

Installation and Maintenance Manual

Disc Coupling

“PWH”

(Mounting on keyed cylindrical shaft)



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1. Introduction

1.1. Company Information

Lamiflex Couplings® is a manufacturer of flexible disc couplings, elastomeric, gears, transmission shafts, bearing guards and coupling guards. The company was founded in 1999 under the name Powerflex Transmission, but after restructuring it became Lamiflex do Brasil Equipamentos Industriais Ltda.

In July 2012, Lamiflex do Brasil Equipamentos Industriais Ltda merged with the group **Altra Industrial Motion SA**. This acquisition allowed Lamiflex to provide the market with a wide range of products related to the power transmission segment.

➤ Registration data

Company name	Altra Industrial Motion do Brasil Equipamentos Industriais Ltda.
Tel.	+55 (11) 4615-6300 / Fax: +55 (11) 4625-6300
Address	Avenida João Paulo Ablas, 2970, Jardim da Glória, Cotia – São Paulo ZIP CODE: 06711-250 - Brazil
Federal Tax No.	03.324.310/0001-50
State Registration	278.236.973.114
Municipal Registration	6.010.387
Website	www.altrabrasil.com www.lamiflexcouplings.com www.altramotion.com

1.2. Introduction

The PWE couplings line was developed to provide high power transmission and rotation applications with a low weight ratio.

These parts do not require readjustment, cleaning or replacement during operation, except in cases when intervention is required because of fatigue or system overload.

PWE couplings achieve high speeds with a high level of inherent balance because of their dimensional accuracy, which can be increased within the parameters of ISO 1940 and API671, when requested.

Under normal running conditions, PWH line couplings will have a long, problem-free life.

The PWH line couplings are supplied with stainless steel discs, high-tension carbon steel bolts and bushings and other components made of anti-corrosion treated carbon steel.

1.3. Safety

1.3.1. Notes and Symbols

In accordance with the safety standards, we use indications and symbols in some points of this manual that define the relevant points to be applied in the procedures, in order to guarantee the safety of the equipment and the people involved.



HAZARD!

This symbol refers to people's safety. It indicates situations that can lead to death or serious injuries.



WARNING!

This symbol refers to the use of equipment. It indicates situations that can cause damage or destroy equipment.



NOTE!

This symbol relates to information that can facilitate the installation and use of the equipment



HOT!

Indicates hot surfaces and/or components that may cause bodily injury to persons involved in the operations referred to in this manual.



ELECTRICITY!

Indicates the risk of electric shock. The necessary safety actions must be implemented in order to prevent injuries.



WARNING!

Risk of crushing or cutting of limbs, or parts of them.



WARNING!

Indicates rotational movement of the entire component. It must be enclosed to prevent accidents harm to people in its vicinity.

**POLLUTION!**

This symbol refers to materials which when discarded can cause pollution or have a negative impact on the natural environment. Their disposal must be performed in accordance with current environmental laws.

1.3.2. Personal Protection and Safety Equipment

The entire mechanical installation of the transmission unit must be carried out by a trained and qualified worker, in compliance with safety standards. During installation and maintenance, the service engineer responsible for carrying out work must be properly equipped with PPE that is suitable for the tasks carried out:

- ☐ Safety shoes and gloves to prevent injuries;
- ☐ Eye protection: to prevent contact with any particles that can harm the eyes and cause injuries and/or accidents;
- ☐ Face mask: must be worn if there are particles in the environment and/or in the performance of the work;
- ☐ Protective helmet: to prevent injuries that may occur during installation or maintenance;
- ☐ Hearing protectors (or mufflers) if the environment is subject to noise exceeding the limit allowed by the standard (85 dB);
- ☐ If cleaning products are used (solvents, degreasers, etc.), make sure the manufacturer's instructions are followed before use;
- ☐ Disposable protective gloves: to prevent contact with skin if cleaning products (solvents, degreasers, etc.) are used.



POLLUTION!

Disposable gloves: gloves and their waste must be disposed of in a suitable place, in compliance with environmental laws.

Cleaning products: must be used in a way that does not have a negative impact on the environment, according to the manufacturer's instructions for use.



HAZARD!

Cleaning products: before use, read the instructions on use and safety to prevent the occurrence of serious injuries. Make sure there are no reactions in case of contact with other chemicals, as they may emit toxic gases.

1.3.3. Important notes

Do not start installation/maintenance tasks without first reading and taking note of the following pages, as they are intended to provide safety guidelines for those involved and to prevent damage to equipment.

This product line was developed to be assembled in a torque transmission system, that is, rotating equipment. In view of this, it is important to note the following:

Heavy equipment



Be careful when lifting the coupling, as it is heavy equipment and should not be lifted by hand. Use suitable equipment to prevent injuries. NOTE: ensure that lifting accessories comply with safety standards.

During lifting, ensure that there are no people below the equipment.

Watch your hands and fingers



WARNING!

Never place your fingers between the coupling and hubs during assembly, as there is a risk of crushing.

- ☐ Always use original spare parts in order to maintain the design conditions and ensure operation.
- ☐ Consult Altra Brasil before using tools or any other equipment not recommended/specified in this manual.
- ☐ The customer/user is responsible for ensuring that the transmission unit is installed according to the information included in this manual.
- ☐ Always ensure that at least one copy of this manual is provided to the service engineers who provide maintenance/inspections.
- ☐ The area in which the coupling is installed must be designed/constructed to ensure adequate lighting and safe access for carrying out installation and maintenance work.
- ☐ The service engineers must be trained and able to carry out the necessary tasks (mechanics, alignment, electrical, etc.) in complete safety.

Coupling:

- ☐ When installing the coupling, the drive must be completely non-operational and adequately locked to guarantee safety.
- ☐ Make sure that the power supply has been disconnected and blocked in accordance with safety regulations.
- ☐ The drive cannot start operating without being properly adjusted according to the installation and alignment procedures described in this manual.

- Never change the size, quantity or type of the disc packs in the flexible units, as they have a direct impact on torque transmission.
- As the equipment is rotating equipment, it must be enclosed in order to prevent the occurrence of injuries or accidents during operation.

1.3.4. Disclaimers

Lamiflex Couplings® reserves the right to revise this document without prior notice. These documents were revised in order to enhance accuracy and correct errors, although technical and typographical divergences may still occur.

This document is regularly updated and any changes will be published in future editions. Improvements and/or changes to the products described or to the manual may be implemented at any time, without notice.

Under no circumstances will **Lamiflex Couplings®** be responsible for any special, incidental, consequential or punitive damages. This includes but is not limited to: damage to third-party property or the Installation and Maintenance Manual, inconvenience, loss of profits or revenue, loss of use of this product or any associated equipment, cost of replacement of equipment, downtime costs, or claims from any party whose damage is caused by any misspelling or inaccurate information in this user guide.

Under no circumstances may this document or parts thereof be copied, reproduced, altered or translated, without the explicit written permission of **Lamiflex Couplings®**.

2. Hibernation

2.1. Shipping

Couplings are supplied correctly packaged and locked so that the assembly will not be damaged during movement.

For couplings with dynamic balancing or a long shaft, the set will have the mechanical locking implement (used for balancing and transportation) and must only be removed when the coupling is mounted.

2.2. Receipt

Upon receipt of the coupling, inspect it carefully to ensure that no damage has been caused during shipping. Upon receipt, the following procedures should be followed:

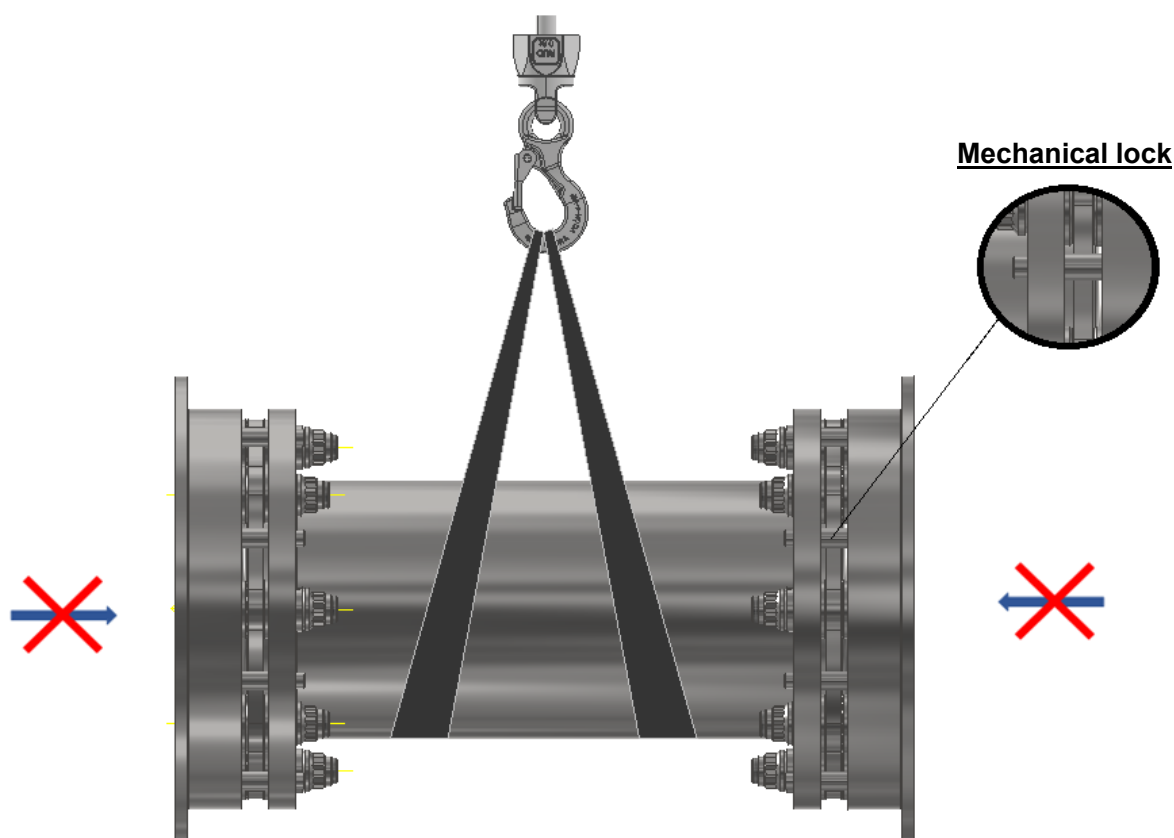
- ☐ Make sure that the packaging has not been tampered with during shipping.
- ☐ Compare the volume described on the invoice to the physical volume.
- ☐ Inspect the entire product to verify that no damage has been caused during shipping.

Log any damage in writing (with photos) with the shipping agent and immediately inform the insurance company and **Lamiflex Couplings®**. Failure to notify the relevant entities that damage has occurred may result in the cancellation of the warranty.

2.3. Handling

Shocks of any kind must be avoided during handling or assembly. Forcing in the axial direction must be avoided, in order to prevent damage from occurring to the flexible units. If the coupling is supplied with a mechanical lock (bolt and sleeve), the lock must be fixed in its position during shipping, handling and storage, up to final installation.

Mechanical locks must be removed before putting into operation as described in (section 4. Operations).



WARNING!

Ensure the coupling is correctly handled and transported, and that axial force is not be applied during assembly, as it may cause deformation to the entire component and invalidate the warranty

2.4. Storage

- ☐ Store the coupling in a horizontal direction (resting on the flanges). It should not be kept on one end (balanced) for a long time when handling.
- ☐ Preferably keep the equipment in the box with its cover for protection, if it is stored for long periods until its installation.
- ☐ Avoid shocks of any kind during handling.
- ☐ Protect against corrosion when stored for long periods.
- ☐ The storage place must be sheltered and clean, with relative humidity of up to 65%.
- ☐ Ensure that there is no possibility of falling objects, forklift passage or similar.

NOTE: For the disposal of packaging waste, see the topic 6.1 Disposal of Components.

3. Installation

3.1.1. Technical data

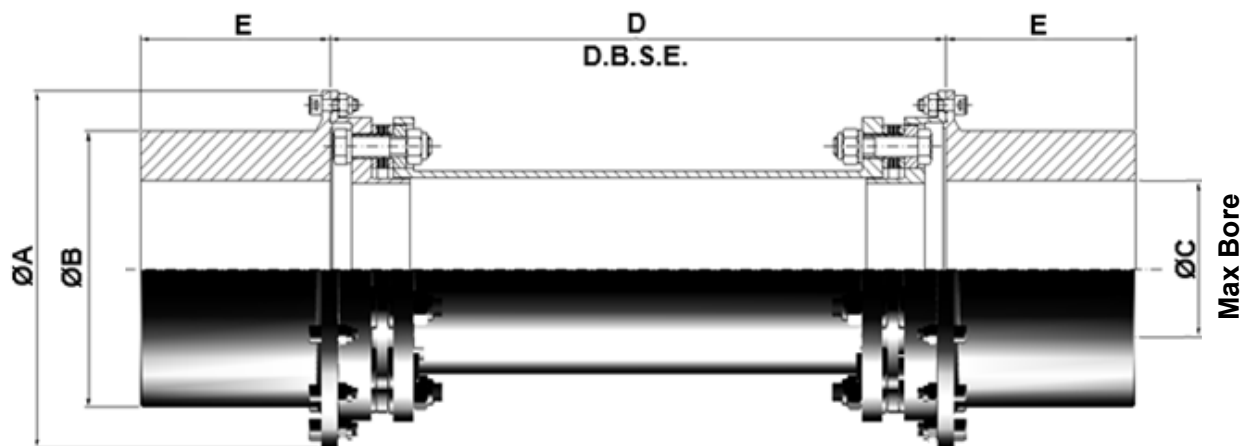
			Weight (kg) (2)		Mom. of Inertia (kg*m ²) (2)		Torsional Stiffness MNm/rad
Model	Rating (HP/1000 RPM)	Maximum Rotation RPM	Assembly min. DBSE	p/extra meter	Assembly min. DBSE	p/extra meter	K (2)
PWH-00800	800	13,000	21.0	6.5	0.080	0.013	0.26
PWH-01400	1400	11,000	34.0	9.3	0.180	0.026	0.54
PWH-02000	2000	9000	50.5	12.0	0.360	0.042	0.90
PWH-02800	2800	8500	72.5	15.0	0.655	0.073	1.50
PWH-04000	4000	8000	95.5	19.0	1.100	0.115	2.30
PWH-05500	5500	8000	125.0	23.0	1.740	0.170	3.30
PWH-07000	7000	7500	160.0	28.0	2.600	0.240	4.60
PWH-09000	9000	7200	163.0	28.0	2.640	0.240	5.90
PWH-11500	11,500	7000	248.0	46.0	5.140	0.555	8.50
PWH-15000	15000	6500	260.0	46.0	5.720	0.555	9.40
PWH-22000	22,000	6000	361.0	56.0	10.310	0.880	21.0



NOTE!

1. Maximum angular misalignment per flexible unit
2. The couplings' weight, moment of inertia and torsional rigidity are based on standard products with maximum bore, standard hubs and minimum DBSE.
3. Maximum drilling capacity and hub dimensions are nominal only.
4. For special projects, consult the assembly drawings.

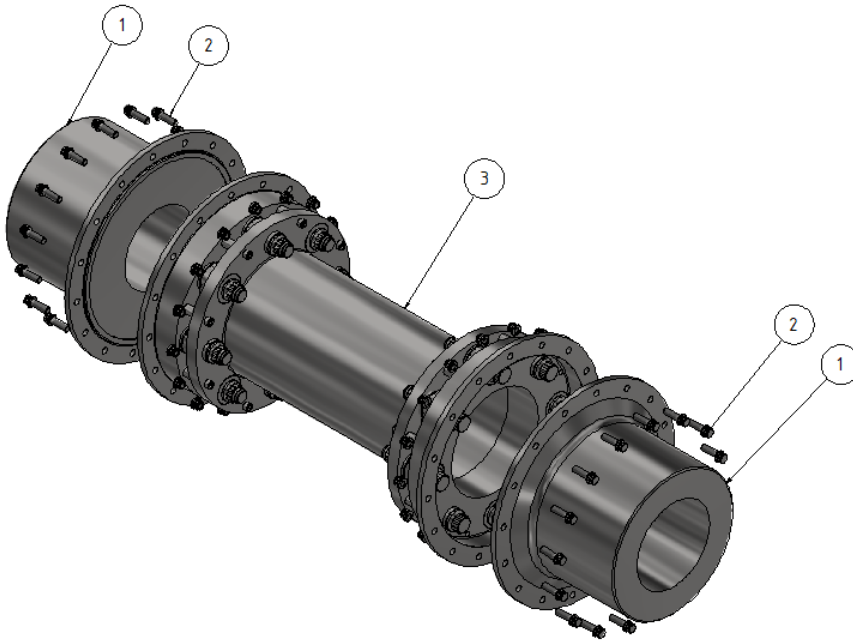
3.1.2. Dimensions (mm)



Model	Dimensions (mm)					Misal. Angular (degree) Max. (1)	Misal. Axial (mm) Max.
	ØA	ØB	ØC (MAX. BORE) (3)	(D – Min) (DBSE)	E (3)		
PWH-00800	176	138	96	215	110	0.25	1.0
PWH-01400	205	166	115	230	135	0.25	2.0
PWH-02000	237	190	130	250	150	0.25	2.0
PWH-02800	264	214	147	265	175	0.25	2.0
PWH-04000	289	240	165	290	200	0.25	2.5
PWH-05500	326	262	180	285	210	0.25	3.0
PWH-07000	350	287	195	300	225	0.25	3.5
PWH-09000	350	287	195	300	225	0.15	2.0
PWH-11500	404	338	234	340	265	0.25	4.5
PWH-15000	404	338	230	335	265	0.15	3.0
PWH-22000	444	380	260	365	305	0.15	3.5

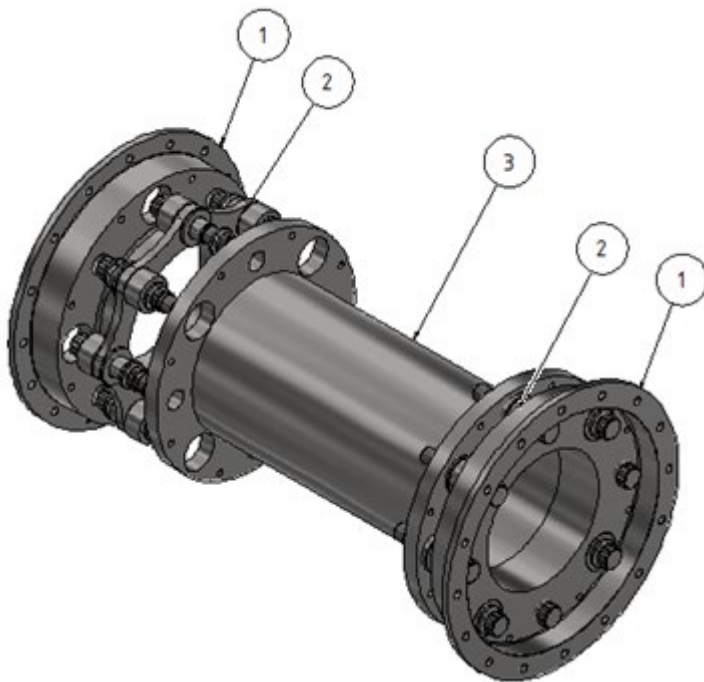
3.2. Component identification

3.2.1. Complete drive



Item	Description
1	Hubs
2	Hub fitting kit
3	Transmission unit

3.2.2. Transmission Unit (TU)



Item	Description
1	Guard ring
2	Flexible unit
3	Spacer

3.3. Hubs and Alignments

3.3.1. Hubs



WARNING!

Hubs must be manufactured in compliance with the project's dimensional and geometric tolerances. Noncompliance may cause possible failures during the operation.



NOTE!

Hub design: Before starting assembly of the hubs, establish whether they were manufactured in compliance with the dimensions, tolerances and interference of the project.

Coupling Design: Check the coupling length (free space between the “DBSE” hubs) before assembling the hubs.

➤ **STEP 1: Installation of Hubs on Cylindrical Keyed Shaft**



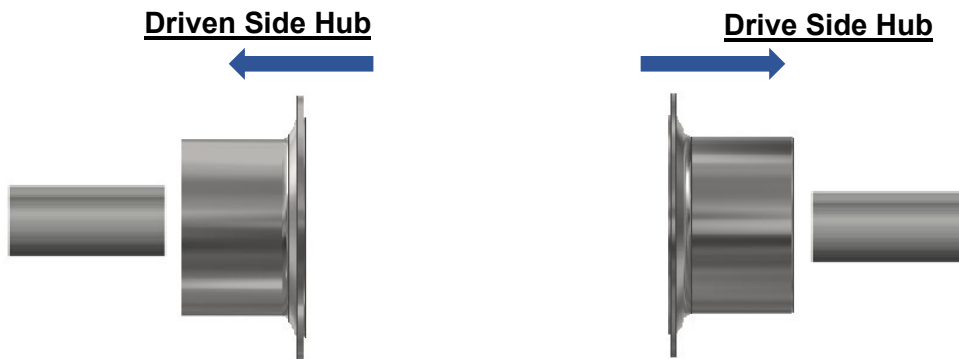
HOT!

When handling components during assembly, take the necessary precautions to prevent accidents/burns.

This type of assembly is performed with little interference between hubs/axes.

- Clean the axles and hub bores, removing any existing particles.
- Heat the hubs to facilitate assembly, avoiding the use of localized heating so as not to cause deformations, using the following methods:
 - Inductive heater (do not exceed 175°C)
 - Oil bath (do not exceed 175°C)

- Assemble the hubs following the DBSE distance indicated in the drawing.



3.3.2. Distance between Shaft Ends (DBSE)

➤ STEP 2: Setting the Distance Between Shaft Ends (DBSE)



WARNING!

DBSE distance: must conform to the project, obeying the informed tolerances in order to avoid deformation in the flexible units and consequently a reduction in their useful life.

Take into account any axial movement that may occur during operation.

3.3.3. Alignments

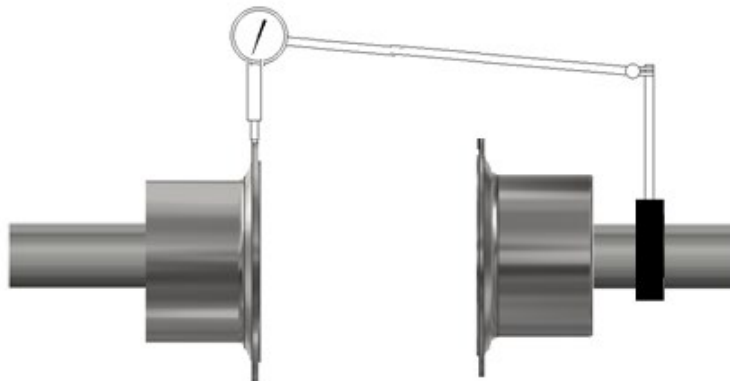
➤ **STEP 3: Confirm Alignments**

Take the measurements below before installing the transmission unit against the project's stipulated limits. If the values found in the installation are outside the design limits, the necessary corrections must be made.

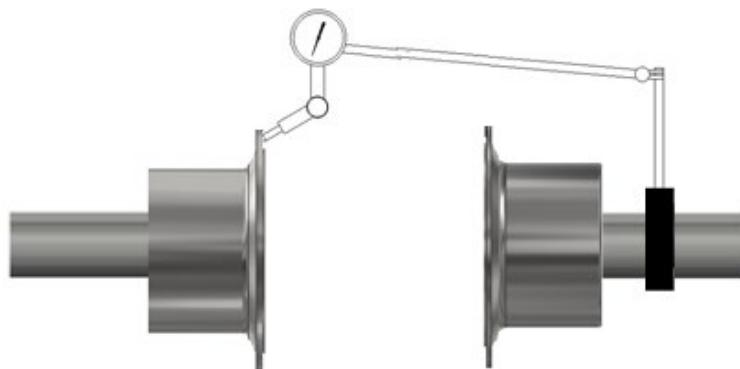


WARNING!

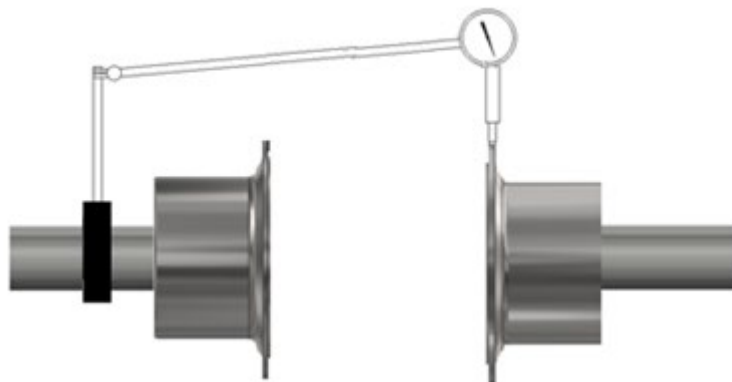
To ensure the service life of the transmission unit, axial, radial and angular misalignment values must be strictly adhered to.



With the dial indicator mounted on the powered side of the hub shaft, check the concentricity



With the dial indicator mounted on the motor side of the hub shaft, check the parallel of one of the faces.



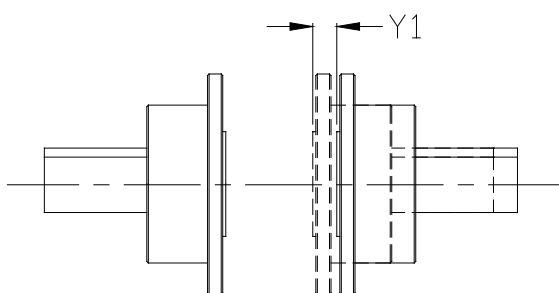
With the dial indicator mounted on the motor side of the hub shaft, check the concentricity.

If necessary, our **Powershim** calibrated shims can be purchased for necessary system corrections; please contact us.

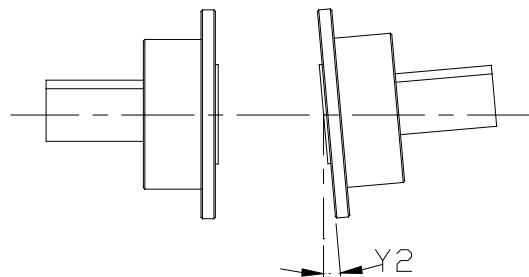


NOTE!

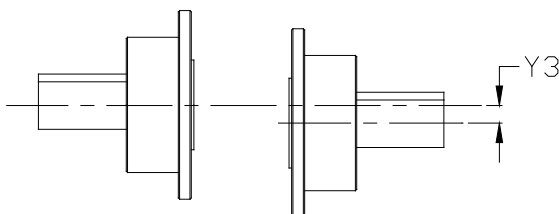
Possible types of misalignment that may be encountered during installation.



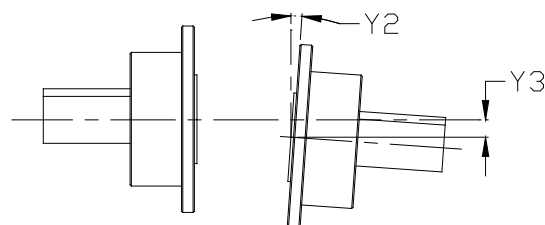
Axial



Angular



Radial / Parallel



Combined

NOTE: In the combined misalignment, other combinations can be found, which must be carefully analyzed and, consequently, the necessary corrective actions must be taken.

The reported misalignments (catalogs, manuals or designs) allow variations according to the service conditions.

Therefore, in order to improve the performance of the transmission unit, we recommend that the discovered misalignments do not exceed 10% of the values reported for the project.



NOTE!

Misalignments: for good alignment, possible movements that occur during the operation must be taken into account (for example, thermal expansion).

3.4. Installation

3.4.1. Hubs

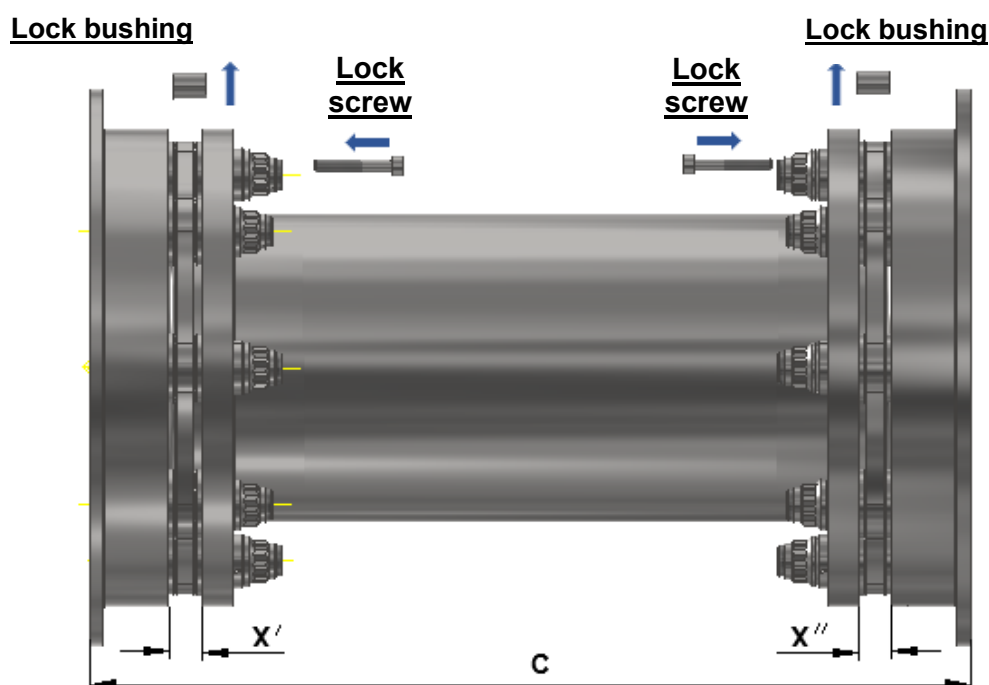
➤ STEP 1: Hubs

Install the two hubs on the drive and drive-side shafts as described in item (3.3.1 Step 1), making sure that both are properly aligned and face the shaft. The useful life of the coupling depends on this alignment.

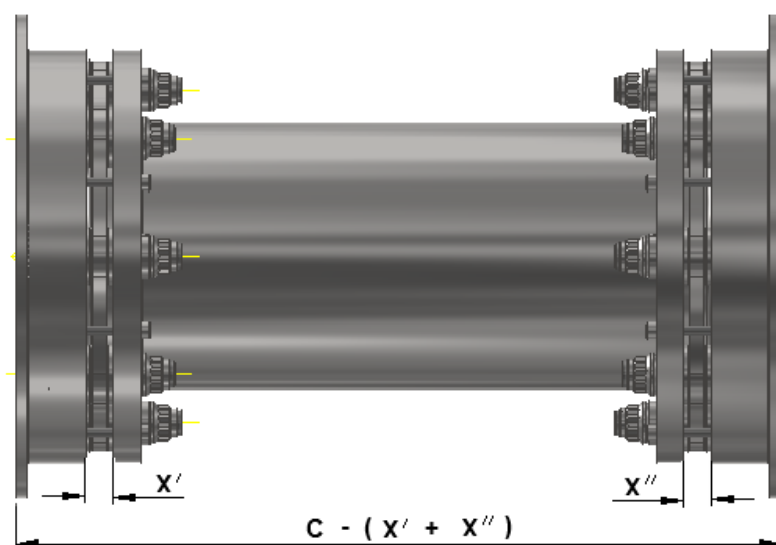
3.4.2. Transmission unit

➤ STEP 2: Compress the Blades

After setting the correct distance between the shaft faces (DBSE) according to item (3.3.2 Step 2), remove the spacer bushings from the mechanical locks and using the lock screws, compress the blades by changing the spaces between the protective rings and the spacer (dimension "X") as necessary so that the "measurement C" is less than the DBSE measure of the cubes already installed.



Remove the locking devices and compress the discs only using only the bolts



The DBSE distance existing in the hubs must be greater than the measurement C

Coupling size	X	X
PWH-00800	8.3	8.3
PWH-01400	9.0	9.0
PWH-02000	11.5	11.5
PWH-02800	13.5	13.5
PWH-04000	13.0	13.0
PWH-05500	15.0	15.0
PWH-07000	17.0	17.0
PWH-09000	18.5	18.5
PWH-11500	22.0	22.0
PWH-15000	22.0	22.0
PWH-22000	23.5	23.5



NOTE!

With the flexible units compressed, measure “C” and compare with the DBSE distance (discounting the hub pilots) to ensure that the discs are compressed enough so that the coupling can be positioned between the hollow spaces.

➤ **STEP 3: Position the Transmission Unit Between Hubs (TU)**

Carefully position the transmission unit between the hubs already installed, following the safety regulations.

Decompress the flexible unit discs by loosening the bolts until the protective rings touch the inner face of the hubs.

Completely remove the bolts used in the disc compression, and save them for future needs.



HAZARD!

When lifting, take the necessary precautions with regard to safety, as there is a risk of serious injury.



WARNING!

When lifting, use suitable, safe equipment in order to prevent the coupling from falling.



WARNING!

Take the necessary precautions so that there are no injuries at the time of installation, as crushing of the hands can occur.



WARNING!

Mechanical lock: the bolts and bushings of the mechanical locks must be kept for removal, movement and shipping.

For any movement of the coupling, it must be properly locked. If it is not locked, damage to the flexible units may occur.

3.4.3. Hub fitting

Perform the cross torquing according to the respective values informed in the table below or in its assembly drawing.

Coupling size	Hub bolt (Nm)
PWH-00800	10
PWH-01400	10
PWH-02000	25
PWH-02800	25
PWH-04000	25
PWH-05500	80
PWH-07000	80
PWH-09000	80
PWH-11500	80
PWH-15000	80
PWH-22000	80

Follow the sequence below for tightening torque of the bolts:

- ☐ Start: 50% of the rated torque
- ☐ End: 100% of the rated torque



Insert the bolts and perform cross torquing

4. Operation

Before operating equipment, the following points must be checked:



HAZARD!

Follow the instructions below, ensuring that the steps are followed in order to prevent personal injury.



WARNING!

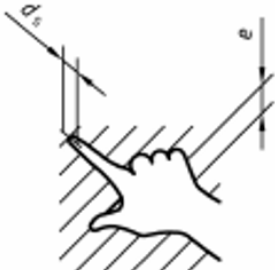
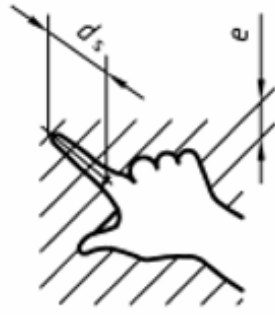
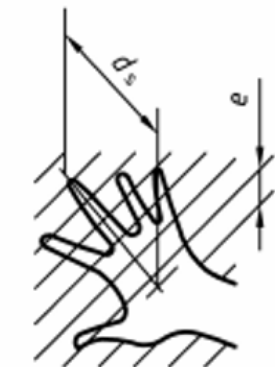
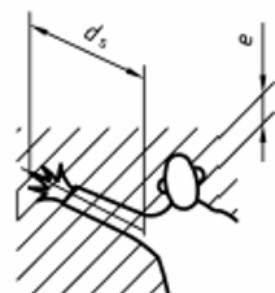
Failure to follow the instructions below may result in damage to the equipment or the entire system.

- ☐ The blade transport/compression screws, with their mechanical locks, must be completely removed before starting operation.
- ☐ Ensure that the alignment and dimensions comply with the design data.
- ☐ Check that the hub fastening screws torsion is correct.
- ☐ As this is rotating equipment, a physical barrier must be installed to protect limbs in accordance with NR12.



HAZARD!

Beware of rotating parts or equipment as they can cause serious injuries.

Parts of the body	Illustration	Opening and (mm)	Safe Distance s_d (mm)		
			Slit	Square	Circular
Fingertip		$and \leq 4$	≥ 2	≥ 2	≥ 2
		$4 < and \leq 6$	≥ 10	≥ 5	≥ 5
Finger to hand joint		$6 < and \leq 8$	≥ 20	≥ 15	≥ 15
		$8 < and \leq 10$	≥ 80	≥ 25	≥ 20
		$10 < and \leq 12$	≥ 100	≥ 80	≥ 80
		$12 < and \leq 20$	≥ 120	≥ 120	≥ 120
		$20 < and \leq 30$	$\geq 850^*$	≥ 120	≥ 120
Arm to shoulder joint		$30 < and \leq 40$	≥ 850	≥ 200	≥ 120
		$40 < and \leq 120$	≥ 850	≥ 850	≥ 850

Safety distances, to prevent upper limb access to danger zones.

If the length between the guard and the rotating component is 65 mm or less, the thumb will act as a limiter and the safety distance can be reduced.

Various types of construction and materials can be used to make the protective components. However, we recommend observing the following points for construction:

- ☐ Perforated steel material: to improve viewing by the maintenance team during inspections.
- ☐ Hinges for opening, if it is necessary to carrying out any work again (alignment, maintenance, etc.).
- ☐ Locks (padlocks) that make it impossible to open when the equipment is operating.
- ☐ Sufficient space between the guard and the coupling along the entire the circular perimeter.

if necessary, coupling guards can be purchased. **Coupguard** meets the NR12 standard providing safety for the installation. Please contact us to find out more.

When operating the coupling, observe the points below:

- ☐ Strange noises that may occur;.
- ☐ Excessive vibration.



WARNING!

If irregularities are encountered when in operation, immediately stop the operation. Find out the cause of the irregularity and correct it, and make sure that no damage has occurred to the coupling.

5. Maintenance

5.1. Visual Inspection



WARNING!

Failure to follow the instructions below may result in damage to the system and/or premature equipment failure.



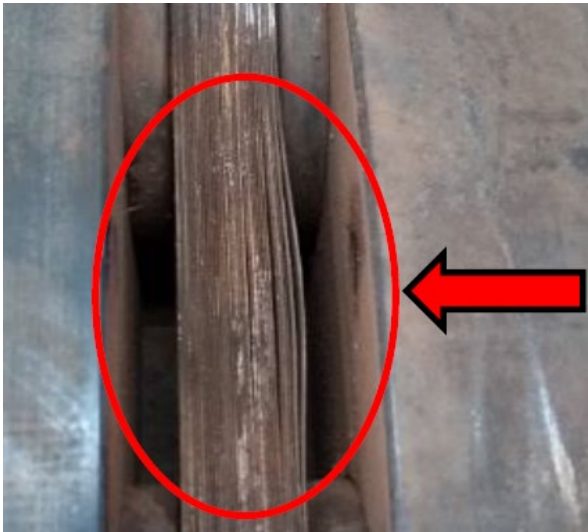

HAZARD!

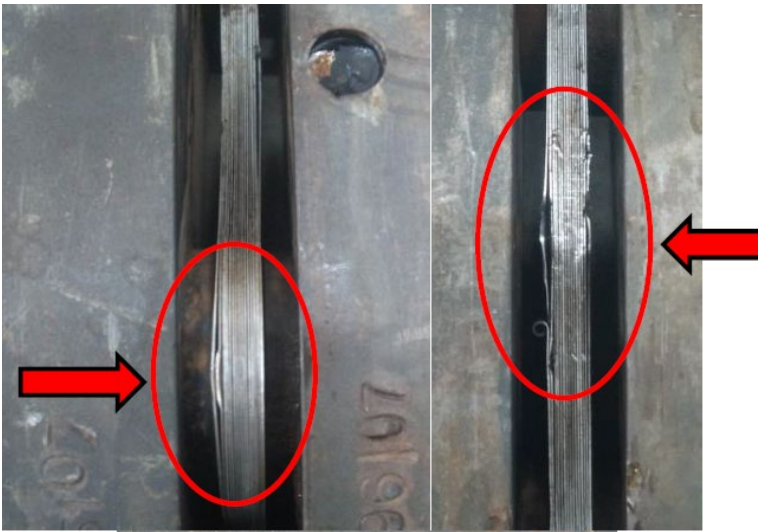
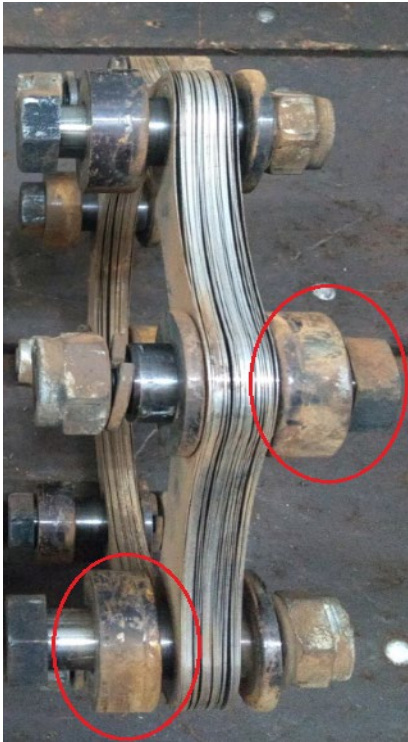
Beware of rotating parts or equipment as they can cause serious injuries.

Although the line of disc couplings makes periodic maintenance unnecessary, inspections must be performed regularly by the team to ensure perfect operating performance. The following points should be checked when carrying out inspections:

- ☐ Corrosion found in the transmission unit, fastening bolts and components of the flexible units;
- ☐ Flexible unit failures;
- ☐ Change in the transmission system vibration compared to at the start of the installation. Always monitor the system's vibration history.

For more information on failures, see topic 5.2 Troubleshooting.

Failure	Figure
Misalignment	
Corrosion in the spacer	

Failure	Figure
Broken discs	
Corrosion of flexible unit components	

➤ **Inspection frequency**

Below, we suggest an inspection schedule to be applied to the maintenance team's inspection routines to guarantee the sound performance of the system's operation.



NOTE!

The purpose of the inspection schedule is to report the minimum points that must be observed in the team's inspection routine. These can then be adapted to the tasks that are performed.

Items to check	Complement	Commissioning and initial installation	After commissioning
Corrosion	-----	1st week	Monthly
Flexible units	-----	1st week	Monthly
Hub fitting kit	Tightening torque	1st week	Yearly
System vibration	Monitoring vibration history	1st week	Weekly
Misalignment	Log the history	1st week	Yearly

5.2. Troubleshooting

➤ **Corrosion**

As standard, the couplings and their components are provided with surface treatment according to our standard design. However, other treatments may be applied according to the scope of the project.

Although the couplings are given surface treatments, that protection is not applied in the long term and cannot be applied in harsh environments. In view of this, if oxidation is confirmed on all or part of the couplings, action must be taken so as not to compromise their structural integrity.

➤ **Misalignments**

It is possible that misalignments may gradually worsen over time and/or that the flexible unit discs have deformities.

Therefore, it is possible to check their condition using a strobe light during inspection, without stopping the equipment. Using this tool, check for any deformations in the flexible units.

➤ **Flexible units failures**

Flexible unit discs are pressed during assembly and if there is a failure, it will occur from the outside to the inside.

The coupling was developed to operate even when a few of the discs are faulty. However, if appropriate action is not taken, the other discs may become overloaded and this may compromise other parts of the coupling.

This failure can be observed during operation by using a strobe light.

➤ **Failure list**

Failure	Possible cause	Verification
Excessive noise during operation System vibration	Misalignment	<input type="checkbox"/> Stop the operation <input type="checkbox"/> Find the cause of the misalignment <input type="checkbox"/> Correct the misalignment source
	Hub fitting kit is improperly torqued	<input type="checkbox"/> Stop the operation <input type="checkbox"/> Ensure the alignment is within the design parameters <input type="checkbox"/> Check the flexible unit bolts for wear <input type="checkbox"/> Reinstall the bolts by torquing them according to the design data

Failure	Possible cause	Verification
Flexible unit disc breakage	Overtorque	<input type="checkbox"/> Stop the operation <input type="checkbox"/> Remove the coupling and analyze the reason for the overtorque in the operation history <input type="checkbox"/> Analyze the components that have been damaged in the coupling and replace them <input type="checkbox"/> Reinstall the coupling and monitor the operation
	Misalignment	<input type="checkbox"/> Stop the operation <input type="checkbox"/> Find the cause and types of misalignment and correct them <input type="checkbox"/> Ensure the alignment is within the design parameters <input type="checkbox"/> Analyze the components that have been damaged in the coupling and replace them <input type="checkbox"/> Reinstall the coupling and monitor the operation
Failure	Possible cause	Verification
Cracks/breaks of discs and/or bolts	Vibration	<input type="checkbox"/> Stop the operation <input type="checkbox"/> Remove the coupling <input type="checkbox"/> Analyze the development of system vibrations in the operation history <input type="checkbox"/> Analyze the components that have been damaged in the coupling and replace them <input type="checkbox"/> Reinstall the coupling and monitor the operation

5.3. General maintenance

One of the advantages of disc couplings, according to the information included in this manual, is that they do not require periodic maintenance if properly installed. Maintenance can be provided whenever there is downtime for routine maintenance (at least once a year) and it is recommended that the following items be checked:

- ☐ Flexible units
- ☐ Hub fitting kit
- ☐ Hubs
- ☐ Shafts (if the hubs are removed)
- ☐ Maintenance frequency



WARNING!

Failure to follow the instructions below may result in damage to the system and/or premature equipment failure.

➤ **Flexible units:**

- There should be no spaces between the flexible unit discs' springs.
- Check for broken, cracked or compromised discs.
- If larger than normal spacing, cracks, broken discs are found, the complete flexible unit must be replaced.
- Nuts and bolts must be in good condition and free from corrosion. If they are not, the flexible units must be replaced.

➤ **Hub fitting kits:**

- If they have been removed, analyze their integrity - thread, possible deformation, cracks - if these are found, the kit must be entirely replaced.
- Tightening torque according to the project.
- We suggest using nuts and bolts no more than twice. If they are used more than twice, deformation can occur and can cause locking problems, so they must be replaced.

➤ **Hubs:**

- Evaluate the structural condition, visually checking that there are no cracks or corrosion.
- The pilot must be free of wear and tear;
- Check for possible hub fitting hole deformation.
- Hole status and keyway (for hubs, for interference).

➤ **Shafts:**

- Evaluate the circular perimeter, ensure there is no wear and check the condition of the keyway (for hubs, for interference).



WARNING!

To guarantee the system's operational safety, only **Lamiflex Couplings®** original parts should be used.

➤ **Maintenance frequency**

- As mentioned earlier, couplings do not require periodic maintenance. However, we suggest some relevant points are applied during the yearly downtime:

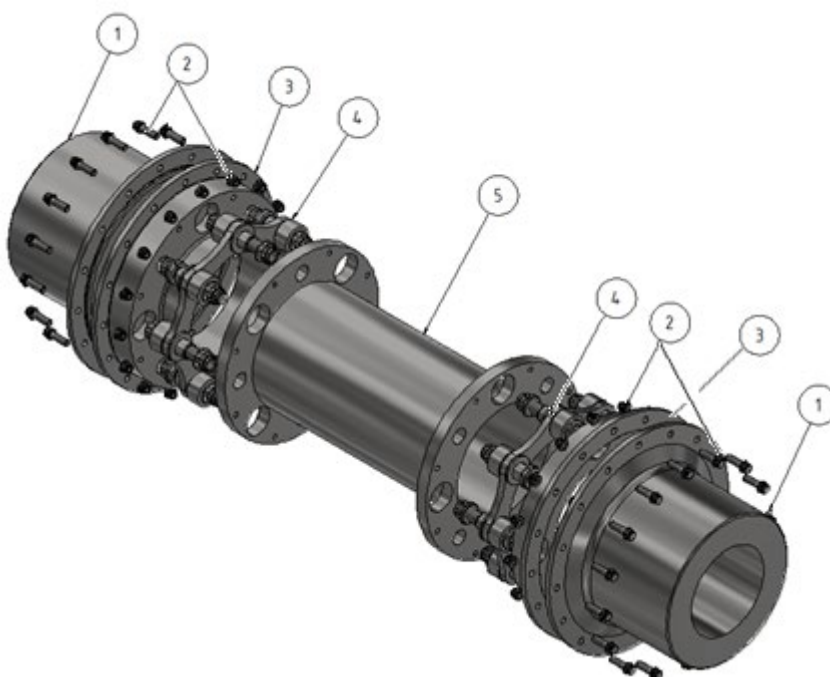
Maintenance	Maintenance/services required	Supplier
1 year	Surface treatment	Lamiflex couplings
	Hub fitting kit replacement	Lamiflex couplings
	Transmission unit balancing	Lamiflex couplings
	Alignment check	Customer
	Comparison of the vibration history	Customer
3 years	Surface treatment	Lamiflex couplings
	Hub fitting kit replacement	Lamiflex couplings
	Transmission unit balancing	Lamiflex couplings
	Flexible unit replacement	Lamiflex couplings
	Alignment check	Customer
	Comparison of the vibration history	Customer

5.4. Spare parts

5.4.1. General Information

The availability of replacement parts in stock for replacement when necessary will ensure reduced downtime and the operation-readiness of the coupling.

We recommend keeping the following spare parts in stock, with their respective quantities:



Item	Description	Quantity to maintain in stock
1	Hubs	N.A.
2	Hub fitting kit	02
3	Guard ring	N.A.
04	Flexible unit	02
05	Spacer	N.A.

5.4.2. Storage

To store spare parts correctly, some precautions must be taken to ensure that there is no damage to the assemblies:

- ☐ Preferably keep the items packaged and, if possible, with the original packaging, until installation.
- ☐ Avoid shocks of any kind during handling.
- ☐ Protect against corrosion when stored for long periods.
- ☐ The storage place must be sheltered and clean, with relative humidity of up to 65%.
- ☐ Ensure there is no likelihood of falling objects (particularly for flexible units) or something similar.

NOTE: For the disposal of packaging waste, see the topic 6.1 Disposal of Components.

5.4.3. Replacement of flexible units



WARNING!

To guarantee the system's operational safety, only **Lamiflex Couplings®** original parts should be used.

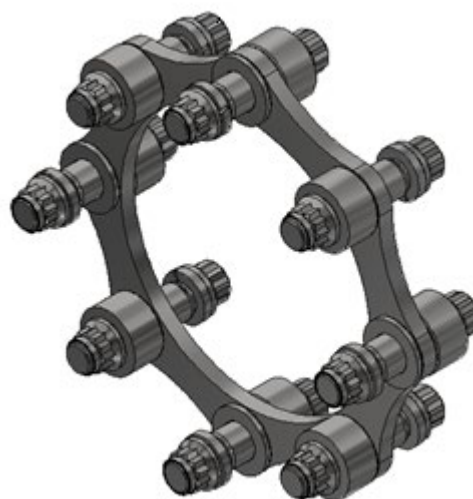


NOTE!

Ensure that the flexible units in stock are the same model as the existing coupling.

- ☐ Flexible units for spare parts include overhead bolts, nuts and collars.
- ☐ Remove the transmission unit from the drive system.
- ☐ Dismantle the damaged flexible units and dispose of them according to the guidelines mentioned in item 6.1 Disposal of components.
- ☐ Perform the installation of new flexible units between the protective rings and spacer.
- ☐ Follow the sequence below for tightening torque of the bolts (cross shape).
 - Start: 50% of the rated torque
 - End: 100% of the rated torque

Coupling size	Flexible unit bolt (Nm)
PWH-00800	25
PWH-01400	50
PWH-02000	90
PWH-02800	145
PWH-04000	220
PWH-05500	245
PWH-07000	345
PWH-09000	345
PWH-11500	465
PWH-15000	465
PWH-22000	590



NOTE: If flexible units are replaced and your design is balanced, we recommend rebalancing according to the supplied design data.

6. General Information

6.1. Disposal of Components



POLLUTION!

In compliance with current laws regarding environmental issues, it is necessary to respect the environment when disposing of waste.

Waste must be collected by an authorized company for proper disposal with no negative environmental impact.

Materials used for the packaging and composition of the equipment that must be considered when disposing of waste are shown below.

➤ **Coupling Packaging**

Upon receipt, the couplings are packed and comprise the following materials:

Smaller Couplings	Cardboard box
	Plastic (smooth or bubble-wrap)
	Metal clamps
Larger couplings	Wooden box
	Plastic (smooth or bubble-wrap)
	Metal latches

➤ **Spare part packaging**

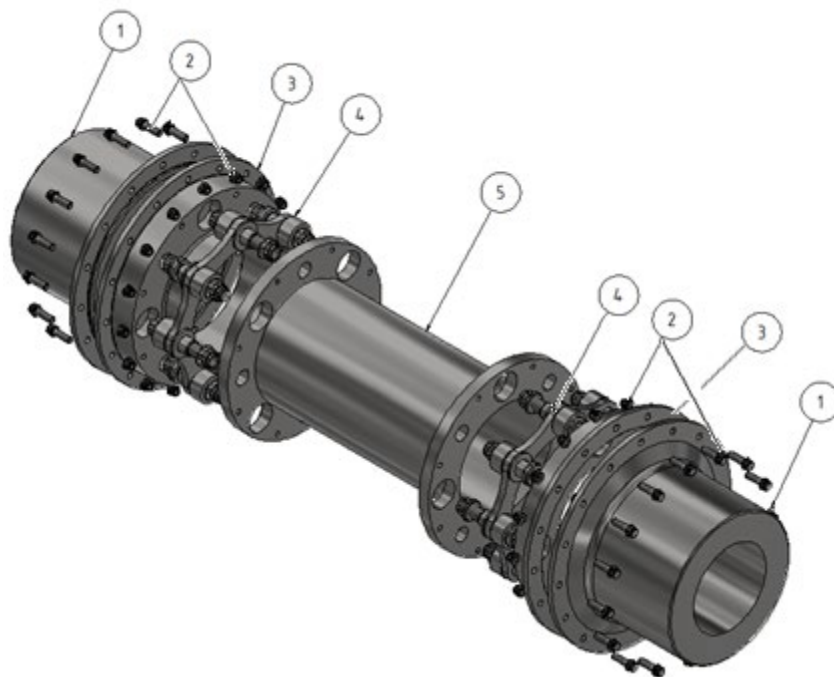
Upon receipt, spare parts are packed and can be made of the following materials:

Flexible units (spare part)	Cardboard box
	Plastic (smooth or bubble-wrap)
	Metal clamps
Hub fitting kit	Cardboard box
	Plastic (smooth or bubble-wrap)
	Metal clamps

➤ **Couplings**

For disposal of the couplings, it is necessary to:

- ☐ Clean all parts.
- ☐ Disassemble the equipment and destroy it so can no longer be used.



Item	Description	Material
------	-------------	----------

1	Hubs	Metal
2	Hub fitting kit	Metal
3	Guard rings	Metal
4	Flexible units	Metal
5	Spacer	Metal

NOTE: Both hubs and flexible units must also be taken into consideration when discarding of waste, as they are made of metal and follow the same guidelines as are stated in this section.

6.2. Additional information

This manual was developed based on the standard conditions of the product catalog. In the case of special projects, the information included in the technical documentation for the project or in the special designs made available by Altra will prevail.