DJ
D
DS

Bibby Turboflex

Installation & Maintenance Manual

For General Purpose Couplings

Issue	Issued By:	Checked By:	Released On
A	N.A.	G.D.M.	1/12/98
B	N.A.	G.D.M.	22/2/99
C	N.A.	G.D.M	6/8/99
D	G.P.M	P.S.K	12/01/17
E	G.P.M	P.S.K	03/04/2017
F	I.A	J.A.B	02/01/2019

INSTALLATION & MAINTENANCE INSTRUCTIONS FOR BIBBY TURBOFLEX DISC COUPLINGS

Bibby Turboflex Disc Couplings offer numerous advantages, particularly in high speed, heavy duty, hazardous or environmentally sensitive applications or where accurate translation of rotary motion must be maintained. The most prominent characteristics are:

1. No maintenance – no wearing parts, no lubrication
2. No Environmental Limitation – good resistance to atmospheric conditions
3. High operating speeds
4. Precise Synchronisation – No backlash, no torsional winding
5. Long life – excellent fatigue properties

Bibby Turboflex general purpose disc couplings are surface protected, chemical blacked, for corrosion resistance.

The Bibby Turboflex products have been subjected to the most intensive technical scrutiny and design development in order to satisfy Bibby Turboflex's commitment to product integrity and reliability. It is for this reason that, when installing the product, all the instruction contained in this document must be adhered to, and that variations are not allowed beyond those which may be given by Bibby Turboflex.

GENERAL NOTES

1. It is essential that all the instruction contained within this publication be carried out by a competent person. Should problems be anticipated or encountered then Bibby Turboflex personnel are available for site visits or, alternatively, repairs and overhauls can be undertaken in our works.
2. Prior to performing any maintenance work (including inspection), it is essential that the power supply is isolated and no movement is allowed of any rotating machinery.
3. The product is designed for a specific purpose. It is vital that it is not used for any purpose other than that for which is was designed and supplied, and that the limits of capacities as detailed here, in the catalogues or in any other document, are not exceeded.
4. No liability will be accepted and any warranty, either expressed or implied, will be null and void should any component of whatever kind, including nuts, bolts and washers be used in the assembly, or modifications be made to all or part of the product which are not supplied, specified or agreed by Bibby Turboflex.

Registered Office:- Bibby Transmissions, Cannon Way, Dewsbury, England WF13 1EH –
Registered in England – Number 158829

DO

1. The following instructions should be read and understood prior to starting any assembly or maintenance work on the disc couplings.
2. Prior to replacing any component, care must be taken to ensure that it is clean and free from dirt.
3. When tightening any bolts or screws, this should be carried out evenly, in cylinder head fashion, to 50% torque then to 100% torque in the same sequence. Where specified, it is essential that torque-tightening figures are not exceeded nor should it be allowed for them to be below specification.
4. While installing and removing the transmission unit, the unit should be supported to ensure that the weight is not imposed on one side only.
5. Record the Bibby Turboflex order number, coupling type and size, and any relevant information for future references.
6. Contact Bibby Turboflex for refurbishment works and spare components.

DO NOT

1. Do not use any component that is not supplied or approved by Bibby Turboflex in the assembly of this component.
2. Do not attempt to lift the coupling without the use of lifting equipment where the weight is excessive.
3. The inherent balance of these couplings could be disturbed if they are allowed to be knocked either by striking or rolling. Care should be taken when transporting and fitting to avoid such knocks. This is particularly relevant when a coupling has been specifically balanced.

BIBBY Turboflex and BIBBY Transmissions

Bibby Turboflex can offer technical advice and assistance to help users select the right coupling from our extensive range. This service can be extended to installation, maintenance and refurbishments.

As part of the Bibby Transmissions Group, we can provide solutions ranging from the tiniest of shaft couplers to high performance disc couplings. As a group, we design, manufacture and supply an extensive range of products such as disc couplings, gears and gear couplings, pin & bush couplings, grid couplings, powder couplings, torque limiters, safety elements, back stops, PIV chains and cardan shafts. Hence, there can be hardly any power transmission application which cannot be met by a Bibby Transmissions product. A technical consultancy service is available to assist all manners of power transmission problems.

Bibby Turboflex
Cannon Way
Mill Street West, Dewsbury
West Yorkshire, WF13 1EH
Tel. +44 (0) 1924 460801
Fax. +44 (0) 1924 457668

ALIGNMENT METHOD

Generally, the better the initial alignment of the driver and driven machinery the smoother the drive line will run. Each company has its own methods for aligning machines and the various alternatives are well documented. It is, therefore, not our intention to describe methods of setting machines.

Important Note: All Bibby Turboflex Disc Couplings will accept substantial amounts of misalignment, the configuration and design of each individual unit defining the actual acceptance levels. However, it must be appreciated that the various installation allowances shown are the *Maximum Permitted Values* for *Normal Use*. To allow for movement of machines and shafts during operation, it is important to limit the levels of permitted misalignment at initial installation to make allowance for maximum movement (and minimum resultant loads) during actual use. All the following information is intended as a guide to maximum recommended accuracy of the initial set-up values. It should be remembered that the greater degree of accuracy of initial alignment, the greater the length of trouble-free life the coupling is likely to enjoy.

Having correctly aligned the coupling, ensure that all bolts or attachment screws are correctly tightened to the torque figures given for the particular coupling. If possible, check tightness after a few hours running.

AXIAL ALIGNMENT

The axial distance between flange faces of disc coupling hubs will vary depending on the type of coupling and the requirements of the customer. In general, the fewer the bolts used in the coupling drive the greater the allowance which can be made for initial set up. In all instances of double element design where there is a predetermined distance between shaft ends (DBSE), the coupling will be manufactured such that, on assembly, the shafts to which the hubs are to be fitted must be to that dimensions, within the following tolerances.

No. of Bolts	Tolerance on DBSE
4	±0.4 mm
6	±0.3 mm
8	±0.25 mm
10	±0.2 mm

In the case of single element couplings (type DS) this tolerance must be halved and applied to the catalogue DBSE. The flange faces are checked to ensure that they are parallel within 0.25mm across the diameter.

If this axial distance is allowed to vary from that specified above and in the product sections which follow, damage to the coupling will result. There will also be excessive axial loads imposed upon connected equipment.

ANGULAR ALIGNMENT

The maximum angular misalignment allowed for disc couplings is dependent on the number of bolts connected to the blades. The assembly limits are as shown in the product sections which follow, but these should be considered to be maximums and every effort should be made to reduce these to an absolute minimum.

PARALLEL OFFSET

Parallel offset is not available with single element disc couplings (type DS). Where the coupling has two elements the offset is a function of the allowable angular misalignment and distance between the centres of the element assemblies. The maximum offsets on assembly should be kept to an absolute minimum. For details, see the product selections which follow.

Note:
As angular misalignment and parallel offset result in the same angular disposition of opposing flanges, these should be measured together. The product sections show two sets of figures. The angular misalignment is illustrated as 'mm of gap variation per mm of flange diameter', and an actual gap variation in mm at the periphery of flange. Either method will measure the misalignment successfully. Where more than one element assembly is present, as applies to all except DS types, then these instructions apply to each element.

HANDLING AND STORAGE

The coupling is normally dispatched with standard commercial packing and the case should contain a copy of the required documentation. During transport, the installation (or compression) screws will be in position to ensure that the elements are not in free state. The coupling should be stored in this condition. On receipt and also immediately before assembly, all the items should be checked to ensure that they are all in good condition and free of damage. The coupling should be stored horizontally. It should be protected against corrosion if stored for long periods or outdoors.

GENERAL PROCEDURE FOR ALIGNMENT & INSTALLATION

No liability will be accepted, and any warranty, either expressed or implied, will be null and void should any components of whatsoever kind, including nuts, bolts and washers, be used in the assembly or any modifications be made to all or part of the unit which are not supplied, specified or agreed by **Bibby Turboflex**.

When tightening any bolts or screws, this should be done evenly, i.e. cylinder head fashion, to 50% torque then to 100% torque in the same sequence. Threads should be lubricated with Molybdenum Disulphide grease or equivalent. Bibby Turboflex document TIS 5-262 carries more detailed instructions on torque tightening.

The following procedure is a general recommended guidelines for installation of the coupling.

Installation Procedure

1. Reference any applicable drawings for sizes and dimensions. Ensure that all the required tools and equipment are available.
2. Inspect the coupling for any indication of deviation from specification to ensure that it conforms to the requirements.
3. For balanced couplings, note any match markings, which must be aligned when the coupling is installed.
4. Fit the appropriate hubs to the driver and driven shafts ensuring that the shaft ends are flush with the flange faces of the hubs. For interference fits, the hubs can be heated up to 180°C, in oil bath or oven, (avoid spot heating and do not exceed the recommended temperature).
5. Check the shafts (hubs) misalignments and DBSE (distance between shaft ends) are within the allowable limits (see tables on following pages).

6. For 'D type' couplings –
    a. Assemble the centre section of the coupling (spacer and element assemblies)
    b. Tighten coupling bolts and nuts to the correct procedure.

7. For 'DJ type' couplings –
    a. The transmission unit (TU) should be as factory assembled
    b. Undo the installation screws and measure the length in 'free-state' which should be the same as the measured distance between the flange faces of the hubs. (DJ couplings maybe ordered with a packing ring and shims as part of the transmission unit. By the removal and addition of shims the length of the transmission unit maybe adjusted)
    c. Re-install the installation screws and compress each element assembly to the following figures by tightening the screws to enable the unit to be inserted between the hubs.

Size	Element Gap			Size	Element Gap	
	Free state	Compressed			Free state	Compressed
DJ62	6.5	4.7		DJ82	7.1	5.3
DJ102	9.6	7.6		DJ103	10.7	8.7
DJ122	10.7	8.7		DJ123	12.2	10.2
DJ142	12.2	9.7		DJ143	14.5	12
DJ162	16.4	13.9		DJ163	19.1	16.6
DJ192	19.7	16.7		DJ193	23.1	20.1
DJ232	18.6	15.6		DJ233	22.8	19.8
DJ272	20.5	17.5		DJ273	25.4	22.4
DJ312	23.2	19.7		DJ313	28.2	24.7

    d. Position the TU between the hubs, ensuring all the relevant match marks and attachment screw holes are aligned. The unit should be supported to ensure that the weight is not imposed on the joint during assembly. (If a packing ring and shims are supplied these need to be fitted to the TU before positioning between the hubs)

e. Insert attachment screws in position and release the installation screws carefully and evenly making sure that the pilots and recesses are properly seated. ***(Note: Do not torque tighten the attachment screws before removing the installation screws.)*** Store the tooling for future use.
c. Torque Tightened the Attachment Screws to correct procedure.

8. Inspect the installed coupling to ensure that all the fasteners are fully tightened and all the components are free from damage or deformities before starting the machines.

MAINTENANCE

On the whole, Bibby Turboflex couplings do not require any maintenance however it is recommended that the following checks are carried out annually.

a. Axial and parallel misalignment to ensure that these are still within the acceptable limits of the coupling and that no major machinery movement has occurred.
b. All bolts, nuts and screws to ensure they are still correctly tightened.
c. Flexible elements, by visual inspection, for signs of fatigue cracking local to the washer anchor points or general signs of fretting corrosion. Slight bowing or 'S' like distortion of the lamination is not detrimental to the operation of the unit.

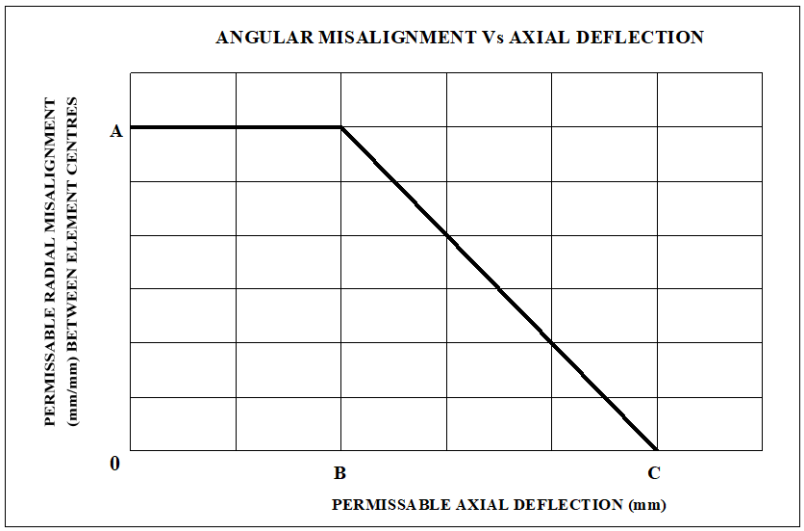
BALANCED COUPLINGS

The fasteners supplied with the balanced couplings are matched sets and must not be mixed or substituted. Balanced couplings are match-marked (normally on major flanges) and must be assembled with mating match marks aligned. When refurbishing the fasteners of a balanced coupling, the whole set must be replaced by balance-weighed parts.

As an aid to on-site balancing (a procedure which is always recommended), tapped holes are provided in the hub flanges for the addition of balance weights.

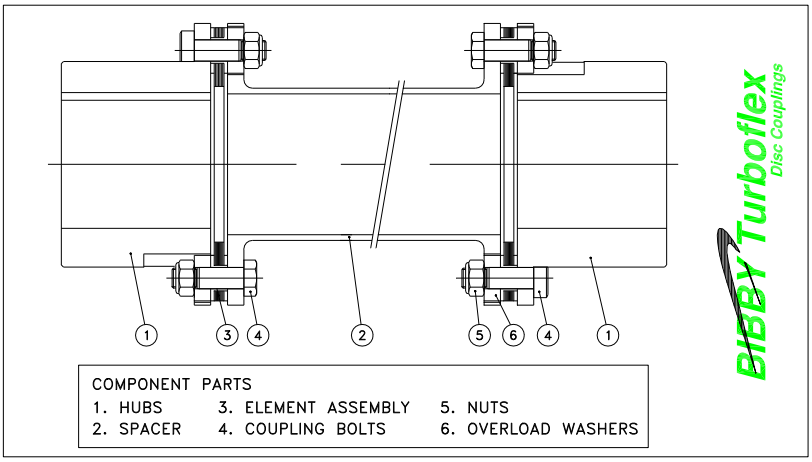
INSTALLATION AND OPERATING MISALIGNMENT LIMITS

The following curve shows the general allowable running misalignment limits which should be read in conjunction with the specific details for the relevant couplings. Point 'A' is the maximum permissible radial misalignment of the coupling at *zero* axial deflection and point 'C' represents the maximum allowable axial displacement value when *no* radial misalignment exists.



The coupling shall operate within this envelope (below the allowable misalignment curve) and providing these limits are not exceeded at any time, the coupling should enjoy a trouble free life.

Type 'D' – Double Element Couplings with Spacers



Initial Installation allowances

Size	Tightening Torques [1]	Axial Tolerance	Radial/Parallel Tolerance [2]
D52	4 Nm	± 0.4mm	0.004 mm/mm
D62	7 Nm	± 0.3mm	0.003 mm/mm
D102	18 Nm	± 0.3mm	0.003 mm/mm
D122	35 Nm	± 0.3mm	0.003 mm/mm
D142	60 Nm	± 0.3mm	0.003 mm/mm
D162	95 Nm	± 0.3mm	0.003 mm/mm
D192	210 Nm	± 0.3mm	0.003 mm/mm
D232	400 Nm	± 0.3mm	0.003 mm/mm
D272	510 Nm	± 0.3mm	0.003 mm/mm
D312	750 Nm	± 0.3mm	0.002 mm/mm

Size	Tightening Torques [1]	Axial Tolerance	Radial/Parallel Tolerance [2]
-	-	-	-
D82	7Nm	± 0.3mm	0.003 mm/mm
D103	25 Nm	± 0.3mm	0.003 mm/mm
D123	50 Nm	± 0.3mm	0.003 mm/mm
D143	95 Nm	± 0.3mm	0.003 mm/mm
D163	150 Nm	± 0.3mm	0.003 mm/mm
D193	320 Nm	± 0.3mm	0.003 mm/mm
D233	630 Nm	± 0.3mm	0.003 mm/mm
D273	760 Nm	± 0.3mm	0.003 mm/mm
D313	1150 Nm	± 0.3mm	0.002 mm/mm

1 - Tightening Torques figures are for the coupling bolts, Components 4.
2 - The given figure are for element to element centres. To achieve the allowable figure, multiply the given tolerance with the coupling DBFF (distance between flange faces).

Maximum Operating Allowances

Size	Speed (max) rpm	A mm/mm	B Mm	C mm
D52	19000	0.017	0.5	1.8
D62	14500	0.012	0.3	1.5
D102	12000	0.012	0.9	2.8
D122	10000	0.012	1.3	3.5
D142	8600	0.012	1.6	4.2
D162	7500	0.012	1.9	5.0
D192	6000	0.012	2	5.5
D232	5000	0.012	2.2	6.5
D272	4200	0.012	3.0	8.0
D312	3600	0.0085	2.0	6.2

Size	Speed (max) rpm	A mm/mm	B mm	C mm
-	-	-	-	
D82	12000	0.012	0.7	2.2
D103	12000	0.012	0.9	2.8
D123	10000	0.012	1.3	3.5
D143	8600	0.012	1.6	4.2
D163	7500	0.012	1.9	5.0
D193	6000	0.012	2	5.5
D233	5000	0.012	2.2	6.5
D273	4200	0.012	3.0	8.0
D313	3600	0.0085	2.0	6.2

Type 'DCC' – Double Element Couplings with Spacers

Bibby Turboflex 'DCC' type couplings are as 'D' type couplings except have one hub reversed. The Technical details remain the same.

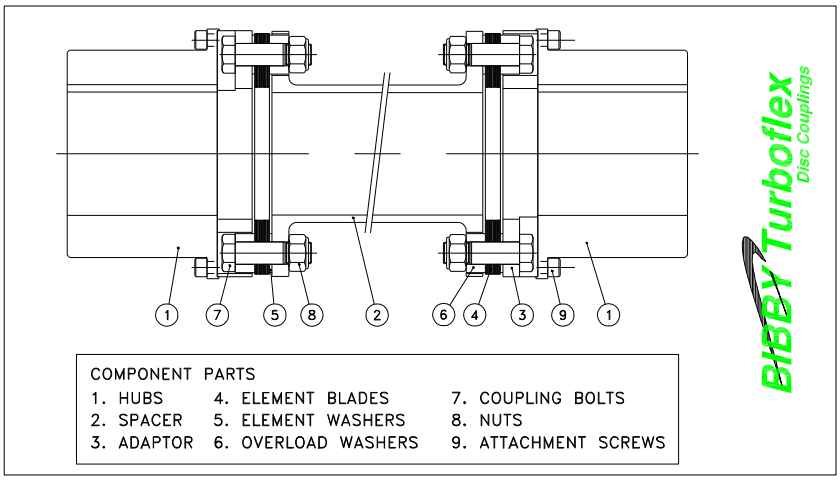
Type 'DGC' – Double Element Couplings with Split Spacers

Bibby Turboflex 'DGC' type couplings are as 'D' type couplings except have two hub reversed. Customer needs to move the machinery to install the coupling.
The Technical details remain the same.

Type 'DCT' – Double Element Couplings with Spacers

Bibby Turboflex 'DCT' type couplings are as 'D' type couplings except that they employ a fabricated spacer. The Technical details remain the same.

Type 'DJ' – Double Element 'Plug-In' Couplings



Initial Installation allowances

Size	Tightening Torques [1]	Axial Tolerance	Radial/Parallel Tolerance [2]
DJ62	3.5 Nm	± 0.3mm	0.002 mm/mm
DJ102	12 Nm	± 0.3mm	0.002 mm/mm
DJ122	30 Nm	± 0.3mm	0.002 mm/mm
DJ142	30 Nm	± 0.3mm	0.002 mm/mm
DJ162	60 Nm	± 0.3mm	0.002 mm/mm
DJ192	100 Nm	± 0.3mm	0.002 mm/mm
DJ232	160 Nm	± 0.3mm	0.002 mm/mm
DJ272	250 Nm	± 0.3mm	0.002 mm/mm
DJ312	340 Nm	± 0.3mm	0.002 mm/mm

Size	Tightening Torques [1]	Axial Tolerance	Radial/Parallel Tolerance [2]
DJ82	7Nm	± 0.3mm	0.002 mm/mm
DJ103	12 Nm	± 0.3mm	0.002 mm/mm
DJ123	30 Nm	± 0.3mm	0.002 mm/mm
DJ143	30 Nm	± 0.3mm	0.002 mm/mm
DJ163	60 Nm	± 0.3mm	0.002 mm/mm
DJ193	100 Nm	± 0.3mm	0.002 mm/mm
DJ233	160 Nm	± 0.3mm	0.002 mm/mm
DJ273	250 Nm	± 0.3mm	0.002 mm/mm
DJ313	340 Nm	± 0.3mm	0.002 mm/mm

1 - Tightening Torques figures are for the Attachment screws, Components 9.
2 - The given figure are for element to element centres. To achieve the allowable figure, multiply the given tolerance with the coupling DBFF (distance between flange faces).

In the case of plug-in type 'DJ' units, locations between the hubs and adaptors are by registers. To install or remove, the central section of the coupling must be compressed sufficiently to clear the length of the register.
The 'DJ' coupling will be supplied with the installation screws (not shown) to 'crush' or 'compress' the flexible elements sufficiently for this purpose. These screws must be removed completely before the operation of the unit.

Coupling Bolts (Component No.7) will already have been correctly tightened and under no circumstances should the assembly be broken down or disturbed in any way.

Maximum Operating Allowances

Size	Speed (max) rpm	A mm/mm	B mm	C mm
DJ62	14500	0.012	0.3	1.5
DJ102	12000	0.012	0.8	2.7
DJ122	10000	0.012	1.3	3.5
DJ142	8500	0.012	1.6	4.0
DJ162	7500	0.012	1.9	5.0
DJ192	6000	0.012	2	5.5
DJ232	5000	0.012	2.2	6.5
DJ272	4000	0.012	3.0	8.0
DJ312	3600	0.0085	2.0	6.2

Size	Speed (max) rpm	A mm/mm	B mm	C mm
DJ82	12000	0.012	0.7	2.2
DJ103	12000	0.012	0.8	2.7
DJ123	10000	0.012	1.3	3.5
DJ143	8500	0.012	1.6	4.0
DJ163	7500	0.012	1.9	5.0
DJ193	6000	0.012	2	5.5
DJ233	5000	0.012	2.2	6.5
DJ273	4000	0.012	3.0	8.0
DJ313	3600	0.0085	2.0	6.2

Transmission Units (TU's) are supplied as complete assemblies (part 2 to 9 inclusively). and are fitted between hubs that are already mounted on to shafts which are aligned correctly. Should this not be the case, reference should be to other relevant sections of this document. The technical details remain the same as DJ's.

Type 'DJ-CT' – Double Element 'Plug-In' Couplings

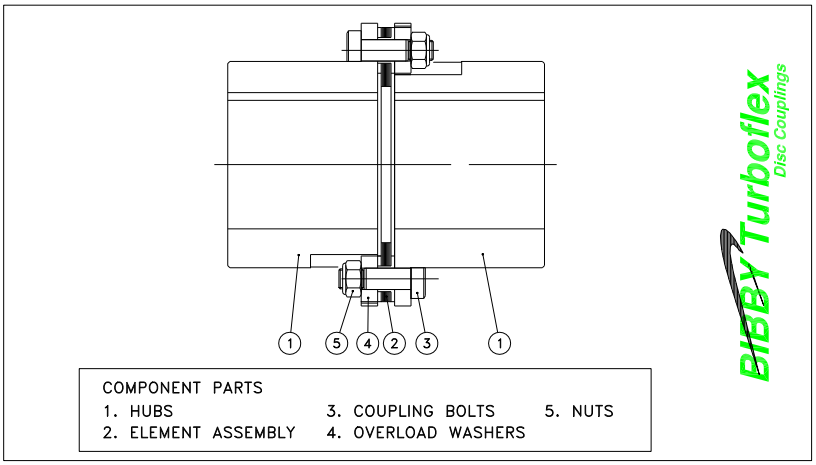
Bibby Turboflex 'DJ-CT' type couplings are as 'DJ' type couplings except that they employ a fabricated spacer. The Technical details remain the same.

Type 'DJ-CFT' – Double Element 'Plug-In' Couplings

Bibby Turboflex 'DJ-CFT' type couplings are as 'DJ' type couplings except that they employ a Carbon Fibre spacer. The Technical details remain the same.

Type 'DS' – Single Element Couplings

Registered Office:- Bibby Transmissions, Cannon Way, Dewsbury, England WF13 1EH –
Registered in England – Number 158829



Initial Installation Allowances

Size	Tightening Torques [1]	Axial Tolerance	Angular Tolerance [2]
DS52	4 Nm	± 0.4mm	0.25°
DS62	7 Nm	± 0.3mm	0.20°
DS102	18 Nm	± 0.3mm	0.20°
DS122	35 Nm	± 0.3mm	0.20°
DS142	60 Nm	± 0.3mm	0.20°
DS162	95 Nm	± 0.3mm	0.20°
DS192	210 Nm	± 0.3mm	0.20°
DS232	400 Nm	± 0.3mm	0.20°
DS272	510 Nm	± 0.3mm	0.20°
DS312	750 Nm	± 0.3mm	0.15°

Size	Tightening Torques [1]	Axial Tolerance	Radial Tolerance [2]
-	-	-	-
DS82	7Nm	± 0.3mm	0.20°
DS103	25 Nm	± 0.3mm	0.20°
DS123	50 Nm	± 0.3mm	0.20°
DS143	95 Nm	± 0.3mm	0.20°
DS163	150 Nm	± 0.3mm	0.20°
DS193	320 Nm	± 0.3mm	0.20°
DS233	630 Nm	± 0.3mm	0.20°
DS273	760 Nm	± 0.3mm	0.20°
DS313	1150 Nm	± 0.3mm	0.15°

1 – Tightening Torques figures are for the nuts, Components 5.
2 – 'DS' type couplings will not accept parallel offset.

Maximum Operating Allowances

Size	Speed (max) rpm	A degrees	B mm	C mm
DS52	19000	1.0	0.2	0.9
DS62	14500	0.75	0.1	0.8
DS102	12000	0.75	0.4	1.4
DS122	10000	0.75	0.6	1.7
DS142	8600	0.75	0.8	2.1
DS162	7500	0.75	0.9	2.5
DS192	6000	0.75	1.0	2.6
DS232	5000	0.75	1.1	3.2
DS272	4200	0.75	1.5	4.0
DS312	3600	0.50	1.0	3.1

Size	Speed (max) rpm	A Degrees	B mm	C mm
-	-	-	-	
DS82	12000	0.75	0.3	1.1
DS103	12000	0.75	0.4	1.4
DS123	10000	0.75	0.6	1.7
DS143	8600	0.75	0.8	2.1
DS163	7500	0.75	0.9	2.5
DS193	6000	0.75	1.0	2.6
DS233	5000	0.75	1.1	3.2
DS273	4200	0.75	1.5	4.0
DS313	3600	0.50	1.0	3.1

PROPOSITION 65 COMPLIANCE WARNING

WARNING: This product contains chemicals known to the State of California to cause cancer and/or birth defects or other reproductive harm.