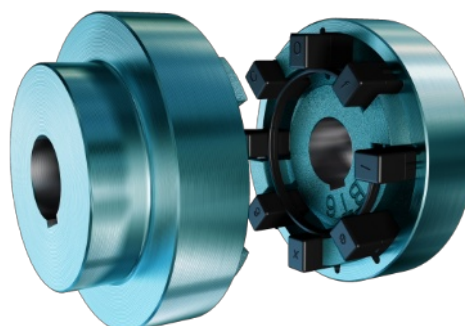


ATEX



ECOflex



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2. ASSEMBLY

2.1. BT & BTP VERSIONS

Unless otherwise specified, the ECOflex couplings are normally supplied unbored. Upon request the couplings can be bored and keyed and provided with a radially tapped hole for a set screw.

When boring, check that the flanged hub is accurately centred on its outer diameter in order to ensure correct alignment and to avoid premature wear of the flexible sleeve.

In case of a slide fit, axial securing is either assured by a set screw holding the key or an axial securing screw keeping the flange (BT) or the hub (BTP) against a shaft shoulder.

In case of an interference fit, heat the flanges or hubs, taking care not to exceed 100°C. Then mount them on the shaft until they are pressed against the shaft shoulder.

- If the shaft end is longer than the hubs, a spacer ring of suitable should be placed against the shaft shoulder. If hubs are equipped with a setscrew, then, no spacer is needed. This will make easier the replacement of elastic elements in sliding back the hub on shafts.
- On the contrary, if shaft is shorter than hub, a shortening of hub is not required.

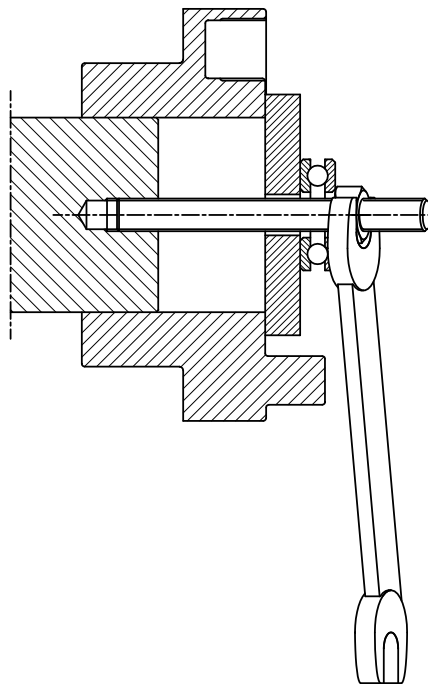


Figure 1: Fitting of hub onto shaft

Hammer blows may cause damage to the bearings and must be avoided at all accounts. It is preferable to use a threaded bar, a nut and a metal plate as a bridge and a thrust bearing if needed (see Figure 1).

A slide fit is to be preferred for easy maintenance.

In case of a BTP coupling types, centre the flanges and bolt them on the hubs.

Insert the flexible element into one of the flanges before alignment.

2.2. BTB VERSION WITH UNIVERSAL BUSHES

1. Clean unprotected surfaces, bores, outer diameter of the cone of the bush as well as the taper fore in the hub receiving it.

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2. Put the bush into the hub and align all connexion holes (the half tapped holes should be in front of half drilling's).
3. Gently grease and engage the screws without tightening them.

★ In an Explosive Atmosphere, DO NOT grease threads but degrease them in order to use thread-lock paste! (See § 8.5 - First Start page 7 and point 7 below)

4. Clean and degrease the shaft. Engage hub equipped with its bush onto it and slide it up to the desired position on shaft.
5. Check that key is correctly seated and that there is play between its back and the bottom of the keyway in the bush.
6. With a hexagon-socket (DIN911), regularly tighten the screws up to the tightening torques shown on Table 1 - Tightening torques for fixing screws of Universal Bushes.
7. After a short running-in (1/2 h to 1 hour), check the tightening of the fixing screws and correct it if necessary.

★ In an Explosive Atmosphere, remove screws one by one to wrap them with medium-strength Thread-Lock paste (Loctite 243 or equivalent) before their final tightening to required torque (see Table 1 - Tightening torques for fixing screws of Universal Bushes below)

8. To avoid penetration of impurities, fill all bores with grease.

Tableau 1: Tightening torques for fixing screws of Universal Bushes

Coupling sizes	Type of bush	Type of screws	Hexagon-socket (DIN 911)	Tightening torques Nm
6	1108	1/4" – BSW13	3	6
15	1210	3/8" – BSW16	5	20
22 30	1615	3/8" – BSW16	5	20
40	2012	7/16" – BSW22,5	5	31
55 85	2517	1/2" – BSW22,5	6	48
135 200	3030	5/8" – BSW32	8	90
300	3535	1/2" – BSW38	10	112

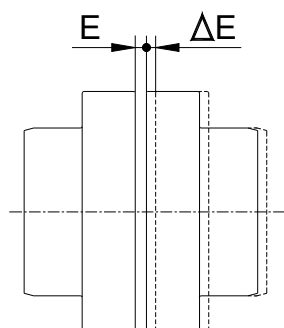
3. ALIGNMENT

When mounting the couplings halves, ensure that the coupling is flush with the shaft. Alignment must be performed so that radial and angular misalignment is kept to a minimum. Accurate alignment extends the service life of the coupling and bearings.

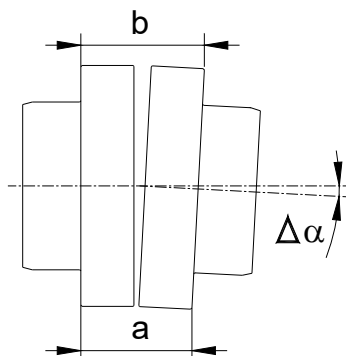
Appropriate measures should be taken in order to ensure that the state of alignment is maintained under all operating conditions.

Unavoidable shaft misalignments should not exceed the values given in Table 2 - Maximum Misalignment Values page 4.

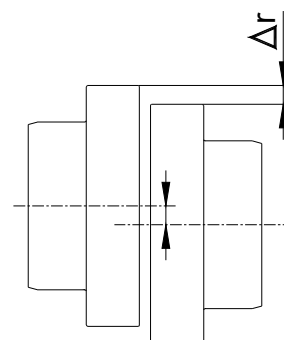
★ The values in Table 2 - Maximum Misalignment Values apply to operate speeds=1500rpm. The values Δr and $\Delta\alpha$ must be reduced to half when $n=3000\text{rpm}$.



Axial Misalignment ΔE



Angular Misalignment $\Delta\alpha$



Radial Misalignment Δr

Table 2: Maximum Misalignment Values

Size		4	6	10	15	22	30	40	55	85	135	200	300
E+ΔE (mm)	BT, BTB, BTJ	2 ⁺¹											3 ⁺²
	BTP	3 ⁺¹				4 ⁺¹				5 ⁺¹			6 ⁺²
Δα (b-a) (mm)		0.15	0.2				0.25		0.30		0.35	0.40	0.45
Δr (mm)													

Angular and radial misalignment can occur simultaneously.

In practice, measure each misalignment value; report this value with respect to the maximum indicated value.

The sum of these ratios shall not exceed 1.

$$dr/\Delta r + d\alpha/\Delta\alpha < 1$$

With:

dr : value of measured radial misalignment

Δr : value of maximum radial misalignment (e.g. 0,20mm for size 15)

$d\alpha$: value of measured angular misalignment

$\Delta\alpha$: value of maximum angular misalignment (e.g. (b-a)=0,20mm for size 15)

The misalignment measurements must be made on two perpendicular planes and the verification measurements be made at four points at 90° .

Check the adjustment values when the machine is warm.

4. EARTHING

The plates or the shafts on which they are mounted must be grounded.

5. INSPECTION AND REPLACEMENT OF ELASTIC ELEMENTS

Maintenance of the ECOflex coupling is limited to replacing the flexible element when signs of wear or damage become apparent.

- When the hubs are provided with grub screws to prevent axial displacement, displace axially one of the flanges, loosen set screw and remove the flexible element.
- In contrary case, misalign the motor or machine and remove the flexible element.

In case of an individual flexible elements, use a screw driver or a similar tool.

Place the new flexible element into the fixed flange. It can be split open to allow the passage of the shaft ends

Position the other flange so that distance E is respected.

5.1. BTP COUPLINGS

Remove the screws retaining both flanges on their respective hub and withdraw both flanges and the flexible element at the same time.

Replace the flexible element and mount the whole assembly between the two hubs.

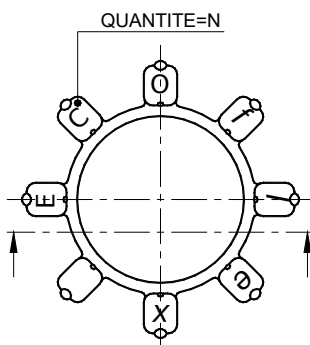
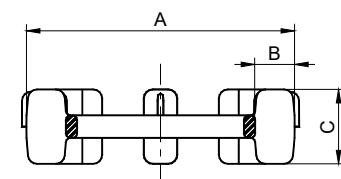
Tighten the flanges.

Alignment is not required.

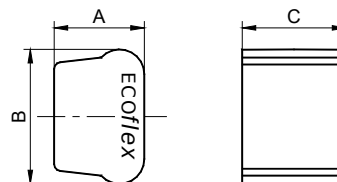
5.2. DIMENSIONS OF ELASTIC ELEMENTS

Table 3: Dimensions of Elastic Elements

Size	A	B	C	N
4	59	8.5	16	8
6	68	10	18	
10	77	10	18	10
15	85	12	23	
22	95	12	24	12
30	107	13	26	
40	118	14	28	
55	129	15	30	
85	145	18	35	
135	168	21	42	
200	20	29.8	23	24
300	23	33.8	25	



TAILLES 4 A 135



QUANTITE: 24

TAILLES 200 & 300

6. CLEANING OF RUBBER ELEMENTS

Clean the elastic elements with a damp cloth. Do not use solvent but soapy water.

7. COUPLING DISASSEMBLY

7.1. BT & BTP VERSIONS

Hubs must be removed from shafts using adapted extractions tools requiring no shocks or hammering (Claw extractors ...).

Setscrews must be loosened beforehand.

7.2. BTB VERSION

1. Loosen all screws and remove them.
2. Put the removed screw(s) in the puller hole(s).
3. Tighten the screw(s) regularly until the bush is released from its taper bore in hub and the set can easily slide along the shaft.
4. Completely remove the hub and bush from the shaft extension.

★ When remounting, we recommend to use new screws! Also replace the bush if the threads in it are damaged.

8. USE IN EXPLOSIVE ATMOSPHERES

➔ IMPORTANT : Any coupling not presenting marking as detailed in chapter 8.4 MUST NOT be used in explosive atmosphere.

Indications and instructions regarding use in explosive atmospheres:

8.1. INSPECTION INTERVALS FOR USE IN EXPLOSIVE ATMOSPHERE

Explosion Group	Inspection Intervals
II 2D 120°C II 2G T4 II 3G T4 II 3D 120°C	The visual inspection of elastic element wear must be carried out after 100 hours of operation, or one month at the latest. If no significant deformation is observed, the following inspections can be performed every 2000 hours of operation or at most every 3 months. If the elements are worn or show signs of major deformation and if tearing is observed, it will be necessary to replace the elements and seek the possible causes as described in the chapter« Malfunctions and Remedies ». The periodicity of the maintenance intervals must be restarted if the operating parameters are changed

8.2. INDICATION OF WEAR VALUES

The wear of the elastic elements is checked by the angular offset between the plates:

The measurement must be made at a stop and without any load in order to measure the angular clearance

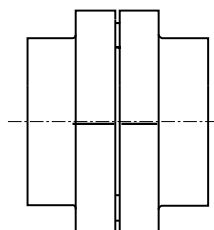


Figure 2: New Elements

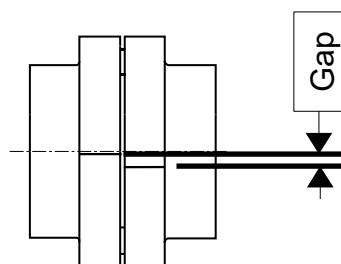


Figure 3: Elements Worn-out

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Size	4	6	10	15	22	30	40	55	85	135	200	300
Max Gap (mm)	3,2	4,0	4,0	4,2	4,3	4,7	5,0	5,3	6,0	7,3	7,7	9,0

★ CAUTION: To ensure a Risk-free long-lasting operation in an explosive atmosphere, its is particularly important to check misalignment.

If values shown in chapter 3 are exceeded, the coupling should be considered as damaged and must be replaced.

8.3. MATERIALS USED

- Material of Hubs: EN-GJL-250 as per EN 1561
- Material of rubber elements: Mixture of Rubber with Nitrile Butadiene (NBR).

8.4. MARKING OF COUPLINGS FOR EXPLOSIVE ZONES



Couplings certified for use in explosive zones are marked:



II 2 D 120°C



II 2 G T4



II 3 D 120°C



II 3 G T4

8.5. FIRST START

Before startup, check that the radial screws (if there are any) are tight, or check that the shaft end screw is tight. Check the alignment and the gap between the hubs.

Check that elastic elements are correctly placed in hubs.

★ In an explosive atmosphere, the screws must be protected from any possible loosening off, for instance, by the application of medium-strength thread-lock paste (Loctite 243 or equivalent) on the threads.

8.6. MALFUNCTIONS AND REMEDIES

Malfunction	Cause	Indication of Risk in Hazardous Area	Solution
Noise and vibration during operation.	Misalignment.	Danger of elastic elements overheating.	1) Turn off the machine. 2) Eliminate the cause of misalignment (loose attaching screw, broken fastener, and dilatation, assembly dimensions not complied with, deformation of support under load). 3) Check the wear of the components and replace as necessary.
	Wear of elastic elements, short-term risk of metal on metal contact.	Danger of ignition due to sparks	1) Turn off the machine. 2) Remove the elastic elements. 3) Check the coupling parts and replace them if necessary. 4) Fit new elastic elements. 5) Check the alignment at a stop and in operation and correct if necessary.

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Malfunction	Cause	Indication of Risk in Hazardous Area	Solution
	Loosening of the hubs securing screws.		1) Turn off the machine. 2) Check the alignment of the coupling. 3) Tighten the securing screws of the hubs and lock them. 4) Check the wear of the elements. 5) Check the alignment at a stop and in operation and correct if necessary.
Premature wear of elastic elements (degradation of material inside hubs).	Machine vibration.	Danger of elastic elements overheating.	1) Turn off the machine. 2) Replace the elastic elements. 3) Check the alignment at a stop and in operation and correct if necessary. 4) On the machine seek the cause of vibration.
Driving claws breakage or bolt-on flange damage (BTP Version)	Wear of elastic elements, transmission of torque by metal on metal contact.	Danger of ignition due to sparks.	1) Turn off the machine. 2) Replace the entire coupling 3) Check the alignment at a stop and in operation and correct if necessary.
	Driving claws or bolt-on flange breakage due to shock or overtorque.		1) Turn off the machine. 2) Identify and eliminate the cause of overload. 3) Replace the entire coupling 4) Check the alignment at a stop and in operation and correct if necessary.
	Loosening of the bolt-on flange fixation screws (BTP version).		1) Turn off the machine. 2) Replace the entire coupling 4) Drive the ring fixation screw with the recommended torque and use a thread-locking paste.
	The conditions of use do not correspond to the coupling performance.		1) Turn off the machine. 2) Check the operating conditions and select a larger coupling. 3) Install the new coupling 4) Check the alignment at a stop and in operation and correct if necessary.
	Error on machine commissioning		1) Turn off the machine. 2) Replace the entire coupling 3) Check the alignment at a stop and in operation and correct if necessary. 4) Train the operating and maintenance personnel.
Loosening of the screws fixing the bushes (BTB version). No thread-lock paste on bushes fixing screws (BTB Version).	Wrong tightening of the screws fixing the bushes (BTB version). No thread-lock paste on bushes fixing screws (BTB Version).	Danger of destruction of flanges and bushes creating sparks.	1) Turn off machine. 2) Check components of the coupling and replace them if necessary. 3) Tighten the screws fixing the bushes to recommended tightening torque and use thread-lock paste.

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Premature wear of rubber elements.	Contact with an aggressive compound such as hydrocarbons, ozone...	Danger of overheating and ignition caused by sparks.	1) Turn off the machine. 2) Check components of the coupling and replace them if necessary. 3) Fit new rubber elements 4) Protect coupling from future contact with the degrading compound.
	Temperature of use outside the authorised range -20°C/+40°C.		1) Turn off the machine. 2) Check components of the coupling and replace them if necessary. 3) Fit new rubber elements 4) Measure and regulate ambient temperature.
	Misalignment		1) Turn off the machine. 2) Fix the reason for misalignment (Loosening or breakage of fixing screws, expansion, assembly dimensions not respected, bending of basement under load). 3) Check components of the coupling and replace them if necessary. 4) Fit new rubber elements 5) Check alignment when stopped and while running. Correct it if necessary.

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