

# FlexDur - Mounting instructions



## 1. Mounting the hubs on the shafts

### a) Keyed cylindrical shafts

FlexDur hub bores are machined with a H7 (ISO-286) tolerance as a standard. We recommend to machine the shaft with an interference fit with s6 (ISO-286) tolerance.

If the shafts are already machined with a tolerance other than s6, the bore can be adapted to the hubs. The following tolerances are recommended in such a case:

Shaft tolerance	Hub tolerance
h6	T7
k6	R7
m6	P7
n6	N7
p6	M7

### b) Clamped joints

If clamped joints such as locking units are used, we recommend to machine the shafts with g6 tolerances for FlexDur standard bores.

For other types of joints please consult our Engineering Department.

## 2. Alignment of the machines

FlexDur couplings enjoy a long life as long as the machine components are aligned within the limits specified in this catalogue. However, it should be understood that the life of the disc packs is affected directly by the displacement encountered in operation. In other words: The better the alignment, the longer the life expectancy of the coupling.

FlexDur couplings are capable of working adequately safe with the displacements specified in the catalogue. Both the life of the coupling and the wearing rate of the machine bearing assemblies can, however, be enhanced substantially when the machine alignment is better than the maximum compensating capability of the coupling. The displacement at installation should therefore not exceed 20% of the catalogue value. The following formulas are recommendations for maximum displacement.

Three types of machine displacement (radial, angular and axial) need to be verified:

**The maximum radial displacement** that the FlexDur coupling can compensate for, is a function of the distance between the disc packs. For the S version, this distance is actually identical with the clearance between the shaft ends. This statement, however, does not apply to the other versions such as C and O.

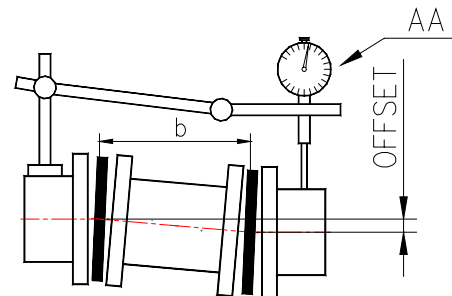
If the shafts have minimum angular displacement, the following maximum values apply to radial compensation acc. to the calculation:

$$AA \leq \frac{b}{k}$$

with AA: Max. difference of the total indicator reading after one rotation in mm corresponding to two times the displacement.

b: Clearance between disc packs in mm

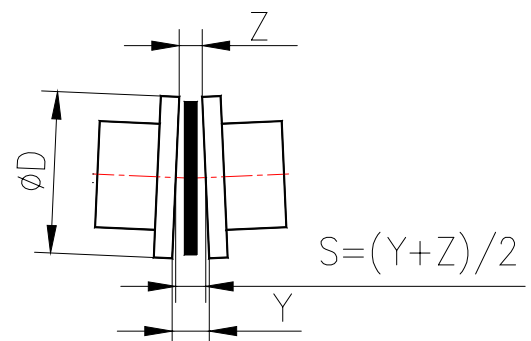
k: Constant factor of each series:  
 k = 150 for FD \_\_ - 4, FD \_\_ - 6  
 k = 300 for FD \_\_ - 8  
 k = 350 for FD \_\_ - 10



**The maximum angular displacement** per disc pack is specified in the tables. The said angular displacement can be verified by measuring the flange-to-flange distance at several points (see figure) and subtracting the smallest reading from the largest reading (Y-Z). The obtained value (Y-Z) also depends on the flange diameter and thus the coupling size D<sub>A</sub>. The following maximum values are recommended for (Y-Z) in mm based on the tabulated data:

FlexDur with 4 bolts	
FD 13-4, FD 26-4	(Y-Z) ≤ 0.5 mm
FD 36-4, FD 80-4	(Y-Z) ≤ 0.6 mm
FD 125-4, FD 160-4	(Y-Z) ≤ 0.7 mm
FD 255-4, FD 345-4	(Y-Z) ≤ 0.8 mm
FlexDur with 6 bolts	(Y-Z) ≤ D / 300
FlexDur with 8 bolts	(Y-Z) ≤ D / 600
FlexDur with 10 bolts	(Y-Z) ≤ D / 700

Example: The max. angular displacement is 1° for FD 380-6. (Y-Z) must not exceed 380/300 = 1.27 mm.



**The maximum axial displacement** between the shafts is specified in the tables and is a function of the coupling size and the number of bolts. The larger the coupling, the larger the axial displacement; the more bolts, the smaller the axial displacement.

Axial displacement generates enormous stresses in the discs. For a long life time it is recommended to adjust the installation dimension S (complies with the average content of the dimensions Z and Y - see above at angular displacement) at every disc pack most exactly. The installation dimension S relates to the geometrical situation of the equipment in operation. Variations of the installation length as for example thermal expansions or similar things have to be taken into account during alignment. If, e.g. the clearance between the shaft ends varies by -5 mm between the cooled down and operationally warm condition of the machines (i.e. the shafts move closer together), the clearance between the shaft ends of cooled down machines must be increased deliberately by 5 mm during assembly. The specified size S and the recommended installation tolerance can be taken from the following table.

Coupling size	S [mm]	tolerance for S (+/-) in [mm]	Coupling size	S [mm]	tolerance for S (+/-) in [mm]
FD 13 - 4	6.2	0.3	FD 278 - 8	21.2	0.4
FD 26 - 4	8.2	0.3	FD 302 - 8	24.4	0.4
FD 36 - 4	8.8	0.4	FD 325 - 8	26	0.4
FD 80 - 4	11.7	0.4	FD 345 - 8	28.2	0.5
FD 125 - 4	12.4	0.5	FD 380 - 8	32	0.5
FD 160 - 4	12.5	0.6	FD 410 - 8	33.2	0.5
FD 255 - 4	15.5	0.7	FD 440 - 8	36.4	0.6
FD 345 - 4	16.2	0.8	FD 475 - 8	38.2	0.6
FD 90 - 6	7.5	0.15	FD 505 - 8	42	0.7
FD 110 - 6	8.4	0.2	FD 540 - 8	46	0.7
FD 132 - 6	8.4	0.3	FD 570 - 8	51.6	0.8
FD 158 - 6	11.2	0.3	FD 605 - 8	53.2	0.8
FD 185 - 6	14	0.4	FD 635 - 8	60.8	0.8
FD 202 - 6	15.5	0.4	FD 675 - 8	65.2	0.8
FD 228 - 6	17.5	0.4	FD 700 - 8	68.8	0.9
FD 255 - 6	20.5	0.5	FD 730 - 8	71.2	0.9
FD 278 - 6	21.2	0.5	FD 760 - 8	72.8	1.0
FD 302 - 6	24.4	0.6	FD 505 - 10	42	0.5
FD 325 - 6	26	0.7	FD 540 - 10	46	0.5
FD 345 - 6	28.2	0.7	FD 570 - 10	51.6	0.6
FD 380 - 6	32	0.8	FD 605 - 10	53.2	0.6
FD 410 - 6	33.2	0.8	FD 635 - 10	60.8	0.6
FD 440 - 6	36.4	0.9	FD 675 - 10	65.2	0.6
FD 475 - 6	38.2	1.0	FD 700 - 10	68.8	0.7
FD 505 - 6	42	1.0	FD 730 - 10	71.2	0.7
			FD 760 - 10	72.8	0.8

### 3. Mounting the disc packs and spacers

The coupling components are mounted in different ways depending on the FlexDur coupling type: The only tools required are a standard spanner and a torque wrench. It is of most importance that the coupling bolts be tightened properly to the following specifications. The screws shall be tightened uniformly one after the other in clockwise direction. It will be necessary to go round 3 times (30%. 60%. 100% MA) before all the screws are tightened to the recommended value. Note: Values to be reduced by 20 % for lubricated threads.

Values for disc bolt tightening torques in Nm

Coupling size	Tightening torque $M_A$ [Nm]	Coupling size	Tightening torque $M_A$ [Nm]
13-4	10	302-6/8	600
26-4	25	325-6/8	600
36-4	25	345-6/8	780
80-4	49	380-6/8	1100
125-4	86	410-6/8	1500
160-4	86	440-6/8	2000
255-4	210	475-6/8	2600
345-4	210	505-6/8/10	3300
110-6	30	540-8/10	4100
132-6	30	570-8/10	5100
158-6	60	605-8/10	6200
185-6	100	635-8/10	7900
202-6	150	675-8/10	9900
228-6	230	700-8/10	12200
255-6	450	730-8/10	12200
278-6/8	450	760-8/10	14800

Values for flange bolt tightening torques in Nm  
FD\_\_ - 6 O and FD\_\_ - 8 O

Coupling size	Tightening torque $M_A$ [Nm]	Coupling size	Tightening torque $M_A$ [Nm]
110-6	35	278-8	108
132-6	35	302-8	108
158-6	69	325-8	325
185-6	120	345-8	325
202-6	190	380-8	325
228-6	295	410-8	565
255-6	580	440-8	660
278-6	580	475-8	660
302-6	780	505-8	660
325-6	780	540-8	760
345-6	580	570-8	760
380-6	780	605-8	760
410-6	1000		
440-6	1500		
475-6	2000		
505-6	2000		

### **a) Standard version - S and N series**

The only bolts to be mounted and tightened are those connecting the disc packs to the hubs and spacer. Position the spacer properly and mount the bolts with their heads at the flange (and not at the disc pack). The nuts shall be tightened to the specified torque using the torque wrench while the heads of the bolts shall be kept fixed.

### **b) Compact version - C series**

The C coupling series is designed for machines, the shafts of which are too close to each other for being able to use the S standard version. The hubs have reduced outside diameters so that they can be inserted through the disc pack hole.

For mounting the hubs on the associated shafts, a space of at least one hub length is required between the shafts (see tabulated dimensions  $L_1$  and  $L_2$ ). For installing the coupling, the disc packs should be connected to the spacer with their bolts, the heads of which lie against the spacer, and then slid over one of the hubs and bolted onto it. The machine parts shall then be positioned properly for mounting the second disc pack to the associated hub.

The machines are now ready for alignment. As the spacer covers the shaft ends, the axial clearance needs to be checked by measuring the flange-to-flange distance (see tabulated dimension S). The radial and angular displacements can be checked as detailed above.

The bolts for mounting the disc packs to the hubs and spacer must be tightened as specified using a torque wrench for the nuts while the bolt heads shall be kept fixed.

### **c) Drop out version – O series**

The plug-in type design allows assembly and disassembly of the coupling with no need for removing the hubs from the shafts. The coupling is supplied in a preassembled state, with the bolts being tightened as specified. When the coupling components are stripped for whatever reason (e.g. for changing the disc packs) the nuts must be retightened to specification using a torque wrench while the bolt heads shall be kept fixed.

The machine parts should be aligned prior to mounting the coupling. The preassembled coupling element does not fit between the coupling hubs when the shaft-to-shaft clearance is duly observed. The element must therefore be compressed by pressing the disc packs together using the transport bolts so that the element fits between the centering keyways.

The centering snaps in place when the coupling is positioned properly. The bolts connecting the preassembled element to the hubs shall be tightened with a torque wrench to the specified values. This operation requires much attention as these bolts transmit the full torque of the coupling.

When removing the preassembled element, all bolts connecting it to the shaft hubs must be loosened first. The element can then be compressed by introducing the existing flange bolts in the transport bores so that the element is pressed out of the centering keyways.

## **Safety precautions**

***It is the customer' and user's responsibility to provide proper guards over rotating machinery and to observe the national and international safety rules and laws.***

***Check all bolted connections for proper fit preferably after the test run.***

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