

Installation and Operational Instructions for primeflex[®]-couplings Types 933._33.1 / 933._35.1 / 933._66.1 / 933._67.1 (B.9.9.GB)

Please read these Operational Instructions carefully and follow them accordingly!

Ignoring these Instructions may lead to malfunctions or to coupling failure, resulting in damage to other parts.

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Safety Regulations

These Installation and Operational Instructions (I + O) are part of the coupling delivery. Please keep them handy and near to the coupling at all times.



It is forbidden to start use of the product until you have ensured that all applicable EU directives and directives for the machine or system into which the product has been installed have been fulfilled. At the time these Installation and Operational Instructions go to print, the couplings accord with the known technical specifications and are operationally safe at the time of delivery. Without a conformity inspection, this product is not suitable for use in areas where there is a high danger of explosion. This statement is based on the ATEX directive.



Danger!

This warning applies if:

- the shaft couplings are modified.
- the relevant standards for safety and / or installation conditions are ignored.

User-implemented Protective Measures

- Cover all moving parts to protect against seizure, dust or foreign body impact.

To prevent injury or damage, only professionals and specialists should work on the devices, following the relevant standards and directives. Please read the Installation and Operational Instructions carefully before installation and initial operation of the device.

These Safety Regulations are user hints only and may not be complete!

Safety and Guideline Signs



Danger!
Danger of injury to personnel and damage to machines.



Please Observe!
Guidelines on important points.



According to German notation, decimal points in this document are represented with a comma (e.g. 0,5 instead of 0.5).

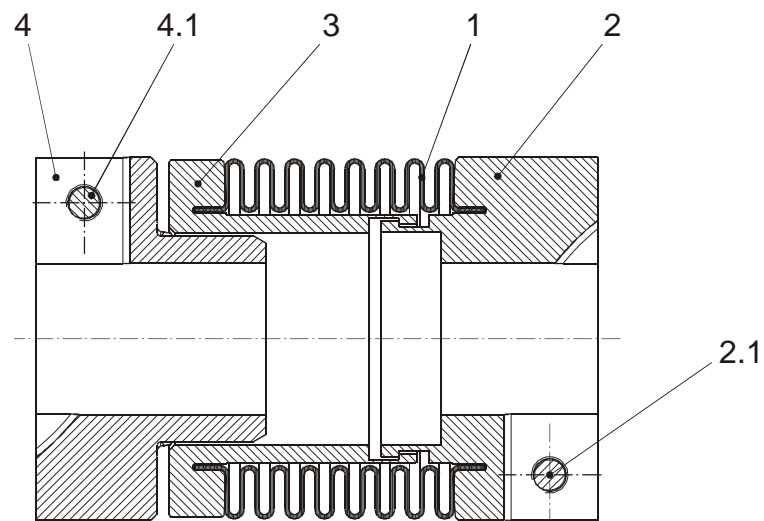


Fig. 1

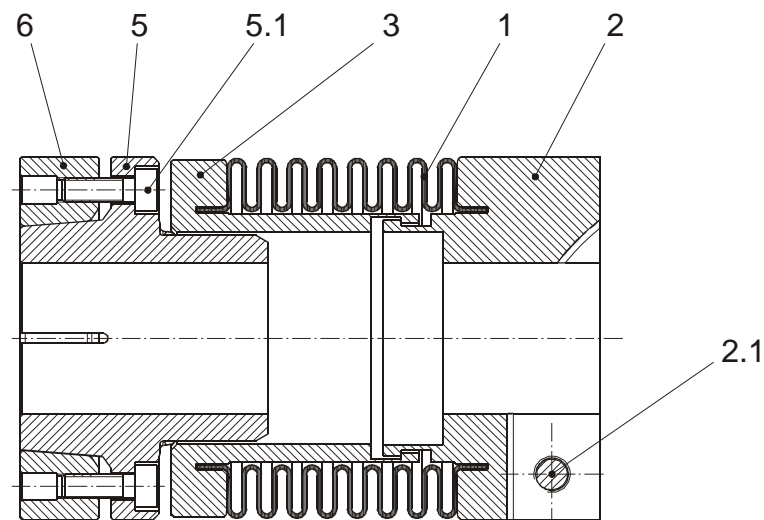


Fig. 2

Parts List

Only use mayr[®] original parts

- 1 Metal bellows
- 2 Clamping hub
- 2.1 Cap screw
- 3 Centring hub
- 4 Plug-in clamping hub
- 4.1 Cap screw
- 5 Plug-in shrink disk hub
- 5.1 Cap screw
- 6 Shrink disk

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Table 1: Technical Data

primeflex [®] Sizes	1	2	3
Clamping hub bore (Item 2) without keyway [mm]	12 – 25	19 – 35	25 – 45
Clamping hub bore (Item 2) with keyway [mm]	12 – 21	19 – 30	25 – 38
Plug-in clamping hub bore (Item 4) without keyway [mm]	12 – 20	19 – 30	25 – 40
Plug-in clamping hub bore (Item 4) with keyway [mm]	12 – 17	19 – 25	25 – 35
Plug-in shrink disk bore (Item 5) without keyway [mm]	10 – 20	15 – 30	18 – 40
Plug-in shrink disk bore (Item 5) with keyway [mm]	10 – 17	15 – 25	18 – 35
Coupling nominal torque T_{KN} [Nm]	24	60	120
Max. speed $n_{max.}$ [rpm]	8000	6000	4000
Cap screw tightening torque (Items 2.1 / 4.1) [Nm]	10	17	40
Cap screw tightening torque (Item 5.1) [Nm]	1,8	4,1	8,1
Axial displacement ΔK_a for Type 933.3_..1 [mm]	$\pm 0,1$	$\pm 0,15$	$\pm 0,15$
Axial displacement ΔK_a for Type 933.5_..1 [mm]	$\pm 0,2$	$\pm 0,25$	$\pm 0,25$
Radial misalignment ΔK_r for Type 933.3_..1 [mm]	0,1	0,1	0,1
Radial misalignment ΔK_r for Type 933.5_..1 [mm]	0,2	0,3	0,3
Angular misalignment ΔK_w for all Types [°]	1	1	1
Untensioned length L for Types 933.533.1 / 933.566.1 [mm]	77	93	117
Untensioned length L1 for Types 933.333.1 / 933.366.1 [mm]	62	74	92
Untensioned length L2 for Types 933.535.1 / 933.567.1 [mm]	78	96	118
Untensioned length L3 for Types 933.335.1 / 933.367.1 [mm]	63	77	93

Table 2: Preferred Bores

Size	Preferred bores $\varnothing d$ H7
1	10, 11, 12, 14, 15, 16, 18, 19, 20, 22, 24, 25
2	15, 16, 18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 35
3	18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 35, 36, 38, 40, 42, 45

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Design

primeflex[®]-couplings are designed as axial plug-in type steel bellows couplings for the connection of two shafts.

Function

primeflex[®]-couplings transmit the torque backlash-free and compensate for radial, axial and angular shaft misalignments.

State of Delivery

- Plugged together and secured with cable ties.
- The bores in the hubs (Items 2, 4 and 5) have H7 tolerances.

Installation Guidelines for Shaft Ends

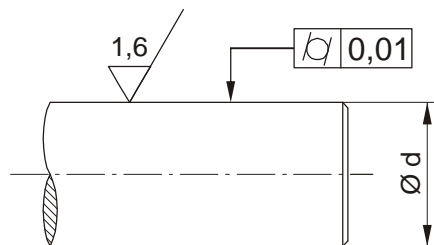


Fig. 3

Shaft Requirements

- Surface quality: $R_a = 1,6 \mu\text{m}$
- Run-out accuracy: 0,01 mm
- Minimum tensile strength: 500 N/mm²
- Tolerance: h6

For other tolerances, please contact the manufacturers.

Temperature Resistance:

Permanent temperature up to +120 °C
For higher operating temperatures, please contact the manufacturer.

Installation Position: Any

Important Installation Guidelines

- primeflex[®]-couplings are primarily intended for the connection of two shafts in locations that are hard to reach and where installing conventional shaft couplings would be very difficult or impossible.
- In order to guarantee permanently safe function, the plug-in toothing connection between the centring hub (Item 3) and the plug-in clamping hub (Item 4) or plug-in shrink disk hub (Item 5) must be flexibly pre-tensioned axially by compressing the steel bellows (Item 1) slightly. For this, both coupling halves must be mounted individually onto the shafts so that, after joining the coupling, a constructional length results which is between 0,5 and 1,0 mm shorter than the unclamped length (L, L1, L2 or L3) for the respective Type stated in Table 1.
- Wash off the conserving layer in the bores with paraffin, white spirit, cleaner solvent or similar.
- The bores and shafts must be free of grease and oil.
- The permitted shaft misalignments (see Table 1) must not under any circumstances be exceeded.
- Damage to the steel bellows (Item 1) before or during installation must be prevented.
- Ideally, the operator-side technician should have devices or inspection dimensions at their disposal which ensure correct installation of the coupling halves onto the shafts. In this case, please proceed acc. the Type-dependent installation descriptions on pages 5 and 6.
- If the technician does not have any such specifications, we recommend installation independent of Type acc. page 7.

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Installation of Coupling Types 933._33.1 and 933._66.1 (Figs. 4 to 6)

1. Check whether all the data required for installation is available. Above all, it is necessary that specifications are available for the correct axial position of the plug-in clamping hub (Item 4) and the bellows with clamping hub (Item 2) on the respective shaft or the respective devices. Only this can ensure that the coupling achieves the stipulated axial pre-tension of 0,5 to 1,0 mm, thus operating permanently backlash-free.
2. Check whether both coupling hubs can easily be pushed onto the shafts.
3. Push the plug-in clamping hub (Item 4) into the correct axial position on the shaft provided for it.
The correct axial position is determined using a suitable device or appropriate dimension specifications.
The shaft must project at least 2/3 of the hub length (Catalogue dimension I1) into the hub.
Tighten the cap screw (Item 4.1) to the specified torque (see Table 1).
4. Push the bellows coupling with the clamping hub (Item 2) onto the other shaft into the correct axial position. This correct axial position is also determined using a suitable device or appropriate dimension specifications. This shaft, too, must project at least 2/3 of the hub length (Catalogue dimension I) into the hub.
Tighten this cap screw, too (Item 2.1) to the specified torque (see Table 1).
5. Now ensure that at least one of the shafts on the units to be connected can rotate freely.
6. Produce the torque-transmitting connection between the drive units by carefully plugging the coupling halves together, and finish installing the unit.
If possible, ensure again that the required axial pre-tension of 0,5 to 1,0 mm is produced on the coupling.
Depending on the installation situation, this can be checked e.g. at gap "T" between the flange surfaces before the flange screws are tightened (Fig. 6).

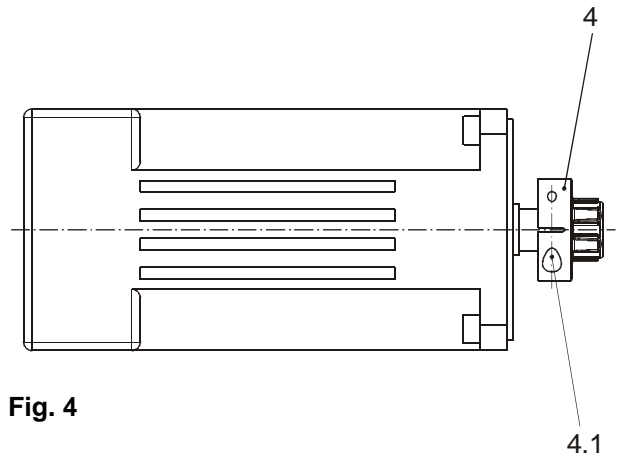


Fig. 4

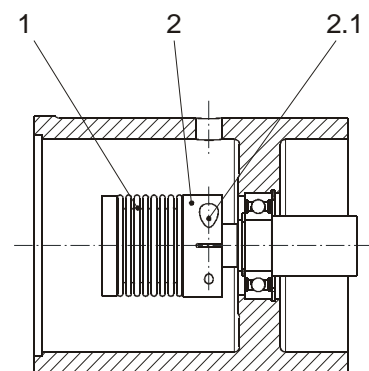


Fig. 5

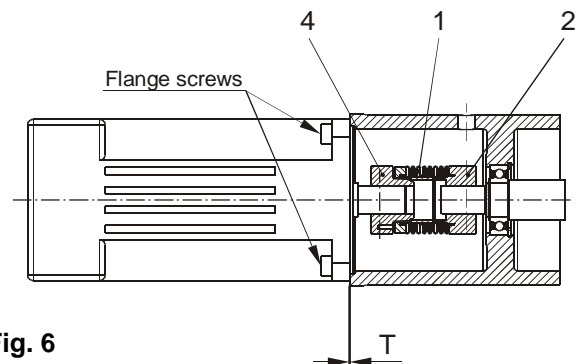


Fig. 6

Installation and Operational Instructions for primeflex[®]-couplings Types 933._33.1 / 933._35.1 / 933._66.1 / 933._67.1

(B.9.9.GB)

Installation of Coupling Types 933._35.1 and 933._67.1 (Figs. 7 to 9)

1. Check whether all the data required for installation is available. Above all, it is necessary that specifications are available for the correct axial position of the plug-in shrink disk hub (Item 5) and the bellows with clamping hub (Item 2) on the respective shaft or the respective devices. Only this can ensure that the coupling achieves the stipulated axial pre-tension of 0,5 to 1,0 mm, thus operating permanently backlash-free.
2. Check whether both coupling hubs can easily be pushed onto the shafts.
3. Push the plug-in shrink disk hub (Item 5) into the correct axial position on the shaft provided for it. The correct axial position is determined using a suitable device or appropriate dimension specifications. The shaft must project at least 2/3 of the hub length (Catalogue dimension l_1) into the hub. Tighten the 6 cap screws (Item 5.1) alternately by at least 3 tightening turns; first to 1/3; then to 2/3 and then to the full specified tightening torque (see Table 1). Ensure that the shaft is prevented from turning as you work.
4. Push the bellows coupling with the clamping hub (Item 2) into the correct axial position on the other shaft. The correct axial position is determined here too using a suitable device or appropriate dimension specifications. Here, too, the shaft must project at least 2/3 of the hub length (Catalogue dimension l) into the hub. Tighten this cap screw, too (Item 2.1) to the specified torque (see Table 1).
5. Now ensure that at least one of the shafts on the units to be connected can rotate freely.
6. Produce the torque-transmitting connection between the drive units by carefully plugging the coupling halves together, and finish installing the unit. If possible, ensure again that the required axial pre-tension of 0,5 to 1,0 mm is produced on the coupling. Depending on the installation situation, this can be checked e.g. at gap "T" between the flange surfaces before the flange screws are tightened (Fig. 9).

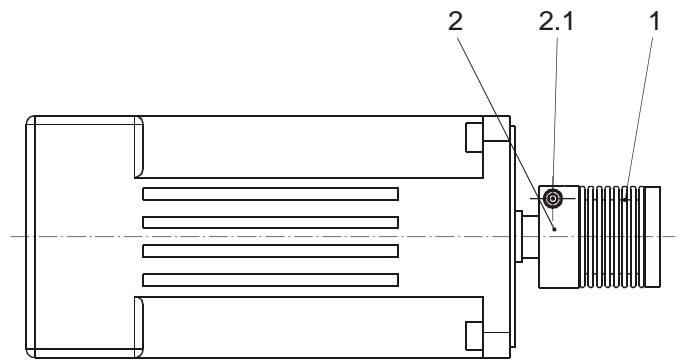


Fig. 7

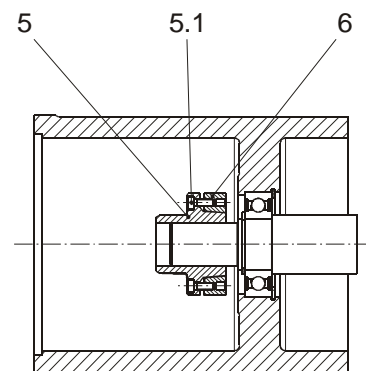


Fig. 8

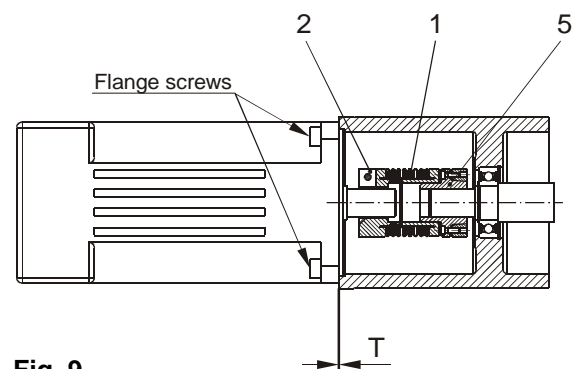


Fig. 9

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Installation Independent of Type (Figs. 10 to 13)

1. Push the housing-side coupling half in the specified direction onto the housing-side shaft up to the shaft shoulder, if there is one, and check whether the coupling half can rotate freely, without contacting any housing or machine parts.
Also check whether the shaft projects at least 2/3 of the hub length into the hub (see Fig. 10).
2. Finally, mount the housing-side coupling halves onto the shaft.
If the device is a clamping hub (Items 2/4), tighten the cap screws (Items 2.1/4.1) to the specified torque acc. Table 1.
If the device is a shrink disk hub (Item 5), first ensure that the shaft is held torque-proof and then tighten the 6 cap screws (Item 5.1) alternately by at least 3 tightening turns; first to 1/3; then to 2/3 and then to the full specified torque acc. Table 1.
3. Plug the coupling together and determine the distance dimension "A" between the housing flange and the coupling, see Fig. 11.
4. Convert the distance dimension "A" into the installation dimension "M" in the following way:

$$M = A + 0,8$$

This ensures that the coupling retains the specified flexible compressive pre-tension during installation.

5. Pull the coupling apart once more.
6. Push the removed coupling halves with the hub in front onto the shaft of the second unit (see Fig. 12).
Ensure using suitable measuring tools that the installation dimension "M" determined in Point 4 is retained, and tighten the clamping screws or the cup point socket set screw, depending on the respective hub used, as described in Point 2.
Once again, the shaft must project at least 2/3 of the hub length into the hub.
If the installation dimension "M" cannot be set, for example because there is a shaft shoulder, please consult the person responsible in your company.
7. Now ensure that at least one of the shafts on the units to be connected can rotate freely.
Produce the torque-transmitting connection between the drive units by carefully plugging the coupling halves together, and then finish installing the unit.
If possible, ensure again that the required axial pre-tension of 0,5 to 1,0 mm is produced on the coupling.
Depending on the installation situation, this can be checked e.g. at gap "T" between the flange surfaces before the flange screws are tightened (Fig. 13).

Hubs Items 2, 4 or 5

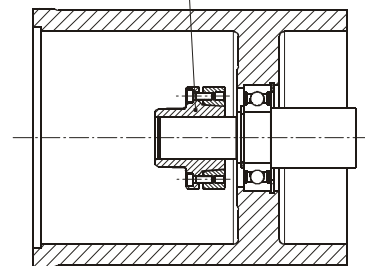


Fig. 10

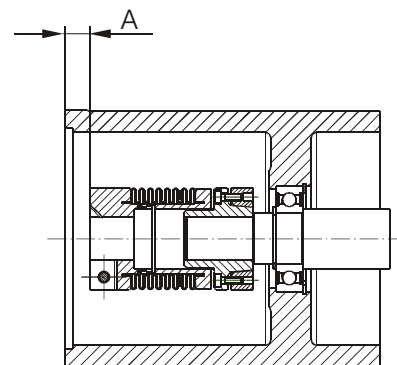


Fig. 11

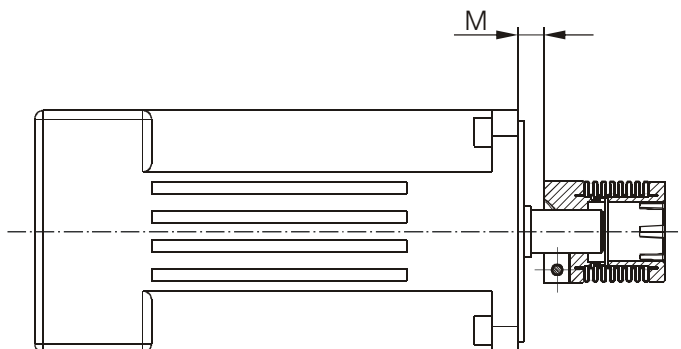


Fig. 12

Flange screws

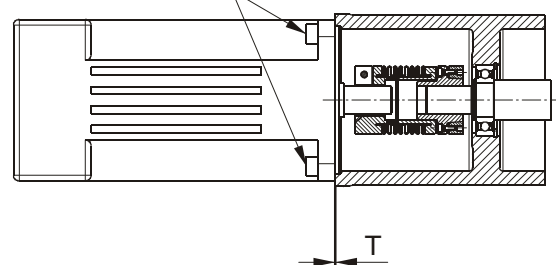


Fig. 13

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(B.9.9.GB)

Coupling Deinstallation

The plug-in connection on the coupling:

In order to remove the plug-in connection, the screw connections on the connected drive units are unscrewed and the plug-in connection is disconnected by pulling off one unit axially.



Please Observe!

An axial force of over 1000 N may be required to de-install the plug-in connection, which however is prevented from damaging the bellows due to the internal coupling stops.

The de-installation force may only be applied in an axial direction.

Clamping hubs:

For clamping hubs, it is sufficient to unscrew the clamping screw (Items 2.1 or 4.1).

After this, the hub can be removed from the shaft.

Plug-in shrink disk hubs:

In order to de-install the plug-in shrink disk hub (5), first unscrew the 6 cap screws (Item 5.1).

Then the cap screws (Item 5.1) are screwed into the tapped extracting holes on the plug-in shrink disk hub (5) and evenly screwed in against the shrink disk until it loosens itself from the hub.

Now the plug-in shrink disk hub (5) can be pulled off the shaft.

Coupling Dimensioning:

1. Determine the maximum operating torque on the coupling.
2. Multiply the maximum operating torque by the value of the temperature factor (Table 3) and the applicable operating factor (Table 4).
3. Select a coupling size, the nominal torque of which lies over the maximum torque determined in Point 2.



Please Observe!

primeflex®-couplings may be subjected temporarily to overloads of factor 1,5 at nominal torque. In this case, please contact the manufacturers.

$$M_{\text{nom}} \geq M_{\text{max}} = M_B \times f_t \times f_B$$

Table 3: Temperature Factors f_t

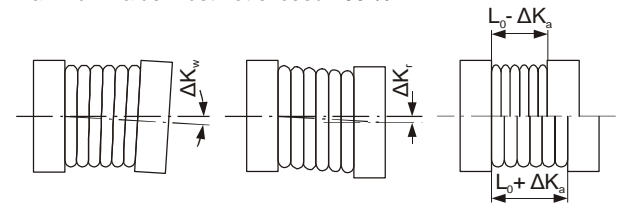
Temperature [°C]	50	80	100	120
Temperature factor [-]	1	1,1	1,2	1,5

Table 4: Service factor f_B

Operating mode	Service factor f_B
Even load	1,5
Uneven load	2
Impact load	2,5 - 4

Permitted Shaft Misalignments

primeflex®-couplings compensate for angular, axial and radial shaft misalignments (Fig. 10) without losing their backlash-free function. However, the permitted shaft misalignments indicated in Table 1 must not simultaneously reach their maximum value. If more than one kind of misalignment takes place simultaneously, they influence each other. This means that the permitted misalignment values are dependent on one another (Fig. 11). The sum total of the actual misalignments in percent of the maximum value must not exceed 100 %.



Angular misalignment Radial misalignment Axial displacement

Fig. 14

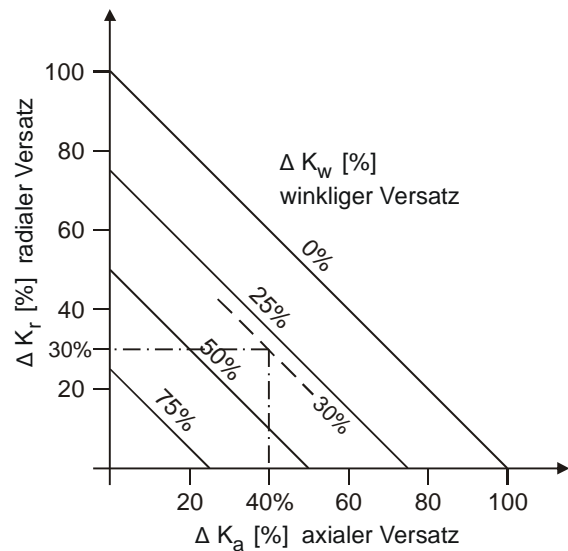


Fig. 15

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Maintenance

primeflex[®]-couplings are maintenance-free. Special maintenance work may only be necessary in extreme ambient or operating conditions (in this case, please contact the manufacturer).

Disposal

All steel components:
Steel scrap (Code No. 160117)

All aluminium components:
Non-ferrous metals (Code No. 160118)

Malfunctions / Breakdowns

Malfunctions	Possible Causes	Solutions
Bellows breakage	Incorrect alignment	<ol style="list-style-type: none"> 1) Set the system out of operation 2) Replace the entire coupling 3) Check the alignment
	Prior damage to the bellows during transport or installation	<ol style="list-style-type: none"> 1) Set the system out of operation 2) Replace the entire coupling 3) Check the alignment
	Operating parameters are not appropriate for the coupling performance	<ol style="list-style-type: none"> 1) Set the system out of operation 2) Check the operating parameters and select a suitable coupling (observe installation space) 3) Install a new coupling 4) Check the alignment
	Bellows is energised at natural frequency; resonances	<ol style="list-style-type: none"> 1) Set the system out of operation 2) Redesign the line characteristics 3) Replace the entire coupling 4) Check the alignment
	Bellows was axially pre-tensioned too severely during installation	<ol style="list-style-type: none"> 1) Set the system out of operation 2) Replace the entire coupling 3) Check the installation specifications 4) Check the alignment
Changes in running noise and vibration occurrence	Loosened screws, resonances, insufficient coupling securement	<ol style="list-style-type: none"> 1) Set the system out of operation 2) Check the screw tightening torques 3) The line characteristics must be checked 4) Check the coupling parts and replace if damaged
	Plug-in toothing connection is not backlash-free due to insufficient axial pre-tension during installation	<ol style="list-style-type: none"> 1) Set the system out of operation 2) Check the toothing for wear; replace coupling if necessary 3) Check the installation specifications 4) Check the alignment



Please Observe!

mayr[®] will take no responsibility or guarantee for replacement parts and accessories which have not been delivered by mayr[®], or for damage resulting from the use of these products.