

Crossflex Disc Couplings

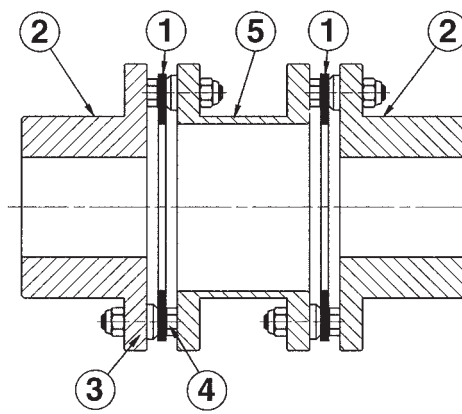
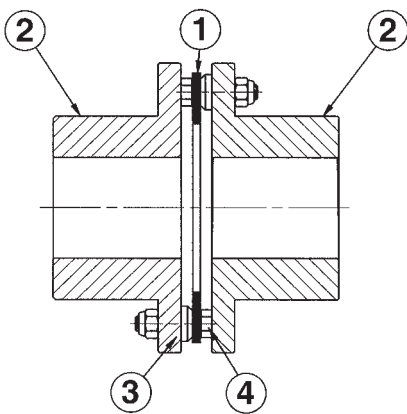


Crossflex Disc flexible shaft couplings provide reliable and accurate transmission of mechanical power for applications requiring low maintenance and no lubrication.

The couplings are particularly suited for drives to pumps, compressors, generators, and paper making machinery operating in poor environmental conditions, as well as the accurate drives on assembly equipment, printing machines and servomotors.

The well balanced all steel construction enables transmission of high torques at high shaft speeds, as encountered on turbine drives.

Three hub designs, and option of spacer provides numerous design possibilities to accommodate space limitations and shafting dimensions.



- ① Disc Pack
- ② Hub
- ③ Precision Bush
- ④ High Tensile Bolts
- ⑤ Spacer Hub

Crossflex Couplings Construction

Crossflex couplings use disc packs (1) manufactured from stainless spring steel, as the driving flexible element.

Steel hubs (2) are connected to the disc packs by a system of precision bushes (3) and high tensile bolts (4). This design provides a backlash free, torsionally stiff, all steel construction, which is maintenance free.

The Crossflex coupling has modular components to enable adaption to a wide range of applications.

Series 1 uses two hubs with a single disc pack. This series provides maximum torsional stiffness, but cannot compensate for radial misalignment.

Series 2 incorporates a spacer (5) between two disc packs and two hubs. These compensate for radial as well as axial and angular misalignments.

To reduce overall length, reversed hubs are available which fit inside of the central spacer.

Both series can be supplied with shaft clamping elements to provide a totally backlash free drive.

Crossflex Couplings Performance Characteristics

- 1) Backlash Free: ensures accuracy of control on all positioning applications, particularly essential for drives with frequent stop and starts, and reversing drives. The use of Shaft Clamping Elements with the couplings ensure a totally positive drive.
- 2) Torsionally stiff: the disc pack design ensures high torsional stiffness, essential for applications with servomotors, machine tools, assembly machinery, packaging machines and printing presses.
- 3) High Temperature: the Crossflex Couplings are manufactured entirely from steel, enabling operating temperatures up to 240 °C in difficult environmental conditions.
- 4) High Operating Speeds: close tolerances, and precision machining provide accurate concentricity enabling high speed operation.
- 5) Long maintenance free life: The design of the Crossflex coupling ensures there is almost no wear enabling a very long service life. As there are no moving parts within the system no lubrication or maintenance are required.

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Crossflex Disc Couplings Selection



Crossflex Coupling Selection

To correctly select a Crossflex Coupling it is necessary to determine the correct service factor (f_s) and then multiply the actual maximum torque transmitted by this factor to give a Design torque (T_d). This design torque must be no higher than the nominal torque of the coupling selected. The service factor (f_s) accounts for shaft misalignment (f_1), the type of operating machinery (f_2), and the temperature (f_3).

$$f_s = f_1 \times f_2 \times f_3$$

Misalignment Factor f_1

The maximum misalignment shown in the technical data table cannot be accommodated together ; therefore, the presence of axial misalignment Δ_{ax} reduces the amount misalignment Δ_{rad} and angular misalignment Δ_{ang} which can be accommodated. These can be seen in fig. 1.

The effective total angular misalignment Δ_{TOT} is a function of the combined effects of the combined effects of the angular misalignment Δ_{ang} and misalignment Δ_{rad} of the two shafts, and can be determined as below:

$$\Delta_{TOT} = \frac{\Delta_{ang}}{2} + \frac{\arcsin \Delta_{rad}}{(H - B)}$$

Values for H and B are in the dimensions table.

The misalignment factor f_1 is a function of Δ_{TOT} , and can be found from fig. 2.

Operating Machinery Load Factor f_2

The load factor f_2 can be obtained from the following table which gives values for machines using a soft drive system such as electric motor, hydraulic motor, or steam/gas turbines. For other power units refer to the correction factors at base of the table. If the drive is subject to continuous reversing of direction or torque load, or subject to more than 60 starts per hour the factor obtained must be increased by 25%.

Operating Machinery	Factor f_2	Operating Machinery	Factor f_2
Agitators and Centrifuges light liquids	1.00	Machine Tool main drives	1.75
Agitators and Centrifuges semi-liquids	1.75	Machine Tool auxiliary drives	1.00
Blowers - low inertia	1.00	Mills	2.50
Blowers - high inertia/cooling towers	2.00	Mining Machinery incl. Crushers	3.00
Centrifugal Compressors	1.50	Packaging and bottling Machinery	1.50
Centrifugal Pumps light liquids	1.00	Paper Machinery	2.00
Centrifugal Pumps semi-liquids	1.75	Presses	3.00
Ceramic machinery	2.50	Reciprocating Compressors	2.50
Continuous Casting machinery	2.50	Reciprocating Pumps	2.50
Conveyors	1.50	Rolling Machines and Washing Machines	1.75
Elevators and Cranes	2.00	Rotating Ovens	2.00
Extruders and mixers for plastic materials	1.75	Textile Machinery	2.00
Gear Pumps	1.50	Welding Generators	1.75
Generators	1.00	Woodworking Machinery	1.50

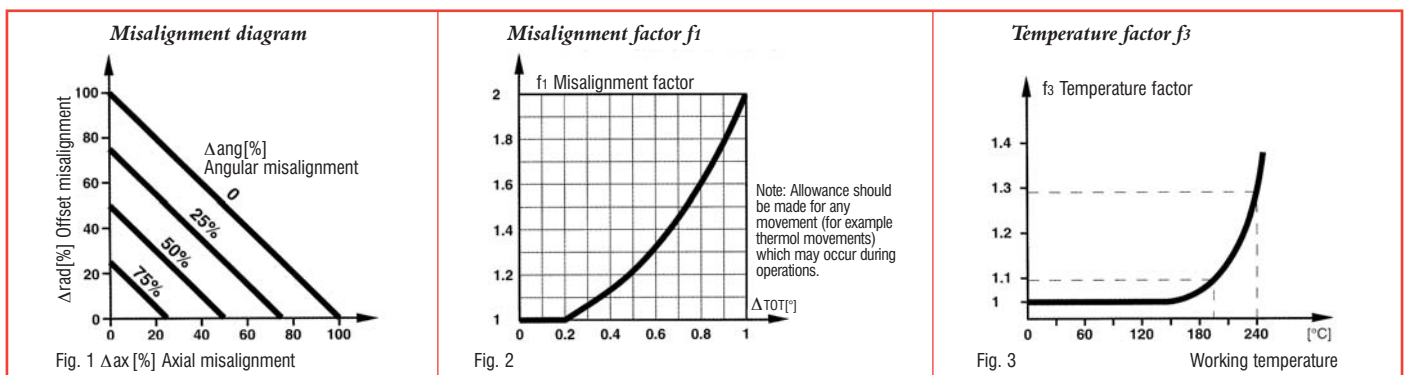
Modify load factor f_2 for the following:-

1 to 3 cylinder internal combustion engines $f_2 + 0.9$

4 plus cylinder internal combustion engines $f_2 + 0.4$

Temperature Factor f_3

For temperature above 160°C use factor from diagram 3



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Crossflex Disc Couplings



Capacities and Technical Specifications

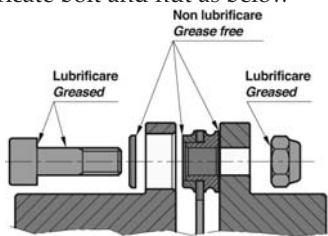
Coupling Size	Nom.* Torque T Nm	Max Speed V rpm	Bolt Torque T _B Nm	Crossflex Single Disc Coupling					Crossflex Twin Disc Coupling					
				Max. misalignment			Inertia I kgcm ²	Torsional Stiffness T _s kNm/rad	Spacer Width H mm	Max. misalignment			Inertia I kgcm ²	Torsional Stiffness T _s kNm/rad
				Δ rad mm	Δ ax ± mm	Δ ang [°]				Δ rad mm	Δ ax ± mm	Δ ang [°]		
CF40	18	12000	2.5	0	0.4	1.0	0.2	14	16 26	0.2 0.3	0.8	2.0	0.50 0.4	7 5
CF53	90	11500	7	0	0.4	1.0	1.1	110	30 43	0.3 0.4	0.8	2.0	1.6 1.9	56 41
CF72	170	8800	8	0	0.5	1.0	4.9	140	31.2 60 100 140	0.3 0.8 1.5 2.2	1.1	2.0	7.1 7.6 8.1 8.7	71 56 47 40
CF89	320	7000	14	0	0.6	1.0	16.3	200	37.6 70 80 100 140	0.4 1.0 1.1 1.5 2.1	1.2	2.0	22 25 26 27 28	100 90 89 86 80
CF118	750	6200	31	0	0.8	1.0	60.8	340	46.3 100 140 180	0.5 1.4 2.1 2.8	1.6	2.0	80 91 95 99	170 154 147 141
CF142	1350	5100	62	0	1.0	1.0	137.5	500	55 100 140 180	0.7 1.5 2.1 2.8	2.1	2.0	180 210 220 230	252 233 224 216
CF168	2400	4300	110	0	1.2	1.0	351.3	710	100 140 180	1.4 2.1 2.8	2.5	2.0	520 540 560	327 314 301
CF200	4000	3600	180	0	1.4	1.0	838.5	1260	140 180	2.0 2.7	2.8	2.0	1200 1300	587 573
CF238	6500	3000	280	0	1.7	1.0	2320.0	2270	140 180	2.0 2.6	3.4	2.0	3400 3500	1068 1043
CF295	21000	2500	570	0	1.1	0.5	6138.5	6160	200 250	1.4 1.8	2.2	1.0	10700 11000	2787 2698
CF345	36000	2100	1000	0	1.3	0.5	15308.4	8680	224 250 300	1.6 1.8 2.2	2.6	1.0	26200 26400 26800	3993 3942 3847

*Can be exceeded by up to 1.75x for brief periods. Angle of Torsional Deflection [°] = $0.18 \cdot \frac{TA}{T_s}$ TA = Actual Torque Nm

Higher Torque Capacity units available giving 30% to 50% increase

Crossflex - Mounting and Operating Instructions

Prior to assembly lubricate bolt and nut as below



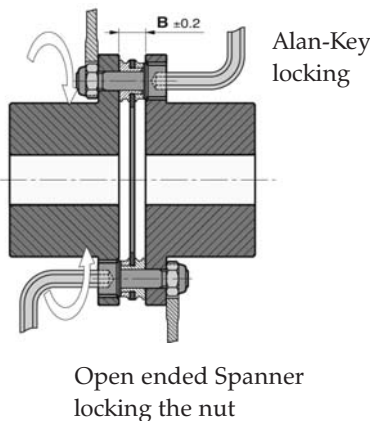
All Bolt Torques must be set by a Torque Wrench in steps and checked again after 100 hours service. Please refer to catalogue values for both Coupling and Clamping Elements.

Preferred Method to tighten bolts
Tighten nut with open-end Torque Wrench

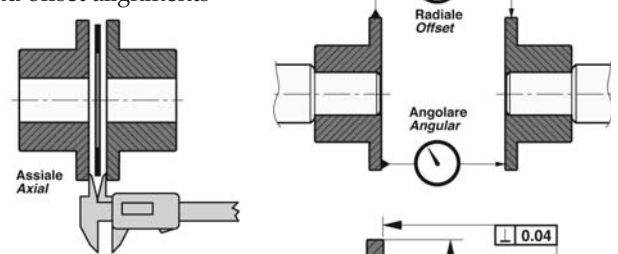
Avoid twisting the Disc Pack when tightening screws

Alternative Method to Tighten bolts
Alan-key Torque Wrench used to tighten bolts

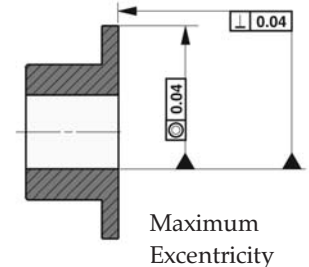
After mounting dimension B should be checked, and should be equal all round to avoid pretensioning of the Disc Pack.



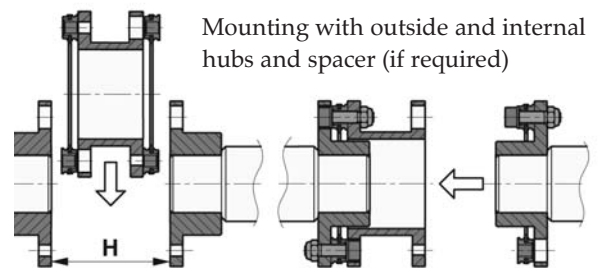
Measurement of axial, angular and offset alignments



Limits of excentricity possible when bores are reworked



Maximum Excentricity



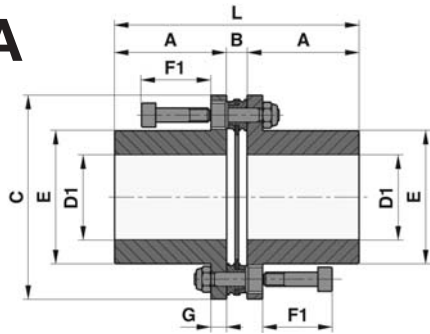
Mounting with outside and internal hubs and spacer (if required)

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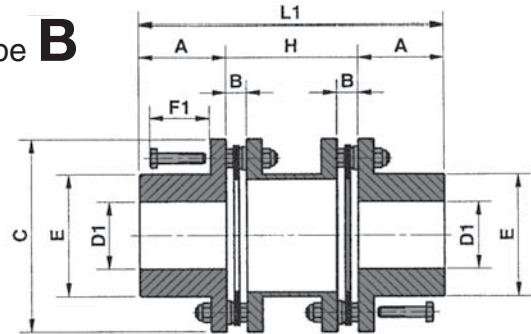
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Type **A**

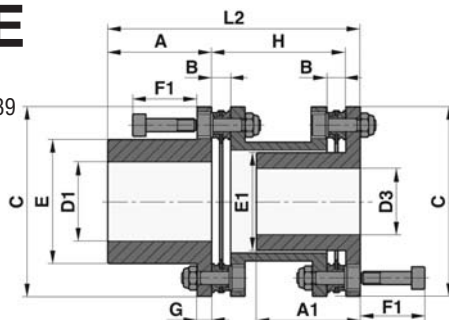


Type **B**



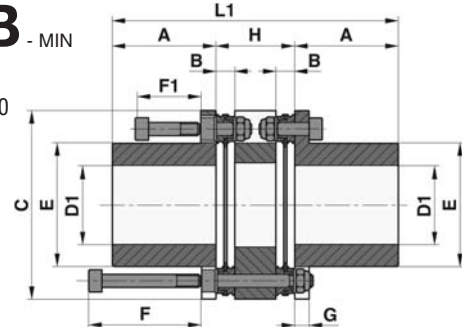
Type **E**

Sizes
CF53 to 239



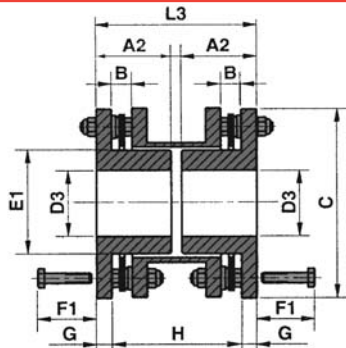
Type **B** - MIN

Sizes
CF53 to 200



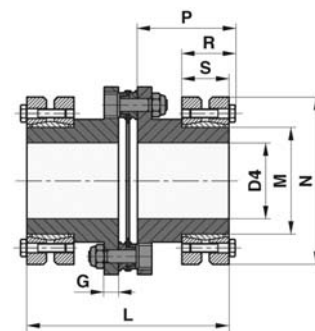
Type **F**

Sizes
CF53 to 239



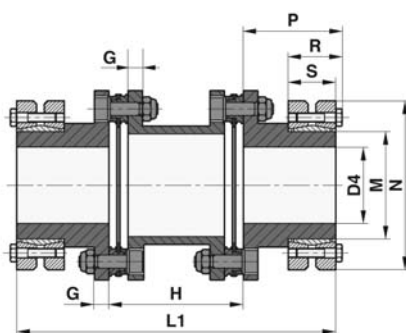
Type **G**

Only Sizes
CF142 to 345



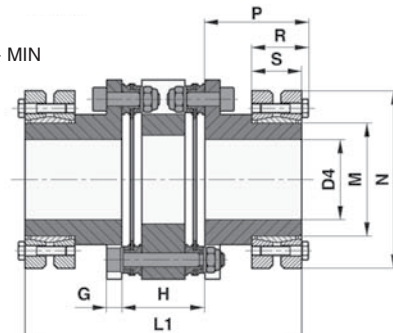
Type **H**

Only Sizes
CF142 to 345



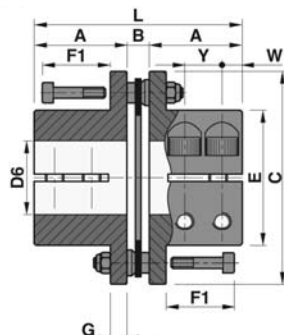
Type **H** - MIN

Only Sizes
CF142 to 345



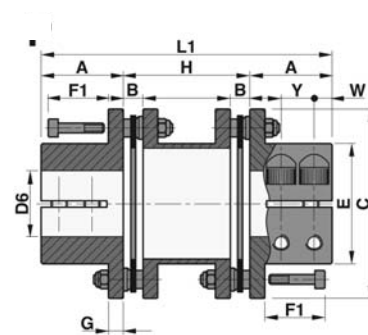
Type **N**

Sizes
CF40 to 142



Type **P**

Sizes
CF40 to 142



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Crossflex Disc Couplings



Dimensions

Coupling Size	A mm	A1 mm	A2 mm	B mm	C mm	Bore D mm	Maximum Bores				Dimensions							Spacer H mm	L mm	L1 mm	L2 mm	L3 mm
							D1 mm	D3 mm	D4 mm	D6 mm	E mm	E1 mm	F mm	F1 mm	G mm	W mm	Y mm					
CF40	17			2.9	40	6	18*	-	-	15	26	-	25	15	4	4.5	-	16 26	36.9	50 60	-	-
CF53	24.5	- 24.5	- 24.5	6.9	53	6	22	- 18*	-	19	32.5	24.5	43	24	5	5	9	30 43	55.9	79 92	- 72.5	- 53
CF72	39.5	39.5	- 34.5 39.5 39.5	7.5	70.5	10	35	28*	-	25	47	37	43	24	5	7.5	13	31.2 60 100 140	86.5	110.2 139 179 219	- 105 145 185	- 70 110 150
CF89	45	- 45 45 45	- 40 45 45	8.8	88.3	14	45	35	-	35	62.5	48	53	32	8	9	16	37.6 70 80 100 140	98.8	127.6 160 170 190 230	- 123 133 153 193	- 86 96 116 156
CF118	55	- 55 55 55	- 55	10.4	116.5	15	60	50	-	45	82	64	67	40	10	10.5	19.5	46.3 100 140 180	120.4	156.3 210 250 290	- 165 205 245	- 120 160 200
CF142	60	- 60 60 60	- 58 60 60	12	140.5	19	75	60	75	60	98	77	82	47	11	11.5	20	55 100 140 180	131.7	175 220 260 300	- 171 211 251	- 122 162 202
CF168	75	75 75 75	60 75 75	13	166.5	25	90	75	90	-	118	90.5	94	55	12			100 140 180	162.7	250 290 330	187 227 267	124 164 204
CF200	90	90 90	81 90	15	198.5	30	110*	90*	100	-	141	114	108	64	14			140 180	194.6	320 360	244 284	168 208
CF238	125	125 125	- 104	20.8	238	39	120	100	125	-	169	135	-	81	16			140 180	270.8	390 430	281 321	- 212
CF295	160	160 160	- 160	28	295	59	150	130	155	-	205	170	-	112	22			200 250	348	520 570	382 432	- 294
CF345	200	- 200 200	- 145 168	32.2	345	79	180	140	200	-	254	170	-	133	26			224 250 300	432.2	624 650 700	- 476 526	- 302 352

*With shallow keyways to DIN6885 Sheet 3

Additional Dimensions Types G&H

Coupling Size	Clamping Element Size	Bore Min/Max mm	M mm	N mm	P mm	R mm	S mm	Max Torque T Nm	Axial Thrust F KN	RCK 19	
										Bolt Size	Bolt Torque Nm
CF142	90x155	65 75	90	155	69.5	45	39	1350	146 193	M8	30
CF168	90x155	65 75	90	155	76.0	45	39	2400	146 193	M8	30
CF168	115x188	80 90	115	188	87.5	57	50	2400	212 266	M10	59
CF200	90x155	65 75	90	155	82.5	45	39	4000	146 193	M8	30
CF200	115x188	80 90	115	188	97.0	57	50	4000	212 266	M10	59
CF200	130x215	90 100	130	215	97.0	59	52	4000	304 364	M10	59
CF238	130x215	90 100	130	215	132.0	59	52	6500	304 364	M10	59
CF238	155x265	105 115	155	265	133.0	72	64	6500	390 450	M12	100
CF238	165x290	115 125	165	290	135.0	81	71	6500	630 700	M16	250
CF295	175x300	125 135	175	300	170	81	71	21000	650 720	M16	250
CF295	185x330	135 145	185	330	170	96	86	21000	815 896	M16	250
CF295	195x350	140 155	195	350	170	96	86	21000	950 1100	M16	250
CF345	220x370	160 170	220	370	210	114	104	36000	1200 1300	M16	250
CF345	250x450	180 200	250	405	213	121	108	36000	1500 1700	M20	490

Available Bore sizes Types N & P

Bore Size	Coupling Size						
	40	40	53	72	89	118	142
8	9						
10	12						
11	12						
12	12						
14			50				
15		13	55				
16		15	60	65			
18			70	75			
19			75	90			
20			75	100			
22			75	115	120		
24				140	150		
25				170	180		
28				170	210		
30					250		
32					300	360	340
35					320	420	380
38					320	490	420
40						550	470
42						650	500
45						750	600
48						750	650
50							750
55							900
60							1200
M	4	3	4	6	8	10	10
T s Nm	5.2	2.6	5.2	17	41	83	83

Figures given under Coupling size are transmittable Torque Nm
M is the Screw size, and T s thr tightening torque

Crossflex Coupling Part No.

The full Crossflex Coupling part no. indicates Coupling size, type (with spacer dimension 'H' if applicable), and minor diameter of Clamping Disc on types 'G' and 'H'. Finish bore size, keyway and setscrew requirements for each hub should be indicated after with on type 'E' the external hub being shown first e.g. Coupling size CF72, type E with 60mm spacer, external hub bored 28mmH7, with standard Js9 tolerance keyway and 2 setscrews @ 120°, internal hub 25mm H7, with standard key and 1 setscrew at 90° to key. Part No. is CF72E60 - 28H7, Key J9, 2ss120 - 25KeyJ9, 1ss90. Coupling size CF168, type H, one half finish bore 65mm, other 80mm. Part No. is CF168H/90-100 - 65H7 - 80H7.

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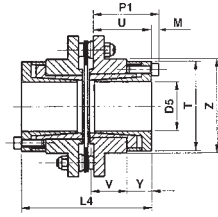
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Crossflex Disc Couplings L & M With Avante Shaft Clamping Elements



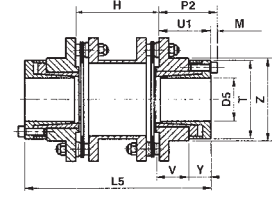
This series of Disc Couplings provides a totally zero backlash connection between shafts, with decrease in both weight and inertia over standard Disc Couplings. A selection of bore sizes for each bush size gives great design flexibility. The combination eliminates the need for keys and set screws to locate the coupling, and provides an easy method for timing in a multi-function machine, either at initial build or at later during production. The total lack of rotary free play makes the system well suited to torque reversal and timing applications, robotics, and servo drives.

Type L



Single Disc Coupling

Type M



Twin Disc Coupling with Spacer

Dimensions

Coupling Size	Avante Bush Size	Torque Max. *2 Nm	Bore Size D5*1		Dimensions									
			min mm	max mm	M mm	P1/P2 mm	T mm	U/U1 mm	V mm	Y mm	Z mm	L4 mm	H mm	L5 mm
CF53	ACE81-x26	140	11	20	3	28.5	40.5	25.5	14.0	13.5	42	57.9	30 39	81 90
CF72	ACE81-x26	145	11	20	3	30.5	40.5	27.5	14.0	13.5	42	62.5	31.2 60 100 140	86.2 115 155 195
CF72	ACE81-x38	331	19	30	4	37.0	57.0	33.0	14.0	19.0	58	73.5	31.2 60 100 140	97.2 126 166 206
CF89	ACE81-x38H	497	19	30	4	48.5	57.0	44.5	27.0	19.0	58	97.8	37.6 70 80 100 140	126.6 159 169 189 229
CF89	ACE81-x52	720	24	42	4	48.5	70.5	44.5	25.5	19.0	72	97.8	37.6 70 80 100 140	126.6 159 169 189 229
CF118	ACE81-x56	1140	32	50	4	39.0	74.0	35.0	16.5	19.0	80	80.4	46.3 100 140 180	116.3 170 210 250
CF118	ACE81-x70	1368	55	60	4	48.0	89.5	44.0	27.0	19.0	92	98.4	46.3 100 140 180	134.3 188 228 268
CF142	ACE81-x52	926	24	42	4	50.0	70.5	45.5	26.5	19.0	72	102.7	55 100 140 180	146 191 231 271
CF142	ACE81-x72	2900	28	60	6	65.0	96.5	59.5	36.5	23.0	98	130.7	55 100 140 180	174 219 259 299
CF168	ACE81-x72	3133	28	60	6	65.0	96.5	59.5	36.5	23.0	98	131.7	100 140 180	219 259 299
CF200	ACE81-x72	3133	28	60	6	65.0	96.5	59.5	36.5	23.0	98	133.6	140 180	259 299

* 1 See table below for bore sizes available for bush * 2 Torque restricted by Clamping Bush capacity, check torque in table below.

Avante Clamping Element standard bore sizes with transmittable torques 'T'

Clamping Element	Bore Sizes available with respective Torque capacity														Locking Screws		Weight kg
	d mm	T Nm	11	12	14	15	16	18	19	20					Size	Torque	
ACE81-x26	d mm	11	12	14	15	16	18	19	20						M4	5	0.22
	T Nm	50	55	90	95	115	130	140	145								
ACE81-x38	d mm	19	20	22	24	25	28	30							M6	17	0.32
	T Nm	195	200	240	265	275	310	330									
ACE81-x38H	d mm	19	20	22	24	25	28	30							M6	17	0.40
	T Nm	310	330	360	400	410	460	500									
ACE81-x52	d mm	24	25	28	30	32	35	38	40	42					M6	17	0.60
	T Nm	470	490	550	590	700	770	840	880	920							
ACE81-x56	d mm	32	35	38	40	42	45	48	50						M6	17	0.80
	T Nm	540	710	780	820	950	1020	1090	1140								
ACE81-x70	d mm	55	60												M6	17	1.20
	T Nm	1250	1370														
ACE81-x72	d mm	28	30	32	35	38	40	42	45	48	50	55	60		M8	41	1.50
	T Nm	1240	1330	1420	1550	1780	1880	1970	2110	2250	2350	2590	2820				

Clamping Element part No. The part. No. combines the unit size with the bore size replacing the dash. e.g. a 24mm bored size 38H unit has part No. ACE81-24x38H, and this will fit all Coupling Hubs with bush refACE81-38H.