

Instruction Manual

Insert Bearing Units

Silver Series
(Set screws locking type)

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1. Scope of application

This instruction manual applies to the insert bearing units shown in Table 1.

Table 1

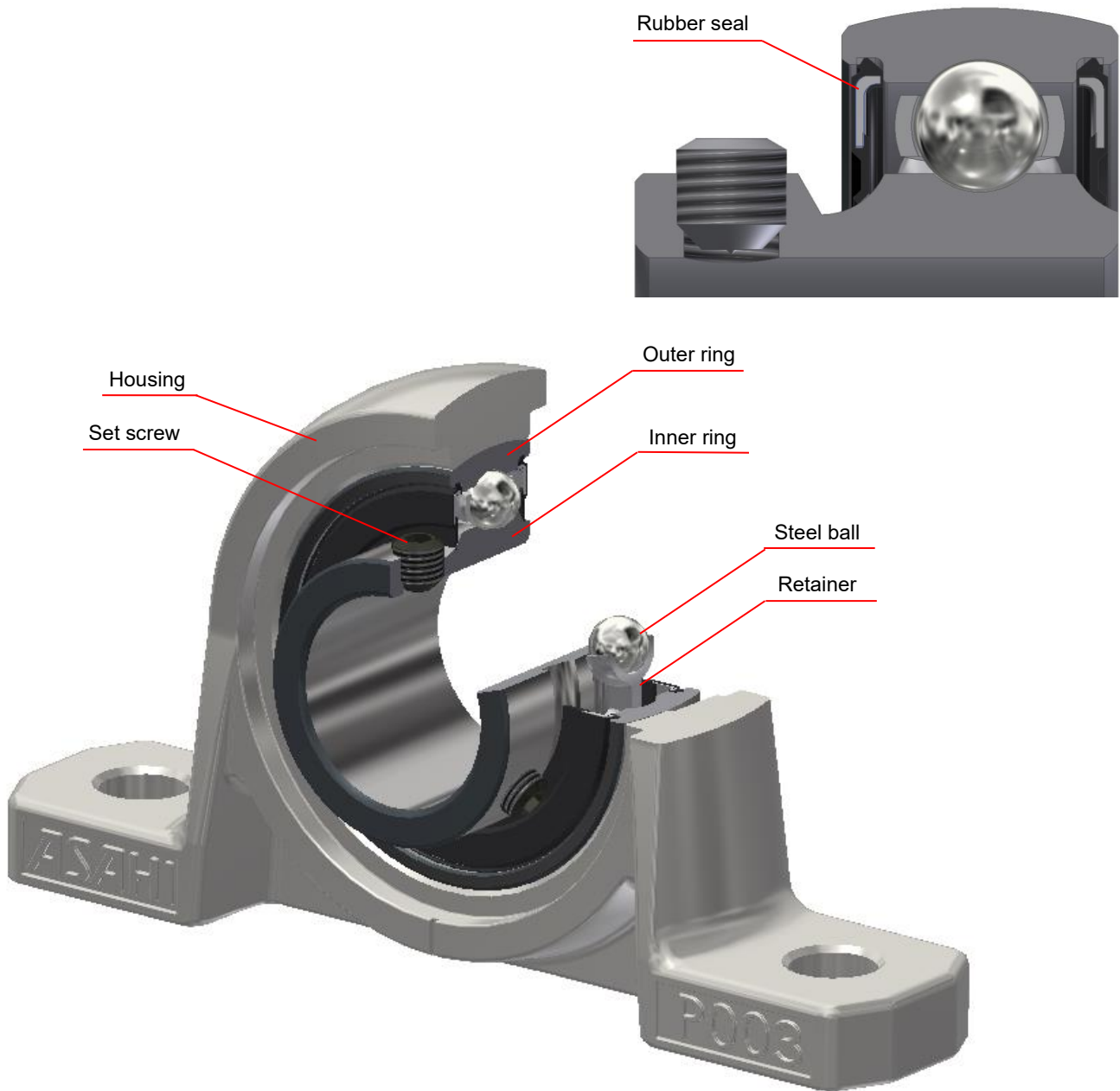
Silver Series		Stainless-Steel Silver Series	
Pillow block unit	Rhombic flange unit	Pillow block unit	Rhombic flange unit
KP000	KFL000	KP000C(E)	KFL000C(E)
KP001	KFL001	KP001C(E)	KFL001C(E)
KP002	KFL002	KP002C(E)	KFL002C(E)
KP003	KFL003	KP003C(E)	KFL003C(E)
KP004	KFL004	KP004C(E)	KFL004C(E)
KP005	KFL005	KP005C(E)	KFL005C(E)
KP006	KFL006	KP006C(E),Y	KFL006C(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 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.

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.
- Set screw: Secures the insert bearing and 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.

Furthermore, when the bearing and shaft will be used tightly press-fitted, the initial clearance of the bearing must be designed to be larger than those of the standard specifications.

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.
- 2) Mount the insert bearing unit on the machine base and secure it firmly with bolts. (Refer to Table 4.1.)
- 3) Tighten the set screws uniformly with a hexagonal wrench key and secure the unit to the shaft. (Refer to Table 4.2.)

- 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 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. The values shown in Table 4.2 are considered appropriate for tightening torque of set screws.
If the set screws are tightened excessively, deformation of the inner ring may cause the rotational accuracy to be reduced and the inner ring to be cracked.
 6. Use washers to prevent the housing from being damaged when fixing the bearing unit on the mounting base with bolts.

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

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

Table 4.2: Tightening torque of set screws 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)
K000, K001	M3×0.35	1.5	0.59	0.35
K002, K003	M4×0.5	2	1.47	0.43
K004 to K006	M5×0.5	2.5	2.94	0.72

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.

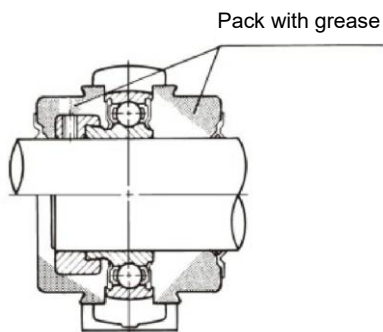


Fig. 5.1

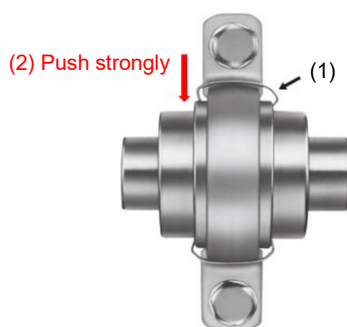


Fig. 5.2



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	KP, KFL	Alvania Grease S	Shell Lubricants Japan K.K.	3	Li	182	-25 to +135

* 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

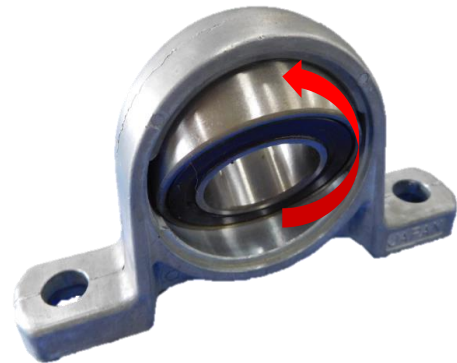


Photo 8.3

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