



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coated except for portions given secondary operation

* The precision grade of F Series products is equivalent to the value shown in the table.
* Bushing material: S45C, screw material: SCM435

Features of F Series

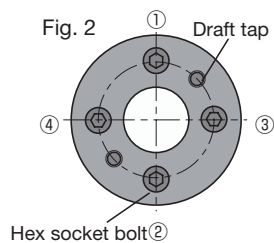
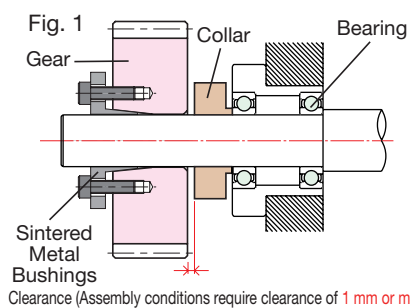
- No rattling of shaft and gear when fastening
- Freely positionable mounting for easy meshing of teeth
- Easily mounted and removed for repeated use
- The bushing slips when overloaded to reduce damage to the gears.

Mounting Method and Precautions

- ① Shaft diameter recommended tolerance is h7. The limit is h8, but we recommend h6 when minimizing runout. Use 1.6a as reference for the surface roughness of the shaft diameter.
- ② Wipe away any debris, dirt or oil on the shaft surface and hole of the fastened section with thinner or the like, and lightly apply hydraulic oil #68. Do not apply molybdenum-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 flange against the gear before tightening. Removal will not be possible, so be sure to leave a clearance of 1mm or more on the gear rear surface side. (Fig.1)
- ④ Use a torque wrench to fasten bolts on opposite sides when tightening. First tighten at 1/4 of the regulated torque, then at 1/2 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 contact area is reduced and the transmission rate is decreased by 15 to 20%.

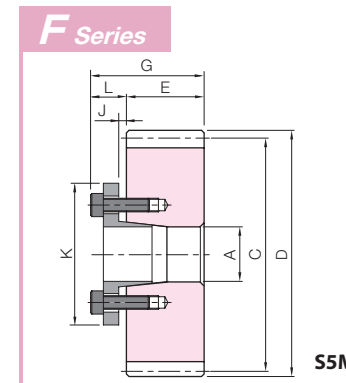
Catalog Number	Module	No. of teeth	Pitch dia.			Face width	Allowable torque (N·m)		
			C	D	E		Bending strength	Surface durability	
SSA2-24	m2	24	48	52	20	59.8	4.24		
SSA2-25		25	50	54				63.3	4.64
SSA2-28		28	56	60				73.9	5.89
SSA2-30		30	60	64				81.1	6.80
SSA2-32		32	64	68				88.4	7.78
SSA2-35		35	70	74				99.3	9.39
SSA2-36		36	72	76				103	9.96
SSA2-40		40	80	84				118	12.5
SSA2-45		45	90	94				137	16.0
SSA2-48		48	96	100				148	18.3
SSA2-50	m2.5	50	100	104	25	117	8.47		
SSA2-55		55	110	114				124	9.26
SSA2-56		56	112	116				144	11.7
SSA2-60		60	120	124				159	13.6
SSA2-70		70	140	144				173	15.6
SSA2-80		80	160	164				194	18.8
SSA2-100		100	200	204				201	20.0
SSA2.5-24		24	60	65				230	24.9
SSA2.5-25		25	62.5	67.5				267	31.9
SSA2.5-28		28	70	75				289	36.7
SSA2.5-30	30	75	80	304	40.0				
SSA2.5-32	32	80	85	341	49.1				
SSA2.5-35	35	87.5	92.5	349	51.0				
SSA2.5-36	36	90	95	379	59.1				
SSA2.5-40	40	100	105	454	82.1				
SSA2.5-45	45	112.5	117.5	441	90.9				
SSA2.5-48	48	120	125						
SSA2.5-50	50	125	130						
SSA2.5-55	55	137.5	142.5						
SSA2.5-56	56	140	145						
SSA2.5-60	60	150	155						
SSA2.5-70	70	175	180						
SSA2.5-80	80	200	205						

* For the backlash of each product, please refer to the dimension table of the original product.



Removal Method and Precautions

- ① Turn off the power source (supply), 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 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.**

Bore A	* The product shapes of F Series items are identified by background color.																
	Catalog Number	12	14	15	16	17	18	19	20	22	25	28	30	32	35		
SSA2-24 F Bore	S5M																
SSA2-25 F Bore	S5M	S5M	S5M														
SSA2-28 F Bore			S5M	S5M	S5M	S5M	S5M										
SSA2-30 F Bore			S5M	S5M	S5M	S5M	S5M	S5M									
SSA2-32 F Bore			S5M	S5M	S5M	S5M	S5M	S5M									
SSA2-35 F Bore			S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M							
SSA2-36 F Bore			S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M						
SSA2-40 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2-45 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2-48 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2-50 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2-55 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2-56 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2-60 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2-70 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2-80 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2-100 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2.5-24 F Bore			S5M	S5M	S5M	S5M	S5M										
SSA2.5-25 F Bore			S5M	S5M	S5M	S5M	S5M										
SSA2.5-28 F Bore						S5M	S5M										
SSA2.5-30 F Bore						S5M	S5M	S5M	S5M	S5M							
SSA2.5-32 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2.5-35 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2.5-36 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2.5-40 F Bore									S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2.5-45 F Bore									S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2.5-48 F Bore									S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2.5-50 F Bore									S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2.5-55 F Bore									S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2.5-56 F Bore									S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2.5-60 F Bore									S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2.5-70 F Bore									S5M	S5M	S5M	S5M	S5M	S5M	S5M		
SSA2.5-80 F Bore									S5M	S5M	S5M	S5M	S5M	S5M	S5M		
Bore A		12	14	15	16	17	18	19	20	22	25	28	30	32	35		
Ref. slipping torque N·m	23	37	39	42	45	48	49	97	110	124	141	149	163	173			
Ref. thrust load kN	3.76	5.21	5.1	5.17	5.23	5.28	5.12	9.68	9.98	9.9	10	9.89	10.1	9.88			
Sintered Metal Bushings	L	10	12						14								
Clearance	K	31	36	37	38	39	40	42	46	47	51	53	56	58	61		
Total Length	J	2															
Hex socket bolt	G	m2	30						32						34		
		m2.5	35						37						39		
Tightening torque N·m	Qty	3															
	Size	M4x12						M4x15						M5x18			
Bushing weight (g)		22	38	40	41	43	45	49	71	71	81	84	93	97	106		



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coated except for portions given secondary operation

* The precision grade of F Series products is equivalent to the value shown in the table.
* Bushing material: S45C, screw material: SCM435

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 slips when overloaded to reduce damage to the gears.

Mounting Method and Precautions

- ① Shaft diameter recommended tolerance is h7. The limit is h8, but we recommend h6 when minimizing runout. Use 1.6a as reference for the surface roughness of the shaft diameter.
- ② Wipe away any debris, dirt or oil on the shaft surface and hole of the fastened section with thinner or the like, and lightly apply hydraulic oil #68. Do not apply molybdenum-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 flange against the gear before tightening. Removal will not be possible, so be sure to leave a clearance of 1mm or more on the gear rear surface side. (Fig.1)
- ④ Use a torque wrench to fasten bolts on opposite sides when tightening. First tighten at 1/4 of the regulated torque, then at 1/2 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 contact area is reduced and the transmission rate is decreased by 15 to 20%.

Catalog Number	Module	No. of teeth	Pitch dia.			Allowable torque (N·m)	
			C	D	E	Bending strength	Surface durability
SSA3-20	m3	20	60	66	30	155	9.95
SSA3-24		24	72	78		202	14.9
SSA3-25		25	75	81		214	16.3
SSA3-28		28	84	90		250	20.7
SSA3-30		30	90	96		274	24.0
SSA3-32		32	96	102		298	27.4
SSA3-35		35	105	111		335	33.1
SSA3-36		36	108	114		348	35.2
SSA3-40		40	120	126		398	44.0
SSA3-45		45	135	141		461	56.6
SSA3-48		48	144	150		500	65.0
SSA3-50		50	150	156		525	70.9
SSA3-55		55	165	171		590	86.9
SSA3-56		56	168	174		602	90.3
SSA3-60		60	180	186		654	105
SSA3-70		70	210	216		654	121
SSA3-80	80	240	246	763	162		

* For the backlash of each product, please refer to the dimension table of the original product.

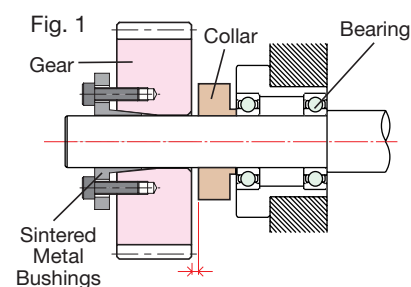


Fig. 1 Clearance (Assembly conditions require clearance of 1 mm or more)

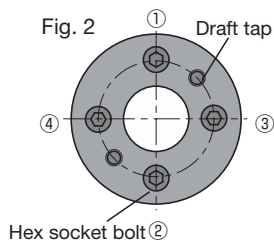
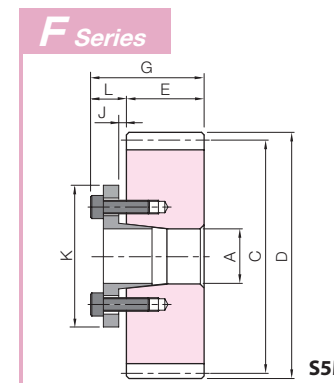


Fig. 2 Hex socket bolt ②

Removal Method and Precautions

- ① Turn off the power source (supply), 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 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.**

Bore A Catalog Number	* The product shapes of F Series items are identified by background color.													
	15	16	17	18	19	20	22	25	28	30	32	35	40	
SSA3-20 F Bore	S5M	S5M	S5M	S5M										
SSA3-24 F Bore	S5M	S5M	S5M	S5M	S5M									
SSA3-25 F Bore	S5M	S5M	S5M	S5M	S5M	S5M	S5M							
SSA3-28 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	
SSA3-30 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	
SSA3-32 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	
SSA3-35 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M
SSA3-36 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M
SSA3-40 F Bore								S5M	S5M	S5M	S5M	S5M	S5M	S5M
SSA3-45 F Bore								S5M	S5M	S5M	S5M	S5M	S5M	S5M
SSA3-48 F Bore								S5M	S5M	S5M	S5M	S5M	S5M	S5M
SSA3-50 F Bore								S5M	S5M	S5M	S5M	S5M	S5M	S5M
SSA3-55 F Bore								S5M	S5M	S5M	S5M	S5M	S5M	S5M
SSA3-56 F Bore								S5M	S5M	S5M	S5M	S5M	S5M	S5M
SSA3-60 F Bore								S5M	S5M	S5M	S5M	S5M	S5M	S5M
SSA3-70 F Bore								S5M	S5M	S5M	S5M	S5M	S5M	S5M
SSA3-80 F Bore								S5M	S5M	S5M	S5M	S5M	S5M	S5M
Ref. slipping torque N·m	39	42	45	48	49	97	110	124	141	149	163	173	725	
Ref. thrust load kN	5.10	5.17	5.23	5.28	5.12	9.68	9.98	9.90	10.0	9.89	10.1	9.88	12.3	
Sintered Metal Bushings	L	12						14						19
Clearance	K	37	38	39	40	42	46	47	51	53	56	58	61	71
Total Length	J	3						3						
Hex socket bolt	G	42						44						49
Qty	Qty	4						4						6
Size	Size	M4×15						M5×18						M6×25
Tightening torque N·m	Tightening torque N·m	3.9						7.8						13.7
Bushing weight (g)	Bushing weight (g)	40	41	43	45	49	71	71	81	84	93	97	106	237