**Features of F-Series**

- No rattling of shaft and gear when fastening
- Freely positionable mounting for easy meshing of teeth
- Easily mounted and removed for repeated use
- The bushing slides when overloaded to reduce damage to the gears.

**Mounting Method and Precautions**

1. Shaft diameter recommended tolerance is H7. The limit is H11, but we recommend H7 when minimizing noise. Use 1.6α as a reference for the surface roughness of the shaft diameter.
2. Wipe away any dust, dirt or oil on the shaft surface and hole of the fastened section with thinner or the like, and tighten the screws with the balls. Do not apply any synthetic resin-based or oil or additives, as this may cause reduced fastening torque or slippage.
3. Pass completely through the shaft while pressing the bushing flush against the gear before tightening. Removal will not be possible, so be sure to leave a clearance of 1 mm or more on the gear near surface side.
4. Use a torque wrench to fasten bolts on opposite sides when tightening.

**Removal Method and Precautions**

1. **Turn off the power source (apparatus) and inspect that no load is applied to the gear, and confirm that there is no danger due to falling, etc.**
2. **Insert removed bolts into all draft taps, and gradually and evenly tighten each bolt in diagonal order until removal is complete.**
3. **The washer and thread surfaces will be roughened, compromising tightening strength, if the bolts are reused. Consequently, we recommend using new bolts of the same size.**

---

**F Series**

![Diagram of F Series](image_url)

To order F Series products, please specify: **Catalog Number + F + BORE + A.**

**Catalog Number**

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*The product shapes of F Series items are identified by background color.*

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**Notes:**

- For the basic of each product, please refer to the dimension table of the original product.
- No rattling of shaft and gear when fastening
- Freely positionable mounting for easy meshing of teeth
- Easily mounted and removed for repeated use
- The bushing slides when overloaded to reduce damage to the gears.

**Mounting Method and Precautions**

1. Shaft diameter recommended tolerance is ±0.07. The limit is ±0.07, but we recommend ±0.07 for better performance.

2. Use a dial test indicator to check the runout of the shaft surface.

3. Wipe any debris, dirt, or oil off the shaft surface and apply lubricant to the area.

4. Center the bushing before tightening.

5. Remove the bushing if necessary.

6. The clearance should be 1.0 mm or more.

**Removal Method and Precautions**

1. Turn off the power source (grill), check that no load is applied to the gear, and confirm that there is no danger due to falling, etc.

2. Insert removed bolts into all draft holes, and gradually and evenly tighten each bolt in diagonal order until removal is complete.

3. The washer and threads surfaces will be roughened, compromising strength, if the bolts are reused. Consequently, we recommend using new bolts of the same size.

---

**To order F Series products, please specify:** Catalog Number + F + BORE + A.

---

**Catalog Number**

- S52.2-5 F Bore 0.100
- S52.2-6 F Bore 0.180
- S52.3-6 F Bore 0.250
- S52.2-7 F Bore 0.210
- S52.3-7 F Bore 0.280
- S52.3-8 F Bore 0.350

**Product Shapes**

- The product shapes of F Series items are identified by background color.

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**Catalog Number**

- S52.2-23 F A Type
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- S52.2-25 F A Type
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- S52.3-88 F A Type
- S52.3-89 F A Type
- S52.3-90 F A Type

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**Steel Spur Gears**

- [Image of Steel Spur Gears]

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**Other Products**

- Gearboxes
- Internal Gears
- Helical Gears
- Spur Gears
- Worm Gears
- Slot Gears
- Crown Gears
- Spiral Bevel Gears
- External Bevel Gears
- Crossed Helical Gears
- Miter Bevel Gears

---

**Dimensions**

- [Table of Dimensions]

---

**Bore A**

- [Catalog Number Table]

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**Flange A**

- [Catalog Number Table]

---

**Fitting A**

- [Catalog Number Table]

---

**Notes**

- For the dimensions for each product, please refer to the table or the product specifications.

---

**F Series**

- [Diagram of F Series]

---

**F Series Dimensions**

- [Table of F Series Dimensions]
**Features of F Series**

- No rattling of shaft and gear when fastening
- Freely positionable mounting for easy meshing of teeth
- Easily mounted and removed for repeated use
- The bushing slides when overloaded to reduce damage to the gears

**Mounting Method and Precautions**

1. Shaft diameter recommended tolerance is ±H7. The limit is ±H10, but we recommend left when minimizing radial runout. Use 1.6 f as a reference for the surface roughness of the shaft diameter.
2. Wipe away any dust, dirt or oil on the shaft surface and hole of the fastened section with thinner or the like, and tightly apply hydraulic oil #110. Do not apply lubricants or-based oil or oil with additives, as this may cause reduced fastening torque or slippage.
3. Pass completely through the shaft while pressing the bushing against the gear before tightening. Removal will not be possible, so be sure to leave a clearance of 1mm or more on the gear near surface side.
4. Use a torque wrench to fasten bolts on opposite sides when tightening.
   - First tighten to 1/4 of the regulated torque, then 1/2 to 1 of the regulated torque, before finally tightening up to the regulated torque. Do not tighten without passing through the shaft, or fasten the bolts after insertion on the draft tap side (Fig.2).
5. If the shaft has a keyway, the fastened section area is reduced and the transmission rate is decreased by 15 to 20%.

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**Removal Method and Precautions**

1. Turn off the power source (pump), check that no load is applied to the gear, and confirm that there is no danger due to falling, etc.
2. Insert released bolts into all draft taps, and gradually and evenly tighten each bolt in diagonal order until removal is complete.
3. The washer and thread surfaces will be roughened, compromising tightening strength, if the bolts are reused. Consequently, we recommend using new bolts of the same size.

**To order F Series products, please specify:** Catalog Number + F + BORE + A.

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**Removal Method and Precautions**

1. Turn off the power source (pump), check that no load is applied to the gear, and confirm that there is no danger due to falling, etc.
2. Insert released bolts into all draft taps, and gradually and evenly tighten each bolt in diagonal order until removal is complete.
3. The washer and thread surfaces will be roughened, compromising tightening strength, if the bolts are reused. Consequently, we recommend using new bolts of the same size.

**To order F Series products, please specify:** Catalog Number + F + BORE + A.