

INSTRUCTION MANUAL
FOR
SUPERHIGH RIGID PLATE SPRING COUPLING
SERVO-FLEX SFS SERIES



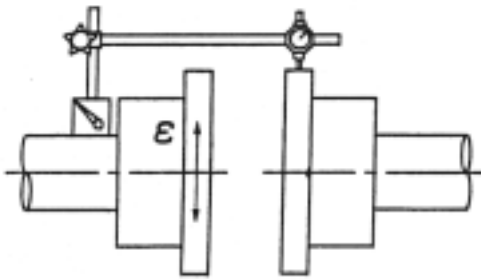
Important: You are kindly requested to hand over this
Instruction Manual to each end user without
fail.

MIKI PULLEY CO., LTD.

■ SFS mounting

1. Parallel offset (ε)

Fix the dial gauge on one shaft and read the run-out of the outer periphery of the other flange while rotating the shaft. The models (SFS-□S) with one pair of elements (plate springs) do not allow parallel offset and should be moved close to 0. Use the following formula and calculate permissible parallel offset values for Models (SFS-□G), whose full length can be set freely.

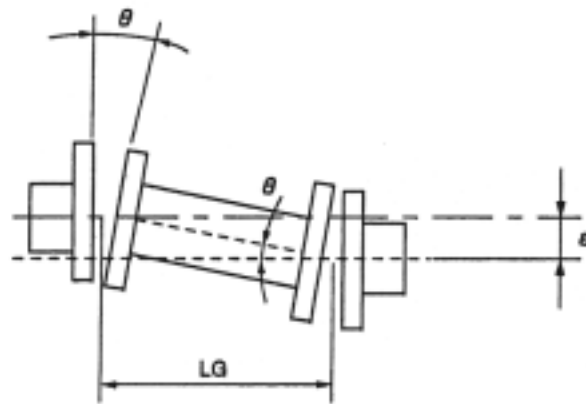
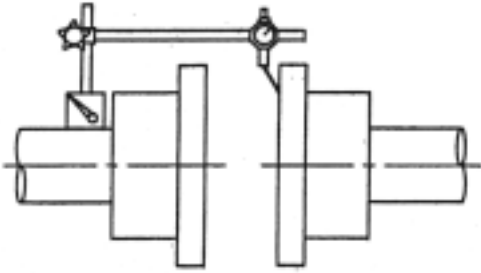


$$B = D \tan \theta$$

B : Run-out
 D : Flange outer diameter
 $\theta = 1^\circ$

2. Angular misalignment (θ)

Fix the dial gauge on one shaft and read the run-out of the end surface near the outer periphery of the other flange while rotating the shaft. Adjust run-out B so that $\theta \leq 1^\circ$ can be accomplished.



$$B = \tan \theta \times LG$$

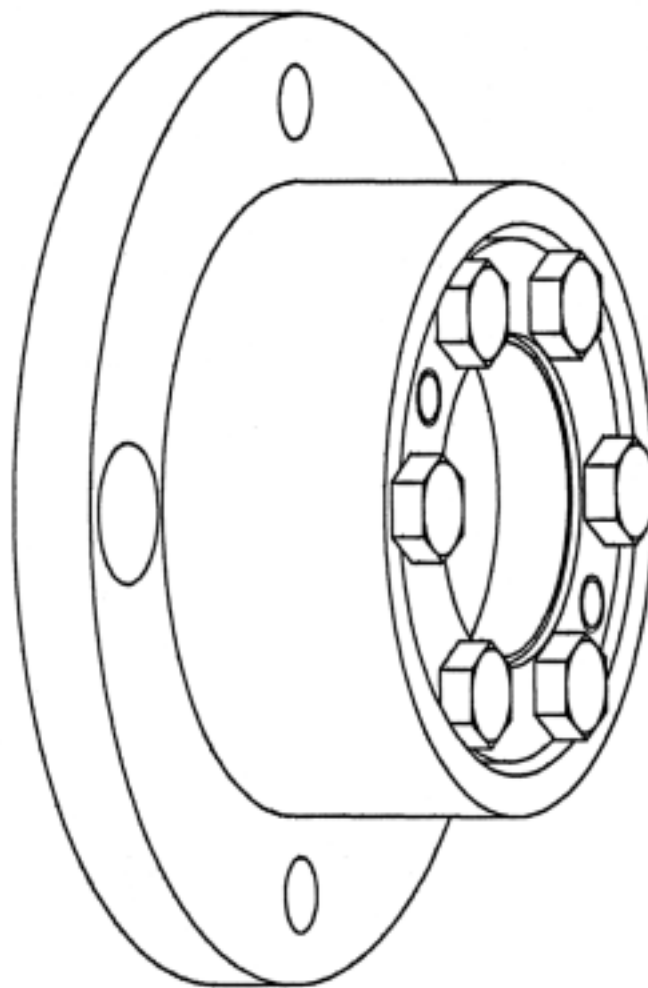
ε : Permissible parallel offset
 $\theta = 1^\circ$
 LG : Dimensions $LS+S$
 LS : Full length of spacer
 S : Dimension between flange on one side and spacer

3. Axial displacement

Adjust to achieve Dimension S in the dimension table to be less than $S \pm 0.25\text{mm}$.

※SFS-□S is a dimension between flanges. SFS-□W and SFS-□G are dimensions between a flange and a spacer.

INSTRUCTION MANUAL
FOR
SUPERHIGH RIGID PLATE SPRING COUPLING
SERVO-FLEX SFS SERIES
MP Type(Friction Locking Element Built-in)



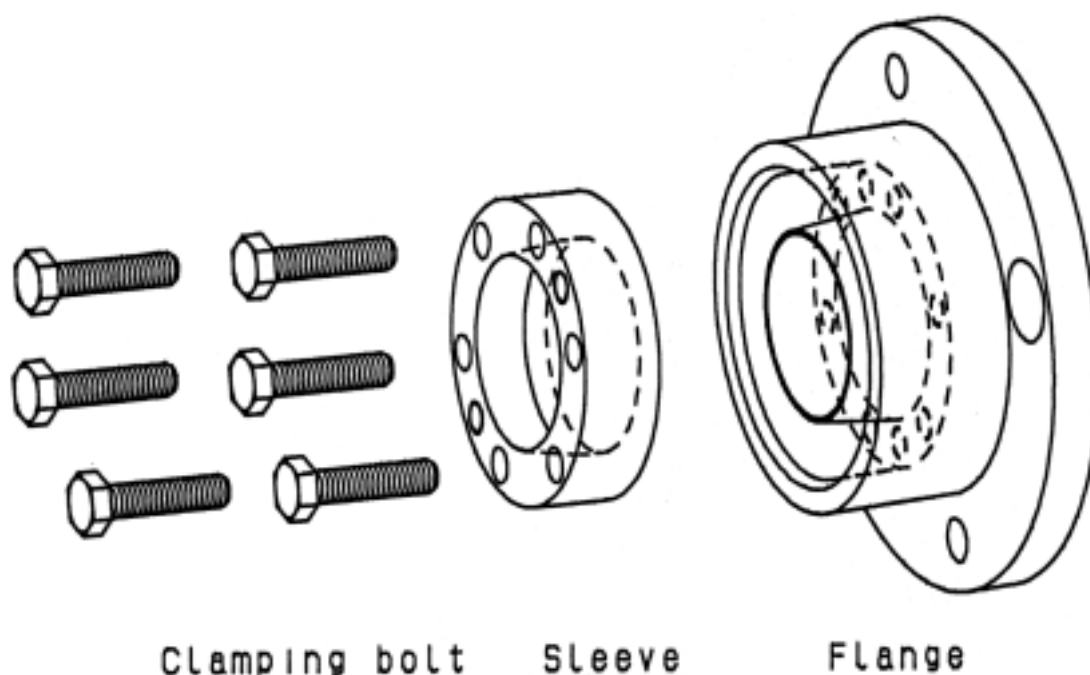
Important: You are kindly requested to hand over this
Instruction Manual to each end user without
fail.

We appreciate you highly for your purchasing this product. First of all, please check the product if it is just as you ordered and also it has not any damage to be caused in the course of transportation.

Read this Instruction Manual with full care before using it for proper handling of this product.

1. CONSTRUCTION

<MP hub> (friction locking element built-in) is composed of flange, sleeve and clamping bolt.



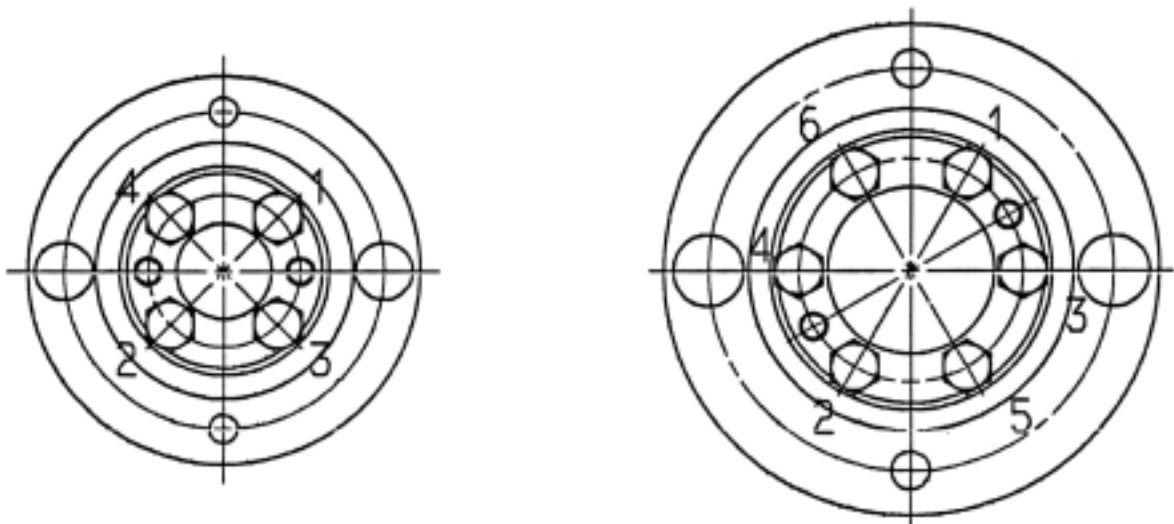
2. PRINCIPLE OF OPERATION

Facial pressure is applied to bore of flange in radial direction by pressing sleeve inside the flange with clamping bolt. This frictional force generated by the facial pressure clutches the flange to the shaft.

3. MOUNTING PROCEDURE

- a) Wipe off cleanly the rust and/or dust stuck around the shaft and to the bore of flange with cloth. Do not absolutely screw the clamping bolt before inserting the shaft into <MP hub>.
- If you screw the clamping bolt, the flange and sleeve may be permanently deformed.
- b) Loosen the clamping bolt in advance and, then, insert the shaft with the flange and sleeve set free. If the tapers of flange and sleeve contact each other, the bore of <MP hub> may be deformed and prevent the shaft insertion.
- c) screw in the clamping bolts evenly diagonal direction (starting the place 1 in order) until <MP hub> clutches the shaft lightly. Then, tighten all the clamping bolts evenly with torque wrench upto the tightening torque specified in the following table.

Clamping Bolt Size	M5×20	M6×24	M8×25
Tightening Torque N·m (kgf·m)	8 (0.8)	14 (1.4)	34 (3.4)



4. REMOVAL PROCEDURE

As <MP hub> is made of self-locking mechanism, the hub cannot be removed even if loosening the clamping bolts. Here, if you try forcibly to removed it, it may damage the shaft and main unit. Accordingly, do not absolutely try to do so.

To remove <MP hub>, loosen the clamping bolts diagonally until clearance between the seat faces of clamping bolts and sleeve becomes 2mm approximately.

Flange(sleeve) has screw holes for removal at 2 places. It is unlocked by screwing the bolt in this screw hole. Please use commercially available bolt for this removal.

Removal Bolt Size	M5×18 or above	M6×18 or above	M8×18 or above
-------------------	----------------	----------------	----------------

5. CAUTIONS

- a) <MP hub> is applicable even if the shaft has a small groove (such as key way as per JIS Standard), though it depends on configuration.
- b) If it is mounted with the grease of molybdenum disulfide or of containing extreme pressure additives stuck to the bore of <MP hub>, coefficient of friction may reduce so as to cause hazardous slipping.
- c) Tolerance of outside diameter for mating shaft is class h7. But the tolerance of shaft diameter at $\varnothing 35$ is specified as below.

$\varnothing 35$	$\begin{matrix} +0.010 \\ -0.025 \end{matrix}$
------------------	--

- d) Finish surface roughness of mating shaft as finer than 6.35 (1.6a for average roughness at center line).

Specification

Clamping torque for shaft-fixing clamping bolts in SFC series

Tighten the clamping bolts at the specified torque using a torque screwdriver and torque wrench.

Size	020	03-030	035-04-040	05	06
Clamping Torque (N·m)	1	1.5	3.4	7	14
Clamping Torque (kgf·m)	0.1	0.15	0.34	0.7	1.4
Nominal Bolt Diameter	M2.5	M3	M4	M5	M6

Clamping torque for element-fixing reamer bolts in SFS series

Tighten the reamer bolt temporarily and tighten to the required torque using a torque wrench. Do not apply an external axial force to the element more than necessary. Applying an external axial force will bend the element, fixing it in this condition. This sometimes will affect the rotating accuracy.

Size	05	06	08	09	10	12	14
Clamping Torque (N·m)	8	14	14	34	34	68	118
Clamping Torque (kgf·m)	0.8	1.4	1.4	3.4	3.4	6.8	11.8
Nominal Bolt Diameter	M5	M6	M6	M8	M8	M10	M12

Clamping bolt for shaft-fixing of model M in SFS series

Loosen the clamping bolts in advance and check that the sleeve is free to move. Then insert the flange hub into the shaft. Retighten the clamping bolts evenly diagonally (sequentially beginning with 1) using a torque wrench. Tighten all the clamping bolts at the specified torque.

Never tighten the clamping bolts of Model M till the flange hub is inserted into the shaft. Otherwise, the inner diameter of the flange hub boss may deform and the shaft can no longer be inserted.

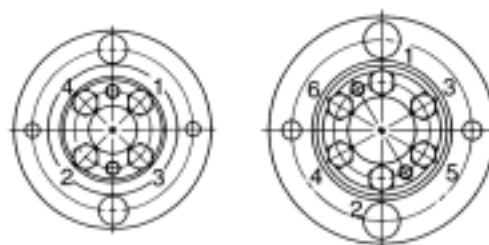
Nominal Bolt Diameter	M5	M6	M8
Clamping Torque (N·m)	8	14	34
Clamping Torque (kgf·m)	0.8	1.4	3.4

SFS series M model dismounting method

Follow the below procedures when dismounting the flange hub from the shaft.

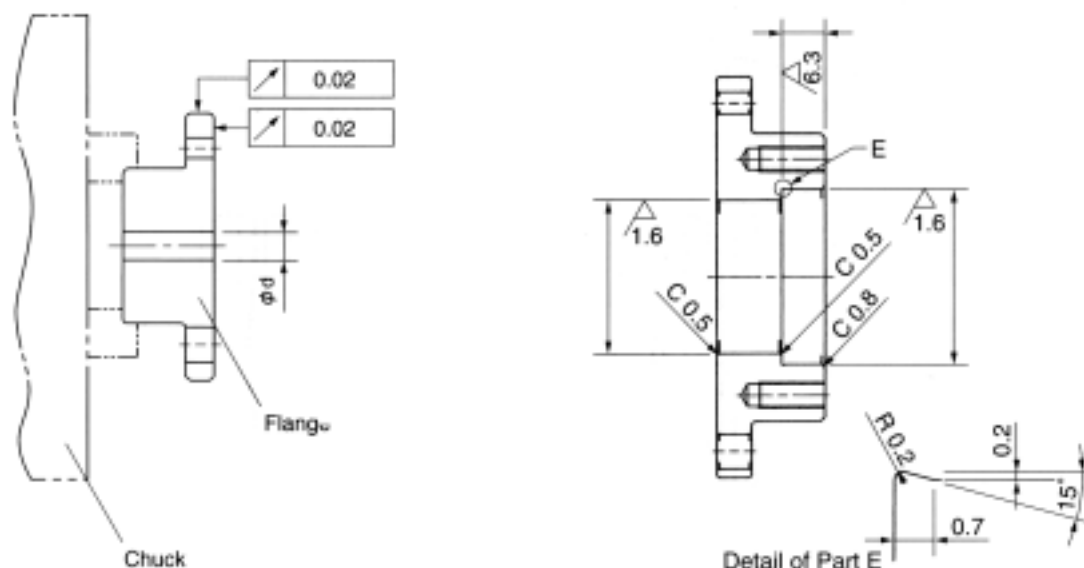
- 1) Loosen the clamping bolts about 2mm from the bearing surface.
- 2) Joining of the flange hub and shaft can be released by fastening bolts sold on the market diagonally in the two screw bores for dismounting in the sleeve. (The screw holes for dismounting are located on the backside also.)

The M-model sleeve has a self-locking mechanism. Merely loosening the clamping bolts does not release fastening of the flange hub and shaft.



Centering and finishing in flange bore drilling in SFS series

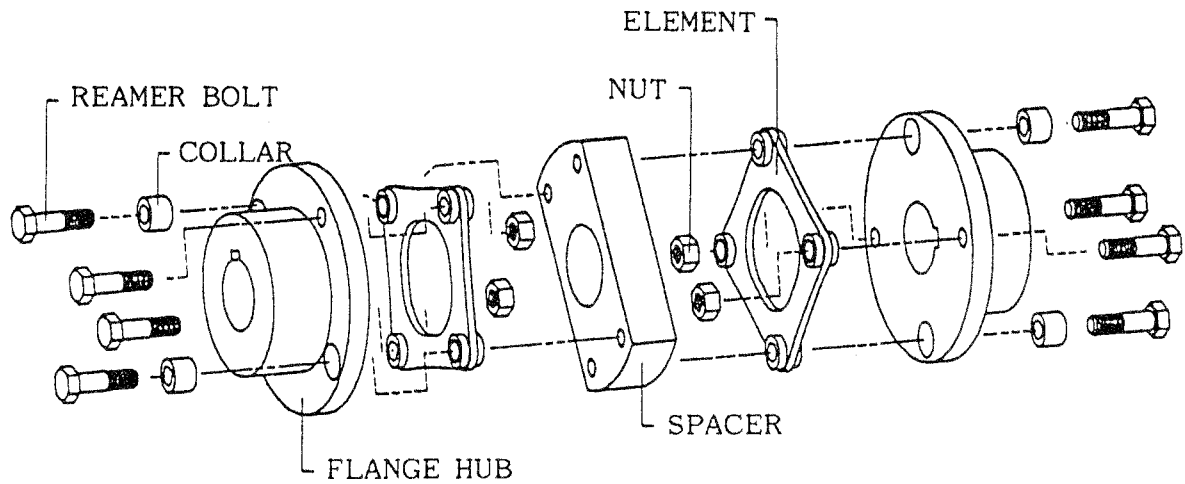
Check center run-out of each size by the flange outer diameter. Finish as illustrated in the diagram when machining to SHUPANRING



SFS INSTRUCTION MANUAL
(W-TYPE)

□ STRUCTURE

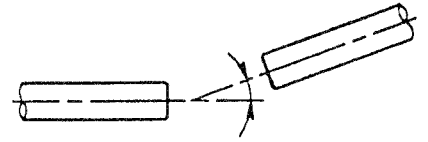
2 FLANGE HUBS, SPACER AND EMBODIED MEMBRANCE PACK (ELEMENT) ARE ASSEMBLED BY REAMER BOLTS.



□ ASSEMBLE

PARTS AND THE NUMBER ARE AS FOLLOWING. ELEMENT CONSISTS OF 3-15 PCS OF MEMBRANE EMBODIED.

PARTS	SFS-05W	SFS-06W	SFS-08W	SFS-09W	SFS-10W	SFS-12W	SFS-14W
ELEMENT	2	2	2	2	2	2	2
FLAGE HUB	2	2	2	2	2	2	2
SPACER	1	1	1	1	1	1	1
COLLAR	4	4	4	4	4	4	4
REAMER BOLT	8-M5×15	8-M6×18	8-M6×20	8-M8×27	8-M8×27	8-M10×32	8-M12×38
NUT	4-M5	4-M6	4-M6	4-M8	4-M8	4-M10	4-M12

ANGULAR: θ

□ HOW TO MAKE CONCENTRICITY

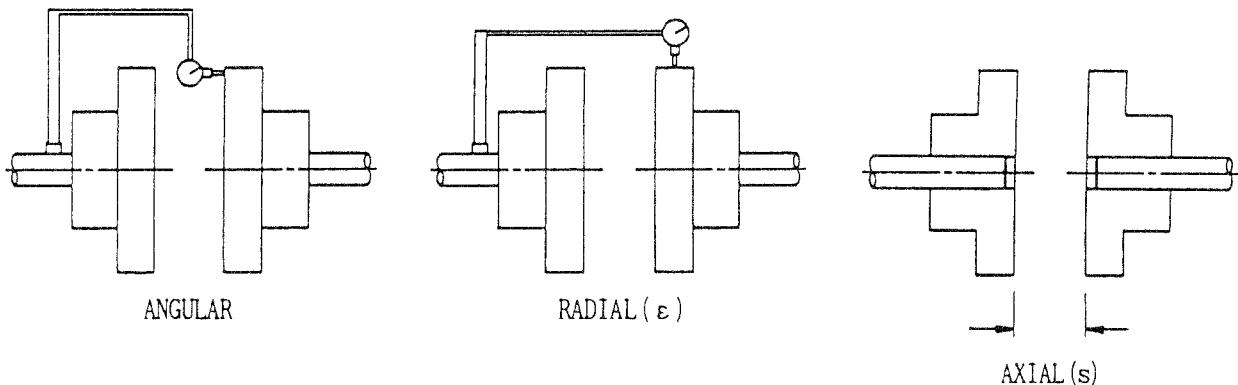
MAX. MISALIGNMENT IS AS THE FOLLOWING.

SIZE	05W	06W	08W	09W	10W	12W	14W
MAX. ANGULAR MISALIGNMENT: θ (°)	1	1	1	1	1	1	1
MAX. AXIAL MISALIGNMENT: s	18 ± 0.5	24 ± 0.5	24 ± 0.5	38 ± 0.5	40 ± 0.5	47 ± 0.5	54 ± 0.5
MAX. RADIAL MISALIGNMENT: ϵ	± 0.2	± 0.3	± 0.3	± 0.5	± 0.5	± 0.6	± 0.7

- TO CHECK PARALLEL MISALIGNMENT
PLEASE FIX A DIALGAUGE ON ONE SHAFT, AND ROUNDING IT, CHECK THE CONCENTRICITY AT THE OUTER EDGE OF ANOTHER FLANGE HUB.
- TO CHECK ANGULAR MISALIGNMENT
PLEASE FIX A DIALGAUGE ON ONE SHAFT, AND ROUNDING IT, CHECK THE FIGURE AT THE FACING SURFACE NEAR BY THE EDGE OF ANOTHER FLANGE. THE FIGURES AS BEROW IS AT 0.1 MISALIGNMENT.

SIZE	05W	06W	08W	09W	10W	12W	14W
GAUGE FIGURE (mm)	0.10	0.12	0.14	0.16	0.18	0.22	0.25

- TO CHECK AXIAL MISALIGNMENT
THE TOLERANCE OF DIMENSION BETWEEN BOTH FLANGES SHOULD BE ARRANGED WITHIN ± 0.25 .



PLEASE USE REAMER BOLTS ENCLOSED WITH COUPLING. STRENGTH GRADE OF REAMER BOLT IS 12.9. WHEN CLAMPING REAMER BOLTS, PLEASE USE TORQUE-WRENCH. TO GET CERTAIN TORQUE, IT IS EFFECTIVE TO PUT SMALL GREASE ON THE CONTACTING SURFACE OF BOLT HEAD. PLEASE CLAMP REAMER BOLTS GRADUALLY. IF CLAMPING ONE BOLT INTENSIVELY, IT CAUSES CLAMPING TORQUE DOWN AND GIVES ELEMENT A BAD INFLUENCE.

SIZE	05W	06W	08W	09W	10W	12W	14W
CLAMPING TORQUE (kgfm)	0.8	1.4	1.4	3.4	3.4	6.8	11.8

PLEASE USE NUTS AND COLLARS ENCLOSED WITH COUPLING. OTHERWISE OTHERS MAY CAUSE TROUBLE.

□NOTE

DON'T DISASSEMBLE ELEMENT.

DON'T ADD EXCESSIVE POWER ON ELEMENT. WHEN HANDLING IT.

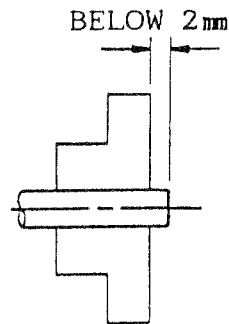
IN THE CASE OF AROUND MAX BORE AND PUTTING SHAFT INTO ELEMENT, THE SHAFT OR KEY MAY TOUCH TO ELEMENT.

LENGTH OF PROTRUDED SHAFT FROM FLANGE SHOULD BE BELOW 2mm, AS LEFT.

IF SOME NOISE OCCURRS AFTER OPERATION, PLEASE CHECK THE CONCENTRICITY AGAIN.

BORE SHOULD BE MACHINED BASING ON THE OUTER EDGE OF FLANGE HUB.

ALLOWABLE TEMPERATURE IS FROM -40°C TO $+120^{\circ}\text{C}$.



□SPECIAL DESIGN

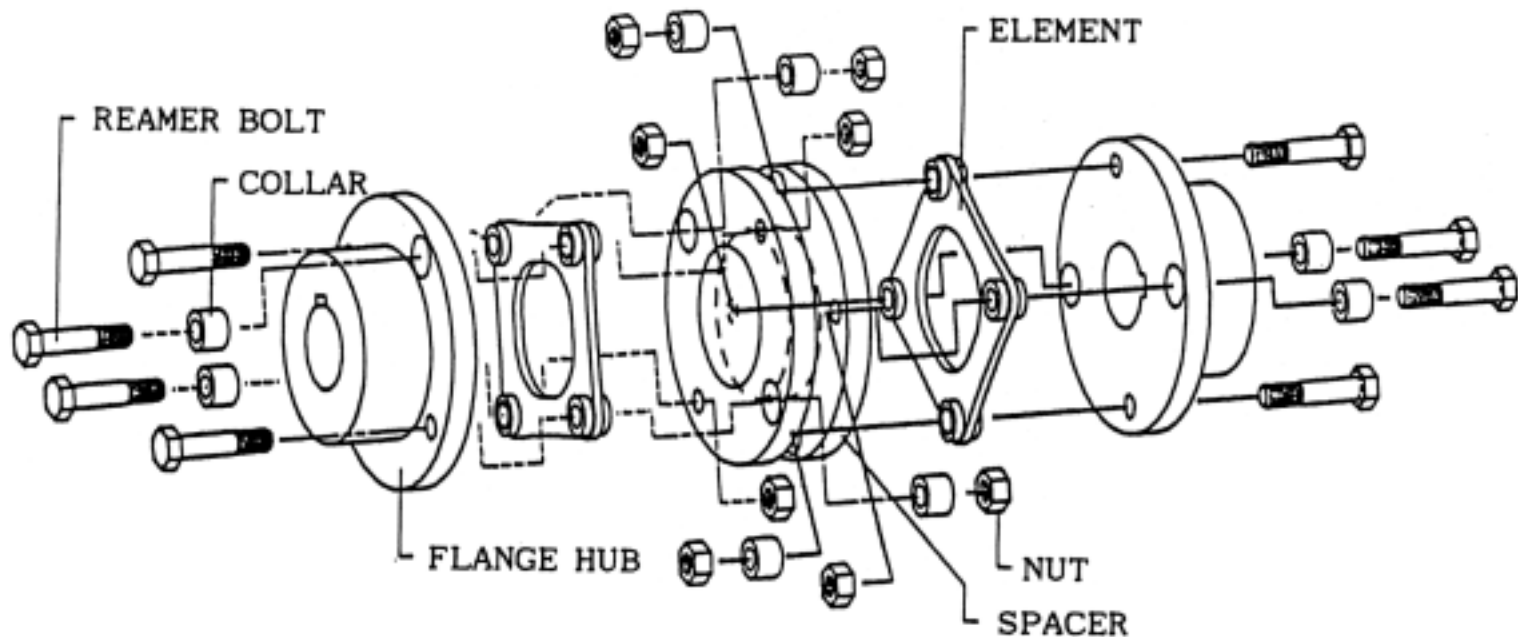
WE PREPARE FLANGE HUB WITH FRICTION JOINT. WHICH IS BUILT IN THE FLANGE HUB.

IF YOU DEMAND SPECIFICATION.

SFS INSTRUCTION MANUAL
(G-TYPE)

□ STRUCTURE

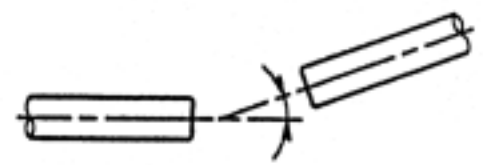
2 FLANGE HUBS, SPACER AND EMBODIED MEMBRANCE PACK (ELEMENT) ARE ASSEMBLED BY REAMER BOLTS.



□ ASSEMBLE

PARTS AND THE NUMBER ARE AS FOLLOWING. ELEMENT CONSISTS OF 3-15 PCS OF MEMBRANE EMBODIED.

PARTS	SFS-05G	SFS-06G	SFS-08G	SFS-09G	SFS-10G	SFS-12G	SFS-14G
ELEMENT	2	2	2	2	2	2	2
FLAGE HUB	2	2	2	2	2	2	2
SPACER	1	1	1	1	1	1	1
COLLAR	8	8	8	8	8	8	8
REAMER BOLT	8-M5×22	8-M6×25	8-M6×29	8-M8×36	8-M8×36	8-M10×45	8-M12×54
NUT	8-M5	8-M6	8-M6	8-M8	8-M8	8-M10	8-M12



□ HOW TO MAKE CONCENTRICITY

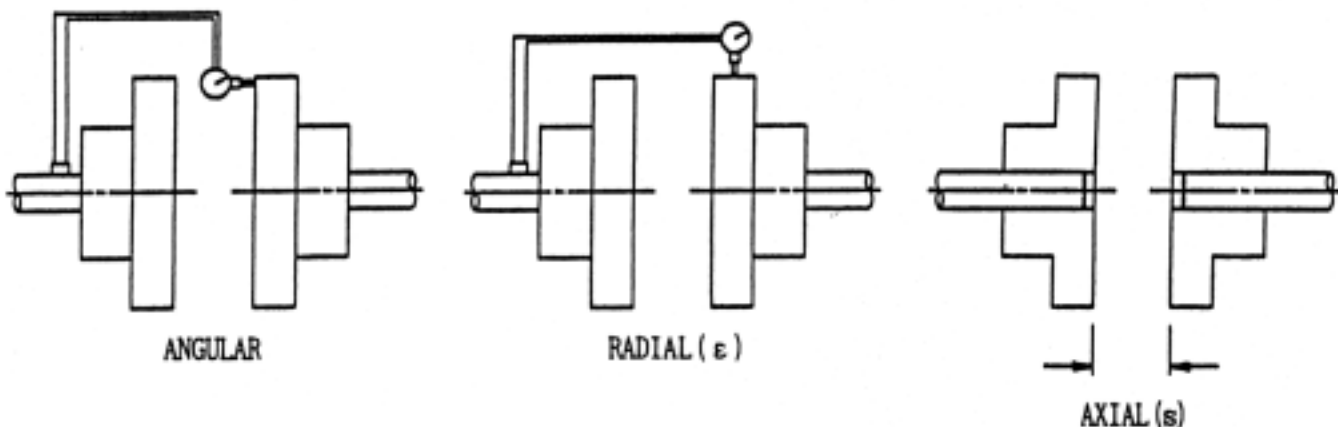
MAX. MISALIGNMENT IS AS THE FOLLOWING.

SIZE	05G	06G	08G	09G	10G	12G	14G
MAX. ANGULAR MISALIGNMENT: θ (°)	1	1	1	1	1	1	1
MAX. AXIAL MISALIGNMENT: s	34 ± 0.5	36 ± 0.5	38 ± 0.5	46 ± 0.5	50 ± 0.5	60 ± 0.5	70 ± 0.5
MAX. RADIAL MISALIGNMENT: ϵ	± 0.5	± 0.5	± 0.5	± 0.6	± 0.6	± 0.8	± 0.9

- TO CHECK PARALLEL MISALIGNMENT
PLEASE FIX A DIALGAUGE ON ONE SHAFT, AND ROUNDING IT, CHECK THE CONCENTRICITY AT THE OUTER EDGE OF ANOTHER FLANGE HUB.
- TO CHECK ANGULAR MISALIGNMENT
PLEASE FIX A DIALGAUGE ON ONE SHAFT, AND ROUNDING IT, CHECK THE FIGURE AT THE FACING SURFACE NEAR BY THE EDGE OF ANOTHER FLANGE.
THE FIGURES AS BEROW IS AT 0.1 MISALIGNMENT.

SIZE	05G	06G	08G	09G	10G	12G	14G
GAUGE FIGURE (mm)	0.10	0.12	0.14	0.16	0.18	0.22	0.25

- TO CHECK AXIAL MISALIGNMENT
THE TOLERANCE OF DIMENSION BETWEEN BOTH FLANGES SHOULD BE ARRANGED WITHIN ± 0.25 .



PLEASE USE REAMER BOLTS ENCLOSED WITH COUPLING. STRENGTH GRADE OF REAMER BOLT IS 12.9.
WHEN CLAMPING REAMER BOLTS, PLEASE USE TORQUE-WRENCH. TO GET CERTAIN TORQUE, IT IS EFFECTIVE TO PUT SMALL GREASE ON THE CONTACTING SURFACE OF BOLT HEAD. PLEASE CLAMP REAMER BOLTS GRADUALLY.
IF CLAMPING ONE BOLT INTENSIVELY, IT CAUSES CLAMPING TORQUE DOWN AND GIVES ELEMENT A BAD INFLUENCE.

SIZE	05G	06G	08G	09G	10G	12G	14G
CLAMPING TORQUE (kgfm)	0.8	1.4	1.4	3.4	3.4	6.8	11.8

PLEASE USE NUTS AND COLLARS ENCLOSED WITH COUPLING. OTHERWISE OTHERS MAY CAUSE TROUBLE.

NOTE

DON'T DISASSEMBLE ELEMENT.

DON'T ADD EXCESSIVE POWER ON ELEMENT. WHEN HANDLING IT.

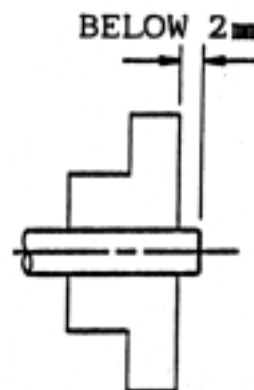
IN THE CASE OF AROUND MAX BORE AND PUTTING SHAFT INTO ELEMENT. THE SHAFT OR KEY MAY TOUCH TO ELEMENT.

LENGTH OF PROTRUDED SHAFT FROM FLANGE SHOULD BE BELOW 2mm. AS LEFT.

IF SOME NOISE OCCURRS AFTER OPERATION. PLEASE CHECK THE CONCENTRICITY AGAIN.

BORE SHOULD BE MACHINED BASING ON THE OUTER EDGE OF FLANGE HUB.

ALLOWABLE TEMPERATURE IS FROM -40°C TO $+120^{\circ}\text{C}$.



SPECIAL DESIGN

WE PREPARE FLANGE HUB WITH FRICTION JOINT. WHICH IS BOLT IN THE FLANGE HUB.

IF YOU DEMAND SPECIFICATION.