ASAHI

HE13E-002D

Instruction Manual

Insert Bearing Units

(Set-screws locking type)

ASAHI SEIKO CO., LTD.

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1. Scope of application

This instruction manual applies to the insert bearing units shown in Tables 1.1 to 1.6.

Remarks: This instruction manual also applies to the insert bearing units marked with auxiliary marks (Note 1) and aggregation marks (Note 2) in addition to the standard products shown in Table 1.1 to 1.6.

(Note) 1. Special and change marks showing accuracy, shape, additional processing, etc. for bearings, housings and main parts.

2. Abbreviated marks for special parts whose nominal number consists of many characters and is complicated.

Table 1.1

Pillow block unit				Square flange unit	Round flange unit with spigot joint	Rhombic flange unit			Take-up unit	Cartridge unit
UCP201	—	UCPH201	UCPA201	UCF201	UCFC201	UCFL201	UCFK201	UCFA201	UCT201	UCC201
UCP202	—	UCPH202	UCPA202	UCF202	UCFC202	UCFL202	UCFK202	UCFA202	UCT202	UCC202
UCP203	—	UCPH203	UCPA203	UCF203	UCFC203	UCFL203	UCFK203	UCFA203	UCT203	UCC203
UCP204	—	UCPH204	UCPA204	UCF204	UCFC204	UCFL204	UCFK204	UCFA204	UCT204	UCC204
UCP205	—	UCPH205	UCPA205	UCF205	UCFC205	UCFL205	UCFK205	UCFA205	UCT205	UCC205
UCP206	—	UCPH206	UCPA206	UCF206	UCFC206	UCFL206	UCFK206	UCFA206	UCT206	UCC206
UCP207	—	UCPH207	UCPA207	UCF207	UCFC207	UCFL207	UCFK207	UCFA207	UCT207	UCC207
UCP208	UCIP208	UCPH208	UCPA208	UCF208	UCFC208	UCFL208	UCFK208	UCFA208	UCT208	UCC208
UCP209	UCIP209	UCPH209	UCPA209	UCF209	UCFC209	UCFL209	UCFK209	UCFA209	UCT209	UCC209
UCP210	UCIP210	UCPH210	UCPA210	UCF210	UCFC210	UCFL210	UCFK210	UCFA210	UCT210	UCC210
UCP211	UCIP211	—	—	UCF211	UCFC211	UCFL211	—	UCFA211	UCT211	UCC211
UCP212	UCIP212	—	—	UCF212	UCFC212	UCFL212	—	—	UCT212	UCC212
UCP213	UCIP213	—	—	UCF213	UCFC213	UCFL213	—	—	UCT213	UCC213
UCP214	—	—	—	UCF214	UCFC214	UCFL214	—	—	UCT214	—
UCP215	—	—	—	UCF215	UCFC215	UCFL215	—	—	UCT215	—
UCP216	—	—	—	UCF216	UCFC216	UCFL216	—	—	UCT216	—
UCP217	—	—	—	UCF217	UCFC217	UCFL217	—	—	UCT217	—
UCP218	—	—	—	UCF218	UCFC218	UCFL218	—	—	—	—

Table 1.2

Pillow block unit	Square flange unit	Round flange unit with spigot joint	Two-bolt flange unit	Take-up unit	Hanger unit
UCPX05	UCFX05	UCFCX05	UCFLX05	UCTX05	UCECH201
UCPX06	UCFX06	UCFCX06	UCFLX06	UCTX06	UCECH202
UCPX07	UCFX07	UCFCX07	UCFLX07	UCTX07	UCECH203
UCPX08	UCFX08	UCFCX08	UCFLX08	UCTX08	UCECH204
UCPX09	UCFX09	UCFCX09	UCFLX09	UCTX09	UCECH205
UCPX10	UCFX10	UCFCX10	UCFLX10	UCTX10	UCECH206
UCPX11	UCFX11	UCFCX11	—	UCTX11	UCECH207
UCPX12	UCFX12	UCFCX12	—	UCTX12	UCECH208
UCPX13	UCFX13	UCFCX13	—	UCTX13	UCECH209
UCPX14	UCFX14	UCFCX14	—	UCTX14	UCECH210
UCPX15	UCFX15	UCFCX15	—	UCTX15	UCECH211
UCPX16	UCFX16	UCFCX16	—	UCTX16	UCECH212
UCPX17	UCFX17	UCFCX17	—	UCTX17	UCECH213
UCPX18	UCFX18	UCFCX18	—	—	UCECH215
UCPX20	UCFX20	UCFCX20	—	—	—

Table 1.3

Pillow block unit		Square flange unit	Round flange unit with spigot joint	Two-bolt flange unit	Take-up unit	Cartridge unit
UCP305	—	UCF305	UCFS305	UCFL305	UCT305	UCC305
UCP306	—	UCF306	UCFS306	UCFL306	UCT306	UCC306
UCP307	—	UCF307	UCFS307	UCFL307	UCT307	UCC307
UCP308	—	UCF308	UCFS308	UCFL308	UCT308	UCC308
UCP309	—	UCF309	UCFS309	UCFL309	UCT309	UCC309
UCP310	—	UCF310	UCFS310	UCFL310	UCT310	UCC310
UCP311	—	UCF311	UCFS311	UCFL311	UCT311	UCC311
UCP312	—	UCF312	UCFS312	UCFL312	UCT312	UCC312
UCP313	UCIP313	UCF313	UCFS313	UCFL313	UCT313	UCC313
UCP314	UCIP314	UCF314	UCFS314	UCFL314	UCT314	UCC314
UCP315	UCIP315	UCF315	UCFS315	UCFL315	UCT315	UCC315
UCP316	UCIP316	UCF316	UCFS316	UCFL316	UCT316	UCC316
UCP317	UCIP317	UCF317	UCFS317	UCFL317	UCT317	UCC317
UCP318	UCIP318	UCF318	UCFS318	UCFL318	UCT318	UCC318
UCP319	UCIP319	UCF319	UCFS319	UCFL319	UCT319	UCC319
UCP320	UCIP320	UCF320	UCFS320	UCFL320	UCT320	UCC320
UCP321	—	UCF321	UCFS321	UCFL321	UCT321	UCC321
UCP322	UCIP322	UCF322	UCFS322	UCFL322	UCT322	UCC322
UCP324	UCIP324	UCF324	UCFS324	UCFL324	UCT324	UCC324
UCP326	UCIP326	UCF326	UCFS326	UCFL326	UCT326	UCC326
UCP328	UCIP328	UCF328	UCFS328	UCFL328	UCT328	UCC328

Table 1.4: Units with cast-iron covers

Pillow block unit		Square flange unit	Round flange unit with spigot joint	Two-bolt flange unit	Take-up unit
CUCP201C(CE)	—	CUCF201C(CE)	CUCFC201C(CE)	CUCFL201C(CE)	CUCT201C(CE)
CUCP202C(CE)	—	CUCF202C(CE)	CUCFC202C(CE)	CUCFL202C(CE)	CUCT202C(CE)
CUCP203C(CE)	—	CUCF203C(CE)	CUCFC203C(CE)	CUCFL203C(CE)	CUCT203C(CE)
CUCP204C(CE)	—	CUCF204C(CE)	CUCFC204C(CE)	CUCFL204C(CE)	CUCT204C(CE)
CUCP205C(CE)	—	CUCF205C(CE)	CUCFC205C(CE)	CUCFL205C(CE)	CUCT205C(CE)
CUCP206C(CE)	—	CUCF206C(CE)	CUCFC206C(CE)	CUCFL206C(CE)	CUCT206C(CE)
CUCP207C(CE)	—	CUCF207C(CE)	CUCFC207C(CE)	CUCFL207C(CE)	CUCT207C(CE)
CUCP208C(CE)	CUCIP208C(CE)	CUCF208C(CE)	CUCFC208C(CE)	CUCFL208C(CE)	CUCT208C(CE)
CUCP209C(CE)	CUCIP209C(CE)	CUCF209C(CE)	CUCFC209C(CE)	CUCFL209C(CE)	CUCT209C(CE)
CUCP210C(CE)	CUCIP210C(CE)	CUCF210C(CE)	CUCFC210C(CE)	CUCFL210C(CE)	CUCT210C(CE)
CUCP211C(CE)	CUCIP211C(CE)	CUCF211C(CE)	CUCFC211C(CE)	CUCFL211C(CE)	CUCT211C(CE)
CUCP212C(CE)	CUCIP212C(CE)	CUCF212C(CE)	CUCFC212C(CE)	CUCFL212C(CE)	CUCT212C(CE)
CUCP213C(CE)	CUCIP213C(CE)	CUCF213C(CE)	CUCFC213C(CE)	CUCFL213C(CE)	CUCT213C(CE)
CUCP214C(CE)	—	CUCF214C(CE)	CUCFC214C(CE)	CUCFL214C(CE)	CUCT214C(CE)
CUCP215C(CE)	—	CUCF215C(CE)	CUCFC215C(CE)	CUCFL215C(CE)	CUCT215C(CE)
CUCP216C(CE)	—	CUCF216C(CE)	CUCFC216C(CE)	CUCFL216C(CE)	CUCT216C(CE)
CUCP217C(CE)	—	CUCF217C(CE)	CUCFC217C(CE)	CUCFL217C(CE)	CUCT217C(CE)
CUCP218C(CE)	—	CUCF218C(CE)	CUCFC218C(CE)	CUCFL218C(CE)	—

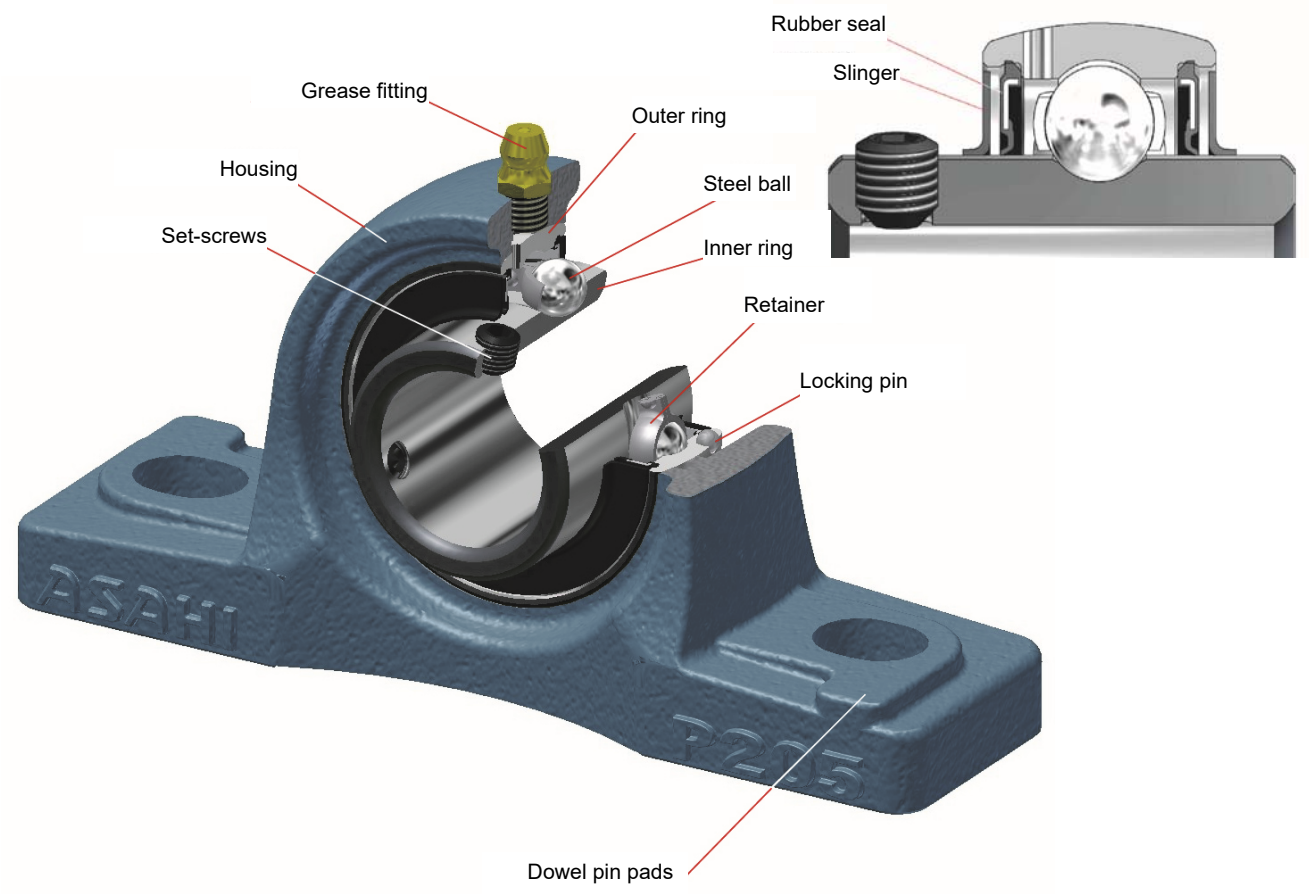
Table 1.5: Units with cast-iron covers

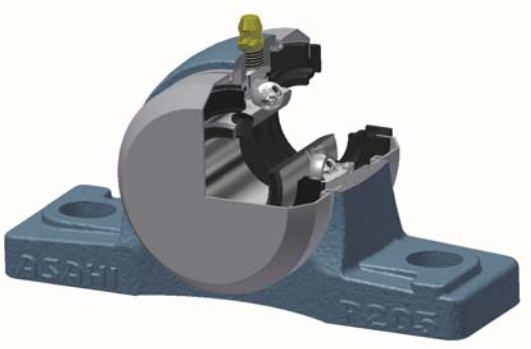
Pillow block unit		Square flange unit	Round flange unit with spigot joint	Two-bolt flange unit	Take-up unit
CUCP305C(CE)	—	CUCF305C(CE)	CUCFS305C(CE)	CUCFL305C(CE)	CUCT305C(CE)
CUCP306C(CE)	—	CUCF306C(CE)	CUCFS306C(CE)	CUCFL306C(CE)	CUCT306C(CE)
CUCP307C(CE)	—	CUCF307C(CE)	CUCFS307C(CE)	CUCFL307C(CE)	CUCT307C(CE)
CUCP308C(CE)	—	CUCF308C(CE)	CUCFS308C(CE)	CUCFL308C(CE)	CUCT308C(CE)
CUCP309C(CE)	—	CUCF309C(CE)	CUCFS309C(CE)	CUCFL309C(CE)	CUCT309C(CE)
CUCP310C(CE)	—	CUCF310C(CE)	CUCFS310C(CE)	CUCFL310C(CE)	CUCT310C(CE)
CUCP311C(CE)	—	CUCF311C(CE)	CUCFS311C(CE)	CUCFL311C(CE)	CUCT311C(CE)
CUCP312C(CE)	—	CUCF312C(CE)	CUCFS312C(CE)	CUCFL312C(CE)	CUCT312C(CE)
CUCP313C(CE)	CUCIP313C(CE)	CUCF313C(CE)	CUCFS313C(CE)	CUCFL313C(CE)	CUCT313C(CE)
CUCP314C(CE)	CUCIP314C(CE)	CUCF314C(CE)	CUCFS314C(CE)	CUCFL314C(CE)	CUCT314C(CE)
CUCP315C(CE)	CUCIP315C(CE)	CUCF315C(CE)	CUCFS315C(CE)	CUCFL315C(CE)	CUCT315C(CE)
CUCP316C(CE)	CUCIP316C(CE)	CUCF316C(CE)	CUCFS316C(CE)	CUCFL316C(CE)	CUCT316C(CE)
CUCP317C(CE)	CUCIP317C(CE)	CUCF317C(CE)	CUCFS317C(CE)	CUCFL317C(CE)	CUCT317C(CE)
CUCP318C(CE)	CUCIP318C(CE)	CUCF318C(CE)	CUCFS318C(CE)	CUCFL318C(CE)	CUCT318C(CE)
CUCP319C(CE)	CUCIP319C(CE)	CUCF319C(CE)	CUCFS319C(CE)	CUCFL319C(CE)	CUCT319C(CE)
CUCP320C(CE)	CUCIP320C(CE)	CUCF320C(CE)	CUCFS320C(CE)	CUCFL320C(CE)	CUCT320C(CE)
CUCP321C(CE)	—	CUCF321C(CE)	CUCFS321C(CE)	CUCFL321C(CE)	CUCT321C(CE)
CUCP322C(CE)	CUCIP322C(CE)	CUCF322C(CE)	CUCFS322C(CE)	CUCFL322C(CE)	CUCT322C(CE)
CUCP324C(CE)	CUCIP324C(CE)	CUCF324C(CE)	CUCFS324C(CE)	CUCFL324C(CE)	CUCT324C(CE)
CUCP326C(CE)	CUCIP326C(CE)	CUCF326C(CE)	CUCFS326C(CE)	CUCFL326C(CE)	CUCT326C(CE)
CUCP328C(CE)	CUCIP328C(CE)	CUCF328C(CE)	CUCFS328C(CE)	CUCFL328C(CE)	CUCT328C(CE)

Table 1.6: Units with pressed steel covers

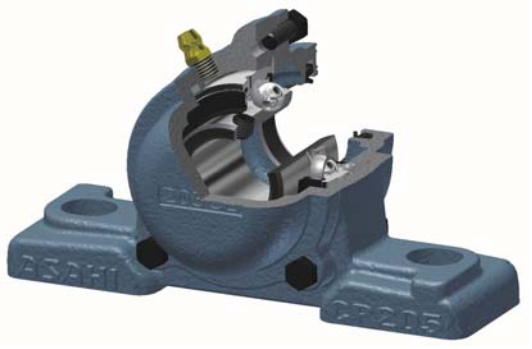
Pillow block unit		Square flange unit	Round flange unit with spigot joint	Two-bolt flange unit	Take-up unit
UCP201C(E)	—	UCF201C(E)	UCFC201C(E)	UCFL201C(E)	UCT201C(E)
UCP202C(E)	—	UCF202C(E)	UCFC202C(E)	UCFL202C(E)	UCT202C(E)
UCP203C(E)	—	UCF203C(E)	UCFC203C(E)	UCFL203C(E)	UCT203C(E)
UCP204C(E)	—	UCF204C(E)	UCFC204C(E)	UCFL204C(E)	UCT204C(E)
UCP205C(E)	—	UCF205C(E)	UCFC205C(E)	UCFL205C(E)	UCT205C(E)
UCP206C(E)	—	UCF206C(E)	UCFC206C(E)	UCFL206C(E)	UCT206C(E)
UCP207C(E)	—	UCF207C(E)	UCFC207C(E)	UCFL207C(E)	UCT207C(E)
UCP208C(E)	UCIP208C(E)	UCF208C(E)	UCFC208C(E)	UCFL208C(E)	UCT208C(E)
UCP209C(E)	UCIP209C(E)	UCF209C(E)	UCFC209C(E)	UCFL209C(E)	UCT209C(E)
UCP210C(E)	UCIP210C(E)	UCF210C(E)	UCFC210C(E)	UCFL210C(E)	UCT210C(E)
UCP211C(E)	UCIP211C(E)	UCF211C(E)	UCFC211C(E)	UCFL211C(E)	UCT211C(E)
UCP212C(E)	UCIP212C(E)	UCF212C(E)	UCFC212C(E)	UCFL212C(E)	UCT212C(E)
UCP213C(E)	UCIP213C(E)	UCF213C(E)	UCFC213C(E)	UCFL213C(E)	UCT213C(E)

2. Name of parts and functions





Insert bearing unit with pressed steel covers

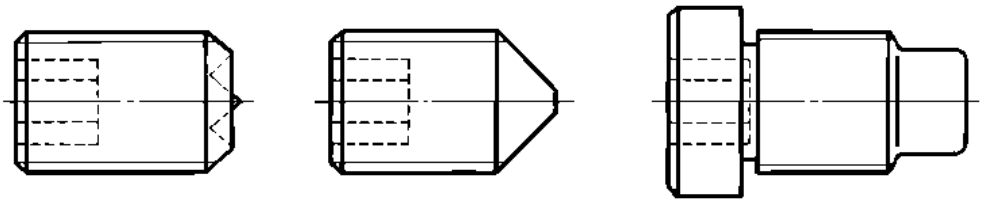


Insert bearing unit with cast-iron covers

Name of parts	Functions
Grease fitting	A part to supply lubrication grease to enable the service lives of bearings to be extended by supplying grease at an interval suitable for the use environment.
Set-screws	Secures the insert bearing and shaft.
Dowel pin pads	Providing a pin hole at this position makes it easy to position the insert bearing unit when replacing bearings and is convenient for reinforcing the mounting bolts.
Locking pin	Prevents the outer ring from drag turning and the section between the bearing and housing from being worn.
Rubber seal	Prevents dust and moisture from intruding because it is secured to the outer ring and the lip part comes in contact with the inner ring.
Slinger	Prevents dust from intruding by centrifugal force because it is secured to the inner ring and rotates together with the inner ring.

3. Types of set-screws and nominal number

Three type set-screws are available for various applications as shown in Fig. 3.1. SW type is ASAHI standard set-screws and performs certain fixing force of insert ball bearing units to shaft. Other two types contribute to requirements which SW type cannot meet though shaft must be partly pre-machined; SC type is capable of more preventing sliding between bearing units and shaft while SH type can allow bearing units to flee flexibly from expansion/contraction of shaft in axial direction.



SW type SC type SH type

Fig. 3.1

4. Selection of shafts

4.1 Shaft dimensional tolerance

Clearance fit “h” is normally applied for the dimensional tolerance between bearing inner rings and spherical in side diameter of housing. The values shown in Table 4.1 are considered appropriate for the shaft dimensional tolerance in the case of loose press-fitting.

When using flat tip set-screw (SH type), h7/h8 (when using carbon steel) shown in Table 4.1 are appropriate as the shaft dimensional tolerance.

For high precision operation, high speed rotation, heavy and/or shock load application, interference fit is recommended for the fit between the shaft and the bearing inner ring. When applying tight fit like this, it is recommended to follow the dimensional tolerance for the shaft as shown as per the Table 4.2. For such tight fit between the bearing and the shaft, the initial bearing internal clearance must be larger than its standard clearance.

Table 4.1: Shaft dimensional tolerance (for loose press-fitting)

Shaft diameter (mm)		Shaft dimensional tolerance (μm)		
Over	Or less	js7	h7	h8
10	18	±9	0 to -18	0 to -27
18	30	±10.5	0 to -21	0 to -33
30	50	±12.5	0 to -25	0 to -39
50	80	±15	0 to -30	0 to -46
80	120	±17.5	0 to -35	0 to -54
120	180	±20	0 to -40	0 to -63

Remarks: In general, js7 shall be applied.

Table 4.2: Shaft dimensional tolerance (for tight press-fitting)

Shaft diameter (mm)		Shaft dimensional tolerance (μm)			
Over	Or less	n6	n7	m6	m7
10	18	+23 to +12	+30 to +12	+18 to +7	+25 to +7
18	30	+28 to +15	+36 to +15	+21 to +8	+29 to +8
30	50	+33 to +17	+42 to +17	+25 to +9	+34 to +9
50	80	+39 to +20	+50 to +20	+30 to +11	+41 to +11
80	120	+45 to +23	+58 to +23	+35 to +13	+48 to +13
120	180	+52 to +27	+67 to +27	+40 to +15	+55 to +15

Remarks: If the shaft diameter is 30mm or less, it is better that values other than m6 are not used.

4.2 Mounting shaft

For the shaft on which the Insert bearing unit is mounted, use one that is not bent and does not have burrs, and conduct chamfering of the shaft end. When using SW type set-screws, the shaft contact point for the set-screws should be ground as shown in Fig. 4.1 or hollowed using a drill as shown in Fig. 4.2 so that the tip of the set-screws is sunk slightly below the surface of the shaft before tightening. For shafts subject to vibrations and shock or large axial loads, use a shouldered shaft and tighten it with nuts as shown in Fig.4.4.

When using SC type set-screws, it is necessary to provide a drilled hole so that the tip of the cone point set-screws is sunk. The SC type set-screws for respective nominal numbers are given as shown in Table 4.3.

In case of using SH type set-screws, it is necessary to provide a slot on the shaft as shown in Fig. 4.3 and dimension of groove are given as shown in Table 4.4.

For above-mentioned drilled hole/slot when a set of two set-screws of SC/SH type in a bearing unit, it is recommended that machining is made at corresponding points with actual positions of the set-screws attached to the unit.

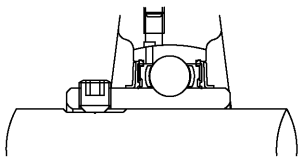


Fig. 4.1

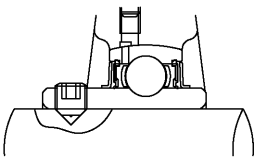


Fig. 4.2

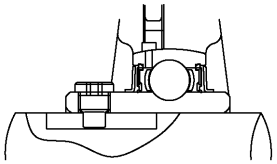


Fig. 4.3

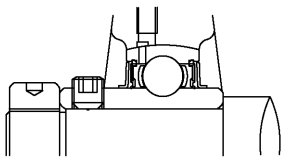


Fig. 4.4

Table 4.3: Tip dimension of SC type set-screws Unit: mm

Bearing nominal number			Dimension "a"
UC201 to 206	UCX05	UC305, 306	2.5
UC207 to 209	UCX06 to X08	UC307	3
UC210 to 213	UCX09 to X12	UC308, 309	3.5
UC214 to 218	UCX13 to X17	UC310 to 314	4.5
—	UCX18	UC315, 316	5
—	UCX20	UC317 to 319	6
—	—	UC320 to 324	6.5
—	—	UC326, 328	7

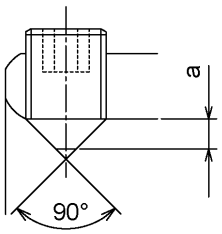
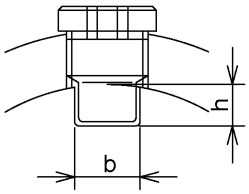


Table 4.4: Shaft groove dimensions for SH type set-screws Unit: mm

Bearing nominal number	h (min.)	b (min.)	Bearing nominal number	h (min.)	b (min.)	Bearing nominal number	h (min.)	b (min.)
UC201	3	5	UC305	3.5	5	UC X05	4	5
UC202	3.5	5	UC306	4	5	UC X06	4.5	7
UC203	3.5	5	UC307	4.5	7	UC X07	4.5	7
UC204	3.5	5	UC308	5	8	UC X08	5	7
UC205	4	5	UC309	5	8	UC X09	5	8
UC206	4.8	5	UC310	5	10	UC X10	4	8
UC207	4.5	7	UC311	5.5	10	UC X11	4.5	8
UC208	4.5	7	UC312	5	10	UC X12	4.5	8
UC209	5	7	UC313	6.5	10	UC X13	5	10
UC210	5	8	UC314	5.5	10	UC X14	5.5	10
UC211	5.5	8	UC315	7.5	11	UC X15	6.5	10
UC212	5.5	8	UC316	6.5	11	UC X16	7	10
UC213	5.5	8	UC317	7.5	13	UC X17	6.5	10
UC214	6.5	10	UC318	8.5	13	UC X18	6.5	11
UC215	7	10	UC319	8	13	UC X20	8	13
UC216	7	10	UC320	8	14			
UC217	8	10	UC321	7	14			
UC218	7.5	10	UC322	9.5	14			
			UC324	8	14			
			UC326	9.5	16			
			UC328	8	16			



5. Mounting method

1) Slide the insert bearing unit onto the shaft slowly and bring it to the predetermined position.
2) Mount the insert bearing unit on the machine base and secure it firmly with bolts.
3) Tighten the set-screws by equal force with a hexagonal wrench key to secure the insert bearing unit to the shaft.

Remarks: 1. Before sliding the insert bearing unit onto the shaft, check that the tips of set-screws do not protrude from the inside diameter of bearing. If a tip protrudes, loosen the set-screws.

2. When sliding the insert bearing unit onto the shaft, do not allow the shaft to come in direct contact with the side of the inner ring or the slinger and use extra caution to prevent it from being twisted.
If strong impact is applied to the insert bearing unit, it is possible that the slingers on both sides may move and come in contact with the seal. In this case, the rotation torque becomes larger, which may cause abnormal heating and noise to be generated if the insert bearing unit is used in such condition. After mounting the insert bearing unit, applying strong impact when mounting transmission system parts such as pulleys, sprockets, etc. on the shaft may cause the same phenomenon, so extra caution should be taken to prevent strong impact from being applied to the insert bearing unit.

3. The machine base on which the insert bearing unit is mounted must have high rigidity and high flatness to prevent the housing from being deformed.
(Excluding cartridge type and take-up type models)

Inside diameter number	Flatness
13 or less (shaft diameter: Φ65 or less)	0.1mm or less
14 or higher (shaft diameter: Φ70 or more)	0.15mm or less

4. The values shown in Table 5.1 are considered appropriate for the tightening torque.
If the set-screws is tightened excessively, deformation of the inner ring may cause the rotational accuracy to be reduced and the inner ring to be cracked.

5. The values shown in Table 5.2 are considered appropriate for the tightening torque of housing mounting bolts.

6. Use washers to prevent the housing from being damaged when fixing the bearing unit on the mounting base with bolts.

Table 5.1: Appropriate tightening torque of set-screws

Bearing nominal number			Hexagonal wrench key nominal number	Appropriate tightening torque (N·m)
UC201 to 203	UCX05	UC305, 306	3	3.9
UC204 to 206	—	—	3	4.9
—	UCX06 to X08	—	4	8.3
UC207 to 209	—	UC307	4	11.8
—	UCX09 to X12	—	5	16.2
UC210 to 213	—	UC308,309	5	23.5
UC214 to 216	—	UC310, 311	6	39.2
UC217, 218	UCX13 to X18	UC312 to 316	6	27.9
—	UCX20	UC317 to 324	8	66.6
—	—	UC326 to 328	10	112.7

Table 5.2: Tightening torque of housing mounting bolts (reference values)

Bolt nominal number	Torque (N·m)	Bolt nominal number	Torque (N·m)	Bolt nominal number	Torque (N·m)
M5	1.7 to 2.7	M14	38 to 61	M24	196 to 319
M6	2.8 to 4.5	M16	59 to 95	M27	294 to 466
M8	6.9 to 11	M18	81 to 130	M30	397 to 632
M10	14 to 22	M20	118 to 186	M33	539 to 862
M12	24 to 38	M22	157 to 250	M36	691 to 1107

6. Installation the covers

1) Attach the covers after finishing mounting the insert bearing unit.
2) Apply an amount of grease corresponding to 1/3 to 1/2 of the volume of the space inside the covers to that space as shown in Figs. 6.1 and 6.2.

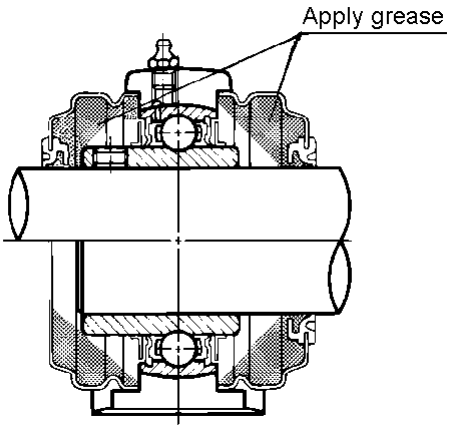


Fig. 6.1: For pressed steel covers

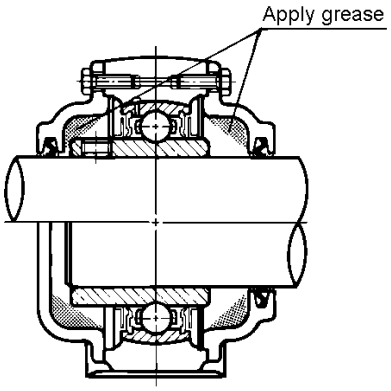


Fig. 6.2: For cast-iron covers

3) Press-fit the spigot joint of the covers into the spigot joint of the housing.
4) For cast-iron covers, secure it with hexagon bolts.
5) For pressed steel covers, attach it by tapping the side of the circumference with a wood hammer or plastic hammer as shown in Fig. 6.3.

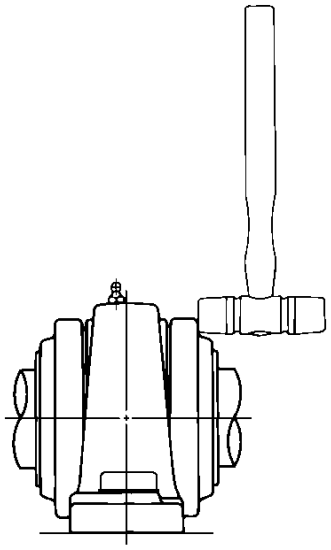


Fig. 6.3: Attaching pressed steel covers

Remarks: 1. For a rubber-sealed cover to be located inside, slide it onto the shaft before mounting it on the insert bearing unit main body.

2. To maximize dust resistance and humidity resistance, also apply grease to the spigot joint of the housing and the shaft surface where the lip part of the rubber seal comes in contact.

7. Inspection

After finishing mounting the insert bearing unit, inspect whether the mounting conditions are appropriate or not.
First, turn the shaft by hand to check that the insert bearing unit rotates smoothly. If no problem is observed, rotate it by electric power to inspect for noise or temperature increases.

7.1 Noise

Touch the housing with a listening rod or screwdriver and listen for noises during operation to check for abnormalities. (Photo 7.1)
For normal operation conditions, a smooth rotation noise is generated, but if there is an abnormality in mounting, an abnormal noise may be generated.

Photo 7.1: Checking the rotation noise with a listening rod

7.2 Rise of temperature

Measure the temperature on the outer circumferences of the bearing outer ring and housing. (Photos 7.2 and 7.3)
The rise of temperature reaches saturation 2 to 3 hours after start of operation and the insert bearing unit reaches to the regular conditions in general; however, if there are abnormalities in mounting, etc., the temperature will increases excessively, which will prevents the insert bearing unit from reaching the regular conditions. (For temperature measurement of cartridge type bearings, measure at the side of housing.)

Photo 7.2: Temperature measurement (contact type)

Photo 7.3: Temperature measurement (non-contact type)

Inspect the above items during commissioning and start operating the insert bearing unit fully after checking that there is no abnormality.
Further, it is recommended that inspections also be performed periodically at the predetermined interval during operation to detect failures in the bearings at an early stage.
In addition, monitoring to check that there are no changes in noise or increases in temperature by comparing the differences between the results of periodic inspections and other inspections is an effective measure for preventing accidents and damage to machinery.
For the bearing failure and its preventive measures during the test run and the periodical inspection of the insert bearing units, please refer to our General Catalogue and/or access ASAHI WEBSITE to ‘Inspection and Failure’.

8. Lubrication

8.1 Lubrication grease

This insert bearing has been factory-lubricated with the grease shown in Table 8.1. Therefore, it is recommended that the same grease as the factory-lubricated grease be used.

Table 8.1: Properties of standard factory-lubricated grease

Type	Auxiliary mark	Product name	Manufacturer name	NLGI No.	Soap-based grease	Drop point (°C)	Usable temperature point (°C)	Remarks
For general use	—	Alvania Grease S	Shell Lubricants Japan	3	Li	182	-20 to +135	—
For heat-resistant use	HR4 HR5	Super Lube	Yuken Kogyo	3	Ca-mixed	300 or more	-20 to +200	—
For low-temperature-resistant use	CR2A	AeroShell Grease 7	Shell Lubricants Japan	—	(Microgel)	Approx. 250	-70 to +150	Equivalent with the level between NLGI No. 1 and 2
For food machines use	FD HR20	CLARION ® FOOD MACHINERYHTEP GREASE, NO.2	CITGO Petroleum Corporation	2	Al-mixed	260	-12 to +163	—

Remarks: 1. The usable temperature ranges in the above table are the ranges for the grease. The usable temperature ranges for the insert bearing unit are as follows:

Type	Auxiliary mark	Range of operating temperature point (°C)
For general use	—	-15 to +100
For heat-resistant use	HR4	Normal temperature to +120
	HR5	Normal temperature to +200
	HR23	Normal temperature to +230
For low-temperature-resistant use	CR2A	-40 to +100
For food machines use	FD	-10 to +100
	HR20 (heat-resistant)	-10 to +150

2. For heat-resistant specifications, the bearing radial inside clearance has been designed to be larger originally; therefore, clearance marks such as C3, C4, etc. are added as auxiliary marks.

*** HR23 specifications**

For H23 specifications, the insert bearing chamber has been filled with fluorinated high-quality heat-resistant grease and lubrication-free insert bearing units are provided as standard.

The lubrication-free type shows all insert bearing units having specifications not equipped with a grease filling mechanism, such as specifications using completely-lubrication-free type housings whose housing nominal number includes an auxiliary mark “G00”, specifications whose housing grease fitting hole is blocked with “KU” and “KA” steel plugs, etc. (Figs. 8.1 to 8.3)

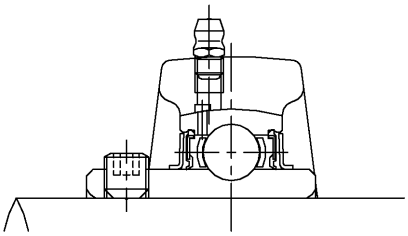


Fig. 8.1: Lubrication type insert bearing unit
Example of nominal number: UCP205

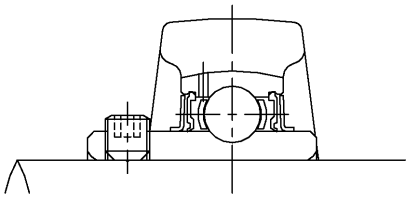


Fig. 8.2: Lubrication-free type insert bearing unit (G00 specifications)
Example of nominal number: UCP205G00

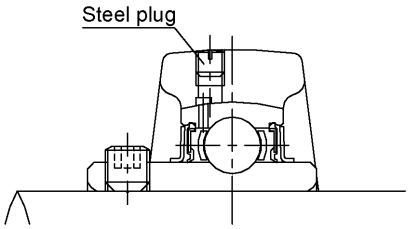


Fig. 8.3: Lubrication-free type insert bearing unit (Steel-plug filled specifications)
Example of nominal number: UCP205/KU

8.2 Grease replenishing method

Replenish grease using a grease gun (Photo 8.1) from the grease fitting mounted on the housing. Be careful to prevent dust or other foreign materials from getting into the grease to be replenished. If the grease fitting is contaminated, wipe it off before replenishing.

Photo 8.1: Grease gun

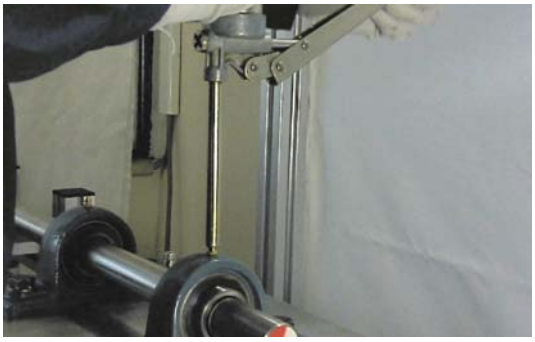


Photo 8.2: Example of filling with a grease gun

Grease is injected into the inside of the bearing from the grease hole of the outer ring through the grease groove provided on the circumference of the spherical bearing seat from the grease fitting replenishing port. Injected grease is stirred by the rotation of the bearing and mixed with previously-injected grease in the bearing and excess grease is discharged from the section between the slinger and outer ring through the rubber seal lip part. (Photo 8.3, Fig. 8.4)

Photo 8.3: Normal grease discharging conditions from inside the bearing

Re-lubrication should be performed during operation to cause the grease to be spread into every corner of the inside of the bearing. However, if it is difficult to replenish grease during operation because replenishment during operation at high speed may cause dangerous accidents, after replenishing the grease while operation is stopped, continue to replenish while performing intermittent operation to cause the grease to be mixed by manual operation or regular operation. **Replenishing with a large amount of grease at one time while operation is stopped may cause the rubber seal to be peeled by internal pressure acting on the rubber seals on both sides from the grease and the seals may come in contact with the slinger. In this case, the rotation torque will increase, which may cause abnormal heating conditions to be generated if the insert bearing unit is operated without correcting the situation.**

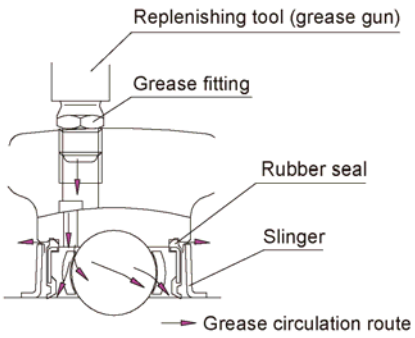


Fig. 8.4: Grease circulation route

*** Low torque specifications (auxiliary: TAA)**

Low-torque specifications are exhibited as "TAA" in which non-contact type rubber seals (Fig. 8.5) are used, Alvania Grease S1 (NLGI No. 1) is used as the factory-lubricated grease. The pre-lubricated grease amount is designed to be 1/3 of standard amount; note that if grease is replenished, the amount of inside grease increases.

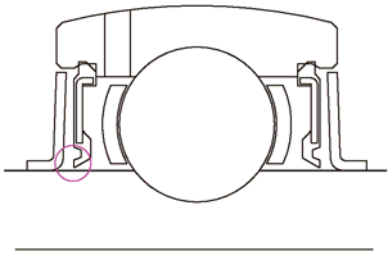


Fig. 8.5: Non-contact seal

8.3 Grease replenishment amount

The values shown in Table 8.2 are considered appropriate for grease replenishment amounts. If it is difficult to replenish grease quantitatively, replenish grease until deteriorated grease comes out from the clearance between the outer ring and slinger as a reference of the replenishment amount. (Photo 8.3)

Table 8.2: Grease replenishment amount Unit: g

Bearing nominal number	Grease replenishment amount	Bearing nominal number	Grease replenishment amount	Bearing nominal number	Grease replenishment amount
UC201 to UC204	1.2	—	—	—	—
UC205	1.4	UCX05	2.2	UC305	3
UC206	2.2	UCX06	3.2	UC306	3.8
UC207	3.2	UCX07	3.9	UC307	5.7
UC208	3.9	UCX08	5	UC308	7.8
UC209	5	UCX09	5.4	UC309	9.4
UC210	5.4	UCX10	7.4	UC310	12.8
UC211	7.4	UCX11	10	UC311	16.4
UC212	10	UCX12	11.8	UC312	21
UC213	11.8	UCX13	13.6	UC313	26
UC214	13.6	UCX14	15.2	UC314	31.5
UC215	15.2	UCX15	18.8	UC315	38
UC216	18.8	UCX16	23	UC316	41
UC217	23	UCX17	28	UC317	52
UC218	28	UCX18	33.5	UC318	62
—	—	—	—	UC319	73
—	—	UCX20	46.5	UC320	92
—	—	—	—	UC321	106
—	—	—	—	UC322	133
—	—	—	—	UC324	158
—	—	—	—	UC326	194
—	—	—	—	UC328	246

(Note) The replenishment amount shows the amount per one shot.

* For insert bearing units with a cover, the grease amount in the covers increases by replenishment of grease, but this does not interfere with operation. It is recommended that the covers be removed during overhaul (once or twice per year when used at normal temperature), the grease in the covers be removed, and then replenishment with new grease be performed.

8.4 Grease replenishment interval

The recommended grease replenishment interval is shown in Table 8.3.

Table 8.3: Grease replenishment interval

Bearing operation temperature (℃)	Environment conditions		
	Very clean	Very dirty	Very dirty, very humid, much splashing
50 or less	3 years	6 months	3 months
70	1 year	2 months	1 month
100	2.5 months	2 weeks	1 week
120	1.5 months	1 week	3 days
150	2 weeks	3 days	Every day

9. Replacement of bearing

When replacing the insert bearing unit with a new one, if either the bearing or housing is slightly damaged, replacement of either one is possible instead of replacing both ones.

When assembling the bearing into the housing, position the bearing outer ring at right angles to the bearing seat, and press-fit it into the notched part of housing, and then turn the bearing. (Photo 9.1)

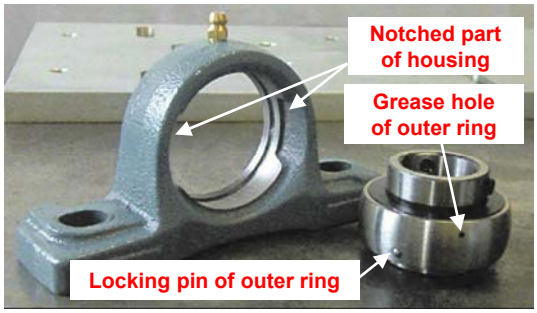


Photo 9.1

At this time, ensure that the outer ring locking pin is inserted into the notched part of housing. **Note that forcibly pressing the locking pin in the bearing seat other than at the notched part may cause outer ring cranking.** (Photo 9.2)

Photo 9.2

Further, when replenishing grease, in order to help the grease spread into every corner of the inside of the bearing, it is recommended to assemble the bearing so that the grease hole of outer ring is located near the grease fitting of housing. (Photo 9.3)

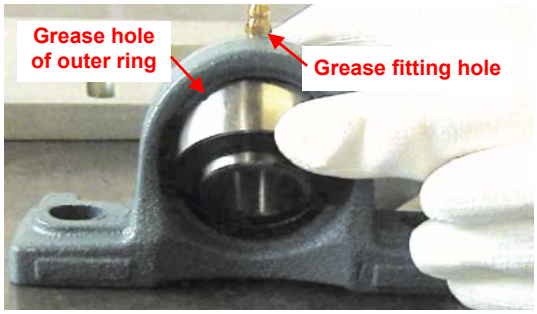


Photo 9.3

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