 7/16	4 59/64	3 17/32	7	4 11/32	23/32	3 13/16	1 11/32	1 5/16	2 5/32	2.244	0.866	UCT309-28 UCT309	T309	48.9 29.5	13.3	-	-	-	-	-	-	-	-	-	-			
	1 7/8	1 15/16	2	1 15/16	5/8	1 15/32	4 19/32	4 1/64	3 9/32	5 7/8	3 17/32	5/8	3 3/8	1 5/32	3/4	1 15/16	2.031	0.748	UCT210-30 UCT210-31 UCT210 UCT210-32	T210	2.6 2.6 2.6 2.6	35.1 23.3	14.4	UCT210C	UCT210CD	73	2 7/8	2.6	UCT210FC	UCT210FCD	97	3 13/16
50 1 15/16	2 17/32	55/64	1 21/32	5 3/4	5 1/8	4 1/32	6 23/32	4 3/16	3/4	3 3/4	1 3/8	31/32	2 17/32	2.189	0.874	UCTX10-31 UCTX10 UCTX10-32	TX10	43.4 29.4	14.4	UCTX10C	UCTX10CD	75	2 15/16	4.4	-	-	-	-	-	-		
	2	2 13/32	25/32	1 9/16	5 15/16	5 33/64	3 27/32	7 17/32	4 19/32	25/32	4 3/16	1 15/32	1 1/16	2 13/32	2.402	0.866	UCT310	T310	62.0 38.3	13.2	-	-	-	-	-	-	UCT310C	UCT310CD	110	4 11/32	6.5	
55 2 1/8	2 17/32	55/64	1 1/2	5 3/4	5 1/8	4 1/32	6 23/32	4 3/16	3/4	3 3/4	1 3/8	31/32	2 17/32	2.189	0.874	UCT211-32 UCT211-34 UCT211 UCT211-35	T211	43.4 29.4	14.4	UCT211C	UCT211CD	75	2 15/16	4.0	UCT211FC	UCT211FCD	99	3 29/32	5.2			
	2 3/16	2 17/32	55/64	1 23/32	5 3/4	5 1/8	4 1/32	7 5/8	4 11/16	3/4	4 1/32	1 3/8	1 1/4	2 17/32	2.563	1.000	UCTX11 UCTX11-35 UCTX11-36	TX11	52.4 36.2	14.4	UCTX11C	UCTX11CD	88	3 15/32	5.3	-	-	-	-	-	-	
	2 1/4	2 19/32	55/64	1 23/32	6 13/32	5 29/32	4 1/8	8 5/32	5 13/16	4 17/32	1 17/32	1 5/32	2 19/32	2.598	0.984	UCT311-32 UCT311	T311	71.6 45.0	13.2	-	-	-	-	-	-	UCT311C	UCT311CD	114	4 1/2	7.9		
	2 3/16	2 17/32	55/64	1 23/32	5 3/4	5 1/8	4 1/32	7 5/8	4 11/16	3/4	4 1/32	1 3/8	1 1/4	2 17/32	2.563	1.000	UCT212-36 UCT212 UCT212-38 UCT212-39	T212	52.4 36.2	14.4	UCT212C	UCT212CD	88	3 15/32	4.9	UCT212FC	UCT212FCD	114	4 1/2	6.4		
60 2 7/16	2 3/4	1 1/32	1 7/8	6 9/16	5 15/16	4 3/8	8 13/16	5 13/32	13/16	4 3/4	1 5/8	1 1/4	2 3/4	2.563	1.000	UCTX12 UCTX12-39	TX12	57.2 40.1	14.4	UCTX12C	UCTX12CD	88	3 15/32	7.4	-	-	-	-	-	-		
	2 1/2	2 25/32	55/64	1 13/16	7	6 19/64	4 7/16	8 21/32	5 9/16	29/32	4 27/32	1 5/8	1 7/32	2 25/32	2.795	1.024	UCT312	T312	81.9 52.2	13.2	-	-	-	-	-	-	UCT312C	UCT312CD	124	4 7/8	9.9	
65 2 1/2	2 3/4	1 1/32	1 23/32	6 9/16	5 15/16	4 3/8	8 13/16	5 13/32	13/16	4 3/4	1 5/8	1 1/4	2 3/4	2.563	1.000	UCT213-40 UCT213	T213	57.2 40.1	14.4	UCT213C	UCT213CD	88	3 15/32	6.9	UCT213FC	UCT213FCD	114	4 1/2	8.6			
	2 3/4	1 1/32	1 7/8	6 9/16	5 15/16	4 3/8	8 13/16	5 13/32	13/16	4 3/4	1 5/8	1 1/4	2 3/4	2.937	1.189	UCTX13-40 UCTX13	TX13	62.2 44.1	14.5	UCTX13C	UCTX13CD	98	3 27/32	7.6	-	-	-	-	-	-		
	2 1/2	3 5/32	1 1/32	1 31/32	7 15/32	6 11/16	4 9/16	9 3/8	5 3/4	31/32	5 9/32	1 11/16	1 1/4	2 3/4	2.953	1.181	UCT313-40 UCT313	T313	92.7 59.9	13.2	-	-	-	-	-	-	UCT313C	UCT313CD	122	4 13/16	11.4	
70 2 3/4	2 3/4	1 1/32	1 13/16	6 9/16	5 15/16	4 3/8	8 13/16	5 13/32	13/16	4 3/4	1 5/8	1 1/4	2 3/4	2.937	1.189	UCT214-44 UCT214	T214	62.2 44.1	14.5	UCT214C	UCT214CD	98	3 27/32	7.0	UCT214FC	UCT214FCD	124	4 7/8	8.9			
	2 3/4	1 1/32	1 7/8	6 9/16	5 15/16	4 3/8	9 1/8	5 1/2	13/16	4 3/4	1 5/8	1 1/4	2 3/4	3.063	1.331	UCTX14-44 UCTX14	TX14	67.4 48.3	14.5	UCTX14C	UCTX14CD	98	3 27/32	7.9	-	-	-	-	-	-		
	2 3/4	3 17/32	1 1/32	2 1/16	7 15/16	7 3/32	5 1/8	9 29/32	6 3/32	31/32	5 1/2	1 13/16	1 13/32	3 11/32	3.071	1.299	UCT314-44 UCT314	T314	104 68.2	13.2	-	-	-	-	-	-	UCT314C	UCT314CD	124	4 7/8	13.4	
75 2 15/16	2 3/4	1 1/32	1 7/8	6 9/16	5 15/16	4 3/8	9 1/8	5 1/2	13/16	4 3/4	1 5/8	1 1/4	2 3/4	3.063	1.331	UCT215-47 UCT215 UCT215-48	T215	67.4 48.3	14.5	UCT215C	UCT215CD	98	3 27/32	7.3	UCT215FC	UCT215FCD	124	4 7/8	9.2			
	3	2 3/4	1 7/64	1 7/8	7 1/4	6 1/2	4 3/8	9 1/4	5 1/2	13/16	4 3/4	1 5/8	1 1/4	2 3/4	3.252	1.311	UCTX15-47 UCTX15 UCTX15-48	TX15	72.7 53.0	14.6	UCTX15C	UCTX15CD	108	4 1/4	8.7	-	-	-	-	-	-	
	2 15/16	2 3/4	1 7/64	1 7/8	7 1/4	6 1/2	4 3/8	9 1/4	5 1/2	13/16	4 3/4	1 5/8	1 1/4	2 3/4	3.252	1.311	UCTX15-47 UCTX15 UCTX15-48	TX15	72.7 53.0	14.6	UCTX15C	UCTX15CD	108	4 1/4	8.7	-	-	-	-	-	-	

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
2. Part No. of applicable grease nipples are shown below.  
B-1/4-28UNF..... 201~210, X05~X09, 305~308  
B-PT1/8..... 211~217, X10~X17, 309~328

3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (L2) follows the Part No. of unit or bearing. (Example of Part No. : UCT206JL3, UC206L3)  
4. As for the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.



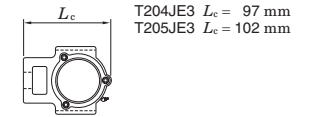
UCT  
Cylindrical bore (with set screws)  
d (75) ~ 140 mm



Variations of tolerance of groove width ( $\Delta_{A1s}$ ), variations of tolerance of distance between both grooves ( $\Delta_{H1s}$ ), and tolerance of symmetry of both groove sides (X)

Housing No.		$\Delta_{A1s}$	$\Delta_{H1s}$	X	Unit : mm
T204-T210	TX05-TX10	+0.2	0	0.5	0
	T305-T310	0	-0.5	0.5	
T211-T217	TX11-TX17	+0.3	0	0.6	0
	T311-T318			0.6	
	T319-T322	0	-0.8	0.7	0
	T324-T328	-0.8	0.8		

Form and dimensions of  $L_c$  of T204JE3 and T205JE3 (housing with cast iron covers) are shown below.



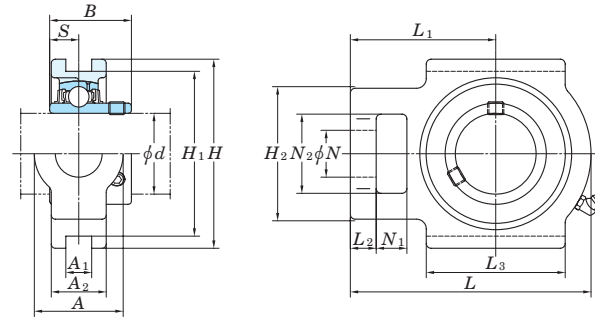
Shaft Dia. mm inch d	Dimensions inch mm															Standard		Basic		Factor	With Pressed Steel Covers			With Cast Iron Covers								
	A	A1	A2	H	H1	H2	L	L1	L2	L3	N	N1	N2	B	S	Unit No.	Housing No.	Bearing No.	Mass kg		Load Ratings kN $C_r$ $C_{0r}$	$f_0$	Unit No. Open End Type Closed End Type	Dimension mm inch $A_s$	Mass kg	Unit No. Open End Type Closed End Type	Dimension mm inch $A_c$	Mass kg				
75 3	3 17/32	1 1/32	2 9/32	8 1/2	7 9/16	5 3/16	10 5/16	6 5/16	3 1/32	5 29/32	1 13/16	1 13/32	3 11/32	3.228	1.260	UCT315-47		UC315-47	13.0													
																UCT315	T315	UC315	13.0	113	77.2	13.2				UCT315C	UCT315CD	134	5 9/32	15.5		
																UCT315-48		UC315-48	13.0													
80	2 3/4	1 1/32	2	7 1/4	6 1/2	4 3/8	9 1/4	5 1/2	1 9/16	4 3/4	1 5/8	1 1/4	2 3/4	3.252	1.311	UCT216-50		UC216-50	8.2	72.7	53.0	14.6										
																UCT216	T216	UC216	8.2			UCT216C	UCT216CD	108	4 1/4	8.2	UCT216FC	UCT216FCD	138	5 7/16	10.6	
																UCTX16	TX16	UCX16	11.7	84.0	61.9	14.5	UCTX16C	UCTX16CD	112	4 13/32	11.7					
85	4 1/32	1 3/16	2 3/8	9 1/16	8 1/32	5 29/32	11 3/32	6 27/32	1 3/32	6 5/16	2 3/32	1 21/32	3 27/32	3.386	1.339	UCT316		UC316	16.2	123	86.7	13.3										
																UCT217-52		UC217-52	11.0													
																UCT217	T217	UC217	11.0	84.0	61.9	14.5	UCT217C	UCT217CD	112	4 13/32	11.0	UCT217FC	UCT217FCD	142	5 19/32	13.7
90	2 7/8	1 7/64	2 1/8	7 25/32	6 13/16	4 7/8	10 1/4	6 3/8	1 3/32	6 3/16	1 7/8	1 1/2	2 7/8	3.780	1.563	UCTX17		UCX17	11.7	96.1	71.5	14.5	UCTX17C	UCTX17CD	122	4 13/16	11.7					
																UCTX17-55	TX17	UCX17-55	11.7													
																UCT317	T317	UC317	19.0	133	96.8	13.3				UCT317C	UCT317CD	146	5 3/4	22.3		
95	4 11/32	1 17/64	2 19/32	10 1/32	8 31/32	6 9/16	12 9/32	7 9/16	1 3/16	6 7/8	2 1/4	1 13/16	4 3/16	3.780	1.575	UCT318-56		UC318-56	21.6													
																UCT318	T318	UC318	21.6	143	107	13.3				UCT318C	UCT318CD	150	5 29/32	25.4		
100	4 11/32	1 3/8	2 27/32	10 5/8	9 29/64	6 1/2	12 11/16	7 3/4	1 7/32	7 3/32	2 1/4	1 13/16	4 3/16	4.055	1.614	UCT319		UC319	24.9	153	119	13.3										
																UCT320		UC320	30.7													
																UCT320-63	T320	UC320-63	30.7	173	141	13.2				UCT320C	UCT320CD	174	6 27/32	36.3		
105	4 11/32	1 3/8	2 15/16	11 13/32	10 15/64	6 7/8	13 19/32	8 9/32	1 1/4	7 7/8	2 5/16	1 7/8	4 17/32	4.409	1.732	UCT321		UC321	36.7	184	153	13.2										
																UCT321	T321	UC321	36.7													
110	5 1/8	1 1/2	3 5/32	12 19/32	11 7/32	7 9/32	15 5/32	9 1/4	1 1/2	8 15/32	2 9/16	2 1/16	4 29/32	4.606	1.811	UCT322		UC322	39.7	205	180	13.2										
																UCT322	T322	UC322	39.7													
120	5 1/2	1 49/64	3 17/32	13 31/32	12 9/32	8 9/32	17	10 1/2	1 21/32	9 1/16	2 3/4	2 3/8	5 1/2	4.961	2.008	UCT324		UC324	54.4	207	185	13.5										
																UCT324	T324	UC324	54.4													
130	5 29/32	1 31/32	3 15/16	15 5/32	13 25/32	8 21/32	18 5/16	11 7/32	1 25/32	9 7/16	2 15/16	2 9/16	5 29/32	5.315	2.126	UCT326		UC326	69.3	229	214	13.6										
																UCT326	T326	UC326	69.3													
140	6 3/32	1 31/32	3 15/16	16 11/32	14 51/64	9 1/16	20 9/32	12 13/32	1 31/32	10 1/32	3 3/32	2 3/4	6 9/16	5.709	2.323	UCT328		UC328	85.1	253	246	13.6										
																UCT328	T328	UC328	85.1													

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
 2. Part No. of applicable grease nipples are shown below.  
 B-1/4-28UNF ..... 201-210, X05-X09, 305-308  
 B-PT1/8 ..... 211-217, X10-X17, 309-328

3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (L2) follows the Part No. of unit or bearing. (Example of Part No. : UCT206JL3, UC206L3)  
 4. As for the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

Take-up type

UCT-E  
Cylindrical bore (with set screws)  
d 12 ~ 50 mm



Variations of tolerance of groove width ( $\Delta_{A1s}$ ), variations of tolerance of distance between both grooves ( $\Delta_{H1s}$ ), and tolerance of symmetry of both groove sides (X)  
Unit : mm

Housing No.		$\Delta_{A1s}$	$\Delta_{H1s}$	X
T204E-T210E	TX05E-TX10E	+0.2 0	0 -0.5	0.5
T211E-T217E	TX11E-TX17E	+0.3 0	0 -0.8	0.6

Shaft Dia. mm inch  d	Dimensions inch mm															Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor $f_0$	Mass kg
	A	A <sub>1</sub>	A <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	N	N <sub>1</sub>	N <sub>2</sub>	B	S				C <sub>r</sub>	C <sub>0r</sub>		
12 1/2																UCT201E UCT201-8E UCT202E UCT202-10E UCT203E UCT204-12E UCT204E	T204E	UC201 UC201-8 UC202 UC202-10 UC203 UC204-12 UC204	12.8 6.65	13.2	0.81 0.79 0.78 0.76	
15 5/8	1 1/4	17/32	13/16	3 1/2	3	2	3 11/16	2 13/32	13/32	2	3/4	5/8	1 1/4	1.220	0.500	UCT205-14E UCT205-15E UCT205E UCT205-16E	T205E	UC205-14 UC205-15 UC205 UC205-16	14.0 7.85	13.9	0.84	
17 3/4	32	13.5	21	89	76.2	51	94	61	10	51	19	16	32	31	12.7	UCTX05E UCTX05-16E	TX05E	UCX05 UCX05-16	19.5 11.3	13.9	1.4	
20	1 1/4	17/32	15/16	3 1/2	3	2	3 13/16	2 7/16	13/32	2	3/4	5/8	1 1/4	1.343	0.563	UCT206-18E UCT206E UCT206-19E UCT206-20E	T206E	UC206-18 UC206 UC206-19 UC206-20	19.5 11.3	13.9	1.3	
25 7/8 15/16	1 1/4	17/32	1 3/32	4 1/32	3 1/2	2 7/32	4 7/16	2 3/4	13/32	2 1/4	7/8	5/8	1 15/32	1.500	0.626	UCTX06E UCTX06-19E UCTX06-20E	TX06E	UCX06 UCX06-19 UCX06-20	25.7 15.4	13.9	1.7	
25 1	32	13.5	24	89	76.2	51	97	62	10	51	19	16	32	34.1	14.3	UCT207-20E UCT207-21E UCT207-22E UCT207E UCT207-23E	T207E	UC207-20 UC207-21 UC207-22 UC207 UC207-23	25.7 15.4	13.9	1.6	
30 1 1/8 1 3/16 1 1/4	1 15/32	17/32	1 3/32	4 1/32	3 1/2	2 7/32	4 7/16	2 3/4	13/32	2 1/4	7/8	5/8	1 15/32	1.500	0.626	UCTX07E UCTX07-22E UCTX07E UCTX07-23E	TX07E	UCX07 UCX07-22 UCX07 UCX07-23	29.1 17.8	14.0	2.7	
30 1 3/16 1 1/4	37	13.5	28	102	88.9	56	113	70	10	57	22	16	37	38.1	15.9	UCT208-24E UCT208-25E UCT208E UCTX08-24E UCTX08E	T208E	UC208-24 UC208-25 UC208 UCX08-24 UCX08	29.1 17.8	14.0	2.5	
30 1 3/16 1 1/4	37	13.5	30	102	88.9	64	129	78	13	64	22	16	37	42.9	17.5	UCT209-26E UCT209-27E UCT209-28E UCT209E UCTX09-28E UCTX09E	TX08E	UC209-26 UC209-27 UC209-28 UC209 UCX09-28 UCX09	34.1 21.3	14.0	2.6	
35 1 1/4 1 5/16 1 3/8	1 15/32	17/32	1 3/16	4 1/32	3 1/2	2 17/32	5 3/32	3 1/16	1/2	2 17/32	7/8	5/8	1 15/32	1.689	0.689	UCT209-26E UCT209-27E UCT209-28E UCT209E UCTX09-28E UCTX09E	T209E	UC209-26 UC209-27 UC209-28 UC209 UCX09-28 UCX09	34.1 21.3	14.0	2.4	
35 1 7/16 1 3/8	1 15/16	11/16	1 13/32	4 1/2	4	3 9/32	5 21/32	3 15/32	19/32	3 9/32	1 5/32	3/4	1 15/16	1.937	0.748	UCT210-30E UCT210-31E UCT210E UCT210-32E UCTX10-31E UCTX10E UCTX10-32E	TX09E	UC210-30 UC210-31 UC210 UC210-32 UCX10-31 UCX10 UCX10-32	35.1 23.3	14.4	2.9	
35 1 7/16	49	17.5	36	114	101.6	83	144	88	15	83	29	19	49	49.2	19	UCT210-30E UCT210-31E UCT210E UCT210-32E UCTX10-31E UCTX10E UCTX10-32E	T210E	UC210-30 UC210-31 UC210 UC210-32	35.1 23.3	14.4	2.6	
40 1 1/2 1 9/16	1 15/16	11/16	1 5/16	4 1/2	4	3 9/32	5 21/32	3 15/32	19/32	3 9/32	1 5/32	3/4	1 15/16	1.937	0.748	UCT210-30E UCT210-31E UCT210E UCT210-32E UCTX10-31E UCTX10E UCTX10-32E	TX09E	UC210-30 UC210-31 UC210 UC210-32	35.1 23.3	14.4	2.6	
40 1 1/2	49	17.5	33	114	101.6	83	144	88	16	83	29	19	49	49.2	19	UCT209-26E UCT209-27E UCT209-28E UCT209E UCTX09-28E UCTX09E	TX09E	UC209-26 UC209-27 UC209-28 UC209 UCX09-28 UCX09	34.1 21.3	14.0	2.4	
40 1 1/2	49	17.5	36	117	101.6	83	144	87	15	83	29	19	49	49.2	19	UCT209-26E UCT209-27E UCT209-28E UCT209E UCTX09-28E UCTX09E	TX09E	UC209-26 UC209-27 UC209-28 UC209 UCX09-28 UCX09	34.1 21.3	14.0	2.4	
45 1 5/8 1 11/16 1 3/4	1 15/16	11/16	1 3/8	4 19/32	4	3 9/32	5 21/32	3 7/16	5/8	3 9/32	1 5/32	3/4	1 15/16	1.937	0.748	UCT209-26E UCT209-27E UCT209-28E UCT209E UCTX09-28E UCTX09E	T209E	UC209-26 UC209-27 UC209-28 UC209 UCX09-28 UCX09	34.1 21.3	14.0	2.4	
45 1 3/4	49	17.5	35	117	101.6	83	144	87	16	83	29	19	49	49.2	19	UCT209-26E UCT209-27E UCT209-28E UCT209E UCTX09-28E UCTX09E	TX09E	UC209-26 UC209-27 UC209-28 UC209 UCX09-28 UCX09	34.1 21.3	14.0	2.4	
45 1 3/4	49	17.5	38	117	101.6	83	149	90	16	86	29	19	49	51.6	19	UCT209-26E UCT209-27E UCT209-28E UCT209E UCTX09-28E UCTX09E	TX09E	UC209-26 UC209-27 UC209-28 UC209 UCX09-28 UCX09	35.1 23.3	14.4	2.9	
50 1 7/8 1 15/16	1 15/16	11/16	1 15/32	4 19/32	4	3 9/32	5 7/8	3 17/32	5/8	3 3/8	1 5/32	3/4	1 15/16	2.031	0.748	UCT210-30E UCT210-31E UCT210E UCT210-32E UCTX10-31E UCTX10E UCTX10-32E	T210E	UC210-30 UC210-31 UC210 UC210-32	35.1 23.3	14.4	2.6	
50 2	49	17.5	37	117	101.6	83	149	90	16	86	29	19	49	51.6	19	UCT210-30E UCT210-31E UCT210E UCT210-32E UCTX10-31E UCTX10E UCTX10-32E	TX10E	UC210-30 UC210-31 UC210 UC210-32	35.1 23.3	14.4	2.6	
50 1 15/16	2 17/32	1 1/16	1 21/32	5 3/4	5 1/8	4 1/64	6 23/32	4 3/16	3/4	3 3/4	1 3/8	31/32	2 17/32	2.189	0.874	UCT210-30E UCT210-31E UCT210E UCT210-32E UCTX10-31E UCTX10E UCTX10-32E	TX10E	UC210-30 UC210-31 UC210 UC210-32	43.4 29.4	14.4	4.4	
50 2	64	27	42	146	130.17	102	171	106	19	95	35	25	64	55.6	22.2	UCT210-30E UCT210-31E UCT210E UCT210-32E UCTX10-31E UCTX10E UCTX10-32E	TX10E	UC210-30 UC210-31 UC210 UC210-32	43.4 29.4	14.4	4.4	

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

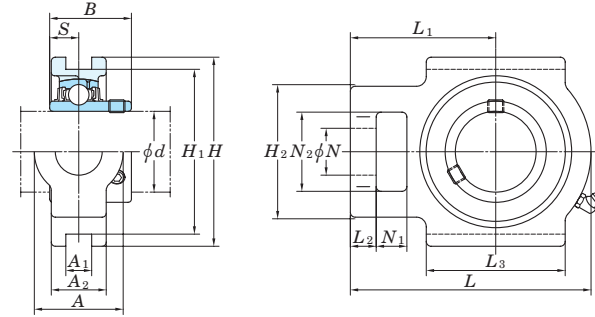
2. Part No. of applicable grease nipples are shown below.  
B-1/4-28UNF ..... 201~210, X05~X09, 305~308  
B-PT1/8 ..... 211~217, X10~X17, 309~328

3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (L2) follows the Part No. of unit or bearing. (Example of Part No. : UCT206EL3, UC206L3)

4. As for the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

Take-up type

UCT-E  
Cylindrical bore (with set screws)  
d 55 ~ 85 mm



Variations of tolerance of groove width ( $\Delta_{A1s}$ ), variations of tolerance of distance between both grooves ( $\Delta_{H1s}$ ), and tolerance of symmetry of both groove sides (X)  
Unit : mm

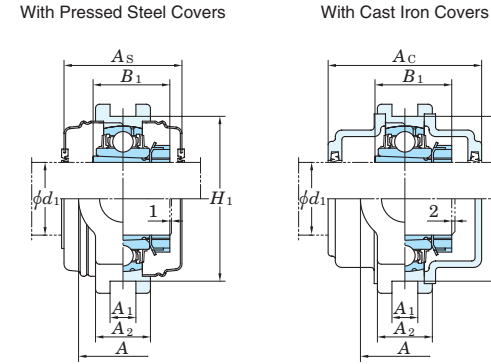
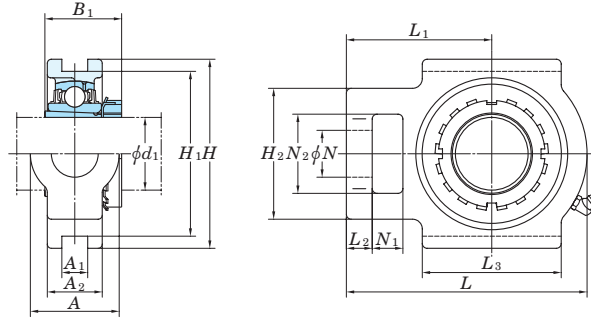
Housing No.	$\Delta_{A1s}$	$\Delta_{H1s}$	X
T204E-T210E	+0.2 0	0 -0.5	0.5
T211E-T217E	+0.3 0	0 -0.8	0.6

Shaft Dia. mm inch	Dimensions inch mm															Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor $f_0$	Mass kg							
	A	A <sub>1</sub>	A <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	N	N <sub>1</sub>	N <sub>2</sub>	B	S				C <sub>r</sub>	C <sub>0r</sub>									
55 2 2 1/8 2 3/16	2 17/32	1 1/16	1 1/2	5 3/4	5 1/8	4 1/64	6 23/32	4 3/16	3/4	3 3/4	1 3/8	3 1/32	2 17/32	2.189	0.874	UCT211-32E UCT211-34E UCT211E UCT211-35E	T211E	UC211-32 UC211-34 UC211 UC211-35	43.4	29.4	14.4	4.0							
	64	27	38	146	130.17	102	171	106	19	95	35	25	64	55.6	22.2														
	2 3/16	1 1/16	1 23/32	5 3/4	5 1/8	4 1/64	7 5/8	4 11/16	3/4	4 1/32	1 3/8	1 1/4	2 17/32	2.563	1.000								UCTX11E UCTX11-35E UCTX11-36E	TX11E	UCX11 UCX11-35 UCX11-36	52.4	36.2	14.4	5.3
	64	27	44	146	130.17	102	194	119	19	102	35	32	64	65.1	25.4														
60 2 1/4 2 3/8 2 7/16	2 17/32	1 1/16	1 21/32	5 3/4	5 1/8	4 1/64	7 5/8	4 11/16	3/4	4 1/32	1 3/8	1 1/4	2 17/32	2.563	1.000	UCT212-36E UCT212E UCT212-38E UCT212-39E	T212E	UC212-36 UC212 UC212-38 UC212-39	52.4	36.2	14.4	4.9							
	64	27	42	146	130.17	102	194	119	19	102	35	32	64	65.1	25.4														
	2 7/16	1 1/16	1 7/8	6 9/16	5 15/16	4 3/8	8 13/16	5 13/32	13/16	4 3/4	1 5/8	1 1/4	2 3/4	2.563	1.000								UCTX12E UCTX12-39E	TX12E	UCX12 UCX12-39	57.2	40.1	14.4	7.4
	70	27	48	167	150.8	111	224	137	21	121	41	32	70	65.1	25.4														
65 2 1/2 2 1/2	2 3/4	1 1/16	1 23/32	6 9/16	5 15/16	4 3/8	8 13/16	5 13/32	13/16	4 3/4	1 5/8	1 1/4	2 3/4	2.563	1.000	UCT213-40E UCT213E	T213E	UC213-40 UC213	57.2	40.1	14.4	6.9							
	70	27	44	167	150.8	111	224	137	21	121	41	32	70	65.1	25.4														
	2 1/2	1 1/16	1 7/8	6 9/16	5 15/16	4 3/8	8 13/16	5 13/32	13/16	4 3/4	1 5/8	1 1/4	2 3/4	2.937	1.189								UCTX13-40E UCTX13E	TX13E	UCX13-40 UCX13	62.2	44.1	14.5	7.6
	70	27	48	167	150.8	111	224	137	21	121	41	32	70	74.6	30.2														
70 2 3/4 2 3/4	2 3/4	1 1/16	1 13/16	6 9/16	5 15/16	4 3/8	8 13/16	5 13/32	13/16	4 3/4	1 5/8	1 1/4	2 3/4	2.937	1.189	UCT214-44E UCT214E	T214E	UC214-44 UC214	62.2	44.1	14.5	7.0							
	70	27	46	167	150.8	111	224	137	21	121	41	32	70	74.6	30.2														
	2 3/4	1 1/16	1 7/8	6 9/16	5 15/16	4 3/8	9 1/8	5 1/2	13/16	4 3/4	1 5/8	1 1/4	2 3/4	3.063	1.331								UCTX14-44E UCTX14E	TX14E	UCX14-44 UCX14	67.4	48.3	14.5	7.9
	70	27	48	167	150.8	111	232	140	21	121	41	32	70	77.8	33.3														
75 2 15/16 3 2 15/16 3	2 3/4	1 1/16	1 7/8	6 9/16	5 15/16	4 3/8	9 1/8	5 1/2	13/16	4 3/4	1 5/8	1 1/4	2 3/4	3.063	1.331	UCT215-47E UCT215E UCT215-48E	T215E	UC215-47 UC215 UC215-48	67.4	48.3	14.5	7.3							
	70	27	48	167	150.8	111	232	140	21	121	41	32	70	77.8	33.3														
	2 15/16	1 1/16	1 7/8	7 1/4	6 1/2	4 3/8	9 1/4	5 1/2	13/16	4 3/4	1 5/8	1 1/4	2 3/4	3.252	1.311								UCTX15-47E UCTX15E UCTX15-48E	TX15E	UCX15-47 UCX15 UCX15-48	72.7	53.0	14.6	8.7
	70	27	48	184	165	111	235	140	21	121	41	32	70	82.6	33.3														
80 3 1/8 - 3 1/2	2 3/4	1 1/16	2	7 1/4	6 1/2	4 3/8	9 1/4	5 1/2	13/16	4 3/4	1 5/8	1 1/4	2 3/4	3.252	1.311	UCT216-50E UCT216E	T216E	UC216-50 UC216	72.7	53.0	14.6	8.2							
	70	27	51	184	165	111	235	140	21	121	41	32	70	82.6	33.3														
	3 1/2	1 13/16	2 11/16	7 25/32	6 13/16	4 7/8	10 1/4	6 3/8	1 3/32	6 3/16	1 7/8	1 1/2	2 7/8	3.374	1.343								UCTX16E	TX16E	UCX16	84.0	61.9	14.5	12.4
	89	46	68	198	173	124	260	162	28	157	48	38	73	85.7	34.1														
85 3 1/4 - 3 7/16	3 1/2	1 13/16	2 11/16	7 25/32	6 13/16	4 7/8	10 1/4	6 3/8	1 3/32	6 3/16	1 7/8	1 1/2	2 7/8	3.374	1.343	UCT217-52E UCT217E	T217E	UC217-52 UC217	84.0	61.9	14.5	12.1							
	89	46	68	198	173	124	260	162	29	157	48	38	73	85.7	34.1														
	3 1/2	1 13/16	2 11/16	7 25/32	6 13/16	4 7/8	10 1/4	6 3/8	1 3/32	6 3/16	1 7/8	1 1/2	2 7/8	3.780	1.563								UCTX17E UCTX17-55E	TX17E	UCX17 UCX17-55	96.1	71.5	14.5	13.3
	89	46	68	198	173	124	260	162	28	157	48	38	73	96	39.7														

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
2. Part No. of applicable grease nipples are shown below.  
B-1/4-28UNF ..... 201~210, X05~X09, 305~308  
B-PT1/8 ..... 211~217, X10~X17, 309~328

3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (L2) follows the Part No. of unit or bearing. (Example of Part No. : UCT206EL3, UC206L3)  
4. As for the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

**UKT**  
**Tapered bore (with adapter)**  
 $d_1$  20 ~ (50) mm

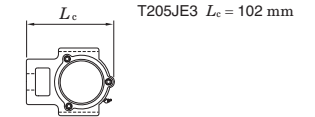


Variations of tolerance of groove width ( $\Delta_{A1s}$ ), variations of tolerance of distance between both grooves ( $\Delta_{H1s}$ ), and tolerance of symmetry of both groove sides ( $X$ )

Housing No.		$\Delta_{A1s}$	$\Delta_{H1s}$	$X$
T205-T210	TX05-TX10 T305-T310	+0.2 0	0 -0.5	0.5
T211-T217	TX11-TX17 T311-T318	+0.3 0	0 -0.8	0.6 0.7 0.8
	T319-T322 T324-T328			

Unit : mm

Form and dimension of  $L_c$  of T205JE3 (housing with cast iron covers) are shown below.



Shaft Dia. mm inch $d_1$	Dimensions inch mm															Standard			Basic			Factor			With Pressed Steel Covers				With Cast Iron Covers				
	A	A <sub>1</sub>	A <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	N	N <sub>1</sub>	N <sub>2</sub>	B <sub>1</sub> <sup>1)</sup>	Unit No.	Housing No.	Bearing No.	Adapter <sup>1)</sup> assembly No.	Mass kg	Load Ratings kN C <sub>r</sub> C <sub>0r</sub>	f <sub>0</sub>	Unit No. Open Ends Type	Unit No. Closed End Type	Dimension mm inch	Mass kg	Unit No. Open Ends Type	Unit No. Closed End Type	Dimension mm inch	Mass kg				
20 3/4	1 1/4	15/32	15/16	3 1/2	2 63/64	2	3 13/16	2 7/16	13/32	2	3/4	5/8	1 1/4	1 5/32(1 3/8)	UKT205	T205	UK205	HE305X(HE2305X) H305X(H2305X)	0.88 0.88	14.0 7.85	13.9	-	-	-	-	-	-	-	-	-	-	-	-
	32	12	24	89	76	51	97	62	10	51	19	16	32	29(35)	UKTX05	TX05	UKX05	HE2305X H2305X	1.3 1.3	19.5 11.3	13.9	UKT205C	UKT205CD	48 1 7/8	0.88	UKT205FC	UKT205FCD	66 2 19/32	1.3				
	37	12	28	102	89	56	113	70	10	57	22	16	37	35	UKT305	T305	UK305	HE2305X H2305X	1.5 1.5	21.2 10.9	12.6	UKTX05C	UKTX05CD	52 2 1/16	1.3	-	-	-	-	UKT305C	UKT305CD	76 3	2.1
25 1	1 15/32	15/32	1 3/32	4 1/32	3 1/2	2 7/16	4 7/16	2 3/4	13/32	2 1/4	7/8	5/8	1 15/32	1 7/32(1 1/2)	UKT206	T206	UK206	H306X(H2306X) HE306X(HE2306X)	1.3 1.3	19.5 11.3	13.9	UKT206C	UKT206CD	52 2 1/16	1.3	UKT206FC	UKT206FCD	70 2 3/4	1.8				
	37	12	28	102	89	56	113	70	10	57	22	16	37	31(38)	UKTX06	TX06	UKX06	H2306X HE2306X	1.7 1.7	25.7 15.4	13.9	UKTX06C	UKTX06CD	59 2 5/16	1.7	-	-	-	-	-	-	-	-
	41	16	28	100	90	70	137	85	14	74	28	18	41	38	UKT306	T306	UK306	H2306X HE2306X	1.9 1.9	26.7 15.0	13.3	-	-	-	-	UKT306C	UKT306CD	82 3 7/32	2.5				
30 1 1/8	1 15/32	15/32	1 3/16	4 1/32	3 1/2	2 17/32	5 3/32	3 11/32	1 1/2	2 17/32	7/8	5/8	1 15/32	1 3/8(1 11/16)	UKT207	T207	UK207	HS307X(HS2307X) H307X(H2307X)	1.7 1.7	25.7 15.4	13.9	UKT207C	UKT207CD	59 2 5/16	1.7	UKT207FC	UKT207FCD	78 3 1/16	2.5				
	37	12	30	102	89	64	129	78	13	64	22	16	37	35(43)	UKTX07	TX07	UKX07	HS2307X H2307X	2.6 2.6	29.1 17.8	14.0	UKTX07C	UKTX07CD	68 2 11/16	2.6	-	-	-	-	-	-	-	-
	49	16	36	114	102	83	144	88	15	83	29	19	49	43	UKT307	T307	UK307	HS2307X H2307X	2.4 2.4	33.4 19.3	13.2	-	-	-	-	UKT307C	UKT307CD	88 3 15/32	3.3				
35 1 1/4	1 15/16	5/8	1 5/16	4 1/2	4 1/4	3 9/32	5 21/32	3 15/32	5/8	3 9/32	1 5/32	3/4	1 15/16	1 13/32(1 13/16)	UKT208	T208	UK208	HE308X(HE2308X) HS308X(HS2308X) H308X(H2308X)	2.5 2.5 2.5	29.1 17.8	14.0	UKT208C	UKT208CD	68 2 11/16	2.5	UKT208FC	UKT208FCD	86 3 3/8	3.4				
	49	16	36	117	102	83	144	87	15	83	29	19	49	46	UKTX08	TX08	UKX08	HE2308X HS2308X H2308X	2.6 2.6 2.6	34.1 21.3	14.0	UKTX08C	UKTX08CD	68 2 11/16	2.6	-	-	-	-	-	-	-	-
	50	18	34	124	112	83	162	100	17	89	32	22	50	46	UKT308	T308	UK308	HE2308X HS2308X H2308X	3.0 3.0 3.0	40.7 24.0	13.2	-	-	-	-	UKT308C	UKT308CD	96 3 25/32	4.0				
40 1 1/2	1 15/16	5/8	1 3/8	4 19/32	4 1/4	3 9/32	5 21/32	3 7/16	5/8	3 9/32	1 5/32	3/4	1 15/16	1 17/32(1 31/32)	UKT209	T209	UK209	HE309X(HE2309X) H309X(H2309X) HS309X(HS2309X)	2.5 2.5 2.5	34.1 21.3	14.0	UKT209C	UKT209CD	68 2 11/16	2.5	UKT209FC	UKT209FCD	88 3 15/32	3.4				
	49	16	35	117	102	83	144	87	16	83	29	19	49	39(50)	UKTX09	TX09	UKX09	HE2309X H2309X HS2309X	2.9 2.9 2.9	35.1 23.3	14.4	UKTX09C	UKTX09CD	73 2 7/8	2.9	-	-	-	-	-	-	-	-
	55	18	38	138	125	90	178	110	18	97	34	24	55	50	UKT309	T309	UK309	HE2309X H2309X HS2309X	4.2 4.2 4.2	48.9 29.5	13.3	-	-	-	-	UKT309C	UKT309CD	102 4 1/32	5.5				
45 1 3/4	1 15/16	5/8	1 15/32	4 19/32	4 1/4	3 9/32	5 7/8	3 17/32	5/8	3 3/8	1 5/32	3/4	1 15/16	1 21/32(2 5/32)	UKT210	T210	UK210	HE310X(HE2310X) H310X(H2310X)	2.7 2.7	35.1 23.3	14.4	UKT210C	UKT210CD	73 2 7/8	2.7	UKT210FC	UKT210FCD	97 3 13/16	3.8				
	49	16	37	117	102	83	149	90	16	86	29	19	49	42(55)	UKTX10	TX10	UKX10	HE2310X H2310X	4.4 4.4	43.4 29.4	14.4	UKTX10C	UKTX10CD	75 2 15/16	4.4	-	-	-	-	-	-	-	-
	64	22	42	146	130	102	171	106	19	95	35	25	64	55	UKT310	T310	UK310	HE2310X H2310X	5.0 5.0	62.0 38.3	13.2	-	-	-	-	UKT310C	UKT310CD	110 4 11/32	6.7				
50 2	2 17/32	59/64	1 1/2	5 3/4	5 1/8	4 1/32	6 23/32	4 3/16	3/4	3 3/4	1 3/8	31/32	2 17/32	1 25/32(2 5/16)	UKT211	T211	UK211	HS311X(HS2311X) H311X(H2311X) HE311X(HE2311X)	4.1 4.1 4.1	43.4 29.4	14.4	UKT211C	UKT211CD	75 2 15/16	4.1	UKT211FC	UKT211FCD	99 3 29/32	5.4				

Note 1) Codes shown in parentheses indicate the dimensions and Part No. of applicable adapter (H2300X series) for UK200L3 series (triple-lip seal type).

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.

B-1/4-28UNF.....205~210, X05~X09, 305~308  
B-PT1/8.....211~217, X10~X17, 309~328

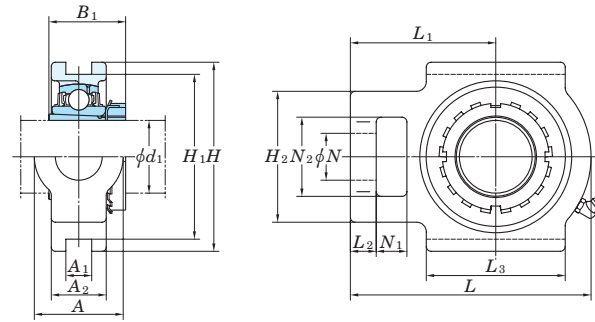
3. In Part No. of unit with adapters and bearing with adapters, Part No. of applicable adapter follow the Part No. shown in the dimensional tables. (Example of Part No. : UKT206J + H306X, UK206 + H306X)

4. As for the triple-lip seal type product (205 is the double-lip seal type product), supplementary code L3 (or L2) follows the Part No. of unit or bearing. (Example of Part No. : UKT206JL3 + H2306X, UK206L3 + H2306X)

5. For the dimensions and forms of applicable bearings and adapters, see the dimensional tables of ball bearing for unit and adapter assemblies.

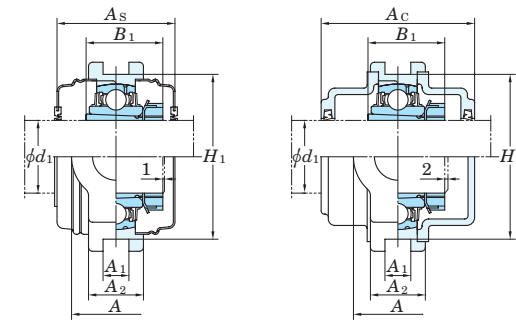


**UKT**  
**Tapered bore (with adapter)**  
 $d_1$  (50) ~ 100 mm



With Pressed Steel Covers

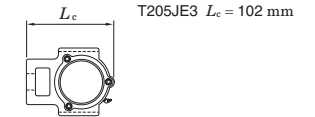
With Cast Iron Covers



Variations of tolerance of groove width ( $\Delta A_{1s}$ ), variations of tolerance of distance between both grooves ( $\Delta H_{1s}$ ), and tolerance of symmetry of both groove sides (X)

Housing No.		$\Delta A_{1s}$	$\Delta H_{1s}$	X
T205-T210	TX05-TX10	T305-T310	+0.2 0 -0.5	0 0.5
T211-T217	TX11-TX17	T311-T318	+0.3 0 -0.8	0.6 0.7 0.8

Form and dimension of  $L_c$  of T205JE3 (housing with cast iron covers) are shown below.



Shaft Dia. mm inch	Dimensions inch mm														Standard			Adapter <sup>1)</sup> assembly No.	Mass kg	Basic Load Ratings kN		Factor $f_0$	With Pressed Steel Covers				With Cast Iron Covers													
	$d_1$	A	A <sub>1</sub>	A <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	N	N <sub>1</sub>	N <sub>2</sub>	B <sub>1</sub> <sup>1)</sup>	Unit No.	Housing No.			Bearing No.	Cr		C <sub>0r</sub>	Unit No. Open Ends Type	Unit No. Closed End Type	Dimension mm inch	Mass kg	Unit No. Open Ends Type	Unit No. Closed End Type	Dimension mm inch	Mass kg									
50 1 7/8 2	2 17/32	55/64	1 23/32	5 3/4	5 1/8	4 1/32	7 5/8	4 11/16	3/4	4 1/32	1 3/8	1 1/4	2 17/32	2 5/16	UKTX11	TX11	UKX11	52.4	36.2	14.4	-	-	-	-	-	-	-	-	-	-										
	64	22	44	146	130	102	194	119	19	102	35	32	64	59							HS2311X	5.1	UKTX11C	UKTX11CD	88	3 15/32	5.1	-	-	-	-	-	-	-						
55 2 1/8	2 19/32	55/64	1 23/32	6 13/32	5 29/32	4 1/8	8 5/32	5 13/16	4 17/32	1 17/32	1 5/32	2 19/32	2 5/16	UKTX12	TX12	UKX12	57.2	40.1	14.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	70	26	48	167	151	111	224	137	21	121	41	32	70							62	HS2312X	7.3	UKTX12C	UKTX12CD	88	3 15/32	7.3	-	-	-	-	-	-	-	-	-	-			
60 2 3/8	2 25/32	55/64	1 13/16	7	6 19/64	4 7/16	8 21/32	5 5/16	29/32	4 27/32	1 5/8	1 7/32	2 25/32	2 7/16	UKTX13	TX13	UKX13	62.2	44.1	14.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	71	22	46	178	160	113	220	135	23	123	41	31	71	62							HE2313X	7.2	UKTX13C	UKTX13CD	98	3 27/32	7.2	-	-	-	-	-	-	-	-	-	-	-		
65 2 1/2	2 3/4	1 1/32	1 23/32	6 9/16	5 15/16	4 3/8	8 13/16	5 13/32	13/16	4 3/4	1 5/8	1 1/4	2 3/4	2 9/16	UKTX15	TX15	UKX15	72.7	53.0	14.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	70	28	48	184	165	111	235	140	21	121	41	32	70	73							HE2315X	8.4	UKTX15C	UKTX15CD	108	4 1/4	8.4	-	-	-	-	-	-	-	-	-	-	-	-	
70 2 3/4	3 17/32	1 1/32	2 5/32	8 1/2	7 9/16	5 3/16	10 5/16	6 5/16	31/32	5 29/32	1 13/16	1 13/32	3 11/32	2 7/8	UKTX16	TX16	UKX16	84.0	61.9	14.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	73	28	54	198	173	124	260	162	28	157	48	38	73	78							HE2316X	11.8	UKTX16C	UKTX16CD	112	4 13/32	11.8	-	-	-	-	-	-	-	-	-	-	-	-	-
75 3	4 1/32	1 3/16	2 3/8	9 1/16	8 1/32	5 29/32	11 3/32	6 27/32	1 3/32	6 9/16	2 3/32	1 21/32	3 27/32	3 1/16	UKTX17	TX17	UKX17	96.1	71.5	14.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	73	28	54	198	173	124	260	162	28	157	48	38	73	82							H2317X	11.4	UKTX17C	UKTX17CD	122	4 13/16	11.4	-	-	-	-	-	-	-	-	-	-	-	-	-
80 3 1/2	4 1/32	1 17/64	2 17/32	9 7/16	8 27/64	5 31/32	11 23/32	7 7/32	1 3/16	6 11/16	2 3/32	1 21/32	3 27/32	3 1/32	UKTX18	TX18	UKX18	133	96.8	13.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	110	32	64	240	214	152	298	183	30	170	53	42	98	82							H2318X	21.7	UKTX18C	UKTX18CD	146	5 3/4	22.4	-	-	-	-	-	-	-	-	-	-	-	-	-
85 3 3/4	4 11/32	1 17/64	2 19/32	10 1/32	8 31/32	6 5/16	12 9/32	7 9/16	1 3/16	6 7/8	2 1/4	1 13/16	4 3/16	3 3/8	UKTX19	TX19	UKX19	153	119	13.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	110	35	72	270	240	165	322	197	31	180	57	46	106	90							H2319X	25.2	UKTX19C	UKTX19CD	162	6 3/8	29.9	-	-	-	-	-	-	-	-	-	-	-	-	-
90 4	4 23/32	1 3/8	2 15/16	11 13/32	10 15/64	6 7/8	13 19/32	8 9/32	1 1/4	7 7/8	2 5/16	1 7/8	4 17/32	3 13/16	UKTX20	TX20	UKX20	173	141	13.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	120	35	75	290	260	175	345	210	32	200	59	48	115	97							H2320X	30.4	UKTX20C	UKTX20CD	174	6 27/32	36.6	-	-	-	-	-	-	-	-	-	-	-	-	-
100 4	5 1/8	1 1/2	3 5/32	12 19/32	11 7/32	7 9/32	15 5/32	9 1/4	1 1/2	8 15/32	2 9/16	2 1/16	4 29/32	4 1/8	UKTX22	TX22	UKX22	205	180	13.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	130	38	80	320	285	185	385	235	38	215	65	52	125	105							H2322X	39.5	UKTX22C	UKTX22CD	188	7 13/32	46.4	-	-	-	-	-	-	-	-	-	-	-	-	-

Note 1) Codes shown in parentheses indicate the dimensions and Part No. of applicable adapter (H2300X series) for UK200L3 series (triple-lip seal type).

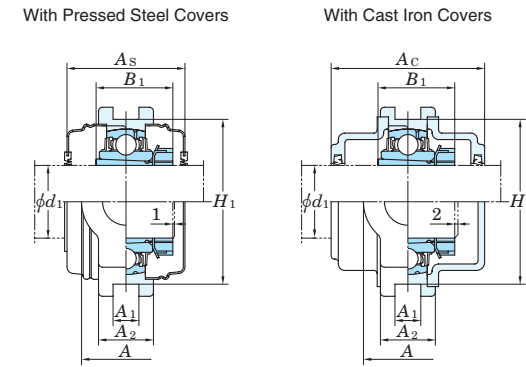
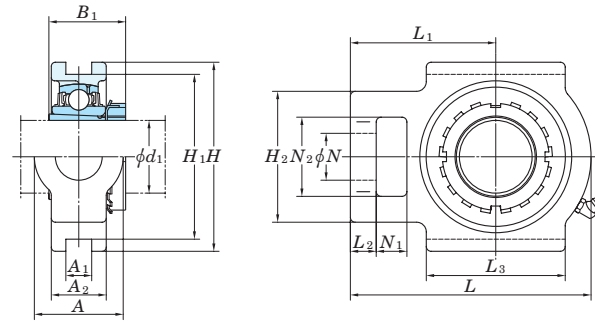
Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.  
 B-1/4-28UNF.....205-210, X05-X09, 305-308  
 B-PT1/8.....211-217, X10-X17, 309-328

3. In Part No. of unit with adapters and bearing with adapters, Part No. of applicable adapter follow the Part No. shown in the dimensional tables. (Example of Part No. : UKT206J + H306X, UK206 + H306X)  
 4. As for the triple-lip seal type product (205 is the double-lip seal type product), supplementary code L3 (or L2) follows the Part No. of unit or bearing. (Example of Part No. : UKT206JL3 + H2306X, UK206L3 + H2306X)  
 5. For the dimensions and forms of applicable bearings and adapters, see the dimensional tables of ball bearing for unit and adapter assemblies.

Take-up type

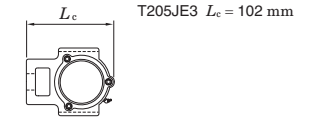
UKT  
Tapered bore (with adapter)  
 $d_1$  110 ~ 125 mm



Variations of tolerance of groove width ( $\Delta A_{1s}$ ), variations of tolerance of distance between both grooves ( $\Delta H_{1s}$ ), and tolerance of symmetry of both groove sides (X)

Housing No.		$\Delta A_{1s}$	$\Delta H_{1s}$	X	Unit : mm
T205-T210	TX05-TX10	+0.2 0	0 -0.5	0.5	
T211-T217	TX11-TX17	+0.3 0	0 -0.8	0.6 0.7 0.8	

Form and dimension of  $L_c$  of T205JE3 (housing with cast iron covers) are shown below.



Shaft Dia. mm inch	Dimensions inch mm														Unit No.	Housing No.	Bearing No.	Adapter <sup>1)</sup> assembly No.	Mass kg	Basic Load Ratings kN $C_r$ $C_{0r}$	Factor $f_0$	With Pressed Steel Covers			With Cast Iron Covers							
	A	A <sub>1</sub>	A <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	N	N <sub>1</sub>	N <sub>2</sub>	B <sub>1</sub> <sup>1)</sup>								Open Ends Type	Closed End Type	Dimension mm inch	Mass kg	Open Ends Type	Closed End Type	Dimension mm inch	Mass kg			
110	5 1/2 140	1 49/64 45	3 17/32 90	13 31/32 355	12 9/32 320	8 9/32 210	17 432	10 1/2 267	1 21/32 42	9 1/16 230	2 3/4 70	2 3/8 60	5 1/2 140	4 13/32 112	UKT324	T324	UK324	H2324	54.7	207	185	13.5	-	-	-	-	-	UKT324C	UKT324CD	196	7 23/32	65.0
115	4 1/2 150	5 29/32 50	1 31/32 100	3 15/16 385	15 5/32 350	13 25/32 220	8 21/32 465	18 5/16 285	11 7/32 45	1 25/32 240	9 7/16 75	2 15/16 65	2 9/16 150	5 29/32 121	UKT326	T326	UK326	HE2326 H2326	69.1 69.1	229	214	13.6	-	-	-	-	-	UKT326C	UKT326CD	214	8 7/16	82.4
125	6 3/32 155	1 31/32 50	3 15/16 100	16 11/32 415	14 61/64 380	9 1/16 230	20 9/32 515	12 13/32 315	1 31/32 50	10 1/32 255	3 5/32 80	2 3/4 70	6 5/16 160	5 5/32 131	UKT328	T328	UK328	H2328	85.1	253	246	13.6	-	-	-	-	-	UKT328C	UKT328CD	222	8 3/4	102

Note 1) Codes shown in parentheses indicate the dimensions and Part No. of applicable adapter (H2300X series) for UK200L3 series (triple-lip seal type).

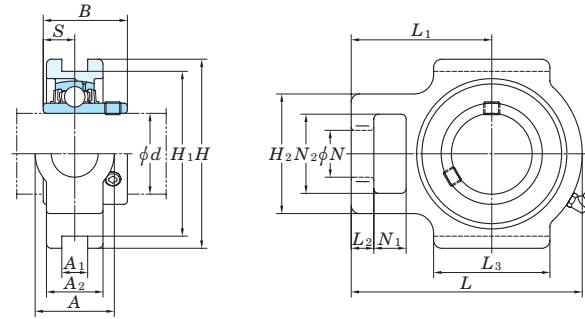
2. Part No. of applicable grease nipples are shown below.  
B-1/4-28UNF.....205~210, X05~X09, 305~308  
B-PT1/8.....211~217, X10~X17, 309~328

3. In Part No. of unit with adapters and bearing with adapters, Part No. of applicable adapter follow the Part No. shown in the dimensional tables. (Example of Part No. : UKT206J + H306X, UK206 + H306X)  
4. As for the triple-lip seal type product (205 is the double-lip seal type product), supplementary code L3 (or L2) follows the Part No. of unit or bearing. (Example of Part No. : UKT206JL3 + H2306X, UK206L3 + H2306X)  
5. For the dimensions and forms of applicable bearings and adapters, see the dimensional tables of ball bearing for unit and adapter assemblies.

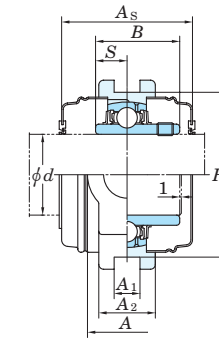
Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)



**UCST-H1S6**  
**Cylindrical bore (with set screws)**  
*d* 20 ~ 50 mm



With Pressed Stainless Steel Covers



Variations of tolerance of groove width ( $\Delta A_{1s}$ ), variations of tolerance of distance between both grooves ( $\Delta H_{1s}$ ), and tolerance of symmetry of both groove sides (X)

Housing No.	$\Delta A_{1s}$	$\Delta H_{1s}$	X
ST204H1-ST210H1	+0.2 0	0 -0.5	0.5

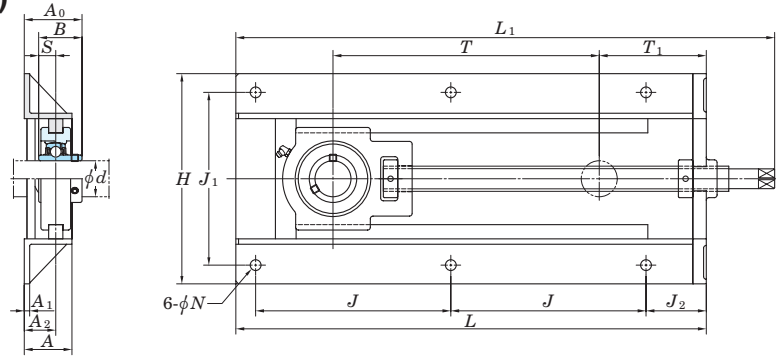
Unit : mm

Shaft Dia. mm <i>d</i>	Dimensions															Standard Unit No.	Housing No.	Bearing No.	Mass kg	Basic Load Ratings kN		Factor <i>f</i> <sub>0</sub>	With Pressed Stainless Steel Covers			
	inch mm																			Open Ends Type	Closed End Type		Dimension mm inch	Mass kg		
<i>d</i>	A	A <sub>1</sub>	A <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	N	N <sub>1</sub>	N <sub>2</sub>	B	S	<i>C</i> <sub>r</sub>	<i>C</i> <sub>0r</sub>	<i>f</i> <sub>0</sub>	Open Ends Type	Closed End Type	A <sub>s</sub>	kg				
20	1 1/4 32	15/32 12	29/32 23	3 1/2 89	2 63/64 76	1 13/16 46	3 1/2 89	2 5/16 59	1 1/32 9	1 23/32 44	3/4 19	23/32 18	1 1/4 32	1.220 31	0.500 12.7	UCST204H1S6	ST204H1	UC204S6	0.73	10.9	5.35	13.2	UCST204H1CS6	UCST204H1CDS6	45 1 25/32	0.73
25	1 1/4 32	15/32 12	31/32 25	3 1/2 89	2 63/64 76	1 13/16 46	3 21/32 93	2 3/8 60	1 1/32 9	1 23/32 44	3/4 19	23/32 18	1 1/4 32	1.343 34.1	0.563 14.3	UCST205H1S6	ST205H1	UC205S6	0.79	11.9	6.3	13.9	UCST205H1CS6	UCST205H1CDS6	49 1 15/16	0.79
30	1 15/32 37	15/32 12	1 1/16 27	4 1/32 102	3 1/2 89	2 1/16 52	4 3/16 106	2 5/8 67	1 1/32 9	1 31/32 50	7/8 22	23/32 18	1 15/32 37	1.500 38.1	0.626 15.9	UCST206H1S6	ST206H1	UC206S6	1.1	16.5	9.05	13.9	UCST206H1CS6	UCST206H1CDS6	53 2 3/32	1.1
35	1 15/32 37	15/32 12	1 7/32 31	4 1/32 102	3 1/2 89	2 7/32 56	4 11/16 119	2 15/16 75	7/16 11	2 1/32 56	7/8 22	23/32 18	1 15/32 37	1.689 42.9	0.689 17.5	UCST207H1S6	ST207H1	UC207S6	1.5	21.8	12.3	13.9	UCST207H1CS6	UCST207H1CDS6	60 2 3/8	1.5
40	1 15/16 49	5/8 16	1 1/4 32	4 1/2 114	4 1/64 102	2 29/32 74	5 5/16 135	3 11/32 85	9/16 14	2 17/32 64	1 5/32 29	25/32 20	1 15/16 49	1.937 49.2	0.748 19	UCST208H1S6	ST208H1	UC208S6	2	24.8	14.3	14.0	UCST208H1CS6	UCST208H1CDS6	69 2 23/32	2
45	1 15/16 49	5/8 16	1 11/32 34	4 19/32 117	4 1/64 102	2 29/32 74	5 13/32 137	3 11/32 85	9/16 14	2 19/32 66	1 5/32 29	25/32 20	1 15/16 49	1.937 49.2	0.748 19	UCST209H1S6	ST209H1	UC209S6	2.1	27.8	16.2	14.0	UCST209H1CS6	UCST209H1CDS6	69 2 23/32	2.1
50	1 15/16 49	5/8 16	1 3/8 35	4 19/32 117	4 1/64 102	2 29/32 74	5 5/8 143	3 7/16 87	9/16 14	2 27/32 72	1 5/32 29	25/32 20	1 15/16 49	2.031 51.6	0.748 19	UCST210H1S6	ST210H1	UC210S6	2.3	29.8	18.6	14.4	UCST210H1CS6	UCST210H1CDS6	74 2 29/32	2.3

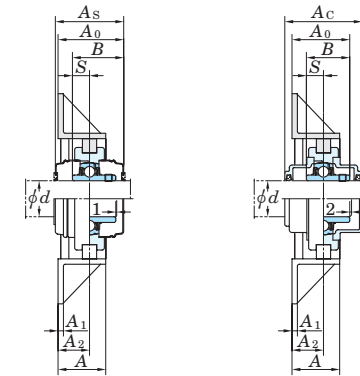
Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter codes. (See Table 10.5 in P.51.)  
 2. Part No. of the applicable grease nipple is A-1/4-28UNFN12.  
 3. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

Section steel frame take-up type

UCTH  
Cylindrical bore (with set screws)  
d 12 ~ 65 mm



With Pressed Steel Covers      With Cast Iron Covers



Variations of tolerance of distance between centers of bolt holes ( $\Delta J_s, \Delta J_{1s}$ )

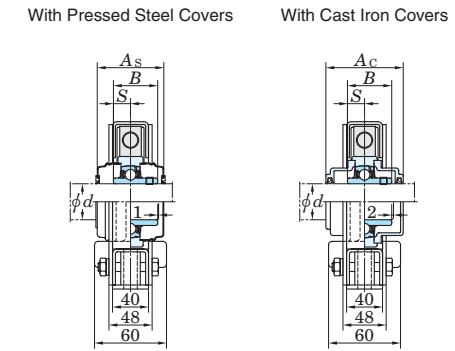
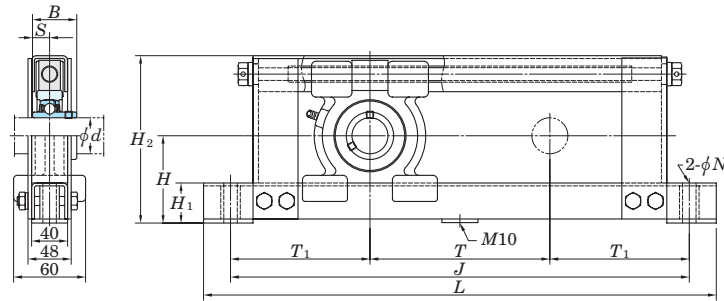
Nominal unit code	$\Delta J_s$	$\Delta J_{1s}$
UCTH201-UCTH213	±0.5	±0.5

Shaft Dia. mm    inch	Dimensions inch mm																Bolt Size inch mm	Standard Unit No.	Bearing No.	Mass kg	Basic Load Ratings kN $C_r$ $C_{or}$	Factor $f_0$	With Pressed Steel Covers				With Cast Iron Covers																																																																																				
	H	L	L <sub>1</sub>	A	J	J <sub>1</sub>	J <sub>2</sub>	N	T	T <sub>1</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>0</sub>	B	S	Open Ends Type							Closed End Type	Dimension mm    inch	Mass kg	Open Ends Type	Closed End Type	Dimension mm    inch	Mass kg																																																																																		
12 1/2	200	318	376	50	117	154	65	12	153	88	6	28	46.3	31	12.7	M10	UCTH201-150 UCTH201-8-150 UCTH202-150 UCTH202-10-150 UCTH203-150 UCTH204-12-150 UCTH204-150	UC201 UC201-8 UC202 UC202-10 UC203 UC204-12 UC204	6.7 6.7 6.7 6.7 6.7 6.7 6.7	12.8    6.65	13.2	UCTH201C-150    UCTH201CD-150	44    1 23/32	6.7	UCTH204FC-150    UCTH204FCD-150	62    2 7/16	7.0																																																																																				
																												15 5/8	200	318	376	50	117	154	65	12	153	88	6	28	46.3	31	12.7	M10	UCTH205-14-150 UCTH205-15-150 UCTH205-150 UCTH205-16-150 UCTH206-18-150 UCTH206-150 UCTH206-19-150 UCTH206-20-150	UC205-14 UC205-15 UC205 UC205-16 UC206-18 UC206 UC206-19 UC206-20	6.7 6.7 6.7 6.7 8.0 8.0 8.0 8.0	14.0    7.85	13.9	UCTH205C-150    UCTH205CD-150	48    1 7/8	6.7	UCTH206FC-150    UCTH206FCD-150	70    2 3/4	8.5																																																								
																																																								17 3/4	200	318	376	50	117	154	65	12	153	88	6	28	46.3	31	12.7	M10	UCTH207-20-230 UCTH207-21-230 UCTH207-22-230 UCTH207-230 UCTH207-23-230	UC207-20 UC207-21 UC207-22 UC207 UC207-23	10.5 10.5 10.5 10.5 10.5	3    15.4	13.9	UCTH207C-230    UCTH207CD-230	59    2 5/16	10.5	UCTH207FC-230    UCTH207FCD-230	78    3 1/16	11.2																												
																																																																																				20	200	318	376	50	117	154	65	12	153	88	6	28	46.3	31	12.7	M10	UCTH208-24-300 UCTH208-25-300 UCTH208-300	UC208-24 UC208-25 UC208	12.5 12.5 12.5	29.1    17.8	14.0	UCTH208C-300    UCTH208CD-300	68    2 11/16	12.5	UCTH208FC-300    UCTH208FCD-300	86    3 3/8	13.3
30	213	336	407	50	126	166	65	12	143	100	6	32	54.2	38.1	15.9	M10	UCTH210-30-300 UCTH210-31-300 UCTH210-300 UCTH210-32-300	UC210-30 UC210-31 UC210 UC210-32	12.6 12.6 12.6 12.6	35.1    23.3	14.4	UCTH210C-300    UCTH210CD-300	73    2 7/8	12.6	UCTH210FC-300    UCTH210FCD-300	97    3 13/16	13.6																																																																																				
																												35	213	430	500	50	173	166	65	12	219	107	6	32	57.4	42.9	17.5	M10	UCTH211-32-300 UCTH211-34-300 UCTH211-300 UCTH211-35-300	UC211-32 UC211-34 UC211 UC211-35	20.1 20.1 20.1 20.1	43.4    29.4	14.4	UCTH211C-300    UCTH211CD-300	75    2 5/16	20.1	UCTH211FC-300    UCTH211FCD-300	99    3 29/32	21.3																																																								
40	234	523	599	50	217	192	67	12	296	119	6	35	65.2	49.2	19	M10	UCTH212-36-300 UCTH212-300 UCTH212-38-300 UCTH212-39-300	UC212-36 UC212 UC212-38 UC212-39	21.4 21.4 21.4 21.4	52.4    36.2	14.4	UCTH212C-300    UCTH212CD-300	88    3 15/32	21.4	UCTH212FC-300    UCTH212FCD-300	114    4 1/2	21.9																																																																																				
																												45	234	523	598	50	217	192	67	12	297	118	6	35	65.2	49.2	19	M10	UCTH213-40-300 UCTH213-300	UC213-40 UC213	25.5 25.5	57.2    40.1	14.4	UCTH213C-300    UCTH213CD-300	88    3 15/32	25.5	UCTH213FC-300    UCTH213FCD-300	114    4 1/2	27.2																																																								

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
 2. Part No. of applicable grease nipples are shown below.  
 B-1/4-28UNF ..... 201~210  
 B-PT1/8 ..... 211~213  
 3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (or L2) follows the Part No. of unit or bearing. (Example of Part No. : UCTH206JL3-150, UC206L3)

4. If heavy load ( $P_r/C_r > 0.12$ ), vibration, or impact occurs, contact with JTEKT.  
 5. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.  
 6. Tapered bore (with adapter) type products are also available.  
 (Example of Part No. : UKTH205J-150 + H305X, UK205 + H305X)

**UCTL**  
Cylindrical bore (with set screws)  
 $d$  20 ~ 45 mm



Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ ) and variations of tolerance of distance between centers of bolt holes ( $\Delta J_s$ )

Nominal unit code	Unit : mm	
	$\Delta H_s$	$\Delta J_s$
UCTL204-207	±2	±0.5
UCTL208, 209		±0.8

Shaft Dia. mm $d$	Dimensions mm											Bolt Size mm	Standard			Basic			Factor $f_0$	With Pressed Steel Covers				With Cast Iron Covers			
	$H$	$H_1$	$H_2$	$L$	$J$	$N$	$T$	$T_1$	$B$	$S$	Unit No.		Bearing No.	Mass	Load Ratings kN		Unit No.			Dimension mm	Mass	Unit No.		Dimension mm	Mass		
															kg	$C_r$	$C_{or}$	Open Ends Type		Closed End Type	$A_s$	kg	Open Ends Type	Closed End Type	$A_c$	kg	
20	77	44	146	430	370	15	100	135	31	12.7	M12	UCTL204-100	UC204	6.0	12.8	6.65	13.2	UCTL204C-100	UCTL204CD-100	44	6.0	UCTL204FC-100	UCTL204FCD-100	62	6.5		
	77	44	146	530	470	15	200	135	31	12.7	M12	UCTL204-200	UC204	7.0	12.8	6.65	13.2	UCTL204C-200	UCTL204CD-200	44	7.0	UCTL204FC-200	UCTL204FCD-200	62	7.5		
	77	44	146	630	570	15	300	135	31	12.7	M12	UCTL204-300	UC204	7.5	12.8	6.65	13.2	UCTL204C-300	UCTL204CD-300	44	7.5	UCTL204FC-300	UCTL204FCD-300	62	8.0		
	77	44	146	730	670	15	400	135	31	12.7	M12	UCTL204-400	UC204	8.0	12.8	6.65	13.2	UCTL204C-400	UCTL204CD-400	44	8.0	UCTL204FC-400	UCTL204FCD-400	62	8.5		
25	82	44	156	440	380	15	100	140	34.1	14.3	M12	UCTL205-100	UC205	7.0	14.0	7.85	13.9	UCTL205C-100	UCTL205CD-100	48	7.0	UCTL205FC-100	UCTL205FCD-100	66	7.5		
	82	44	156	540	480	15	200	140	34.1	14.3	M12	UCTL205-200	UC205	7.5	14.0	7.85	13.9	UCTL205C-200	UCTL205CD-200	48	7.5	UCTL205FC-200	UCTL205FCD-200	66	8.0		
	82	44	156	640	580	15	300	140	34.1	14.3	M12	UCTL205-300	UC205	8.0	14.0	7.85	13.9	UCTL205C-300	UCTL205CD-300	48	8.0	UCTL205FC-300	UCTL205FCD-300	66	8.5		
	82	44	156	740	680	15	400	140	34.1	14.3	M12	UCTL205-400	UC205	9.0	14.0	7.85	13.9	UCTL205C-400	UCTL205CD-400	48	9.0	UCTL205FC-400	UCTL205FCD-400	66	9.5		
30	87	44	166	450	390	15	100	145	38.1	15.9	M12	UCTL206-100	UC206	7.0	19.5	11.3	13.9	UCTL206C-100	UCTL206CD-100	52	7.0	UCTL206FC-100	UCTL206FCD-100	70	7.5		
	87	44	166	550	490	15	200	145	38.1	15.9	M12	UCTL206-200	UC206	8.0	19.5	11.3	13.9	UCTL206C-200	UCTL206CD-200	52	8.0	UCTL206FC-200	UCTL206FCD-200	70	8.5		
	87	44	166	650	590	15	300	145	38.1	15.9	M12	UCTL206-300	UC206	9.0	19.5	11.3	13.9	UCTL206C-300	UCTL206CD-300	52	9.0	UCTL206FC-300	UCTL206FCD-300	70	9.5		
	87	44	166	750	690	15	400	145	38.1	15.9	M12	UCTL206-400	UC206	9.5	19.5	11.3	13.9	UCTL206C-400	UCTL206CD-400	52	9.5	UCTL206FC-400	UCTL206FCD-400	70	10		
35	92	44	176	460	400	15	100	150	42.9	17.5	M12	UCTL207-100	UC207	8.0	25.7	15.4	13.9	UCTL207C-100	UCTL207CD-100	59	8.0	UCTL207FC-100	UCTL207FCD-100	78	9.0		
	92	44	176	560	500	15	200	150	42.9	17.5	M12	UCTL207-200	UC207	8.5	25.7	15.4	13.9	UCTL207C-200	UCTL207CD-200	59	8.5	UCTL207FC-200	UCTL207FCD-200	78	9.5		
	92	44	176	660	600	15	300	150	42.9	17.5	M12	UCTL207-300	UC207	9.0	25.7	15.4	13.9	UCTL207C-300	UCTL207CD-300	59	9.0	UCTL207FC-300	UCTL207FCD-300	78	10		
	92	44	176	760	700	15	400	150	42.9	17.5	M12	UCTL207-400	UC207	10	25.7	15.4	13.9	UCTL207C-400	UCTL207CD-400	59	10	UCTL207FC-400	UCTL207FCD-400	78	11		
40	97	44	186	470	410	15	100	155	49.2	19	M12	UCTL208-100	UC208	8.5	29.1	17.8	14.0	UCTL208C-100	UCTL208CD-100	68	8.5	UCTL208FC-100	UCTL208FCD-100	86	9.5		
	97	44	186	570	510	15	200	155	49.2	19	M12	UCTL208-200	UC208	9.0	29.1	17.8	14.0	UCTL208C-200	UCTL208CD-200	68	9.0	UCTL208FC-200	UCTL208FCD-200	86	10		
	97	44	186	670	610	15	300	155	49.2	19	M12	UCTL208-300	UC208	10	29.1	17.8	14.0	UCTL208C-300	UCTL208CD-300	68	10	UCTL208FC-300	UCTL208FCD-300	86	11		
	97	44	186	770	710	15	400	155	49.2	19	M12	UCTL208-400	UC208	10.5	29.1	17.8	14.0	UCTL208C-400	UCTL208CD-400	68	10.5	UCTL208FC-400	UCTL208FCD-400	86	11.5		
45	100	44	192	480	420	15	100	160	49.2	19	M12	UCTL209-100	UC209	9.0	34.1	21.3	14.0	UCTL209C-100	UCTL209CD-100	68	9.0	UCTL209FC-100	UCTL209FCD-100	88	10		
	100	44	192	580	520	15	200	160	49.2	19	M12	UCTL209-200	UC209	9.5	34.1	21.3	14.0	UCTL209C-200	UCTL209CD-200	68	9.5	UCTL209FC-200	UCTL209FCD-200	88	10.5		
	100	44	192	680	620	15	300	160	49.2	19	M12	UCTL209-300	UC209	10.5	34.1	21.3	14.0	UCTL209C-300	UCTL209CD-300	68	10.5	UCTL209FC-300	UCTL209FCD-300	88	11.5		
	100	44	192	780	720	15	400	160	49.2	19	M12	UCTL209-400	UC209	11	34.1	21.3	14.0	UCTL209C-400	UCTL209CD-400	68	11	UCTL209FC-400	UCTL209FCD-400	88	12		

- Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter codes. (See Table 10.5 in P.51.)  
 2. Part No. of applicable grease nipples is C-1/4-28UNF.  
 3. As for the triple-lip seal type product (204 and 205 are the double-lip seal type products), supplementary code L3 (or L2) follows the Part No. of unit or bearing. (Example of Part No. : UCTL206JL3-100, UC206L3)  
 4. The unit should be mounted so that load is applied to the frame mounting surface vertically and downward.

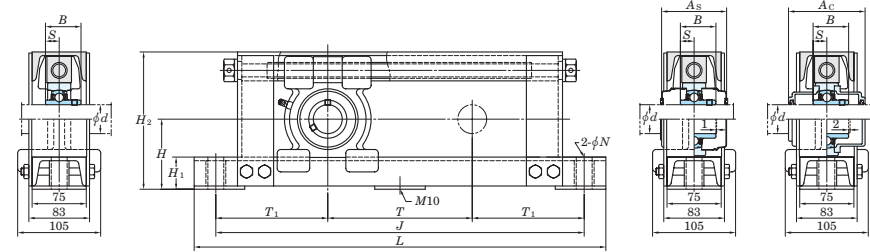
5. If heavy load ( $P_r/C_r > 0.12$ ), vibration, or impact occurs, contact with JTEKT.  
 6. Tapered bore (with adapter) type bearing units are also available. (Example of Part No. : UKTL206J-100 + H306X, UK206 + H306X)  
 7. If frame parts need to be corrosion resistant, contact with JTEKT.  
 8. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.





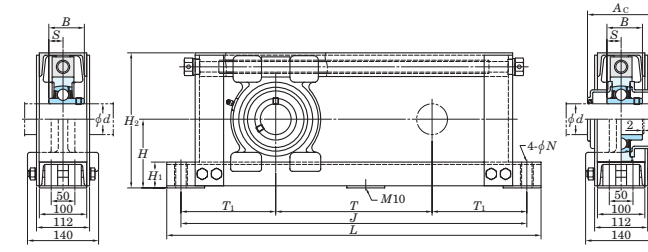
**UCTU**  
**Cylindrical bore (with set screws)**  
*d* 85 ~ 90 mm

With Pressed Steel Covers With Cast Iron Covers



UCTU200

With Cast Iron Covers



UCTU300

Variations of tolerance of distance from mounting bottom to center of spherical bore ( $\Delta H_s$ ) and variations of tolerance of distance between centers of bolt holes ( $\Delta J_s$ )

Nominal unit code	$\Delta H_s$	$\Delta J_s$
UCTU208-212	±2	±0.8
UCTU313-315		±1.2
UCTU316-318		

Shaft Dia. mm <i>d</i>	Dimensions mm										Bolt Size mm	Standard			Basic			Factor $f_0$	With Pressed Steel Covers				With Cast Iron Covers			
	<i>H</i>	<i>H</i> <sub>1</sub>	<i>H</i> <sub>2</sub>	<i>L</i>	<i>J</i>	<i>N</i>	<i>T</i>	<i>T</i> <sub>1</sub>	<i>B</i>	<i>S</i>		Unit No.	Bearing No.	Mass	Load Ratings kN		Unit No.		Unit No.		Dimension mm		Mass			
	<i>C<sub>r</sub></i>	<i>C<sub>0r</sub></i>	Open Ends Type	Closed End Type	Dimension <i>A<sub>s</sub></i>	kg	Open Ends Type	Closed End Type	Dimension <i>A<sub>c</sub></i>	kg																
85	165	55	325	1 020	960	22	500	230	96	40	M18	UC317	62	133	96.8	13.3	—	—	—	—	UCTU317C-500	UCTU317CD-500	146	65		
	165	55	325	1 120	1 060	22	600	230	96	40	M18	UC317	64	133	96.8	13.3	—	—	—	—	UCTU317C-600	UCTU317CD-600	146	67		
	165	55	325	1 220	1 160	22	700	230	96	40	M18	UC317	67	133	96.8	13.3	—	—	—	—	UCTU317C-700	UCTU317CD-700	146	70		
	165	55	325	1 320	1 260	22	800	230	96	40	M18	UC317	69	133	96.8	13.3	—	—	—	—	UCTU317C-800	UCTU317CD-800	146	72		
	165	55	325	1 420	1 360	22	900	230	96	40	M18	UC317	71	133	96.8	13.3	—	—	—	—	UCTU317C-900	UCTU317CD-900	146	74		
90	170	55	335	1 050	990	22	500	245	96	40	M18	UC318	65	143	107	13.3	—	—	—	—	UCTU318C-500	UCTU318CD-500	150	68		
	170	55	335	1 150	1 090	22	600	245	96	40	M18	UC318	67	143	107	13.3	—	—	—	—	UCTU318C-600	UCTU318CD-600	150	70		
	170	55	335	1 250	1 190	22	700	245	96	40	M18	UC318	70	143	107	13.3	—	—	—	—	UCTU318C-700	UCTU318CD-700	150	73		
	170	55	335	1 350	1 290	22	800	245	96	40	M18	UC318	72	143	107	13.3	—	—	—	—	UCTU318C-800	UCTU318CD-800	150	75		
	170	55	335	1 450	1 390	22	900	245	96	40	M18	UC318	74	143	107	13.3	—	—	—	—	UCTU318C-900	UCTU318CD-900	150	77		

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.

C-1/4-28UNF..... 208~210

C-PT1/8..... 211, 212, 313~318

3. As for the triple-lip seal type product, supplementary code L3 follows the Part No. of unit or bearing.  
 (Example of Part No. : UCTU208JL3-500, UC208L3)

4. The unit should be mounted so that load is applied to the frame mounting surface vertically and downward.

5. If heavy load ( $P_r/C_r > 0.12$ ), vibration, or impact occurs, contact with JTEKT.

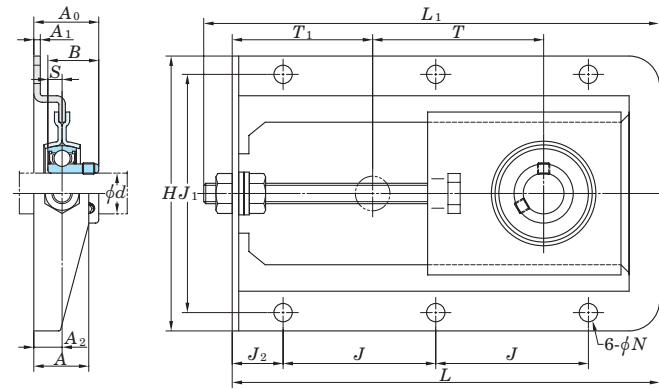
6. Tapered bore (with adapter) type bearing units are also available. (Example of Part No. : UKTU208J-500 + H308X, UK208 + H308X)

7. If frame parts need to be corrosion resistant, contact with JTEKT.

8. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

Pressed steel frame take-up type

SBPTH  
Cylindrical bore (with set screws)  
d 12 ~ 25 mm



Variations of tolerance of distance between centers of bolt holes ( $\Delta J_s, \Delta J_{1s}$ )

Nominal unit code	$\Delta J_s$	$\Delta J_{1s}$
SBPTH201-SBPTH205	$\pm 0.7$	$\pm 0.7$

Unit : mm

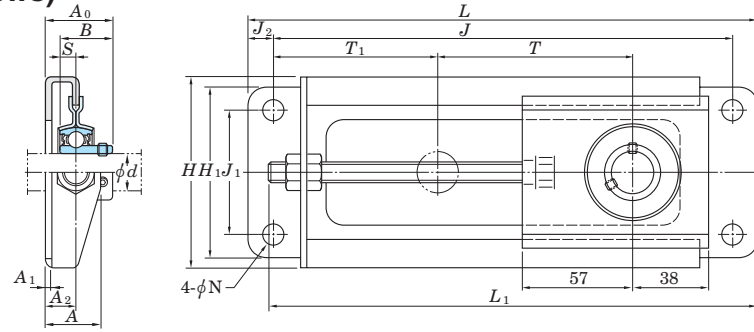
Shaft Dia. mm  d	Dimensions																Bolt Size  inch mm	Unit No.	Bearing No.	Basic Load Ratings		Factor  $f_0$	Mass  kg
	H	L	L <sub>1</sub>	A	J	J <sub>1</sub>	J <sub>2</sub>	N	T	T <sub>1</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>0</sub>	B	S	C <sub>r</sub>				C <sub>0r</sub>			
12	5 5/16	8 9/32	8 21/32	1 1/16	2 61/64	4 39/64	31/32	11/32	3 15/32	2 23/32	1/8	35/64	1 3/16	0.866	0.236	5/16	SBPTH201-90	SB201	9.55	4.80	13.2	0.91	
	135	210	220	27	75	117	25	9	88	69	3.2	13.9	29.9	22	6	M8							
15	5 5/16	8 9/32	8 21/32	1 1/16	2 61/64	4 39/64	31/32	11/32	3 15/32	2 23/32	1/8	35/64	1 3/16	0.866	0.236	5/16	SBPTH202-90	SB202	9.55	4.80	13.2	0.91	
	135	210	220	27	75	117	25	9	88	69	3.2	13.9	29.9	22	6	M8							
17	5 5/16	8 9/32	8 21/32	1 1/16	2 61/64	4 39/64	31/32	11/32	3 15/32	2 23/32	1/8	35/64	1 3/16	0.866	0.236	5/16	SBPTH203-90	SB203	9.55	4.80	13.2	0.91	
	135	210	220	27	75	117	25	9	88	69	3.2	13.9	29.9	22	6	M8							
20	5 5/16	8 9/32	8 21/32	1 1/16	2 61/64	4 39/64	31/32	11/32	3 15/32	2 23/32	1/8	35/64	1 1/4	0.984	0.276	5/16	SBPTH204-90	SB204	12.8	6.65	13.2	0.91	
	135	210	220	27	75	117	25	9	88	69	3.2	13.9	31.9	25	7	M8							
25	5 5/16	8 9/32	8 21/32	1 1/16	2 61/64	4 39/64	31/32	11/32	3 15/32	2 23/32	1/8	35/64	1 5/16	1.063	0.295	5/16	SBPTH205-90	SB205	14.0	7.85	13.9	0.91	
	135	210	220	27	75	117	25	9	88	69	3.2	13.9	33.4	27	7.5	M8							

Remark For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.



Pressed steel frame take-up type

**SBNPTH**  
Cylindrical bore (with set screws)  
 $d$  12 ~ 25 mm



Variations of tolerance of distance between centers of bolt holes ( $\Delta J_s, \Delta J_{1s}$ )

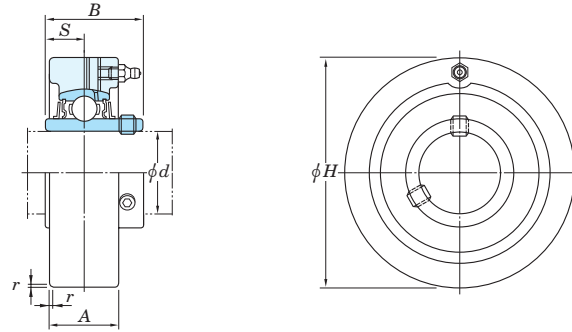
Nominal unit code	$\Delta J_s$	$\Delta J_{1s}$
SBNPTH201-SBNPTH205	$\pm 0.7$	$\pm 0.7$

Unit : mm

Shaft Dia. mm $d$	Dimensions																	Bolt Size	Unit No.	Bearing No.	Basic Load Ratings		Factor $f_0$	Mass kg
	$H$	$H_1$	$L$	$L_1$	$A$	$J$	$J_1$	$J_2$	$N$	$T$	$T_1$	$A_1$	$A_2$	$A_0$	$B$	$S$	$C_r$				$C_{0r}$			
12	$3 \frac{15}{16}$	$3 \frac{17}{32}$	$10 \frac{1}{4}$	$9 \frac{11}{16}$	$1 \frac{1}{16}$	$9 \frac{1}{4}$	$2 \frac{9}{16}$	$\frac{1}{2}$	$\frac{7}{16}$	$3 \frac{15}{16}$	$3 \frac{9}{32}$	$\frac{1}{8}$	$\frac{19}{32}$	$1 \frac{7}{32}$	0.866	0.236	$\frac{5}{16}$	SBNPTH201-100	SB201	9.55	4.80	13.2	0.93	
	100	90	260	246	27	235	65	12.5	11	100	83.5	3.2	15	31	22	6	M8							
15	$3 \frac{15}{16}$	$3 \frac{17}{32}$	$10 \frac{1}{4}$	$9 \frac{11}{16}$	$1 \frac{1}{16}$	$9 \frac{1}{4}$	$2 \frac{9}{16}$	$\frac{1}{2}$	$\frac{7}{16}$	$3 \frac{15}{16}$	$3 \frac{9}{32}$	$\frac{1}{8}$	$\frac{19}{32}$	$1 \frac{7}{32}$	0.866	0.236	$\frac{5}{16}$	SBNPTH202-100	SB202	9.55	4.80	13.2	0.93	
	100	90	260	246	27	235	65	12.5	11	100	83.5	3.2	15	31	22	6	M8							
17	$3 \frac{15}{16}$	$3 \frac{17}{32}$	$10 \frac{1}{4}$	$9 \frac{11}{16}$	$1 \frac{1}{16}$	$9 \frac{1}{4}$	$2 \frac{9}{16}$	$\frac{1}{2}$	$\frac{7}{16}$	$3 \frac{15}{16}$	$3 \frac{9}{32}$	$\frac{1}{8}$	$\frac{19}{32}$	$1 \frac{7}{32}$	0.866	0.236	$\frac{5}{16}$	SBNPTH203-100	SB203	9.55	4.80	13.2	0.93	
	100	90	260	246	27	235	65	12.5	11	100	83.5	3.2	15	31	22	6	M8							
20	$3 \frac{15}{16}$	$3 \frac{17}{32}$	$10 \frac{1}{4}$	$9 \frac{11}{16}$	$1 \frac{1}{16}$	$9 \frac{1}{4}$	$2 \frac{9}{16}$	$\frac{1}{2}$	$\frac{7}{16}$	$3 \frac{15}{16}$	$3 \frac{9}{32}$	$\frac{1}{8}$	$\frac{19}{32}$	$1 \frac{5}{16}$	0.984	0.276	$\frac{5}{16}$	SBNPTH204-100	SB204	12.8	6.65	13.2	0.93	
	100	90	260	246	27	235	65	12.5	11	100	83.5	3.2	15	33	25	7	M8							
25	$3 \frac{15}{16}$	$3 \frac{17}{32}$	$10 \frac{1}{4}$	$9 \frac{11}{16}$	$1 \frac{1}{16}$	$9 \frac{1}{4}$	$2 \frac{9}{16}$	$\frac{1}{2}$	$\frac{7}{16}$	$3 \frac{15}{16}$	$3 \frac{9}{32}$	$\frac{1}{8}$	$\frac{19}{32}$	$1 \frac{11}{32}$	1.063	0.295	$\frac{5}{16}$	SBNPTH205-100	SB205	14.0	7.85	13.9	0.93	
	100	90	260	246	27	235	65	12.5	11	100	83.5	3.2	15	34.5	27	7.5	M8							

Remark For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

**UCC**  
Cylindrical bore (with set screws)  
*d* 12 ~ (45) mm



*d* (45) ~ 90 mm

Variations of tolerance of outside diameter ( $\Delta H_s$ ), variations of tolerance of width ( $\Delta A_s$ ), and tolerance of circumferential runout of outside diameter (Y)

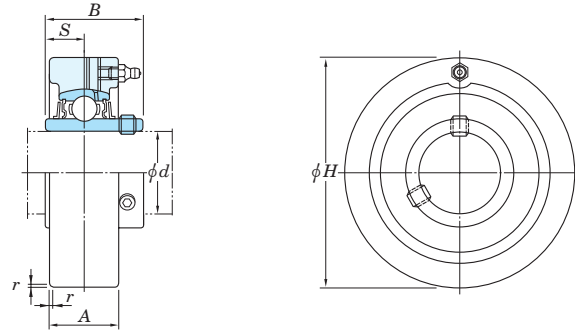
Housing No.		$\Delta H_s$	$\Delta A_s$	Y
C204-C205		0 -0.030	±0.2	0.2
C206-C210	CX05-CX08 C305-C308	0 -0.035		
C211-C213	CX09-CX10 C309-C310	0 -0.040	±0.3	0.3
	C311-C314 C315-C318	0 -0.046		
	C319 C320-C322	0 -0.052		
	C324-C328	0 -0.057		

Shaft Dia. mm inch	Dimensions inch mm					Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor $f_0$	Mass kg	
	<i>d</i>	<i>H</i>	<i>A</i>	<i>r</i>	<i>B</i>				<i>S</i>	$C_r$			$C_{0r}$
12	1/2					UCC201		UC201				0.52	
15	5/8	2.835	25/32	0.06	1.220	0.500	C204	UC201-8	12.8	6.65	13.2	0.50	
17	3/4	72	20	1.5	31	12.7		UC202				UC202-10	0.49
20								UC203				UC204-12	0.47
25	7/8	3.150	55/64	0.06	1.343	0.563	C205	UC205-14	14.0	7.85	13.9	0.64	
	15/16							80				22	1.5
	1	3.543	11/16	0.06	1.500	0.626	CX05	UCX05	19.5	11.3	13.9	1.0	
	1	90	27	1.5	38.1	15.9		UCX05-16				UC305	1.5
30	1 1/8	3.346	11/16	0.06	1.500	0.626	C206	UC206-18	19.5	11.3	13.9	0.81	
	1 3/16							85				27	1.5
	1 1/4	3.937	13/16	0.08	1.689	0.689	CX06	UCX06	25.7	15.4	13.9	1.3	
	1 3/16	100	30	2	42.9	17.5		UCX06-19				UCX06-20	1.3
	1 1/4	3.937	17/64	0.08	1.693	0.669	C306	UC306	26.7	15.0	13.3	1.7	
	1 3/8	100	28	2	43	17		UC306				UC207-20	0.93
35	1 1/4	3.543	17/64	0.08	1.689	0.689	C207	UC207-21	25.7	15.4	13.9	0.93	
	1 5/16							90				28	2
	1 3/8	4.331	1 11/32	0.08	1.937	0.748	CX07	UCX07-22	29.1	17.8	14.0	1.7	
	1 7/16	110	34	2	49.2	19		UCX07				UCX07-23	1.7
	1 7/16	4.331	1 17/64	0.12	1.890	0.748	C307	UC307	33.4	19.3	13.2	2.2	
1 3/8	110	32	3	48	19	UC307		UC208-24				1.2	
40	1 1/2	3.937	1 3/16	0.08	1.937	0.748	C208	UC208-24	29.1	17.8	14.0	1.2	
	1 9/16							100				30	2
	1 1/2	4.724	1 1/2	0.08	1.937	0.748	CX08	UCX08-24	34.1	21.3	14.0	2.3	
1 1/2	120	38	2	49.2	19	UCX08		UC308-24				2.2	
45	1 1/2	4.724	1 11/32	0.12	2.047	0.748	C308	UC308-24	40.7	24.0	13.2	2.2	
	1 3/4							120				34	3
	1 5/8	4.331	1 7/32	0.08	1.937	0.748	C209	UC209-26	34.1	21.3	14.0	1.5	
1 11/16	110	31	2	49.2	19	UC209-27		UC209-28				1.5	
1 3/4							UC209						

Shaft Dia. mm inch	Dimensions inch mm					Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor $f_0$	Mass kg						
	<i>d</i>	<i>H</i>	<i>A</i>	<i>r</i>	<i>B</i>				<i>S</i>	$C_r$			$C_{0r}$					
45	1 3/4	4.724	1 1/2	0.08	2.031	0.748	CX09	UCX09-28	35.1	23.3	14.4	2.3						
	1 3/4	120	38	2	51.6	19		UCX09				UC309-28	2.8					
50	1 7/8	4.724	1 19/64	0.08	2.031	0.748	C210	UC210-30	35.1	23.3	14.4	2.0						
	1 15/16							120				33	2	51.6	19	UC210-31	UC210	2.0
	2	5.118	1 37/64	0.1	2.189	0.874	CX10	UCX10-31	43.4	29.4	14.4	2.8						
	1 15/16							130				40	2.5	55.6	22.2	UCX10-32	UCX10-32	2.8
	2							140				40	3	61	22	UCC310	UC310	3.2
55	2	4.921	1 3/8	0.1	2.189	0.874	C211	UC211-32	43.4	29.4	14.4	2.2						
	2 1/8							125				35	2.5	55.6	22.2	UC211-34	UC211	2.2
	2 3/16	5.906	1 21/32	0.1	2.563	1.000	CX11	UCX11	52.4	36.2	14.4	4.0						
	2 1/4							150				42	2.5	65.1	25.4	UCX11-35	UCX11-36	4.0
	2							150				44	3	66	25	UCC311-32	UCC311	3.9
60	2 1/4	5.118	1 1/2	0.1	2.563	1.000	C212	UC212-36	52.4	36.2	14.4	2.6						
	2 3/8							130				38	2.5	65.1	25.4	UC212-38	UC212-39	2.6
	2 7/16	6.299	1 47/64	0.1	2.563	1.000	CX12	UCX12	57.2	40.1	14.4	4.6						
	2 1/2							160				44	2.5	65.1	25.4	UCX12-39	UCX12-39	4.6
	2 7/16							160				46	3	71	26	UCC312	UC312	4.8
65	2 1/2	5.512	1 37/64	0.1	2.563	1.000	C213	UC213-40	57.2	40.1	14.4	3.0						
	2 1/2							140				40	2.5	65.1	25.4	UC213	UC313-40	5.7
70	2 3/4	7.087	2 3/64	0.12	3.071	1.299	C314	UC314-44	104	68.2	13.2	6.7						
	2 15/16							180				52	3	78	33	UC314	UC315-47	7.8
75	2 15/16	7.480	2 11/64	0.16	3.228	1.260	C315	UC315-47	113	77.2	13.2	7.8						
	3							190				55	4	82	32	UC315	UC315-48	7.8
80	—	7.874	2 23/64	0.16	3.386	1.339	C316	UC316	123	86.7	13.3	9.2						
	—							200				60	4	86	34	UCC316	UC317	11.7
85	—	8.465	2 33/64	0.16	3.780	1.575	C317	UC317	133	96.8	13.3	11.7						
	—							215				64	4	96	40	UCC317	UC318-56	13.1
90	3 1/2	8.858	2 19/32	0.16	3.780	1.575	C318	UC318-56	143	107	13.3	13.1						
	—							225				66	4	96	40	UCC318	UC318	13.1

- Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
 2. Part No. of applicable grease nipples are shown below.  
 A-1/4-28UNF ..... 201-213, X05-X12, 305-308  
 A-PT1/8 ..... 309-328  
 3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (L2) follows the Part No. of unit or bearing. (Example of Part No. : UCC206JL3, UC206L3)  
 4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

**UCC**  
**Cylindrical bore (with set screws)**  
*d* 95 ~ 140 mm



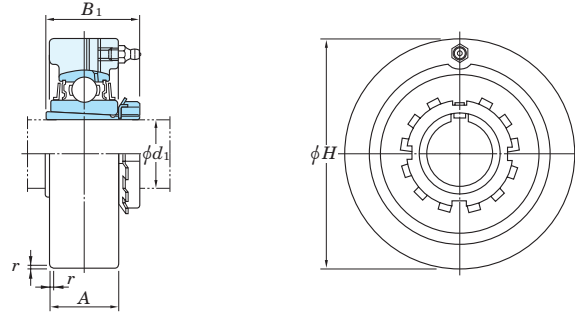
Shaft Dia.		Dimensions					Unit No.	Housing No.	Bearing No.	Basic Load Ratings		Factor	Mass
mm	inch	inch mm								$C_r$	$C_{0r}$		
<i>d</i>		<i>H</i>	<i>A</i>	<i>r</i>	<i>B</i>	<i>S</i>							
95	—	9.449	2 53/64	0.16	4.055	1.614	UCC319	C319	UC319	153	119	13.3	15.8
		240	72	4	103	41							
100	3 15/16 4	10.236	2 61/64	0.16	4.252	1.654	UCC320 UCC320-63 UCC320-64	C320	UC320 UC320-63 UC320-64	173	141	13.2	19.6
		260	75	4	108	42							
		10.236	2 61/64	0.16	4.409	1.732							
105	—	260	75	4	112	44	UCC321	C321	UC321	184	153	13.2	27.0
		11.811	3 5/32	0.2	4.606	1.811							
110	—	300	80	5	117	46	UCC322	C322	UC322	205	180	13.2	29.2
		12.598	3 35/64	0.2	4.961	2.008							
120	—	320	90	5	126	51	UCC324	C324	UC324	207	185	13.5	35.9
		13.386	3 15/16	0.24	5.315	2.126							
130	—	340	100	6	135	54	UCC326	C326	UC326	229	214	13.6	43.0
		14.173	3 15/16	0.24	5.709	2.323							
140	—	360	100	6	145	59	UCC328	C328	UC328	253	246	13.6	52.9

- Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
 2. Part No. of applicable grease nipples are shown below.  
 A-1/4-28UNF ..... 201~213, X05~X12, 305~308  
 A-PT1/8 ..... 309~328  
 3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (L2) follows the Part No. of unit or bearing. (Example of Part No. : UCC206JL3, UC206L3)  
 4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.

Variations of tolerance of outside diameter ( $\Delta H_s$ ), variations of tolerance of width ( $\Delta A_s$ ), and tolerance of circumferential runout of outside diameter (Y)

Housing No.			$\Delta H_s$	$\Delta A_s$	Y
C204-C205			0 -0.030	±0.2	0.2
C206-C210	CX05-CX08	C305-C308	0 -0.035		
C211-C213	CX09-CX10 CX11-CX12	C309-C310	0	±0.3	0.3
		C311-C314	-0.040		
		C315-C318	0		
		C319	-0.046	±0.3	0.4
		C320-C322	0 -0.052		
C324-C328			0 -0.057		

**UKC**  
**Tapered bore (with adapter)**  
 $d_1$  20 ~ 45 mm



Shaft Dia. mm inch	Dimensions inch mm				Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor $f_0$	Adapter <sup>1)</sup> assembly No.	Mass <sup>1)</sup> kg
	$d_1$	H	A	r				$B_1^{1)}$	$C_r$			
20	3/4	3.150 80	55/64 22	0.06 1.5	1 5/32(1 3/8) 29(35)	UKC205	C205	UK205	14.0 7.85	13.9	HE305X(HE2305X) H305X(H2305X)	0.68(0.70)
	3/4	3.543 90	11/16 27	0.06 1.5	1 3/8 35	UKCX05	CX05	UKX05	19.5 11.3	13.9	HE2305X H2305X	0.99
	3/4	3.543 90	11/32 26	0.08 2	1 3/8 35	UKC305	C305	UK305	21.2 10.9	12.6	HE2305X H2305X	1.6
25	1	3.346 85	11/16 27	0.06 1.5	1 7/32(1 1/2) 31(38)	UKC206	C206	UK206	19.5 11.3	13.9	H306X(H2306X) HE306X(HE2306X)	0.85(0.89)
	1	3.937 100	13/16 30	0.08 2	1 1/2 38	UKCX06	CX06	UKX06	25.7 15.4	13.9	H2306X HE2306X	1.3
	1	3.937 100	13/16 28	0.08 2	1 1/2 38	UKC306	C306	UK306	26.7 15.0	13.3	H2306X HE2306X	1.8
30	1 1/8	3.543 90	17/64 28	0.08 2	1 3/8(1 11/16) 35(43)	UKC207	C207	UK207	25.7 15.4	13.9	HS307X(HS2307X) H307X(H2307X)	0.97(1.0)
	1 1/8	4.331 110	1 11/32 34	0.08 2	1 11/16 43	UKCX07	CX07	UKX07	29.1 17.8	14.0	HS2307X H2307X	1.7
	1 1/8	4.331 110	1 17/64 32	0.12 3	1 11/16 43	UKC307	C307	UK307	33.4 19.3	13.2	HS2307X H2307X	2.2
35	1 1/4	3.937 100	1 3/16 30	0.08 2	1 13/32(1 13/16) 36(46)	UKC208	C208	UK208	29.1 17.8	14.0	HE308X(HE2308X) HS308X(HS2308X) H308X(H2308X)	1.3(1.4)
	1 1/4	4.724 120	1 1/2 38	0.08 2	1 13/16 46	UKCX08	CX08	UKX08	34.1 21.3	14.0	HE2308X HS2308X H2308X	2.3
	1 1/4	4.724 120	1 11/32 34	0.12 3	1 13/16 46	UKC308	C308	UK308	40.7 24.0	13.2	HE2308X HS2308X H2308X	2.2
40	1 1/2	4.331 110	1 7/32 31	0.08 2	1 17/32(1 31/32) 39(50)	UKC209	C209	UK209	34.1 21.3	14.0	HE309X(H2309X) H309X(H2309X) HS309X(H2309X)	1.6(1.7)
	1 1/2	4.724 120	1 1/2 38	0.08 2	1 31/32 50	UKCX09	CX09	UKX09	35.1 23.3	14.4	HE2309X H2309X HS2309X	2.3
	1 1/2	5.118 130	1 1/2 38	0.12 3	1 31/32 50	UKC309	C309	UK309	48.9 29.5	13.3	HE2309X H2309X HS2309X	2.8
45	1 3/4	4.724 120	1 19/64 33	0.08 2	1 21/32(2 5/32) 42(55)	UKC210	C210	UK210	35.1 23.3	14.4	HE310X(HE2310X) H310X(H2310X)	2.0(2.1)
	1 3/4	5.118 130	1 37/64 40	0.1 2.5	2 5/32 55	UKCX10	CX10	UKX10	43.4 29.4	14.4	HE2310X H2310X	2.8
	1 3/4	5.512 140	1 37/64 40	0.12 3	2 5/32 55	UKC310	C310	UK310	62.0 38.3	13.2	HE2310X H2310X	3.2

Note 1) Numerals shown in parentheses indicate the dimensions, Part No. of applicable adapters (H2300X series), and the unit weight of UK200L3 series (triple-lip seal type).

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)

2. Part No. of applicable grease nipples are shown below.

A-1/4-28UNF..... 205-213, X05-X12, 305-308

A-PT1/8..... 309-328

3. In Part No. of unit with adapters and bearing with adapters, Part No. of applicable adapter follow the Part No. shown in the dimensional tables. (Example of Part No. : UKC206J + H306X, UK206 + H306X)

4. As for the triple-lip seal type product (205 is the double-lip seal type product), supplementary code L3 (or L2) follows the Part No. of unit or bearing. (Example of Part No. : UKC206JL3 + H2306X, UK206L3 + H2306X)

5. As for the dimensions and forms of applicable bearings and adapters, see the dimensional tables of ball bearing for unit and adapter assemblies.

$d_1$  50 ~ 125 mm

Variations of tolerance of outside diameter ( $\Delta H_s$ ), variations of tolerance of width ( $\Delta A_s$ ), and tolerance of circumferential runout of outside diameter (Y)

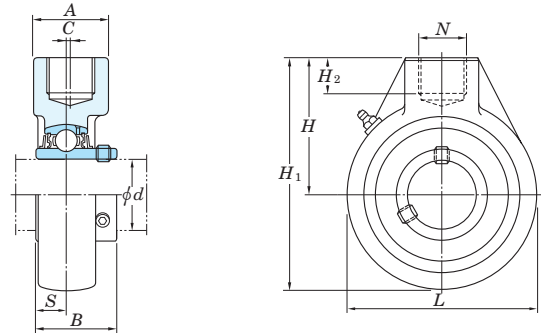
Housing No.		$\Delta H_s$	$\Delta A_s$	Y
C205		0 -0.030	±0.2	0.2
C206-C210	CX05-CX08	0 -0.035		
C211-C213	C305-C308	0	±0.3	0.3
	C309-C310	0		
	C311-C314	-0.040		
	C315-C318	0		
C319	C319	-0.046	±0.3	0.4
	C320-C322	0 -0.052		
	C324-C328	0 -0.057		

Unit : mm

Shaft Dia. mm inch	Dimensions inch mm				Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor $f_0$	Adapter <sup>1)</sup> assembly No.	Mass <sup>1)</sup> kg
	$d_1$	H	A	r				$B_1^{1)}$	$C_r$			
50	1 7/8	4.921 125	1 3/8 35	0.1 2.5	1 25/32(2 5/16) 45(59)	UKC211	C211	UK211	43.4 29.4	14.4	HS311X(HS2311X) H311X(H2311X) HE311X(HE2311X)	2.3(2.6)
	2	5.906 150	1 21/32 42	0.1 2.5	2 5/16 59	UKCX11	CX11	UKX11	52.4 36.2	14.4	HS2311X H2311X HE2311X	3.8
55	1 7/8	5.906 150	1 47/64 44	0.12 3	2 5/16 59	UKC311	C311	UK311	71.6 45.0	13.2	HS2311X H2311X HE2311X	4.1
	2	5.906 150	1 47/64 44	0.12 3	2 5/16 59	UKC311	C311	UK311	71.6 45.0	13.2	HS2311X H2311X HE2311X	4.1
60	2 1/8	5.118 130	1 1/2 38	0.1 2.5	1 27/32(2 7/16) 47(62)	UKC212	C212	UK212	52.4 36.2	14.4	HS312X(HS2312X) H312X(H2312X)	2.5(2.9)
	2 1/8	6.299 160	1 47/64 44	0.1 2.5	2 7/16 62	UKCX12	CX12	UKX12	57.2 40.1	14.4	HS2312X H2312X	4.4
	2 1/8	6.299 160	1 13/16 46	0.12 3	2 7/16 62	UKC312	C312	UK312	81.9 52.2	13.2	HS2312X H2312X	4.7
65	2 1/4	5.512 140	1 37/64 40	0.1 2.5	1 31/32(2 9/16) 50(65)	UKC213	C213	UK213	57.2 40.1	14.4	HE313X(HE2313X) H313X(H2313X) HS313X(HS2313X)	3.0(3.3)
	2 3/8	6.693 170	1 31/32 50	0.12 3	2 9/16 65	UKC313	C313	UK313	92.7 59.9	13.2	HE2313X H2313X HS2313X	5.8
	2 1/2	7.480 190	2 11/64 55	0.16 4	2 7/8 73	UKC315	C315	UK315	113 77.2	13.2	HE2315X H2315X	8.0
70	2 3/4	7.874 200	2 23/64 60	0.16 4	3 1/16 78	UKC316	C316	UK316	123 86.7	13.3	HE2316X H2316X	9.2
75	3	8.465 215	2 39/64 64	0.16 4	3 7/32 82	UKC317	C317	UK317	133 96.8	13.3	H2317X HE2317X	11.6
80	-	8.858 225	2 19/32 66	0.16 4	3 3/8 86	UKC318	C318	UK318	143 107	13.3	H2318X	13.1
85	3 1/4	9.449 240	2 53/64 72	0.16 4	3 17/32 90	UKC319	C319	UK319	153 119	13.3	HE2319X H2319X	16.1
90	3 1/2	10.236 260	2 61/64 75	0.16 4	3 13/16 97	UKC320	C320	UK320	173 141	13.2	HE2320X H2320X	19.2
100	4	11.811 300	3 3/32 80	0.2 5	4 1/8 105	UKC322	C322	UK322	205 180	13.2	H2322X HE2322X	29.1
110	-	12.598 320	3 35/64 90	0.2 5	4 13/32 112	UKC324	C324	UK324	207 185	13.5	H2324	36.2
115	4 1/2	13.386 340	3 19/16 100	0.24 6	4 3/4 121	UKC326	C326	UK326	229 214	13.6	HE2326 H2326	42.8
125	-	14.173 360	3 15/16 100	0.24 6	5 5/32 131	UKC328	C328	UK328	253 246	13.6	H2328	52.9

Hanger type

**UCHA**  
Cylindrical bore (with set screws)  
d 12 ~ 75 mm



Shaft Dia. mm inch  d	Dimensions inch mm										Unit No.	Housing No.	Bearing No.	Basic Load Ratings kN		Factor f <sub>0</sub>	Mass kg
	H	A	L	H <sub>1</sub>	H <sub>2</sub>	N	C	B	S	C <sub>r</sub>				C <sub>0r</sub>			
12 1/2											UCHA201 UCHA201-8 UCHA202 UCHA202-10 UCHA203 UCHA204-12 UCHA204	HA204	UC201 UC201-8 UC202 UC202-10 UC203 UC204-12 UC204	12.8	6.65	13.2	0.77 0.75 0.74 0.72
15 5/8	2 17/32	1 9/16	2 17/32	3 25/32	3/4	PF 3/4	—	1.220	0.500								
17 3/4	64	40	64	96	19	PF 3/4	—	31	12.7								
20											UCHA205-14 UCHA205-15 UCHA205 UCHA205-16 UCHA206-18 UCHA206 UCHA206-19 UCHA206-20	HA205	UC205-14 UC205-15 UC205 UC205-16 UC206-18 UC206 UC206-19 UC206-20	14.0	7.85	13.9	0.87
25 7/8 15/16	2 17/32	1 9/16	3 1/16	4 1/16	3/4	PF 3/4	—	1.343	0.563								
25	64	40	78	103	19	PF 3/4	—	34.1	14.3								
30 1 1/8	2 17/32	1 9/16	3 1/16	4 1/16	3/4	PF 3/4	—	1.500	0.626								
30	64	40	78	103	19	PF 3/4	—	38.1	15.9								
35 1 1/4 1 5/16 1 3/8	2 3/4	1 9/16	3 5/8	4 9/16	3/4	PF 3/4	—	1.689	0.689								
35	70	40	92	116	19	PF 3/4	—	42.9	17.5								
40 1 1/2 1 9/16	2 7/8	1 9/16	3 25/32	4 3/4	3/4	PF 3/4	5/64	1.937	0.748								
40	73	40	96	121	19	PF 3/4	2	49.2	19								
45 1 5/8 1 11/16 1 3/4	3 7/32	1 7/8	4 1/4	5 11/32	13/16	PF 1	13/64	1.937	0.748								
45	82	48	108	136	21	PF 1	5	49.2	19								
50 1 7/8 1 15/16	3 9/32	1 7/8	4 21/32	5 19/32	13/16	PF 1	13/64	2.031	0.748								
50	83	48	118	142	21	PF 1	5	51.6	19								
55 2 2 1/8 2 3/16	3 7/16	2 3/8	4 31/32	5 29/32	31/32	PF 1 1/4	9/32	2.189	0.874								
55	87	60	126	150	25	PF 1 1/4	7	55.6	22.2								
60 2 1/4 2 3/8 2 7/16	4 1/32	2 3/8	5 19/32	6 13/16	1 3/32	PF 1 1/4	23/64	2.563	1.000								
60	102	60	142	173	28	PF 1 1/4	9	65.1	25.4								
65 2 1/2	4 19/32	2 3/4	6 17/32	7 7/8	1 1/4	PF 1 1/2	3/8	2.563	1.000								
65	117	70	166	200	32	PF 1 1/2	9.5	65.1	25.4								
70 2 3/4	4 19/32	2 3/4	6 17/32	7 7/8	1 1/4	PF 1 1/2	3/8	2.937	1.189								
70	117	70	166	200	32	PF 1 1/2	9.5	74.6	30.2								
75 2 15/16 3	4 19/32	2 3/4	6 17/32	7 7/8	1 1/4	PF 1 1/2	3/8	3.063	1.311								
75	117	70	166	200	32	PF 1 1/2	9.5	77.8	33.3								

Remarks 1. In Part No. of unit and units with covers, fitting codes follow bore diameter numbers. (See Table 10.5 in P.51.)  
 2. Part No. of applicable grease nipples are shown below.  
 A-1/4-28UNF..... 201~210  
 A-PT1/8..... 211~215

3. As for the triple-lip seal type product (from 201 to 205 are the double-lip seal type products), supplementary code L3 (or L2) follows the Part No. of unit or bearing. (Example of Part No.: UCHA206JL3, UC206L3)  
 4. For the dimensions and forms of applicable bearings, see the dimensional tables of ball bearing for unit.  
 5. Tapered bore (with adapter) type products are also available. (Example of Part No.: UKHA205J + H305X, UK205 + H305X)

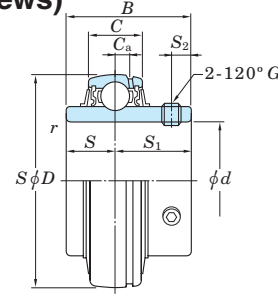




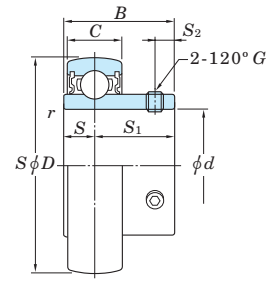




**UC-S6, SU-S6 (Stainless-series)**  
**Cylindrical bore (with set screws)**  
*d* 10 ~ 50 mm



UC-S6



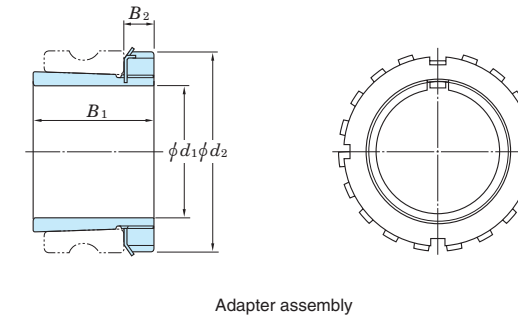
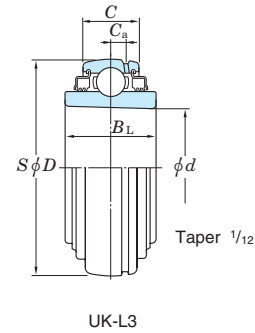
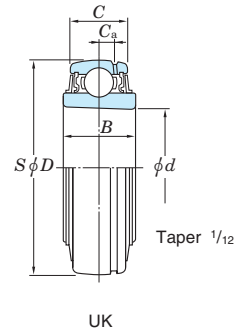
SU-S6

Shaft Dia. mm <i>d</i>	Dimensions							Basic Load Ratings kN		Factor <i>f</i> <sub>0</sub>	Bearing No.	Dimensions						Set Screw Dia. <i>G</i>	Mass kg			
	<i>D</i>		<i>B</i>		<i>C</i>		<i>r</i> (min.)		<i>C</i> <sub>r</sub>			<i>C</i> <sub>0r</sub>	<i>C</i> <sub>a</sub>	<i>S</i>		<i>S</i> <sub>1</sub>				<i>S</i> <sub>2</sub>		
	mm	inch	mm	inch	mm	inch	mm	inch						mm	inch	mm	inch			mm	inch	mm
10	26	1.024	15	0.591	8	0.315	0.3	0.012	3.9	1.55	12.3	SU000S6	—	—	5	0.197	10	0.394	3	0.118	M3×0.35	0.024
12	28	1.102	15	0.591	8	0.315	0.3	0.012	4.3	1.9	13.2	SU001S6	—	—	5	0.197	10	0.394	3	0.118	M3×0.35	0.026
15	32	1.260	16.5	0.650	9	0.354	0.3	0.012	4.7	2.25	13.9	SU002S6	—	—	5.5	0.217	11	0.433	3.3	0.130	M4×0.5	0.038
17	35	1.378	17.5	0.689	10	0.394	0.3	0.012	5.1	2.6	14.4	SU003S6	—	—	6	0.236	11.5	0.453	3.3	0.130	M4×0.5	0.050
20	42	1.654	21	0.827	12	0.472	0.6	0.024	7.9	4	13.9	SU004S6	—	—	7	0.276	14	0.551	4	0.157	M5×0.5	0.080
	47	1.850	31	1.220	16	0.630	1	0.039	10.9	5.35	13.2	UC204S6	4	0.158	12.7	0.500	18.3	0.720	5	0.197	M6×0.75	0.16
25	47	1.850	22	0.866	12	0.472	0.6	0.024	8.5	4.65	14.5	SU005S6	—	—	7	0.276	15	0.591	4.5	0.177	M5×0.5	0.10
	52	2.047	34.1	1.343	17	0.669	1	0.039	11.9	6.3	13.9	UC205S6	5	0.197	14.3	0.563	19.8	0.780	5.5	0.217	M6×0.75	0.20
30	55	2.165	24.5	0.965	13	0.512	1	0.039	11.2	6.6	14.7	SU006S6	—	—	7.5	0.295	17	0.669	5.5	0.217	M5×0.5	0.15
	62	2.441	38.1	1.500	19	0.748	1	0.039	16.5	9.05	13.9	UC206S6	5	0.197	15.9	0.626	22.2	0.874	6	0.236	M6×0.75	0.32
35	72	2.835	42.9	1.689	20	0.787	1.1	0.043	21.8	12.3	13.9	UC207S6	5.5	0.217	17.5	0.689	25.4	1.000	6.5	0.256	M8×1	0.48
40	80	3.150	49.2	1.937	21	0.827	1.1	0.043	24.8	14.3	14.0	UC208S6	6	0.236	19	0.748	30.2	1.189	8	0.315	M8×1	0.64
45	85	3.346	49.2	1.937	22	0.866	1.1	0.043	27.8	16.2	14.0	UC209S6	6	0.236	19	0.748	30.2	1.189	8	0.315	M8×1	0.68
50	90	3.543	51.6	2.031	24	0.945	1.1	0.043	29.8	18.6	14.4	UC210S6	6	0.236	19	0.748	32.6	1.283	8	0.315	M8×1	0.80



Ball bearings for units

UK  
Tapered bore (with adapter)  
d<sub>1</sub> 20 ~ (50) mm



Shaft Dia. mm inch	Dimensions inch mm							Basic Load Ratings kN		Factor f <sub>0</sub>	Bearing				Adapter assembly No.	H3 Series Adapter			Sleeve No.	H23 Series Adapter			Sleeve No.			
	d <sub>1</sub>	d	D	B	B <sub>L</sub>	C	C <sub>a</sub>	C <sub>r</sub>	C <sub>0r</sub>		No.		Mass kg			Dimensions inch mm				Dimensions inch mm				Mass kg		
											Standard	L3 Type	Standard	L3 Type		B <sub>1</sub>	B <sub>2</sub>	d <sub>2</sub>		B <sub>1</sub>	B <sub>2</sub>	d <sub>2</sub>				
20	3/4	0.984 25	2.047 52	0.827 21	0.945 24	0.669 17	0.197 5	14.0	7.85	13.9	UK205	UK205L2	0.16	0.18	HE305X H305X	1.142 29	0.315 8	1.496 38	0.075	AE305X A305X	HE2305X H2305X	1.378 35	0.315 8	1.496 38	0.095	AE2305X A2305X
	3/4	0.984 25	2.441 62	0.906 23	-	0.748 19	0.197 5	19.5	11.3	13.9	UKX05	-	0.27	-	-	-	-	-	-	-	HE2305X H2305X	1.378 35	0.315 8	1.496 38	0.095	AE2305X A2305X
	3/4	0.984 25	2.441 62	1.063 27	-	0.866 22	0.236 6	21.2	10.9	12.6	UK305	-	0.40	-	-	-	-	-	-	-	HE2305X H2305X	1.378 35	0.315 8	1.496 38	0.095	AE2305X A2305X
25	1	1.181 30	2.441 62	0.906 23	1.063 27	0.748 19	0.197 5	19.5	11.3	13.9	UK206	UK206L3	0.25	0.29	H306X HE306X	1.220 31	0.315 8	1.772 45	0.11	A306X AE306X	H2306X HE2306X	1.496 38	0.315 8	1.772 45	0.13	A2306X HE2306X
	1	1.181 30	2.835 72	1.024 26	-	0.787 20	0.217 5.5	25.7	15.4	13.9	UKX06	-	0.43	-	-	-	-	-	-	-	H2306X HE2306X	1.496 38	0.315 8	1.772 45	0.13	A2306X HE2306X
	1	1.181 30	2.835 72	1.181 30	-	0.945 24	0.256 6.5	26.7	15.0	13.3	UK306	-	0.47	-	-	-	-	-	-	-	H2306X HE2306X	1.496 38	0.315 8	1.772 45	0.13	A2306X HE2306X
30	1 1/8	1.378 35	2.835 72	1.024 26	1.181 30	0.787 20	0.217 5.5	25.7	15.4	13.9	UK207	UK207L3	0.37	0.43	HS307X H307X	1.378 35	0.354 9	2.047 52	0.14	AS307X A307X	HS2307X H2307X	1.693 43	0.354 9	2.047 52	0.17	AS2307X A2307X
	1 1/8	1.378 35	3.150 80	1.063 27	-	0.827 21	0.236 6	29.1	17.8	14.0	UKX07	-	0.53	-	-	-	-	-	-	-	HS2307X H2307X	1.693 43	0.354 9	2.047 52	0.17	AS2307X A2307X
	1 1/8	1.378 35	3.150 80	1.299 33	1.299 33	1.024 26	0.295 7.5	33.4	19.3	13.2	UK307	UK307L3	0.60	0.60	-	-	-	-	-	-	HS2307X H2307X	1.693 43	0.354 9	2.047 52	0.17	AS2307X A2307X
35	1 1/4	1.575 40	3.150 80	1.063 27	1.339 34	0.827 21	0.236 6	29.1	17.8	14.0	UK208	UK208L3	0.47	0.58	HE308X HS308X H308X	1.417 36	0.394 10	2.283 58	0.19	AE308X AS308X A308X	HE2308X HS2308X H2308X	1.811 46	0.394 10	2.283 58	0.22	AE2308X AS2308X A2308X
	1 1/4	1.575 40	3.346 85	1.142 29	-	0.866 22	0.236 6	34.1	21.3	14.0	UKX08	-	0.58	-	-	-	-	-	-	-	HE2308X HS2308X H2308X	1.811 46	0.394 10	2.283 58	0.22	AE2308X AS2308X A2308X
	1 1/4	1.575 40	3.543 90	1.378 35	1.378 35	1.102 28	0.315 8	40.7	24.0	13.2	UK308	UK308L3	0.80	0.80	-	-	-	-	-	-	HE2308X HS2308X H2308X	1.811 46	0.394 10	2.283 58	0.22	AE2308X AS2308X A2308X
40	1 1/2	1.772 45	3.346 85	1.142 29	1.417 36	0.866 22	0.236 6	34.1	21.3	14.0	UK209	UK209L3	0.52	0.65	HE309X H309X HS309X	1.535 39	0.433 11	2.559 65	0.25	AE309X A309X AS309X	HE2309X H2309X HS2309X	1.969 50	0.433 11	2.559 65	0.28	AE2309X A2309X AS2309X
	1 1/2	1.772 45	3.543 90	1.142 29	-	0.945 24	0.236 6	35.1	23.3	14.4	UKX09	-	0.67	-	-	-	-	-	-	-	HE2309X H2309X HS2309X	1.969 50	0.433 11	2.559 65	0.28	AE2309X A2309X AS2309X
	1 1/2	1.772 45	3.937 100	1.496 38	1.496 38	1.181 30	0.335 8.5	48.9	29.5	13.3	UK309	UK309L3	1.08	1.08	-	-	-	-	-	-	HE2309X H2309X HS2309X	1.969 50	0.433 11	2.559 65	0.28	AE2309X A2309X AS2309X
45	1 3/4	1.969 50	3.543 90	1.142 29	1.417 36	0.945 24	0.236 6	35.1	23.3	14.4	UK210	UK210L3	0.59	0.65	HE310X H310X	1.654 42	0.472 12	2.756 70	0.30	AE310X A310X	HE2310X H2310X	2.165 55	0.472 12	2.756 70	0.36	AE2310X A2310X
	1 3/4	1.969 50	3.937 100	1.220 31	-	0.984 25	0.276 7	43.4	29.4	14.4	UKX10	-	0.89	-	-	-	-	-	-	-	HE2310X H2310X	2.165 55	0.472 12	2.756 70	0.36	AE2310X A2310X
	1 3/4	1.969 50	4.331 110	1.575 40	1.575 40	1.260 32	0.354 9	62.0	38.3	13.2	UK310	UK310L3	1.38	1.38	-	-	-	-	-	-	HE2310X H2310X	2.165 55	0.472 12	2.756 70	0.36	AE2310X A2310X
50	1 7/8	2.165 55	3.937 100	1.220 31	1.575 40	0.984 25	0.276 7	43.4	29.4	14.4	UK211	UK211L3	0.80	1.09	HS311X H311X HE311X	1.772 45	0.472 12	2.953 75	0.35	AS311X A311X AE311X	HS2311X H2311X HE2311X	2.323 59	0.472 12	2.953 75	0.42	AS2311X A2311X AE2311X

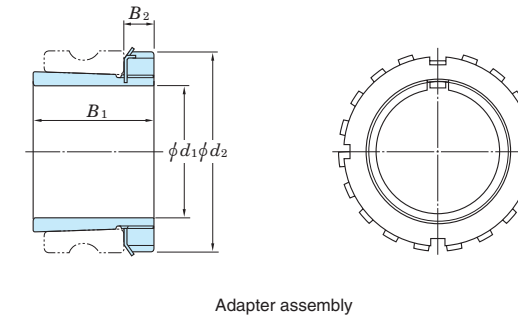
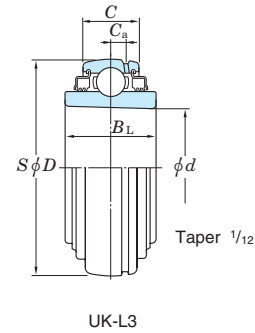
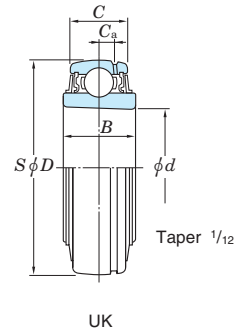
Remarks 1. In Part No. of unit with adapters, Part No. of applicable adapters follow the Part No. shown in the dimensional tables.  
(Example of Part No. : UK206 + H306X, UK206L3 + H2306X)

2. Adapter series applicable to UK200 series  
UK200..... H300X series  
UK200L3 (or L2) ..... H2300X series  
3. UK205 is the double-lip seal type product (L2).  
4. Inch bore diameter series adapters are also available (see the dimensional tables of adapter assemblies).



Ball bearings for units

UK  
Tapered bore (with adapter)  
d<sub>1</sub> (50) ~ 85 mm

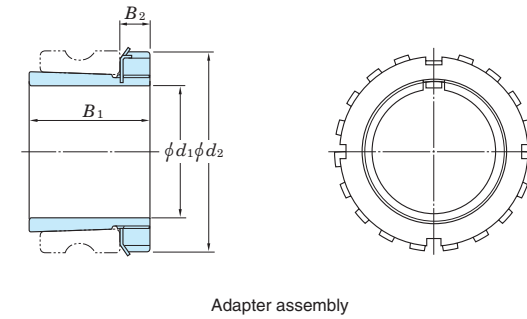
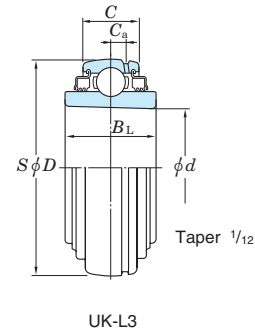
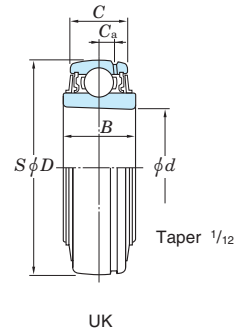


Shaft Dia. mm inch	Dimensions inch mm						Basic Load Ratings kN		Factor f <sub>0</sub>	Bearing				Adapter assembly No.	H3 Series Adapter			Sleeve No.	H23 Series Adapter			Sleeve No.		
	d <sub>1</sub>	d	D	B	B <sub>L</sub>	C	C <sub>a</sub>	C <sub>r</sub>		C <sub>0r</sub>	No.	Mass kg	Standard		L3 Type	Standard	L3 Type		Dimensions inch mm	Mass kg	Adapter assembly No.		Dimensions inch mm	Mass kg
50	1 7/8 2	2.165 55	4.331 110	1.299 33	— —	1.063 27	0.295 7.5	52.4	36.2	14.4	UKX11	—	1.15	—	—	—	—	—	HS2311X H2311X HE2311X	2.323 59	0.472 12	2.953 75	0.42	AS2311X A2311X AE2311X
	1 7/8 2	2.165 55	4.724 120	1.693 43	1.693 43	1.339 34	0.394 10	71.6	45.0	13.2	UK311	UK311L3	1.78	1.78	—	—	—	—	HS2311X H2311X HE2311X	2.323 59	0.472 12	2.953 75	0.42	AS2311X A2311X AE2311X
55	2 1/8 60	2.362 60	4.331 110	1.299 33	1.850 47	1.063 27	0.295 7.5	52.4	36.2	14.4	UK212	UK212L3	1.02	1.41	—	—	0.43	AS312X A312X	HS2312X H2312X	2.441 62	0.512 13	3.150 80	0.48	AS2312X A2312X
	2 1/8 60	2.362 60	4.724 120	1.417 36	—	1.102 28	0.295 7.5	57.2	40.1	14.4	UKX12	—	1.45	—	—	—	—	—	HS2312X H2312X	2.441 62	0.512 13	3.150 80	0.48	AS2312X A2312X
	2 1/8 60	2.362 60	5.118 130	1.850 47	1.850 47	1.417 36	0.453 11.5	81.9	52.2	13.2	UK312	UK312L3	2.06	2.06	—	—	—	—	HS2312X H2312X	2.441 62	0.512 13	3.150 80	0.48	AS2312X A2312X
60	2 1/4 65	2.559 65	4.724 120	1.417 36	1.850 47	1.102 28	0.295 7.5	57.2	40.1	14.4	UK213	UK213L3	1.34	1.67	—	—	0.46	AE313X A313X AS313X	HE2313X H2313X HS2313X	2.559 65	0.551 14	3.346 85	0.56	AE2313X A2313X AS2313X
	2 1/4 65	2.559 65	4.921 125	1.575 40	—	1.181 30	0.354 9	62.2	44.1	14.5	UKX13	—	1.62	—	—	—	—	—	HE2313X H2313X HS2313X	2.559 65	0.551 14	3.346 85	0.56	AE2313X A2313X AS2313X
	2 1/4 65	2.559 65	5.512 140	1.929 49	1.929 49	1.496 38	0.472 12	92.7	59.9	13.2	UK313	UK313L3	2.71	2.71	—	—	—	—	HE2313X H2313X HS2313X	2.559 65	0.551 14	3.346 85	0.56	AE2313X A2313X AS2313X
	2 3/8 65	2.953 75	5.118 130	1.575 40	2.008 51	1.260 32	0.354 9	67.4	48.3	14.5	UK215	UK215L3	1.50	1.99	—	—	0.83	AE315X A315X	HE2315X H2315X	2.874 73	0.591 15	3.858 98	1.05	AE2315X A2315X
65	2 1/2 75	2.953 75	5.512 140	1.654 42	—	1.299 33	0.354 9	72.7	53.0	14.6	UKX15	—	2.10	—	—	—	—	—	HE2315X H2315X	2.874 73	0.591 15	3.858 98	1.05	AE2315X A2315X
	2 1/2 75	2.953 75	6.299 160	2.165 55	2.165 55	1.654 42	0.571 14.5	113	77.2	13.2	UK315	UK315L3	3.80	3.80	—	—	—	—	HE2315X H2315X	2.874 73	0.591 15	3.858 98	1.05	AE2315X A2315X
	2 3/4 80	3.150 80	5.512 140	1.654 42	2.165 55	1.299 33	0.354 9	72.7	53.0	14.6	UK216	UK216L3	1.96	2.56	—	—	1.05	AE316X A316X	HE2316X H2316X	3.071 78	0.669 17	4.134 105	1.3	AE2316X A2316X
70	2 3/4 80	3.150 80	5.906 150	1.732 44	—	1.378 35	0.394 10	84.0	61.9	14.5	UKX16	—	2.64	—	—	—	—	—	HE2316X H2316X	3.071 78	0.669 17	4.134 105	1.3	AE2316X A2316X
	2 3/4 80	3.150 80	6.693 170	2.165 55	2.165 55	1.732 44	0.591 15	123	86.7	13.3	UK316	UK316L3	4.39	4.39	—	—	—	—	HE2316X H2316X	3.071 78	0.669 17	4.134 105	1.3	AE2316X A2316X
	3 85	3.346 85	5.906 150	1.732 44	2.244 57	1.378 35	0.394 10	84.0	61.9	14.5	UK217	UK217L3	2.42	3.10	—	—	1.2	A317X AE317X	H2317X	3.228 82	0.709 18	4.331 110	1.45	A2317X
75	3 85	3.346 85	6.299 160	1.890 48	—	1.496 38	0.433 11	96.1	71.5	14.5	UKX17	—	3.25	—	—	—	—	—	H2317X HE2317X	3.228 82	0.709 18	4.331 110	1.45	A2317X AE2317X
	3 85	3.346 85	7.087 180	2.362 60	2.362 60	1.811 46	0.591 15	133	96.8	13.3	UK317	UK317L3	5.30	5.30	—	—	—	—	H2317X HE2317X	3.228 82	0.709 18	4.331 110	1.45	A2317X AE2317X
	3 85	3.543 90	6.299 160	1.890 48	2.480 63	1.496 38	0.433 11	96.1	71.5	14.5	UK218	UK218L3	2.90	3.77	—	—	1.4	A318X	H2318X	3.386 86	0.709 18	4.724 120	1.7	A2318X
80	— 90	3.543 90	6.693 170	1.969 50	—	1.575 40	0.453 11.5	109	81.9	14.4	UKX18	—	3.80	—	—	—	—	—	H2318X	3.386 86	0.709 18	4.724 120	1.7	A2318X
	— 90	3.543 90	7.480 190	2.362 60	2.362 60	1.890 48	0.610 15.5	143	107	13.3	UK318	UK318L3	6.20	6.20	—	—	—	—	H2318X	3.386 86	0.709 18	4.724 120	1.7	A2318X
	3 1/4 95	3.740 95	7.874 200	2.598 66	2.598 66	1.969 50	0.650 16.5	153	119	13.3	UK319	UK319L3	7.31	7.31	—	—	—	—	H2319X	3.543 90	0.748 19	4.921 125	1.95	A2319X

Remarks 1. In Part No. of unit with adapters, Part No. of applicable adapters follow the Part No. shown in the dimensional tables.  
(Example of Part No. : UK206 + H306X, UK206L3 + H2306X)

2. Adapter series applicable to UK200 series  
UK200..... H300X series  
UK200L3 (or L2)..... H2300X series  
3. UK205 is the double-lip seal type product (L2).  
4. Inch bore diameter series adapters are also available (see the dimensional tables of adapter assemblies).

**UK**  
**Tapered bore (with adapter)**  
 $d_1$  90 ~ 125 mm

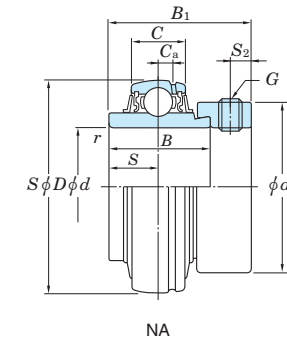
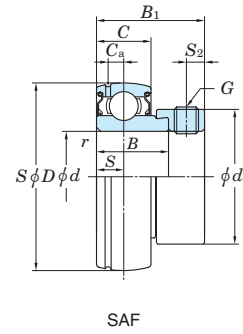
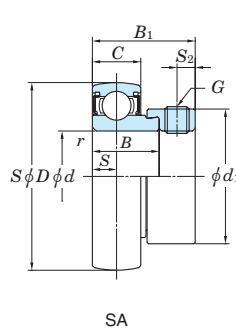


Shaft Dia. mm inch	Dimensions							Basic Load Ratings		Factor $f_0$	Bearing				Adapter assembly No.	H3 Series Adapter			Sleeve No.	H23 Series Adapter			Adapter assembly No.	Mass kg	Sleeve No.
	inch							$C_r$	$C_{0r}$		No.		Mass kg	Dimensions			Dimensions								
	mm										Standard	L3 Type		$B_1$		$B_2$	$d_2$	$B_1$		$B_2$	$d_2$				
90	3 1/2	3.937	7.480	2.126	—	1.693	0.512	133	105	14.4	UKX20	—	5.36	—	—	—	—	—	HE2320X	3.819	0.787	5.118	2.2	AE2320X	
		100	190	54	—	43	13												H2320X	97	20	130		A2320X	
90	3 1/2	3.937	8.465	2.677	2.677	2.126	0.709	173	141	13.2	UK320	UK320L3	8.70	8.70	—	—	—	—	HE2320X	3.819	0.787	5.118	2.2	AE2320X	
		100	215	68	68	54	18												H2320X	97	20	130		A2320X	
100	4	4.331	9.449	3.071	3.071	2.362	0.787	205	180	13.2	UK322	UK322L3	12.2	12.2	—	—	—	—	H2322X	4.134	0.827	5.709	2.75	AE2322X	
		110	240	78	78	60	20												HE2322X	105	21	145		AE2322X	
110	—	4.724	10.236	3.425	3.425	2.520	0.827	207	185	13.5	UK324	UK324L3	16.1	16.1	—	—	—	—	H2324	4.409	0.866	6.102	3.2	A2324	
		120	260	87	87	64	21													112	22	155			
115	4 1/2	5.118	11.024	3.425	3.425	2.677	0.866	229	214	13.6	UK326	UK326L3	18.8	18.8	—	—	—	—	HE2326	4.764	0.906	6.496	4.6	AE2326	
		130	280	87	87	68	22												H2326	121	23	165		A2326	
125	—	5.512	11.811	3.819	3.819	2.835	0.906	253	246	13.6	UK328	UK328L3	23.9	23.9	—	—	—	—	H2328	5.157	0.945	7.087	5.5	A2328	
		140	300	97	97	72	23													131	24	180			

Remarks 1. In Part No. of unit with adapters, Part No. of applicable adapters follow the Part No. shown in the dimensional tables.  
 (Example of Part No. : UK206 + H306X, UK206L3 + H2306X)

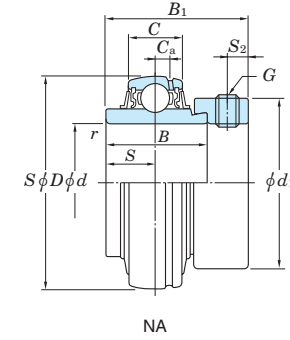
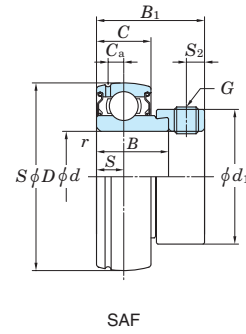
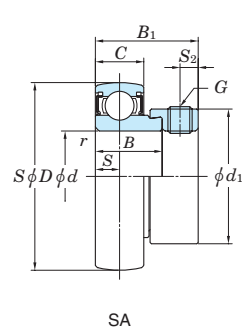
- Adapter series applicable to UK200 series  
 UK200..... H300X series  
 UK200L3 (or L2) ..... H2300X series
- UK205 is the double-lip seal type product (L2).
- Inch bore diameter series adapters are also available (see the dimensional tables of adapter assemblies).

SA, SA-F, NA  
Cylindrical bore  
(with eccentric locking collar)  
d 12 ~ (30) mm



Shaft Dia mm inch	d	Dimensions										Basic Load Ratings kN	Factor f <sub>0</sub>	Bearing No.	Dimensions						Set Screw Brg. Bore		Mass kg			
		D		B	B <sub>1</sub>		C		r (min.)		C <sub>r</sub>				C <sub>0r</sub>	C <sub>a</sub>	S		S <sub>2</sub>		d <sub>1</sub>	mm		inch		
		mm	inch	mm	inch	mm	inch	mm	inch	mm							inch	mm	inch	mm					inch	mm
12	-	40	1.575	19	0.784	28.5	1.122	12	0.472	0.6	0.024	9.55	4.80	13.2	SA201	-	-	6	0.236	4.8	0.189	28.6	1.126	M6x0.75	-	0.13
		40	1.575	19.1	0.752	28.6	1.126	13	0.512	0.6	0.024	9.55	4.80	13.2	SA201F	3.4	0.134	6.5	0.256	4.8	0.189	28.6	1.126	M6x0.75	-	0.13
		47	1.850	34.2	1.346	43.7	1.720	16	0.630	1	0.039	12.8	6.65	13.2	NA201	4	0.157	17.1	0.673	4.8	0.189	33.3	1.311	M6x0.75	-	0.29
-	1/2	40	1.575	19	0.784	28.5	1.122	12	0.472	0.6	0.024	9.55	4.80	13.2	SA201-8	-	-	6	0.236	4.8	0.189	28.6	1.126	-	1/4-28UNF	0.13
		40	1.575	19.1	0.752	28.6	1.126	13	0.512	0.6	0.024	9.55	4.80	13.2	SA201-8F	3.4	0.134	6.5	0.256	4.8	0.189	28.6	1.126	-	1/4-28UNF	0.13
		47	1.850	34.2	1.346	43.7	1.720	16	0.630	1	0.039	12.8	6.65	13.2	NA201-8	4	0.157	17.1	0.673	4.8	0.189	33.3	1.311	-	1/4-28UNF	0.29
15	-	40	1.575	19	0.784	28.5	1.122	12	0.472	0.6	0.024	9.55	4.80	13.2	SA202	-	-	6	0.236	4.8	0.189	28.6	1.126	M6x0.75	-	0.13
		40	1.575	19.1	0.752	28.6	1.126	13	0.512	0.6	0.024	9.55	4.80	13.2	SA202F	3.4	0.134	6.5	0.256	4.8	0.189	28.6	1.126	M6x0.75	-	0.13
		47	1.850	34.2	1.346	43.7	1.720	16	0.630	1	0.039	12.8	6.65	13.2	NA202	4	0.157	17.1	0.673	4.8	0.189	33.3	1.311	M6x0.75	-	0.27
-	5/8	40	1.575	19	0.784	28.5	1.122	12	0.472	0.6	0.024	9.55	4.80	13.2	SA202-10	-	-	6	0.236	4.8	0.189	28.6	1.126	-	1/4-28UNF	0.13
		47	1.850	34.2	1.346	43.7	1.720	16	0.630	1	0.039	12.8	6.65	13.2	NA202-10	4	0.157	17.1	0.673	4.8	0.189	33.3	1.311	-	1/4-28UNF	0.26
		40	1.575	19	0.784	28.5	1.122	12	0.472	0.6	0.024	9.55	4.80	13.2	SA203	-	-	6	0.236	4.8	0.189	28.6	1.126	M6x0.75	-	0.13
17	-	40	1.575	19.1	0.752	28.6	1.126	13	0.512	0.6	0.024	9.55	4.80	13.2	SA203F	3.4	0.134	6.5	0.256	4.8	0.189	28.6	1.126	M6x0.75	-	0.13
		47	1.850	34.2	1.346	43.7	1.720	16	0.630	1	0.039	12.8	6.65	13.2	NA203	4	0.157	17.1	0.673	4.8	0.189	33.3	1.311	M6x0.75	-	0.25
		47	1.850	20	0.787	29.5	1.161	14	0.551	1	0.039	12.8	6.65	13.2	SA204-12	-	-	7	0.276	4.8	0.189	33.3	1.311	-	1/4-28UNF	0.15
-	3/4	47	1.850	21.5	0.846	31	1.220	15	0.591	1	0.039	12.8	6.65	13.2	SA204-12F	3.7	0.146	7.5	0.295	4.8	0.189	33.3	1.311	-	1/4-28UNF	0.19
		47	1.850	34.2	1.346	43.7	1.720	16	0.630	1	0.039	12.8	6.65	13.2	NA204-12	4	0.157	17.1	0.673	4.8	0.189	33.3	1.311	-	1/4-28UNF	0.23
		47	1.850	20	0.787	29.5	1.161	14	0.551	1	0.039	12.8	6.65	13.2	SA204	-	-	7	0.276	4.8	0.189	33.3	1.311	M6x0.75	-	0.15
20	-	47	1.850	21.5	0.846	31	1.220	15	0.591	1	0.039	12.8	6.65	13.2	SA204F	3.7	0.146	7.5	0.295	4.8	0.189	33.3	1.311	M6x0.75	-	0.19
		47	1.850	34.2	1.346	43.7	1.720	16	0.630	1	0.039	12.8	6.65	13.2	NA204	4	0.157	17.1	0.673	4.8	0.189	33.3	1.311	M6x0.75	-	0.22
		52	2.047	21	0.827	30.5	1.201	15	0.591	1	0.039	14.0	7.85	13.9	SA205-14	-	-	7.5	0.295	4.8	0.189	38.1	1.511	-	1/4-28UNF	0.22
-	7/8	52	2.047	34.9	1.374	44.4	1.748	17	0.669	1	0.039	14.0	7.85	13.9	NA205-14	5	0.197	17.5	0.689	4.8	0.189	38.1	1.500	-	1/4-28UNF	0.27
		52	2.047	21	0.827	30.5	1.201	15	0.591	1	0.039	14.0	7.85	13.9	SA205-15	-	-	7.5	0.295	4.8	0.189	38.1	1.311	-	1/4-28UNF	0.22
		52	2.047	21.5	0.846	31	1.220	15	0.591	1	0.039	14.0	7.85	13.9	SA205-15F	3.7	0.146	7.5	0.295	4.8	0.189	38.1	1.311	-	1/4-28UNF	0.23
25	-	52	2.047	34.9	1.374	44.4	1.748	17	0.669	1	0.039	14.0	7.85	13.9	NA205-15	5	0.197	17.5	0.689	4.8	0.189	38.1	1.500	-	1/4-28UNF	0.29
		52	2.047	21	0.827	30.5	1.201	15	0.591	1	0.039	14.0	7.85	13.9	SA205	-	-	7.5	0.295	4.8	0.189	38.1	1.311	M6x0.75	-	0.22
		52	2.047	21.5	0.846	31	1.220	15	0.591	1	0.039	14.0	7.85	13.9	SA205F	3.7	0.146	7.5	0.295	4.8	0.189	38.1	1.311	M6x0.75	-	0.23
-	1	52	2.047	34.9	1.374	44.4	1.748	17	0.669	1	0.039	14.0	7.85	13.9	NA205	5	0.197	17.5	0.689	4.8	0.189	38.1	1.500	M6x0.75	-	0.25
		52	2.047	21	0.827	30.5	1.201	15	0.591	1	0.039	14.0	7.85	13.9	SA205-16	-	-	7.5	0.295	4.8	0.189	38.1	1.311	-	1/4-28UNF	0.22
		52	2.047	21.5	0.846	31	1.220	15	0.591	1	0.039	14.0	7.85	13.9	SA205-16F	3.7	0.146	7.5	0.295	4.8	0.189	38.1	1.311	-	1/4-28UNF	0.23
-	1 1/8	52	2.047	34.9	1.374	44.4	1.748	17	0.669	1	0.039	14.0	7.85	13.9	NA205-16	5	0.197	17.5	0.689	4.8	0.189	38.1	1.500	-	1/4-28UNF	0.25
		62	2.441	22	0.866	33.9	1.335	16	0.630	1	0.039	19.5	11.3	13.9	SA206-18	-	-	8	0.315	6	0.236	44.5	1.752	-	5/16-24UNF	0.3
		62	2.441	23.8	0.937	35.7	1.406	18	0.709	1	0.039	19.5	11.3	13.9	SA206-18F	4.7	0.185	9	0.354	6	0.236	44.5	1.752	-	5/16-24UNF	0.34
30	-	62	2.441	36.5	1.437	48.4	1.906	19	0.748	1	0.039	19.5	11.3	13.9	NA206-18	5	0.197	18.3	0.720	6	0.236	44.5	1.752	-	5/16-24UNF	0.43
		62	2.441	22	0.866	33.9	1.335	16	0.630	1	0.039	19.5	11.3	13.9	SA206	-	-	8	0.315	6	0.236	44.5	1.752	M8x1	-	0.3
		62	2.441	23.8	0.937	35.7	1.406	18	0.709	1	0.039	19.5	11.3	13.9	SA206F	4.7	0.185	9	0.354	6	0.236	44.5	1.752	M8x1	-	0.34
-	1 3/16	62	2.441	36.5	1.437	48.4	1.906	19	0.748	1	0.039	19.5	11.3	13.9	NA206	5	0.197	18.3	0.720	6	0.236	44.5	1.752	M8x1	-	0.41
		62	2.441	22	0.866	33.9	1.335	16	0.630	1	0.039	19.5	11.3	13.9	SA206-19	-	-	8	0.315	6	0.236	44.5	1.752	-	5/16-24UNF	0.3
		62	2.441	23.8	0.937	35.7	1.406	18	0.709	1	0.039	19.5	11.3	13.9	SA206-19F	4.7	0.185	9	0.354	6	0.236	44.5	1.752	-	5/16-24UNF	0.34
-	1 1/4	62	2.441	36.5	1.437	48.4	1.906	19	0.748	1	0.039	19.5	11.3	13.9	NA206-19	5	0.197	18.3	0.720	6	0.236	44.5	1.752	-	5/16-24UNF	0.41
		62	2.441	22	0.866	33.9	1.335	16	0.630	1	0.039	19.5	11.3	13.9	SA206-20	-	-	8	0.315	6	0.236	44.5	1.752	-	5/16-24UNF	0.3
		62	2.441	23.8	0.937	35.7	1.406	18	0.709	1	0.039	19.5	11.3	13.9	SA206-20F	4.7	0.185	9	0.354	6	0.236	44.5	1.752	-	5/16-24UNF	0.34
-	1 1/2	62	2.441	36.5	1.437	48.4	1.906	19	0.748	1	0.039	19.5	11.3	13.9	NA206-20	5	0.197	18.3	0.720	6	0.236	44.5	1.752	-	5/16-24UNF	0.38
		72	2.835	23	0.906	36.5	1.437	17	0.669	1.1	0.043	25.7	15.4	13.9	SA207-20	-	-	8.5	0.335	6.8	0.268	55.6	2.189	-	5/16-24UNF	0.5
		72	2.835	25.4	1.000	38.9	1.531	19	0.748	1.1	0.043	25.7	15.4	13.9	SA207-20F	5.7	0.224	9.5	0.335	6.8	0.268	55.6	2.189	-	5/16-24UNF	0.57
-	1 5/16	72	2.835	37.6	1.480	51.1	2.012	20	0.787	1.1	0.043	25.7	15.4	13.9	NA207-20	5.5	0.217	18.8	0.740	6.8	0.268	55.6	2.189	-	5/16-24UNF	0.68
		72	2.835	23	0.906	36.5	1.437	17	0.669	1.1	0.043	25.7	15.4	13.9	SA207-21	-	-	8.5	0.335	6.8	0.268	55.6	2.189	-	5/16-24UNF	0.5
		72	2.835	25.4	1.000	38.9	1.531	19	0.748	1.1	0.043	25.7	15.4	13.9	SA207-21F	5.7	0.224	9.5	0.335	6.8	0.268	55.6	2.189	-	5/16-24UNF	0.57
		72	2.835	37.6	1.480	51.1	2.012	20	0.787	1.1	0.043	25.7	15.4	13.9	NA207-21	5.5	0.217	18.8	0.740	6.8	0.268	55.6	2.189	-	5/16-24UNF	

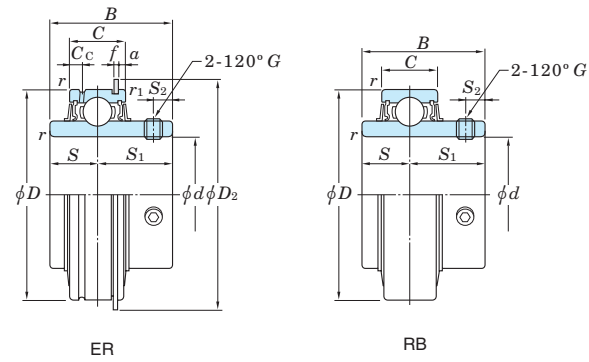
**SA, SA-F, NA**  
Cylindrical bore  
(with eccentric locking collar)  
*d* (30) ~ 75 mm



Shaft Dia mm inch <i>d</i>	Dimensions									Basic Load Ratings kN		Factor <i>f<sub>0</sub></i>	Bearing No.	Dimensions						Set Screw Brg. Bore		Mass kg				
	<i>D</i> mm inch	<i>B</i> mm inch	<i>B<sub>1</sub></i> mm inch		<i>C</i> mm inch		<i>r</i> (min.) mm inch		<i>C<sub>r</sub></i>	<i>C<sub>0r</sub></i>	<i>C<sub>a</sub></i> mm inch			<i>S</i> mm inch		<i>S<sub>2</sub></i> mm inch		<i>d<sub>1</sub></i> mm inch	mm	inch						
-	1 3/8	72	2.835	23	0.906	36.5	1.437	17	0.669	1.1	0.043	25.7	15.4	13.9	SA207-22	-	-	8.5	0.335	6.8	0.268	55.6	2.189	-	5/16-24UNF	0.5
		72	2.835	25.4	1.000	38.9	1.531	19	0.748	1.1	0.043	25.7	15.4	13.9	SA207-22F	5.7	0.224	9.5	0.335	6.8	0.268	55.6	2.189	-	5/16-24UNF	0.57
		72	2.835	37.6	1.480	51.1	2.012	20	0.787	1.1	0.043	25.7	15.4	13.9	NA207-22	5.5	0.217	18.8	0.740	6.8	0.268	55.6	2.189	-	5/16-24UNF	0.61
35	-	72	2.835	23	0.906	36.5	1.437	17	0.669	1.1	0.043	25.7	15.4	13.9	SA207	-	-	8.5	0.335	6.8	0.268	55.6	2.189	M8x1	-	0.5
		72	2.835	25.4	1.000	38.9	1.531	19	0.748	1.1	0.043	25.7	15.4	13.9	SA207F	5.7	0.224	9.5	0.335	6.8	0.268	55.6	2.189	M8x1	-	0.57
		72	2.835	37.6	1.480	51.1	2.012	20	0.787	1.1	0.043	25.7	15.4	13.9	NA207	5.5	0.217	18.8	0.740	6.8	0.268	55.6	2.189	M8x1	-	0.61
-	1 7/16	72	2.835	23	0.906	36.5	1.437	17	0.669	1.1	0.043	25.7	15.4	13.9	SA207-23	-	-	8.5	0.335	6.8	0.268	55.6	2.189	-	5/16-24UNF	0.5
		72	2.835	25.4	1.000	38.9	1.531	19	0.748	1.1	0.043	25.7	15.4	13.9	SA207-23F	5.7	0.224	9.5	0.335	6.8	0.268	55.6	2.189	-	5/16-24UNF	0.57
		72	2.835	37.6	1.480	51.1	2.012	20	0.787	1.1	0.043	25.7	15.4	13.9	NA207-23	5.5	0.217	18.8	0.740	6.8	0.268	55.6	2.189	-	5/16-24UNF	0.58
-	1 1/2	80	3.150	27	1.063	40.5	1.595	18	0.709	1.1	0.043	29.1	17.8	14.0	SA208-24	-	-	9	0.354	6.8	0.268	60.3	2.374	-	5/16-24UNF	0.67
		80	3.150	30.2	1.189	43.7	1.720	22	0.866	1.1	0.043	29.1	17.8	14.0	SA208-24F	6.4	0.252	11	0.433	6.8	0.268	60.3	2.374	-	5/16-24UNF	0.75
		80	3.150	42.8	1.685	56.3	2.217	21	0.827	1.1	0.043	29.1	17.8	14.0	NA208-24	6	0.236	21.4	0.843	6.8	0.268	60.3	2.374	-	5/16-24UNF	0.83
-	1 9/16	80	3.150	27	1.063	40.5	1.595	18	0.709	1.1	0.043	29.1	17.8	14.0	SA208-25	-	-	9	0.354	6.8	0.268	60.3	2.374	-	5/16-24UNF	0.67
		80	3.150	30.2	1.189	43.7	1.720	22	0.866	1.1	0.043	29.1	17.8	14.0	SA208-25F	6.4	0.252	11	0.433	6.8	0.268	60.3	2.374	-	5/16-24UNF	0.75
		80	3.150	42.8	1.685	56.3	2.217	21	0.827	1.1	0.043	29.1	17.8	14.0	NA208-25	6	0.236	21.4	0.843	6.8	0.268	60.3	2.374	-	5/16-24UNF	0.79
40	-	80	3.150	27	1.063	40.5	1.595	18	0.709	1.1	0.043	29.1	17.8	14.0	SA208	-	-	9	0.354	6.8	0.268	60.3	2.374	M8x1	-	0.67
		80	3.150	30.2	1.189	43.7	1.720	22	0.866	1.1	0.043	29.1	17.8	14.0	SA208F	6.4	0.252	11	0.433	6.8	0.268	60.3	2.374	M8x1	-	0.75
		80	3.150	42.8	1.685	56.3	2.217	21	0.827	1.1	0.043	29.1	17.8	14.0	NA208	6	0.236	21.4	0.843	6.8	0.268	60.3	2.374	M8x1	-	0.78
-	1 5/8	85	3.346	30.2	1.189	43.7	1.720	22	0.866	1.1	0.043	34.1	21.3	14.0	SA209-26F	6	0.236	11	0.433	6.8	0.268	63.5	2.500	-	5/16-24UNF	0.82
		85	3.346	42.8	1.685	56.3	2.217	22	0.866	1.1	0.043	34.1	21.3	14.0	NA209-26	6	0.236	21.4	0.843	6.8	0.268	63.5	2.500	-	5/16-24UNF	0.96
-	1 11/16	85	3.346	30.2	1.189	43.7	1.720	22	0.866	1.1	0.043	34.1	21.3	14.0	SA209-27F	6	0.236	11	0.433	6.8	0.268	63.5	2.500	-	5/16-24UNF	0.82
		85	3.346	42.8	1.685	56.3	2.217	22	0.866	1.1	0.043	34.1	21.3	14.0	NA209-27	6	0.236	21.4	0.843	6.8	0.268	63.5	2.500	-	5/16-24UNF	0.91
-	1 3/4	85	3.346	30.2	1.189	43.7	1.720	22	0.866	1.1	0.043	34.1	21.3	14.0	SA209-28F	6	0.236	11	0.433	6.8	0.268	63.5	2.500	-	5/16-24UNF	0.82
		85	3.346	42.8	1.685	56.3	2.217	22	0.866	1.1	0.043	34.1	21.3	14.0	NA209-28	6	0.236	21.4	0.843	6.8	0.268	63.5	2.500	-	5/16-24UNF	0.87
45	-	85	3.346	30.2	1.189	43.7	1.720	22	0.866	1.1	0.043	34.1	21.3	14.0	SA209F	6	0.236	11	0.433	6.8	0.268	63.5	2.500	M8x1	-	0.82
		85	3.346	42.8	1.685	56.3	2.217	22	0.866	1.1	0.043	34.1	21.3	14.0	NA209	6	0.236	21.4	0.843	6.8	0.268	63.5	2.500	M8x1	-	0.85
		90	3.543	30.2	1.189	43.7	1.720	22	0.866	1.1	0.043	35.1	23.3	14.4	SA210-30F	6.6	0.260	11	0.433	6.8	0.268	69.9	2.752	-	5/16-24UNF	0.85
-	1 7/8	90	3.543	49.2	1.937	62.7	2.469	24	0.945	1.1	0.043	35.1	23.3	14.4	NA210-30	6	0.236	24.6	0.969	6.8	0.268	69.9	2.752	-	5/16-24UNF	1.08
		90	3.543	30.2	1.189	43.7	1.720	22	0.866	1.1	0.043	35.1	23.3	14.4	SA210-31F	6.6	0.260	11	0.433	6.8	0.268	69.9	2.752	-	5/16-24UNF	0.85
		90	3.543	49.2	1.937	62.7	2.469	24	0.945	1.1	0.043	35.1	23.3	14.4	NA210-31	6	0.236	24.6	0.969	6.8	0.268	69.9	2.752	-	5/16-24UNF	1.04
50	-	90	3.543	30.2	1.189	43.7	1.720	22	0.866	1.1	0.043	35.1	23.3	14.4	SA210F	6.6	0.260	11	0.433	6.8	0.268	69.9	2.752	M8x1	-	0.85
		90	3.543	49.2	1.937	62.7	2.469	24	0.945	1.1	0.043	35.1	23.3	14.4	NA210	6	0.236	24.6	0.969	6.8	0.268	69.9	2.752	M8x1	-	1.01
		90	3.543	49.2	1.937	62.7	2.469	24	0.945	1.1	0.043	35.1	23.3	14.4	NA210-32	6	0.236	24.6	0.969	6.8	0.268	69.9	2.752	-	5/16-24UNF	0.99
-	2	100	3.937	32.4	1.276	48.4	1.906	24	0.945	1.5	0.059	43.4	29.4	14.4	SA211-32F	7	0.276	12	0.472	8	0.315	76.2	3.000	-	3/8-24UNF	1.2
		100	3.937	55.5	2.185	71.4	2.811	25	0.984	1.5	0.059	43.4	29.4	14.4	NA211-32	7	0.276	27.8	1.094	8	0.315	76.2	3.000	-	3/8-24UNF	1.58
		100	3.937	32.4	1.276	48.4	1.906	24	0.945	1.5	0.059	43.4	29.4	14.4	SA211-34F	7	0.276	12	0.472	8	0.315	76.2	3.000	-	3/8-24UNF	1.2
-	2 1/8	100	3.937	55.5	2.185	71.4	2.811	25	0.984	1.5	0.059	43.4	29.4	14.4	NA211-34	7	0.276	27.8	1.094	8	0.315	76.2	3.000	-	3/8-24UNF	1.49
		100	3.937	32.4	1.276	48.4	1.906	24	0.945	1.5	0.059	43.4	29.4	14.4	SA211F	7	0.276	12	0.472	8	0.315	76.2	3.000	M10x1.25	-	1.2
		100	3.937	55.5	2.185	71.4	2.811	25	0.984	1.5	0.059	43.4	29.4	14.4	NA211	7	0.276	27.8	1.094	8	0.315	76.2	3.000	M10x1.25	-	1.39
-	2 3/16	100	3.937	32.4	1.276	48.4	1.906	24	0.945	1.5	0.059	43.4	29.4	14.4	SA211-35F	7	0.276	12	0.472	8	0.315	76.2	3.000	-	3/8-24UNF	1.2
		100	3.937	55.5	2.185	71.4	2.811	25	0.984	1.5	0.059	43.4	29.4	14.4	NA211-35	7	0.276	27.8	1.094	8	0.315	76.2	3.000	-	3/8-24UNF	1.36
		110	4.331	61.9	2.437	77.8	3.063	27	1.063	1.5	0.059	52.4	36.2	14.4	NA212-36	7.5	0.295	31	1.220	8	0.315	84.2	3.315	-	3/8-24UNF	2.03
60	2 1/4	110	4.331	61.9	2.437	77.8	3.063	27	1.063	1.5	0.059	52.4	36.2	14.4	NA212	7.5	0.295	31	1.220	8	0.315	84.2	3.315	M10x1.25	-	1.87
		120	4.724	68.2	2.685	85.7	3.374	28	1.102	1.5	0.059	57.2	40.1	14.4	NA213-40	7.5	0.295	34.1	1.343	8.5	0.335	92	3.622	-	3/8-24UNF	2.51
65	2 1/2	120	4.724	68.2	2.685	85.7	3.374	28	1.102	1.5	0.059	57.2	40.1	14.4	NA213	7.5	0.295	34.1	1.343	8.5	0.335	92	3.622	M10x1.25	-	2.45
		125	4.921	68.2	2.685	85.7	3.374	30	1.181	1.5	0.059	62.2	44.1	14.5	NA214-44	9	0.354	34.1	1.343	8.5	0.335	97	3.819	-	3/8-24UNF	2.94
70	2 3/4	125	4.921	68.2	2.685	85.7	3.374	30	1.181	1.5	0.059	62.2	44.1	14.5	NA214	9	0.354	34.1	1.343	8.5	0.335	97	3.819	M10x1.25	-	2.92
		130	5.118	74.6	2.937	92.1	3.626	32	1.260	1.5	0.059	67.4	48.3	14.5	NA215	9	0.354	37.3	1.469	8.5	0.335	102	4.016	M10x1.25	-	2.74
75	3	130																								



ER, RB  
Cylindrical bore (with set screws),  
Cylindrical outside surface  
 $d$  12 ~ 60 mm

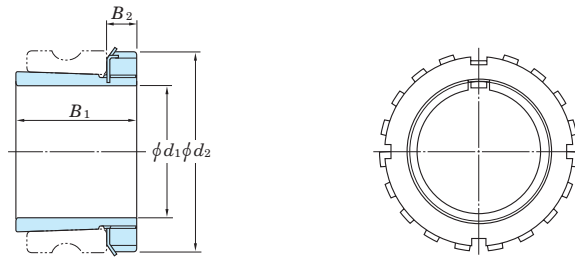


Shaft Dia.		Dimensions					Basic Load Ratings		Factor	Bearing No.		Dimensions							Set Screw Brg. Bore		Mass								
mm	inch	inch mm					$C_r$	$C_{0r}$		$f_0$	(ER)	(RB)	$S$	$S_1$	$S_2$	$C_c$	$a$	$f$	$D_2$	mm	inch	(ER)	(RB)						
12	1/2	1.850	1.220	0.630	0.024	0.020	12.8	6.65	13.2	ER201	RB201	0.500	0.720	0.197	0.157	0.094	0.042	2.067	M6x0.75	-	0.27	0.27							
										ER201-8	RB201-8								-	1/4-28UNF	0.27	0.27							
										ER202	RB202								12.7	18.3	5	4	2.38	1.07	52.5	-	1/4-28UNF	0.25	0.25
15	5/8	47	31	16	0.6	0.5	12.8	6.65	13.2	ER202-10	RB202-10	0.500	0.720	0.197	0.157	0.094	0.042	2.067	M6x0.75	-	0.25	0.25							
										ER203	RB203								-	1/4-28UNF	0.25	0.25							
17	3/4	1.850	1.220	0.630	0.039	0.020	12.8	6.65	13.2	ER204-12	RB204-12	0.500	0.720	0.197	0.157	0.094	0.042	2.067	M6x0.75	-	0.24	0.24							
										ER204	RB204								-	1/4-28UNF	0.22	0.22							
20	7/8	2.047	1.343	0.748	0.039	0.020	14.0	7.85	13.9	ER205-14	RB205-14	0.563	0.780	0.217	0.197	0.094	0.042	2.272	-	1/4-28UNF	0.3	0.29							
										ER205-15	RB205-15								-	1/4-28UNF	0.28	0.27							
										ER205	RB205								14.3	19.8	5.5	5	2.38	1.07	57.7	M6x0.75	-	0.27	0.26
25	15/16	52	34.1	19	1	0.5	14.0	7.85	13.9	ER205-16	RB205-16	0.563	0.780	0.217	0.197	0.094	0.042	2.272	-	1/4-28UNF	0.27	0.26							
										ER206-18	RB206-18								-	1/4-28UNF	0.41	0.4							
30	1 1/8	2.441	1.500	0.866	0.039	0.020	19.5	11.3	13.9	ER206	RB206	0.626	0.874	0.236	0.217	0.125	0.065	2.657	M6x0.75	-	0.39	0.38							
										ER206-19	RB206-19								15.9	22.2	6	5.5	3.18	1.65	67.5	-	1/4-28UNF	0.39	0.38
										ER206-20	RB206-20								-	-	-	-	-	-	-	-	1/4-28UNF	0.37	0.36
35	1 1/4	2.835	1.689	0.945	0.043	0.020	25.7	15.4	13.9	ER207-20	RB207-20	0.689	1.000	0.256	0.217	0.125	0.065	3.087	-	5/16-24UNF	0.69	0.68							
										ER207-21	RB207-21								-	5/16-24UNF	0.66	0.65							
										ER207-22	RB207-22								17.5	25.4	6.5	5.5	3.18	1.65	78.4	-	5/16-24UNF	0.64	0.63
40	1 1/2	3.150	1.937	1.102	0.043	0.020	29.1	17.8	14.0	ER207	RB207	0.748	1.189	0.315	0.236	0.125	0.065	3.402	M8x1	-	0.63	0.62							
										ER207-23	RB207-23								-	5/16-24UNF	0.61	0.6							
										ER208-24	RB208-24								19	30.2	8	6	3.18	1.65	86.4	-	5/16-24UNF	0.85	0.84
45	1 5/8	3.346	1.937	1.102	0.043	0.020	34.1	21.3	14.0	ER208-25	RB208-25	0.748	1.189	0.315	0.236	0.125	0.065	3.598	-	5/16-24UNF	0.82	0.81							
										ER208	RB208								-	5/16-24UNF	0.81	0.78							
										ER209-26	-								19	30.2	8	6	3.18	1.65	91.4	M8x1	-	1.0	-
50	1 7/8	3.543	2.031	1.102	0.043	0.020	35.1	23.3	14.4	ER209-27	-	0.748	1.283	0.354	0.295	0.125	0.095	3.791	-	5/16-24UNF	0.96	-							
										ER209-28	-								-	5/16-24UNF	0.92	-							
										ER209	-								-	5/16-24UNF	0.90	-							
55	2 1/8	3.937	2.189	1.181	0.059	0.020	43.4	29.4	14.4	ER210-30	-	0.748	1.283	0.354	0.295	0.125	0.095	4.185	-	3/8-24UNF	1.05	-							
										ER210-31	-								-	3/8-24UNF	1.0	-							
										ER210	-								19	32.6	9	7.5	3.18	2.41	96.3	M10x1.25	-	0.98	-
60	2 3/8	4.331	2.563	1.260	0.059	0.020	52.4	36.2	14.4	ER210-32	-	1.000	1.563	0.413	0.295	0.125	0.095	4.583	-	3/8-24UNF	1.56	-							
										ER211-32	-								-	3/8-24UNF	1.56	-							
										ER211-34	-								22.2	33.4	9	7.5	3.18	2.41	106.3	M10x1.25	-	1.45	-
60	2 7/16	110	65.1	32	1.5	0.5	52.4	36.2	14.4	ER211	-	1.000	1.563	0.413	0.295	0.125	0.095	4.583	-	3/8-24UNF	1.41	-							
										ER211-35	-								-	3/8-24UNF	1.39	-							
										ER212-36	-								-	3/8-24UNF	2.02	-							
60	2 7/16	110	65.1	32	1.5	0.5	52.4	36.2	14.4	ER212	-	1.000	1.563	0.413	0.295	0.125	0.095	4.583	M10x1.25	-	1.89	-							
										ER212-38	-								-	3/8-24UNF	1.87	-							
										ER212-39	-								25.4	39.7	10.5	7.5	3.18	2.41	116.4	-	3/8-24UNF	1.8	-



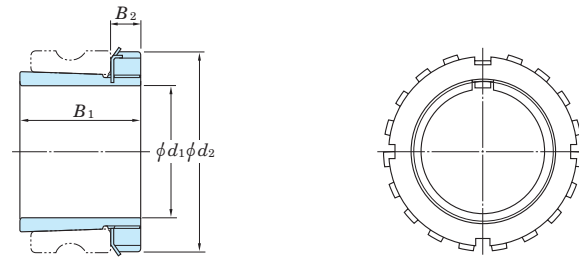
H300X, H2300X

$d_1$  20 ~ (70) mm



Shaft Dia. $d_1$			Dimensions			Adapter assembly			Sleeve			Lock Nut	Washer	Mass		
mm	inch		inch mm			No.			No.					No.	No.	kg
(H)	(HE)	(HS)	$B_1$	$B_2$	$d_2$	(H)	(HE)	(HS)	(H)	(HE)	(HS)			(H)	(HE)	(HS)
20	—	—	1.142	0.315	1.496	H305X	—	—	A305X	—	—	AN05	AW05X	0.075	—	—
	3/4	—	29	8	38	—	HE305X	—	—	AE305X	—	AN05	AW05X	—	0.08	—
20	—	—	1.378	0.315	1.496	H2305X	—	—	A2305X	—	—	AN05	AW05X	0.095	—	—
	3/4	—	35	8	38	—	HE2305X	—	—	AE2305X	—	AN05	AW05X	—	0.085	—
25	—	—	1.220	0.315	1.772	H306X	—	—	A306X	—	—	AN06	AW06X	0.11	—	—
	1	—	31	8	45	—	HE306X	—	—	AE306X	—	AN06	AW06X	—	0.105	—
25	—	—	1.496	0.315	1.772	H2306X	—	—	A2306X	—	—	AN06	AW06X	0.13	—	—
	1	—	38	8	45	—	HE2306X	—	—	AE2306X	—	AN06	AW06X	—	0.12	—
30	—	—	1.378	0.354	2.047	H307X	—	—	A307X	—	—	AN07	AW07X	0.14	—	—
	—	1 1/8	35	9	52	—	—	HS307X	—	—	AS307X	AN07	AW07X	—	—	0.15
30	—	—	1.693	0.354	2.047	H2307X	—	—	A2307X	—	—	AN07	AW07X	0.17	—	—
	—	1 1/8	43	9	52	—	—	HS2307X	—	—	AS2307X	AN07	AW07X	—	—	0.19
35	—	—	1.417	0.394	2.283	H308X	—	—	A308X	—	—	AN08	AW08X	0.19	—	—
	1 1/4	—	36	10	58	—	HE308X	—	—	AE308X	—	AN08	AW08X	—	0.23	—
35	—	—	1.811	0.394	2.283	H2308X	—	—	A2308X	—	—	AN08	AW08X	0.22	—	—
	1 1/4	—	46	10	58	—	HE2308X	—	—	AE2308X	—	AN08	AW08X	—	0.28	—
40	—	—	1.535	0.433	2.559	H309X	—	—	A309X	—	—	AN09	AW09X	0.25	—	—
	1 1/2	—	39	11	65	—	HE309X	—	—	AE309X	—	AN09	AW09X	—	0.28	—
40	—	—	1.969	0.433	2.559	H2309X	—	—	A2309X	—	—	AN09	AW09X	0.28	—	—
	1 1/2	—	50	11	65	—	HE2309X	—	—	AE2309X	—	AN09	AW09X	—	0.32	—
45	—	—	1.654	0.472	2.756	H310X	—	—	A310X	—	—	AN10	AW10X	0.30	—	—
	1 3/4	—	42	12	70	—	HE310X	—	—	AE310X	—	AN10	AW10X	—	0.31	—
45	—	—	2.165	0.472	2.756	H2310X	—	—	A2310X	—	—	AN10	AW10X	0.36	—	—
	1 3/4	—	55	12	70	—	HE2310X	—	—	AE2310X	—	AN10	AW10X	—	0.37	—
50	—	—	1.772	0.472	2.953	H311X	—	—	A311X	—	—	AN11	AW11X	0.35	—	—
	2	—	45	12	75	—	HE311X	—	—	AE311X	—	AN11	AW11X	—	0.33	—
50	—	—	2.323	0.472	2.953	H2311X	—	—	A2311X	—	—	AN11	AW11X	0.42	—	—
	2	—	59	12	75	—	HE2311X	—	—	AE2311X	—	AN11	AW11X	—	0.40	—
55	—	—	1.850	0.512	3.150	H312X	—	—	A312X	—	—	AN12	AW12X	0.43	—	—
	—	2 1/8	47	13	80	—	—	HS312X	—	—	AS312X	AN12	AW12X	—	—	0.40
55	—	—	2.441	0.512	3.150	H2312X	—	—	A2312X	—	—	AN12	AW12X	0.48	—	—
	—	2 1/8	62	13	80	—	—	HS2312X	—	—	AS2312X	AN12	AW12X	—	—	0.52
60	—	—	1.969	0.551	3.346	H313X	—	—	A313X	—	—	AN13	AW13X	0.46	—	—
	2 1/4	—	50	14	85	—	HE313X	—	—	AE313X	—	AN13	AW13X	—	0.56	—
60	—	—	2.559	0.551	3.346	H2313X	—	—	A2313X	—	—	AN13	AW13X	0.56	—	—
	2 1/4	—	65	14	85	—	HE2313X	—	—	AE2313X	—	AN13	AW13X	—	0.69	—
65	—	—	2.165	0.591	3.858	H315X	—	—	A315X	—	—	AN15	AW15X	0.83	—	—
	2 1/2	—	55	15	98	—	HE315X	—	—	AE315X	—	AN15	AW15X	—	0.89	—
65	—	—	2.874	0.591	3.858	H2315X	—	—	A2315X	—	—	AN15	AW15X	1.05	—	—
	2 1/2	—	73	15	98	—	HE2315X	—	—	AE2315X	—	AN15	AW15X	—	1.15	—
70	—	—	2.323	0.669	4.134	H316X	—	—	A316X	—	—	AN16	AW16X	1.05	—	—
	2 3/4	—	59	17	105	—	HE316X	—	—	AE316X	—	AN16	AW16X	—	1.05	—

H300X, H2300X  
 $d_1$  (70) ~ 125 mm



Shaft Dia. $d_1$			Dimensions			Adapter assembly			Sleeve			Lock Nut	Washer	Mass		
mm	inch		inch mm			No.			No.					No.	No.	kg
(H)	(HE)	(HS)	$B_1$	$B_2$	$d_2$	(H)	(HE)	(HS)	(H)	(HE)	(HS)			(H)	(HE)	(HS)
70	-	-	3.071	0.669	4.134	H2316X	-	-	A2316X	-	-	AN16	AW16X	1.3	-	-
	2 3/4	-	78	17	105	-	HE2316X	-	-	AE2316X	-					
75	-	-	2.480	0.709	4.331	H317X	-	-	A317X	-	-	AN17	AW17X	1.2	-	-
	3	-	63	18	110	-	HE317X	-	-	AE317X	-					
75	-	-	3.228	0.709	4.331	H2317X	-	-	A2317X	-	-	AN17	AW17X	1.45	-	-
	3	-	82	18	110	-	HE2317X	-	-	AE2317X	-					
80	-	-	2.559	0.709	4.724	H318X	-	-	A318X	-	-	AN18	AW18X	1.4	-	-
	-	-	65	18	120	-	-	-	-	-	-					
80	-	-	3.386	0.709	4.724	H2318X	-	-	A2318X	-	-	AN18	AW18X	1.7	-	-
	-	-	86	18	120	-	-	-	-	-	-					
85	-	-	3.543	0.748	4.921	H2319X	-	-	A2319X	-	-	AN19	AW19X	1.95	-	-
	3 1/4	-	90	19	125	-	HE2319X	-	-	AE2319X	-					
90	-	-	3.819	0.787	5.118	H2320X	-	-	A2320X	-	-	AN20	AW20X	2.2	-	-
	3 1/2	-	97	20	130	-	HE2320X	-	-	AE2320X	-					
100	-	-	4.134	0.827	5.709	H2322X	-	-	A2322X	-	-	AN22	AW22X	2.75	-	-
	4	-	105	21	145	-	HE2322X	-	-	AE2322X	-					
110	-	-	4.409	0.866	6.102	H2324	-	-	A2324	-	-	AN24	AW24	3.2	-	-
	-	-	112	22	155	-	-	-	-	-	-					
115	-	-	4.764	0.906	6.496	H2326	-	-	A2326	-	-	AN26	AW26	4.6	-	-
	4 1/2	-	121	23	165	-	HE2326	-	-	AE2326	-					
125	-	-	5.157	0.945	7.087	H2328	-	-	A2328	-	-	AN28	AW28	5.5	-	-
	-	-	131	24	180	-	-	-	-	-	-					

16 Parts and accessories

16.1 Part No. of pressed steel covers

Table 16.1 Part No. of pressed steel cover for UC type bearing

Bearing No.	Shaft dia. (mm)	Pressed steel cover No.	
		Open ends type	Closed end type
UC201	12	C- 4×12	D- 4
UC202	15	C- 4×15	D- 4
UC203	17	C- 4×17	D- 4
UC204	20	C- 4×20	D- 4
UC205	25	C- 5×25	D- 5
UC206	30	C- 6×30	D- 6
UC207	35	C- 7×35	D- 7
UC208	40	C- 8×40	D- 8
UC209	45	C- 9×45	D- 9
UC210	50	C-10×50	D-10
UC211	55	C-11×55	D-11
UC212	60	C-12×60	D-12
UC213	65	C-13×65	D-13
UC214	70	C-14×70	D-14
UC215	75	C-15×75	D-15
UC216	80	C-16×80	D-16
UC217	85	C-17×85	D-17
UC218	90	C-18×90	D-18
UCX05	25	C- 6×25	D- 6
UCX06	30	C- 7×30	D- 7
UCX07	35	C- 8×35	D- 8
UCX08	40	C- 9×40	D- 9
UCX09	45	C-10×45	D-10
UCX10	50	C-11×50	D-11
UCX11	55	C-12×55	D-12
UCX12	60	C-13×60	D-13
UCX13	65	C-14×65	D-14
UCX14	70	C-15×70	D-15
UCX15	75	C-16×75	D-16
UCX16	80	C-17×80	D-17
UCX17	85	C-18×85	D-18

Table 16.2 Part No. of pressed steel cover for UK type bearing

Bearing No.	Shaft dia. (mm)	Pressed steel cover No.	
		Open ends type	Closed end type
-			
-			
-			
-			
UK205	20	C- 5×20	D- 5
UK206	25	C- 6×25	D- 6
UK207	30	C- 7×30	D- 7
UK208	35	C- 8×35	D- 8
UK209	40	C- 9×40	D- 9
UK210	45	C-10×45	D-10
UK211	50	C-11×50	D-11
UK212	55	C-12×55	D-12
UK213	60	C-13×60	D-13
-			
UK215	65	C-15×65	D-15
UK216	70	C-16×70	D-16
UK217	75	C-17×75	D-17
UK218	80	C-18×80	D-18
UKX05	20	C- 6×20	D- 6
UKX06	25	C- 7×25	D- 7
UKX07	30	C- 8×30	D- 8
UKX08	35	C- 9×35	D- 9
UKX09	40	C-10×40	D-10
UKX10	45	C-11×45	D-11
UKX11	50	C-12×50	D-12
UKX12	55	C-13×55	D-13
UKX13	60	C-14×60	D-14
-			
UKX15	65	C-16×65	D-16
UKX16	70	C-17×70	D-17
UKX17	75	C-18×75	D-18

Remark In the Part No. of the pressed steel covers for shouldered shaft, shaft diameter follows the basic code of the cover. For example, Part No. of the cover for a shaft with 30 mm diameter for UC206 is C-6×30.

## 16.2 Part No. of cast iron covers

**Table 16.3 Part No. of cast iron cover for UC type bearing**

Bearing No.	Shaft dia. (mm)	Cast iron cover No.		Mounting bolt (reference)
		Open ends type	Closed end type	
UC204	20	204FC×20 (204FC3×20) <sup>1)</sup>	204FD (204FD3) <sup>1)</sup>	M3 (M4)
UC205	25	205FC×25 (205FC3×25) <sup>1)</sup>	205FD (205FD3) <sup>1)</sup>	M3 (M4)
UC206	30	206FC×30	206FD	M4
UC207	35	207FC×35	207FD	M4
UC208	40	208FC×40	208FD	
UC209	45	209FC×45	209FD	
UC210	50	210FC×50	210FD	M4
UC211	55	211FC×55	211FD	
UC212	60	212FC×60	212FD	
UC213	65	213FC×65	213FD	M4
UC214	70	214FC×70	214FD	
UC215	75	215FC×75	215FD	
UC216	80	216FC×80	216FD	M5
UC217	85	217FC×85	217FD	
UC218	90	218FC×90	218FD	
UCX18	90	X18C×90 (X18C3×90) <sup>2)</sup>	X18D (X18D3) <sup>2)</sup>	M5
UCX20	100	X20C×100 (X20C3×100) <sup>2)</sup>	X20D (X20D3) <sup>2)</sup>	
UC305	25	305C×25	305D	M4
UC306	30	306C×30	306D	
UC307	35	307C×35	307D	
UC308	40	308C×40	308D	M5
UC309	45	309C×45	309D	
UC310	50	310C×50	310D	
UC311	55	311C×55	311D	M5
UC312	60	312C×60	312D	
UC313	65	313C×65	313D	
UC314	70	314C×70	314D	M5
UC315	75	315C×75	315D	
UC316	80	316C×80	316D	
UC317	85	317C×85	317D	M5
UC318	90	318C×90	318D	
UC319	95	319C×95	319D	
UC320	100	320C×100	320D	M5
UC321	105	321C×105	321D	
UC322	110	322C×110	322D	
UC324	120	324C×120	324D	M5
UC326	130	326C×130	326D	M8
UC328	140	328C×140	328D	

**Table 16.4 Part No. of cast iron cover for UK type bearing**

Bearing No.	Shaft dia. (mm)	Cast iron cover No.		Mounting bolt (reference)
		Open ends type	Closed end type	
–				
UK205	20	205FC×20 (205FC3×20) <sup>1)</sup>	205FD (205FD3) <sup>1)</sup>	M3 (M4)
UK206	25	206FC×25	206FD	M4
UK207	30	207FC×30	207FD	M4
UK208	35	208FC×35	208FD	
UK209	40	209FC×40	209FD	
UK210	45	210FC×45	210FD	M4
UK211	50	211FC×50	211FD	
UK212	55	212FC×55	212FD	
UK213	60	213FC×60	213FD	M4
–				
UK215	65	215FC×65	215FD	
UK216	70	216FC×70	216FD	M5
UK217	75	217FC×75	217FD	
UK218	80	218FC×80	218FD	
UKX18	80	X18C×80 (X18C3×80) <sup>2)</sup>	X18D (X18D3) <sup>2)</sup>	M5
UKX20	90	X20C×90 (X20C3×90) <sup>2)</sup>	X20D (X20D3) <sup>2)</sup>	
UK305	20	305C×20	305D	M4
UK306	25	306C×25	306D	
UK307	30	307C×30	307D	
UK308	35	308C×35	308D	M5
UK309	40	309C×40	309D	
UK310	45	310C×45	310D	
UK311	50	311C×50	311D	M5
UK312	55	312C×55	312D	
UK313	60	313C×60	313D	
–				
UK315	65	315C×65	315D	M5
UK316	70	316C×70	316D	
UK317	75	317C×75	317D	M5
UK318	80	318C×80	318D	
UK319	85	319C×85	319D	
UK320	90	320C×90	320D	M5
–				
UK322	100	322C×100	322D	
UK324	110	324C×110	324D	M5
UK326	115	326C×115	326D	M8
UK328	125	328C×125	328D	

Note 1) Items in parentheses are applicable to the pillow block type (P), square-flanged type (F), rhombic-flanged type (FL), and the take-up type (T) bearings, and can be mounted to housings with three hexagon socket head cap screws (use four to mount other items).

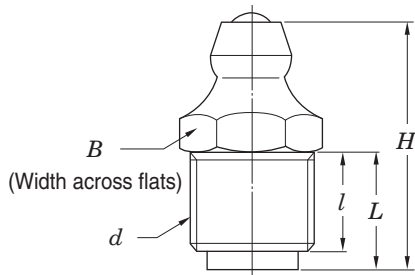
2) Items in parentheses are applicable to the round-flanged type with joint (FC), and can be mounted to housings with three hexagon socket head cap screws (use four to mount other items).

Remark In the nominal No. of the cast iron covers for shouldered shaft, shaft diameter follows the basic code of the cover. For example, Part No. of the cover for a shaft with 60 mm diameter for UC210 is 210FC×60.

16.3 Nominal number and dimensions of grease nipples and reducing socket

Table 16.5 Nominal number and dimensions of grease nipple

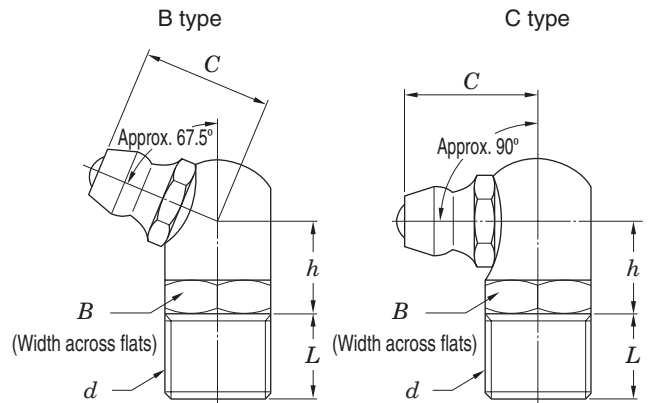
(1) Nominal number and dimensions of A type grease nipple



Unit : mm

Nominal grease nipple No.	Nominal screw code <i>d</i>	<i>B</i>	<i>H</i>	<i>L</i>	<i>l</i>
A-1/4-28UNF	1/4-28UNF	7	13.5	5.4	4
A-PT1/8	PT1/8	10	20	9.5	8

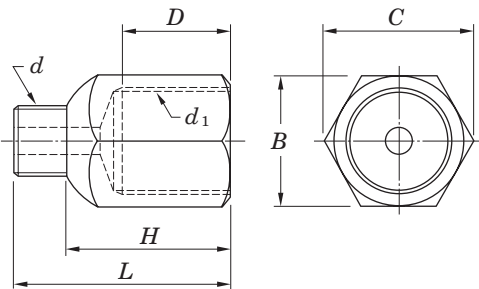
(2) Nominal number and dimensions of B and C type grease nipples



Unit : mm

Nominal grease nipple No.	Nominal screw code <i>d</i>	Type	<i>B</i>	<i>C</i>	<i>h</i>	<i>L</i>
B-1/4-28UNF	1/4-28UNF	B	8	9.5	6.5	5
C-1/4-28UNF		C				
B-PT1/8	PT1/8	B	10	12.5	8.5	8
C-PT1/8		C				

Table 16.6 Nominal number and dimensions of reducing socket code



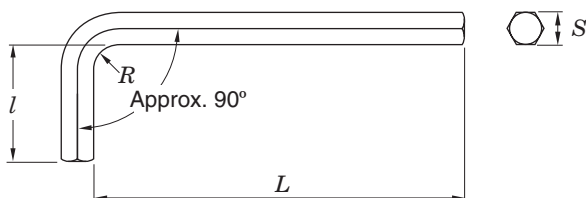
Unit : mm

Nominal No. of reducing socket	Nominal male thread code <i>d</i>	Nominal female thread code <i>d</i> <sub>1</sub>	<i>B</i>	<i>C</i>	<i>D</i>	<i>H</i>	<i>L</i>
1/4-28UNF-PT1/8	1/4-28UNF	PT1/8	12	13.8	10	15	20
1/4-28UNF-PF1/8		PF1/8					
1/4-28UNF-PT1/4	1/4-28UNF	PT1/4	17	19.6	11	17	22
1/4-28UNF-PF1/4		PF1/4					
PT1/8-PT1/4	PT1/8	PT1/4	17	19.6	11	19	26
PT1/8-PF1/4		PF1/4					

16.4 Nominal number and dimensions of Allen key wrench

Table 16.7 Nominal number and dimensions of Allen key wrench

Unit : mm



Nominal No. of Allen key wrench	<i>S</i>	<i>L</i> (Approx.)	<i>l</i> (Approx.)	<i>R</i> (Approx.)	Applicable set screw
2.5	2.5	56	18	2.5	M5
3	3	63	20	3	M6
4	4	70	25	4	M8
5	5	80	28	5	M10
6	6	90	32	6	M12, M14
8	8	100	36	8	M16, M18
10	10	112	40	10	M20



## 17 Example of use

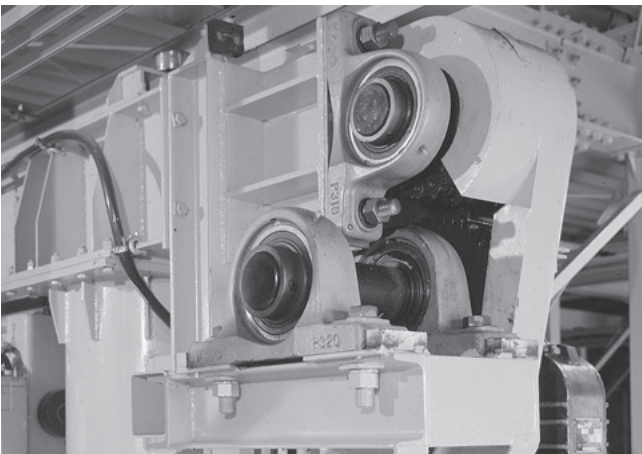
Koyo Ball Bearing units are used in varied equipment, and their performance contributes to technical advantages, automation, and energy-saving of equipment.

### Automatic warehouse system

Many ball bearings are used in automatic warehouse systems for automation and energy-saving of the systems.



Automatic warehouse system



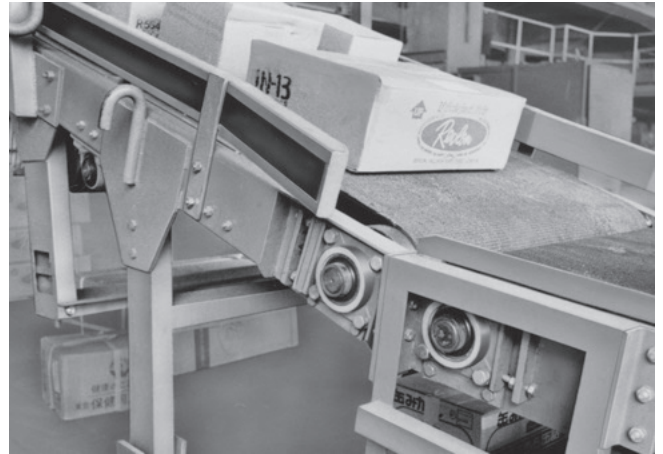
Mast driving system



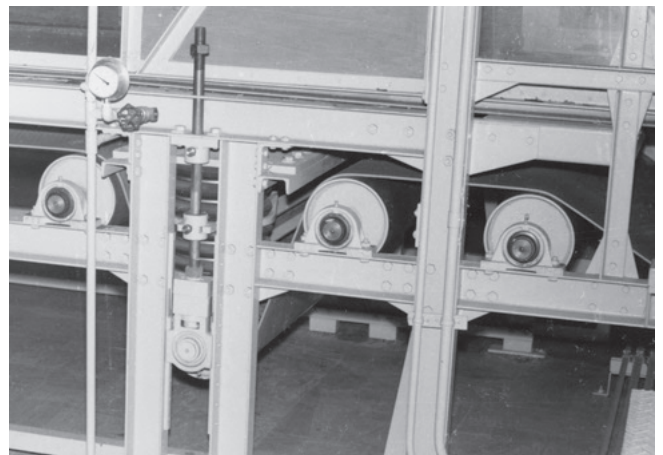
Conveyor

### Delivery center

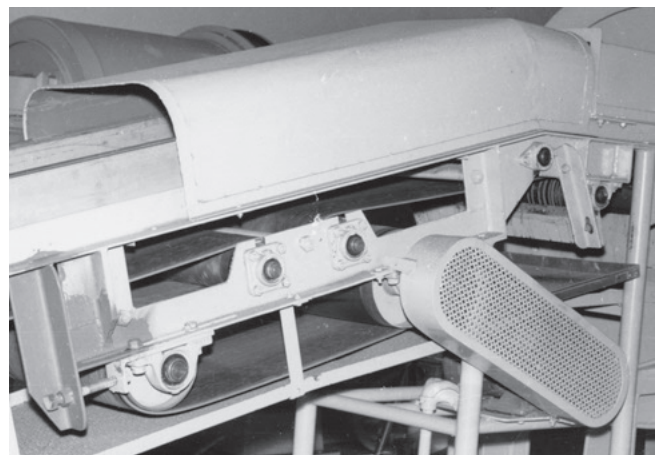
Koyo Ball bearings of various types including pillow block type, flange type, take-up type are used in conveyors of delivery centers.



Belt conveyor



Belt conveyor driving system



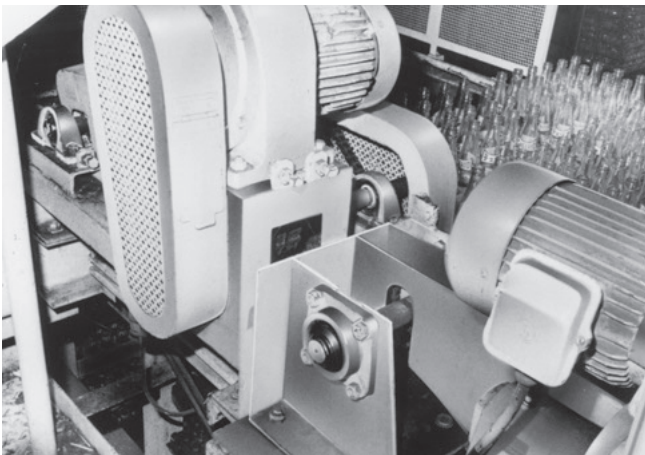
Belt conveyor driving system

**Soft drink plant**

Since soft drink manufacturing facilities are frequently cleaned for hygiene control, covered unit, "compact" series unit, and stainless-series unit are suitable for them.



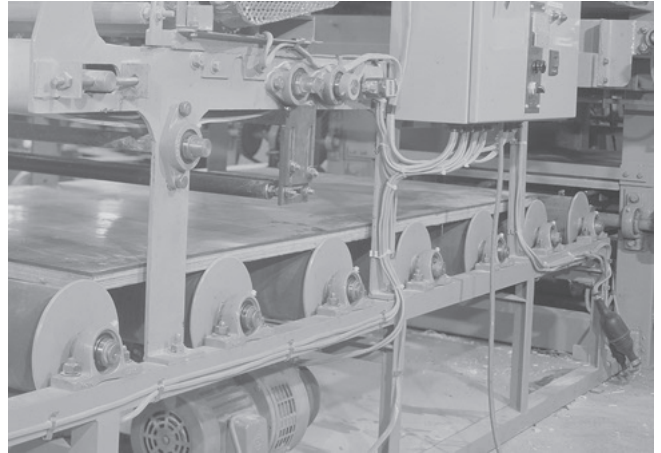
Bottle filling line conveyor



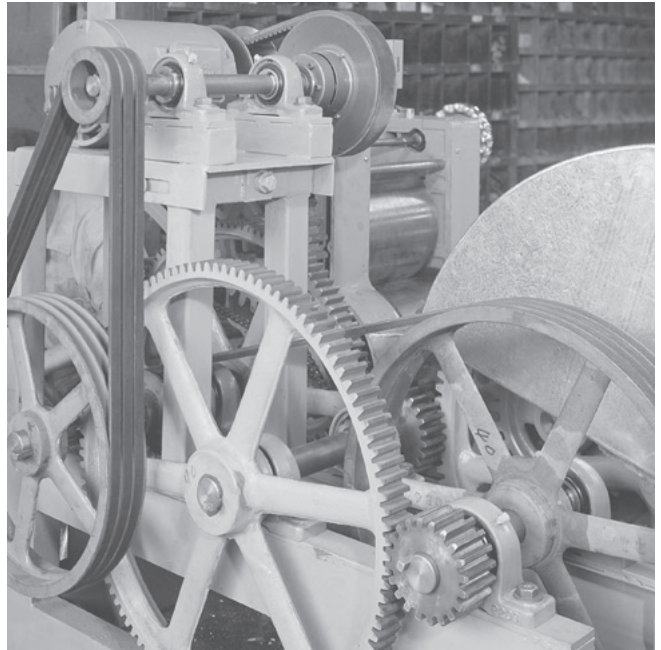
Pallet driving system

**Noodle manufacturing plant**

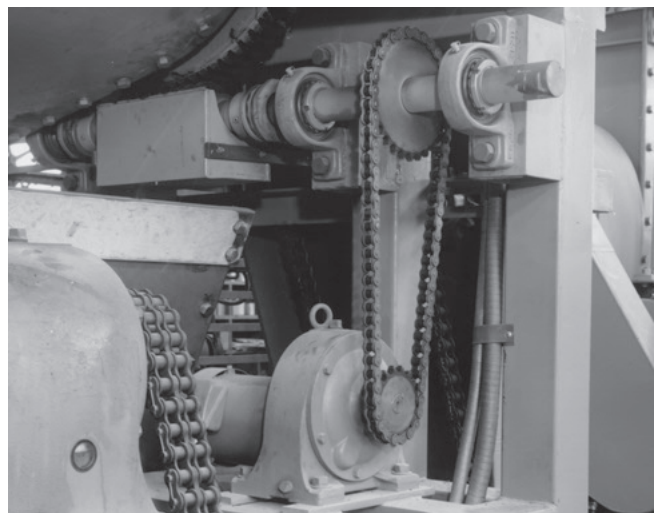
Triple-lip seal units or covered units are suitable for locations dusted with a great deal of noodle flour.



Feeding system



Noodle manufacturing machine driving system

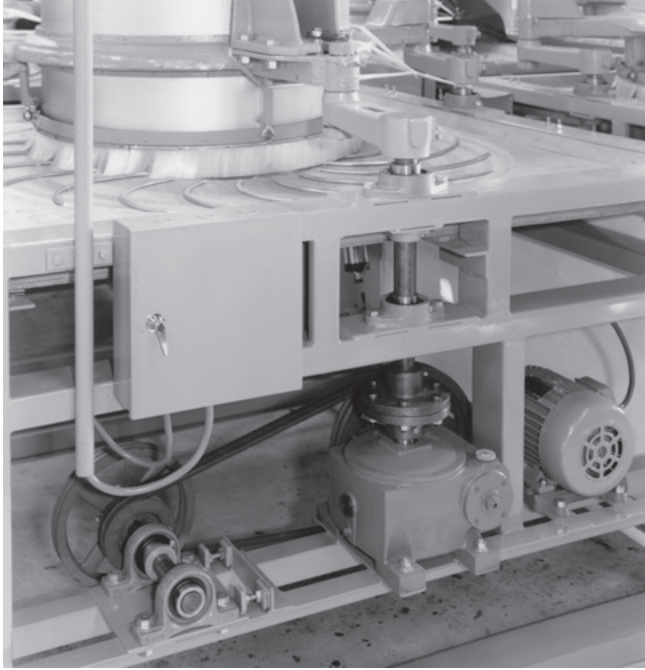


Mixer driving system

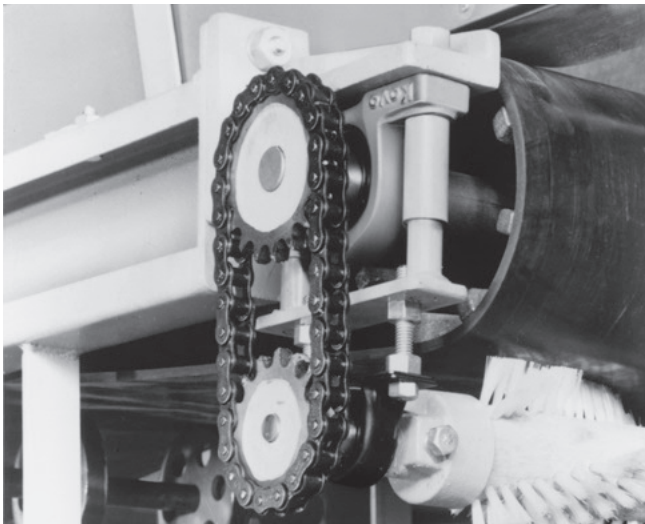


## Tea manufacturing plant

Koyo Ball Bearings contribute to the automation of tea manufacturing lines and downsizing of tea manufacturing machines.



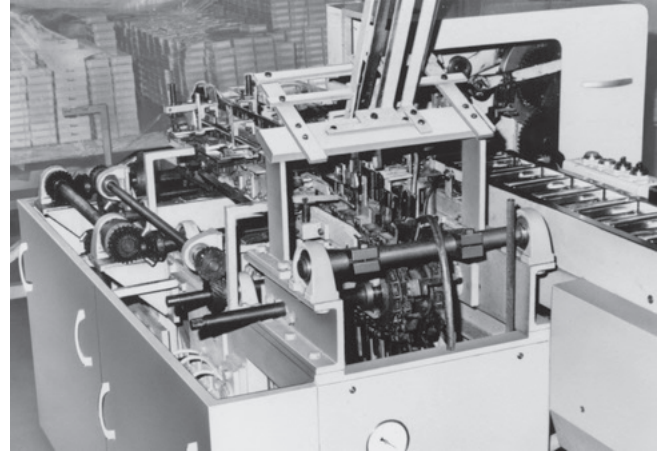
Tea processor driving system



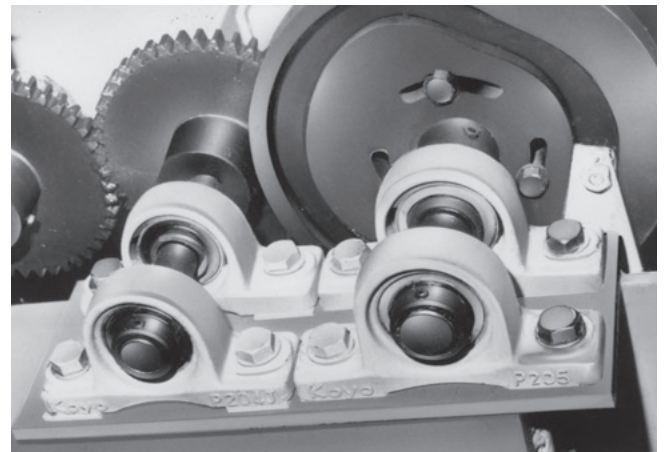
Conveyor driving system

## Packing machine

Koyo Ball Bearings, used in transmission units, cam shafts, and conveyors, contribute to high-efficiency and automation of packing lines.



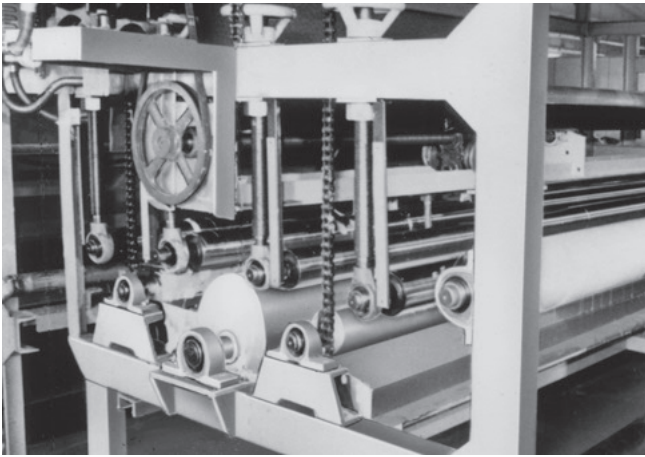
Packing machine



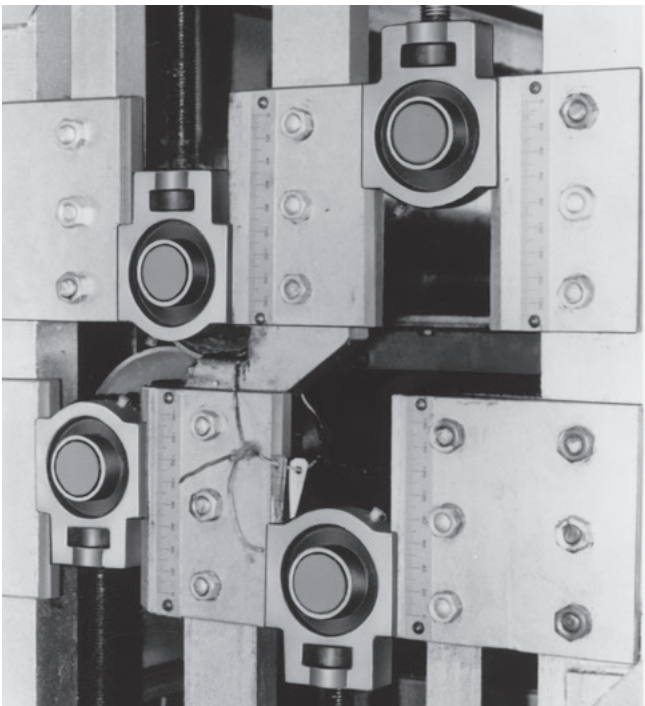
Cam shaft

**Textile machine**

Take-up units are suitable for locations where adjustment of distance between shaft axes is required, while hanger units are suitable for locations where the shaft must be hung because of the structure of the machine.



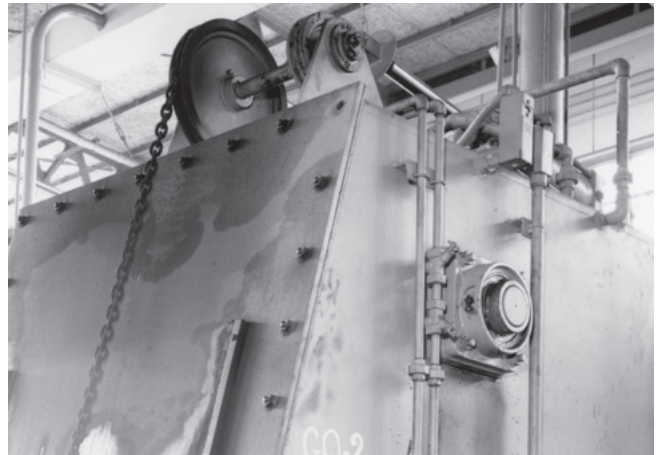
Carpet pasting system



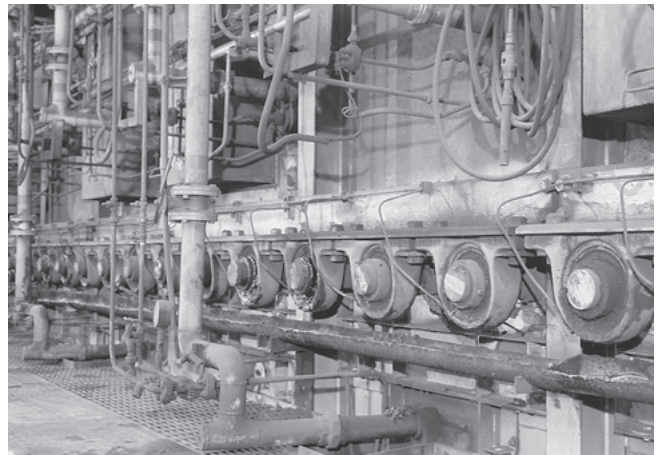
Carpet feeding shaft

**Heat treatment system**

The heat resistant unit is used for applications at a high temperature.



Carburizing furnace

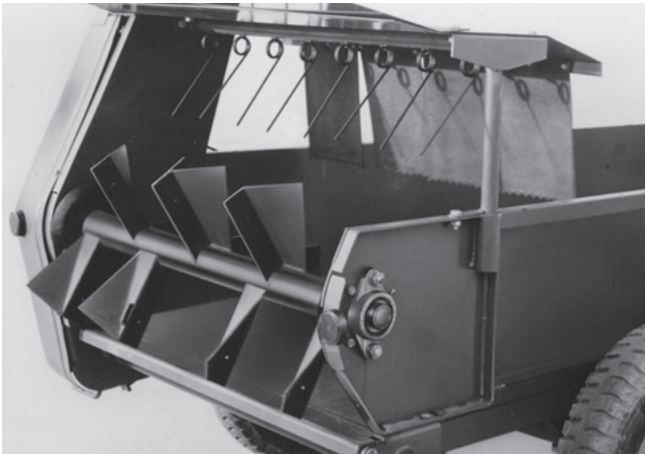


Heat treatment furnace



**Agricultural machine**

Koyo Ball Bearings contribute to downsizing and high-performance of agricultural machines. Triple-lip seal units or covered units are suitable for locations where are subject to a great deal of mud water and dusts.



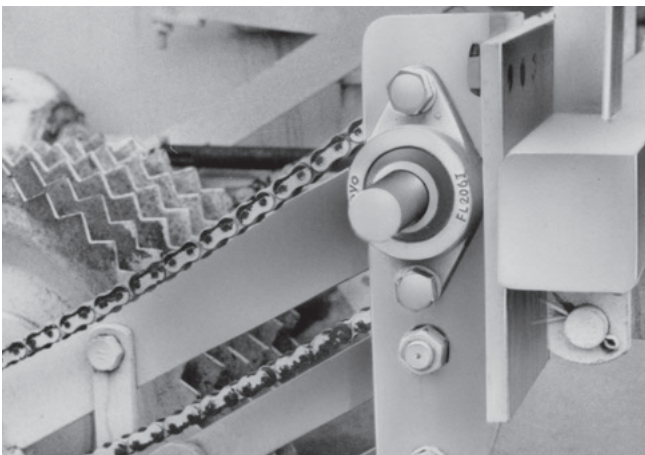
Small wagon

**Construction machinery**

Koyo Ball Bearings contribute to high-performance and longer service life of construction machinery used under severe environment.



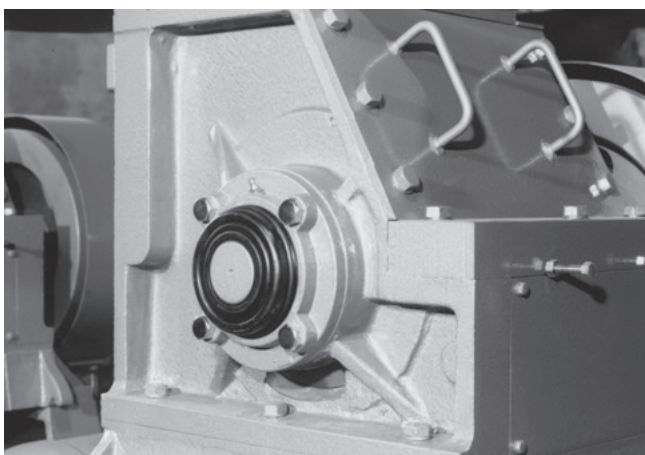
Concrete mixer



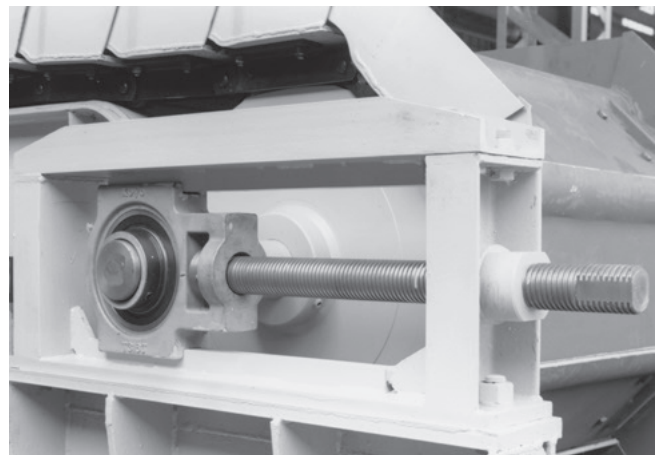
Beat harvester power transmission system



Conveyor



Grain mill

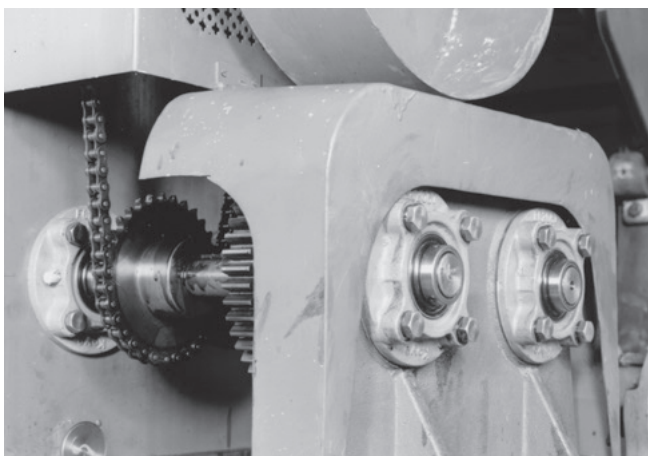


Conveyor

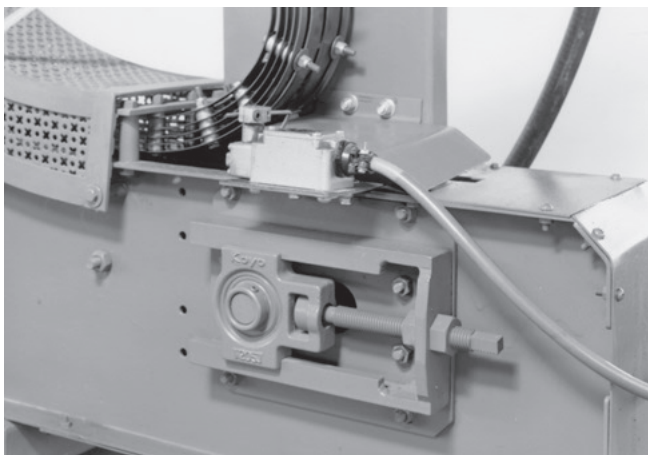


### Other applications

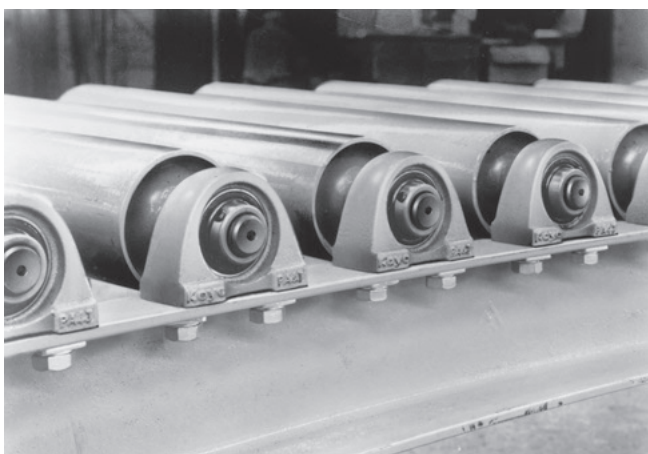
Ball Bearings of various types appropriate for applications and specifications are used.



(Round-flanged type with spigot joint)



(Take-up type unit)









(Pillow block type unit)

## Supplementary table (contents)

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Supplementary table 1 Simplified chart of ball bearing unit combinations

Type	Housing for units	Ball bearing for units							
		Cylindrical bore (with set screws)				Tapered bore (with adapter)			
		UC200	UCX00	UC300	Stainless steel UC200S6	UK200	UKX00	UK300	
Pillow block type 	P200, PX00, P300 PK200	UCP200	UCPX00	UCP300		UKP200	UKPX00	UKP300	
	P200SC, P300SC	UCP200SC		UCP300SC		UKP200SC		UKP300SC	
	IP200, IP300 PA200, SPA200H1	UCIP200 UCPA200		UCIP300	UCSPA200H1S6	UKIP200		UKIP300	
	PH200 LP200	UCPH200							
P000, SP000 SP200H1 PP200					UCSP200H1S6				
Square-flanged type 	F200, FX00, F300 F200E, FX00E SF200H1 NF200 FS300	UCF200 UCF200E	UCFX00 UCFX00E	UCF300	UCSF200H1S6	UKF200	UKFX00	UKF300	
				UCFS300				UKFS300	
Oval flange type 	FL200, FLX00, FL300 FL200E FA200	UCFL200 UCFL200E UCFA200	UCFLX00	UCFL300		UKFL200	UKFLX00	UKFL300	
	FB200 LF200	UCFB200							
	FL000, SFL000 NFL200 SFL200H1				UCSFL200H1S6				
Round-flanged type with spigot joint 	FC200, FCX00, FCX00E	UCFC200	UCFCX00 UCFCX00E			UKFC200	UKFCX00		
Pressed steel flange type 	PF200 PFL200								
Take-up type 	T200, TX00, T300 T200E, TX00E ST200H1 T200+H	UCT200 UCT200E	UCTX00 UCTX200E	UCT300	UCST200H1S6	UKT200	UKTX00	UKT300	
	TL200 TU200, TU300	UCTL200 UCTU200		UCTU300		(UKTL200) (UKTU200)		(UKTU300)	
	PTH200 NPTH200								
Cartridge type 	C200, CX00, C300	UCC200	UCCX00	UCC300		UKC200	UKCX00	UKC300	
Hanger type 	HA200	UCHA200							

Ball bearing for units					Housing for units	Type
Cylindrical bore (with set screws)		Cylindrical bore (with eccentric locking collar)				
"Compact" series SU000	Stainless steel SU000S6	SB200	SA200	NA200		
				NAP200 NAPK200	P200, PX00, P300 PK200 P200SC, P300SC	Pillow block type 
					IP200, IP300 PA200, SPA200H1	
		BLP200	ALP200		PH200 LP200	Square-flanged type 
UP000	USP000S6	SBPP200	SAPP200		P000, SP000 SP200H1 PP200	
				NANF200	F200, FX00, F300 F200E, FX00E SF200H1 NF200 FS300	
					FL200, FLX00, FL300 FL200E FA200	Oval flange type 
		BLF200	ALF200		FB200 LF200	
UFL000	USFL000S6			NANFL200	FL000, SFL000 NFL200 SFL200H1	Round-flanged type with spigot joint 
		SBPF200 SBPFL200	SAPF200 SAPFL200		PF200 PFL200	
				NAT200	T200, TX00, T300 T200E, TX00E ST200H1 T200+H	
					TL200 TU200, TU300	Take-up type 
		SBPTH200 SBNPTH200			PTH200 NPTH200	
				NAC200	C200, CX00, C300	Cartridge type 
					HA200	Hanger type 

**Supplementary table 2 Tightening torques of mounting bolts for housing and cast iron cover**

**(1) Tightening torques of mounting bolts for housing (recommended)**

Nominal size of screws	Tightening torques N · m
M 6	2.6– 4.7
M 8	6 – 10
M10	12 – 21
M12	21 – 37
M14	34 – 60
M16	53 – 93
M18	77 – 137
M20	104 – 186
M22	143 – 256
M27	266 – 478
M30	360 – 645
M33	494 – 886
M36	631 – 1 130

**(2) Tightening torques of mounting bolts for cast iron cover (recommended)**

Nominal size of screws	Tightening torques, N · m	Part No. of applicable cast iron covers (reference)		
		200 series	X00 series	300 series
M3	0.3– 0.6	204, 205	–	–
M4	0.8– 1.4	204FC3 (FD3), 205FC3 (FD3), 206–215	–	305–307
M5	1.5– 2.8	216–218	X18, X20	308–324
M8	6 – 10	–	–	326, 328



### Supplementary table 3 Tightening torques of set screws for inner ring and eccentric locking collar

#### (1) Tightening torques of set screws for inner ring and eccentric locking collar (metric series) (recommended)

Nominal size of screws	Tightening torques, N · m	Part No. of applicable bearings						
		UC200, RB200	UCX00	UC300	NA200	SB200	SU000	ER200
M 3X0.35	0.7						000, 001	
M 4X0.5	1.8	–				–	002, 003	
M 5X0.5	3	201X–203X	–	–		201–203	004–006	–
M 6X0.75	4	201–206	X05	305, 306	–	204–207	–	201–206
M 6X1	4	–	–	–	204, 205	–		
M 8X1	8.5	207–209	X06–X08	307	206–210	208		207–209
M10X1.25	17.5	210–212	X09–X11	308, 309	211, 212	–		210–212
M12X1.5	28	213–218	X12–X17	310–314	–			–
M14X1.5	35	–	X18	315, 316				
M16X1.5	56		X20	317–319				
M18X1.5	62		–	320–324				
M20X1.5	83			326, 328				

#### (2) Tightening torques of set screws for inner ring and eccentric locking collar (inch series) (recommended)

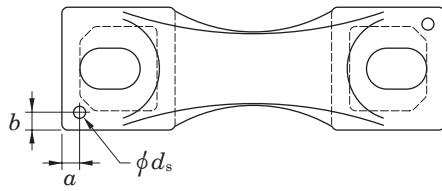
Nominal size of screws	Tightening torques, N · m	Part No. of applicable bearings		
		UC200, ER200, RB200	UCX00	SB200
10-32UNF	3	–	–	201, 202
1/4-28UNF	4	201–206	X05	204–207
5/16-24UNF	8.5	207–209	X06–X08	208
3/8-24UNF	17.5	210–212	X09–X11	–
1/2-20UNF	28	213–218	X12–X18	
5/8-18UNF	56	–	X20	

### Supplementary table 4 Tightening torques of adapter lock nuts (reference)

Bore code	Tightening torques, N · m			Bore code	Tightening torques, N · m		
	UK200	UKX00	UK300		UK200	UKX00	UK300
05	24.5	34	29	16	196	255	441
06	29	39	44	17	225	294	530
07	39	49	59	18	265	343	608
08	49	73	78	19	–	–	706
09	59	78	117	20		490	883
10	73	108	147	22		–	1 220
11	98	137	177	24			1 470
12	127	167	225	26			1 770
13	147	196	265	28			2 150
15	167	215	373				

Supplementary table 5 Machining dimensions of holes for housing dowel pins

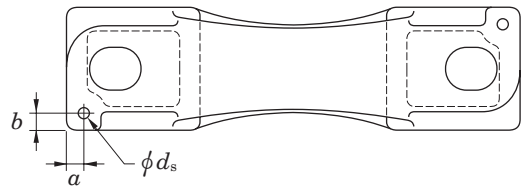
(1) Machining dimensions of holes for pillow block type housing (P) dowel pins (recommended)



Unit : mm

Nominal No.	$a$	$b$	$d_s$ (reference)	Pin seat thickness
P203	6	6	4	12
P204	6	6	4	13
P205	6	6	4	13
P206	6	6	4	15
P207	8	8	5	16
P208	8	8	5	17
P209	8	8	5	17
P210	10	10	5	19
P211	10	10	6	19
P212	10	10	6	22
P213	10	10	6	25
P214	12	12	8	28
P215	12	12	8	28
P216	12	12	8	32
P217	12	12	8	32
P218	15	15	8	34
PX05	7	7	5	16
PX06	8	8	5	17
PX07	8	8	5	19
PX08	8	8	5	21
PX09	8	8	5	21
PX10	9	9	6	22
PX11	9	9	6	28
PX12	9	9	6	28
PX13	10	10	8	28
PX14	10	10	8	32
PX15	10	10	8	32
PX16	12	12	8	34
PX17	12	12	8	34
PX18	15	15	10	38
PX20	19	19	10	45
P305	8	8	5	16
P306	10	10	5	17
P307	10	10	5	19
P308	11	11	6	19
P309	11	11	6	21
P310	11	11	6	24
P311	12	12	8	27
P312	12	12	8	29
P313	12	12	8	32
P314	12	12	10	35
P315	14	14	10	35
P316	15	15	10	35
P317	15	15	10	40
P318	15	15	10	40
P319	15	15	10	46
P320	17	17	13	46
P321	17	17	13	46
P322	17	17	13	50
P324	17	17	13	50
P326	20	20	13	50
P328	20	20	13	60

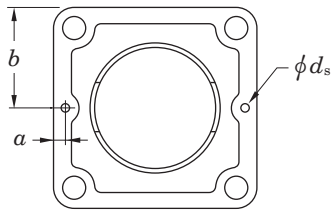
(2) Machining dimensions of holes for cast steel pillow block type housing (PSC) dowel pins (recommended)



Unit : mm

Nominal No.	$a$	$b$	$d_s$ (reference)	Pin seat thickness
P205SC	7.5	6	4	16
P206SC	8.5	6	4	18
P207SC	10	6	5	19
P208SC	12	7	5	19
P209SC	10.5	8	5	20
P210SC	10	8	5	22
P211SC	12	8	6	24
P212SC	15	10	6	25
P213SC	12.5	10	6	28
P214SC	10	10	8	28
P215SC	11.5	10	8	29
P216SC	10	11	8	31
P217SC	12.5	11	8	33
P218SC	12.5	11	8	35
P310SC	14	7	6	27
P311SC	18	10	8	30
P312SC	18	10	8	32
P313SC	18	10	8	35
P314SC	17	10	10	38
P315SC	25	13	10	38
P316SC	30	13	10	38
P317SC	27	15	10	45
P318SC	27	15	10	45
P319SC	30	17	10	51
P320SC	30	18	13	51
P322SC	33	20	13	57
P324SC	33	20	13	57
P326SC	33	20	13	57
P328SC	33	20	13	70

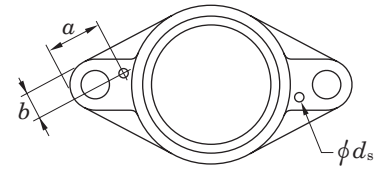
**(3) Machining dimensions of holes for square-flanged type housing (F) dowel pins (recommended)**



Unit : mm

Nominal No.	a	b	d <sub>s</sub> (reference)	Pin seat thickness
F204	6	43	4	11
F205	6	47.5	4	13
F206	7.5	54	4	13
F207	7.5	58.5	5	15
F208	7.5	65	5	15
F209	7.5	68.5	5	16
F210	7.5	71.5	5	16
F211	9	81	6	18
F212	9	87.5	6	18
F213	9	93.5	6	22
F214	10	96.5	8	22
F215	10	100	8	22
F216	10	104	8	22
F217	10	110	8	24
F218	10	117.5	8	25
FX05	7.5	54	5	13
FX06	7.5	58.5	5	14
FX07	7.5	65	5	14
FX08	7.5	68.5	5	14
FX09	7.5	71.5	5	14
FX10	9	81	6	20
FX11	9	87.5	6	20
FX12	9	93.5	6	21
FX13	10	93.5	8	21
FX14	10	98.5	8	22
FX15	10	142	8	24
FX16	10	107	8	24
FX17	10	155	8	24
FX18	12	155	10	24
FX20	12	134	10	28
F305	7.5	55	5	13
F306	7.5	62.5	5	15
F307	7.5	67.5	5	16
F308	9	75	6	17
F309	9	80	6	18
F310	9	87.5	6	19
F311	10	92.5	8	20
F312	10	97.5	8	22
F313	10	104	8	22
F314	12	113	10	25
F315	12	118	10	25
F316	12	125	10	27
F317	12	130	10	27
F318	12	140	10	30
F319	12	145	10	30
F320	16	155	13	32
F321	16	155	13	32
F322	16	170	13	35
F324	16	185	13	40
F326	16	205	13	45
F328	16	225	13	55

**(4) Machining dimensions of holes for Rombic-flanged type housing (FL) dowel pins (recommended)**



Unit : mm

Nominal No.	a	b	d <sub>s</sub> (reference)	Pin seat thickness
FL204	26	9	4	11
FL205	32	10	4	13
FL206	34	12	4	13
FL207	34	14	5	14
FL208	35	15	5	14
FL209	40	15	5	15
FL210	41	16	5	15
FL211	43	19	6	18
FL212	52	22	6	18
FL213	50	21	6	20
FL214	52	22	8	20
FL215	53	23	8	20
FL216	56	23	8	20
FL217	57	25	8	22
FL218	57	26	8	23
FLX05	27	12	5	13
FLX06	30	14	5	14
FLX07	32	15	5	14
FLX08	33	15	5	14
FLX09	35	16	5	14
FLX10	37	19	6	20
FL305	32	12	5	13
FL306	46	14	5	15
FL307	44	14	5	16
FL308	45	17	6	17
FL309	53	19	6	18
FL310	53	19	6	19
FL311	52	20	8	20
FL312	60	21	8	22
FL313	60	25	8	25
FL314	68	26	10	28
FL315	64	26	10	30
FL316	74	29	10	32
FL317	75	31	10	32
FL318	74	32	10	36
FL319	80	32	10	40
FL320	86	34	13	40
FL321	86	34	13	40
FL322	86	36	13	42
FL324	94	41	13	48
FL326	95	41	13	50
FL328	103	45	13	60

**Supplementary table 6 Shaft tolerances (deviation from nominal dimensions)**

**Supplementary table 6 Shaft tolerances (deviation from nominal dimensions)**

Nominal shaft dia. (mm)		Deviation classes of shaft dia.															
Over	Up to	d 6	e 6	f 6	g 5	g 6	h 5	h 6	h 7	h 8	h 9	h 10	js 5	js 6	js 7	j 5	j 6
3	6	-30 -38	-20 -28	-10 -18	-4 -9	-4 -12	0 -5	0 -8	0 -12	0 -18	0 -30	0 -48	± 2.5	± 4	± 6	+3 -2	+6 -2
6	10	-40 -49	-25 -34	-13 -22	-5 -11	-5 -14	0 -6	0 -9	0 -15	0 -22	0 -36	0 -58	± 3	± 4.5	± 7.5	+4 -2	+7 -2
10	18	-50 -61	-32 -43	-16 -27	-6 -14	-6 -17	0 -8	0 -11	0 -18	0 -27	0 -43	0 -70	± 4	± 5.5	± 9	+5 -3	+8 -3
18	30	-65 -78	-40 -53	-20 -33	-7 -16	-7 -20	0 -9	0 -13	0 -21	0 -33	0 -52	0 -84	± 4.5	± 6.5	±10.5	+5 -4	+9 -4
30	50	-80 -96	-50 -66	-25 -41	-9 -20	-9 -25	0 -11	0 -16	0 -25	0 -39	0 -62	0 -100	± 5.5	± 8	±12.5	+6 -5	+11 -5
50	80	-100 -119	-60 -79	-30 -49	-10 -23	-10 -29	0 -13	0 -19	0 -30	0 -46	0 -74	0 -120	± 6.5	± 9.5	±15	+6 -7	+12 -7
80	120	-120 -142	-72 -94	-36 -58	-12 -27	-12 -34	0 -15	0 -22	0 -35	0 -54	0 -87	0 -140	± 7.5	±11	±17.5	+6 -9	+13 -9
120	180	-145 -170	-85 -110	-43 -68	-14 -32	-14 -39	0 -18	0 -25	0 -40	0 -63	0 -100	0 -160	± 9	±12.5	±20	+7 -11	+14 -11
180	250	-170 -199	-100 -129	-50 -79	-15 -35	-15 -44	0 -20	0 -29	0 -46	0 -72	0 -115	0 -185	±10	±14.5	±23	+7 -13	+16 -13
250	315	-190 -222	-110 -142	-56 -88	-17 -40	-17 -49	0 -23	0 -32	0 -52	0 -81	0 -130	0 -210	±11.5	±16	±26	+7 -16	±16
315	400	-210 -246	-125 -161	-62 -98	-18 -43	-18 -54	0 -25	0 -36	0 -57	0 -89	0 -140	0 -230	±12.5	±18	±28.5	+7 -18	±18
400	500	-230 -270	-135 -175	-68 -108	-20 -47	-20 -60	0 -27	0 -40	0 -63	0 -97	0 -155	0 -250	±13.5	±20	±31.5	+7 -20	±20
500	630	-260 -304	-145 -189	-76 -120	-22 -54	-22 -66	0 -32	0 -44	0 -70	0 -110	0 -175	0 -280	±16	±22	±35	-	-
630	800	-290 -340	-160 -210	-80 -130	-24 -60	-24 -74	0 -36	0 -50	0 -80	0 -125	0 -200	0 -320	±18	±25	±40	-	-
800	1 000	-320 -376	-170 -226	-86 -142	-26 -66	-26 -82	0 -40	0 -56	0 -90	0 -140	0 -230	0 -360	±20	±28	±45	-	-

\*  $\Delta_{dmp}$  : Single plane mean bore diameter deviation

Unit :  $\mu\text{m}$  (Reference)

												Nominal shaft dia. (mm)		$\Delta_{dmp}^*$ of bearing (class 0)
k 5	k 6	k 7	m 5	m 6	m 7	n 5	n 6	p 6	r 6	r 7	Over	Up to		
+ 6 + 1	+ 9 + 1	+13 + 1	+ 9 + 4	+12 + 4	+ 16 + 4	+13 + 8	+ 16 + 8	+ 20 + 12	+ 23 + 15	+ 27 + 15	3	6	0 - 8	
+ 7 + 1	+10 + 1	+16 + 1	+12 + 6	+15 + 6	+ 21 + 6	+16 +10	+ 19 + 10	+ 24 + 15	+ 28 + 19	+ 34 + 19	6	10	0 - 8	
+ 9 + 1	+12 + 1	+19 + 1	+15 + 7	+18 + 7	+ 25 + 7	+20 +12	+ 23 + 12	+ 29 + 18	+ 34 + 23	+ 41 + 23	10	18	0 - 8	
+11 + 2	+15 + 2	+23 + 2	+17 + 8	+21 + 8	+ 29 + 8	+24 +15	+ 28 + 15	+ 35 + 22	+ 41 + 28	+ 49 + 28	18	30	0 - 10	
+13 + 2	+18 + 2	+27 + 2	+20 + 9	+25 + 9	+ 34 + 9	+28 +17	+ 33 + 17	+ 42 + 26	+ 50 + 34	+ 59 + 34	30	50	0 - 12	
+15 + 2	+21 + 2	+32 + 2	+24 +11	+30 +11	+ 41 + 11	+33 +20	+ 39 + 20	+ 51 + 32	+ 60 + 41	+ 71 + 41	50	65	0 - 15	
									+ 62 + 43	+ 73 + 43	65	80		
+18 + 3	+25 + 3	+38 + 3	+28 +13	+35 +13	+ 48 + 13	+38 +23	+ 45 + 23	+ 59 + 37	+ 73 + 51	+ 86 + 51	80	100	0 - 20	
									+ 76 + 54	+ 89 + 54	100	120		
+21 + 3	+28 + 3	+43 + 3	+33 +15	+40 +15	+ 55 + 15	+45 +27	+ 52 + 27	+ 68 + 43	+ 88 + 63	+103 + 63	120	140	0 - 25	
									+ 90 + 65	+105 + 65	140	160		
									+ 93 + 68	+108 + 68	160	180		
+24 + 4	+33 + 4	+50 + 4	+37 +17	+46 +17	+ 63 + 17	+51 +31	+ 60 + 31	+ 79 + 50	+106 + 77	+123 + 77	180	200	0 - 30	
									+109 + 80	+126 + 80	200	225		
									+113 + 84	+130 + 84	225	250		
+27 + 4	+36 + 4	+56 + 4	+43 +20	+52 +20	+ 72 + 20	+57 +34	+ 66 + 34	+ 88 + 56	+126 + 94	+146 + 94	250	280	0 - 35	
									+130 + 98	+150 + 98	280	315		
+29 + 4	+40 + 4	+61 + 4	+46 +21	+57 +21	+ 78 + 21	+62 +37	+ 73 + 37	+ 98 + 62	+144 +108	+165 +108	315	355	0 - 40	
									+150 +114	+171 +114	355	400		
+32 + 5	+45 + 5	+68 + 5	+50 +23	+63 +23	+ 86 + 23	+67 +40	+ 80 + 40	+108 + 68	+166 +126	+189 +126	400	450	0 - 45	
									+172 +132	+195 +132	450	500		
+32 0	+44 0	+70 0	+58 +26	+70 +26	+ 96 + 26	+76 +44	+ 88 + 44	+122 + 78	+194 +150	+220 +150	500	560	0 - 50	
									+199 +155	+225 +155	560	630		
+36 0	+50 0	+80 0	+66 +30	+80 +30	+110 + 30	+86 +50	+100 + 50	+138 + 88	+225 +175	+255 +175	630	710	0 - 75	
									+235 +185	+265 +185	710	800		
+40 0	+56 0	+90 0	+74 +34	+90 +34	+124 + 34	+96 +56	+112 + 56	+156 +100	+266 +210	+300 +210	800	900	0 -100	
									+276 +220	+310 +220	900	1 000		



Supplementary table 7 Housing bore tolerances (deviation from nominal dimensions)

Nominal Bore dia. (mm)		Deviation classes of housing bore														
Over	Up to	E 6	F 6	F 7	G 6	G 7	H 6	H 7	H 8	H 9	H 10	JS 5	JS 6	JS 7	J 6	J 7
10	18	+ 43 + 32	+ 27 + 16	+ 34 + 16	+17 + 6	+ 24 + 6	+11 0	+ 18 0	+ 27 0	+ 43 0	+ 70 0	± 4	± 5.5	± 9	+ 6 - 5	+10 - 8
18	30	+ 53 + 40	+ 33 + 20	+ 41 + 20	+20 + 7	+ 28 + 7	+13 0	+ 21 0	+ 33 0	+ 52 0	+ 84 0	± 4.5	± 6.5	±10.5	+ 8 - 5	+12 - 9
30	50	+ 66 + 50	+ 41 + 25	+ 50 + 25	+25 + 9	+ 34 + 9	+16 0	+ 25 0	+ 39 0	+ 62 0	+100 0	± 5.5	± 8	±12.5	+10 - 6	+14 -11
50	80	+ 79 + 60	+ 49 + 30	+ 60 + 30	+29 +10	+ 40 + 10	+19 0	+ 30 0	+ 46 0	+ 74 0	+120 0	± 6.5	± 9.5	±15	+13 - 6	+18 -12
80	120	+ 94 + 72	+ 58 + 36	+ 71 + 36	+34 +12	+ 47 + 12	+22 0	+ 35 0	+ 54 0	+ 87 0	+140 0	± 7.5	±11	±17.5	+16 - 6	+22 -13
120	180	+110 + 85	+ 68 + 43	+ 83 + 43	+39 +14	+ 54 + 14	+25 0	+ 40 0	+ 63 0	+100 0	+160 0	± 9	±12.5	±20	+18 - 7	+26 -14
180	250	+129 +100	+ 79 + 50	+ 96 + 50	+44 +15	+ 61 + 15	+29 0	+ 46 0	+ 72 0	+115 0	+185 0	±10	±14.5	±23	+22 - 7	+30 -16
250	315	+142 +110	+ 88 + 56	+108 + 56	+49 +17	+ 69 + 17	+32 0	+ 52 0	+ 81 0	+130 0	+210 0	±11.5	±16	±26	+25 - 7	+36 -16
315	400	+161 +125	+ 98 + 62	+119 + 62	+54 +18	+ 75 + 18	+36 0	+ 57 0	+ 89 0	+140 0	+230 0	±12.5	±18	±28.5	+29 - 7	+39 -18
400	500	+175 +135	+108 + 68	+131 + 68	+60 +20	+ 83 + 20	+40 0	+ 63 0	+ 97 0	+155 0	+250 0	±13.5	±20	±31.5	+33 - 7	+43 -20
500	630	+189 +145	+120 + 76	+146 + 76	+66 +22	+ 92 + 22	+44 0	+ 70 0	+110 0	+175 0	+280 0	±16	±22	±35	-	-
630	800	+210 +160	+130 + 80	+160 + 80	+74 +24	+104 + 24	+50 0	+ 80 0	+125 0	+200 0	+320 0	±18	±25	±40	-	-
800	1 000	+226 +170	+142 + 86	+176 + 86	+82 +26	+116 + 26	+56 0	+ 90 0	+140 0	+230 0	+360 0	±20	±28	±45	-	-
1 000	1 250	+261 +195	+164 + 98	+203 + 98	+94 +28	+133 + 28	+66 0	+105 0	+165 0	+260 0	+420 0	±23.5	±33	±52.5	-	-

\*  $\Delta_{D_{mp}}$  : Single plane mean outside diameter deviation

Unit :  $\mu\text{m}$  (Reference)

													Nominal Bore dia. (mm)		$\Delta_{Dmp}^*$ of bearing (class 0)
K 5	K 6	K 7	M 5	M 6	M 7	N 5	N 6	N 7	P 6	P 7	R 7	Over	Up to		
+ 2 - 6	+ 2 - 9	+ 6 - 12	- 4 - 12	- 4 - 15	0 - 18	- 9 - 17	- 9 - 20	- 5 - 23	- 15 - 26	- 11 - 29	- 16 - 34	10	18	0 - 8	
+ 1 - 8	+ 2 - 11	+ 6 - 15	- 5 - 14	- 4 - 17	0 - 21	- 12 - 21	- 11 - 24	- 7 - 28	- 18 - 31	- 14 - 35	- 20 - 41	18	30	0 - 9	
+ 2 - 9	+ 3 - 13	+ 7 - 18	- 5 - 16	- 4 - 20	0 - 25	- 13 - 24	- 12 - 28	- 8 - 33	- 21 - 37	- 17 - 42	- 25 - 50	30	50	0 - 11	
+ 3 - 10	+ 4 - 15	+ 9 - 21	- 6 - 19	- 5 - 24	0 - 30	- 15 - 28	- 14 - 33	- 9 - 39	- 26 - 45	- 21 - 51	- 30 - 60	50	65	0 - 13	
											- 32 - 62	65	80		
+ 2 - 13	+ 4 - 18	+ 10 - 25	- 8 - 23	- 6 - 28	0 - 35	- 18 - 33	- 16 - 38	- 10 - 45	- 30 - 52	- 24 - 59	- 38 - 73	80	100	0 - 15	
											- 41 - 76	100	120		
+ 3 - 15	+ 4 - 21	+ 12 - 28	- 9 - 27	- 8 - 33	0 - 40	- 21 - 39	- 20 - 45	- 12 - 52	- 36 - 61	- 28 - 68	- 48 - 88	120	140	(up to 150) 0	
											- 50 - 90	140	160	- 18 (over to 150)	
											- 53 - 93	160	180	0 - 25	
+ 2 - 18	+ 5 - 24	+ 13 - 33	- 11 - 31	- 8 - 37	0 - 46	- 25 - 45	- 22 - 51	- 14 - 60	- 41 - 70	- 33 - 79	- 60 - 106	180	200	0 - 30	
											- 63 - 109	200	225		
											- 67 - 113	225	250		
+ 3 - 20	+ 5 - 27	+ 16 - 36	- 13 - 36	- 9 - 41	0 - 52	- 27 - 50	- 25 - 57	- 14 - 66	- 47 - 79	- 36 - 88	- 74 - 126	250	280	0 - 35	
											- 78 - 130	280	315		
											- 87 - 144	315	355		
+ 3 - 22	+ 7 - 29	+ 17 - 40	- 14 - 39	- 10 - 46	0 - 57	- 30 - 55	- 26 - 62	- 16 - 73	- 51 - 87	- 41 - 98	- 93 - 150	355	400	0 - 40	
											- 103 - 166	400	450		
+ 2 - 25	+ 8 - 32	+ 18 - 45	- 16 - 43	- 10 - 50	0 - 63	- 33 - 60	- 27 - 67	- 17 - 80	- 55 - 95	- 45 - 108	- 109 - 172	450	500	0 - 45	
											- 150 - 220	500	560		
0 - 32	0 - 44	0 - 70	- 26 - 58	- 26 - 70	- 26 - 96	- 44 - 76	- 44 - 88	- 44 - 114	- 78 - 122	- 78 - 148	- 155 - 225	560	630	0 - 50	
											- 175 - 255	630	710		
0 - 36	0 - 50	0 - 80	- 30 - 66	- 30 - 80	- 30 - 110	- 50 - 86	- 50 - 100	- 50 - 130	- 88 - 138	- 88 - 168	- 185 - 265	710	800	0 - 75	
											- 210 - 300	800	900		
0 - 40	0 - 56	0 - 90	- 34 - 74	- 34 - 90	- 34 - 124	- 56 - 96	- 56 - 112	- 56 - 146	- 100 - 156	- 100 - 190	- 220 - 310	900	1 000	0 - 100	
											- 250 - 355	1 000	1 120		
0 - 47	0 - 66	0 - 105	- 40 - 87	- 40 - 106	- 40 - 145	- 66 - 113	- 66 - 132	- 66 - 171	- 120 - 186	- 120 - 225	- 260 - 365	1 120	1 250	0 - 125	

Supplementary Table 8 (1) SI units and conversion factors

Mass	SI units	Other Units <sup>1)</sup>	Conversion into SI units	Conversion from SI units
<b>Angle</b>	rad [radian(s)]	° [degree(s)] ' [minute(s)] " [second(s)]	* 1° = $\pi / 180$ rad * 1' = $\pi / 10\,800$ rad * 1" = $\pi / 648\,000$ rad	1 rad = 57.295 78°
<b>Length</b>	m [meter(s)]	Å [Angstrom unit] μ [micron(s)] in [inch(es)] ft [foot(feet)] yd [yard(s)] mile [mile(s)]	1 Å = 10 <sup>-10</sup> m = 0.1 nm = 100 pm 1 μ = 1 μm 1 in = 25.4 mm 1 ft = 12 in = 0.304 8 m 1 yd = 3 ft = 0.914 4 m 1 mile = 5 280 ft = 1 609.344 m	1 m = 10 <sup>10</sup> Å 1 m = 39.37 in 1 m = 3.280 8 ft 1 m = 1.093 6 yd 1 km = 0.621 4 mile
<b>Area</b>	m <sup>2</sup>	a [are(s)] ha [hectare(s)] acre [acre(s)]	1 a = 100 m <sup>2</sup> 1 ha = 10 <sup>4</sup> m <sup>2</sup> 1 acre = 4 840 yd <sup>2</sup> = 4 046.86 m <sup>2</sup>	1 km <sup>2</sup> = 247.1 acre
<b>Volume</b>	m <sup>3</sup>	ℓ, L [liter(s)] cc [cubic centimeters] gal (US) [gallon(s)] floz (US) [fluid ounce(s)] barrel (US) [barrels(US)]	* 1 ℓ = 1 dm <sup>3</sup> = 10 <sup>-3</sup> m <sup>3</sup> 1 cc = 1 cm <sup>3</sup> = 10 <sup>-6</sup> m <sup>3</sup> 1 gal (US) = 231 in <sup>3</sup> = 3.785 41 dm <sup>3</sup> 1 floz (US) = 29.573 5 cm <sup>3</sup> 1 barrel (US) = 158.987 dm <sup>3</sup>	1 m <sup>3</sup> = 10 <sup>3</sup> ℓ 1 m <sup>3</sup> = 10 <sup>6</sup> cc 1 m <sup>3</sup> = 264.17 gal 1 m <sup>3</sup> = 33 814 floz 1 m <sup>3</sup> = 6.289 8 barrel
<b>Time</b>	s [second(s)]	min [minute(s)] h [hour(s)] d [day(s)]	* * *	
<b>Angular velocity</b>	rad/s			
<b>Velocity</b>	m/s	kn [knot(s)] m/h	1 kn = 1 852 m/h *	1 km/h = 0.539 96 kn
<b>Acceleration</b>	m/s <sup>2</sup>	G	1 G = 9.806 65 m/s <sup>2</sup>	1 m/s <sup>2</sup> = 0.101 97 G
<b>Frequency</b>	Hz [hertz]	c/s [cycle(s)/second]	1 c/s = 1 s <sup>-1</sup> = 1 Hz	
<b>Rotational frequency</b>	s <sup>-1</sup>	rpm [revolutions per minute] min <sup>-1</sup> r/min	1 rpm = 1/60 s <sup>-1</sup> *	1 s <sup>-1</sup> = 60 rpm
<b>Mass</b>	kg [kilogram(s)]	t [ton(s)] lb [pound(s)] gr [grain(s)] oz [ounce(s)] ton (UK) [ton(s) (UK)] ton (US) [ton(s) (US)] car [carat(s)]	* 1 t = 10 <sup>3</sup> kg 1 lb = 0.453 592 37 kg 1 gr = 64.798 91 mg 1 oz = 1/16 lb = 28.349 5 g 1 ton (UK) = 1 016.05 kg 1 ton (US) = 907.185 kg 1 car = 200 mg	1 kg = 2.204 6 lb 1 g = 15.432 4 gr 1 kg = 35.274 0 oz 1 t = 0.984 2 ton (UK) 1 t = 1.102 3 ton (US) 1 g = 5 car

Note 1) \* : Unit can be used as an SI unit.  
No asterisk : Unit cannot be used.

**Supplementary Table 8 (2) SI units and conversion factors**

Mass	SI units	Other Units <sup>1)</sup>	Conversion into SI units	Conversion from SI units
Density	kg/m <sup>3</sup>			
Linear density	kg/m			
Momentum	kg · m/s			
Moment of momentum, Angular momentum	} kg · m <sup>2</sup> /s			
Moment of inertia		kg · m <sup>2</sup>		
Force	N [newton(s)]	dyn [dyne(s)] kgf [kilogram-force] gf [gram-force] tf [ton-force] lbf [pound-force]	1 dyn = 10 <sup>-5</sup> N 1 kgf = 9.806 65 N 1 gf = 9.806 65 × 10 <sup>-3</sup> N 1 tf = 9.806 65 × 10 <sup>3</sup> N 1 lbf = 4.448 22 N	1 N = 10 <sup>5</sup> dyn 1 N = 0.101 97 kgf  1 N = 0.224 809 lbf
Moment of force	N · m [newton meter(s)]	gf · cm kgf · cm kgf · m tf · m lbf · ft	1 gf · cm = 9.806 65 × 10 <sup>-5</sup> N · m 1 kgf · cm = 9.806 65 × 10 <sup>-2</sup> N · m 1 kgf · m = 9.806 65 N · m 1 tf · m = 9.806 65 × 10 <sup>3</sup> N · m 1 lbf · ft = 1.355 82 N · m	1 N · m = 0.101 97 kgf · m 1 N · m = 0.737 56 lbf · ft
Pressure, Normal stress	Pa [pascal(s)]  or N/m <sup>2</sup> {1 Pa = 1 N/m <sup>2</sup> }	gf/cm <sup>2</sup> kgf/mm <sup>2</sup> kgf/m <sup>2</sup> lbf/in <sup>2</sup> bar [bar(s)] at [engineering air pressure] mH <sub>2</sub> O, mAq [meter water column] atm [atmosphere] mHg [meter mercury column] Torr [torr]	1 gf/cm <sup>2</sup> = 9.806 65 × 10 Pa 1 kgf/mm <sup>2</sup> = 9.806 65 × 10 <sup>6</sup> Pa 1 kgf/m <sup>2</sup> = 9.806 65 Pa 1 lbf/in <sup>2</sup> = 6 894.76 Pa 1 bar = 10 <sup>5</sup> Pa 1 at = 1kgf/cm <sup>2</sup> = 9.806 65 × 10 <sup>4</sup> Pa 1 mH <sub>2</sub> O = 9.806 65 × 10 <sup>3</sup> Pa 1 atm = 101 325 Pa 1 mHg = $\frac{101\ 325}{0.76}$ Pa 1 Torr = 1mmHg = 133.322 Pa	1 MPa = 0.101 97 kgf/mm <sup>2</sup> 1 Pa = 0.101 97 kgf/m <sup>2</sup> 1 Pa = 0.145 × 10 <sup>-3</sup> lbf/in <sup>2</sup> 1 Pa = 10 <sup>-2</sup> mbar  1 Pa = 7.500 6 × 10 <sup>-3</sup> Torr
Viscosity	Pa · s [pascal second]	P [poise] kgf · s/m <sup>2</sup>	10 <sup>-2</sup> P = 1 cP = 1 mPa · s 1 kgf · s/m <sup>2</sup> = 9.806 65 Pa · s	1 Pa · s = 0.101 97 kgf · s/m <sup>2</sup>
Kinematic viscosity	m <sup>2</sup> /s	St [stokes]	10 <sup>-2</sup> St = 1 cSt = 1 mm <sup>2</sup> /s	
Surface tension	N/m			

Note 1) \* : Unit can be used as an SI unit.  
No asterisk : Unit cannot be used.

Supplementary Table 8 (3) SI units and conversion factors

Mass	SI units	Other Units <sup>1)</sup>	Conversion into SI units	Conversion from SI units
<b>Work, energy</b>	J [joule(s)] {1 J = 1 N · m}	eV [electron volt(s)] * erg [erg(s)] kgf · m lbf · ft	1 eV = (1.602 189 2 ± 0.000 004 6) × 10 <sup>-19</sup> J 1 erg = 10 <sup>-7</sup> J 1 kgf · m = 9.806 65 J 1 lbf · ft = 1.355 82 J	1 J = 10 <sup>7</sup> erg 1 J = 0.101 97 kgf · m 1 J = 0.737 56 lbf · ft
<b>Power</b>	W [watt(s)]	erg/s [ergs per second] kgf · m/s PS [French horse-power] HP [horse-power (British)] lbf · ft/s	1 erg/s = 10 <sup>-7</sup> W 1 kgf · m/s = 9.806 65 W 1 PS = 75 kgf · m/s = 735.5 W 1 HP = 550 lbf · ft/s = 745.7 W 1 lbf · ft/s = 1.355 82 W	1 W = 0.101 97 kgf · m/s 1 W = 0.001 36 PS 1 W = 0.001 34 HP
<b>Thermo-dynamic temperature</b>	K [kelvin(s)]			
<b>Celsius temperature</b>	°C [celsius(s)] {t °C = (t + 273.15) K}	°F [degree(s) Fahrenheit]	t°F = $\frac{5}{9} (t - 32) °C$	t°C = $(\frac{5}{9} t + 32) °F$
<b>Linear expansion coefficient</b>	K <sup>-1</sup>	°C <sup>-1</sup> [per degree]		
<b>Heat</b>	J [joule(s)] {1 J = 1 N · m}	erg [erg(s)] kgf · m cal <sub>IT</sub> [l. T. calories]	1 erg = 10 <sup>-7</sup> J 1 cal <sub>IT</sub> = 4.186 8 J 1 Mcal <sub>IT</sub> = 1.163 kW · h	1 J = 10 <sup>7</sup> erg 1 J = 0.238 85 cal <sub>IT</sub> 1 kW · h = 0.86 × 10 <sup>6</sup> cal <sub>IT</sub>
<b>Thermal conductivity</b>	W/ (m · K)	W/ (m · °C) cal/ (s · m · °C)	1 W/ (m · °C) = 1 W/ (m · K) 1 cal/ (s · m · °C) = 4.186 05 W/ (m · K)	
<b>Coefficient of heat transfer</b>	W/ (m <sup>2</sup> · K)	W/ (m <sup>2</sup> · °C) cal/ (s · m <sup>2</sup> · °C)	1 W/ (m <sup>2</sup> · °C) = 1 W/ (m <sup>2</sup> · K) 1 cal/ (s · m <sup>2</sup> · °C) = 4.186 05 W/ (m <sup>2</sup> · K)	
<b>Heat capacity</b>	J/K	J/°C	1 J/°C = 1 J/K	
<b>Massic heat capacity</b>	J/ (kg · K)	J/ (kg · °C)		

Note 1) \* : Unit can be used as an SI unit.  
No asterisk : Unit cannot be used.



**Supplementary Table 8 (4) SI units and conversion factors**

Mass	SI units	Other Units <sup>1)</sup>	Conversion into SI units	Conversion from SI units
<b>Electric current</b>	A [ampere(s)]			
<b>Electric charge, quantity of electricity</b>	C [coulomb(s)]  {1 C = 1 A · s}	A · h *  	1 A · h = 3.6 kC	
<b>Tension, electric potential</b>	V [volt(s)] {1 V = 1 W/A}			
<b>Capacitance</b>	F [farad(s)] {1 F = 1 C/V}			
<b>Magnetic field strength</b>	A/m	Oe [oersted(s)]	$1 \text{ Oe} = \frac{10^3}{4\pi} \text{ A/m}$	1 A/m = $4\pi \times 10^{-3}$ Oe
<b>Magnetic flux density</b>	T [tesla(s)]  {1 T = 1 N/(A · m) = 1 Wb/m <sup>2</sup> = 1 V · s/m <sup>2</sup> }	Gs [gauss(es)]  $\gamma$ [gamma(s)]	1 Gs = $10^{-4}$ T 1 $\gamma$ = $10^{-9}$ T	1 T = $10^4$ Gs 1 T = $10^9 \gamma$
<b>Magnetic flux</b>	Wb [weber(s)] {1 Wb = 1 V · s}	Mx [maxwell(s)]	1 Mx = $10^{-8}$ Wb	1 Wb = $10^8$ Mx
<b>Self inductance</b>	H [henry (– ries)] {1 H = 1 Wb/A}			
<b>Resistance (to direct current)</b>	$\Omega$ [ohm(s)] {1 $\Omega$ = 1 V/A}			
<b>Conductance (to direct current)</b>	S [siemens] {1 S = 1 A/V}			
<b>Active power</b>	W  {1 W = 1 J/s = 1 A · V}			

Note 1) \* : Unit can be used as an SI unit.  
No asterisk : Unit cannot be used.



## Supplementary table 10 Mechanical properties of metal materials (reference)

### (1) Modulus of longitudinal elasticity, elastic limit, and ultimate strength

Material	Main components and others	Specific gravity	Modulus of longitudinal elasticity (GPa)	Elastic limit $\sigma_e$ (MPa)	Ultimate strength (MPa)			
					Tensile $K_t$	Compression $K_c$	Shear $K_s$	
Gray cast iron (FC150)		7.1–7.3	69	29	118	590	108	
(FC200)		7.1–7.3	98	88	137– 216	740	206	
(FC250)		7.1–7.3	103	88	176– 314	880	206	
White heart malleable cast iron	Residual carbon : 1.6% or less	7.1–7.3	158	196	314– 392	820	382	
Black heart malleable cast iron		7.2–7.6	158	196	274– 392	820	382	
Carbon steel	General	7.7–7.8	196–216	176–245	314– 830	–	–	
Extra mild steel	C 0.05–0.15%	7.8	196	118	Up to 372	Virtually identical to tensile strength, provided buckling can be ignored	0.8 $K_t$	
Mild steel	C 0.15–0.25%	7.8	204	157	372– 392		0.75 $K_t$	
Middle hard steel	C 0.25–0.40%	7.8	206	245–294	490– 590		0.75 $K_t$	
Hard steel	C 0.40–0.50%	7.8	216	343	590– 690		0.7 $K_t$	
Maximum hard steel	C 0.50–0.65%	7.8	216	372	690– 830		0.65 $K_t$	
Mild steel	C 0.18% hot rolling	7.8	206	176	421		314	
Hard steel	Oil hardening, tempering at 700 °C	7.8	206	343	590		461	
Tool steel	C 0.60–1.50% hardening	7.8	216	441	660		820	
Cast steel	General	7.8–7.9	206–211	176–245	343– 600		343–600	284–382
Cast steel (mild)	C 0.15–0.22%	7.8–7.9	206	196	363– 431		363–431	284
Cast steel (middle hard)	C 0.22–0.30%	7.8–7.9	211	225	392– 490	392–490	333	
Cast steel (hard)	C 0.30–0.40%	7.9	211	245	490– 590	490–590	382	
Nickel steel	C 0.25–0.35% Ni 2–5%	7.85	206–216	333	640– 830	640	401	
Chrome steel	C 0.13–0.48% Cr 0.9–1.2%	7.85	206–216	–	780– 980	–	–	
Nickel chrome steel	C, Ni, Cr included	7.85	206–216	–	740– 980	–	382–500	
Chromium molybdenum steel	C, Cr, Mo included	7.85	206–216	–	830– 980	–	–	
Manganese steel	C 0.2–0.46% Mn 1–1.4%	7.85	206–216	–	440–1 080	–	–	
Spring steel		7.86	216	735	1 080–1 670	1 670	–	
Stainless steel	C, Cr, Ni included	7.75	206–216	–	620	–	410	
Brass casting	Cu 60% Zn 40%	8.5	69	–	176– 216	108	147	
Brass (forged plate)	Cu 60% Zn 40%	8.4	78– 98	–	274– 392	314	206	
Brass (forged rod)	Cu 60% Zn 40%	8.4	82	–	520	314	314	
Phosphor bronze casting	Cu 90% Sn 10% P 0.1%	8.8	93–103	–	196– 294	137	176	
Phosphor bronze (forging)	Cu 90% Sn 10% P 0.1%	8.8	132	–	294– 980	206	382	
Tin		7.28	39– 54	–	27	–	–	
Lead		11.34	15– 17	–	20	–	–	
Zinc		7.1	78–127	–	78– 176	–	–	

### (2) Allowable stress

Unit : MPa

Material	Tensile $K_t$			Compression $K_c$		Bending $K_b$			Shear $K_s$			Torsion $K_d$		
	<i>a</i>	<i>b</i>	<i>c</i>	<i>a</i>	<i>b</i>	<i>a</i>	<i>b</i>	<i>c</i>	<i>a</i>	<i>b</i>	<i>c</i>	<i>a</i>	<i>b</i>	<i>c</i>
Cast iron (cast)	29– 34	20– 23	10–12	88– 98	59– 65	45– 59	30– 39	15–20	29– 34	20–23	10–12	26– 34	18–23	88–118
Cast iron (machined)	29– 34	20– 23	10–12	88– 98	59– 65	55– 71	–	–	29– 34	20–23	10–12	26– 34	18–23	88–118
Malleable cast iron	44– 69	29– 46	15–23	59– 88	39– 59	44– 98	29– 46	15–23	–	–	–	29– 39	20–26	10– 13
Cast steel	59–118	39– 78	20–39	88–147	59– 98	74–118	49– 78	25–39	47– 94	31–63	16–31	47– 94	31–63	16– 31
Mild steel	98–157	66–105	32–52	98–157	66–105	88–147	59– 98	35–49	78–127	52–85	26–42	78–137	52–91	26– 46
Middle hard steel	118–176	78–118	39–59	118–176	78–118	118–176	78–118	39–59	94–137	63–94	31–47	88–137	59–94	29– 47
Nickel steel	118–176	78–118	39–59	118–176	78–118	118–176	78–118	39–59	94–137	63–94	31–47	88–137	59–92	29– 47
Carbon steel casting	88–118	59– 78	29–39	88–118	59– 78	88–118	59– 78	29–39	71– 93	47–63	24–31	35– 47	24–31	12– 16
Brass (rolled)	10– 59	26– 35	13–20	39– 59	26– 39	39– 59	26– 39	13–20	34– 47	21–31	11–16	31– 47	21–31	11– 16
Bronze	29– 39	20– 26	10–13	29– 39	20– 26	29– 39	20– 26	10–13	–	–	–	–	–	–
Phosphor bronze	59– 88	39– 59	20–29	59– 88	39– 59	59– 88	39– 59	20–29	44– 69	29–46	15–23	44– 69	29–46	15– 23
Aluminum casting	10– 12	7– 8	2– 4	–	–	15– 20	10– 13	5– 7	–	–	–	–	–	–

Remarks 1. *a* is applicable in the case of static load, *b* is applicable in the case of dynamic load, and *c* is applicable to in the case of repeated load.

2. Bending allowable stress  $K_b$  and torsion allowable stress  $K_d$  of cast iron are applicable when the cross section is round and safety factor is within a range from 5 to 6.

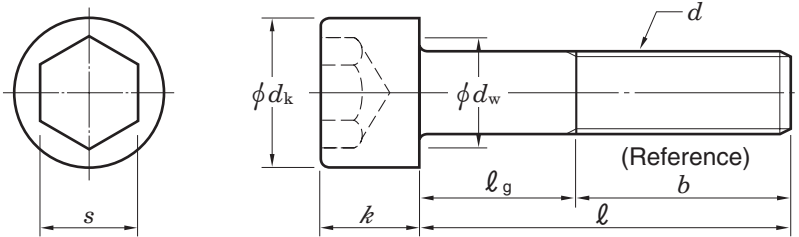
Supplementary table 11 Hexagon socket head cap screws

Supplementary table 11 (1) Hexagon socket head cap screws (abstract from JIS B 1176)

M 1.6 – 24

Allowance of bolt length ( $\ell$ )

Unit : mm



Bolt length ( $\ell$ )		Allowance of length
Over	Up to	
-	3	$\pm 0.2$
3	6	$\pm 0.24$
6	10	$\pm 0.29$
10	16	$\pm 0.35$
16	30	$\pm 0.42$
30	50	$\pm 0.5$
50	80	$\pm 0.6$
80	120	$\pm 0.7$
120	180	$\pm 0.8$
180	240	$\pm 0.95$
240	300	$\pm 1.05$

(1) Parts class A M 1.6–24

Unit : mm

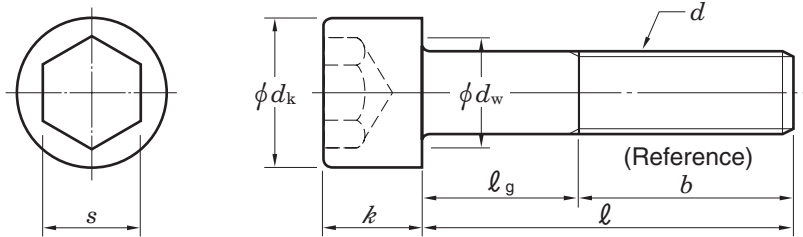
Nominal size of screw $d$	Coarse screw thread pitch	M 1.6	M 2	M 2.5	M 3	M 4	M 5	M 6	M 8	M 10	M 12	(M 14)	M 16	(M 18)	M 20	(M 22)	M 24
Head dia. $d_k$		3	3.8	4.5	5.5	7	8.5	10	13	16	18	21	24	27	30	33	36
Head height $k$		1.6	2	2.5	3	4	5	6	8	10	12	14	16	18	20	22	24
Bearing surface dia. $d_w$ (min.)		2.72	3.4	4.18	5.07	6.53	8.03	9.38	12.33	15.33	17.23	20.17	23.17	25.87	28.87	31.81	34.81
Nominal size of hexagon socket $s$		1.5	1.5	2	2.5	3	4	5	6	8	10	12	14	14	17	17	19
Thread length $b$ (reference)		15	16	17	18	20	22	24	28	32	36	40	44	48	52	56	60

Nominal length $\ell$	M 1.6	Body length $\ell_g$ (max.)															
2.5																	
3			M 2														
4				M 2.5													
5					M 3												
6						M 4											
8							M 5										
10								M 6									
12									M 8								
16										M 10							
20											M 12						
25												M 14					
30													M 16				
35																	
40																	
45																	
50																	
55																	
60																	
65																	
70																	
80																	
90																	
100																	
110																	
120																	
130																	
140																	
150																	
160																	
180																	
200																	

- Remarks
1. Priority is given to the nominal sizes of screws without parentheses.
  2. Nominal lengths ( $\ell$ ) to be recommended for the nominal sizes of screw are within the range enclosed by bold lines in the column of "Body length  $\ell_g$ ". In the column of "Body length  $\ell_g$ ", thread of the screw with length shorter than that indicated under dotted lines should be continuous. For the continuous thread stud screw, the incomplete thread portion length under the neck of the screw should be approximately three times of the thread pitch.
  3. The sides of the head of screw should be single or double knurled. The  $d_k$  values in the table are the maximum values without knurls.
  4. Roundness or chamfers on the bearing surface should be provided between the diameter of the head ( $d_k$ ) and the diameter of bearing surface ( $d_w$ ), and the surface should be free from burrs.

## Supplementary table 11 (2) Hexagon socket head cap screws (abstract from JIS B 1176)

M 27 – 52



Allowance of bolt length ( $\ell$ )

Unit : mm

Bolt length ( $\ell$ )		Allowance of length
Over	Up to	
–	3	$\pm 0.2$
3	6	$\pm 0.24$
6	10	$\pm 0.29$
10	16	$\pm 0.35$
16	30	$\pm 0.42$
30	50	$\pm 0.5$
50	80	$\pm 0.6$
80	120	$\pm 0.7$
120	180	$\pm 0.8$
180	240	$\pm 0.95$
240	300	$\pm 1.05$

(2) Parts class A M 27–52

Unit : mm

Nominal size of screw $d$	Coarse screw thread pitch	(M 27)	M 30	(M 33)	M 36	(M 39)	M 42	(M 45)	M 48	(M 52)
Head dia. $d_k$		40	45	50	54	58	63	68	72	78
Head height $k$		27	30	33	36	39	42	45	48	52
Bearing surface dia. $d_w$ (min.)		38.61	43.61	48.61	52.54	56.34	61.34	66.34	70.34	76.34
Nominal size of hexagon socket $s$		19	22	24	27	27	32	32	36	36
Thread length $b$ (reference)		66	72	78	84	90	96	102	108	116

Nominal length $\ell$	(M 27)	M 30	Body length $\ell_g$ (max.)							
45										
50										
55										
60										
65										
70										
80										
90										
100										
110										
120										
130										
140										
150										
160										
180										
200										
220										
240										
260										
280										
300										

- Remarks
1. Priority is given to the nominal sizes of screws without parentheses.
  2. Nominal lengths ( $\ell$ ) to be recommended for the nominal sizes of screw are within the range enclosed by bold lines in the column of "Body length  $\ell_g$ ". In the column of "Body length  $\ell_g$ ", thread of the screw with length shorter than that indicated under dotted lines should be continuous. For the continuous thread stud screw, the incomplete thread portion length under the neck of the screw should be approximately three times of the thread pitch.
  3. The sides of the head of screw should be single or double knurled. The  $d_k$  values in the table are the maximum values without knurls.
  4. Roundness or chamfers on the bearing surface should be provided between the diameter of the head ( $d_k$ ) and the diameter of bearing surface ( $d_w$ ), and the surface should be free from burrs.

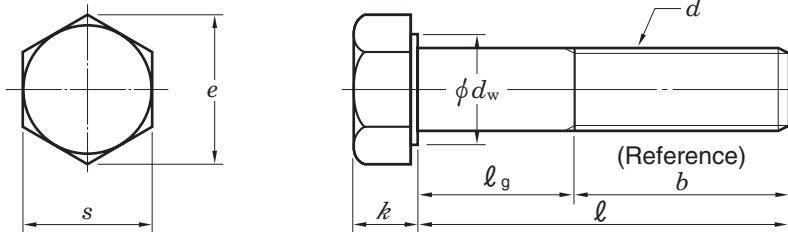


Supplementary table 12 (1) Hexagon head bolts (abstract from JIS B 1180)

Parts class A M 1.6 – 24

Allowance of bolt length ( $\ell$ )

Unit : mm



Bolt length ( $\ell$ )		Allowance of length
Over	Up to	
-	20	±0.35
20	30	±0.42
30	50	±0.5
50	80	±0.6
80	120	±0.7
120	150	±0.8

(1) Parts class A M 1.6–24

Unit : mm

Nominal size of screw $d$	Coarse screw thread pitch	M 1.6	M 2	M 2.5	M 3	(M 3.5)	M 4	M 5	M 6	M 8	M 10	M 12	(M 14)	M 16	(M 18)	M 20	(M 22)	M 24
	Fine thread		-	-	-	-	-	-	-	-	M 8 x 1	M 10 x 1	M 12 x 1.5	-	M 16 x 1.5	-	M 20 x 1.5	-
		-	-	-	-	-	-	-	-	-	(M 10 x 1.25)	(M 12 x 1.25)	(M 14 x 1.5)	-	(M 18 x 1.5)	(M 20 x 2)	(M 22 x 1.5)	-
Bearing surface dia. $d_w$ (min.)		2.27	3.07	4.07	4.57	5.07	5.88	6.88	8.88	11.63	14.63	16.63	19.64	22.49	25.34	28.19	31.71	33.61
Width across flats $s$ (max.)		3.2	4	5	5.5	6	7	8	10	13	16	18	21	24	27	30	34	36
Width across corners $e$ (min.)		3.41	4.32	5.45	6.01	6.58	7.66	8.79	11.05	14.38	17.77	20.03	23.36	26.75	30.14	33.53	37.72	39.98
Head height $k$ (basic)		1.1	1.4	1.7	2	2.4	2.8	3.5	4	5.3	6.4	7.5	8.8	10	11.5	12.5	14	15
Thread length $b$ (reference)	$\ell \leq 125$	9	10	11	12	13	14	16	18	22	26	30	34	38	42	46	50	54
	$125 < \ell \leq 150$	-	-	-	-	-	-	-	-	-	-	-	40	44	48	52	56	60

Nominal length $\ell$	Body length $\ell_g$ (max.)																		
12	3	M 2	M 2.5																
16	7	6	5	M 3	(M 3.5)														
20	10	9	8	7	M 4	M 5													
25	14	13	12	11	9	M 6													
30	18	17	16	14	12														
35	22	21	19	17	M 8														
40	26	24	22	18	M 10														
45	29	27	23	19	M 12														
50	34	32	28	24	20														
55	37	33	29	25	(M 14)														
60	42	38	34	30	26	M 16													
65	43	39	35	31	27	(M 18)													
70	48	44	40	36	32	28	M 20												
80	58	54	50	46	42	38	34	(M 22)	M 24										
90	64	60	56	52	48	44	40	36	32	28	24	20	16	12	8	4			
100	74	70	66	62	58	54	50	46	42	38	34	30	26	22	18	14	10	6	
110	80	76	72	68	64	60	56	52	48	44	40	36	32	28	24	20	16	12	
120	90	86	82	78	74	70	66	62	58	54	50	46	42	38	34	30	26	22	
130	90	86	82	78	74	70	66	62	58	54	50	46	42	38	34	30	26	22	
140	100	96	92	88	84	80	76	72	68	64	60	56	52	48	44	40	36	32	
150	106	102	98	94	90	86	82	78	74	70	66	62	58	54	50	46	42	38	

As for the bolts with nominal length within this area, standards of continuous thread stud hexagon head bolt (parts class A) should be observed.

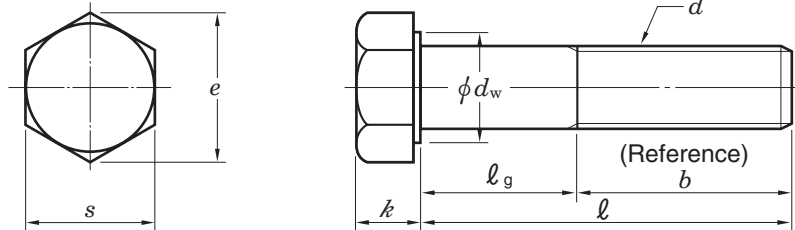
- Remarks 1. Priority is given to the nominal sizes of screws without parentheses.
- 2. Nominal lengths ( $\ell$ ) to be recommended for the nominal sizes of screw are within the range enclosed by bold lines.
- 3. Body length  $\ell_g$  (maximum) should be found by the following formula :  $\ell_g$  (maximum) = Nominal length ( $\ell$ ) – Thread length ( $b$ )

## Supplementary table 12 (2) Hexagon head bolts (abstract from JIS B 1180)

Parts class B M 16 – 64

Allowance of bolt length ( $\ell$ )

Unit : mm



Bolt length ( $\ell$ )		Allowance of length
Over	Up to	
–	80	$\pm 1.5$
80	90	$\pm 1.7$
90	120	$\pm 1.75$
120	180	$\pm 2$
180	240	$\pm 2.3$
240	300	$\pm 2.6$
300	400	$\pm 2.85$
400	500	$\pm 3.15$

### (2) Parts class B M 16–64

Unit : mm

Nominal size of screw $d$	Coarse screw thread pitch	M 16	(M 18)	M 20	(M 22)	M 24	(M 27)	M 30	(M 33)	M 36	(M 39)	M 42	(M 45)	M 48	(M 52)	M 56	(M 60)	M 64
		Fine thread	M 16 x 1.5	–	M 20 x 1.5	–	M 24 x 2	–	M 30 x 2	–	M 36 x 3	–	M 42 x 3	–	M 48 x 3	–	M 56 x 4	–
		–	(M 18 x 1.5)	(M 20 x 2)	(M 22 x 1.5)	–	(M 27 x 2)	–	(M 33 x 2)	–	(M 39 x 3)	–	(M 45 x 3)	–	(M 52 x 4)	–	(M 60 x 4)	–
Bearing surface dia. $d_w$ (min.)		22	24.85	27.7	31.35	33.25	38	42.75	46.55	51.11	55.86	59.95	64.7	69.45	74.2	78.66	83.41	88.16
Width across flats $s$ (max.)		24	27	30	34	36	41	46	50	55	60	65	70	75	80	85	90	95
Width across corners $e$ (min.)		26.17	29.56	32.95	37.29	39.55	45.2	50.85	55.37	60.79	66.44	71.3	76.95	82.6	88.25	93.56	99.21	104.86
Head height $k$ (basic)		10	11.5	12.5	14	15	17	18.7	21	22.5	25	26	28	30	33	35	38	40
Thread length $b$ (reference)	$\ell \leq 125$	38	42	46	50	54	60	66	–	–	–	–	–	–	–	–	–	–
	$125 < \ell \leq 200$	44	48	52	56	60	66	72	78	84	90	96	102	108	116	–	–	–
	$200 < \ell \leq 500$	–	–	–	69	73	79	85	91	97	103	109	115	121	129	137	145	153

Nominal length $\ell$	Body length $l_g$ (max.)																	
65	(M 18)																	
70	M 20																	
80	(M 22) M 24																	
90	(M 27)																	
100	40 M 30																	
110	50 44																	
120	60 54 (M 33)																	
130	64 58 M 36																	
140	74 68 62 56 (M 39)																	
150	84 78 72 66 60 M 42																	
160	116	112	108	104	100	94	88	82	76	70	64	(M 45)	M 48					
180	132 128 124 120 114 108 102 96 90 84 78 72 (M 52)																	
200	148 144 140 134 128 122 116 110 104 98 92 84 M 56																	
220	151 147 141 135 129 123 117 111 105 99 91 83 (M 60)																	
240	161 155 149 143 137 131 125 119 111 103 95 M 64																	
260	181 175 169 163 157 151 145 139 131 123 115 107																	
280	195 189 183 177 171 165 159 151 143 135 127																	
300	215 209 203 197 191 185 179 171 163 155 147																	
320	229 223 217 211 205 199 191 183 175 167																	
340	243 237 231 225 219 211 203 195 187																	
360	263 257 251 245 239 231 223 215 207																	
380	277 271 265 259 251 243 235 227																	
400	291 285 279 271 263 255 247																	
420	311 305 299 291 283 275 267																	
440	325 319 311 303 295 287																	
460	339 331 323 315 307																	
480	359 351 343 335 327																	
500	371 363 355 347																	

As for the bolts with nominal length within this area, standards of continuous thread stud hexagon head bolt (parts class A or B) should be observed.

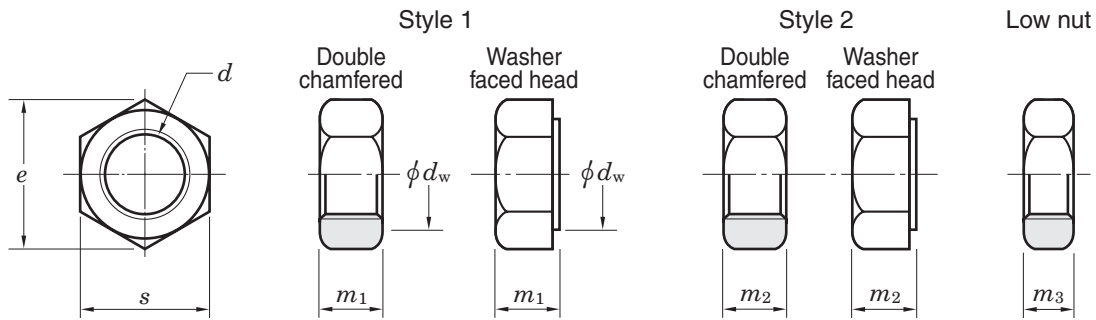
Remarks 1. Priority is given to the nominal sizes of screws without parentheses.

2. Nominal lengths ( $\ell$ ) to be recommended for the nominal sizes of screw are within the range enclosed by bold lines.

3. Body length  $l_g$  (maximum) should be found by the following formula :  $l_g$  (maximum) = Nominal length ( $\ell$ ) – Thread length ( $b$ )

Supplementary table 13 Hexagon head nuts (abstract from JIS B 1181)

Parts class A M 1.6 – 16  
 Parts class B M 18 – 64



(1) Parts class A M 1.6–16

Unit : mm

Nominal size of screw <i>d</i>	Coarse screw thread pitch	M 1.6	M 2	M 2.5	M 3	(M 3.5)	M 4	M 5	M 6	M 8	M 10	M 12	(M 14)	M 16
	Fine thread		–	–	–	–	–	–	–	–	M 8 × 1	M 10 × 1	M 12 × 1.5	–
Bearing surface dia. <i>d<sub>w</sub></i> (min.)		2.27	3.07	4.07	4.57	5.07	5.88	6.88	8.88	11.63	14.63	16.63	19.64	22.49
Width across flats <i>s</i> (max.)		3.2	4	5	5.5	6	7	8	10	13	16	18	21	24
Width across corners <i>e</i> (min.)		3.41	4.32	5.45	6.01	6.58	7.66	8.79	11.05	14.38	17.77	20.03	23.36	26.75
Height	<i>m</i> <sub>1</sub> (max.)	1.3	1.6	2	2.4	2.8	3.2	4.7	5.2	6.8	8.4	10.8	12.8	14.8
	<i>m</i> <sub>2</sub> (max.)	–	–	–	–	–	–	5.1	5.7	7.5	9.3	12	14.1	16.4
	<i>m</i> <sub>3</sub> (max.)	1	1.2	1.6	1.8	2	2.2	2.7	3.2	4	5	6	7	8

Remark Priority is given to the nominal sizes of screws without parentheses.

(2) Parts class B M 18–64

Unit : mm

Nominal size of screw <i>d</i>	Coarse screw thread pitch	(M 18)	M 20	(M 22)	M 24	(M 27)	M 30	(M 33)	M 36	(M 39)	M 42	(M 45)	M 48	(M 52)	M 56	(M 60)	M 64
	Fine thread		–	M 20 × 1.5	–	M 24 × 2	–	M 30 × 2	–	M 36 × 3	–	M 42 × 3	–	M 48 × 3	–	M 56 × 4	–
Bearing surface dia. <i>d<sub>w</sub></i> (min.)		24.85	27.7	31.35	33.25	38	42.75	46.55	51.11	55.86	59.95	64.7	69.45	74.2	78.66	83.41	88.16
Width across flats <i>s</i> (max.)		27	30	34	36	41	46	50	55	60	65	70	75	80	85	90	95
Width across corners <i>e</i> (min.)		29.56	32.95	37.29	39.55	45.2	50.85	55.37	60.79	66.44	71.3	76.95	82.6	88.25	93.56	99.21	104.86
Height	<i>m</i> <sub>1</sub> (max.)	15.8	18	19.4	21.5	23.8	25.6	28.7	31	33.4	34	36	38	42	45	48	51
	<i>m</i> <sub>2</sub> (max.)	17.6	20.3	21.8	23.9	26.7	28.6	32.5	34.7	–	–	–	–	–	–	–	–
	<i>m</i> <sub>3</sub> (max.)	9	10	11	12	13.5	15	16.5	18	19.5	21	22.5	24	26	28	30	32

Remark Priority is given to the nominal sizes of screws without parentheses.

**Supplementary table 14 Steel hardness conversion**

Rockwell C scale 1 471.0 N (150 kgf)	Vickers	Brinell		Rockwell		Shore
		Standard steel ball	Tungsten carbide steel ball	A scale 588.4 N (60 kgf)	B scale 980.7 N (100 kgf)	
68	940			85.6		97
67	900			85.0		95
66	865			84.5		92
65	832		739	83.9		91
64	800		722	83.4		88
63	772		705	82.8		87
62	746		688	82.3		85
61	720		670	81.8		83
60	697		654	81.2		81
59	674		634	80.7		80
58	653		615	80.1		78
57	633		595	79.6		76
56	613		577	79.0		75
55	595	–	560	78.5		74
54	577	–	543	78.0		72
53	560	–	525	77.4		71
52	544	500	512	76.8		69
51	528	487	496	76.3		68
50	513	475	481	75.9		67
49	498	464	469	75.2		66
48	484	451	455	74.7		64
47	471	442	443	74.1		63
46	458	432	432	73.6		62
45	446		421	73.1		60
44	434		409	72.5		58
43	423		400	72.0		57
42	412		390	71.5		56
41	402		381	70.9		55
40	392		371	70.4	–	54
39	382		362	69.9	–	52
38	372		353	69.4	–	51
37	363		344	68.9	–	50
36	354		336	68.4	(109.0)	49
35	345		327	67.9	(108.5)	48
34	336		319	67.4	(108.0)	47
33	327		311	66.8	(107.5)	46
32	318		301	66.3	(107.0)	44
31	310		294	65.8	(106.0)	43
30	302		286	65.3	(105.5)	42
29	294		279	64.7	(104.5)	41
28	286		271	64.3	(104.0)	41
27	279		264	63.8	(103.0)	40
26	272		258	63.3	(102.5)	38
25	266		253	62.8	(101.5)	38
24	260		247	62.4	(101.0)	37
23	254		243	62.0	100.0	36
22	248		237	61.5	99.0	35
21	243		231	61.0	98.5	35
20	238		226	60.5	97.8	34
(18)	230		219	–	96.7	33
(16)	222		212	–	95.5	32
(14)	213		203	–	93.9	31
(12)	204		194	–	92.3	29
(10)	196		187		90.7	28
( 8)	188		179		89.5	27
( 6)	180		171		87.1	26
( 4)	173		165		85.5	25
( 2)	166		158		83.5	24
( 0)	160		152		81.7	24

Supplementary table 15 Viscosity conversion

Kinematic viscosity mm <sup>2</sup> /s	Saybolt SUS (second)		Redwood R (second)		Engler E (degree)
	100 °F	210 °F	50 °C	100 °C	
2	32.6	32.8	30.8	31.2	1.14
3	36.0	36.3	33.3	33.7	1.22
4	39.1	39.4	35.9	36.5	1.31
5	42.3	42.6	38.5	39.1	1.40
6	45.5	45.8	41.1	41.7	1.48
7	48.7	49.0	43.7	44.3	1.56
8	52.0	52.4	46.3	47.0	1.65
9	55.4	55.8	49.1	50.0	1.75
10	58.8	59.2	52.1	52.9	1.84
11	62.3	62.7	55.1	56.0	1.93
12	65.9	66.4	58.2	59.1	2.02
13	69.6	70.1	61.4	62.3	2.12
14	73.4	73.9	64.7	65.6	2.22
15	77.2	77.7	68.0	69.1	2.32
16	81.1	81.7	71.5	72.6	2.43
17	85.1	85.7	75.0	76.1	2.54
18	89.2	89.8	78.6	79.7	2.64
19	93.3	94.0	82.1	83.6	2.76
20	97.5	98.2	85.8	87.4	2.87
21	102	102	89.5	91.3	2.98
22	106	107	93.3	95.1	3.10
23	110	111	97.1	98.9	3.22
24	115	115	101	103	3.34
25	119	120	105	107	3.46
26	123	124	109	111	3.58
27	128	129	112	115	3.70
28	132	133	116	119	3.82
29	137	138	120	123	3.95
30	141	142	124	127	4.07
31	145	146	128	131	4.20
32	150	150	132	135	4.32
33	154	155	136	139	4.45
34	159	160	140	143	4.57

Kinematic viscosity mm <sup>2</sup> /s	Saybolt SUS (second)		Redwood R (second)		Engler E (degree)
	100 °F	210 °F	50 °C	100 °C	
35	163	164	144	147	4.70
36	168	170	148	151	4.83
37	172	173	153	155	4.96
38	177	178	156	159	5.08
39	181	183	160	164	5.21
40	186	187	164	168	5.34
41	190	192	168	172	5.47
42	195	196	172	176	5.59
43	199	201	176	180	5.72
44	204	205	180	185	5.85
45	208	210	184	189	5.98
46	213	215	188	193	6.11
47	218	219	193	197	6.24
48	222	224	197	202	6.37
49	227	228	201	206	6.50
50	231	233	205	210	6.63
55	254	256	225	231	7.24
60	277	279	245	252	7.90
65	300	302	266	273	8.55
70	323	326	286	294	9.21
75	346	349	306	315	9.89
80	371	373	326	336	10.5
85	394	397	347	357	11.2
90	417	420	367	378	11.8
95	440	443	387	399	12.5
100	464	467	408	420	13.2
120	556	560	490	504	15.8
140	649	653	571	588	18.4
160	742	747	653	672	21.1
180	834	840	734	757	23.7
200	927	933	816	841	26.3
250	1 159	1 167	1 020	1 051	32.9
300	1 391	1 400	1 224	1 241	39.5

Remark 1 mm<sup>2</sup>/s = 1 cSt (centistokes)





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