

Please read the Installation and Operational Instructions carefully and follow them accordingly!

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

Contents

Page 1:	- Contents - Manufacturer's Declaration - Safety Regulations - Safety and Guideline Signs	Page 4:	- Installation - Coupling Alignment - Permitted Shaft Misalignments
Page 2:	- Parts List - Function / Operation - State of Delivery - Temperature Resistance	Page 5:	- Table 2: Permitted Shaft Misalignments - Table 3: Technical Data - Diagram 1: Balancing Standard Couplings - Diagram 2: Balancing Couplings with Sleeve S
Page 3:	- Table 1: Construction Table - Hub Boring - Installation Position	Page 6:	- Balancing Couplings - Maintenance - Disposal - Malfunctions / Breakdowns

Manufacturer's Declaration

This component is produced for installation in a machine or system, based on the machinery directive 98/37/EC. It is forbidden to start use of the component until the machine or system into which it should be built is operating to the EC directives.

Safety Regulations

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



Danger!

This caution applies:

- if the ROBA®-D couplings are modified.
- if the relevant standards for safety and / or installation conditions are ignored.

User-implemented protective measures

- Please cover moving parts to protect them against seizure, dust or foreign body impact.
- Replace self-locking hexagon nuts when they become ineffective after frequent loosening and tightening.

To prevent injury or damage, only professionals and specialists should work on the devices, following the relevant standards and regulations. Please read the Installation and Operational Instructions carefully before installing and operating the device.

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

Information:

Without a conformity inspection, this product is not suitable for areas where there is a high danger of explosion. This statement is based on the directive 94/9 EC (ATEX directive).

Safety and Guideline Signs



Danger!

Danger of injury to personnel and damage to machines.



Please Observe!

Guidelines on important points.

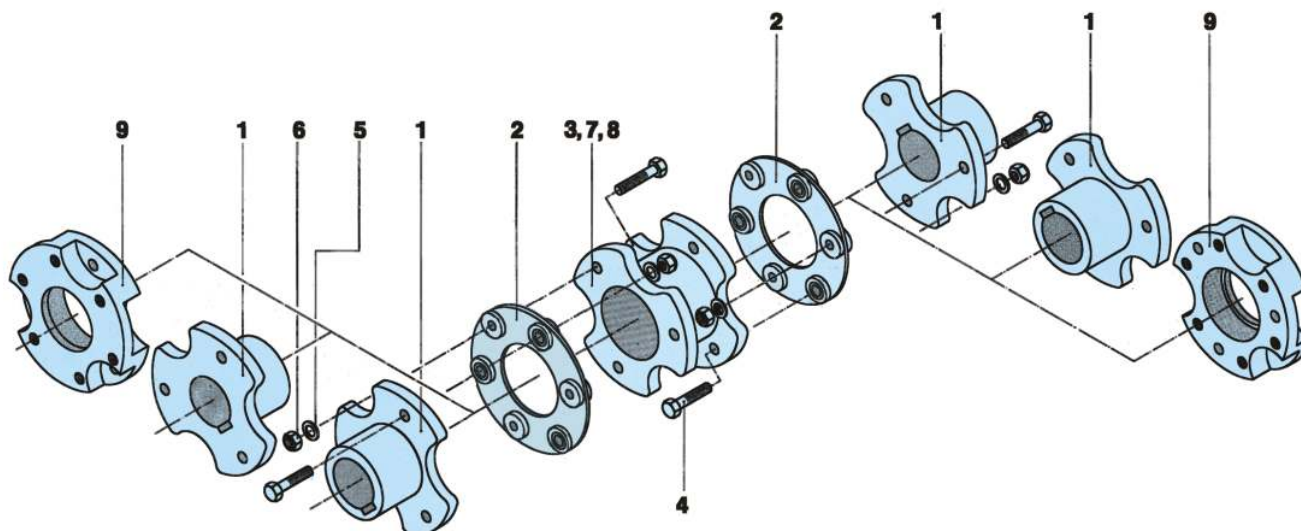


Fig. 1

Parts List

Only use mayr® original parts

- | | |
|---|---------------------------|
| 1 | Hub |
| 2 | Disk pack |
| 3 | Sleeve 1 |
| 4 | Hexagon fitting bolt |
| 5 | Washer |
| 6 | Self-locking hexagon nut |
| 7 | Sleeve 0 |
| 8 | Sleeve S (special sleeve) |
| 9 | Flange A |

Function / Operation

ROBA®-D couplings are shaft connections for torsionally rigid, backlash-free torque transmission for simultaneous compensation of: angular and axial misalignments on single-jointed couplings (Type 910._ _ _), as well as additional radial misalignment compensation on double-jointed couplings (Type 911._ _ _).

State of Delivery

ROBA®-D couplings are delivered as individual parts and as part-assemblies.
Except for the disk pack (2), all parts are phosphated and therefore have a basic corrosion protection.
The hubs can be pilot bored or can be ordered finish-bored with keyway according to DIN 6885.
Designs with clamping elements and shrink disks for backlash-free shaft-hub connection are also available.




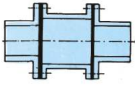

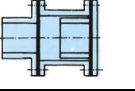
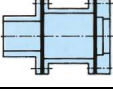


Temperature Resistance

The ROBA®-D is an all-steel coupling and therefore is resistant to temperatures of up to +250 °C.
However, the self-locking hexagon nuts (6) which are included in the standard delivery can only be used within a temperature range of -70 °C up to +120 °C.
At higher temperatures, self-locking all-metal nuts must be replaced with suitable components according to EN ISO 7042.

Installation and Operational Instructions for ROBA®-D Couplings Type 91_

(B.9.0.GB)

Table 1: Construction Table

Construction	Type	Number of Pieces								
		Sleeve 0	Sleeve 1	Sleeve S	Hub	Flange A	Disk pack	Fitting bolt	Hexagon nut	Washer
	910.470				2		1	6	6	6
	910.271				1	1	1	6	6	6
	910.072					2	1	6	6	6
	911.400	1			2		2	12	12	12
	911.410		1							
	911.460			1						
	911.310		1		2		2	12	12	12
	911.500	1			2		2	12	12	12
	911.510		1							
	911.201	1			1	1	2	12	12	12
	911.211		1							
	911.261			1						
	911.002	1				2	2	12	12	12
	911.012		1							
	911.062			1						
	911.101	1			1	1	2	12	12	12
	911.111		1							

Hub Boring

When boring the hub (1), please observe the maximum permitted bore diameter, the specified keyway form and the permitted true-running and axial eccentricity deviation, Fig. 2 and Table 3.

No particular position is specified for the keyway. The keyways are produced according to DIN 6885/1 or according to DIN 6885/3 (see footnote Table 3).

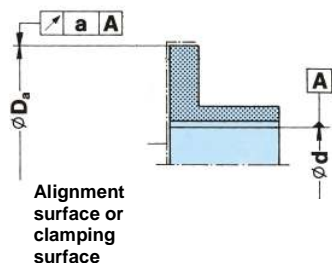


Fig. 2

Installation Position

The ROBA®-D couplings are designed for horizontal installation. For vertical or inclined installation with long sleeves, (sleeve S) the inherent sleeve weight must be held by a vertical support (Fig. 3). Production of this vertical support, including the centering in the hub and the sleeve is carried out at the manufacturing site.

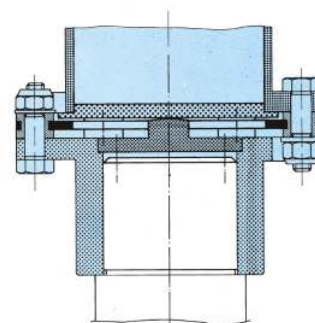


Fig. 3

Installation

For the individual part positioning, please see Fig. 1 and Table 1. The sleeve shown in Fig. 1 and one disk pack are not applicable for single-jointed couplings.

On key connections, the hubs (1) are placed onto the shaft and secured axially. This takes place via a set screw which presses radially onto the key, or via a press cover and a screw, screwed into the shaft central thread, Fig. 4.

The disk packs (2) are screwed using lightly greased hexagon fitting bolts (4), washers (5) and hexagon nuts (6) alternately with the sleeve (3, 7 or 8) and the hub (1) or the flange A (9), Fig. 5.

Please Observe!

The disk pack (2) must always be inserted so that Part 2a (ring with inclined bore) lies against the flange, Fig. 5 (Detail "X"). In order to avoid the disks (2) twisting, the coupling must be screwed in via the fitting bolts (4).

Therefore, please hold the hexagon nut (6) and turn the fitting bolt (4).

Inspect the tightening torque (acc. Table 3, page 5) using the hexagon nut.

Hold the fitting bolt (4) and turn the hexagon nut (6).

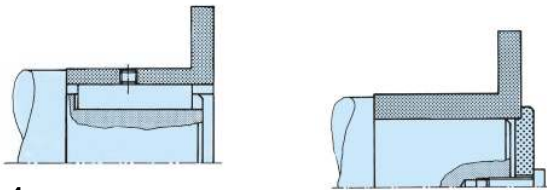


Fig. 4

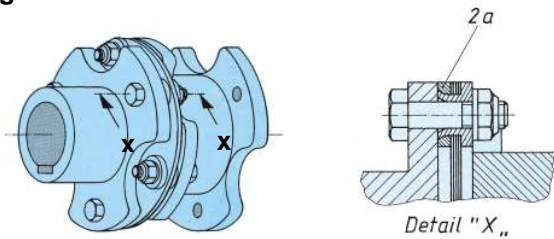
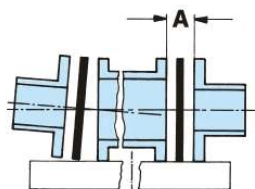


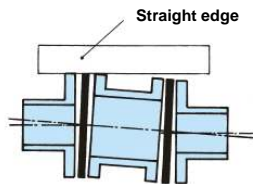
Fig. 5

Coupling Alignment

The ROBA®-D single joint couplings compensate for angular and axial shaft misalignment. The ROBA®-D dual joint couplings compensate for angular, axial and radial shaft misalignment (please observe the permitted values shown in Table 2, page 5). However, an exact coupling alignment greatly increases the lifetime of the disks and reduces the load on the shaft bearings. Normally, it is sufficient to align the coupling using a straight edge at two vertical levels next to each other, Figs. 6 and 7.



Angular misalignment
Aligned coupling
Fig. 6



Radial misalignment
Fig. 7

However, in particularly high speed drives, we recommend the use of an alignment device, e.g. laser or dial gauge, when aligning the coupling (shaft ends).

In order to prevent axial distortion of the disk packs, the dimension A must be maintained according to Table 3 (page 5) and Fig. 6 on aligned angular and radial shaft misalignment. Dimension A is measured between the hub and sleeve screw-on flanges.

Permitted Shaft Misalignments

The permitted shaft misalignments shown in Table 2, Fig. 9 may not simultaneously reach their maximum value.

If more than one kind of misalignment takes place simultaneously, they influence each other. Therefore, each permitted misalignment value (see Fig. 8) is dependent on one another. The sum total of the actual misalignments in percent of the maximum value may not exceed 100 % (see Example and Fig. 8).

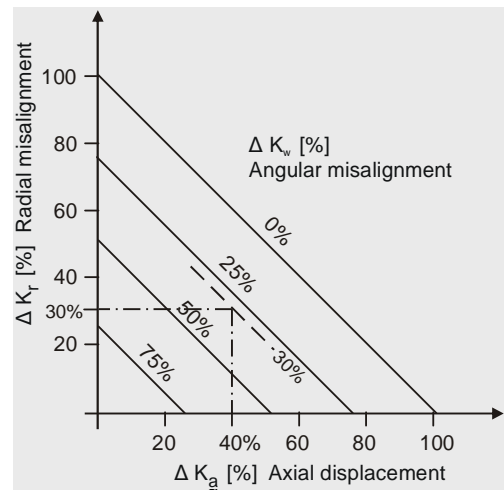


Fig. 8

Example:

ROBA®-D, size 10, Type 911.400
Axial displacement occurrence $\Delta K_a = 0.4 \text{ mm}$ is equal to 40 % of the permitted maximum value $\Delta K_a = 1.0 \text{ mm}$
Angular misalignment occurrence in disk pack $\Delta K_w = 0.3^\circ$ is equal to 30 % of the permitted maximum value $\Delta K_w = 1^\circ$
 \Rightarrow permitted radial misalignment $\Delta K_r = 30 \%$ of the maximum value $\Delta K_r = 0.70 \text{ mm} \Rightarrow \Delta K_r = 0.21 \text{ mm}$

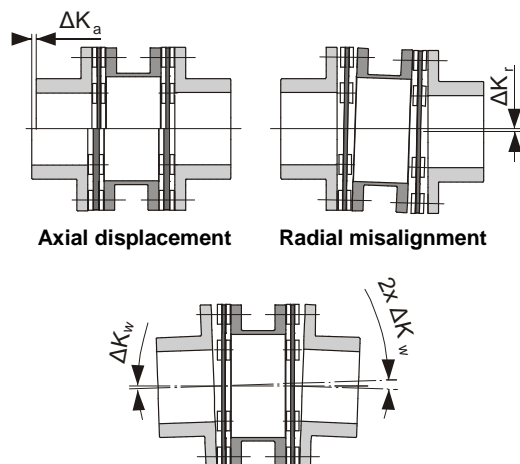


Fig. 9
Angular misalignment

Installation and Operational Instructions for ROBA®-D Couplings Type 91 _ . _ _ _

(B.9.0.GB)

Table 2: Permitted Shaft Misalignments

Size	Permitted Shaft Misalignments			
	Axial ¹⁾ ΔK_a [mm]	Angular ²⁾ ΔK_w [°]	Radial ¹⁾ ΔK_r [mm]	
			Sleeve 0	Sleeve 1
3	0.6	1	-	0.90
5	0.8	1	0.65	1.10
10	1.0	1	0.70	1.25
20	1.2	1	0.85	1.50
40	1.4	1	1.00	1.85
63	1.4	1	-	2.10
100	1.6	1	1.25	2.20
160	1.8	1	1.25	2.20
200	1.8	1	-	2.10
250	1.8	1	1.40	2.45
320	2.0	1	-	2.55
400	2.0	1	1.0	2.55
500	2.0	1	-	2.90
630	2.2	1	1.75	3.00
800	2.4	1	-	3.35
1100	2.6	1	-	3.80
1600	2.8	1	-	4.50

1) These values apply to couplings with 2 disk packs
2) These values apply to couplings with 1 disk pack

Table 3: Technical Data

Size	3	5	10	20	40	63	100	160	200	250	320	400	500	630	800	1100	1600
Max. bore $\varnothing_{d_{max}}$ [mm]	28 ¹⁾	38 ²⁾	45 ³⁾	55	65	75	80	85	85	90	95	100	110	115	125	145	165
Max. permitted true-running und axial eccentricity deviation a [mm]	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.08	0.08	0.08	0.10	0.10	0.10	0.10	0.10
Hexagon fitted bolt (4)	M6	M6	M6	M8	M8	M10	M12	M16	M16	M16	M20	M20	M20	M24	M24	M30	M30
Screw tightening torque T_A [Nm]	10.5	10.5	10.5	26	26	51	89	215	215	215	420	420	420	725	725	1450	1450
Dimension A [mm]	8 ±0.2	8 ±0.2	8 ±0.2	11 ±0.3	11 ±0.3	14 ±0.3	15 ±0.4	15 ±0.4	20 ±0.4	20 ±0.4	23 ±0.5	23 ±0.5	23 ±0.5	27 ±0.6	27 ±0.6	32 ±0.7	32 ±0.7

1) up to $\varnothing 23$ keyway acc. DIN 6885/1, over $\varnothing 23$ keyway acc. DIN 6885/3
2) up to $\varnothing 35$ keyway acc. DIN 6885/1, over $\varnothing 35$ keyway acc. DIN 6885/3
3) up to $\varnothing 42$ keyway acc. DIN 6885/1, over $\varnothing 42$ keyway acc. DIN 6885/3

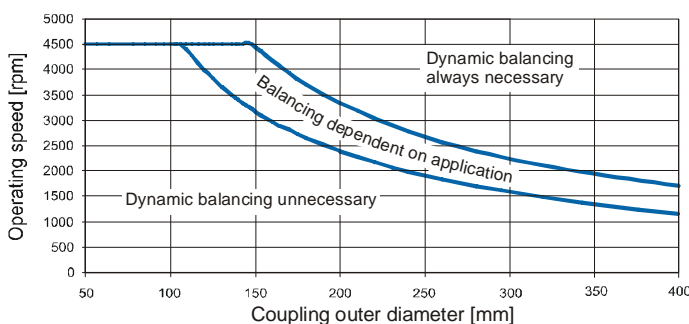


Diagram 1: Balancing standard coupling

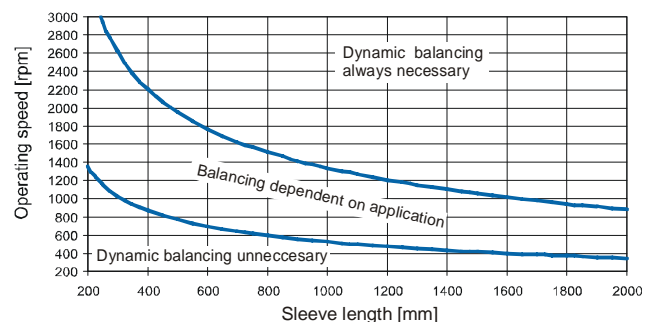


Diagram 2: Balancing coupling with sleeve S (Special length)

Balancing the Coupling

In most application cases, balancing the ROBA®-D coupling is unnecessary. The decision as to whether balancing is necessary depends on the following points:

- Coupling circumferential speed (diagram 1, page 5)
- Length of the special sleeve (diagram 2, page 5)
- Required balance quality

The smooth running of a machine is not only due to the balance quality of the coupling but also is influenced, to at least the same extent, by parameters such as stiffness and distance to the adjacent bearing as well as sensitivity and mass of the whole assembly.

For this reason, the diagrams 1 and 2 should show only reference values, on the basis of which a balance is recommended.

All parts of the ROBA®-D coupling, up to the sleeve S, are machined on all sides and lie therefore at medium speeds within range G 6.3 acc. ISO DIN 1940.

For higher demands on the balancing quality, it is possible to balance the individual parts or even the completely installed coupling (on request). However; for this, the hub must be designed with a finish bore.

Maintenance

ROBA®-D couplings are mainly maintenance-free.

Please keep to the following maintenance and check intervals:

- 1.) Visual inspection, inspection of the installation parameters (misalignment and tightening torques), running behaviour of the coupling **before it is put into initial operation.**
- 2.) Visual inspection, torsional backlash, inspection of misalignment and of tightening torques, coupling running behaviour **after 1000 h, at the latest after 3 months.**
- 3.) If no irregularities or wear are found during the second maintenance and inspection interval, all further inspection intervals can be carried out under unchanged operational parameters **after 4000 operating hours or after at least 12 Months.**

In extreme ambient or operational conditions, the coupling should be inspected after shorter intervals.

Disposal

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

Malfunctions / Breakdowns

Malfunction	Possible Causes	Solutions
Changes in running noise and / or vibration occurrence	Alignment mistake, incorrect installation	<ol style="list-style-type: none"> 1) Set system out of operation 2) Find and solve the reason for the alignment mistake 3) Check the coupling for wear
	Loose connecting screws, low friction corrosion under the screw head and on the disk pack	<ol style="list-style-type: none"> 1) Set system out of operation 2) Inspect the coupling parts and replace damaged coupling parts 3) Tighten the connecting screws to the specified torque 4) Check the alignment and correct if necessary
	Loose clamping screws or loose securing set screw to axially secure the hub	<ol style="list-style-type: none"> 1) Set system out of operation 2) Check the coupling alignment 3) Tighten the clamping screws to axially secure the hub to the specified torque or tighten the securing set screw and secure it with safety lacquer. 4) Inspect the coupling for wear
Disk pack break	Disk pack break due to high load impacts / overload	<ol style="list-style-type: none"> 1) Set system out of operation 2) Dismantle the coupling and remove the rest of the disk packs 3) Check the coupling parts and replace if damaged 4) Find and solve the cause of the overload
	Operational parameters are not suitable for the coupling performance	<ol style="list-style-type: none"> 1) Set system out of operation 2) Check the operational parameters and choose a suitable coupling (observe installation space) 3) Install new coupling 4) Check the alignment
	Operational mistake on the plant unit	<ol style="list-style-type: none"> 1) Set system out of operation 2) Dismantle the coupling and remove the rest of the disk packs 3) Check the coupling parts and replace if damaged 4) Train and school the operating personnel
Disk pack / connecting screw splits / break	Drive vibrations	<ol style="list-style-type: none"> 1) Set system out of operation 2) Dismantle the coupling and remove the rest of the disk packs 3) Check the coupling parts and replace if damaged 4) Check the alignment and correct if necessary 5) Find and solve the vibration cause



Please Observe!

mayr® will neither take responsibility nor accept guarantee claims if replacement parts and accessories from other companies are used, or for the damaging resulting from this action.