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COUPLINGS

**Beijing CHIFLY Technology
Development Co., LTD.**

**BEIJING CHIFLY TECHNOLOGY
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Precision delivery Excellence in action

Dedicated to be a international,professional supplier of power transmission components for medium-to-high clients

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Quality comes first and always satisfy the customers

CHIFLY

Beijing CHIFLY Technology

Development Co., Ltd.

1993

Started in 1993

380

Approximately 380
employees

500

Owns over 500 high precision
CNC machines

Enterprise profile

- Founded in 1993, focusing on the production and processing of ultra-high precision accessories and products, has been awarded the title of National High-tech Enterprise, "Professional Precision Special Emerging Enterprises", and Enterprise Technology Centre for many times.
- It has about 380 employees, more than 500 sets of various high-precision equipment, customized precision transmission parts, stamping products, and blackened phosphating and anodizing surface treatment.
- Vision: Committed to becoming a professional manufacturer of high-end transmission parts; Excellent quality, customer satisfaction.



Couplings

Our entrusted manufacturer has a number of invention patents, more than thirty years of production and processing capabilities, always adhere to the goal of meeting customer needs, and constantly exceed customer expectations as the core of development.

The factory has a professional R&D and process design team, constantly adopts the global advanced lean production management experience, and provides high-quality and superior cost-effective products to the global market through strict quality control as well as supply chain supporting capabilities.

The production base has perfect R & D and testing capabilities, online testing capabilities, and self-developed elastomers and diaphragms and other high-demand product series to use imported materials to ensure the quality.



Superiority



Technical advantages

- CHIFLY Technology cooperates with excellent design teams at home and abroad, specializing in the research and development of front-end products in the market, which is fully reflected in the technical strength and high-quality product stability in the field of transmission parts.
- Provide customized solutions with beautiful appearance, stable torque, reliable power transmission, long life and other characteristics.



Quality management

- GB/T 19001-2016/ISO 9001:2015
- GB/T 24001-2016/ISO 14001:2015
- Implement Six Sigma and TQM
- Independent inspection center and complete inspection equipments
- High-precision Zeiss CMM import from Germany
- High precision contour tester
- Coupling-life comprehensive test system
- High and low temperature torque testing platform for elastomer
- Coupling dynamic balance testing equipment



Resilient coupling with spider

○ Resilient coupling with spider Summary

Jaw Couplings are characterized by small dimension, low weight yet transmit high torques can effectively improve the running quality and stability with its character of small dimensions, low weight and high transmission torques.

Jaw Couplings are torsionally flexible products with failure-protection function. This could dampen and reduce the operational vibrations and shocks efficiently. The Couplings also compensate for axial, radial and angular displacements in the installation process. Plus, the concave claws are used to prevent the elastomer parts from being stress-concentrated.

The elastomer parts of general flexible couplings are subject to bending stress and wear. Instead of this, REACH Jaw Couplings are only subject to pressure. This allows that the elastomer parts being able to accept higher loads. The maximum torsional angle of any size couplings is up to 5°. They can be fitted both horizontally and vertically.

○ Characteristics

- Small and compact structure, low weight and large transmission torque altogether greatly improve mechanical movement in terms of quality and stability and absorb shock from uneven operation of power machine.
- Protect machine functioning, dampen and reduce vibrations and shock appearing in movement and correct deviation and axial, radial and angular mounting.
- Claw coupling 14 and beyond can be mounted horizontally or vertically with torsion angle reaches to 5° at maximum.

○ Merits

- Realize massive production to support industrial leaders home and abroad after years of R&D.
- Introduce German qualified TPU to produce metal parts and manufacture elastomer in large volume on our own.
- Explosion prevention certified.
- Satisfy transmission requirement when the torque exceeds 50% of the maximum level instantaneously.
- Pass life test at high & low temperature and ensure service life even the load reaches to the maximum level.
- Improved test bench applied.

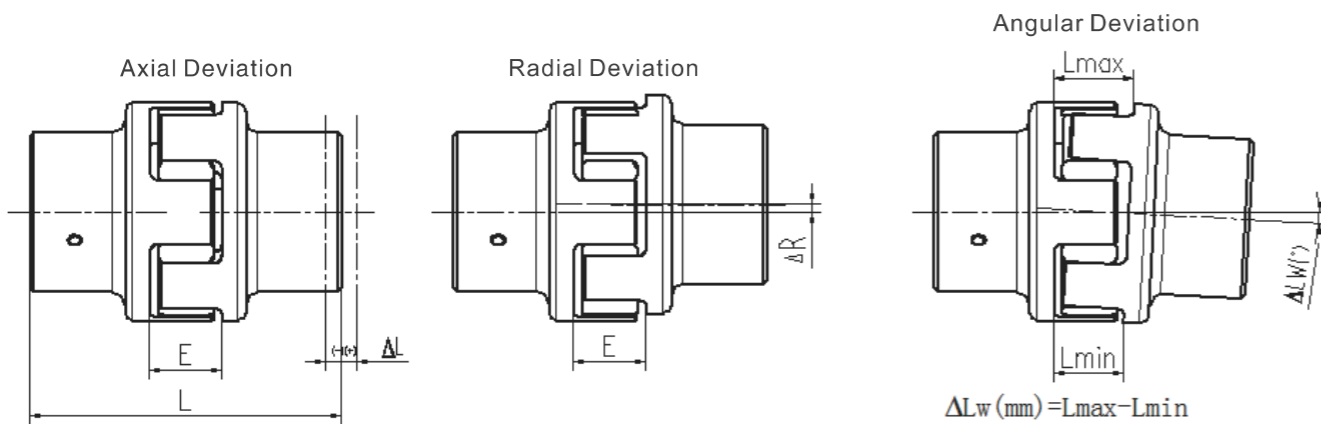
Type	Material	Heat Treating	Surface Treatment	Elastomer Hardness
Backlash:GR	Steel Part:S	Tempering:T	Blackening:B	92SHA
No Backlash:GS	Casting:C	Annealing:H	Phosphate Coating:P	98SHA
	Aluminum Part:A	Normalizing:Z	Polishing:G	64SHD
	Stainless Steel:X	Passivation:D	Spray Paint:Q	
			Anodic Oxidation:Y	

○ Structure Coding

Classic Type: A,B,C
 Coupling, Single-notching: DK
 Coupling, Double-notching: KC

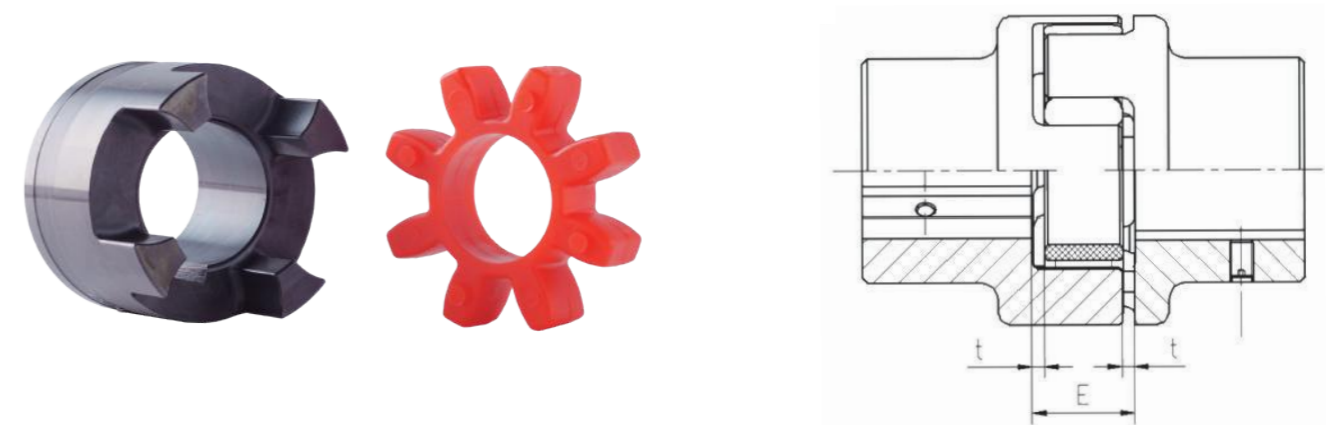
Flange Coupling: FA,FB,FC,FD,FE,FF
 Locking Coupling: ZT
 Braking Coupling: ZD
 2-Section Coupling: SJ

○ Function-Rectification & Parameters



Rectification by 92SHA/98SHA Elastomer																	
Type GR	14	19	24	28	38	42	48	55	65	75	90	100	110	125	140	160	180
Max.Axial Deviation ΔL(mm)	-0.5 +0.1	-0.5 +1.2	-0.5 +1.4	-0.7 +1.5	-0.7 +1.8	-1.0 +2.0	-1.0 +2.1	-1.0 +2.2	-1.0 +2.6	-1.5 +3.0	-1.5 +3.4	-1.5 +3.8	-2.0 +4.2	-2.0 +4.6	-2.0 +5.0	-2.5 +5.7	-3.0 +6.4
Max.Radial Deviation ΔR(mm)	0.17	0.2	0.22	0.25	0.28	0.32	0.36	0.38	0.42	0.48	0.5	0.52	0.55	0.6	0.62	0.64	0.68
Max.Angular Deviation ΔLW(°)	1.2	1.2	0.9	0.9	1	1	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.2	1.2	1.2
Minor Deviation ΔLW(mm)	0.67	0.82	0.85	1.05	1.35	1.7	2	2.3	2.7	3.3	4.3	4.8	5.6	6.5	6.6	7.6	9

Rectification by 64SHD Elastomer																	
Type GR	14	19	24	28	38	42	48	55	65	75	90	100	110	125	140	160	180
Max.Axial Deviation ΔL(mm)	-0.5 +0.1	-0.5 +1.2	-0.5 +1.4	-0.5 +1.4	-0.7 +1.8	-1.0 +2.0	-1.0 +2.1	-1.0 +2.2	-1.0 +2.6	b +3.0	-1.5 +3.4	-1.5 +3.8	-2.0 +4.2	-2.0 +4.6	-2.0 +5.0	-2.5 +5.7	-3.0 +6.4
Max.Radial Deviation ΔR(mm)	0.11	0.13	0.15	0.18	0.21	0.23	0.25	0.27	0.3	0.34	0.36	0.37	0.4	0.43	0.45	0.46	0.49
Max.Angular Deviation ΔLW(°)	1.1	1.1	0.8	0.8	0.9	0.9	1	1	1.1	1.1	1.1	1.1	1.2	1.2	1.1	1.1	1.1
Minor Deviation ΔLW(mm)	0.57	0.76	0.76	0.9	1.25	1.4	1.8	2	2.5	3	3.8	4.3	5.3	6	6.1	7.1	8



○ Mounting Dimensions

Type	14	19	24	28	38	42	48	55	65	75	90	100	110	125	140	160	180
E	13	16	18	20	24	26	28	30	35	40	45	50	55	60	65	75	85
t	1.5	2	2	2.5	3	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	9	10.5

○ Coupling-Selection

Calculation of Rated Torque:

$$TN(Nm) = 9550 \times P(KW) / n(rpm)$$

Examine & Verify load from impulsive torque

$$TK_{max} \geq 2.0 \times TN \times MA \times SA \times SZ \times St$$

MA: Rotational inertia coefficient at the drive end

Temperature Coefficient St										
-50°C	-30°C+30°C	+40°C	+50°C	+60°C	+70°C	+80°C	+90°C	+100°C	+110°C	+120°C
1.0	1.0	1.1	1.2	1.3	1.5	1.6	1.8	2.1	2.5	3.0

Start Frequency Coefficient Sz				
Frequency times/hour	100.0	200.0	400.0	800.0
Sz	1.0	1.2	1.4	1.6

Impulsive Load Coefficient SA/SL	
	SA/SL
Slight	1.5
General	1.8
Heavy	2.5

Please give careful consideration to parameters as mentioned above.
 For coupling selected, the maximum torque Tmax must exceed TKmax.

FGE-GR Coupling

○ Elastomer Parameters

Elastomer Model	Maximum speed		Torque(Nm)									Torsional Angle			
	V=35m/s Cast Iron	V=40m/s Steel	92SHA			98SHA			64SHD			92/98SHA		64SHD	
FGE-□□			Rated	Max.	Alternating	Rated	Max.	Alternating	Rated	Max.	Alternating	TKN	Tkmax	TKN	Tkmax
14	22200	25400	7.5	15	2	12.5	25	3.3	16	32	4.2	6.4°	10°	4.5°	7°
19	16700	19000	10	20	2.6	17	34	4.4	21	42	5.5	3.2°	5°	2.5°	3.6°
24	12100	13800	35	70	9.1	60	120	16	75	150	19.5				
28	10100	11500	95	190	25	160	320	42	200	400	52				
38	8300	9500	190	380	49	325	650	85	405	810	105				
42	7000	8000	265	530	69	450	900	117	560	1120	146				
48	6350	7250	310	620	81	525	1050	137	655	1310	170				
55	5550	6350	410	820	107	685	1370	178	825	1650	215				
65	4950	5650	625	1250	163	940	1880	244	1175	2350	306				
75	4150	4750	1280	2560	333	1920	3840	499	2400	4800	624				
90	3300	3800	2400	4800	624	3600	7200	936	4500	9000	1170				
100	2950	3350	3300	6600	858	4950	9900	1287	6185	12370	1608				
110	2600	2950	4800	9600	1248	7200	14400	1872	9000	18000	2340				
125	2300	2600	6650	13300	1729	10000	20000	2600	12500	25000	3250				
140	2050	2350	8550	17100	2223	12800	25600	3328	16000	32000	4160				
160	1800	2050	12800	25600	3328	19200	38400	4992	24000	48000	6240				
180	1550	1800	18650	37300	4849	28000	56000	7280	35000	70000	9100				



Standard Elastomer

- Hardness: 92SHA
- Color: Yellow
- Working Temperature: -40~+80°C
- Instant Heat: 120°C

Standard Elastomer

- Hardness: 98SHA
- Color: Red
- Working Temperature: -40~+90°C
- Instant Heat: 120°C

Standard Elastomer

- Hardness: 64SHD
- Color: Green
- Working Temperature: -40~+110°C
- Instant Heat: 130°C

For peripheral speed above V=30m/s, dynamic balance is necessary. For peripheral speed above V=35m/s, we recommend steel or nodular cast iron shaft sleeve.

FGE-GR Standard series



○ Characteristics

- Widely used under mechanical and hydraulic pressure circumstances.
- No need to maintain by using steel in conjunction with polyurethane.
- Compensate relevant deviation, buffer and absorb vibration.
- Better insulate electricity.
- Easy mounting by inserting at axial direction.
- Aperture tolerance:ISO H7; Keyslot tolerance:DIN6885/1 Js9.
- Taper and inch bores are designed for option.

Aluminum	Part	Fundamental Parameters /Unit:mm												
		Bore		Dimension								Fixing Screw		
		d(min-max)	L	L1.L2	E	b	t	D	D1.D2	N	d3	M	S	T(Nm)
14	B	6-16	35	11	13	10	1.5	30	30	—	10	M4	5	1.5
19	A	6-19	66	25	16	12	2	41	32	20	18	M5	10	2
	B	19-24							41	—				
24	A	9-24	78	30	18	14	2	56	40	24	27	M5	10	2
	B	22-28							56	—				
28	A	10-28	90	35	20	15	2.5	66	48	28	30	M8	15	10
	B	28-38							66					
38	A	12-48	114	45	24	18	3	80	66	37	38	M8	15	10
	B	38-45							79					
42	A	14-42	126	50	26	20	3	95	75	40	46	M8	20	10
	B	42-55							94					
48	A	15-48	140	56	28	21	3.5	105	85	45	51	M8	20	10
	B	48-60							104					
55	A	20-55	160	65	30	22	4	120	98	52	60	M10	20	17
	B	55-70							118					

CastIron	Part	Fundamental Parameters /Unit:mm													
		Bore		Dimension								Fixing Screw			
		d(min-max)	L	L1.L2	E	b	t	D	D1.D2	N	d3	M	S	T(Nm)	
38	A	12-40	114	45	24	18	3	80	66	37	38	M8	15	10	
	B	38-48							79						62
	C	12-48							164						70
42	A	14-45	126	50	26	20	3	95	75	40	46	M8	20	10	
	B	42-55							94						65
	C	14-55							176						75
48	A	15-52	140	56	28	21	3.5	105	85	45	51	M8	20	10	
	B	48-62							104						69
	C	15-62							188						80
55	A	20-60	160	65	30	22	4	120	98	52	60	M10	20	17	
	B	55-74							118						—
65	A	20-70	185	75	35	26	4.5	135	115	61	68	M10	20	17	
75	A	30-80	210	85	40	30	5	160	135	69	80	M10	25	17	
90	A	40-97	245	100	45	34	5.5	200	160	81	100	M12	30	40	
100	A	50-115	270	110	50	38	6	225	180	89	113	M12	30	40	
110	A	60-125	295	120	55	42	6.5	255	200	96	127	M16	35	80	
125	A	60-145	340	140	60	46	7	290	230	112	147	M16	40	80	
140	A	60-160	375	155	65	50	7.5	320	255	124	165	M20	45	140	
160	A	80-185	425	175	75	57	9	370	290	140	192	M20	50	140	
180	A	85-200	475	195	85	64	10.5	425	325	156	220	M20	50	140	

Note:If orders no material requirements,REACH will use HT250 for model 38 to 90,QT400 for model 100 to 180.

Steel	Part	Fundamental Parameters / Unit:mm												
		Bore	Dimension								Fixing Screw			
Model FGE-□□		d(min-max)	L	L1.L2	E	b	t	D	D1.D2	N	d3	M	S	T(Nm)
14	B	0-16	35	11	13	10	1.5	30	30	—	10	M4	5	1.5
	C		50	18.5										
19	B	0-25	66	25	16	12	2	40	40	—	18	M5	10	2
	C		90	37										
24	B	0-35	78	30	18	14	2	55	55	—	27	M5	10	2
	C		118	50										
28	B	0-40	90	35	20	15	2.5	65	65	—	30	M8	15	10
	C		140	60										
38	A	0-48	114	45	24	18	3	80	70	27	38	M8	15	10
	C		164	70					80	—				
42	A	0-55	126	50	26	20	3	95	85	28	46	M8	20	10
	C		176	75					95	—				
48	A	0-62	140	56	28	21	3.5	105	95	32	51	M8	20	10
	C		188	80					105	—				
55	A	0-74	160	65	30	22	4	120	110	37	60	M10	20	17
	C		210	90					120	—				
65	A	0-80	185	75	35	26	4.5	135	115	47	68	M10	20	17
	C		235	100					135	—				
75	A	0-95	210	85	40	30	5	160	135	53	80	M10	25	17
	C		260	110					160	—				
90	A	0-110	245	100	45	34	5.5	200	160	62	100	M20	30	40
	C		295	125					200	—				

Note: Bore diameter dH7 (Keyway DIN6885/1(GB/T1095-79))S9 and Tighten screw GB77-85); for specifications 15 and beyond, we will supply tighten screw at customer's request.

○ Example

FGE28	C	AA	T	P	Φ24	Φ25	98
Specification	Casting	Structure	Tempering by heat treatment	Phosphate Coating	Aperture	Aperture	Elastome hardness



○ Characteristics

- Compensate very large deviation in mounting.
- Structured in 2 sections of 3 parts.
- Reduce noise by dampening vibration.
- Better insulate electricity.
- Restoring force from deviation is very small.
- Extend service life of adjacent parts (bearing and sealing parts, etc).
- Aperture tolerance: ISO H7; Key slot tolerance: N6885/1 Js9.
- Taper and inch bores are designed for option.

Specification FGE-□□-SJ	Technical Parameters					Appearance & Dimension								
	Rated Torque of Elastomer(Nm)		Max. permitted deviation when n=1500 rad/min			L	L1;L2	L12	b	t	D	D1	D2	d1 d2
	92 SHA	98 SHA	Radial	Angular	Axial (mm)									
19	10	17	0.45	1°	+1.2/-1.0	92	25	42	12	2	40	See the standard type		
24	35	60	0.59	1°	+1.4/-1.0	112	30	52	14	2	55			
28	95	160	0.66	1°	+1.5/-1.4	128	35	58	15	2.5	65			
38	190	325	0.77	1°	+1.8/-1.4	158	45	68	18	3	80			
42	265	450	0.84	1°	+2.0/-2.0	174	50	74	20	3	95			
48	310	525	0.91	1°	+2.1/-2.0	192	56	80	21	3.5	105			
55	410	685	1.01	1°	+2.2/-2.0	218	65	88	22	4	120			
65	625	940	1.17	1°	+2.6/-2.0	252	75	102	26	4.5	135			
75	1280	1920	1.33	1°	+3.0/-3.0	286	85	116	30	5	160			
90	2400	3600	1.48	1°	+3.4/-3.0	330	100	130	34	5.5	200			

Note:for products with aperture Dh7(keyslot DIN 6885/1 (GB/T1095-79)and fixing screw(GB77-85),customers can order any combination of them:A+A,A+B or B+B

○ Example

FGE28	S	SJ	T	B	Φ24	Φ25	98
Specification	Steel	Structure	Heat treatment	Surface treatment	Aperture	Aperture	Elastomer hardness

FGE-GR Flange series



○ Characteristics

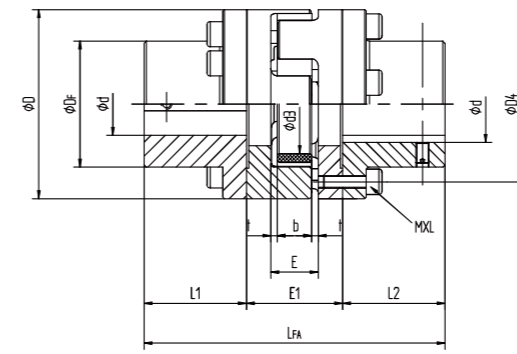
- Structure FLA and FLB are applied to heavy machinery industry.
- Easily dismantle:just remove flange for radial mounting and replace the spider without moving equipment at driving and driven ends.
- Materials:4N Steel,3Na Steel and GGG-40 cast iron.
- Easy assembly by inserting axially.
- Aperture tolerance:ISO H7;Keyslot tolerance:DIN6885/1 Js9.
- Taper or imperial bores are for option.

Model FGE -□□-FL	4N Semi- finished finished Bore	Fundamental Dimension											Connecting Screw			
		D	DF	D4	d3	L1;L2	E	E1	t	b	L3;L4	LFA	LFB	MxL	Qty.	TANm
24	0-24	55	36	45	27	30	18	33	2	14	30.5	94	86	M5X16	8	10
28	0-28	65	42	54	30	35	20	39	2.5	15	35.5	110	100	M6X20	8	17
38	0-38	80	52	66	38	45	24	43	3	18	45.5	134	124	M8X22	8	41
42	0-42	95	62	80	46	50	26	48	3	20	51	150	138	M8X25	12	41
48	0-48	105	70	90	51	56	28	50	3.5	21	57	164	152	M8X25	12	41
55	0-55	120	80	102	60	65	30	60	4	22	66	192	176	M10X30	8	83
65	0-65	135	94	116	68	75	35	65	4.5	26	76	217	201	M10X30	12	83
75	0-75	160	108	136	80	85	40	75	5	30	86.5	248	229	M12X40	15	120
90	0-100	200	142	172	100	100	45	82	5.5	34	101.5	285	265	M16X40	15	295
100	0-110	225	158	195	113	110	50	97	6	38	111.5	320	295	M16X50	15	295
110	0-125	255	178	218	127	120	55	103	6.5	42	122	347	321	M20X50	15	580
125	0-145	290	206	252	147	140	60	116	7	46	142	400	370	M20X60	15	580
140	0-165	320	235	282	165	155	65	128	7.5	50	157.5	443	409	M20X60	15	580
160	0-190	370	270	325	190	175	75	146	9	57	177.5	501	463	M24X70	15	1000
180	0-220	420	315	375	220	195	85	159	10.5	64	198	555	515	M24X80	18	1000

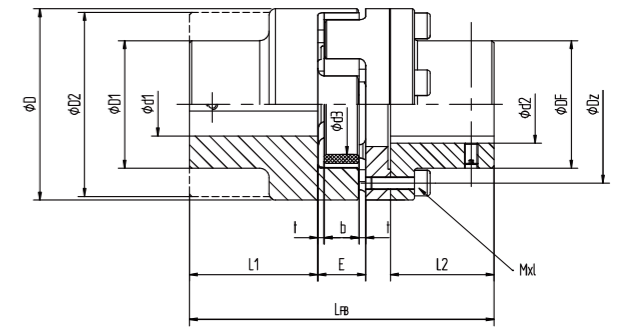
Model FGE -□□-FL	4N Semi- finished finished Bore	Fundamental Dimension														FD/FE				
		D	d3	L1	E	t	b	L5	L7	DA	D3	D4	LFC	LFF	DN3	DN4	M	Qty	LFE	LFD
24	0-35	55	27	30	18	2	14	1.5	8	80	55	65	56	34	36	45	M5	8	56	34
28	0-40	65	30	35	20	2.5	15	1.5	10	100	65	80	65	40	44	54	M6	8	65	40
38	0-48	80	38	45	24	3	18	1.5	10	115	80	95	79	44	54	66	M8	8	79	44
42	0-55	95	46	50	26	3	20	2	12	140	95	115	88	50	65	80	M8	12	88	50
48	0-62	105	51	56	28	3.5	21	2	12	150	105	125	96	52	75	90	M8	12	96	52
55	0-74	120	60	65	30	4	22	2	16	175	120	145	111	62	84	102	M10	8	111	62
65	0-80	135	68	75	35	4.5	26	2	16	190	135	160	126	67	96	116	M10	12	126	67
75	0-95	160	80	85	40	5	30	2.5	19	215	160	185	144	78	112	136	M12	15	144	78
90	0-110	200	100	100	45	5.5	34	3	20	260	200	225	165	85	145	172	M16	15	165	85
100	0-115	225	113	110	50	6	38	4	25	285	225	250	185	100	165	195	M16	15	185	100
110	0-125	255	127	120	55	6.5	42	4	26	330	255	290	201	107	180	218	M20	15	201	107
125	0-145	290	147	140	60	7	46	5	30	370	290	325	230	120	215	252	M20	15	230	120
140	0-160	320	165	155	65	7.5	50	5	34	410	320	360	254	133	245	282	M20	15	254	133

Example

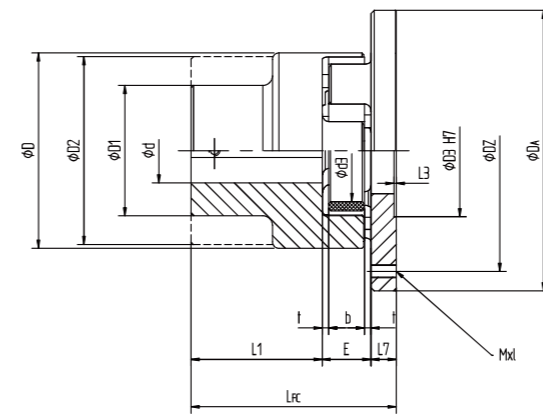
FGE28	C	FA	T	B	Φ24	Φ25	98
Specification	Casting	Structure	Tempering	Blackening	Aperture	Aperture	Elastome hardness



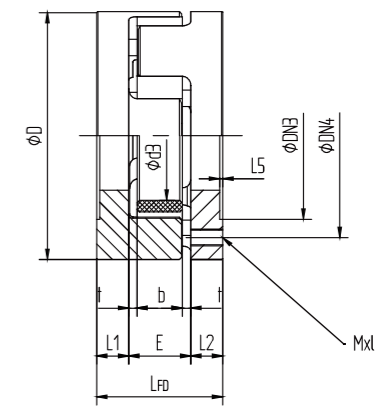
FA type/ FA



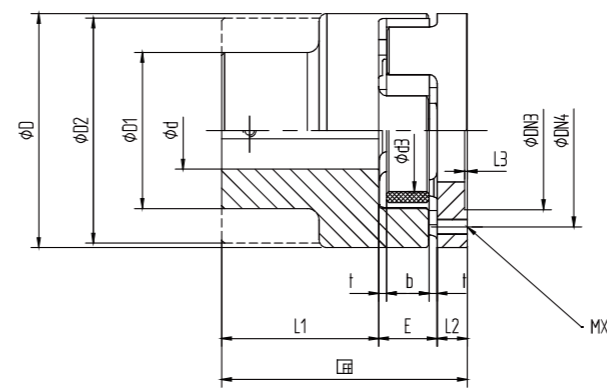
FB type/ FB



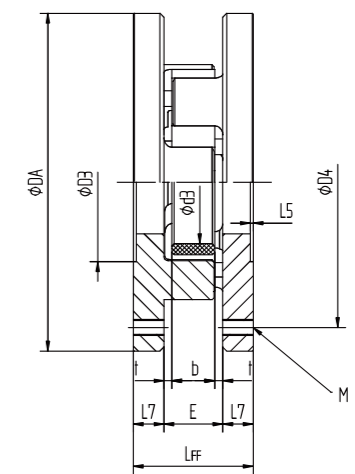
FC type/ FC



FD type/ FD



FE type/ FE



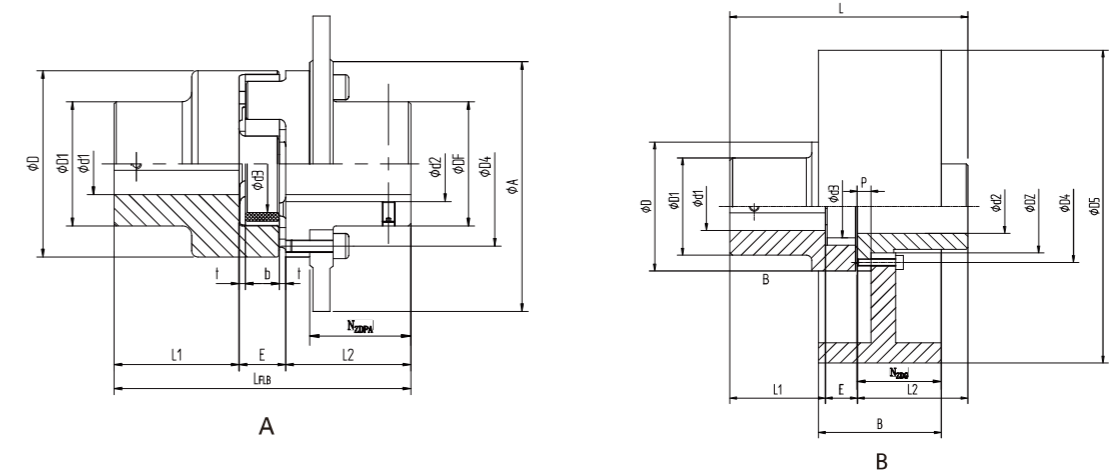
FF type/ FF

FGE-GR Braking series



○ Characteristics

- Coupling with brake drum is designed to application where braking is realized by holding two external brake drums for friction.
- Coupling with brake disc is designed to caliper brake.
- Brake drum or disc should be mounted at the shaft end with largest moment of inertia.
- Max braking torque should not exceed max torque of the coupling.
- The maximum brake torque shall not exceed the maximum one of coupling.
- Aperture tolerance: ISO H7; keyslot width: DIN 6885/1, and tolerance JS9.



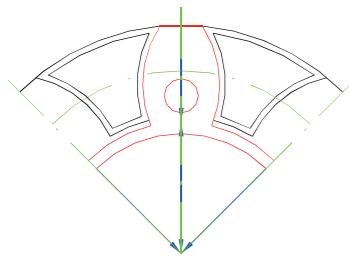
Model FGE-□□-ZD	Elastomer Rated Torque(Nm)			Finished Bore B		Dimension											
	ZDG/ZDPA	92 SHA	98 SHA	64SHD	Casting	Steel	D	DZ	D4	d3	L	L1,L2	E	P	Nzdg	Nzdp	Qty.
38	190	325	405			34	80	50	66	38	114	45	24	7.5	37.5	37.5	8
42	265	450	560			42	95	60	80	46	126	50	26	9.5	40.5	40.5	12
48	310	525	655			48	105	68	90	51	140	56	28	10.5	45.5	45.5	12
55	410	685	825			55	120	78	102	60	160	65	30	12.5	52.5	52.5	8
65	625	940	1175			65	135	92	116	68	185	75	35	13.5	61.5	61.5	12
75	1280	1920	2400			75	160	106	136	80	210	85	40	15.5	69.5	69.5	15
90	2400	3600	4500			100	200	140	172	100	245	100	45	18.5	89.5	89.5	15
100	3300	4950	6185	100			225	156	195	113	270	110	50	20.5	98.5	98.5	15
110	4800	7200	9000	110			255	176	218	127	295	120	55	23.5	96.5	96.5	15
125	6650	10000	12500	130			290	204	252	147	340	140	60	27.5	112.5	112.5	15

○ Example

FGE42	C	ZD	T	B	φ24	φ25	98
Specification	Casting	Structure	Tempering	Blackening	Aperture	Aperture	Elastome hardness

FGE-GS Coupling (Straight teeth, no backlash)

Deformation of elastomer caused by centrifugal force can be avoided by the concave at high speed



Rotation axial support

Straight-teeth type elastomer is installed with prestress, so the surface of the elastomer is applied by prestress, which can achieve better rigidity of the driving system. Elastic teeth can offset installation deviation, with the radial support of the built-in plates, the inside deformation will not be too much at high speed or accelerated rotation. The above characteristics can guarantee long time and smooth performance of the coupling.

Both the claw teeth of the shaft sleeve and the elastomer have bevels, "blind installation" can be achieved during assembling. The small convex parts on the teeth of the elastomer is to reduce contact area between the elastomer teeth and the shaft sleeve. During assembling, if the dimension E between the sleeves can be guaranteed, then the correction ability of the coupling can be achieved.

FGE-GS has 4 different rigidities of elastomers differentiated by the colours, the materials range from soft to hard, based on different occasions, it is easy to choose the materials to meet the requirements of torsional rigidity, vibration control etc.. The prestress is determined by the type of the coupling and the elastomer; the materials and the inserting force during assembling are determined by the hardness of the elastomer and the prestress.

Hardness of elastomer	Colour	Material	Allowable working temperature °C		Available size	Typical applications
			Continuous	Instant		
80 Sh-A		PU	-50~+80	-60~+120	9~24	• Driving for electronic measurement system
92 Sh-A		PU	-40~+90	-50~+120	9~55	• Driving for electronic measurement and control system • Spindle driving
98 ShA		PU	-30~+110	-40~+130	9~90	• Positioning driving • Spindle driving • High load
64 Sh-D		PU	-20~+110	-30~+130	14~90	• Machine spindle driving • Higher load • Higher torsional rigidity

Typical applications

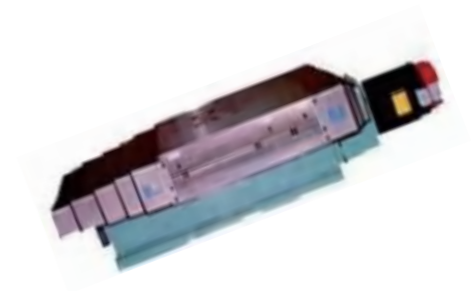


Measurement and control system

The GS series couplings have high torsional rigidity, and can offer precise measurement and control service. Because the elastomer of the GS coupling is installed under prestress condition, in the application situation of low torsion, the driving of torsional rigidity without backlash is totally based on the realization of prestress of the elastomer. GS series coupling can guarantee completely no back rotation gap, high accuracy repeating positioning. To minimize the radial force caused by deviation correction, it is advised to use low hardness elastomer in such application situation, such as 80SHA-GS. Main structure types include: Standard type, KC type, DK type.

Servo and positioning driving

Compared to other torsional rigidity couplings, FGE-GS series couplings have the advantages of no teeth gap of back and forth rotation and vibration control. When there is too much vibration in the driving system, too high torsional rigidity becomes a serious disadvantage, which can make the driving accuracy drop drastically. So RGE-GS coupling is the best choice, even in the high dynamic servo driving system, the advantages of no teeth gap, vibration control and sufficient rigidity etc., it can guarantee the system's driving accuracy. Main Structure types: KC type, DK type.



Spindle Driving

For machine spindle driving, the torque transmitted is relatively bigger, by the hardness of the elastomer, tiny rotation and vibration damping under prestress can be realized, and peak torque and impact load can be diminished, or resonance region can be transferred to non-operational rotating speed area.

When linear speed is no less than 40m/s (Coupling outside diameter), ZT coupling is advised to be used.

Type	Elastome Hardness	Shore hardness	Maximum speed (rpm) bushing form				Torque (Nm)		Static torsional rigidity (Nm/rad)	Dynamic torsional rigidity (Nm/rad)	Radial rigidity Cr (Nm/rad)	Weight (kg)		Rotary inertia J (kgm)	
			Clamping structure KC/DK	Standard structure	Aluminum Locking Devices	Steel Locking devices	T _{KV}	T _{Kmax}				Single sleeve	Elastomer	Single sleeve	Elastomer
5	80	A	38000	47700			0.3	0.6	3.15	10	82	0.001	0.2×10 ⁻³	0.015×10 ⁻⁶	0.002×10 ⁻⁶
	92	A					0.5	1	5.16	16	154				
	98	A					0.9	1.7	8.3	25	296				
7	80	A	27000	34100			0.7	1.4	8.6	26	114	0.003	0.5×10 ⁻³	0.085×10 ⁻⁶	0.01×10 ⁻⁶
	92	A					1.2	2.4	14.3	43	219				
	98	A					2	4	22.9	69	421				
	64	D					2.4	4.8	34.3	103	630				
9	80	A	19000	23800			1.8	3.6	17.2	52	125	0.01	1.7×10 ⁻³	0.48×10 ⁻⁶	0.085×10 ⁻⁶
	92	A					3	6	31.5	95	262				
	98	A					5	10	51.6	155	518				
	64	D					6	12	74.6	224	739				
12	80	A	15200	19100			3	6	84.3	252	274	0.02	2.3×10 ⁻³	1.5×10 ⁻⁶	0.139×10 ⁻⁶
	92	A					5	10	160.4	482	470				
	98	A					9	18	240.7	718	846				
	64	D					12	24	327.9	982	1198				
14	80	A	12700	15900	32000	47700	4	8	60.2	180	153	0.02	4.7×10 ⁻³	2.8×10 ⁻⁶	0.509×10 ⁻⁶
	92	A					7.5	15	114.6	344	336				
	98	A					12.5	25	171.9	513	654				
	64	D					16	32	234.2	702	856				
19	80	A	9550	11900	24000	35800	4.9	9.8	618	1065	582	0.09	7×10 ⁻³	19.5×10 ⁻⁶	1.35×10 ⁻⁶
	92	A					10	20	1090	1815	1120				
	98	A					17	34	1512	2540	2010				
	64	D					21	42	2560	3810	2930				
24	92	A	6950	8650	17000	26000	35	70	2280	4010	1480	0.2	0.02	81.9×10 ⁻⁶	6.7×10 ⁻⁶
	98	A					60	120	3640	5980	2560				
	64	D					75	150	5030	10896	3696				
28	92	A	5850	7350	15000	22000	95	190	4080	6745	1780	0.3	0.03	184.2×10 ⁻⁶	14.85×10 ⁻⁶
	98	A					160	320	6410	9920	3200				
	64	D					200	400	10260	20177	4348				
38	92	A	4750	5950	12000	17900	190	380	6525	11050	2350	0.6	0.05	542.7×10 ⁻⁶	39.4×10 ⁻⁶
	98	A					325	650	11800	17160	4400				
	64	D					405	810	26300	40335	6474				
42	92	A	4000	5000	10000	15000	265	530	10870	15680	2430	2.4	0.08	2802×10 ⁻⁶	85×10 ⁻⁶
	98	A					450	900	21594	37692	5570				
	64	D					560	1120	36860	69825	7270				
48	92	A	3600	4550	9100	13600	310	620	12968	18400	2580	3.3	0.09	4709×10 ⁻⁶	135×10 ⁻⁶
	98	A					525	1050	25759	45620	5930				
	64	D					655	1310	57630	99750	8274				
55	92	A	3150	3950		11900	410	820	15482	21375	2980	5.1	0.12	9460×10 ⁻⁶	229×10 ⁻⁶
	98	A					685	1370	42117	61550	6686				
	64	D					825	1650	05730	130200	9248				
65	98	A	2800	3500		11000	940	1880	48520	71660	6418	6.7	0.2	15143×10 ⁻⁶	437×10 ⁻⁶
	64	D					1175	2350	118510	189189	8870				
75	98	A	2350	2950		8950	1920	3840	79150	150450	8650	10.5	0.3	32750×10 ⁻⁶	1179×10 ⁻⁶
	64	D					2400	4800	182320	316377	11923				
90	98	A	1900	2380			3600	7200	204500	302900	10700	18.2	0.6	87099×10 ⁻⁶	3362×10 ⁻⁶
	64	D					4500	9000	429450	908700	14700				

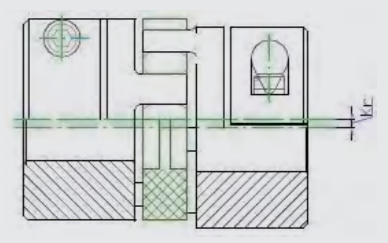
○ Rectifying ability

The design structure of FGE-GS coupling ensures it capable of compensating axial, radial and angular deviation, meanwhile, will not cause wearing and expedited failure of the elastomer. Because only positive pressure is applied on the elastomer, after long time rotation, no teeth gap rotation can still be kept after long time running.



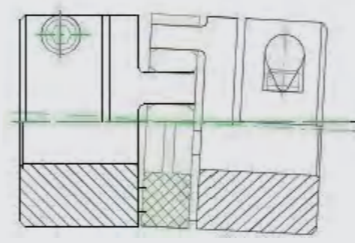
Axial deviation

Due to different tolerance of connecting pieces during assembling, or axial length change caused by temperature change, axial deviation is caused. Normally, Bearing can not be applied with too much axial force, hence axial coupling needs to compensate axial deviation to reduce axial force.



Radial deviation

Due to different deviation arise out of centering and power sources are mounted on different surfaces, radial deviation is caused. The deviation will cause very big stress on the connecting pieces.



Angular deviation

When angular deviation arises, the center line of the shaft will cross the coupling in the middle. within a certain level, the deviation can be compensated by the coupling, meanwhile the danger of accumulated stress will not arise.

Type	Elastomer hardness	Standard deviation		
		(mm) Axial ΔKa	(mm) Radial ΔKr	(°) Angular α
5	80Sh-A	+0.4 -0.2	0.12	1.1°
	92Sh-A		0.06	1.0°
	98Sh-A		0.04	0.9°
7	80Sh-A	+0.6 -0.3	0.15	1.1°
	92Sh-A		0.1	1.0°
	98Sh-A		0.06	0.9°
	64Sh-D		0.04	0.8°
9	80Sh-A	+0.8 -0.4	0.19	1.1°
	92Sh-A		0.13	1.0°
	98Sh-A		0.08	0.9°
	64Sh-D		0.05	0.8°
12	80Sh-A	+0.9 -0.4	0.2	1.1°
	92Sh-A		0.14	1.0°
	98Sh-A		0.08	0.9°
	64Sh-D		0.05	0.8°
14	80Sh-A	+1.0 -0.5	0.21	1.1°
	92Sh-A		0.15	1.0°
	98Sh-A		0.09	0.9°
	64Sh-D		0.06	0.8°
19	80Sh-A	+1.2 -0.5	0.15	1.1°
	92Sh-A		0.1	1.0°
	98Sh-A		0.06	0.9°
	64Sh-D		0.04	0.8°

Type	Elastomer hardness	Standard deviation		
		(mm) Axial ΔKa	(mm) Radial ΔKr	(°) Angular α
24	92Sh-A	+1.4 -0.5	0.14	1.0°
	98Sh-A		0.1	0.9°
	64Sh-D		0.07	0.8°
28	92Sh-A	+1.5 -0.7	0.15	1.0°
	98Sh-A		0.11	0.9°
	64Sh-D		0.08	0.8°
38	92Sh-A	+1.8 -0.7	0.17	1.0°
	98Sh-A		0.12	0.9°
	64Sh-D		0.09	0.8°
42	92Sh-A	+2.0 -1.0	0.19	1.0°
	98Sh-A		0.14	0.9°
	64Sh-D		0.1	0.8°
48	92Sh-A	+2.1 -1.0	0.23	1.0°
	98Sh-A		0.16	0.9°
	64Sh-D		0.11	0.8°
55	92Sh-A	+2.2 -1.0	0.24	1.0°
	98Sh-A		0.17	0.9°
	64Sh-D		0.12	0.8°
65	98Sh-A	+2.6 -1.0	0.18	0.9°
	64Sh-D		0.13	0.8°
75	98Sh-A	+3.0 -1.5	0.21	0.9°
	64Sh-D		0.15	0.8°
90	98Sh-A	+3.4 -1.5	0.23	0.9°
	64Sh-D		0.17	0.8°

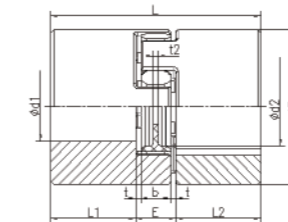
Deviations shown in above table are standard values of FGE-GS couplings, corresponding working situations are: transmitted torque nominal value TKN; rotation speed n=1500r/min; ambient temperature is 30°C.

The above deviation compensation value is only for each single deviation, if there are deviations in three directions at the same time, each single value needs to decrease proportionally. The better the centering of the connecting shaft during assembling, the longer the usage of the coupling.

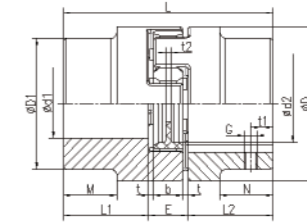
FGE-GS Standard series

Characteristics

- Backlash-free connection, small torque for measuring equipment.
- Small size and small rotation inertia.
- Free maintenance and easy for visual check.
- Elastomer with different hardness for option.
- Finished bore tolerance respects ISO H7, excluding clamping shaft sleeve, DIN6885/1 for bore diameter above $\phi 6$, JS9 for keyway.



B type shaft sleeve
FGE-GS9-38



A type shaft sleeve
FGE-GS42-90

FGE-GS standard type, Size 5-38 in high-strength aluminum Alloy, Size 42-90 in Steel																
Model FGE-GS	Torque(Nm)			Dimensions (mm)											Positioning screw Standard type	
	92sh-A	98sh-A	64sh-D	d1(max)	D1	D	d2	L	L1;L2	M;N	E	b	t	t2	G	t1
9	3	5	6	11	—	20	7.2	30	10	—	10	8	1	1.5	M4	5
12	5	9	12	12	—	25	8.5	34	11	—	12	10	1	3.5	M4	5
14	7.5	12.5	16	16	—	30	10.5	35	11	—	13	10	1.5	2	M4	5
19	10	17	21	24	—	41	18	66	25	—	16	12	2	3	M5	10
24	35	60	75	28	—	56	27	78	30	—	18	14	2	3	M5	10
28	95	160	200	38	—	66	30	90	35	—	20	15	2.5	4	M8	15
38	190	325	405	45	—	80	38	114	45	—	24	18	3	4	M8	15
42	265	450	560	55	85	95	46	126	50	28	26	20	3	4	M8	20
48	310	525	655	62	95	105	51	140	56	32	28	21	3.5	4	M8	20
55	410	685	825	74	110	120	60	160	65	37	30	22	4	4.5	M10	20
65	—	940	1175	80	115	135	68	185	75	47	35	26	4.5	4.5	M10	20
75	—	1920	2400	95	135	160	80	210	85	53	40	30	5	5	M10	25
90	—	3600	4500	110	160	200	104	245	100	62	45	34	5.5	6.5	M12	30

Example: FGE-GS38-24B-24B-98-S-BL-J

FGE-GS38	24	A/B	24	A/B	98	S	BL	J
Product specifications	Bore diameter	Shaft sleeve type	Hole diameter	Shaft sleeve type	Elastomer hardness	Material	Black	Key

FGE-GS Slotting Type (KC)



Characteristics

- Backlash-free connection, small torque for measuring equipment, lifting platform and machining tools, etc..
- Small size and small rotation inertia.
- Clamped by screws after grooving, which can avoid the gap between shaft bores.
- Absorb vibration and compensate radial and axial deviation.
- Elastomer with different hardness for option.
- Finished bore tolerance respects ISO H7, DIN6885/1 and JS9 for keyway.

FGE-GS-KC type, Size 19~38 in high-strength aluminum Alloy, Size 42~90 in Steel																
Model FGE-GS-KC	Torque(Nm)			Dimensions (mm)											Screws	Lacking torque Nm
	92sh-A	98sh-A	64sh-D	D	d1(min-max)	d2	L	L1;L2	E	k	b	t	t1	t2	M _s	T _A
19	10	17	21	41	8-22	18	66	25	16	14.5	12	2	11	3	M6	10.5
24	35	60	75	56	10-28	27	78	30	18	20	14	2	10.5	3	M6	10.5
28	95	160	200	66	14-38	30	90	35	20	25	15	2.5	11.5	4	M8	25
38	190	325	405	80	15-45	38	114	45	24	30	18	3	15.5	4	M8	25
42	265	450	560	95	20-50	46	126	50	26	32	20	3	18	4	M10	69
48	310	525	655	105	25-55	51	140	56	28	36	21	3.5	21	4	M12	120
55	410	685	825	120	32-65	60	160	65	30	42.5	22	4	26	4.5	M12	120
65	—	940	1175	135	35-70	68	185	75	35	45	26	4.5	33	4.5	M12	120
75	—	1920	2400	160	42-80	80	210	85	40	51	30	5	36	5	M16	295
90	—	3600	4500	200	42-90	104	245	100	45	60	34	5.5	40	6.5	M20	580

Example: FGE-GS38-24B-24B-98-YJ-KC

FGE-GS38	24	A/B	24	A/B	98	YJ	KC
Product specifications	Bore diameter	Shaft sleeve type	Hole diameter	Shaft sleeve type	Elastomer hardness	Anodic oxidation	Structural style

FGE-GS Slotting Type (DK)



Characteristics

- Backlash-free connection, small torque for measuring equipment, lifting platform and machining tools, etc..
- Small size and small rotation inertia.
- Clamped by screws after grooving, which can avoid the gap between shaft bores.
- Absorb vibration and compensate radial and axial deviation.
- Elastomer with different hardness for option.
- Finished bore tolerance respects ISO H7, DIN6885/1 and JS9 for keyway.

FGE-GS-DK type, Size 9~28 in high-strength aluminum Alloy																
Model FGE-GS-DK	Torque(Nm)			Dimensions (mm)											Screws	Lacking torque Nm
	92sh-A	98sh-A	64sh-D	D	d1(min-max)	d2	L	L1;L2	E	k	b	t	t1	t2	M _s	T _A
9	3	5	6	20	4-11	7.2	30	10	10	7.5	8	1	5	1.5	M2.5	0.76
12	5	9	12	25	5-12	8.5	34	11	12	9	10	1	5	3.5	M3	1.34
14	8	13	16	30	5-16	10.5	35	11	13	11.5	10	1.5	5	2	M3	1.34
19	10	17	21	41	8-24	18	50	17	16	14	12	2	6	3	M6	10.5
24	35	60	75	56	10-28	27	54	18	18	20	14	2	7	3	M6	10.5
28	95	160	200	66	14-38	30	62	21	20	23.8	15	2.5	9	4	M8	25

Example: FGE-GS28-24B-24B-98-YJ-DK

FGE-GS38	24	A/B	24	A/B	98	YJ	DK
Product specifications	Bore diameter	Shaft sleeve type	Hole diameter	Shaft sleeve type	Elastomer hardness	Anodic oxidation	Structural style

FGE-GS Locking Device Type (AL)



○ Characteristics

- Zero Backlash, Integrated design with high precision.
- Applied to spindle of machining tools and material handling equipment, etc.
- Designed by high strength Aluminum Alloy, Light and small moment of inertia.
- Integrated expansion sleeve and easy mounting by inner expansion and shrinking.
- Big friction torque.

FGE-GS-ZT-AL Aluminum locking shaft sleeve, the shaft sleeve and the guide roll are made of high-strength aluminum alloy																	
Model FGE-GS-ZT-AL	Torque(Nm)			Dimensions (mm)								Expansion bolt				The weight of a single bushing at maximum aperture (kg)	Moment of inertia of a single bushing with maximum aperture (kg·m ²)
	92sh-A	98sh-A	64sh-D	d1(min-max)	D	dh	L	L1;L2	E	b	t1	M	Z	TA(Nm)	M1		
14	7.5	12.5	16	6-14	30	10.5	50	18.5	13	10	2	M3	4	1.34	M3	0.032	0.04×10 ⁻⁴
19	10	17	21	10-20	41	18	66	25	16	12	3	M4	6	3	M4	0.077	0.19×10 ⁻⁴
24	35	60	75	14-28	56	27	78	30	18	14	3	M5	4	6	M5	0.162	0.78×10 ⁻⁴
28	95	160	200	15-38	66	30	90	35	20	15	4	M5	8	6	M5	0.24	1.70×10 ⁻⁴
38	190	325	405	20-45	80	38	114	45	24	18	4	M6	8	10	M6	0.49	5.17×10 ⁻⁴
42	265	450	560	25-50	95	46	126	50	26	20	4	M8	4	25	M8	0.772	11.17×10 ⁻⁴
48	310	525	655	30-55	105	51	140	56	28	21	4	M10	4	49	M10	1.066	18.81×10 ⁻⁴

Note: M1 stands for removing thread, which is between the expansion screws.

○ Example: FGE-GS28-ZT-20-24-98-AL

FGE-GS28	ZT	20	24	98	AL
Product specifications	Structural style	Bore diameter	Hole diameter	Elastomer hardness	Material

FGE-GS Locking Device Type (S)



○ Characteristics

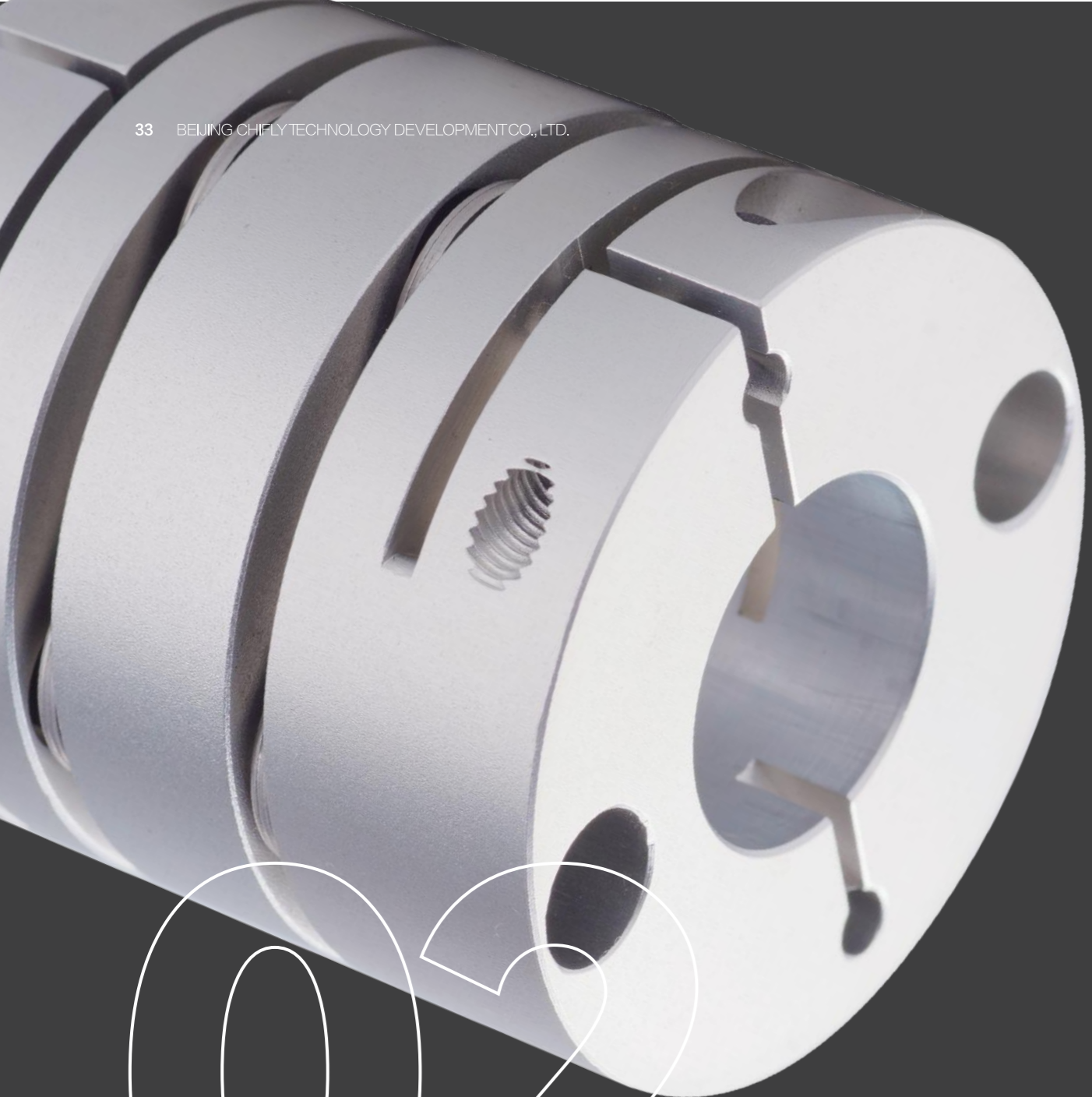
- Zero Backlash, Integrated design.
- Applied to spindle of machining tools and press roller, etc..
- Smooth operation, up to 50m/s for line speed.
- High responding speed, large transmission torque.
- Easy mounting/removal for inner expansion screws.
- Same features in positive and negative rotation.

FGE-GS-ZT-S Steel Locking Shaft Sleeve, the shaft sleeve and the guide roll is made of steel																
Model FGE-GS-ZT-S	Torque(Nm)		Dimensions (mm)								Expansion bolt				The weight of a single bushing at maximum aperture (kg)	Moment of inertia of a single bushing with maximum aperture (kg·m ²)
	92sh-A	64sh-D	d1(min-max)	D	dh	L	L1;L2	E	b	t1	M	Z	TA(Nm)	M1		
19	17	21	10-22	41	18	66	25	16	12	3	M4	6	4.1	M4	0.179	0.44×10 ⁻⁴
24	60	75	14-28	56	27	78	30	18	14	3	M5	4	8.5	M5	0.399	1.91×10 ⁻⁴
28	160	200	15-38	66	30	90	35	20	15	4	M5	8	8.5	M6	0.592	4.18×10 ⁻⁴
38	325	405	20-45	80	38	114	45	24	18	4	M6	8	14	M6	1.225	12.9×10 ⁻⁴
42	450	560	25-50	95	46	126	50	26	20	4	M8	4	35	M8	2.3	31.7×10 ⁻⁴
48	525	655	30-55	105	51	140	56	28	21	4	M10	4	69	M10	3.08	52.0×10 ⁻⁴
55	685	825	35-70	120	60	160	65	30	22	4.5	M10	4	69	M10	4.67	103.0×10 ⁻⁴
65	940	1175	40-70	135	68	185	75	35	26	4.5	M12	4	120	M12	6.7	191.0×10 ⁻⁴
75	1920	2400	42-80	160	80	210	85	40	30	5	M12	5	120	M12	9.9	396.8×10 ⁻⁴
90	3600	4500	50-105	200	100	245	100	45	34	6.5	M16	5	295	M16	17.7	1136×10 ⁻⁴

Note: 1. M1 stands for removing thread, which is between the expansion screws. 2. Max Transmission torque under max gap, see above table, H7/K6 for Size < φ55, G7/m6 for size ≥ φ55.

○ Example: FGE-GS28-ZT-20-24-98-S

FGE-GS28	ZT	20	24	98	98
Product specifications	Structural style	Bore diameter	Hole diameter	Elastomer hardness	Material



02

Diaphragm Coupling



○ Diaphragm Coupling Summarize

Membrane coupling is of zero backlash and free maintenance. Its Membrane is made of stainless steel spring, which has the features as higher strength, better torsional stiffness, strong deviation compensation, smaller restoring force, better resistance to high temperature, etc ...

○ Explosion-proof Performance

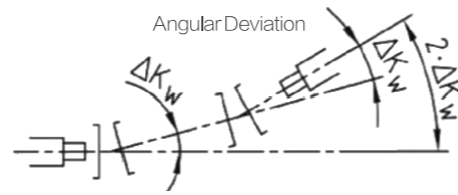
FIC/FDC couplings are designed for explosion-proof application.

○ Technical Term Description

Technical Parameters	Symbol	Note
Allowable Rated Torque	T_{KN}	The torque transmitted by continuous running within the allowable speed.
Allowable Alternative Torque	T_{KW}	Vibration amplitude of allowable alternative torque under frequency of 10Hz, rated torque T_N or dynamic load at T_N .
Allowable Maximum Torque	T_{KMAX}	Allowable torque transmitted by more than 10^5 dynamic load or 5×10^4 alternative load during the whole lifetime of the coupling.

1. Allowable Deviation

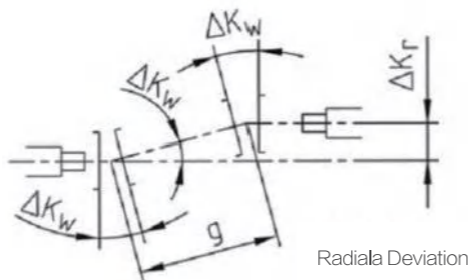
- ΔKa: Allowable Axial Deviation
- ΔKw: Allowable Angular Deviation
- ΔKr: Allowable Radial Deviation



Note: ΔKw stands for max allowable angular deviation for each membrane set, and 2. Kw for max allowable angular deviation for 2 membranes. Pls refer to "technical parameter," for allowable angular deviation of each membrane.

Relationship between allowable radial deviation ΔKr and space of couplings (g):

$$\Delta Kr = g \cdot \tan(\Delta Kw)$$



ΔKr(allowable radial deviation), ΔKw(Max angular deviation) and ΔKa(Axial deviation) can be found for each item/part in the table of technical parameter. They are interrelated, when ΔKa(Axial deviation) increases, ΔKr(allowable radial deviation), ΔKw(Max angular deviation) will decrease accordingly.

2. Transmitted without Alternative Torque

TKN(rated torque) and Tkmax(Max torque) should be considered for a given coupling, e.g. blower, compressor, etc.

3. Rated Torque Loading

TKN(allowable rated torque of the coupling) should be over TN(rated torque of the equipment), for the influence of SB(working condition), SR(rotation).

Calculation of rated torque of equipment: $TN(Nm) = 9550 \cdot P(KW) / n(rpm)$

TKN / Rated torque of coupling TKN

$$TKN \geq TN \times SB \times SR \times ST$$

TN: Operation torque of equipment

SB: Working conditions

SR: Rotation coefficient

SR=1.0, Rotate in one direction all the time

SR=1.7, Rotate clockwise and anticlockwise

ST: Temperature coefficient

Working Conditions SB

Application	SB
Engineering Machinery	2.0
Stiring Mil	1.0-2.0
Centifuge	1.5
Conveying Equipment	2.0
Crane	2.0
Blowe	1.5
Generator	1.0
Cooler	2.0
Crusher	2.5
Textile Machinery	2.0
Rolling Equipment	2.5
Wood Working Equipment	1.5

Application	SB
Stiring Machine & Injection Machine	2.0
Punch	2.5
Machine Tool	2.0
Grinding Mil	2.5
Packing Machinery	1.0
"Roller Drive"	2.5
Piston pump	2.5
Centrifugal pump	1.5
Compression piston pump	2.5
Worm compressor pump	2.0

Temperature Coefficient ST

Temperature Coefficient St						
℃	-30.0	0.0	150.0	200.0	230.0	270.0
ST	1.0	1.0	1.0	1.1	1.25	1.43

User selection should be fully considered the above conditions coefficient.

4. Impulsive Load

After considering the influence of working condition coefficient Sb, temperature coefficient St and rotation coefficient Sr, the maximum permissible torque of the coupling Tkmax must be greater than the sum of the impact torque Ts and the rated torque of the equipment Tn. In this case, the impact load is affected by the operation of the equipment. If the rotational inertia of the follower is larger, please contact our technical department.

$$TKMAX \geq (TN + TS) \times SR \times ST$$

TN: Operation torque of equipment

SB: Working conditions

SR: Rotation coefficient

SR=1.0, Rotate in one direction all the time

SR=1.7, Rotate clockwise and anticlockwise

ST: Temperature coefficient

Ts: Peak Torque

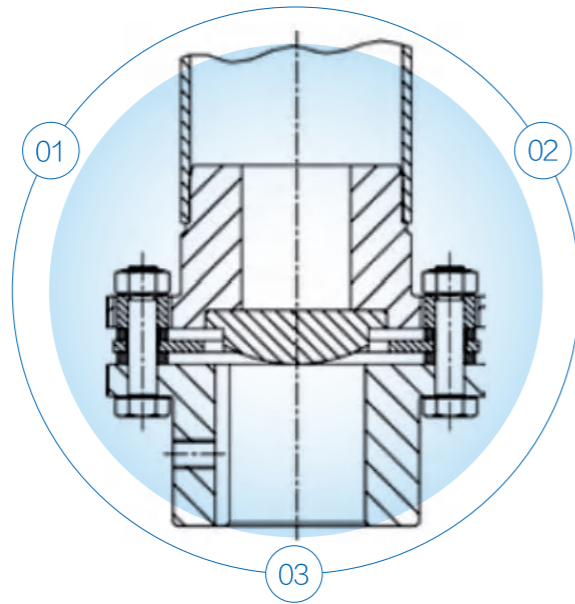
○ Transmission under Alternative Torque

Such as diesel engine, piston compressor, plunger pump and generator, etc, it is necessary to calculate torsional oscillation for the purpose of operation safety. For transmission under alternative torque, Customers are recommended to contact our technology department to ensure appropriate selection.

○ Technical Rules

Impulsive Load

Please ensure no deformation in axial direction occurs in mounting.



Mounting Requirement

FDC/FIC standard couplings are allowed to be mounted horizontally and vertically. If the product contains an intermediate, the part must be supported if mounted vertically.

Dynamic Balance

We provide dynamic balance if customer requests, though it is not necessary in most cases. If you have any question, please contact our technical department.

○ Safety Rules

When select, the operation torque of coupling must not exceed the allowable torque in any working conditions. The actual working load must be compared to the allowable torque.

Customers must prevent rotating parts from being touched by accident.

Customers are recommended to take sufficient protection measures to prevent couplings from rupture in case of overload.

Diaphragm Coupling FIC Series



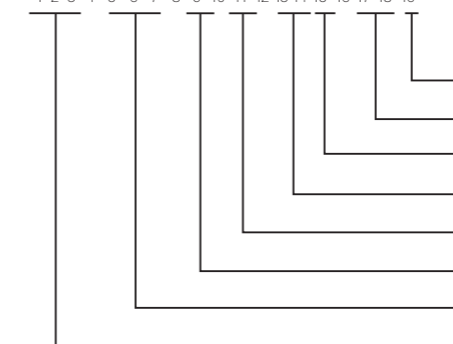
○ FIC series Summarize

- FIC Couplings are made of light-weight and high-strength aluminum alloy. The diaphragms are made of high strength stainless steel sheets. FIC diaphragms are characterized by high torsional stiffness and response with pretty low moment of inertia.
- Couplings are divided into single-diaphragm FIC-□-o type and double-diaphragm FIC-□-T type.
- Application: CNC machine tool, Textile Machinery, Printing press, Printing presses rotational inertia, high speed, high transmission accuracy occasion.

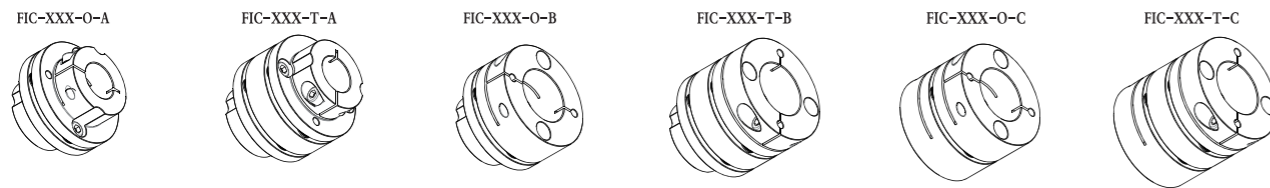
○ Model Coding

FIC-060-T-A-15B-20B

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19



- ① Driven shaft's connection type (B—bolt clamping)
- ② Hole diameter code (driven shaft)
- ③ Driving shaft's connection type (B—bolt clamping)
- ④ Hole diameter code (driving shaft)
- ⑤ Product Structure code 2 (A/B/C)
- ⑥ Product Structure code 1 (O/T)
- ⑦ Model code
- ⑧ Category code



Item		FIC-XXX-0 Single Dia-phragm Coupling	FIC-XXX-T Double Dia-phragm Coupling
Allowable Torque(N·m)		0.6~250	0.6~250
Hole Machining Diameter Range(mm)		3~45	3~45
Operation Temperature(°C)		-30~+100	-30~+100
Max.Allowable Error	Radial(mm)	0.02	0.05~0.44
	Angular(°)	0.5~1	1~2
	Axial(mm)	±0.05~±0.74	±0.1~±1.48

○ Product Features

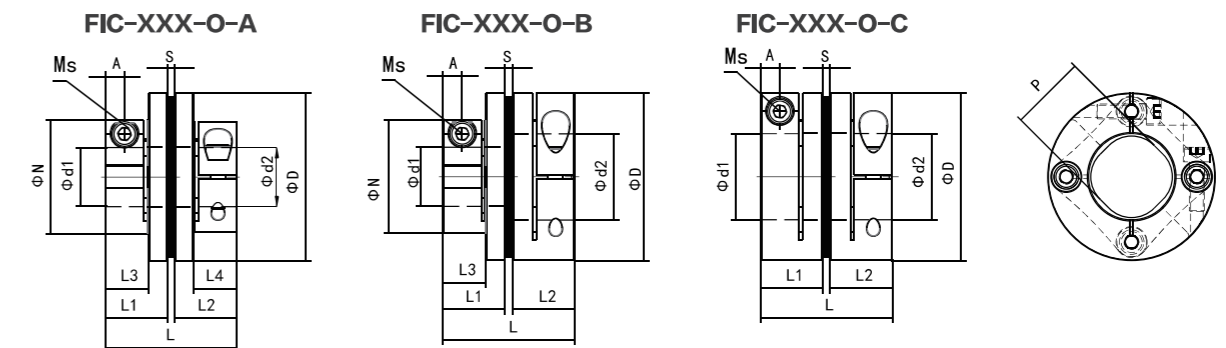
- FIC series diaphragm coupling main body(half-coupling)is made of high strength aluminum alloy materials,it can realize high torsional rigidity and high response speed,in the mean time,the rotation inertia is very low.
- The flexible component is made of stainless steel materials,the structure is compact and no back clearance, it can also absorb the errors in angular,axial,and radial (only for double diaphragm coupling)directions for the two shafts.
- The FIC-XXX-0 single diaphragm structure has higher rigidity,the FIC-XXX-T double diaphragm structure has more flexibility,these are two options to be selected from.
- When the hole size is relatively small,A Model or B Model structure form can be selected,which can reduce the coupling's rotation inertia even lower,so it is more suitable for high acceleration speed occasions.
- Before delivery,the coupling is assembled with special jig machine,so as to ensure the holes' coaxiality.
- Both of the coupling's input and output shafts use clamping method,so as to ensure customers' convenience for installation and maintenance.

○ Applications

The products can be widely applied to:CNC,chemical machineries,food machineries,various automatic production lines and mould groups,moving tables etc.which require low rotation inertia,quick speed up and slowdown,high transmission accuracy, anti-corrosion,non-pollution working conditions.

○ Technical Specification Form for Single Diaphragm Coupling

Technical Specification Form



Note:the product's actual assembling direction may not as same as above drawings,please follow actual confirmation drawings.

Model	d1		d2		D	N	L	L1	L2	L3	L4	S	A	P	Ms	Locking Torque (N·m)
	min	max	min	max												
FIC-005-0-C	3	6	3	6	16	—	16.6	7.85	7.85	—	—	0.9	2.50	6.5	M2	0.4~0.5
FIC-010-0-C	3	8	3	8	19	—	19.2	9.15	9.15	—	—	0.9	3.15	8.5	M2	0.4~0.5
FIC-020-0-C	4	10	4	11	26	—	23.0	10.75	10.75	—	—	1.5	3.30	10.5	M2.5	1.0~1.1
FIC-025-0-C	5	14	5	14	29	—	23.3	10.75	10.75	—	—	1.8	3.30	14.5	M2.5	1.0~1.1
FIC-030-0-A	5	10	5	10	34	21.6	27.4	12.4	12.4	8.9	8.9	2.6	3.80	14.5	M3	1.5~1.9
FIC-030-0-B	5	10	5	16		21.6				—						
FIC-030-0-C	5	14	5	16		—				—						
FIC-035-0-C	6	16	6	18	39	—	34.2	15.5	15.5	—	—	3.2	4.50	17	M4	3.4~4.1
FIC-040-0-A	8	15	8	15	44	29.6	34.2	15.5	15.5	10.5	10.5	3.2	4.50	19.5	M4	3.4~4.1
FIC-040-0-B	8	15	8	22		29.6				—						
FIC-040-0-C	8	22	8	22		—				—						
FIC-050-0-A	8	19	8	19	56	38	43.4	20.5	20.5	14	14	2.4	6.00	26	M5	7.0~8.5
FIC-050-0-B	8	19	8	30		38				—						
FIC-050-0-C	8	25	8	30		—				—						
FIC-060-0-A	11	24	11	24	68	46	53.4	25.2	25.2	17.5	17.5	3	7.75	31	M6	14~15
FIC-060-0-B	11	24	11	35		46				—						
FIC-060-0-C	11	30	11	35		—				—						
FIC-080-0-C	18	35	18	40	82	—	68	30	30	—	—	8	9.00	38	M8	27~30
FIC-090-0-C	25	40	25	45	94	—	68.3	30	30	—	—	8.3	9.00	42	M8	27~30
FIC-100-0-C	32	45	32	45	104	—	69.8	30	30	—	—	9.8	9.00	48	M8	27~30

Note:due to structure form,the max.values for the holes at the two sides are not the same,please pay attention!

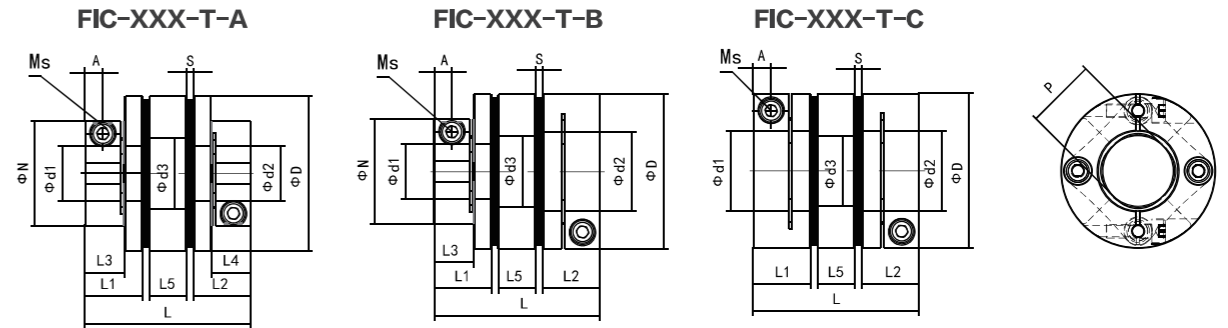
Technical Specification Form

Model	Allowable Torque T _{kmax} (N·m)	Max. Ho-tating Speed (rpm)	Torsional Rigidity (N·m/rad)	Axial Rigidity (N/mm)	Max.Allowable Error			Rotation Inertia (kg·m ²)	Mass (kg)
					Radial (mm)	Angular (°)	Axial (mm)		
FIC-005-0-C	0.6	10000	500	140	0.02	0.5	±0.05	0.27×10 ⁻⁶	0.007
FIC-010-0-0	1	10000	1400	140	0.02	1	±0.1	0.6×10 ⁻⁶	0.011
FIC-020-0-C	2	10000	3700	64	0.02	1	±0.15	2.47×10 ⁻⁶	0.025
FIC-025-0-C	4	10000	5600	60	0.02	1	±0.19	3.78×10 ⁻⁶	0.03
FIC-030-0-A	5	10000	8000	64	0.02	1	±0.2	4.18×10 ⁻⁶	0.035
FIC-030-0-B								6.27×10 ⁻⁶	0.041
FIC-030-0-C								8.44×10 ⁻⁶	0.05
FIC-035-0-C	8	10000	18000	112	0.02	1	±0.25	19.12×10 ⁻⁶	0.086
FIC-040-0-A	10	10000	20000	80	0.02	1	±0.3	17.19×10 ⁻⁶	0.079
FIC-040-0-B								23.63×10 ⁻⁶	0.09
FIC-040-0-C								30.49×10 ⁻⁶	0.105
FIC-050-0-A	25	10000	32000	48	0.02	1	±0.4	57.71×10 ⁻⁶	0.164
FIC-050-0-B								78.78×10 ⁻⁶	0.182
FIC-050-0-C								102.1×10 ⁻⁶	0.213
FIC-060-0-A	60	10000	70000	76	0.02	1	±0.45	147.2×10 ⁻⁶	0.286
FIC-060-0-B								208.1×10 ⁻⁶	0.331
FIC-060-0-C								273.6×10 ⁻⁶	0.392
FIC-080-0-C	100	10000	140000	128	0.02	1	±0.55	733.7×10 ⁻⁶	0.736
FIC-090-0-C	180	10000	100000	108	0.02	1	±0.65	1268×10 ⁻⁶	0.973
FIC-100-0-C	250	10000	120000	111	0.02	1	±0.74	1937×10 ⁻⁶	1.229

Note:
 1. In the table, the values of rotational inertia and mass are theoretical ones measured when the hole diameter at one side is at its maximum.
 2. In the table, the torsional rigidity is the diaphragm group's theoretical value for torsional rigidity.
 3. The maximum rotating speed has taken into consideration the factors such as centrifugal force, rigidity, etc., the dynamic balance is not considered.
 4. In the table, the allowable errors in each direction are mutually relevant, they can not reach the maximum value at the same time. Example: the angular error and axial error can exist at the same time, when the angular value reaches 70% of the maximum allowable value, then the axial error is not allowed to go above 30% of the maximum allowable value.

○ Technical Specification Form for Double Diaphragm Coupling

Technical Specification Form



Note: the product's actual assembling direction may not as same as above drawings, please follow actual confirmation drawings.

Model	d1		d2		d3	D	N	L	L1	L2	L3	L4	L5	S	A	P	Ms	Locking Torque (N·m)
	min	max	min	max														
FIC-005-T-C	3	6	3	6	6.5	16	—	23.6	7.85	7.85	—	—	6.1	0.9	2.50	6.5	M2	0.4~0.5
FIC-010-T-C	3	8	3	8	8.5	19	—	26.3	9.15	9.15	—	—	6.2	0.9	3.15	8.5	M2	0.4~0.5
FIC-020-T-C	4	10	4	11	11	26	—	33.6	10.75	10.8	—	—	9.1	1.5	3.30	10.5	M2.5	1.0~1.1
FIC-025-T-C	5	14	5	14	15	29	—	33.6	10.75	10.8	—	—	8.5	1.8	3.30	14.5	M2.5	1.0~1.1
FIC-030-T-A	5	10	5	10	15	34	21.6	38	12.4	12.4	8.9	8.9	8	2.6	3.80	14.5	M3	1.5~1.9
FIC-030-T-B	5	10	5	16			21.6				—							
FIC-030-T-C	5	14	5	16			—				—							
FIC-035-T-C	6	16	6	18	17	39	—	48.4	15.5	15.5	—	—	11	3.2	4.50	17	M4	3.4~4.1
FIC-040-T-A	8	15	8	15	20	44	29.6	48.4	15.5	15.5	10.5	10.5	11	3.2	4.50	19.5	M4	3.4~4.1
FIC-040-T-B	8	15	8	22			29.6				—							
FIC-040-T-C	8	22	8	22			—				—							
FIC-050-T-A	8	19	8	19	26	56	38	59.8	20.5	20.5	14	14	14	2.4	6.00	26	M5	7.0~8.5
FIC-050-T-B	8	19	8	30			38				—							
FIC-050-T-C	8	25	8	30			—				—							
FIC-060-T-A	11	24	11	24	31	68	46	72.9	25.2	25.2	17.5	17.5	16.5	3	7.75	31	M6	14~15
FIC-060-T-B	11	24	11	35			46				—							
FIC-060-T-C	11	30	11	35			—				—							
FIC-080-T-C	18	35	18	40	40	82	—	101	30	30	—	—	25	8	9.00	38	M8	27~30
FIC-090-T-C	25	40	25	45	47	94	—	101.6	30	30	—	—	25	8.3	9.00	42	M8	27~30
FIC-100-T-C	32	45	32	45	50	104	—	104.6	30	30	—	—	25	9.8	9.00	48	M8	27~30

Note: due to structure form, the max. values for the holes at the two sides are not the same, please pay attention!

○ Technical Specification Form for Double Diaphragm Coupling

Technical Specification Form

Model	Allowable Torque T _{kmax} (N·m)	Max. Rotating Speed (rpm)	Torsional Rigidity (N·m/rad)	Axial Rigidity (N/mm)	Max. Allowable Error			Rotation Inertia (kg·m ²)	Mass (kg)
					Radial (mm)	Angular (°)	Axial (mm)		
FIC-005-T-C	0.6	10000	250	70	0.05	1	±0.	0.39×10 ⁻⁶	0.011
FIC-010-T-C	1	10000	700	70	0.11	2	±0.2	0.84×10 ⁻⁶	0.016
FIC-020-T-C	2	10000	1850	32	0.16	2	±0.3	3.72×10 ⁻⁶	0.038
FIC-025-T-C	4	10000	2800	30	0.15	2	±0.38	5.58×10 ⁻⁶	0.043
FIC-030-T-A	5	10000	4000	32	0.14	2	±0.4	7.65×10 ⁻⁶	0.055
FIC-030-T-B								9.74×10 ⁻⁶	0.062
FIC-030-T-C								11.91×10 ⁻⁶	0.07
FIC-035-T-C	8	10000	9000	56	0.19	2	±0.55	27.92×10 ⁻⁶	0.127
FIC-040-T-A	10	10000	10000	40	0.19	2	±0.65	30.89×10 ⁻⁶	0.127
FIC-040-T-B								37.33×10 ⁻⁶	0.139
FIC-040-T-C								44.19×10 ⁻⁶	0.154
FIC-050-T-A	25	10000	16000	24	0.28	2	±0.8	102.1×10 ⁻⁶	0.259
FIC-050-T-B								123.2×10 ⁻⁶	0.277
FIC-050-T-C								146.5×10 ⁻⁶	0.308
FIC-060-T-A	60	10000	35000	38	0.44	2	±0.9	258.3×10 ⁻⁶	0.451
FIC-060-T-B								319.2×10 ⁻⁶	0.495
FIC-060-T-C								384.7×10 ⁻⁶	0.556
FIC-080-T-C	100	10000	70000	64	0.44	2	±1.1	1103×10 ⁻⁶	1.102
FIC-090-T-C	180	10000	50000	54		2	±1.3	1895×10 ⁻⁶	1.444
FIC-100-T-C	250	10000	60000	55.5		2	±1.48	2901×10 ⁻⁶	1.827

Note:

- In the table, the values of rotational inertia and mass are theoretical ones measured when the hole diameter at one side is at its maximum.
- In the table, the torsional rigidity is the diaphragm group's theoretical value for torsional rigidity.
- The maximum rotating speed has taken into consideration the factors such as centrifugal force, rigidity, etc., the dynamic balance is not considered.
- In the table, the allowable errors in each direction are mutually relevant, they can not reach the maximum value at the same time. Example: the angular error and axial error can exist at the same time, when the angular value reaches 70% of the maximum allowable value, then the axial error is not allowed to go above 30% of the maximum allowable value.

○ Standard Hole Size and Allowable Transmission Torque.

Model	Hole Size Range	3	4	5	6	6.35	7	8	9	9.525	10	11	12	14	15	16	17	18	
FIC-005-0/T	d1	0.6	0.6	0.6	0.6														
	d2	0.6	0.6	0.6	0.6														
FIC-010-0/T	d1	1	1	1	1	1	1	1											
	d2	1	1	1	1	1	1	1											
FIC-020-0/T	d1		2	2	2	2	2	2	2	2	2								
	d2		2	2	2	2	2	2	2	2	2	2							
FIC-025-0/T	d1			2.1	4	4	4	4	4	4	4	4	4	4					
	d2			2.1	4	4	4	4	4	4	4	4	4	4					
FIC-030-0/T	d1			2.8	3.4	5	5	5	5	5	5	5	5	5					
	d2			2.8	3.4	5	5	5	5	5	5	5	5	5	5	5	5		
FIC-035-0/T	d1				5	5	6.6	8	8	8	8	8	8	8	8	8			
	d2				5	5	6.6	8	8	8	8	8	8	8	8	8	8	8	8

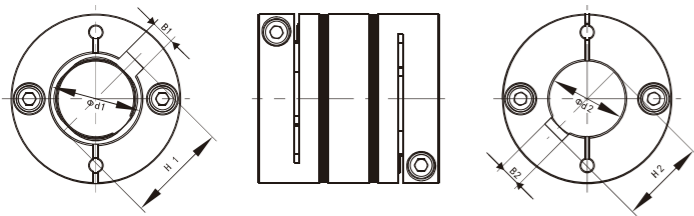
Model	Hole Size Range	8	9	9.525	10	11	12	14~17	18.19	20.22	24	25	28.30	32	35	38.40	42~45	
FIC-040-0/T	d1	9	10	10	10	10	10	10	10									
	d2	9	10	10	10	10	10	10	10	10								
FIC-050-0/T	d1	18	20	22	22	25	25	25	25	25	25	25						
	d2	18	20	22	22	25	25	25	25	25	25	25	25					
FIC-060-0/T	d1					50	51	60	60	60	60	60	60					
	d2					50	51	60	60	60	60	60	60	60	60			
FIC-080-0/T	d1								100	100	100	100	100	100	100			
	d2								100	100	100	100	100	100	100	100		
FIC-090-0/T	d1											180	180	180	180	180		
	d2											180	180	180	180	180	180	
FIC-100-0/T	d1													226	250	250	250	
	d2													226	250	250	250	

Note:

- Because of the diaphragm group's inner diameter, the hole sizes (D1, D2) at the two side can not be the same max. value.
- The above torque is determined when the outer diameter of the coupling's jointed shaft is h7.
- In the hole size range specified in above table, our company can customize according to customers' requirements. (for example, machining hole size in inch).

Customized Service— Key Slot Machining

○ Key Slot Dimension Drawing



○ Key Slot Dimension Form

Hole Size (φd1, φd2)	Key Slot Width (B1, B2)	Key Slot Height (H1, H2)
8	2±0.012	9 ₀ ^{+0.1}
9	3±0.012	10.4 ₀ ^{+0.1}
10	3±0.012	11.45 ₀ ^{+0.1}
11	4±0.015	12.8 ₀ ^{+0.1}
12	4±0.015	13.8 ₀ ^{+0.1}
14	5±0.015	16.3 ₀ ^{+0.1}
15	5±0.015	17.3 ₀ ^{+0.1}
16	5±0.015	18.3 ₀ ^{+0.1}
17	5±0.015	19.3 ₀ ^{+0.1}
18	6±0.015	20.8 ₀ ^{+0.2}
19	6±0.015	21.8 ₀ ^{+0.2}
20	6±0.015	22.8 ₀ ^{+0.2}
22	6±0.015	24.8 ₀ ^{+0.2}
24	8±0.018	27.3 ₀ ^{+0.2}
25	8±0.018	28.3 ₀ ^{+0.2}
28	8±0.018	31.3 ₀ ^{+0.2}
30	8±0.018	33.3 ₀ ^{+0.2}
32	10±0.018	35.3 ₀ ^{+0.2}
35	10±0.018	38.3 ₀ ^{+0.2}
38	10±0.018	41.3 ₀ ^{+0.2}
40	12±0.021	43.3 ₀ ^{+0.2}
42	12±0.021	45.3 ₀ ^{+0.2}
45	14±0.021	48.8 ₀ ^{+0.2}

○ Matters Needing Attention

- 1.The FIC diaphragm coupling transmits allowable torque relying on the friction force when the coupling tightly holds the shaft,the additional keyslot in the hole is not necessary design.
- 2.Shall customers choose to machine keyslot in the hole,please check the keyslot's direction and the dimensional tolerance shown in above drawing or left table,cus-tomers need to ensure that the width of the key used is less than the keyslot width in the table.
- 3.When use keys such as gib-head taper stock key that press-in installation shall be employed, damage may be caused to the coupling during assembling and operation.
- 4.Due to friction between the keyslot and the key, when the coupling is installed on the shaft,relatively high compressing force in axial direction may be applied onto the coupling,please take care to eliminate the compress-ing force applied onto the diaphragm.
- 5.If the key is loose,the key's vibration may cause dust during operation,it is also possible the key will slip out,please avoid that.
- 6.The product code need to be changed("B" to "BJ" behind the hole diameter),example:FIC- 060-T-C-15BJ-20BJ.

○ Model Selection Steps

1.Use FIC coupling to carry out torque checking for servo motor,stepping motor and variable frequency motor.

①.Determine the maximum torque Tm for servo motor, stepping motor and variable frequency motor:

Tm is usually 3 times of the rated torque of servo motor, stepping motor and variable frequency motor

②.Calculate the needed allowable torque for the coupling(Tn)

$$T_n = T_m \cdot 1.5$$

Tn—the needed allowable torque for the coupling,N·m Tm—nominal maximum torque for servo motor, stepping motor and variable frequency motor

③.Based on Tn,the coupling's basic specification is primarily determined,which is to ensure the selected coupling's allowable torque Tkmax≥Tn

2.Use FIC coupling to carry out torque checking for common motors and driving devices.

①.Calculate the needed transmitted torque for the coupling(T)

$$T = 9550 \cdot P / n$$

T—the needed transmitted torque for the coupling,N·m P—the rated torque for motor(or other driving devices),kW

n—actual rotating speed for motor(or other driving devices),r/min(rpm)

②.Calculate the needed transmitted torque for the coupling(Tn)

$$T_n = T \cdot K$$

Tn—the needed allowable torque for the coupling,N·m

T—the needed transmitted torque for the coupling,N·m K—working condition coefficient,①constant load: K=1,②small fluctuating load:K=1.25,

③moderate fluctuating load:K=1.75,④big fluctuating load:K=2.25

③ Based on Tn,the coupling's basic specification is primarily determined,which is to ensure the selected coupling's allowable torque Tkmax≥Tn

3.For the occasions with high alternate torque(for example:diesel fuel engine,piston compressor, plunger pump,generator,etc.),please contact the engineers of for calculation and model selection.

4.During installation and operation of the coupling,ensure the errors in in radial,angular,and axial directions not go above every limiting value specified in the Technical Specification Form,when the errors exist at the same time,the allowable errors shall be reduced proportionally.In theory,the single diaphragm coupling can not sustain radial error,during operation,if there is unavoidable radial error,please select the double diaphragm coupling.

Note:

please refer to the Technical Specification Form for checking and obtaining the aforesaid Tkmax value.

○ Installation and Maintenance Instructions

1.Before installation and operation,please confirm the following: ①.If the product is as same as the product ordered;②.If there is any damage occurred to the product during transportation.

2.Safety precautions:

①.Ambient conditions and relevant devices

i.Hazard notes:

- Rotating couplings may cause harm to human being, please set up safety guard for the coupling,and set up.
- starter on the safety guard for emergency stop protection.
- inflammable,explosive liquid or gas or leakage of such.
- This type of couplings are not allowed to operate under the conditions with chemical leakage,high humidity,or big temperature variation.

②.Assembling work

i,Hazard notes:

- The bolt's tightening torque is very important to the product's performance and safety,please be sure the bolts are tightened according to the specified torques in the Mounting Dimensions.
- When install or dismount the couplings,ensure the machine is already stopped,and relevant power sources are cut off.

ii,Matters needing attention

- Before installing the coupling,please ensure the coaxiality. error of the shafts on the two sides is less than 0.02mm(for FIC single diaphragm coupling)or less than 0.05mm(for FIC double diaphragm coupling);high coaxiality error can cause failure or damage to the devices.
- Please use bolts provided by or of the same performance and grade,so as to avoid damage to the please wear necessary protection devices such as gloves etc,so as to avoid any personal injury during.
- Dismounting and installation hoisting equipment.

③.Operation

i,Hazard notes:

- The couplings are not allowed to operate above the maximum rotating speed specified in the Technical Specification Form,so as to avoid over vibration and damage to the products.
- Please touch exposed rotating parts,so as to avoid personal injury.
- Please prevent the centring error of the shafts on the two sides from being too big or going beyond the allowable value specified in the Technical Specification Form,so as to avoid too much additional load applied on the coupling and causing damage to relevant devices.

ii,Matters needing attention

- Please do not make the torque go beyond the product's allowable value.
- when abnormal noise or vibration occurs,check and confirm if the installation is right;longtime vibration may cause the bolts'loosening or failures,which leads to the whole equipment's failure.
- When operate in narrow space,is shall be considered that poor heat dissipation may cause the temperature to go up and influence the product's performance

④.Other matters

I,Hazard notes:

Please ensure the products are not touched or played by children

ii,Matters needing attention

Disassembling our company's products without permission is forbidden,otherwise,the company is not responsible to any damage to the products.

- The rejected materials shall be sent to special agency for recycling

3.Installation and operation:

- ①.First loose the coupling's clamp bolts,and remove the rust,dust or oil stains etc.on the shafts or inside the holes of the coupling.(Please use woven cotton etc.to remove oil stains or carry out oil removal work based on requirements)
- ②.When sleeve the coupling on the shaft,please do not apply too much compressing and pulling force on the components.Especially when sleeve the coupling on the motor shaft after the coupling is already installed into the motor,wrong operation may cause too much axial compressing force,please pay special attention.
- ③.When the two clamp bolts are loosened,please check if it is possible to easily move the coupling in axial direction or rotate it.If it can not be moved or rotated easily,please re-adjust he two shafts'coaxiality.(this is a easy method to confirm the two shafts' coaxiality,if the method can not be employed for confirmation,please use instrument or employ other methods for confirming installation accuracy)
- ④.When install the FIC coupling on the non-circular shaft which has flatslot,please do not install the shaft's flat slot on the side of the coupling with radial slot.For obtaining sufficient clamping torque,please use circular shaft.
- ⑤.Ensure the shaft inserted into the coupling is identical to L1 and L2 specified in the Installation Dimension Form,so the shaft and the coupling can fully contact with each other.
- ⑥.Please ensure the coupling's actual S dimension is within the S value specified in the Installation Dimension Form and the allowable error range in axial displacement.The allowable error range in axial displacement is based on the assumption that the eccentricity and the deflection are zero,please reduce the error through adjustment as much as possible.
- ⑦.When it is confirmed there is no compressing and pulling in axial direction,tighten the two clamp bolts. During tightening,please use torque wrench that has been calibrated,and follow the Locking Torque specified in the Installation Dimension Form for tightening.

Diaphragm Coupling FEC Series



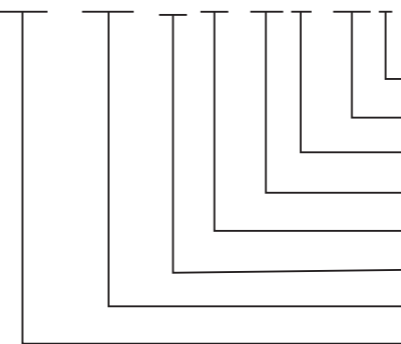
○ FEC series summarize

- The main body of the FEC diaphragm is made of steel,and the diaphragm is made of high-strength stainlesssteel for springs.The FEC diaphragm coupling achieveshigh torque,high rigidity,and low inertia.
- FEC standard coupling is divided into FEC-□-0 typewith single diaphragm and FEC-□-T type with doubledaphragm.
- Application:CNC machine tool spindles,servo motors,stepping motors,and occasions where high precision isrequired for forward and reverse rotation.

○ Model Coding


FEC-080-0-A-25Z-30Z

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19



- ① Driven shaft's connection type(cinching)
- ② Hole diameter code (bigger shaft)
- ③ Driving shaft's connection type (cinching)
- ④ Hole diameter code(smaller shaft)
- ⑤ Product Structure code 2(A/B/C)
- ⑥ Product Structure code 1(0:single diaphragm/T:double diaphragm)
- ⑦ Model code
- ⑧ Category code

○ Product overview




FEC single diaphragm coupling

- ① Compression ring: high-quality structural steel is employed, the surface is blackening treated; based on different aperture, the outer diameter changes accordingly.
- ② Half-coupling: high-quality structural steel is employed, the surface is blackening treated; taper sleeve and compression ring are designed to jointly hold the transmission shaft tightly.
- ③ Diaphragm group: the flexible component is stacked with a few high-quality stainless steel discs through washers and bush, etc., to absorb the shaft's installation error, and transmit corresponding torque.

FEC double diaphragm coupling

- ① Stopper pin hole on the flange excircle: when tightening cinch bolt, insert the pin into the hole for restricting the coupling's rotation.
- ② Cinch bolt: high strength bolts after surface treatment are used, during tightening, alternate locking should be carried out according to prescribed torque (see relevant installation instructions for details).
- ③ Middle part: a unique part of double diaphragm coupling, high-quality structural steel is employed, the surface is blackening treated.
- ④ Bolt for diaphragm group: high strength bolts after surface treatment are used, installed before delivery, please do not install on your own.



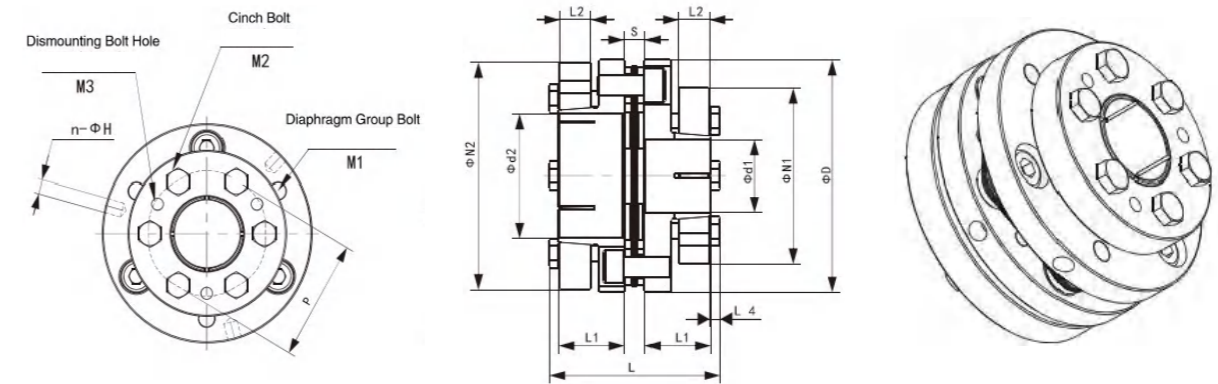
○ Product Overview

Item	FEC Single Diaphragm Coupling	FEC Double Diaphragm Coupling
Allowable Torque(N·m)	70~300	70~300
Hole Machining Diameter Range(mm)	18~60	18~60
Operation Temperature(°C)	-30~+120	-30~+120
Max. Allowable Error	Radial(mm)	0.02
	Angular(°)	1
	Axial(mm)	±0.5~±0.7

○ Product Features And Applications

- The products are very suitable for the connection between the feed shaft lead screw and the motor for various CNC and machining center. The products have features below:
- 1. Ultrahigh rigidity. This type is developed for machine tool's feed shaft, with high torsional rigidity, accurate shaft rotation and ultra-precision control can be performed.
- 2. Big diameter frictional connection can be supported. Compared to previous types' frictional connection, it can be used for big diameter shaft.
- 3. The diaphragm group's bolts are alloy-steel hexagon cheese head screw bolts.
- 4. It is connected to the shaft with expansion sleeve. The shaft is simple in structure, which is to reduce stress concentration area on the slot; with symmetric structure, higher balance requirement can be met without special dynamic balance treatment.
- 5. The flexible component (diaphragms) are made of stainless steel material, with features such as compact structure, no back clearance, it can also absorb the two shafts' errors in angular, axial and radial (only for double diaphragm) direction.
- 6. Before delivery, centering assembling with special jig machine is carried out, which ensures holes original coaxiality on the two sides.

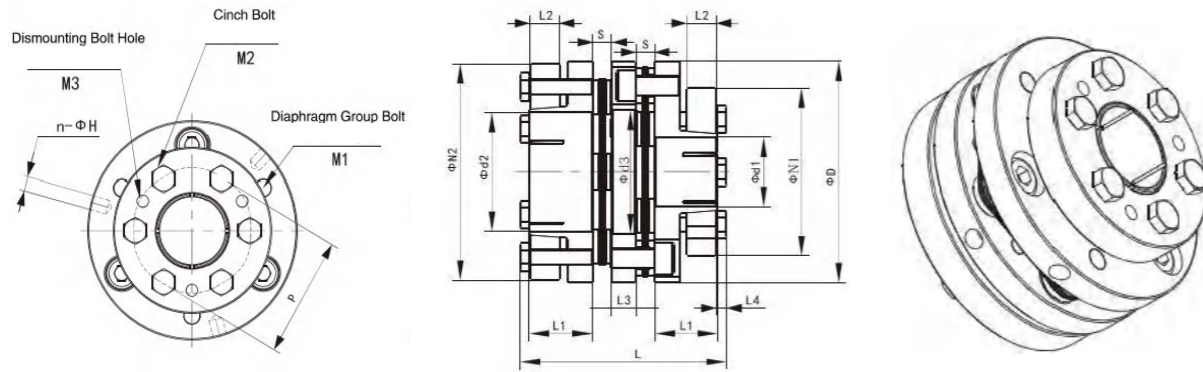
○ Dimension Form for Single Diaphragm Coupling



Model	D	N	d1/d2	N1/N2	L1	L2	L4	S	P	n-φH	M1	M1 Locking Torque	M2	M2 Locking Torque	M3
FEC-070-0-A	70	60.5	18, 19	53	23.5	12	4	6.5	31	4-φ5.1	M6	14	4-M6	12	2-M6
			20, 22, 24, 25	58											
			28, 30	63											
			32, 35	68											
FEC-080-0-A	80	66.3	22, 24, 25	58	25.5	12	4	8.3	37	4-φ5.1	M8	34	4-M6	12	2-M6
			28, 30	63											
			32, 35	68											
FEC-090-0-A	90	66	28	68	25.5	12	4	7.7	50	3-φ6.5	M8	34	6-M6	12	3-M6
			30, 32, 35	73											
			38, 40	78											
			42, 45	83											
FEC-100-0-A	100	66	48	88	25.5	12	4	8	58	3-φ6.5	M8	34	6-M6	12	3-M6
			32, 35	73											
			38, 40	78											
			42, 45	83											
			48, 50, 52	88											
55	93														
60	98														

Note:
 1. The bolts' quantity in the form only refer to the bolts on one side;
 2. The locking torque, determination basis: M1 is Grade 12.9 bolt, M2 is Grade 10.9 bolt

○ Dimension Form for Double Diaphragm Coupling



Model	D	L	d1/d2	N1/ N2	L1	L2	L3	d3	L4	S	P	n-φH	M1 Locking Torque	M2 Locking Torque	M3		
FEC-070-T-A	70	75	18, 19	53	23.5	12	8	35	4	6.5	31	4-φ5.1	M6	14	4-M6	12	2-M6
			20, 22, 24, 25	58													
			28, 30	63													
			32, 35	68													
FEC-080-T-A	80	84.6	22, 24, 25	58	25.5	12	10	40	4	8.3	37	4-φ5.1	M8	34	4-M6	12	2-M6
			28, 30	63													
			32, 35	68													
FEC-090-T-A	90	83.4	28	68	25.5	12	10	50	4	7.7	50	3-φ6.5	M8	34	6-M6	12	3-M6
			30, 32, 35	73													
			38, 40	78													
			42, 45	83													
FEC-100-T-A	100	84	32, 35	73	25.5	12	10	60	4	8	58	3-φ6.5	M8	34	6-M6	12	3-M6
			38, 40	78													
			42, 45	83													
			48, 50, 52	88													
			55	93													
60	98																

Note:
 1. The bolts' quantity in the form only refer to the bolts on one side;
 2. The locking torque, determination basis: M1 is Grade 12.9 bolt, M2 is Grade 10.9 bolt.

○ Technical Specification Form for Single Diaphragm Coupling

Model	Allowable Torque Tkmax (N·m)	Max. Rotating Speed (rpm)	Torsional Rigidity (N·m/rad)	Axial Rigidity (N/mm)	Max. Allowable Error			Rotating Inertia (kg·m²)	Mass (kg)
					Radial (mm)	Angular (°)	Axial (mm)		
FEC-070-0-A	70	18000	60000	105	0.02	1	±0.5	0.55×10 ⁻³	0.88
FEC-080-0-A	130	17000	64000	96	0.02	1	±0.5	0.93×10 ⁻³	1.20
FEC-090-0-A	200	15000	140000	320	0.02	1	±0.6	1.73×10 ⁻³	1.57
FEC-100-0-A	300	13000	160000	360	0.02	1	±0.7	2.52×10 ⁻³	1.78

Note:
 1. In the table, the values of rotational inertia and mass are measured when the hole diameter at one side is at its maximum, and the other side at its minimum.
 2. In the table, the torsional rigidity is the diaphragm group's theoretical value for torsional rigidity.
 3. The maximum rotating speed has taken into consideration the factors such as centrifugal force, rigidity, etc., the dynamic balance is not considered.
 4. In the table, the allowable errors in each direction are mutually relevant, they can not reach the maximum value at the same time. Example: the angular error and axial error can exist at the same time, when the angular value reaches 70% of the maximum allowable value, then the axial error is not allowed to go above 30% of the maximum allowable value.

○ Technical Specification Form for Double Diaphragm Coupling

Model	Allowable Torque Tkmax (N·m)	Max. Rotating Speed (rpm)	Torsional Rigidity (N·m/rad)	Axial Rigidity (N/mm)	Max. Allowable Error			Rotating Inertia (kg·m²)	Mass (kg)
					Radial (mm)	Angular (°)	Axial (mm)		
FEC-070-T-A	70	14000	30000	55	0.25	2	±1	0.70×10 ⁻³	1.08
FEC-080-T-A	130	13000	32000	50	0.3	2	±1	1.26×10 ⁻³	1.54
FEC-090-T-A	200	12000	70000	160	0.3	2	±1.2	2.26×10 ⁻³	1.98
FEC-100-T-A	300	10000	80000	180	0.3	2	±1.4	3.28×10 ⁻³	2.26

Note:
 1. In the table, the values of rotational inertia and mass are measured when the hole diameter at one side is at its maximum, and the other side at its minimum.
 2. In the table, the torsional rigidity is the diaphragm group's theoretical value for torsional rigidity.
 3. The maximum rotating speed has taken into consideration the factors such as centrifugal force, rigidity, etc., the dynamic balance is not considered.
 4. In the table, the allowable errors in each direction are mutually relevant, they can not reach the maximum value at the same time. Example: the angular error and axial error can exist at the same time, when the angular value reaches 70% of the maximum allowable value, then the axial error is not allowed to go above 30% of the maximum allowable value.

○ Model Selection Steps

1. Use FEC coupling to carry out torque checking for servo motor, stepping motor and variable frequency motor.

①. Determine the maximum torque T_m for servo motor, stepping motor and variable frequency motor:

T_m is usually 3 times of the rated torque of servo motor, stepping motor and variable frequency motor

②. Calculate the needed allowable torque for the coupling (T_n)

$$T_n = T_m \cdot 1.5$$

T_n —the needed allowable torque for the coupling, $N \cdot m$ T_m —nominal maximum torque for servo motor, stepping motor and variable frequency motor

③. Based on T_n , the coupling's basic specification is primarily determined, which is to ensure the selected coupling's allowable torque $T_{kmax} \geq T_n$

2. Use FEC coupling to carry out torque checking for common motors and driving devices.

①. Calculate the needed transmitted torque for the coupling (T)

$$T = 9550 \cdot P / n$$

T —the needed transmitted torque for the coupling, $N \cdot m$ P —the rated torque for motor (or other driving devices), kW

n —actual rotating speed for motor (or other driving devices), r/min (rpm)

②. Calculate the needed transmitted torque for the coupling (T_n)

$$T_n = T \cdot K$$

T_n —the needed allowable torque for the coupling, $N \cdot m$

T —the needed transmitted torque for the coupling, $N \cdot m$

K —working condition coefficient, ① constant load: $K=1$, ② small fluctuating load: $K=1.25$, ③ moderate fluctuating load: $K=1.75$, ④ big fluctuating load: $K=2.25$

③ Based on T_n , the coupling's basic specification is primarily determined, which is to ensure the selected coupling's allowable torque $T_{kmax} \geq T_n$

3. For the occasions with high alternate torque (for example: diesel fuel engine, piston compressor, plunger pump, generator, etc.), please contact the engineers of REACH for calculation and model selection.

4. During installation and operation of the coupling, ensure the errors in radial, angular, and axial directions not go above every limiting value specified in the Technical Specification Form, when the errors exist at the same time, the allowable errors shall be reduced proportionally. In theory, the single diaphragm coupling can not sustain radial error, during operation, if there is unavoidable radial error, please select the double diaphragm coupling.

Note:

please refer to the Technical Specification Form for checking and obtaining the aforesaid T_{kmax} value.

○ Installation and Maintenance Instructions

1. Before installation and operation, please confirm the following:

①. If the product is as same as the product ordered; ②. If there is any damage occurred to the product during transportation.

2. Safety precautions:

①. Ambient conditions and relevant devices

i. Hazard notes:

- Rotating couplings may cause harm to human being, please set up safety guard for the coupling, and set up starter on the safety guard for emergency stop protection.
- Please avoid operating RIC products close to places with inflammable, explosive liquid or gas or leakage of such. It is recommended that the motor or other driving devices are equipped with safety brake device.
- This type of couplings are not allowed to operate under the conditions with chemical leakage, high humidity, or big temperature variation.

②. Assembling work

i. Hazard notes:

- The bolt's tightening torque is very important to the product's performance and safety, please be sure the bolts are tightened according to the specified torques in the Mounting Dimensions.
- When install or dismount the couplings, ensure the machine is already stopped, and relevant power sources are cut off.

ii. Matters needing attention.

- Before installing the coupling, please ensure the coaxiality error of the shafts on the two sides is less than 0.02mm (for RIC single diaphragm coupling) or less than 0.05mm (for RIC double diaphragm coupling); high coaxiality error can cause failure or damage to the devices.
- Please use bolts provided by of the same performance and grade, so as to avoid damage to the products.
- Please wear necessary protection devices such as gloves etc, so as to avoid any personal injury during dismounting and installation.
- When haul or lift heavy objects, please use necessary hoisting equipment.

③. Operation

i. Hazard notes:

- The couplings are not allowed to operate above the maximum rotating speed specified in the Technical Specification Form, so as to avoid overvibration and damage to the products.
- Please touch exposed rotating parts, so as to avoid personal injury.
- Please prevent the centring error of the shafts on the two sides from being too big or going beyond the allowable values specified in the Technical Specification Form, so as to avoid too much additional load applied on the coupling and causing damage to relevant devices.

ii. Matters needing attention

- Please do not make the torque go beyond the product's allowable value.
- When abnormal noise or vibration occurs, check and confirm if the installation is right; long time vibration may cause the bolts, loosening or failures, which leads to the whole equipment's failure.
- When operate in narrow space, it shall be considered that poor heat dissipation may cause the temperature to go up and influence the product's performance.

④. Other matters

i. Hazard notes

- Please ensure the products are not touched or played by children.
- Disassembling our company's products without permission is forbidden, rejected materials shall be sent to special agency for recycling.

3. Installation and operation:

(1) First loose the coupling's cinch bolts, and remove the rust, dust or oil stains etc. on the shafts or inside the holes of the coupling.

(2) Sleeve the coupling on the power input shaft (servo motor shaft for CNC). During sleeving, do not pull or push the coupling too hard.

(3) The length of coupling sleeved on the motor shaft is the whole length of the half-coupling (L_1 dimension), and it shall not interfere with the diaphragm group and the shaft on the other side.

(4) Keep the coupling still, gently tighten every cinch bolt (direct hand tightening is recommended).

(5) Fix the dial indicator's stand on the base, the dial indicator's hand touches the flange's sexcircle or end face of the coupling on the side of the motor shaft, rotate slowly the motor shaft with hands, in the mean time, use methods such as hammer striking to make the dial indicator's beating close to 0 as much as possible.

(6) During adjustment by hammer striking, tighten the cinch bolts in order, finally use calibrated torque wrench to alternately tighten the cinch bolts to the specified values of M_2 locking torque in the Dimension Form. During tightening, the hole on the flange's sexcircle can be used to restrict the coupling's rotation.

(7) Confirm again that the coupling's cinch bolts on the motor shaft side have been tightened according to specified torques, and the jumping value is close to 0. the sleeving length is L_1 , and it shall not interfere with the diaphragm group and the shaft on the other side. Then fix the dial indicator's stand on the motor shaft, the dial indicator's hand touches the output shaft, adjust the motor shaft or output shaft's opposite position, in the mean time, slowly rotate the motor shaft, make the dial indicator hand's jumping close to 0, then fix the motor base and the output shaft.

(9) Move the half-coupling on the output shaft side, adjust S dimension in Dimension Form, make the difference of the actual value and the S value in the axial error scope provided deflection exists, the axial error shall be reduced proportionally. Usually the axial error shall be adjusted as small as possible.)

(10) In the same way as the cinch bolts on the motor shaft side are tightened (from (4) to (7)), tighten the cinch bolts on the output shaft side.

(11) To avoid the cinch bolts' loosening during operation, it is recommended that, after operation for some time, re-tighten the cinch bolts according to specified torques and in right order.

4. Dismounting:

(1) The coupling can only be dismounted without sustaining torque or axial load. When using safety clutch or brake, please make sure the devices are not in working status, so as to make sure the coupling is not bearing any torque.

(2) Loosen all the cinch bolts, until the gap between the bolt head and the compression ring is about 2mm.

(3) Take down 2 to 3 pieces of cinch bolts already loosened, screw into the dismounting bolt holes on the compression ring, slowly tighten the bolts in order until the connection is disengaged. (if not space for screwing in the bolt in axial direction, the frontend of the slot type screwdriver or other similar tools can be inserted in between the compression ring and the flange, strike in axial direction or disengage the connection in lever principle.)



Diaphragm Coupling FDC Series

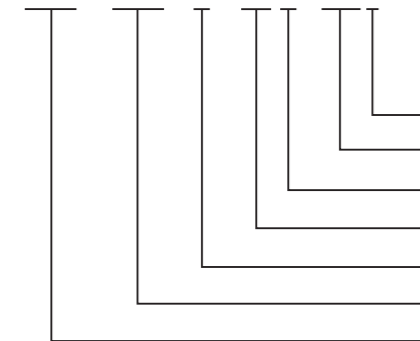
○ FDC series summarize

- FDC Couplings and diaphragms are made of carbon steel materials and high-strength stainless steel sheets respectively. All these make the couplings perfect for the precision transmission because of high torsional stiffness.
- FDC Standard Couplings are designed with single and double diaphragms. For more details, please refer to page 44 to page 50.
- Application: Compressor, pump, mixer and other load larger occasions.

○ Model Coding

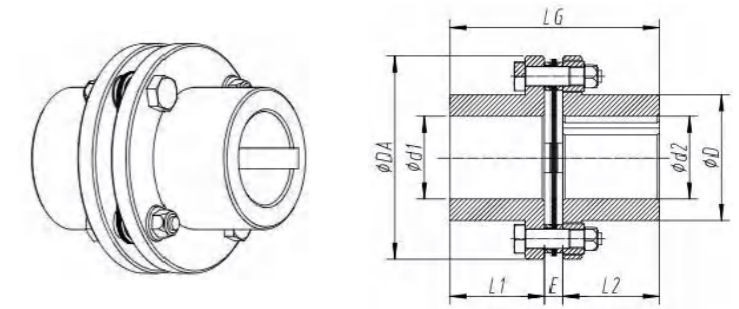
FDC-038-A-24J-24J

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17



- ① Driven Shaft Connection Method (J-Keyway connection)
- ② Bore Dimension Code(Driven Shaft)
- ③ Driving Shaft Connection Method (J-Keyway connection)
- ④ Bore Dimension Code(Driving Shaft)
- ⑤ Product Structure Code(A/B)
- ⑥ Size Code
- ⑦ Series Code

- Single-section structure
- Angular and anxia deviation correction functions
- High torsional stiffness
- Compact structure



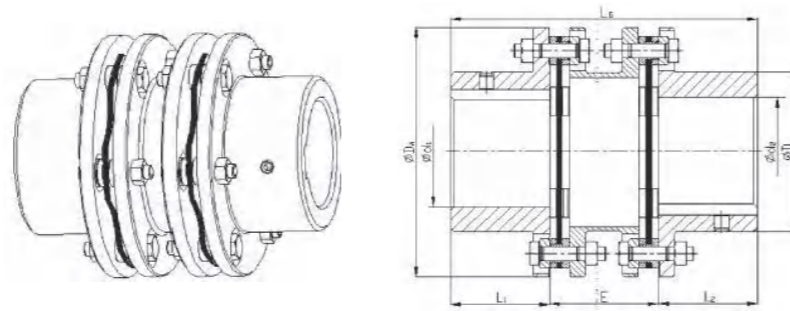
○ Dimension Table of A-type Unit:mm

Size	d1 max	d2 max	DA	D	LG	L1	E	L2
20	20	20	56	32	45	20	5	20
25	25	25	68	40	56	25	6	25
35	35	35	82	54	86	40	6	40
38	38	38	94	58	98	45	8	45
42	42	42	104	68	100	45	10	45
50	50	50	126	78	121	55	11	55
60	60	60	138	88	121	55	11	55
70	70	70	156	102	141	65	11	65
80	80	80	179	117	164	75	14	75
85	85	85	191	123	175	80	15	80
90	90	90	210	132	175	80	15	80
105	105	105	225	147	200	90	20	90
115	115	115	265	163	223	100	23	100

○ Performance Parameters of A-type

Size	Rated Torque (Nm)	Max. Rotation Speed (r/min)	Angular Deviation(°)	Axial Deviation (mm)	Radial Deviation (mm)	Moment of Inertia (kg.m ²)	Tornisional Stiffness of Diaphragm (10° Nm/rad)
20	15	20000	1.0	0.6	—	0.0001	0.017
25	30	16000	1.0	0.8	—	0.00026	0.028
35	60	13000	1.0	1.0	—	0.0008	0.092
38	120	12000	1.0	1.2	—	0.0016	0.198
42	180	10000	1.0	1.4	—	0.0027	0.282
50	330	8000	1.0	1.6	—	0.0061	0.501
60	690	6700	1.3	1.0	—	0.0082	0.56
70	1100	5900	1.3	1.1	—	0.0152	0.90
80	1500	5100	1.3	1.3	—	0.029	1.14
85	2400	4750	1.3	1.3	—	0.042	1.52
90	4500	4300	1.0	1.0	—	0.064	1.94
105	5100	4000	1.0	1.2	—	0.093	2.54
115	9000	3400	1.0	1.4	—	0.199	3.48

- Compact double-section structure
- Strong deviation correction function
- Able to replace curved-tooth couplings



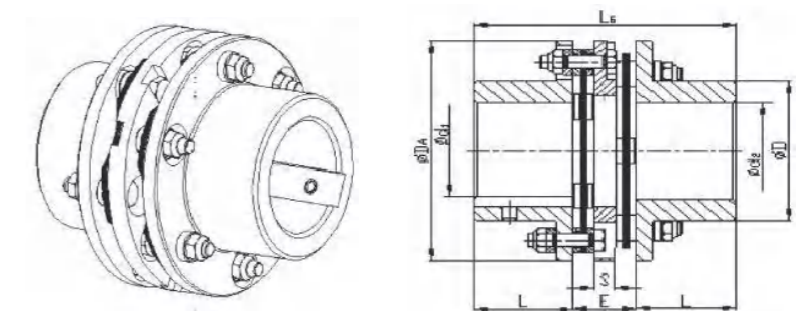
○ Dimension Table of B-type Unit:mm

Size	d1 max	d2 max	DA	D	LG	L1	E	L2
20	20	20	56	32	—	20	—	20
25	25	25	68	40	—	25	—	25
35	35	35	82	54	—	40	—	40
38	38	38	94	58	—	45	—	45
42	42	42	104	68	—	45	—	45
50	50	50	126	78	—	55	—	55
60	60	60	138	88	170	55	60	55
70	70	70	156	102	200	65	70	65
80	80	80	179	117	233	75	83	75
85	85	85	191	123	246	80	86	80
90	90	90	210	132	251	80	91	80
105	105	105	225	147	281	90	101	90
115	115	115	265	163	309	100	109	100

○ Performance Parameters of B-type

Size	Rated Torque (Nm)	Max.Rotation Speed (r/min)	Angular Deviation(o)	Axial Deviation (mm)	Radial Deviation (mm)	Moment of Inertia (kg.m ²)	Torsional Stiffness of Diaphragm (10 ⁴ Nm/rad)
20	15	20000	1.0	1.2	0.1	—	0.0085
25	30	16000	1.0	1.6	0.2	—	0.014
35	60	13000	1.0	2.0	0.2	—	0.046
38	120	12000	1.0	2.4	0.3	—	0.099
42	180	10000	1.0	2.8	0.3	—	0.141
50	330	8000	1.0	3.2	0.4	—	0.2505
60	690	6700	1.3	2.0	1.0	0.012	0.28
70	1100	5900	1.3	2.2	1.2	0.022	0.45
80	1500	5100	1.3	2.6	1.5	0.042	0.57
85	2400	4750	1.3	2.3	1.5	0.064	0.76
90	4500	4300	1.0	2.0	1.4	0.103	0.97
105	5100	4000	1.0	2.4	1.6	0.143	1.27
115	9000	3400	1.0	2.8	1.3	0.333	1.74

- Compact double-section structure
- Strong deviation correction function
- Can be used to replace curved-tooth couplings



○ Dimension Table of C-type Unit:mm

Size	d1 max	d2 max	DA	D	LG	L1	E	L2	S
20	20	20	56	32	55	20	15	20	5
25	25	25	68	40	68	25	18	25	6
35	35	35	82	54	98	40	18	40	6
38	38	38	94	58	114	45	24	45	8
42	42	42	104	68	118	45	28	45	8
50	50	50	126	78	142	55	32	55	10
60	60	60	138	88	144	55	34	55	12
70	70	70	156	102	164	65	34	65	12

○ Performance Parameters of C-type

Size	Rated Torque (Nm)	Max.Rotation Speed (r/min)	Angular Deviation(°)	Axial Deviation (mm)	Radial Deviation (mm)	Moment of Inertia (kg.m ²)	Torsional Stiffness of Diaphragm (10 ⁴ Nm/rad)
20	15	20000	1.0	1.2	0.1	0.0001	0.0085
25	30	16000	1.0	1.6	0.2	0.00025	0.014
35	60	13000	1.0	2.0	0.2	0.0085	0.046
38	120	12000	1.0	2.4	0.3	0.0015	0.099
42	180	10000	1.0	2.8	0.3	0.0024	0.141
50	330	8000	1.0	3.2	0.4	0.008	0.2505
60	690	6700	1.3	2.0	1.0	0.01	0.28
70	1100	5900	1.3	2.2	1.2	0.02	0.45

○ Order Example:FDC-35-A-35Jx28J

FDC-35-A	35J	28J
The diaphragm Couplings Size 35 A-type	The diameter of bore in the hub is 35 Connected by keyway	The diameter of bore in the hub is 35 Keyway Connection

Explanation of the Connection:"J"means the keyway connection and,"z"refers to the connection between the keyway and locking devices