

Fenner



Bush Type
Couplings

Bush Type Flexible Couplings

08

The function of a flexible coupling is to transmit torque from one shaft to another in cases where limited misalignment may occur and also to absorb shock loads.

The Fenner Bush Type Flexible Coupling of the cushioned drive type, transmits the torque through high tensile steel bolts to the machine input shaft. Highly developed rubber compounds are used in bushes to absorb shock loads, torsional vibrations and slight misalignments.

F Fenner Bush Type Flexible Couplings

Simple and compact in construction, the Fenner Coupling is capable of transmitting high torques at maximum speeds. The flanges are manufactured with cast iron, grade 20 of IS. 210. This type of coupling permits drive in either direction and requires neither lubrication nor adjustment after fitting. The flexible bushes remain unaffected by water, dust and atmospheric conditions.

Machines which are to be coupled by flexible couplings should first be aligned with all possible accuracy. The capacity of the coupling will then deal with misalignments which occur by reason of temperature variations or heavy shaft loading. Setting of machine foundations or bearing wear will also cause extra loading to be imposed on the coupling. Any, or all of these conditions can occur once the machines have been coupled.

Flanges are made to suit requirements and are keywayed to British Standard Specification, unless otherwise stated. They can also be supplied with the listed minimum bore to permit machining on site. Power requirements for the standard couplings range from 0.81 Kw to 249 Kw at 100 r.p.m. and sizes from FBC1 to FBC11.

Coupling Selection:

Details required for coupling selection are :

1. Type of driven machine and operating hours per day.
2. Speed and power absorbed by driven machine (If absorbed power is not known, it is calculated based on power rating of the prime mover).
3. Diameter of shafts to be connected.

Procedure:

- a) **Service Factor:** Determine the required service factor from Table 08-01.
- b) **Design Power:** Multiply the normal running power by the service factor. This gives the Design Power which is used as a basis for selecting the coupling.
- c) **Coupling Size:** Refer to Table 08-03 and from the appropriate speed, read across until a power greater than that required in step (b) is found. The size of Coupling required is given at the head of that column.
- d) **Bore Size:** Check from dimension in Table 08-02, whether the chosen flanges can accommodate the required bores.

Table 08-01: Service Factors

Driven Machine	Prime Mover				
	Electric Motor Steam Turbine Shafting	Steam Engine Water Turbine	IC Engine Multi-Cylinder	IC Engine Single-Cylinder Diesel Multi Cylinder	Diesel Engine Single Cylinder
Even Torque Machines: Smooth Loads, Generators, Centrifugal Pumps, Blowers, Small Fans, Line Shafting.	1.00	1.25	1.50	2.00	2.50
Machine Tools (light), Beaters, Exhausters, Wood-working Machines (light), Alternators, Welding Generators, Textile Machines.	1.25	1.50	1.75	2.25	2.75
Multi-Crank Compressors and Pumps, Generators (fluctuating loads), Rotary Dryers & Screens, Rotary Compressors, Planers, Wood-working Machines (heavy), Pulp Grinders, Shakers, Mine Fans.	1.50	1.75	2.00	2.75	3.00
Wire Mills, Cement Mills, Small Printing Presses.	1.75	2.00	2.25	3.00	3.25
Single Crank Compressors & Pumps, Hammers, Ball & Tube Mills, Rolling Mills (light), Shearing Machines, Punches, Rock & Stone Crushers, Brick Making and similar Machines, Printing Presses (large), Grinders, Pulverisers, Cranes & Winches, Mechanical Shovels & Dredges, Winding Gears and Drums.	2.00	2.25	2.50	3.25	3.50
Heavy Rolling Mill Drives, Continuous, Prolonged & Reversing Drives, Severe Traction and Haulage Loads.	2.25	2.50	2.75	3.50	3.75

Fenner Bush Type Flexible Couplings

Notes:

- All dimensions are in millimeters.
- Simple maintenance. No lubrication required.
- Accommodate larger bore diameters.
- Dampens the shock and vibration.
- Grub screw is provided on the hub for locking of key in finish bore couplings.
- Standard range is available with cast iron flanges.
- For special application, we can provide forged steel flanges.
- It is recommended to use coupling guard for better safety.

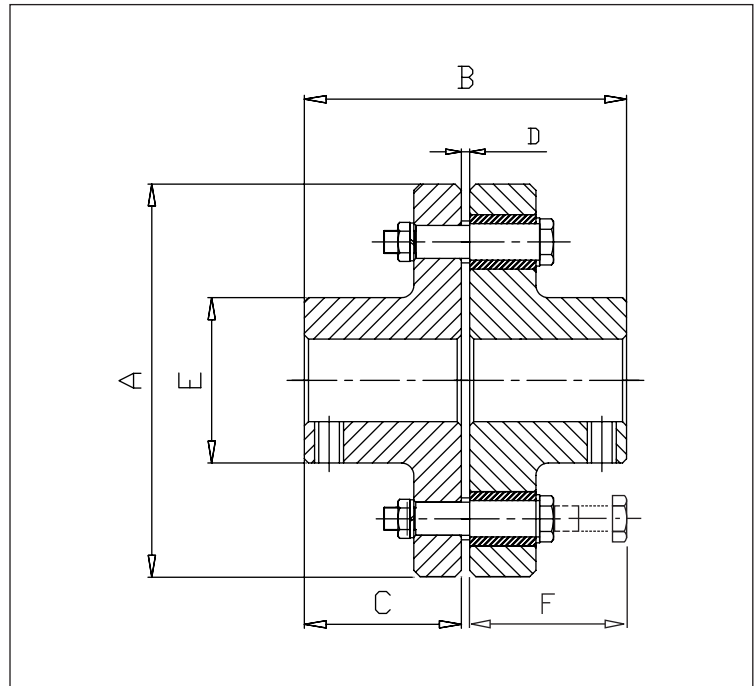


Table 08-02: Dimensions

Coupling Size	Torque Nm	Max.Speed (RPM)	Bore Dia MIN	Bore Dia MAX	QTY N	A	B	C	D	E	F
FBC 1	77	6100	12.7	30	3	95	79	38	3	44	58
FBC 2	310	5100	12.7	35	4	114	99	48	3	51	70
FBC 2A	516	4400	16	45	6	130	105	51	3	67	70
FBC 3	621	3600	16	50	4	160	107	51	5	75	114
FBC 4	831	3000	20	70	4	191	125	60	5	105	114
FBC 4A	1241	3000	20	70	6	191	125	60	5	105	114
FBC 5	1662	2600	25	80	6	225	157	76	5	115	114
FBC 6	2359	2300	45	100	8	254	183	89	5	140	114
FBC 6A	2932	2300	45	100	10	254	183	89	5	140	114
FBC 6B	3533	2300	45	100	12	254	183	89	5	140	114
FBC 7	4154	1950	55	120	12	290	235	115	5	175	114
FBC 7A	5195	1900	55	125	14	300	235	115	5	185	130
FBC 8	5816	1850	60	135	16	310	255	125	5	200	130
FBC 8A	7268	1650	60	138	18	340	265	130	5	205	130
FBC 8B	8729	1590	65	142	12	360	276	135	6	212	200
FBC 9	9932	1470	70	152	13	390	316	155	6	225	200
FBC 9A	13274	1400	80	162	15	410	336	165	6	240	200
FBC 10	14420	1300	90	175	16	440	366	180	6	255	200
FBC 10A	18050	1200	100	185	17	480	386	190	6	270	212
FBC 11	23780	1080	110	195	20	530	406	200	6	285	212



Fenner Bush Type Flexible Couplings - New Series

Table 08-03: Power Rating (Kw)

Speed rev/min	Coupling Sizes																			
	FBC1	FBC2	FBC2A	FBC3	FBC4	FBC4A	FBC5	FBC6	FBC6A	FBC6B	FBC7	FBC7A	FBC8	FBC8A	FBC8B	FBC9	FBC9A	FBC10	FBC10A	FBC11
100	0.81	3.25	5.4	6.5	8.7	13.0	17.4	24.7	30.7	37.0	43.0	54.4	60.9	76.1	91.4	104	139	151	189	240
200	1.62	6.5	10.8	13.00	17.40	26.0	34.8	49.4	61.4	74.0	87.0	108.8	121.8	152.2	182.8	208	278	302	378	498
300	2.43	9.75	16.2	19.50	26.10	39.0	52.2	74.1	92.1	111.0	130.5	163.2	182.7	228.3	274.2	312	417	453	567	747
400	3.24	13.0	21.6	26.00	34.80	52.0	69.6	98.8	122.8	148.0	174.0	217.6	243.6	304.4	365.6	416	556	604	756	996
500	4.05	16.25	27.0	32.50	43.50	65.0	87.0	123.5	153.5	185.0	217.5	272.0	304.5	380.5	457.0	520	695	755	945	1245
600	4.86	19.50	32.4	39.00	52.20	78.0	104.2	148.2	184.2	222.0	261.0	326.4	365.4	456.6	548.4	624	834	906	1134	1494
700	5.67	22.75	37.8	45.50	60.90	91.0	121.8	172.9	214.9	259.0	304.5	380.8	426.3	532.7	639.8	728	973	1057	1323	1743
720	5.83	23.40	38.9	46.80	62.60	93.6	125.3	177.8	221.0	266.4	313.2	391.7	438.5	547.9	658.0	749	1001	1087	1361	1793
800	6.48	26.0	43.2	52.00	69.60	104.0	139.2	197.6	245.6	296.0	348.0	435.2	487.2	608.8	731.2	832	1112	1208	1512	1992
900	7.29	29.25	48.6	58.50	78.30	117.0	156.6	223.3	276.0	333.0	391.5	489.6	548.1	684.9	822.6	936	1251	1359	1701	2241
960	7.77	31.2	51.8	62.40	83.50	124.8	167.0	237.1	294.7	355.2	417.6	522.2	584.6	730.6	877.4	998	1334	1450	1814	2390
1000	8.10	32.5	54.0	65.00	87.00	130.0	174.0	247.0	307.0	370.0	435.0	544.0	609.0	761.0	914.0	1040	1390	1510	1890	2490
1200	9.72	39.0	64.8	78.00	104.40	156.0	208.8	296.4	368.4	444.0	522.0	652.8	730.8	913.2	1097	1248	1668	1812	2268	
1400	11.34	45.5	75.6	91.00	121.80	182.0	243.6	345.8	429.8	518.0	609.0	761.6	852.6	1065	1280					
1440	11.66	46.8	77.8	93.60	125.30	187.2	250.6	355.7	442.0	532.8	626.4	783.4	877.0	1096	1316					
1600	12.96	52.00	86.4	104.00	139.20	208.0	278.4	395.2	491.0	592.0	696.0	870.4	974.4	1218	1462					
1800	14.58	58.50	97.2	117.00	156.6	234.0	313.2	444.6	552.6	666.0	783.0	979.2								
2000	16.2	65.00	108.0	130.00	174.0	260.0	348.0	494.0	614.0	740.0										
2200	17.82	71.50	118.8	143.00	191.4	286.0	382.8	543.4	675.4	814.0										
2400	19.44	78.00	129.60	156.00	208.8	312.0	417.6													
2600	21.06	84.50	140.40	169.00	226.2	338.0	452.4													
2800	22.68	91.00	151.20	182.00	243.6	364.0														
2880	23.33	93.60	155.50	187.2	250.6	374.4														
3000	24.30	97.50	162.00	195.0	261.0	390.0														
3500	28.35	113.75	189.00	260.0																
4000	32.40	130.00	216.00																	
4500	36.45	146.25																		



Fenner

Fenaflex® Tyre Couplings

07

Fenner Fenaflex® Tyre couplings provide all the desirable features of an ideal flexible coupling, including Taper-Lock® fixing. The Fenner Fenaflex® Tyre coupling is a "torsionally elastic" coupling offering versatility to designers and engineers with a choice of flange combinations to suit most applications.

The flanges are available in either F or H version Taper-Lock® fitting or bored to size B.

With the addition of a spacer flange, the coupling can be used to accommodate standard distance between shaft ends and facilitate pump maintenance.

F Fenner Tyre Couplings

Fenner Tyre couplings can accommodate simultaneous maximum misalignment in all planes without imposing undue loads on adjacent bearings and the excellent shock-absorbing properties of the flexible tyre reduce vibrations and torsional oscillations.

Fenner tyres are available in natural rubber compounds for use in ambient temperatures between -50°C to $+50^{\circ}\text{C}$. Neoprene rubber compounds are available for use in adverse operating conditions e.g. oil or grease contaminations and can be used in temperatures of -15°C to $+70^{\circ}\text{C}$.

F.R.A.S. tyres are available for use when fire-resistance and antistatic (F.R.A.S.) properties are required.

TORQUE-BORE RANGE

The range includes couplings with torque capacity upto 12606 Nm. and bore diameters upto 190 mm.

MISALIGNMENT

Handles parallel, angular and axial displacements, either singly or in any combination. They can accommodate parallel misalignment upto 6 mm, angular misalignment upto 4° and end float upto 8 mm.

TORSIONALLY SOFT

Cushions against destructive shock loads protecting the complete system, preventing expensive breakdowns and lengthens machine life.

FREE OF BACKLASH

Does not create 'snatch' on take up of the drive.

INSTALLATION

Requires neither special tools nor skilled labour to assemble. Alignment is quickly checked by placing a straight edge across outside diameter of flanges. The split flexible tyre is then positioned in the flanges and the screws tightened into place.

DAMPING

Reduces vibration and torsional oscillations developed in internal combustion engines, the amplitude of which increases greatly at critical points in the speed range. Fenner Tyre coupling dampens these destructive vibrations.

MAINTENANCE

Because there are no moving parts, no lubrication is required. Periodic visual inspection of the tyre is all that is necessary.

EASY ELEMENT REPLACEMENT

To replace flexible element simply loosen the clamping screws, remove the tyre and replace with a new one. It is not necessary to move either driver or driven machine or coupling flanges.

ENVIRONMENT

Use of natural or Neoprene rubber compounds makes the Fenner Tyre coupling suitable for use in most conditions. For fire hazard areas the F.R.A.S. tyre is recommended. This allows free flow of electricity between the two shafts to avoid static electricity buildup.



Fenner Tyre Couplings - Selection

DETAILS REQUIRED FOR COUPLING SELECTION

1. Type of driven machine and operating hours per day.
2. Speed and power absorbed by driven machine (if absorbed power is not known, calculate on power rating of prime mover).
3. Diameters of shafts to be connected.

PROCEDURE

- a. Service Factor :** Determine the required service factor from table 07-01.
- b. Design Power :** Multiply the normal running power by the service factor. This gives the design power which is used as a basis for selecting the coupling.
- c. Coupling Size :** Refer to table 07-03 (page 07-06) and from the appropriate speed, read across until a power greater than that required in step (b) is found.

The size of Fenner Tyre Coupling required is given at the head of that column.

- d. Bore Size :** Check from dimension tables that chosen flanges can accommodate required bores.

EXAMPLE

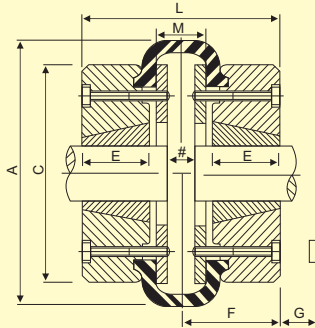
A Fenner Tyre Coupling is required to transmit 45 kW from an A.C. Electric Motor which runs at 1440 rev/min to a rotary screen for 12 hours a day. The motor shaft is 60 mm diameter and the screen shaft is 55 mm diameter.

- a. Service Factor :** From table 07-01 the service factor is 1.4.
- b. Design Power :** Design Power = $45 \times 1.4 = 63 \text{ kW}$.
- c. Coupling Size :** By reading across from 1440 rev/min in table 07-03 (page 07-06) the first figure to exceed the required 63 kW in step (b) is 76.1 kW. The size of coupling is F100.
- d. Bore Size :** By referring to table 07-02 (page 07-05) it can be seen that both shaft diameters fall within the bore range available.

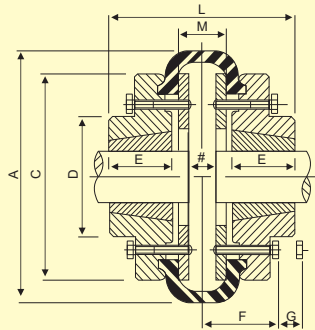
TABLE 07-01: SERVICE FACTORS

Special Cases	Type of Driving Unit					
For applications where substantial shock, vibration and torque fluctuations occur and for reciprocating machines e.g. internal combustion engines, piston pumps and compressors, refer to Fenner with all machine details for torsion analysis	Electric Motors Steam Turbines			Internal Combustion Engines Steam Engines Water Turbines		
Type of Driven Machine	Operational hours per day					
	10 and under	Over 10 to 16 inclusive	over 16	10 and under	Over 10 to 16 inclusive	over 16
CLASS 1 Agitators, Brewing machinery Centrifugal compressors and pumps, Belt conveyors, Dynamometers, Line shafts, Fans upto 7.5 kW, Blowers and Exhausters (except positive displacement) Generators.	0.8	0.9	1.0	1.3	1.4	1.5
CLASS 2 Clay working machinery, General Machine tools, Paper mill beaters and winders, Rotary pumps, Rubber extruders, Rotary screens, Textile machinery, Marine propellers and fans over 7.5 kW.	1.3	1.4	1.5	1.8	1.9	2.0
CLASS 3 Bucket elevators, Cooling tower fans, Piston compressors and pumps, Foundry machinery, Metal presses, Paper mill calendars, Pulverisers and Positive displacement blowers.	1.8	1.9	2.0	2.3	2.4	2.5
CLASS 4 Reciprocating conveyors, Gyratory crushers, Mills (ball, pebble and rod), Rubber machinery (Banbury mixers and mills) and Vibratory screens	2.3	2.4	2.5	2.8	2.9	3.0

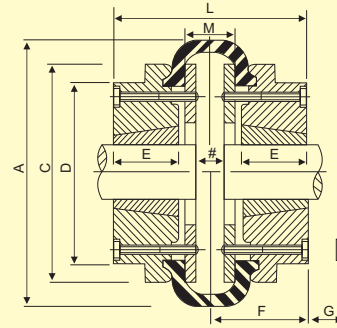
F Type Couplings



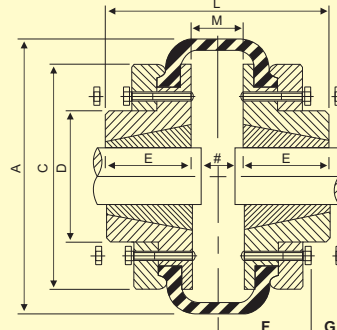
F - 40 & 45



F - 70 TO 120

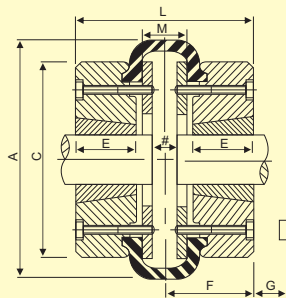


F - 50 & 60

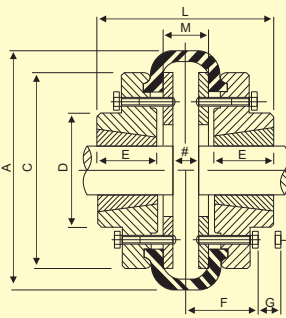


F - 140 TO 220

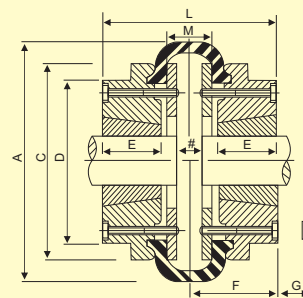
H Type Couplings



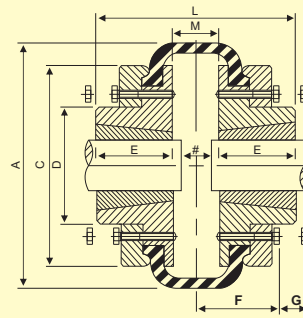
F - 40 & 45



F - 70 TO 120



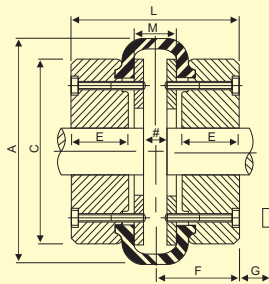
F - 50 & 60



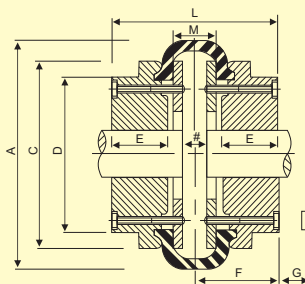
F - 140 TO 220

Fenner Tyre Couplings

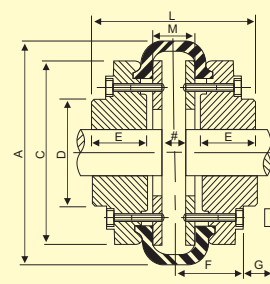
B Type Couplings



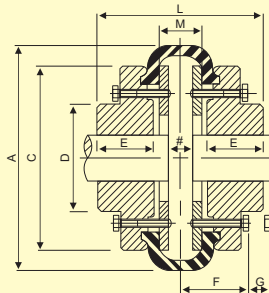
F - 40 & 45



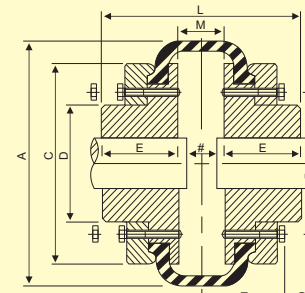
F - 50



F - 60



F - 70 TO 120



F - 140 TO 250

TABLE 07-02 : DIMENSIONS "F&H" AND "B" TYPE COUPLINGS

Size	TYPE F & H								TYPE B								A	C	G	M	No. of screws per flange
	Bush No.	Max Bore	L	D	E	F	J	Approx Weight Kg *	Max Bore	Min Bore	L	D	E	F	Set Screw on key	Approx Weight Kg *					
F40	1008	25	67	-	22	33.5	29	1.4	30	11.00	67	-	22	33.5	M5	2.0	104.0	82	43	23	4
F45	1108	28	67	-	22	33.5	29	3.0	32	11.00	73	-	25	36.5	M5	2.2	120.0	94	43	23	4
F50	1210	32	78	79.0	25	39.0	38	3.1	38	16.00	92	79	32	46.0	M5	4.0	133.5	100	43	28	4
F60	1610	42	86	103.0	25	43.0	38	5.2	48	16.00	112	73	38	43.0	M6	5.0	165.0	125	43	36	5
F70	1610	42	92	76.0	25	50.5	38	7.4	55	19.05	132	82	45	50.5	M6	8.0	197.0	144	10	42	5
F80	2012	50	111	95.0	32	53.0	47	9.2	65	25.40	149	95	51	53.0	M10	12.0	211.0	167	10	47	6
F85	2012	50	112	103.0	32	53.5	47	12.5	70	31.75	154	103	53	53.5	M12	14.0	222.0	179	13	48	6
F90	2517	60	140	110.0	45	59.5	50	15.0	76	31.75	164	110	57	59.5	M12	15.0	235.0	188	13	50	6
F100	2517	60	148	124.0	45	61.5	50	20.0	85	31.75	178	124	60	61.5	M12	21.0	254.0	216	13	58	6
F110	2517	60	140	134.0	45	63.5	50	26.5	90	31.75	180	134	65	63.5	M12	28.0	279.0	233	14	50	6
F120	3020	75	157	152.0	51	70.0	68	35.5	102	38.10	207	152	76	70.0	M12	41.0	314.0	264	14	55	6
F140	3535	90	204	194.5	89	76.0	89	67.2	120	75.00	204	195	89	76.0	M20	61.0	359.0	313	14	26	8
F160	4040	100	220	216.0	102	78.0	110	91.0	140	75.00	220	216	102	78.0	M20	86.0	402.0	345	19	16	8
F180	4545	110	258	266.0	114	94.0	126	146.0	150	75.00	258	266	114	94.0	M20	141.0	470.0	398	19	30	10
F200	4545	110	278	266.0	114	103.0	126	182.0	150	75.00	276	266	114	103.0	M20	179.0	508.0	429	19	48	12
F220	5050	127	312	267.0	127	118.0	140	320.0	160	90.00	312	267	127	118.0	M20	312.0	562.0	474	20	56	12
F250	-	-	-	-	-	-	-	-	190	100.00	360	290	150	125.0	M20	500.0	628.0	532	25	60	12

* Weights given are for min. bore complete coupling.

† M is the distance between flanges.

Shaft ends, although normally located 'M' apart - can project beyond the flanges as shown. In this event, allow sufficient space between shaft ends for the float and misalignment.

‡ G is the amount by which clamping screws need to be withdrawn to release tyre.

§ J is the wrench clearance to allow for tightening and loosening the bush on the shaft. The use of shortened wrench will allow this dimension to be reduced.

Dimensions are in millimetres

Power Ratings

TABLE 07-03 : POWER RATINGS (kW)

Speed (rev/min)	COUPLING SIZE																
	F40	F45	F50	F60	F70	F80	F85	F90	F100	F110	F120	F140	F160	F180	F200	F220	F250
100	0.22	0.39	0.56	1.11	1.70	2.65	3.2	3.82	5.29	7.46	12.4	19.7	32.6	57.4	84	104	132
200	0.44	0.78	1.11	2.22	3.39	5.30	6.4	7.64	10.00	14.90	24.8	39.4	65.2	115	168	209	264
300	0.66	1.17	1.67	3.33	5.09	7.95	9.6	11.50	15.90	22.40	37.1	59.1	97.8	172	252	313	396
400	0.88	1.56	2.22	4.44	6.79	10.60	12.8	15.30	21.20	29.80	49.5	78.8	130	230	336	418	529
500	1.10	1.95	2.78	5.55	8.48	13.20	16.0	19.10	26.40	37.30	61.9	98.5	163	287	420	522	660
600	1.32	2.34	3.33	6.66	10.20	15.90	19.2	22.90	31.70	44.70	74.3	118	196	345	504	627	793
700	1.54	2.73	3.89	7.77	11.90	18.50	22.4	26.80	37.00	52.20	86.6	138	228	402	588	731	925
720	1.58	2.80	4.00	7.99	12.20	19.10	23.0	27.50	38.10	53.70	89.1	142	235	414	605	753	951
800	1.76	3.12	4.44	8.88	13.60	21.20	25.6	30.60	42.30	59.60	99.0	158	261	459	672	836	1057
900	1.98	3.00	5.00	9.99	15.30	23.80	28.8	34.40	47.60	67.10	111.0	177	293	517	756	940	1198
960	2.11	3.74	5.33	10.70	16.30	25.40	30.7	36.70	50.80	71.60	119.0	189	313	551	806	1003	1269
1000	2.20	3.90	5.55	11.10	17.00	26.50	32.0	38.20	52.90	74.60	124.0	197	326	574	840	1045	1322
1200	2.64	4.68	6.66	13.30	20.40	31.80	38.4	45.90	63.50	89.50	149.0	236	391	689	1008		
1400	3.08	5.46	7.77	15.50	23.80	37.10	44.8	53.50	74.00	104.00	173.0	276	456	804			
1440	3.17	5.61	7.99	16.00	24.40	38.10	46.0	55.00	76.10	107.00	178.0	284	469	827			
1600	3.52	6.24	8.88	17.80	27.10	42.40	51.2	61.20	84.60	119.00	198.0	315	522				
1800	3.96	7.02	9.99	20.00	30.50	47.70	57.6	68.80	95.20	134.00	223.0	355					
2000	4.40	7.80	11.10	22.20	33.90	53.00	64.0	76.40	106.00	149.00	248.0						
2200	4.84	8.58	12.20	24.40	37.30	58.30	70.4	84.10	116.00	164.00							
2400	5.08	9.36	13.30	26.60	40.70	63.60	76.8	91.70	127.00								
2600	5.72	10.14	14.40	28.90	44.10	68.90	83.2	99.40	137.00								
2800	6.16	10.92	15.50	31.10	47.50	74.20	89.6	107.00									
2880	6.33	11.23	16.00	32.00	48.90	76.30	92.1	110.00									
3000	6.60	11.70	16.70	33.30	50.90	79.50	96.0										
3500	7.70	13.65	19.40	38.90	59.40	The figures in heavier type are for standard motor speeds											
3600	7.92	14.04	20.00	40.00													

For speeds below 100 rev/min and intermediate speeds, use normal torque ratings.

Fenner Tyre Couplings

Physical Characteristics

TABLE 07-04 : PHYSICAL CHARACTERISTICS

Size	Max. Speed (rev/min)	Torque (Nm)		Moment of inertia MR^2 (kgm ²)	Torsional Stiffness (Nm/°)	Maximum Misalignment (mm)	
		Nominal	Max.			Parallel	End float ±
F40	4500	21	64	0.00148	5	1.1	1.3
F45	4500	37	110	0.00250	9	1.2	1.5
F50	4500	53	160	0.00349	13	1.3	1.7
F60	4000	106	318	0.01030	26	1.6	2.0
F70	3600	162	487	0.01811	41	1.9	2.3
F80	3100	253	759	0.03679	63	2.1	2.6
F85	3000	305	915	0.05015	76	2.2	2.8
F90	2880	365	1096	0.06374	91	2.4	3.0
F100	2600	505	1517	0.11989	126	2.6	3.3
F110	2300	712	2137	0.16012	178	2.9	3.7
F120	2050	1182	3547	0.34302	296	3.2	4.0
F140	1800	1881	5642	0.69452	470	3.7	4.6
F160	1600	3113	9339	1.21767	778	4.2	5.3
F180	1500	5485	16455	2.01800	1371	4.8	6.0
F200	1300	8022	23508	4.03446	1959	5.3	6.6
F220	1100	9932	33125	8.67644	2760	5.8	7.3
F250	1000	12606	42740	16.85095	3562	6.6	8.2

Notes :

1. Maximum torque figures should be regarded as short duration overload ratings for use in such circumstances as direct-on-line starting etc.
2. All flexible tyres have an angular misalignment capacity upto 4°

TABLE 07-05

Coupling Size		F40*	F45*	F50*	F60*	F70	F80	F85	F90	F100	F110	F120	F140	F160	F180	F200	F220	F250
M2 (mm)		23	23	28	36	42	47	48	50	58	50	55	26	16	30	48	56	60
Clamping Screw Torque	Nm	15	15	15	15	24	24	32	32	32	32	35	35	35	35	35	38	38

* Hexabonal Socket Cap Head Clamping Screws on these sizes.

INSTALLATION

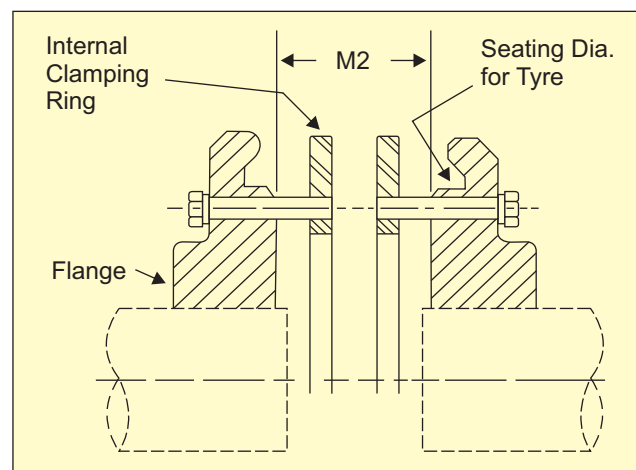
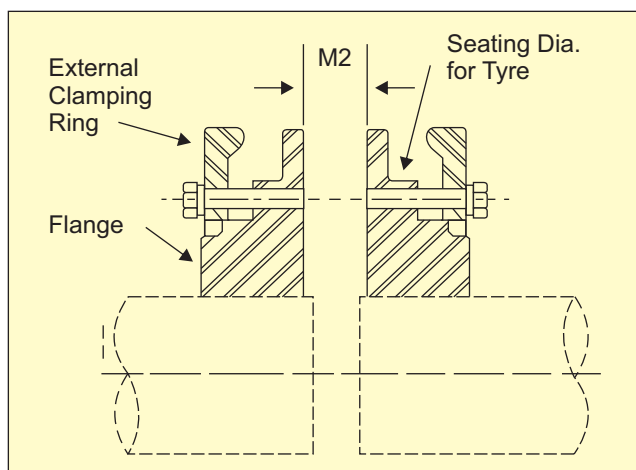
INSTALLATION INSTRUCTIONS

Note : Satisfactory performance depends on correct installation and maintenance. All instructions in this manual must therefore be followed carefully.

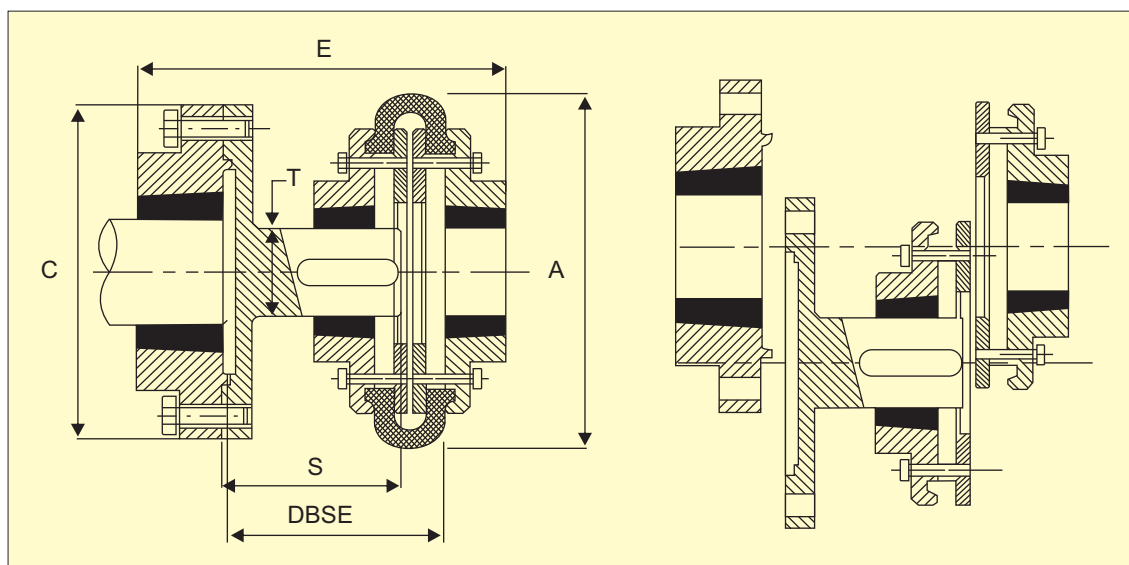
1. Thoroughly clean all components, paying particular attention to the removal of the protective coating in the bore of the flanges.
2. Fit flanges to the shafts placing the external clamp rings on the shafts. (Where Taper-Lock® flanges are used, see separate fitting instructions supplied with the Taper-Lock® Bushes). Locate flanges so that dimension M2 is obtained (see paragraph 3). Flanges with internal clamping rings should then have the clamping rings fitted, engaging only two or three of the threads of the screws at this time.
3. Bring shafts into line until dimension M2 is obtained (table 07-05). If shaft end float is to occur, locate the shafts at mid-position of end float when checking dimension M2. Note that shaft ends may project beyond the faces of the flanges if required. In this event, allow sufficient space between shaft ends for end float and misalignment. Flanges should be fitted flush with the end of the shaft when used with Mill-Motor flanges.
4. Check parallel alignment by laying a straight edge across the flanges at several positions around the circumference. Check angular alignment by measuring gap between flanges at several positions around the circumference. It is desirable to align the coupling as accurately as possible, particularly on high speed applications.
5. Open out tyre and fit over coupling flanges ensuring that the tyre beads seat properly on the flanges and/or clamping rings. To ensure proper seating, it may be necessary to strike the outside diameter of the tyre with a small mallet. When seated, there should be a gap between the ends of the tyre as shown in table 6.
6. Tighten clamping ring screws alternately and evenly (half turn at a time) working round each flange until the required screw torque is achieved.

TABLE 07-06

COUPLING SIZE	F40 TO F60	F70 TO F120	F140	F160 TO F180	F200 TO F250
Tyre Gap in mm.	2	3	5	6.5	8



Fenner Tyre Spacer Couplings



Comprising a Fenner Tyre coupling (size F40-F140) complete with a spacer flange designed for use on applications where it is an advantage to be able to move either shaft axially without disturbing the driving or driven machine; e.g. centrifugal pump rotors. Fenner Type spacer couplings are primarily designed for the standard distance between shaft end dimensions 100, 140 and 180 mm.

TABLE 07-07

SPACER SIZE	DBSE	FENNER TYRE COUPLING SIZE	SPACER BUSH SIZE	MAX. BORE	FENNER TYRE COUPLING BUSH SIZE	MAX. BORE	A	C	E	S	T
SM12	80	F40	1210	32	1008	25	104	118	134	77	25
SM12	100	F40	1210	32	1008	25	104	118	140	97	25
SM16	100	F40 *	1615	42	1008	25	104	127	170	94	32
SM16	140	F40 *	1615	42	1008	25	104	127	210	134	32
SM16	100	F50	1615	42	1210	32	133.5	127	173	94	32
SM16	140	F50	1615	42	1210	32	133.5	127	213	134	32
SM16	100	F60	1615	42	1610	42	165	127	177	94	32
SM16	140	F60	1615	42	1610	42	165	127	214	134	32
SM25	100	F70	2517	60	1610	42	197	178	180	94	42
SM25	140	F70	2517	60	1610	42	197	178	220	134	42
SM25	180	F70	2517	60	1610	42	197	178	260	174	42
SM25	100	F80	2517	60	2012	50	211	178	193	94	48
SM25	140	F80	2517	60	2012	50	211	178	233	134	48
SM25	180	F80	2517	60	2012	50	211	178	273	174	48
SM25	140	F90	2517	60	2517	60	235	178	235	134	48
SM25	180	F90	2517	60	2517	60	235	178	275	174	48
SM30	140	F100	3030	75	2517	60	254	216	269.5	134	60
SM30	180	F100	3030	75	2517	60	254	216	309.5	174	60
SM30	140	F110	3030	75	2517	60	279	216	369.5	134	60
SM30	180	F110	3030	75	2517	60	279	216	309.5	174	60
SM35	140	F120	3535	90	3020	75	314	248	297.5	134	75
SM35	180	F120	3535	90	3020	75	314	248	327.5	174	75
SM35	140	F140	3535	90	3535	90	359	248	296	134	80
SM35	180	F140	3535	90	3535	90	359	248	336	174	80

* F40 'B' Flange must be used to fit spacer shaft.

FENNER TAPERLOCK® BUSHES



Using Fenner Taper-Lock® Bushes, it is possible for unskilled labour to achieve 'shrink fit' of pulleys, coupling etc., onto shafts using only a hexagonal wrench.

The arrangement of half-threaded holes and longitudinally split tapered bushes ensures maximum grip and fast, easy fitting. Tightening of the screws into the threaded holes in the hub forces the bush into the taper bored components, thereby effectively contracting the bore of the Taper-Lock® Bush until the equivalent of a 'shrink fit' is obtained.

Taper-Lock® Bushes are suitable for metric as well as imperial shafts.

ADVANTAGES

- No reboring and keywaying costs.
- Saves time and cost in fitting.
- Eliminates precision taper fitting keys.
- 239 bush size/bore combinations are available.
- Interchangeable between many products.
- Taper bored components can be transferred to other diameter shafts by fitting alternative bore bushes.
- Convenience in dismantling for maintenance and component replacement.
- Accommodates shaft limits of +0.051 mm/-0.127mm.

The benefits of using Taper-Lock® Bushes can be extended to include components which have a parallel bore by incorporating Taper-Lock® Adaptors, Taper-Lock® Bolt-on Hubs or Taper-Lock® weld-on Hubs.

The Fenner logo is displayed in a bold, green, sans-serif font. It is positioned on the left side of the page, overlaid on a blue-tinted background image of industrial machinery.

Gear Couplings

09



Gear Couplings



Fenner Curved Tooth Flexible Gear Couplings are the result of many years of experience in the field of Mechanical Power Transmission.

These Gear Couplings are distinguished by their mechanical flexibility and compensation of Angular, Parallel and Axial misalignments of the connected shafts. They are made for extensive use in Metal Rolling Mills, Paper Machinery, Cranes, Dredgers, Rubber and Plastic Industries, Cement Plants, Conveyors and Elevators, Compressors, Fans and Blowers, Screens and other general industries.

09-01

Fenner Gear Couplings

Flexible Gear Couplings basically consist of two hubs, with crowned external teeth and two outer sleeves with internal spur teeth.

Gear Hubs and the outer sleeves are manufactured from carbon steel and are hardened to the required degree. They are machined to fine tolerances for proper meshing of the gears as well as for inter-changeability.

HUBS :

The teeth of Gear Hubs are crowned and are generated by involute system. The amount of crowning and backlash values are so chosen as to ensure the best results in torque transmission, greater flexibility and smooth operations.

SLEEVES :

The internal teeth of the sleeves are generated to ensure correct profile. The coupling sleeves are joined together with high tensile steel bolts (class 8.8 IS : 1367) fitted using a gasket in between them.

'O' RINGS :

The setting of special 'O' Rings at the ends of coupling hubs prevents leakage of lubricants and entry of dust. The 'O' rings can also withstand high degree of temperature upto 120°C

SEAL CARRIERS :

Seal carriers have been provided for sizes from FGC 11 to FGC 19 to facilitate inspection and replacement of 'O' rings without disturbing the alignment.

POWER RATINGS :

The normal power ratings are given in the Table. For selection of the correct size of couplings, proper service factor depending on the type of machines and the peak load should be considered.

SERVICE FACTOR :

Generally, for medium duty use a service factor of 1.5. For heavy duty use a factor of 2 and for extra heavy duty a factor of 3 should be used. **For special applications please contact Fenner with full details.**

LUBRICATION :

The coupling must be filled with grease or oil. It is recommended to use grease where the maximum temperature is within 80°C and for temperature above

80°C, oil should be used. When using grease it is suggested to fill the coupling completely with Lithium based grease with EP additives (NLGI-No.1 consistency). When the coupling is to be filled with oil, fill half the coupling with EP Gear Oil.

RECOMMENDATION FOR GREASE & OIL:

Grease : Indian Oil - Servogem
EP 1 or equivalent

Oil : Indian Oil - Servomesh
SP 680 or equivalent

SELECTION OF THE COUPLINGS:

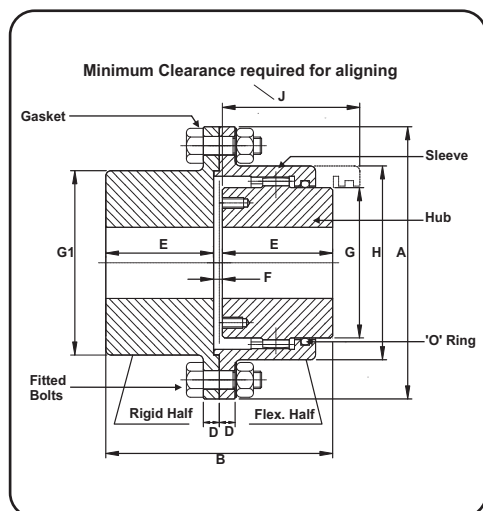
The following details are required for selection of the coupling :

1. Type of driven machine.
2. Power absorbed by the driven machine and Peak load.
3. Speed and Diameter of the connecting shafts and space available for accommodating the coupling.
4. Maximum misalignment to be compensated.
5. Surrounding temperature.
6. Any other special feature of the drive.

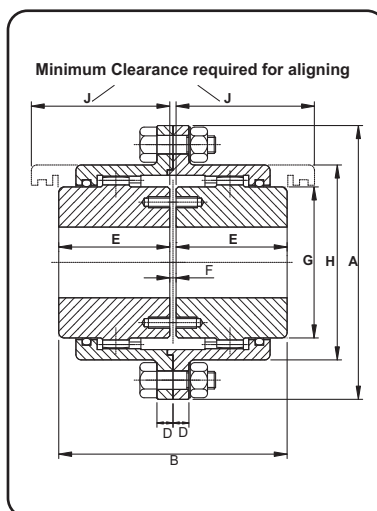
Example : A gear coupling is required to transmit 250 KW from an Electric Motor running at 730 rev/min to a Pulper Machine. Considering the peak load as 180% of full load, the Motor shaft as 100 mm and the Pulper shaft as 110 mm, select a suitable gear coupling.

- a) Service factor : 2 (for heavy duty application)
- b) Peak load : 180% of full load.
- c) Design power : $250 \times 180 / 100 \times 2 = 900 \text{ KW}$
- d) Power to be transmitted at 100 rev/min :
 $900 \times 100 / 730 = 123.3 \text{ KW}$
- e) Coupling size : By referring to the Table, coupling size FGC 5, has got a rating of 150 KW at 100 rev/min which exceeds the required power of 123.3KW. The bore range is 60 mm to 110 mm. Hence, size FGC 5 is selected for the application.

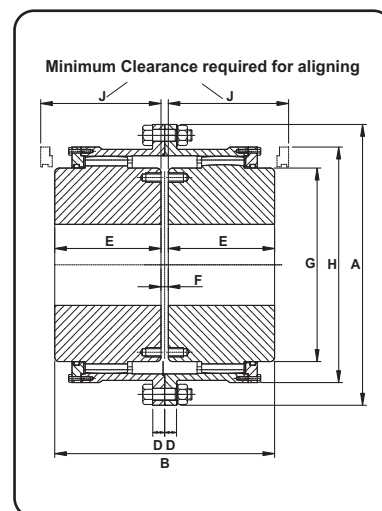
Fenner Gear Couplings



Half Flexible Coupling



Couplings
Size 1 To 10



Couplings
Size 11 To 19

Table : 09-01

Coupling No / Size	Power at 100 rpm in Kw	Maximum Torque in Nm	Hub Bore (mm)			Dimensions (mm)								
			Min.	Max Flex	Max Rigid	A	B	D	E	F	G	G 1	H	J
FGC 1	11.5	1100	14	55	60	170	115	17	55	5	78	90	110	65
FGC 2	28.5	2720	20	60	75	185	145	17	70	5	85	110	125	85
FGC 3	51.5	4920	30	75	90	220	175	20	85	5	107	130	150	105
FGC 4	96.5	9220	40	100	110	250	215	20	105	5	138	160	178	125
FGC 5	150	14320	46	120	130	290	240	25	115	10	166	185	204	140
FGC 6	230	21960	50	125	150	320	260	25	125	10	176	215	230	155
FGC 7	390	37250	60	145	170	350	290	25	140	10	208	240	260	175
FGC 8	515	49180	70	165	200	380	330	25	160	10	230	285	290	200
FGC 9	644	61500	80	200	220	430	340	25	165	10	270	315	332	210
FGC 10	930	88800	100	230	260	490	370	25	180	10	315	370	390	230
FGC 11	1265	120800	110	260	280	545	410	30	200	10	350	380	445	270
FGC 12	1600	152800	150	300	310	590	490	30	240	10	404	420	490	300
FGC 13	2880	275000	160	330	340	680	535	35	260	15	442	480	555	320
FGC 13A	3980	380000	200	340	370	730	575	35	275	25	470	520	595	350
FGC 14	3980	380000	200	370	370	730	575	35	280	15	500	520	610	340
FGC 14A	4765	455000	230	360	400	780	635	35	305	25	510	560	640	375
FGC 15	4765	455000	230	410	400	780	655	35	320	15	540	560	660	385
FGC 16	6800	650000	260	450	460	900	720	45	350	20	630	650	755	425
FGC 16A	8375	800000	300	490	530	1000	815	40	395	25	700	750	855	470
FGC 17	9000	850000	300	520	530	1000	820	45	400	20	720	750	855	490
FGC 17A	10730	1025000	320	540	580	1100	920	40	440	40	750	820	955	525
FGC 18	11800	1120000	320	620	580	1100	920	55	450	20	820	820	950	535
FGC 18A	12700	1200000	400	600	700	1250	1000	55	475	50	840	920	1050	560
FGC 19	15500	1470000	400	710	700	1250	1000	55	485	30	915	920	1050	560

All dimensions are subject to alteration without notice.



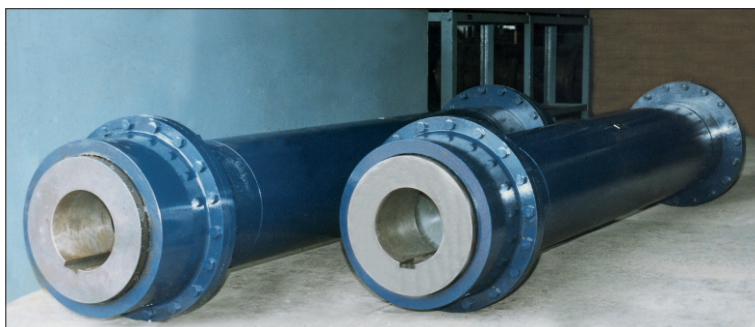
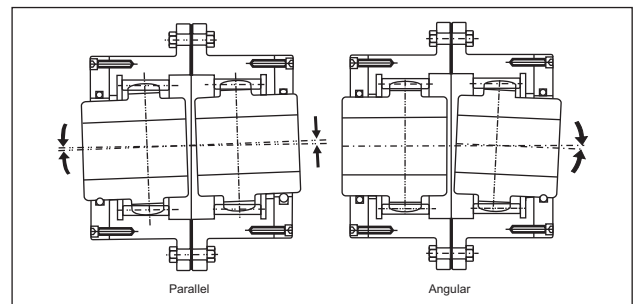
Fenner Gear Couplings

Coupling No. / Size	Approx. Weight in Kg.		Approx. Gd ² Value in Kg M ²		Maximum Speed RPM	Clamping Bolt Size	No. of Bolts	Max. Misalignment Capacity			Amount of Grease / Oil	
	Full Flex	Half Flex	Full Flex	Half Flex				Parallel (mm)	Axial Float (mm)	Angular per Gear Mesh	Kg.	Ltr.
FGC 1	11	10.5	0.14	0.11	6700	M12 X 50	6	0.80	0.5	1.5°	0.25	0.20
FGC 2	16	15	0.21	0.18	6100	M12 X 50	6	0.95			0.50	0.40
FGC 3	26	26	0.45	0.44	5200	M16 X 60	6	1.10			0.80	0.60
FGC 4	41	42	0.98	0.88	4500	M16 X 60	8	1.30			1.00	0.80
FGC 5	63	63	1.90	1.90	3950	M20 X 75	8	1.45			1.80	1.50
FGC 6	86	87	3.05	3.06	3500	M20 X 75	8	1.55	1.0		2.40	2.00
FGC 7	120	120	5.25	5.20	3250	M20 X 75	10	1.80			3.50	3.00
FGC 8	165	170	8.52	8.63	3000	M20 X 75	12	1.90			4.00	4.00
FGC 9	210	220	15.00	15.00	2600	M24 X 80	10	2.25			5.50	5.00
FGC 10	310	320	28.67	29.00	2300	M24 X 80	12	2.60			8.50	8.00
FGC 11	454	430	52.00	46.18	2100	M24 X 90	12	3.30	2.0		12.50	12.00
FGC 12	630	590	88.60	76.57	1900	M24 X 90	14	3.50			14.00	16.00
FGC 13	887	850	155.00	140.00	1550	M30X110	14	6.65			16.00	20.00
FGC 13A	1050	1050	215.00	203.00	1400	M30X110	16	7.35	3.0		18.00	24.00
FGC 14	1097	1050	230.00	203.00	1400	M30X110	16	7.35			18.00	24.00
FGC 14A	1310	1350	300.00	305.00	1350	M30X110	18	8.15			25.00	33.00
FGC 15	1440	1350	352.00	305.00	1350	M30X110	18	8.15			25.00	33.00
FGC 16	2120	2000	670.00	611.20	1150	M36X130	18	8.55			40.00	49.00
FGC 16A	3057	2900	1210.00	1132.00	1050	M36X120	20	9.15			55.00	64.00
FGC 17	3100	2900	1275.00	1132.00	1050	M36X130	20	9.15			55.00	64.00
FGC 17A	4196	4050	2030.00	1913.00	950	M36X120	20	9.65			60.00	72.00
FGC 18	4370	4050	2198.00	1913.00	950	M36X150	20	9.65			60.00	72.00
FGC 18A	5430	5200	3410.00	3179.00	825	M48X165	20	10.25			70.00	80.00
FGC 19	5590	5200	3588.00	3179.00	825	M48X165	20	10.25			70.00	80.00
All dimensions are subject to alteration without notice.												

All dimensions are subject to alteration without notice.

MISALIGNMENT :

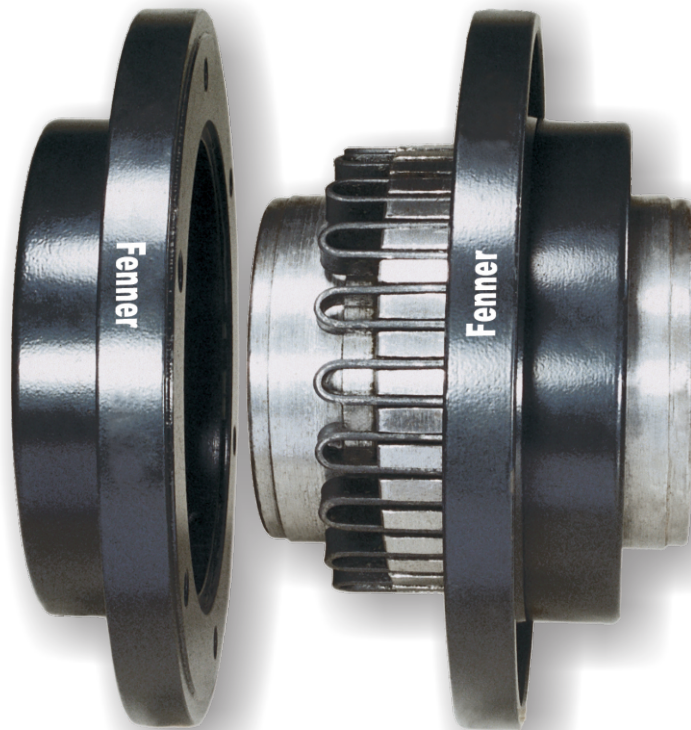
The crowning of the teeth allows the coupling to withstand parallel misalignment upto a maximum of 10.25 mm and angular misalignment upto a maximum of 1.5° per gear mesh. The coupling can also absorb axial displacement of the shafts upto a maximum of 3 mm.



Note: Custom built Gear Spacer Couplings and Torsion Shaft Gear Couplings are also manufactured & supplied as per requirements. Please contact Fenner with all details.

Fenner

Resilient Couplings



Resilient
Couplings

10

Fenner Resilient Couplings give you a combination of advantages of high power rating of a gear coupling and flexibility of elastomer coupling. They are easy to install and simple to maintain. The flexible grids are quickly replaceable without disturbing the connected equipment.

Fenner Resilient Couplings are available in broad range of sizes covering from 0.45 kW to 1307 kW per 100 rpm and bores upto 267mm.

10-01

F Fenner Resilient Couplings

FEATURES :

- All metal construction having no fast wearing out components.
- Accurately machined. Dynamic balancing is normally not required.
- Torsionally flexible. Progressive torsional flexibility (due to curved profile) provides protection against shock load impact load and vibration.
- Heat treated spring steel grid absorbs high impact shocks without loss of energy.
- Transmits full torque with dampened vibration and reduce peak loads.
- When over load occurs, grid fails and prevents failure of the Shaft or machinery part connected to the coupling.
- When parallel misalignment is too severe, the related machine is protected by the virtue of shearing of Grid or Tooth.
- Extended life of parts of machines (Mechanical seal and Bearing etc.)
- Easy to install.

• AVAILABLE IN TWO VARIANTS :

- **Horizontally split covers :** Easy access to grid. Ideal where space is tight.
- **Vertically split covers :** Ideal for higher running speeds

• SIMPLE AND EASY MAINTENANCE :

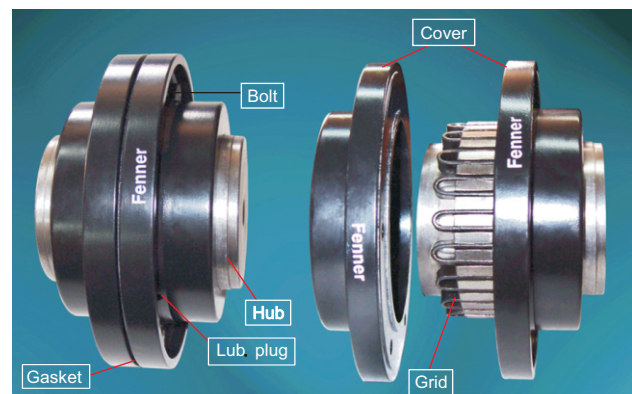
Fewer and less complicated components facilitate easy maintenance.

CONSTRUCTION :

A High torque Resilient Coupling basically comprises a grid spring which connects two hubs one on the driving and the other on the driven shafts through axially cut grooves around the peripheries of the two hubs. The spring, which is of special design compatible to the required characteristics of the system, form a series of resilient bridges along the grooves. The grooves are flared to allow the grid members long flexible spans under normal loads as well as better support by the sides of the grooves under over load conditions.

The stiffness of the spring and thus the coupling depends on the length of each flexible span not in the contact with the grooves. Subsequently, the contact length changes with every variation in torque, resulting in change in the stiffness of the coupling at every instant during a vibration cycle. Consequently this produces a powerful detuning action resulting in continuous alteration of the torsional vibration frequency and prevention of a build up of resonance in the system.

The principle of design adopted in Resilient Coupling, makes it capable to accommodate considerable axial, parallel and angular misalignment between a driving machine and a driven machine. Simultaneously, it can absorb considerable overloads due to high torque with consequent reduction in wear and tear on plants and machinery. With the use of resilient couplings, break-down and down time in any manufacturing unit, will be minimum.



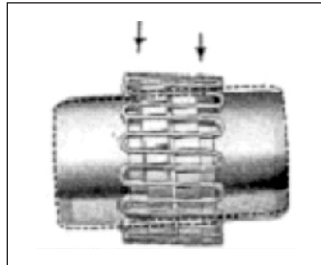
Fenner Resilient Couplings

BENEFITS :

1. Protection against shaft misalignment :

Parallel :

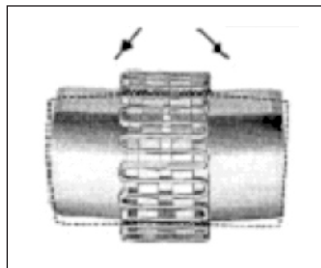
The movement of the grid of the grid in the groove accommodates misalignment and still permits full functioning of the grid-groove action in damping out shock and vibration.



Parallel

Angular :

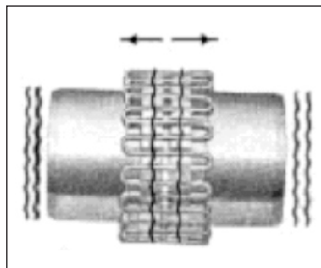
Under angular misalignment, the grid-groove design permits a rocking and sliding action of the grid and hubs without any loss of power through the resilient grid.



Angular

Axial :

End float for both driving and driven members is permitted because the grid slides freely in the grooves

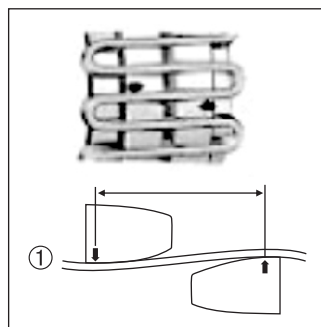


Axial

2. Protection against Shock loads, Vibration & Thrust loads :

Light Load :

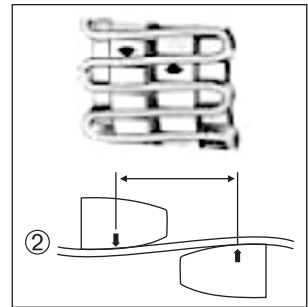
The grid bears near the outer edges of the hub teeth. The long span between the points of contact remains free to flex under load variations.



Light Load

Normal Load :

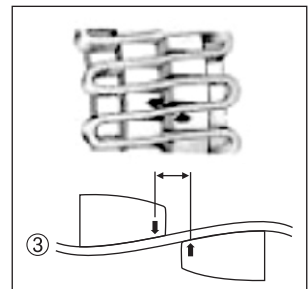
As the load increases, the distance between the contact point & on the hub teeth is shortened, but a free span still remains to cushion shock loads.



Normal Load

Shock Load :

The coupling is flexible within its rated capacity. Under extreme over-loads, the grid bears fully on the hub teeth and transmits full load directly.



Shock Load

APPLICATION :

Agitators
Haulages
Punching Machines
Alternators
Machine Tools
Refrigerators
Ball Mills
Mixers Pulverisers
Traction tube Mills
Fans
Pumps
Winders

Conveyors
Paper Mills
Steam turbines
Cranes
Pulp Mills
Textile Machinery
Crushers
Rolling Mills
Cement Mills
Motor Generators
Rubber Machinery

F Fenner Resilient Couplings

DESIGNATION :

FRC	4	Z	Z _____	(Up to size 17) Vertically split cover
			Y _____	(Size 20 to 23) Vertically split cover
			X _____	Axially split cover
			S _____	Vertically split cover
				Cover
				Coupling size
				Fenner Resilient Coupling

GENERAL GUIDELINES FOR SELECTION OF COUPLING :

1. Determine service factor corresponding to the type of application under consideration from the Table of Service Factors.
2. Determine the maximum Horse Power : $\text{Normal rated H.P.} \times \text{Service Factor of Drive} \times \text{Service Factor of Prime Mover.}$
3. Determine Rating of coupling $= \frac{\text{Maximum H.P.}}{\text{Rated R.P.M. of Drive}}$

After having determined the rating of coupling, select a coupling corresponding to the rating from the Tables of Types & Sizes, and simultaneously check whether maximum bore and recommended speed of the coupling correspond to the requirements of the drive. If the allowable maximum bore is too small, select a larger Coupling; in case allowable safe speed is too low, a different type of Coupling will have to be considered.

EXAMPLE :

Required a coupling to connect a 20 H.P. / 980 R.P.M. Motor to a speed reducer driving an inclined assembly conveyor. Motor shaft diameter is 40mm and reducer shaft diameter is 38mm.

Service factor from Table	:	1
Prime Mover Factor	:	1
Required rating of Coupling	=	$\frac{20 \text{ H.P.} \times 1 \times 1}{980}$
	=	0.020 H.P./R.P.M.
Recommended Coupling size is		"FRC 3"

Fenner Resilient Couplings

APPLICATION AND SERVICE FACTOR

Type of Applications	Factor	Type of applications	Factor
Agitator	2.0	Machine Tools:	
Blower	2.0	Main Drive	2.0
Compressor , Centrifugal/rotary	2.5	Auxiliary drive	1.5
		Traverse drive	1.5
Conveyor	1.0	Bending Roll ,Notching Press	
Apron, Belt, Chain	2.0	Punch Press, Planer, Plate-	
Bucket	3.0	Reversing	3.0
Live Roll, Shaker		Mixers	
		Concrete & Muller	2.5
Cranes & Hoist		*Paper mill	1 to 5
Class 1&2:Hoists	3.0	Fans	
Bridge ,travel or Trolley	2.5	Cooling Tower & Mine	2.5
Class 3 & 4:Hoists	4.0	Industrial	2.0
Bridge, Travel or Trolley	3.0	Pumps:	
		Centrifugal-even load	1.3
Crushers , Stones & Ores	4.0	under load	1.8
Dynamometer	2.0	Gear, Rotary or vane	2.0
Elevators , Bucket	2.5	Reciprocating- 1 or 2 cyl.	3.0
Escalators	2.0	3 or more cyl	2.5
Extruder , Plastics / Rubber	2.0		
Feeders:		Rubber Industry:	
Apron, Belt, Screw-Horizontal	1.0	Mixing Mill, Refiner	3.0
		Worming Mill	2.5
Generators:		Others	1.5 to 3
Even Load	1.7	Screens:	
Hoist or Rly. Service	2.5	Rotary, Coal or Sand	2.0
Welder Load	2.5	Vibrating	3.5
Hammer Mill, Cement or Mines	2.5	*Steel Mills/Rolling Mills	2 to 6
Haulage, Mining	3.0	Stoker	1.5
Kiln, Rotary for cement, Mining	3.0	Turbo-Generator	1.3
Line Shaft	2.0	Winch, Maneuvering:	
		Dredge, Marine	2.0
		Wood working Machinery	1.5

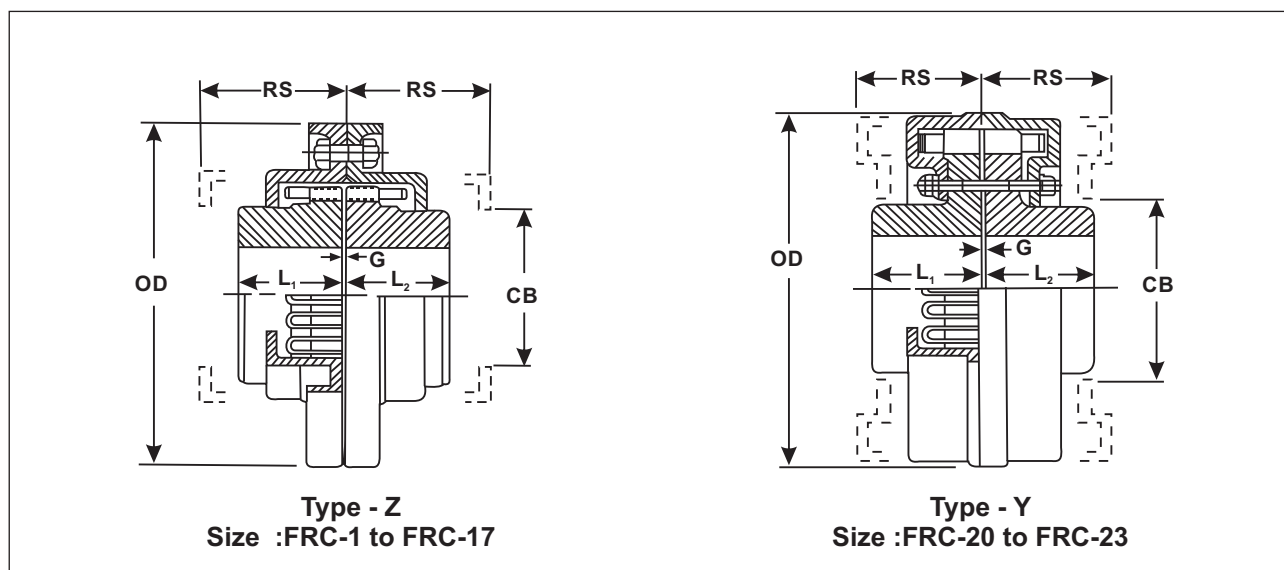
PRIME MOVER FACTOR :

1. Motor or Turbine : 1
2. Steam Engine/Water Turbine : 1.25
3. Gas or Oil Engine :
 - 1 Or 3 Cylinder : 2.0
 - 2 Or 4 Cylinder : 1.5

Note : Transmitted Power at the Coupling should be multiplied by the Prime Mover Factors as above depending on the type of Prime Mover involved in the drive.

** Factors for Paper and Steel Mill drives are for general guidance. As these drives are varied in nature exact factor is to be arrived at after considering individual drives.
Please consult Fenner with drive details.*

STANDARD COUPLINGS-TYPE Z & Y



TYPE - Z

(for use on horizontal shafts only)

Coupling Size	Rating H.P/RPM	Clear Diameter OD (mm)	Boss Length L1 (mm)	Boss Length L2 (mm)	Removal Space RS (mm)	Gap G (mm)	Cover Bore CB (mm)	Safe Speed R.P.M	Stock Rough Bore (mm)	Max. Bore (mm)	Approx. Weight Kgs
FRC-1	0.006	105.00	38.00	38.00	52.00	0.85	44.52	5650	10	29	3
FRC-2	0.010	120.50	38.00	38.00	52.00	0.85	58.80	4750	12	38	4
FRC-3	0.020	144.50	44.50	44.50	59.00	0.85	62.00	4450	16	41	5
FRC-4	0.030	171.50	51.00	51.00	59.00	0.85	87.45	3400	16	57	9
FRC-6	0.045	190.50	51.00	51.00	79.00	0.85	84.25	3200	16	54	11
FRC-7	0.065	197.00	57.00	57.00	79.00	0.85	96.95	2950	16	64	15
FRC-8	0.095	222.00	63.50	63.50	79.00	0.85	119.20	2500	25	78	20
FRC-9	0.125	254.00	70.00	70.00	80.00	0.85	143.00	2150	25	92	27
FRC-10	0.185	276.00	89.00	89.00	80.00	0.85	165.20	1900	25	108	43
FRC-11	0.355	295.00	102.00	102.00	128.00	1.60	155.70	1800	38	102	54
FRC-13	0.455	324.00	101.50	101.50	147.00	1.60	187.46	1650	50	123	63
FRC-14	0.655	336.50	101.50	101.50	147.00	1.60	184.28	1550	50	121	72
FRC-15	0.905	375.00	114.00	114.00	147.00	1.60	222.38	1350	50	146	104
FRC-17	1.255	425.50	127.00	127.00	147.00	1.60	254.00	1200	50	167	149

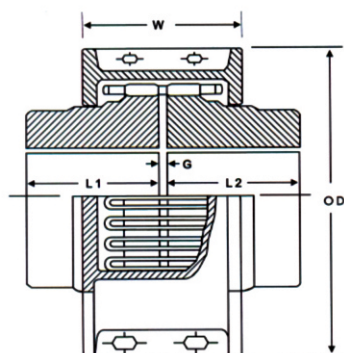
TYPE - Y

(for use on horizontal shafts only)

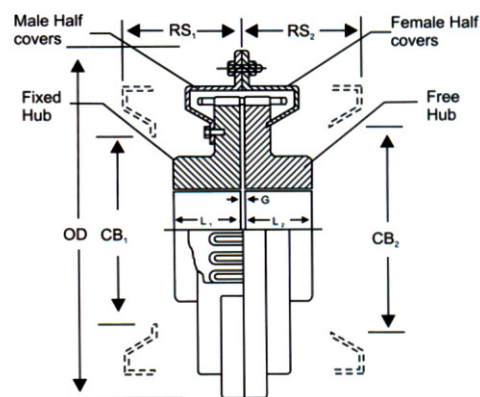
Coupling Size	Rating H.P/RPM	Clear Diameter OD (mm)	Boss Length L1 (mm)	Boss Length L2 (mm)	Removal Space RS (mm)	Gap G (mm)	Cover Bore CB (mm)	Safe Speed R.P.M	Stock Rough Bore (mm)	Max. Bore (mm)	Approx. Weight Kgs
FRC-20	1.755	432.00	140.00	140.00	179.00	3.20	239.50	1200	75	157	175
FRC-21	2.405	432.00	140.00	140.00	179.00	3.20	239.50	1200	75	157	180
FRC-22	2.755	492.00	152.50	152.50	179.00	3.20	266.70	1100	85	173	207
FRC-23	3.505	492.00	152.50	152.50	179.00	3.20	266.70	1100	85	173	216

Fenner Resilient Couplings

STANDARD COUPLINGS-TYPE X & S



TYPE - X - AXIALLY SPLIT COVER
SIZE :FRC-1 TO FRC-23



TYPE - S - VERTICAL SPLIT COVER
SIZE :FRC-25 TO FRC-28

TYPE - X

(for use on horizontal shafts only)

Coupling Size	Rating H.P/RPM	Clear Diameter OD (mm)	Boss Length L1 (mm)	Boss Length L2 (mm)	Cover Width W (mm)	Gap G (mm)	Safe Speed R.P.M	Stock Rough Bore (mm)	Max. Bore (mm)	Approx. Weight Kgs
FRC-1	0.006	104.00	38.00	38.00	57.00	0.85	3600	10	29	3.0
FRC-2	0.010	120.00	38.00	38.00	64.50	0.85	3350	12	38	4.0
FRC-3	0.020	127.00	44.50	44.50	64.50	0.85	3350	16	41	4.5
FRC-4	0.030	159.00	51.00	51.00	66.00	0.85	2575	16	57	7.5
FRC-6	0.045	178.00	51.00	51.00	84.50	0.85	2350	16	54	12.5
FRC-7	0.065	190.50	57.00	57.00	85.00	0.85	2150	16	64	16.5
FRC-8	0.095	222.50	63.50	63.50	86.50	0.85	1850	25	78	19.5
FRC-9	0.125	244.50	70.00	70.00	86.50	0.85	1650	25	92	27.0
FRC-10	0.185	267.00	89.00	89.00	86.50	0.85	1575	25	108	39.5
FRC-11	0.355	276.00	102.00	102.00	138.00	1.60	1450	38	102	47.5
FRC-13	0.455	324.00	101.50	101.50	157.00	1.60	1300	50	123	67.5
FRC-14	0.655	336.50	101.50	101.50	157.00	1.60	1250	50	121	74.0
FRC-15	0.905	381.00	114.00	114.00	159.00	1.60	1050	50	146	108.5
FRC-17	1.255	425.50	127.00	127.00	160.50	1.60	950	50	167	148.5
FRC-21	2.405	501.50	140.00	140.00	179.00	3.20	800	75	202	234.0
FRC-23	3.505	552.50	152.50	152.50	179.50	3.20	700	85	234	318.0

TYPE - S

(for use on horizontal shafts only)

Coupling Size	Rating H.P/RPM	OD (mm)	Hub Length		Cover Bore		Removal Space		Gap G (mm)	Safe Speed R.P.M	Stock Rough Bore(mm)	Max. Bore (mm)	Approx. Weight Kgs
			L1 (mm)	L2 (mm)	CB1(mm)	CB2(mm)	RS1(mm)	RS2(mm)					
FRC-25	5.55	686.50	178.00	178.00	349.25	427.00	210.00	208.00	3.20	1200	110	191	408
FRC-26	7.55	781.00	203.00	203.00	432.50	511.00	210.00	208.00	3.20	1050	135	216	545
FRC-27	10.55	876.00	228.00	228.00	482.65	573.00	249.00	249.00	6.35	900	145	242	875
FRC-28	17.55	1015.00	228.00	228.00	622.30	711.00	286.00	251.00	6.35	800	155	267	1570

Fenner



HRC Couplings

05

HRC
Couplings

HRC Couplings are essentially general purpose couplings with a flexible element which can accommodate higher degree of misalignment.

- Parallel misalignment upto 0.5 mm
- Axial misalignment upto 1.7 mm

Because of their superior design HRC Couplings can accommodate larger shafts which make them a more economical proposition.

F HRC Couplings

Salient Features

Economy: The design of the HRC coupling has been optimised so that power capacities are balanced to the appropriate shaft diameters utilising Taper-Lock® Bush fixing.

Resilience: Transient peak loads are reduced by flexible component, deflection of which is a prime design consideration.

Misalignment: Incidental parallel, angular and axial displacement of the connected shafts can be accommodated.

Installation: Quick and easy without special tools, only an allen key is required.

Maintenance : Virtually eliminated and no lubricant is required.

Environment: The elastomeric component makes HRC coupling suitable for use in most conditions within a temperature range of - 40°C to + 100°C.

Positive : In the unlikely event of the flexible component being destroyed, the drive will be maintained by the interaction of dogs which are integral with the flanges.



Table: 05-01 - Service Factors

Special Cases	Types of Driving Unit					
For applications where substantial shock, vibration and torque fluctuation occur and for reciprocating machines, e.g. internal combustion engines, piston type pumps and compressors, refer to Fenner with full machine details for torsional analysis.	Electric Motors Steam Turbines			Internal Combustion Engines, Steam Engines Water Turbines		
	Operational hours per day					
Driven Machine Class	8 and under	Over 8 to 16 inclusive	Over 16	8 and under	Over 8 to 16 inclusive	Over 16
Uniform Agitators, Brewing Machinery, Centrifugal Blower and Compressors, Conveyors, Centrifugal Fans and Pumps, Generators, Sewage Disposal Equipment.	1.00	1.12	1.25	1.25	1.40	1.60
Moderate Shock* Clay working machinery, Cranes Hoist, Laundry machinery, Wood working machinery, Machinery Tools, Rotary Mills, Paper Mill machinery, Textile machinery.	1.60	1.80	2.00	2.00	2.24	2.50
Heavy Shock* Reciprocating conveyors, Crushers, Shakers, Metal Mills, Rubber machinery, (Banbury Mixers and Mills), Reciprocating compressors.	2.50	2.80	3.12	3.12	3.55	4.00

* It is recommended that keys (with top clearance if in Taper Lock Bushes) are fitted for applications where load fluctuation is expected.

HRC Couplings

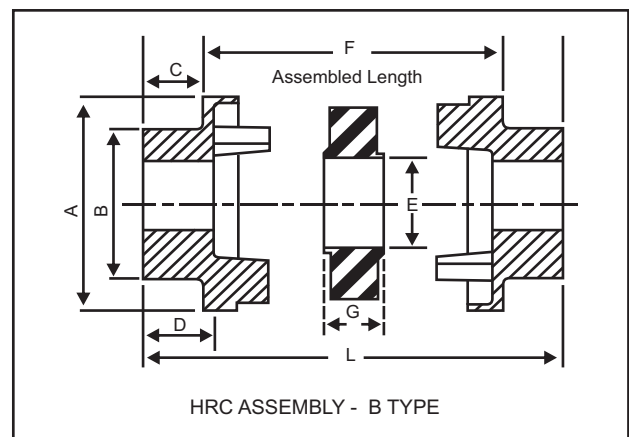
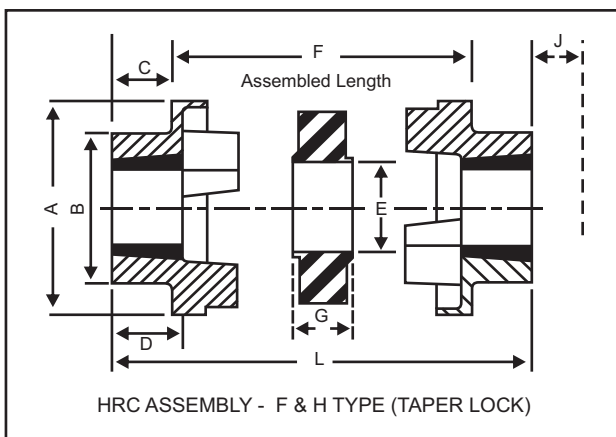
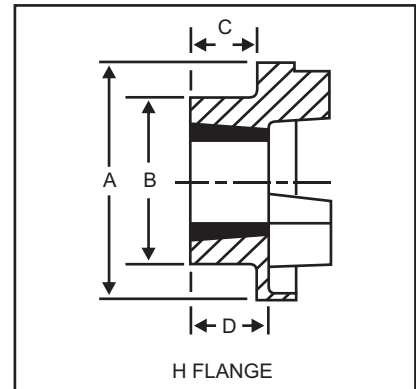
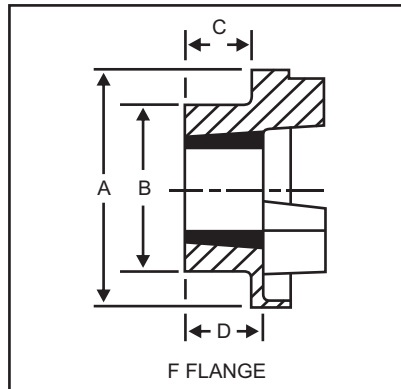
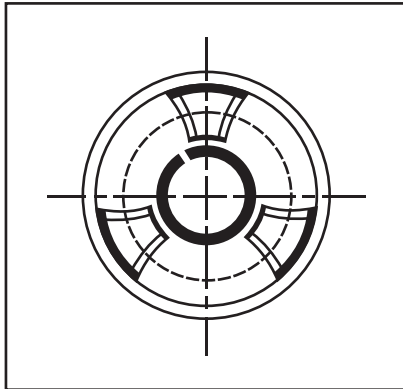


Table: 05-02 - Dimensions

Size	Power at 100rpm kW	Type F & H								Type B						A	B	E	G
		TLB Size	Min. Bore	Max. Bore	C	D	F	L	J*	Min. Bore	Max. Bore	C	D	F	L				
70	0.33	1008	09	25	20.0	24	26.0	66.0	29	10	32	20	24	26.0	66.0	69	60	31	18.0
90	0.84	1108	09	28	19.5	24	31.5	70.5	29	10	35	26	30	30.5	82.5	85	70	32	22.5
110	1.68	1210	11	32	18.5	27	46.0	83.0	38	10	55	37	45	45.0	119.0	112	100	45	29.0
110A	1.68	1610	14	42	18.5	27	46.0	83.0	38	-	-	-	-	-	-	112	100	45	29.0
130	3.30	1610	14	42	18.0	27	54.0	90.0	38	14	60	47	56	54.0	148.0	130	105	50	36.0
150	6.28	2012	14	50	23.5	34	61.0	108.0	44	19	70	50	60	60.0	160.0	150	115	62	40.0
180	9.95	2517	16	60	34.5	47	74.0	143.0	48	35	80	58	70	73.0	189.0	180	125	77	49.0
230	20.90	3020	25	75	39.5	53	86.5	165.5	55	38	100	77	90	85.5	239.5	225	155	99	59.5
280	33.00	3525	35	90	51.0	67	106.5	208.5	67	48	115	90	105	104.5	284.5	275	206	119	74.5

* J - Wrench clearance to allow for tightening and loosening the bush on the shaft.

Selection (Standard Electric Motors BS:3979 and IS : 1231)

1. Read across the table 3 from the appropriate motor frame size and find the applicable nominal motor speed column.
2. Read the appropriate coupling selection for either Taper-Lock® 'H' or 'F'

Table 05-03 - Service Factors not less than 1.6

Motor Frame Size	Shaft Dia. mm.	3000 rev/min		1500 rev/min		1000 rev/min		750 rev/min	
		Motor Power (kW)	Coupling Size	Motor Power (kW)	Coupling Size	Motor Power (kW)	Coupling Size	Motor Power (kW)	Coupling Size
90 S	24	1.5	70	1.1	70	0.75	70	-	-
90 L	24	2.2	70	1.5	70	1.1	70	-	-
112 M	28	4.0	90	4.0	90	2.2	90	-	-
132 S	38	5.5	110 A	5.5	110 A	3.0	110 A	2.2	110 A
		7.5	110 A						
132 M	38			7.5	110 A	4.0	110 A	3.0	110 A
						5.5	110 A		
160 M	42	11.0	110 A	11.0	110 A	7.5	110 A	4.0	110 A
		15.0	110 A					5.5	110 A
160 L	42	18.5	110 A	15.0	110 A	11.0	130	7.5	110 A
180 M	48	22.0	150	18.5	150				
180 L	48			22.0	150	15.0	150	11.0	150
200 L	55	30.0	180						
		37.0	180			22.0	180		
225 S	60			37.0	180			18.5	180
225 M	55 *	45.0	180	45.0	180	30.0	180	22.0	180
	60								
250 M	60 *	55.0	180	55.0	230	37.0	230	30.0	230
	65								
280 S	75			75.0	230	45.0	230	37.0	230
280 M	75			90.0	230	55.0	230	37.0	230
315 S	80			110.0	280	75.0	280	55.0	280
315 M	80			132.0	280	90.0	280	75.0	280

* 3000 rev/min only.

®Registered Trade Mark

a. Service Factor

Determine the required service factor from Table:05-01.

b. Design Power

Multiply the normal running power by the service factor. This gives the Design Power which is used as a basis for coupling selection.

c. Coupling Size

Refer to Table 05-04 (page 05-05) and from the appropriate speed in the speed column, read across until a power equal to or greater than the design power required is found.

d. Bore Size

From the dimension Table: 05-02 check that the chosen flanges can accommodate the required bores.

Example : A shaft coupling is required to transmit 70Kw between a 1440 rev/min electric motor and a hoist running over 16 hours/day. The motor shaft is 70 mm. and the hoist shaft is 75 mm.

Service Factor-From Table: 05-01, the Service Factor is 2.

Design Power-Design Power : 70 x 2 : 140 Kw

Coupling Size- By reading across from 1440 rev/min in the speed column of Table: 05-04 (Power Rating Table) 143 Kw is the first power to exceed the required 140 Kw (design power). The size of coupling at the head of this column is 180.

Bore Size- By referring to the Dimension Table: 05-02 it can be seen that for HRC - 180B type both shaft diameters fall within the bore range available. However in case the coupling selection is required in F&H type then select HRC-230 F&H type.

HRC Couplings

Table 05-04: Power Rating(kw)

Speed Rev/Min.	COUPLING SIZE							
	70	90	110/110A	130	150	180	230	280
100	0.33	0.84	1.68	3.30	6.28	9.95	20.90	33.00
200	0.66	1.68	3.35	6.60	12.60	19.90	41.90	66.00
400	1.32	3.35	6.70	13.20	25.10	39.80	83.80	132.00
600	1.98	5.03	10.10	19.80	37.70	59.70	126.00	198.00
720	2.37	6.03	12.10	23.80	45.20	71.60	151.00	238.00
800	2.64	6.70	13.40	26.40	50.30	79.60	168.00	264.00
960	3.17	8.40	16.10	31.70	60.30	95.50	201.00	317.00
1200	3.96	10.10	20.10	39.60	75.40	119.00	251.00	396.00
1440	4.75	12.10	24.10	47.50	90.50	143.00	302.00	475.00
1600	5.28	13.40	26.80	52.80	101.00	159.00	335.00	528.00
1800	5.94	15.10	30.20	59.40	113.00	179.00	377.00	594.00
2000	6.60	16.80	33.50	66.00	126.00	199.00	419.00	660.00
2200	7.26	18.40	36.90	72.60	138.00	219.00	461.00	
2400	7.92	20.10	40.20	79.20	151.00	239.00	503.00	
2600	8.58	21.80	43.60	85.80	163.00	259.00	545.00	
2880	9.50	24.10	48.30	95.00	181.00	286.00		
3000	9.90	25.10	50.30	99.00	188.00	298.00		
3600	11.90	30.10	60.30	118.00	226.00			

Table 05-05 - Physical Characteristics

Characteristic	COUPLING SIZE							
	70	90	110/110A	130	150	180	230	280
Maximum Speed* rev/min	8300	6740	5110	4400	3800	3180	2540	2080
Nominal Torque (Nm)	31.5	80	160	315	600	950	2000	3150
Maximum Parallel Misalignment (mm)	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5
Maximum axial Misalignment (mm)	0.2	0.5	0.6	0.8	0.9	1.1	1.3	1.7

*Maximum coupling speeds are calculated using an allowable peripheral speed for the hub material. For selection of small sizes above 3600 rev/min - consult Fenner.



Fenner Taper-Lock® Bushes

Advantages :

- No re-boring and keywaying costs.
- Saves time and cost in fitting.
- Eliminates precision taper fitting keys.
- 239 bush size/bore combinations are available.
- Interchangeable between many products.
- Taper bored components can be transferred to other diameter shafts by fitting alternative bore bushes.
- Convenience in dismantling for maintenance and component replacement.
- Accommodates shaft limits of +0.051 mm /- 0.127mm.

The benefits of using Taper-Lock® Bushes can be extended to include components which have a parallel bore by incorporating Taper-Lock® Adaptors, Taper-Lock® Bolt-on-Hubs or Taper-Lock® Weld-on-Hubs.

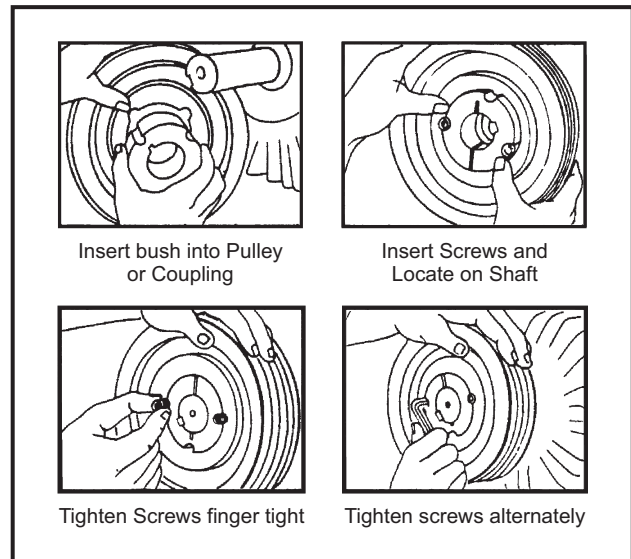
Installation Instructions

To Install

1. Remove the protective coating from the bore, outside of bush and bore of hub. After ensuring that the mating tapered surfaces are completely clean and free from oil and dirt, insert bush in hub, so that the holes line up.
2. Oil thread and point of grub screws, or thread and under-head of cap screws. Place screws loosely in holes threaded in hub, shown thus @ in diagram.
3. Clean shaft and fit hub and bush to shaft as one unit. Locate in position desired, remembering that the bush will grip the shaft first and then the hub will be slightly drawn on to the bush.
4. Using a hexagon wrench tighten screws gradually and alternately until they are fully secured. Use a piece of pipe on wrench to increase leverage.

To Remove

1. Slacken all screws by several turns. Remove one or two according to number of jacking-off holes, shown thus in diagram. Insert screws in jacking off holes after oiling thread and point of grub screws or thread and under-head of cap screws.

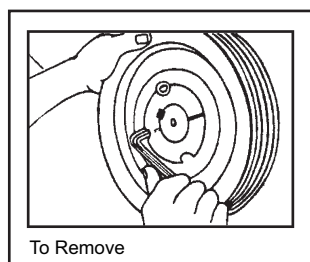


2. Tighten screws alternately until bush is loosened in the hub and assembly is free on the shaft.

3. Remove assembly from shaft.

4. For normal drives a key is not necessary. But when a key is not used hammer against large end of bush using a block or sleeve to prevent damage. (This will ensure that the bush is seated squarely in the bore). Screws will now turn a little more. Repeat this alternate hammering and screw tightening once or twice until correct tightening torque is obtained.

5. If a key is to be fitted, place it in the shaft keyway before fitting the bush. It is essential that only a side-fitting parallel key with TOP CLEARANCE be used.



6. After drive has been running under load for a short time stop and check tightness of screws.
7. Fill empty holes with grease to exclude dirt.

Bush		1008 1108	1310	1210 1215	1510 1615	2012	2517 2525	3020 3030	3525 3535	4040	4545	5050
Screw tightening torque	(Nm.)	56	20	20	20	31	48	90	113	170	192	271
Screw	Qty.	2	2	2	2	2	2	2	3	3	3	3
Details	Size (BSW)	1/4"	3/8"	3/8"	3/8"	7/16"	1/2"	5/8"	1/2"	5/8"	3/4"	7/8"

Fenner



Essex
Couplings

Essex Jaw Couplings

04

Essex Jaw couplings are low weight and torque transmission couplings with bore range from 15 to 90mm. Axial plug-in, easy assembly and maintenance free.

Essex Standard Spacer Couplings are available with different spacer lengths to suit different applications without moving the drive or the driven equipment

Salient Features

- Simple construction; quick easy installation; No special tools required.
- Flexible insert caters for incidental angular, parallel and axial misalignment.
- Absorbs shock loads and damps small amplitude vibration.
- Insert design presets correct distance between hubs, using raised pads on each leg of the insert.
- Available in a range of stock bore sizes. Can also be supplied with finished bore & keyway.
- Unaffected by moisture, grease and oils including non-aromatic and non-detone solvents and temperatures within the range -40° C to + 100° C.
- Spacer coupling with spacer size depending upon the distance between two shaft ends (DBSE)

Table: 04-01 Service Factors

Type of Driven Machine	Type of Driving Unit		
	Electric Motors & Steam Turbines	Internal Combustion Engines	
		More than six cylinders	Less than six cylinders
Uniform Load - Agitators, Brewing machinery, Centrifugal compressors and pumps, Belt conveyers, Dynamo meters, Line shafts, Fans upto 7.5 kW, Blowers and exhausters except positive displacement Generators.	1.0	1.5	2.0
Moderate Shock - Clay working machinery, General machine tools, Paper mill beaters and winders, Rotary pumps, Rubber extruders, Rotary screens, Textile machinery, Marine propellers and fans over 7.5 kW.	1.5	2.0	2.5
Heavy Shock - Bucket elevators, Cooling tower fans, Piston compressors and pumps, Foundry machinery, Metal presses, Paper mill calendars, Hammer mills, Presses and pulp grinders, Rubber calendars, Pulverisers and positive displacement blowers.	2.0	2.5	3.0

Selection

Details required for couplings selection

1. Type of driven machine and operating hours per day.
2. Speed and power absorbed by driven machine (if absorbed power is not known, calculate on power rating of prime mover).
3. Diameter of shafts to be connected.
4. Distance between two shaft ends in case of spacer coupling.

Procedure

a) Service Factor

Determine the required service factor from table.

b) Design Power

Multiply the normal running power by the service factor. This gives the Design Power which is used as a basis for selecting the coupling.

c) Coupling Size

Depending upon the type of coupling required, refer to respective power rating tables. Power ratings can be interpolated in relation to speed parameters.

d) Bore Size

Check from the dimension table to see if bore capacity of the couplings is adequate, otherwise select next higher size coupling.

Polyurethane Spider Elements

Spider elements for Spider couplings are available in Polyurethane material which gives added strength and longer life.



Essex Jaw Couplings

STANDARD COUPLINGS

Size	Power per 100 rev/min kW	Bore in mm		Dimensions in mm				
		Min.	Max.	A	B	D	F	G
F - 095	0.21	15	28	63	54	49	2	25
F - 099	0.39	20	30	72	65	51	2	27
F - 0100	0.50	20	38	88	65	57	2	35
F - 0110	0.92	20	42	108	85	76	3	43
F - 0150	1.50	30	48	115	96	80	3	45
F - 0190	2.02	36	55	133	115	102	3	54
F - 0225	2.75	40	60	153	127	108	3	64

STANDARD SPACER COUPLINGS

Size		Power per 100 rev/min kW	Bore in mm		Distance between shaft ends (DBSE) A	Dimensions in mm		
			Min.	Max.		B	C	X
F-095	S	0.21	15	28	90/100	54	25	6
F-0100	S	0.50	20	38	90/100/140	65	30	6
F-0110	S	0.92	20	42	90/100/140	85	35	8
F-0150	S	1.50	30	48	90/100/140	96	45	10
F-0190	S	2.02	36	55	90/100/140	115	51	10
F-0225	S	2.75	40	60	90/100/140	127	57	12

EXTERNAL SPIDER COUPLINGS

Size		Power per 100 rev/min kW	Bore in mm		Dimensions in mm				
			Min.	Max.	A	B	D	F	G
F - 095	E	0.23	15	23	63	64	49	2	25
F - 099	E	0.38	20	30	72	77	51	2	27
F - 0100	E	0.50	20	38	88	77	57	2	35
F - 0110	E	0.91	20	42	108	95	76	3	43
F - 0150	E	1.47	30	48	115	110	80	3	45
F - 0190	E	2.03	36	55	135	128	102	3	54
F - 0225	E	2.80	40	60	153	141	108	3	64

Essex Jaw Couplings

EXTERNAL SPIDER ALUMINIUM SPACER COUPLINGS

Size		Power per 100 rev/min kW	Bore in mm		Distance between shaft ends (DBSE) A	Dimensions in mm			
			Min.	Max.		B	C	D	F
F-095	ES	0.23	15	28	90/100/140	64	25	49	2
F-0100	ES	0.50	20	38	90/100/140	77	35	57	2
F-0110	ES	0.91	20	42	90/100/140	95	43	76	3
F-0150	ES	1.47	30	48	90/100/140	110	45	80	3
F-0190	ES	2.03	36	55	90/100/140	128	54	102	3
F-0225	ES	2.80	40	60	90/100/140	141	64	108	3

CUSHION COUPLINGS

Size		Power per 100 rev/min kW	Bore in mm		Dimensions in mm				
			Min.	Max.	A	B	D	F	G
F-0226	P	3.45	25	65	178	143	115	3	70
F-0276	P	5.60	25	75	200	163	127	3	80
F-0280	P	8.20	30	75	200	200	140	3	80
F-0295	P	13.40	40	90	238	245	160	3	95
F-02955	P	22.40	50	100	264	245	180	3	108

CUSHION SPACER COUPLINGS

Size		Power per 100 rev/min kW	Bore in mm		Distance between shaft ends (DBSE) A	Dimensions in mm			
			Min.	Max.		B	C	D	X
F-0226	PS	3.45	25	65	135/140/180	145	50	134	12
F-0276	PS	5.60	25	75	135/140/180	165	60	130	12
F-0280	PS	8.20	30	75	135/140/180	200	60	130	14
F-0295	PS	13.40	40	90	135/140/180	249	65	160	16
F-02955	PS	22.40	50	90	135/140/180	249	80	160	16

TYPICAL APPLICATIONS

Pumps including back-pull-out type, Conveyors, Elevators, Packaging Machinery, Food Processing Plants, Compressors, General Machine Tools, Blowers, Paper Mill Beaters and Calenders etc.