PENCOflex

ATEX

1. TABLE OF CONTENT

2. ASSEMBLY

- During the final boring of couplings supplied with a pre-bore, make sure that the hub to be machined is centered correctly on its larger diameter.
- In this way, the bore will be absolutely concentric, a primordial condition for fault-free alignment. Indeed, the premature wear of the elastic packing can result from incorrect bore concentricity.
- For couplings starting from size 510, it is essential to avoid that the shaft end coincides with the hole provided in the hub (see fig.1 page 4). In this case, use a hub without a hole.
- It is not advisable to assemble the hubs on the shafts by driving them with hammer blows so as to avoid damage to the bearings supporting the shafts to be connected. Assembly will be carried out preferably with a threaded rod fitted with a nut and washer. Simply screw this rod into the tapped hole of the shaft. A Thrust Bearing will greatly simplify the task (see fig.2 page 4).
- -To facilitate the assembly of large size couplings, the prior heating of the hubs is advisable. However, avoid exceeding a temperature of 100°C and first remove the rubber elements

3. ALIGNMENT

Correct alignment presupposes that the shaft to be connected are :

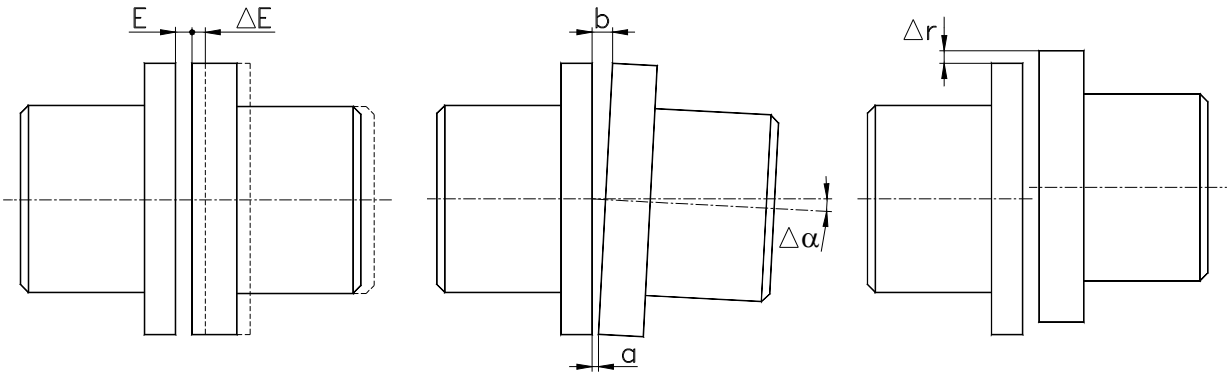
a) Parallel (see fig.3A page 4) ;

b) Not offset radially one to the other (see fig.3B page 4).

When inspection using a thickness gauge shows that the clearance between the hubs is equal all over (see at bottom of fig.4 page 4) shaft axis are reputed parallel.

When a rule placed on the outer cylinder of the plates touches them simultaneously at any point (see the upper part of fig.4 page 4), there is no misalignment.

It is important to note that the alignment of the shafts to be connected must be as accurate as possible. Indeed, although the PENCOflex coupling is capable of neutralizing the alignment defects, it is still true that a misalignment that is relatively too large can cause premature wear of the rubber elements



Size		145	155	175	200	235	245	280	315	355	385
EΔE	PN & PB	3.5±1.5	3.5±1.5			4±2				5.5±2.5	
	PD		$3.5^{+1.5}$			$4^{+1.5}$					
Δα (b-a)		0.3				0.45				0.6	
Δr		0.2				0.25				0.3	

Size		460	510	575	670	725	850	990	1060	1220	1420
EΔE	PN & PB	5.5±2.5	7±3			8.5±3.5			10.5±4.5		
	PD										
Δα (b-a)		0.6	0.9			1.2			2.2		
Δr		0.3	0.4			0.5			0.75		

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 misalgnment

Δr : value of maximum radial misalignement (e.g. 0,25mm for a PN280)

$d\alpha$: value of measured angular misalignement

$\Delta\alpha$: value of maximum angular misalignment (e.g. (b-a)=0,45mm for a PN280)

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 RUBBER ELEMENTS

Remove the nuts or circlips retaining them. This means that the inspection and possible replacement of the rubber elements may be effected without having to back off or move the coupled devices. It is advisable to smear the spindles with grease when replacing the rubber elements. The pins may also be removed without needing to move the two halves.

For sizes PN510 to PN1420 and for all the PD devices, simply remove the bolts or nuts retaining the pins. These taper end pins can be removed through the facing holes. When the pins are put back in place for sizes PN145 to PN200, they must be coated with Loctite 601.

It is advisable to check the rubber elements at regular intervals to detect any wear or misalignment occurring after bearing wear or a movement of the foundation.

6. CLEANING OF RUBBER ELEMENTS

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

7. COUPLING DISASSEMBLY

All coupling halves have two tapped puller holes that can be used with suitable accessories (see fig.5 page 4), , for removing with ease (and without hammer blows) the hubs from shafts.

Any retaining screw should be released beforehand.

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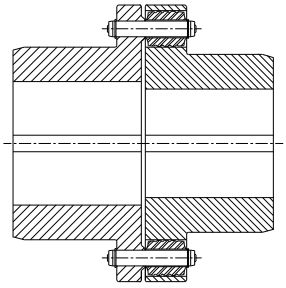
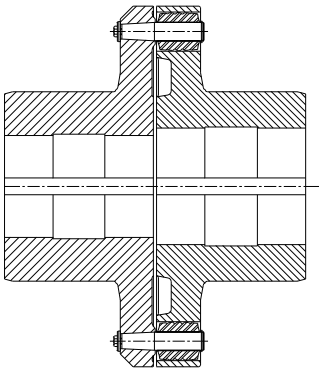


Type 145-460



Type 510-1220

Fig. 1

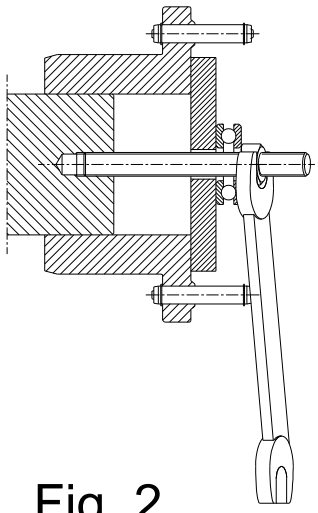


Fig. 2

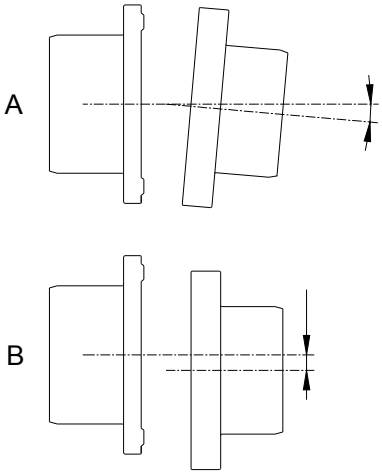


Fig. 3

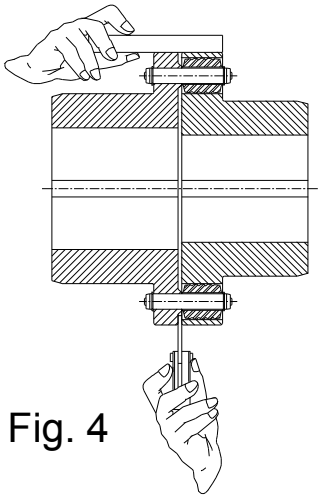


Fig. 4

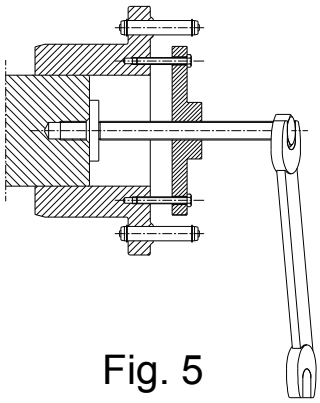
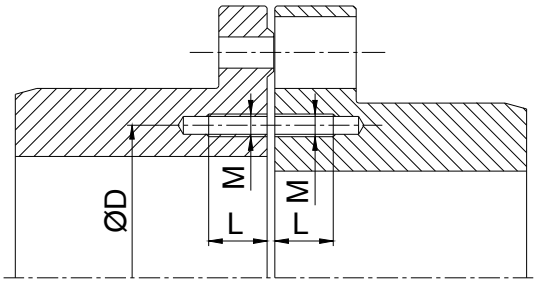
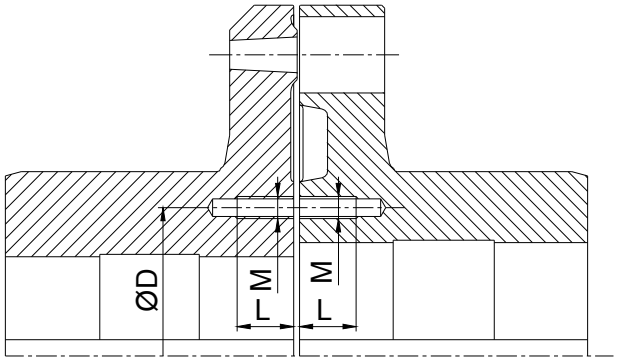


Fig. 5





Size	M	L	ØD
145	M8	15	75
155	M8	15	80
175	M10	20	95
200	M10	20	105
235	M12	22	120
245	M12	22	135
280	M12	22	145
315	M12	22	165
355	M16	30	190
385	M16	30	220
460	M20	34	232
510	M20	40	260
575	M24	45	300
670	M24	45	320
725	M24	45	350
850	M30	60	390
990	M30	60	430
1060	M30	60	470
1220	M36	75	515
1420	M36	75	560

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8.3. MATERIAL USED

- Material of Hubs: EN-GJL-200 (formerly FGL200).
- Material of rubber elements: Mixture of Natural Rubber with Styrene Butadien and Carbon Black.
- Material of Pins: Steel.

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 size between the plates.

Check the tightness of the elastic element attaching nuts (or the correct positioning of the circlips).

In an explosive atmosphere, the screws must be protected from any possible loosening off, for instance, by the application of threadlock to the threads.

8.6. MALFUNCTIONS AND REMEDIES

Malfunction	Cause	Indication of risk in Hazardous Area.	Solution
Nois and vibration during operation.	Misalignment.	Danger of Rubber 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 Rubber Elements, risk on the short-term of metal to metal contact	Danger of ignition due to sparks.	1)Turn off the machine. 2) Disassemble the end stop on the elastic elements and remove them. 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
	Loosening of axial screws fixing coupling hubs.		1) Turn off the machine. 2) Check the alignment of the coupling. 3) Tighten the end attaching screws of the plates and lock them. 4) Check the wear of the elements. 5) Check the alignment at a stop and in operation and correct if necessary.

Malfunction	Cause	Indication of risk in Hazardous Area.	Solution
Premature wear of elastic elements (degradation of material inside plates)	Machine Vibration.	Danger of Rubber 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.
Pin Breakage	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.
	Pin 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
	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 nuts or circlips retaining the elastic elements	Incorrect assembly of elastic elements.	Danger of destruction of elastic elements and ignition due to sparks	1) Turn off the machine. 2) Disassemble the end stop of the elastic elements and remove them. 3) Check the coupling parts and replace them if necessary. 4) Assemble new coupling elements while checking the correct assembly of the stopping parts. 5) Check the alignment at a stop and in operation and correct if necessary.
Premature wear of elastic elements.	Contact with harsh product such as hydrocarbons, ozone…	Danger of overheating and ignition due to sparks.	1) Turn off the machine. 2) Disassemble the end stop of the elastic elements and remove them. 3) Check the coupling parts and replace them if necessary. 4) Fit new elastic elements. 5) Protect the coupling from all contact with the fluid in question.

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