

Instruction Manual

Insert Bearing Units

Silver Series
Stainless-Steel Silver Series
(Eccentric locking collar type)

Table of Contents

	Page
1. Scope of application	1
2. Name of parts and functions	2
3. Selection of shafts	3
4. Mounting method.....	4
5. Stainless-steel cover attachment/removal method	6
1) Attaching the cover	6
2) Removing the press-fit locking cover	7
6. Inspection.....	8
1) Noise	8
2) Rise of temperature	8
7. Lubrication.....	9
8. Replacement of bearing	10

1. Scope of application

This instruction manual applies to the insert bearing units shown in Tables 1.1 and 1.2.

Table 1.1: Standard product units

Silver Series		Stainless-Steel Silver Series	
Pillow block unit	Rhombic flange unit	Pillow block unit	Rhombic flange unit
---	UFL08	---	---
UP000	UFL000	MUP000	MUFL000
UP001	UFL001	MUP001	MUFL001
UP002	UFL002	MUP002	MUFL002
UP003	UFL003	MUP003	MUFL003
UP004	UFL004	MUP004	MUFL004
UP005	UFL005	MUP005	MUFL005
UP006	UFL006	MUP006	MUFL006

Remark: 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.

- (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 1.2: Units with steel plate cover

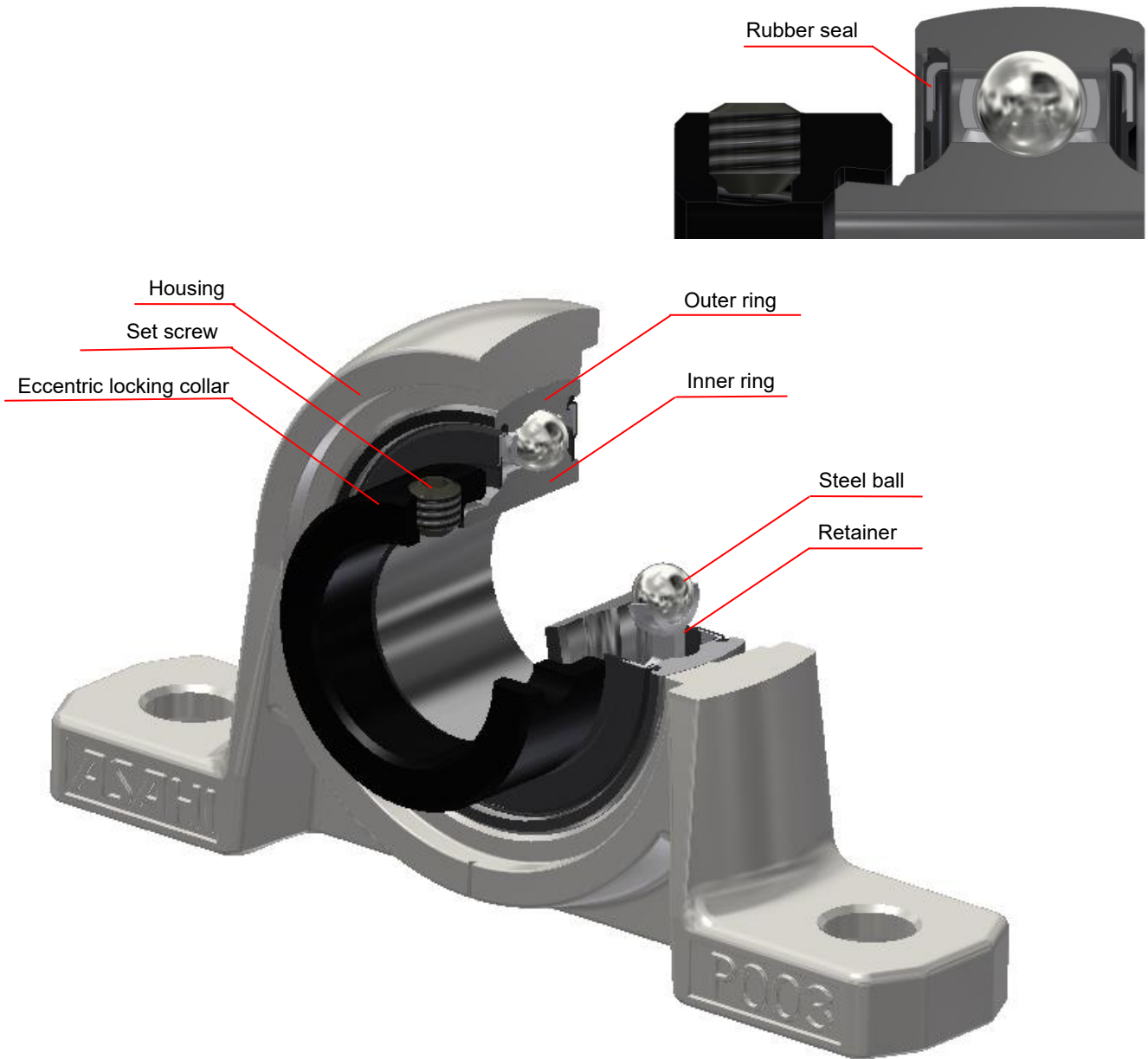
Silver Series		Stainless-Steel Silver Series	
Pillow block unit	Rhombic flange unit	Pillow block unit	Rhombic flange unit
UP000C(E)	UFL000C(E)	MUP000C(E)	MUFL000C(E)
UP001C(E)	UFL001C(E)	MUP001C(E)	MUFL001C(E)
UP002C(E)	UFL002C(E)	MUP002C(E)	MUFL002C(E)
UP003C(E)	UFL003C(E)	MUP003C(E)	MUFL003C(E)
UP004C(E)	UFL004C(E)	MUP004C(E)	MUFL004C(E)
UP005C(E)	UFL005C(E)	MUP005C(E)	MUFL005C(E)
UP006C(E),Y	UFL006C(E),Y	MUP006C(E),Y	MUFL006C(E),Y

Remarks 1: “,Y” indicates units that have a press-fit cover and do not use a clip.

Remarks 2: This instruction manual also applies to insert bearing units marked with auxiliary marks (Note 1) and aggregation marks (Note 2) in addition to the standard products shown in Table 1.2.

- (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.

2. Name of parts and functions



Rubber seal: Prevents grease leakage and dust and moisture intrusion because it is secured to the outer ring and the lip part comes in contact with the inner ring.

Eccentric locking collar: Secures the insert bearing and shaft. This collar is provided with an eccentric part which drives several wedges on the circumferences of the inner ring eccentric part and shaft to secure the bearing to the shaft.

3. Selection of shafts

For the shaft on which the insert bearing unit will be mounted, use one that is not bent and does not have burrs, and perform chamfering of the shaft ends. The press-fitting of the inner ring and shaft is mostly performed by a running fit in general for convenience in handling. The values shown in Table 3.1 are considered appropriate for the shaft dimensional tolerance in the case of loose press-fitting.

If high-precision operation and high-speed rotation are required, it is better to perform the press-fitting between the inner ring and shaft by interference fit. The values shown in Table 3.2 are considered appropriate for the shaft dimensional tolerance in the case of tight press-fitting. If using an insert bearing unit with eccentric locking collar for interference fit, it is unnecessary to use a separate eccentric locking collar. For tight press-fitting of the bearing and shaft, the initial clearance of the bearing must have been designed in advance to be larger than that of standard specification.

Table 3.1: Shaft dimensional tolerance (for loose press-fitting)

Shaft diameter (mm)		Shaft dimensional tolerance (μm)	
Over	Or less	js7	h7
6	10	± 7.5	0 to -15
10	18	± 9	0 to -18
18	30	± 10.5	0 to -21

Remarks: In general, js7 shall be applied.

Table 3.2: Shaft dimensional tolerance (for tight press-fitting)

Shaft diameter (mm)		Shaft dimensional tolerance (μm)
Over	Or less	m6
6	10	+15 to +6
10	18	+18 to +7
18	30	+21 to +8

4. Mounting method

- 1) Slide the insert bearing unit onto the shaft slowly and bring it to the predetermined position. (Photo 4.1)
- 2) Mount the insert bearing unit on the machine base and secure it firmly with bolts. (Photo 4.2) (Refer to Table 4.1.)
- 3) Press-fit the eccentric part of the eccentric locking collar into the eccentric part provided on the bearing inner ring. (Photo 4.3)
- 4) Tighten the eccentric locking collar in the shaft rotation direction.
- 5) Tighten the set screws with a hexagonal wrench key and secure them to the shaft. (Refer to Table 4.2.)

- Remarks:**
1. Before sliding the eccentric locking collar 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 screw.
 2. When sliding the insert bearing unit onto the shaft, be careful that the unit does not get twisted. In addition, do not tap the inner ring side or the rubber seal directly.
 3. The values shown in Table 4.1 are considered appropriate for the tightening torque for bolts for the bearing housing.
 4. The machine base to which the unit is mounted must be rigid enough and flat to prevent the bearing housing from being deformed. (Flatness: 0.1mm or lower)
 5. In case of systems rotating in both normal and reverse directions, the following method should be taken.
 - a) After tightening the eccentric locking collar by hand, tighten it further with a larger torque. (Insert jigs such as a chisel, etc. into the eccentric locking collar drill hole and tighten further with a plastic hammer.) (Photo 4.4)
 - b) Use a stepped shaft and apply the inner ring to the shoulder.
 - c) When using the insert bearing unit with 2 eccentric locking collars in pairs, mount it properly so that both eccentric locking collars are positioned on the outside or inside. (At this time, the insert bearing unit cannot bear large axial loads.)
 - d) Secure the inner ring using the collar for securing in the axial direction.
 6. The values shown in Table 4.2 are considered appropriate for tightening torque of eccentric locking collars.
 7. Use washers to prevent the housing from being damaged when fixing the bearing unit on the mounting base with bolts.



Photo 4.1



Photo 4.2



Photo 4.3



Photo 4.4

Table 4.1: Tightening torque of housing mounting bolts (Reference value)

Nominal size of screw	Torque (N·m)
M4	0.9 to 1.4
M6	2.8 to 4.5
M8	6.9 to 11
M10	14 to 22

Table 4.2: Tightening torque of set screws for eccentric locking collars and axial load-bearing capacity of unit

Nominal number of applicable bearing	Nominal size of set screw	Nominal size of hexagonal wrench	Tightening torque (N·m)	Axial load-bearing capacity (kN)
U08	M3×0.5	1.5	0.59	0.39
U000 to 003 MU000 to 003	M4×0.7	2	1.5	0.88
U004 to 006 MU004 to 006	M5×0.8	2.5	2.9	1.76

5. Stainless-steel cover attachment/removal method

1) Attaching the cover

- * Attach the cover after completion of attachment of the unit main body.
- * Apply an amount of grease corresponding to 1/3 to 1/2 of the volume of the space inside the cover to that space. (Fig. 5.1)

In the case of clip-locking type

- Pillow block (Fig. 5.2)
 - (1) Hook the claw on one side of the clip into the groove on one side of the cover.
 - (2) Push the claw on the other side of the clip strongly into the cover groove on the opposite side.
- Rhombic flange (Fig. 5.3)
 - (1) Hook the L-shaped claw of the clip onto the clip seat of the bearing housing.
 - (2) Push the other claw strongly into the cover groove.
 - * If it is difficult to install the clip, first hook the claw of the clip into the cover groove and then push it into the clip seat of the bearing housing.

In the case of press-fit locking type

- (1) Press the cover against the spigot joint of the bearing housing and push it into the spigot joint with your fingers. (Photo 5.4)
- (2) Tilt the cover and push the lower side of the outer rim of the cover into the spigot joint of the bearing housing with your fingers, and push the outer rim at the opposite position into the bottom of the slit using a tool such as a screwdriver. (Photo 5.5)
- (3) Repeat for other positions of the cover, pressing them in on both sides of the symmetrical position in sequence with a screwdriver, etc. to make sure the entire circumference of the cover is pressed in uniformly.

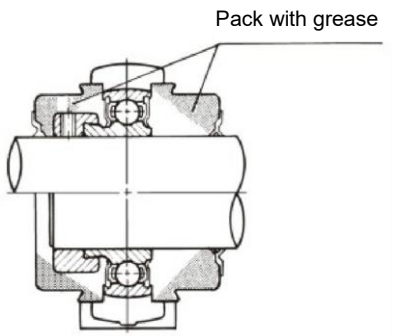


Fig. 5.1

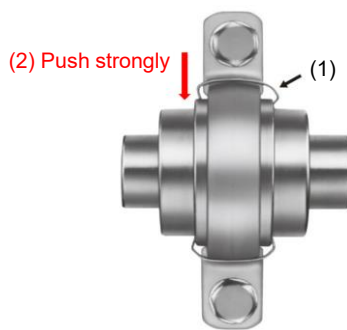


Fig. 5.2



Fig. 5.3



Photo 5.4



Photo 5.5

2) Removing the press-fit locking cover

Apply the screwdriver to the boundary between the outer cylinder and the cone of the cover, and tilt it in the axial direction. Tap with a plastic hammer to remove the cover. (Photo 5.6)



Photo 5.6

Note

1. For the inner cover with a rubber seal, slide the cover onto the shaft in advance before mounting the unit main body.
2. In order to improve dust and moisture resistance, apply grease also to the surface of the shaft that comes into contact with the spigot joint of the bearing housing and the lip part of the rubber seal in advance.
3. About press-fit locking cover
The removed cover can be reused if it is not deformed, but if the cover is deformed such that the diameter of the outer rim becomes smaller when it is removed, the interference with the bearing housing spigot joint is reduced and the cover is easier to remove, so it is recommended to replace it with a new cover.

6. 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.

1) Noise

Touch the housing with a listening rod or screwdriver and listen for noises during operation to check for abnormalities. (Photo 6.1)

For normal operation conditions, a smooth rotation noise is generated, but if there is an abnormality in mounting, an abnormal noise may be generated.

2) Rise of temperature

Measure the temperature on the outer circumferences of the bearing outer ring or housing during operation. (Photos 6.2 and 6.3)

The rise of temperature reaches saturation 2 to 3 hours after start of operation and the insert bearing unit reaches its regular conditions; however, if there are abnormalities in mounting, etc., the temperature will increase excessively, which will prevent the insert bearing unit from reaching its regular conditions.

Inspect the above items during commissioning and start operating the insert bearing unit fully only 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 the current periodic inspections and other inspections is an effective measure for preventing accidents and damage to machinery.

For main abnormalities and countermeasures during commissioning and periodic inspection, check the general catalogue for insert bearing units and the page "Inspection and malfunction (<https://www.asahiseiko.co.jp/qa/bearings.html>)" on our website.



Photo 6.1: Checking the rotation noise with a listening rod



Photo 6.2: Temperature measurement (contact type)



Photo 6.3: Temperature measurement (non-contact type)

7. Lubrication

This unit insert bearing has been factory-lubricated with the grease shown in Table 7. This unit uses the lubrication-free type.

Table 7: Properties of standard factory-lubricated grease

Type	Model	Product name	Manufacturer name	NLGI No.	Soap-based grease	Drop point (°C)	Usable temperature point (°C)
For general use	UP, UFL	Alvania Grease S	Shell Lubricants Japan K.K.	3	Li	182	-25 to +135
For food machine use	MUP, MUFL	CLARION @ FOOD MACHINERY HTEP GREASE, No. 2	CITGO Petroleum Corporation	2	Al-mixed	260	-12 to +163

* The usable temperature point of this unit is -10 to + 80°C.

8. 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. (Photos 8.1, 8.2 and 8.3)

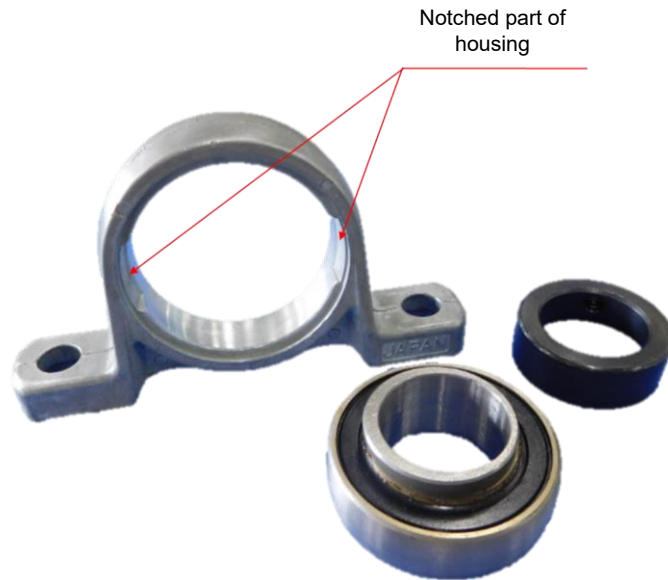


Photo 8.1



Photo 8.2

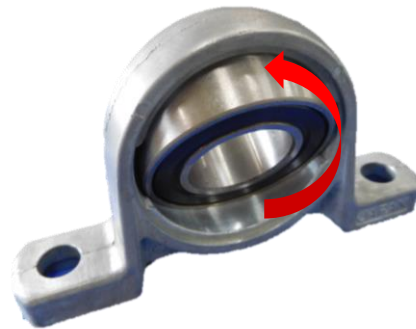


Photo 8.3

ASAHI

Jan. 2023