

FS·F3S Type Attachment and Detachment of Hollow Shaft

Attachment of Hollow Shaft and Driven Shaft of Reducer

- 1 Apply anti-seizing agent proper for the using circumstance such as molybdenum disulfide, on the surface of the driven shaft and the bore of the hollow shaft, and then insert the reducer in the driven shaft.
- 2 In case impact does not affect in the uniform load, "h7" tolerance is recommended for the driven shaft. In case shock load is imposed or great radial load is observed, tighten the fittings. "H2" tolerance is recommended for the bore of the hollow shaft.
- 3 If the fitting is too tight, tap the edge of the hollow drive shaft with the plastic hammer and fit together. In this case, never hit the casing. Smoother insert can be obtained if you prepare jigs shown in the figure below:

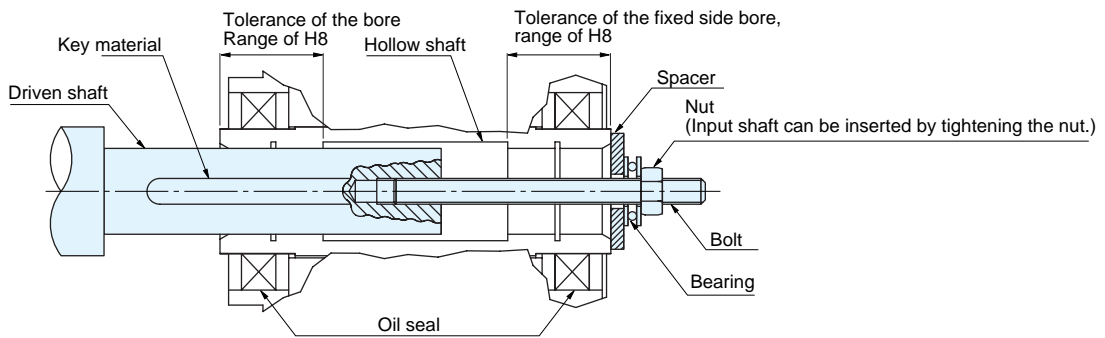


Figure-1

Spacer, nuts, bolts, key materials and bearing parts should be prepared by customer.

- 4 The length of the driven shaft and the fixing key are recommended to be within the tolerance of H₈ range of the fixed side bore. (The dimension of the bore H₈ tolerance part can be seen as L1 in the "Detailed figure of the Hollow Shaft" on page E53.)
- 5 It is recommended to suppress the fluctuation at the edge of the driven shaft below 0.05. The greater fluctuation at operation may give harmful effect to the reducer.

Connecting Reducer with Driven Shaft

- 1 Driven shaft with shoulder

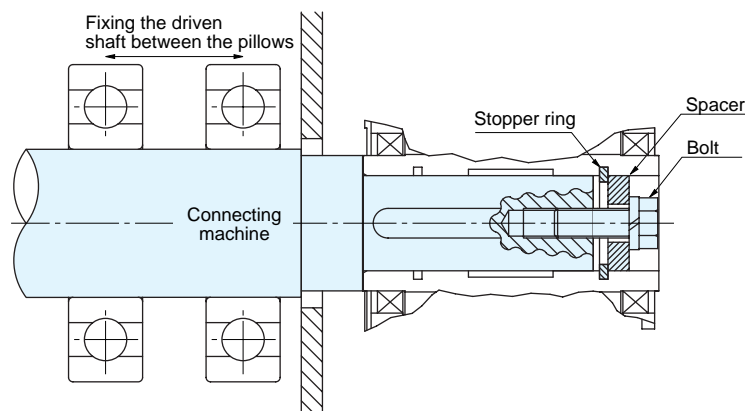


Figure-2 Fixing by spacer and stopper ring

(The spacer, bolt and retaining ring parts should be prepared by customer.)

Note) Excessive tightening of the bolt may cause deformation of the retaining ring, which carefully note.

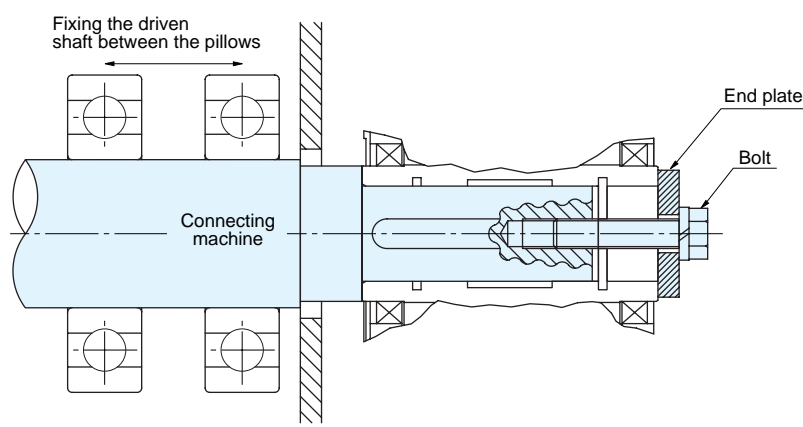


Figure-3 Fixing by End plate
(End plate, bolt parts should be prepared by customer.)

Note) The resin cover which is the attachment of F-Series, cannot be attached, which please note. Safety measure such as preparing the protective cover, should be given by customer in order to avoid wind-in at the output shaft.

② Driven shaft without shoulder

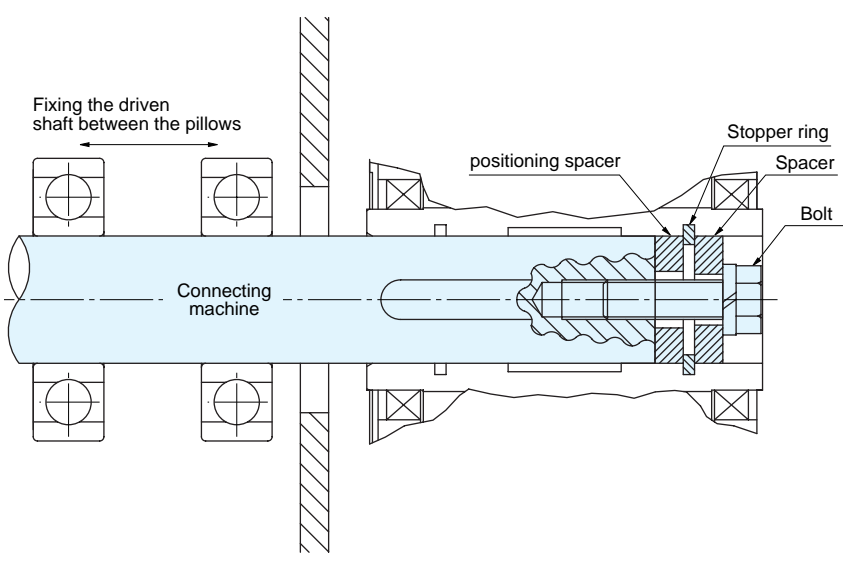


Figure-4 Fixing by spacer and stopper ring
(Spacer, positioning spacer, bolt and stopper ring parts should be prepared by customer.)

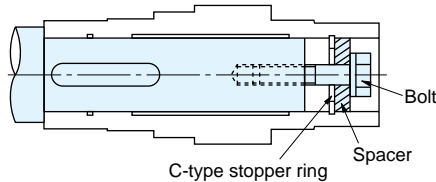
Note) Be sure to have space between the outer diameter of the spacer and the inner diameter of the hollow shaft. Excessive tightness of the fitting or inaccuracy of the spacer's diameter may cause greater fluctuation on the driven and hollow shafts. Positioning spacer is used when deciding the position of the reducer. In case the length of the driven shaft is clarified preliminarily, positioning spacer is not necessary. By having positioning spacer, smooth detachment from the hollow shaft can be obtained. (For the details of detachment from the hollow shaft, refer to Figure-5 on page E58.)

- Parallel Shaft (Performance Table/Dimension)
- Gearmotor with Brake
- Water-resistant, Outdoor Gearmotor with Brake
- Gearmotor with Clutch/Brake
- Reducer (Double Shaft)
- S-Type Reducer
- Right Angle Shaft (Performance Table/Dimension)
- Gearmotor with Brake
- Water-resistant, Outdoor Gearmotor with Brake
- Gearmotor with Clutch /Brake
- Reduce (Double Shaft)
- S-Type Reducer
- Hollow Shaft Solid Shaft Performance Table/Dimension
- Gearmotor with Brake
- Water-Resistant, Outdoor Gearmotor with Brake
- Reduce (Double Shaft)
- S-Type Reducer
- Concentric Hollow Shaft Concentric Solid Shaft Performance Table/Dimension
- Gearmotor with Brake
- Water-Resistant, Outdoor Gearmotor with Brake
- Reducer (Parallel Shaft)
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- Technical Information
- Standard Motors
- Cautions for Safety
- Option
- GT-STEP Index Gearmotor
- KOMPASS Gearbox

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Recommended size for the driven shaft fixing part.

For the attachment of the hollow shaft in general use, we recommend you to refer to the dimensions shown on the right as a guideline for the strength when designing.

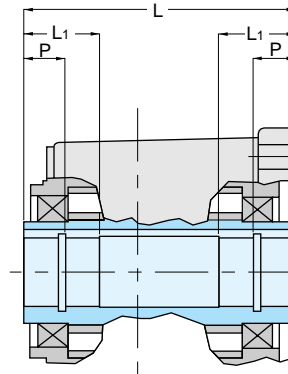


<Recommended sizes for the driven shaft fixing parts>

	Bolt size	Spacer measurements			Nominal designation for C-type stopper ring
		Outer diameter	Inner diameter	Width	
FS -20 F3S-20	M6	19.5	7	3	20
FS -25 F3S-25	M6	24.5	7	4	25
FS -30 F3S-30	M8	29.5	9	5	30
FS -35 F3S-35	M10	34.5	11	5	35
FS -45 F3S-45	M10	44.5	11	5	45
F3S-50	M12	49.5	13	6	50
FS -55 F3S-55	M12	54.5	13	6	55

About the length of driven shaft

The driven shaft must be reached to the both side of the L₁ part. (As shown on the right figure) However, be sure to have an allowance for the spacer's dimension necessary at the "detachment from the hollow shaft".



About the length of key for the driven shaft

The length of the key should be more than 1.5 times of the diameter of hollow shaft. Also, the key inserting position should be the place where more than 1/2 of the total key length can be reached to L₁. (Refer to the figure on the right)

Detaching from the Hollow Shaft

Make sure to avoid excessive force between the casing and the hollow shaft. Smoother detachment can be obtained by using a jig as shown in the figure below:

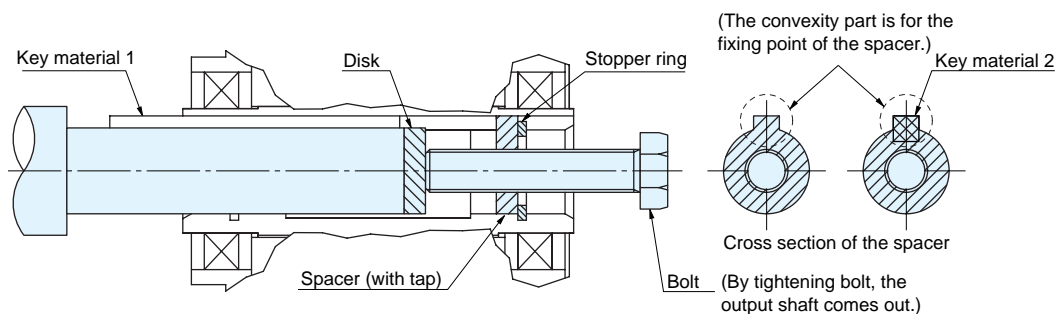


Figure-5

(Parts such as spacer, disk, bolt, stopper ring, etc. should be prepared by customer.)

- Parallel Shaft (Performance Table/Dimension)
- Gearmotor with Brake
- Water-resistant, Outdoor Gearmotor with Brake
- Gearmotor with Clutch/Brake
- Reducer (Double Shaft)
- S-Type Reducer
- Right Angle Shaft (Performance Table/Dimension)
- Gearmotor with Brake
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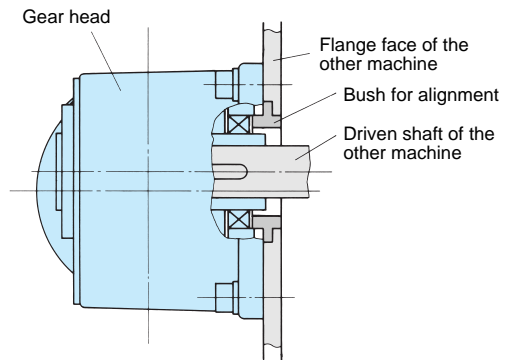
Attaching Reducer

Merits and demerits of flange mounted and torque arm mounted.

	Merits	Demerits
Flange Mounted	<ul style="list-style-type: none"> •Direct attachment to the machine is possible. •Space saving 	<ul style="list-style-type: none"> •Alignment with the connecting machine is needed. •Four(4) attaching taps are needed for connecting with other machine.
Torque Arm Mounted	<ul style="list-style-type: none"> •Easy alignment with the connecting machine •Only one fixing point is needed for fixing with other machine 	<ul style="list-style-type: none"> •Torque arm is needed. •Space for attaching torque arm is needed.

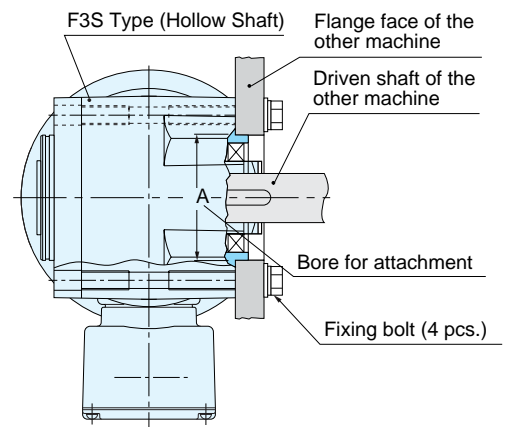
FS Type Hollow Shaft • Flange Mount

When the FS Type unit is directly coupled with the flange face of the other machine, the alignment should be done precisely to avoid motor burn, damage to the bearings, etc. caused by misalignment. Easy alignment can be obtained by using the alignment bush as shown in the diagram on the right. (The alignment bush should be prepared by customer.)



F3S Type Hollow Shaft • Flange Mount

When the F3S Type unit is directly coupled with the flange face of the other machine, the alignment should be done precisely to avoid burnout of motor, damage to the bearings, etc. caused by misalignment. In the F3 Series, there is a bore for the attachment as shown in the diagram on the right. The dimension tolerance of the bore for the attachment A is "h7". The fixing bolts are to be used as shown in the diagram on the right. Fix by 4 bolts.



Parallel Shaft (Performance Table/Dimension)

- Gearmotor with Brake
- Water-resistant, Outdoor Gearmotor with Brake
- Gearmotor with Clutch/Brake
- Reducer (Double Shaft)
- S-Type Reducer

Right Angle Shaft (Performance Table/Dimension)

- Gearmotor with Brake
- Water-resistant, Outdoor Gearmotor with Brake
- Gearmotor with Clutch/Brake
- Reduce (Double Shaft)
- S-Type Reducer

Hollow Shaft Solid Shaft Performance Table/Dimension

- Gearmotor with Brake
- Water-Resistant, Outdoor Gearmotor with Brake
- Reduce (Double Shaft)
- S-Type Reducer

Concentric Hollow Shaft Concentric Solid Shaft Performance Table/Dimension

- Gearmotor with Brake
- Water-Resistant, Outdoor Gearmotor with Brake
- Reducer (Parallel Shaft)
- S-Type Reducer

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