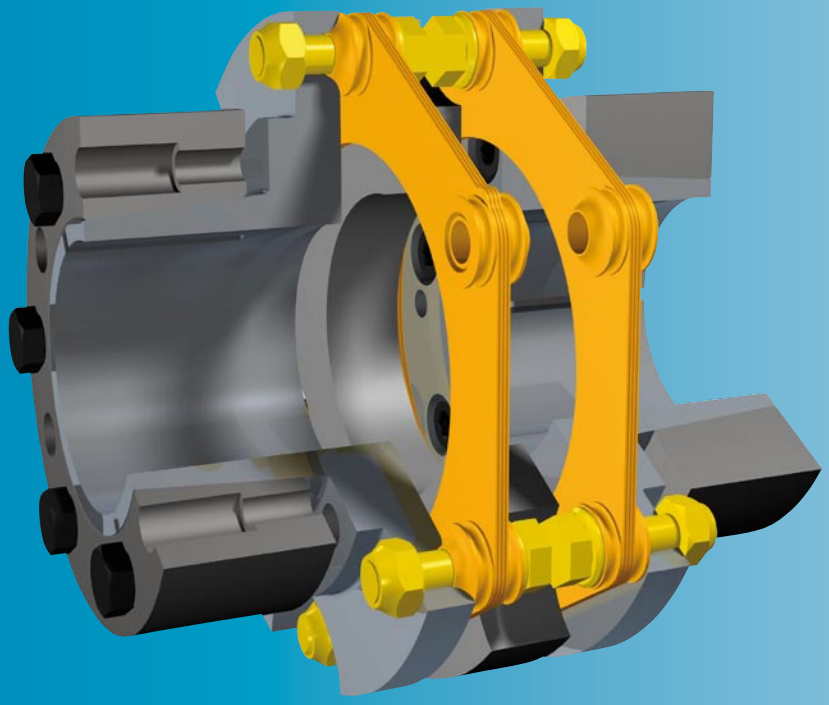
ROBA®-DS

Torsionally Rigid Shaft Couplings



- *High torsional spring rigidity*
- *Extremely high alternating torques*
- *Large variant range*
- *Low mass inertia*

www.mayr®.de

K.950.V11.GB

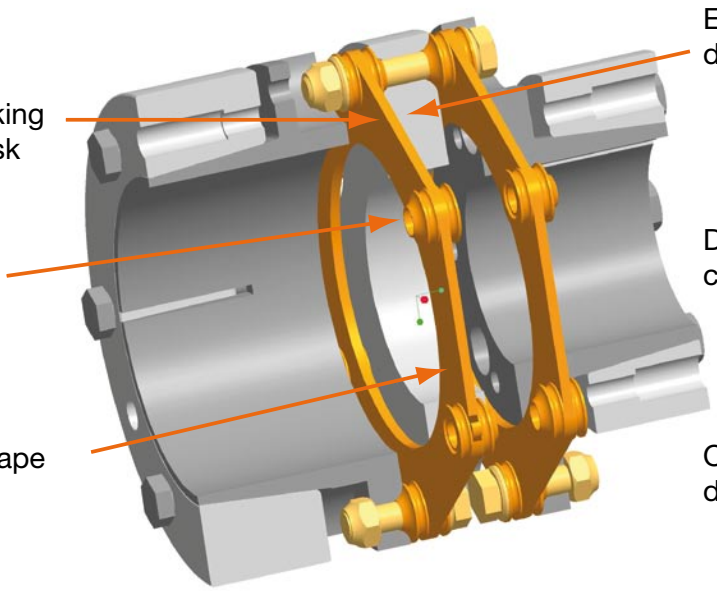
mayr®

your reliable partner

ROBA®-DS

Technologically superior

- Non-sensitive to alternating loads of up to 100 % of the nominal torque
- Low mass inertia due to high performance density
- Completely backlash-free up to nominal torque
- High misalignment compensation capability at low restoring forces
- High torsional rigidity up to nominal torque
- Completely wear and maintenance-free
- Optimum construction shape due to large variant range



The ROBA®-DS transmits drive torques up to the nominal torque completely backlash-free and with permanently high torsional spring rigidity. Problems to be found on other commercially available couplings, such as denting the disks or overcoming the frictional locking, are not a problem on our couplings. The specified shaft misalignments can be 100 % utilized without affecting the transmittable torque. This guarantees unlimited use.

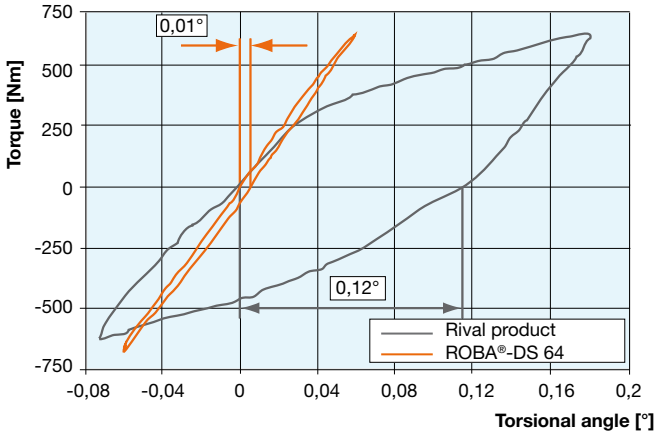


Diagram: A ROBA®-DS coupling rigidity characteristic curve in comparison to a typical rival product with frictionally-locking/positively-locking torque transmission.

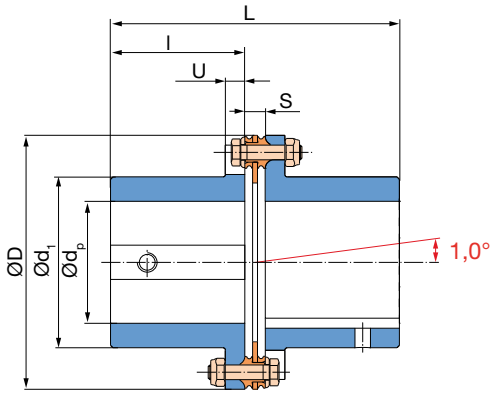
ROBA®-DS couplings are also available in rustproof steel and in ATEX design according to the directive 94/9 EC (ATEX 95).

Please Observe:

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

We reserve the right to make dimensional and constructional alterations.

Single-jointed coupling with key hubs



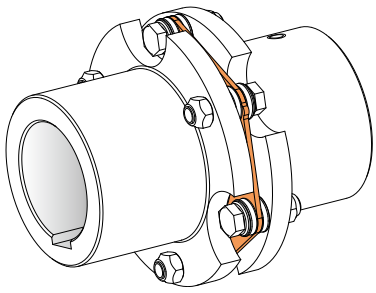


Fig. 29: Type 950.000

Technical Data and Main Dimensions					Size					
					16	25	40	64	100	160
Nominal torque [1]			T_{KN}	[Nm]	190	290	450	720	1000	1600
Peak transient torque [2]			T_{KS}	[Nm]	285	435	675	1080	1500	2400
Outer diameter			D	[mm]	77	89	104	123	143	167
Minimum hub bore			$d_{p\,min}$	[mm]	16	20	25	30	35	40
Maximum hub bore			$d_{p\,max}$	[mm]	32	40	50	55	70	80
Maximum speed [3]			n_{max}	[rpm]	13600	11800	10100	8500	7300	6200
Permitted misalignments [4]	permitted axial misalignment [5] [6]		ΔK_a	[mm]	1,1	1,3	1,5	1,8	2,1	2,5
	permitted radial misalignment [5]	with connecting plate	ΔK_r	[mm]	0,3	0,3	0,4	0,45	0,45	0,55
		with sleeve 1	ΔK_{rH}	[mm]	1,0	1,2	1,5	1,8	2,1	2,2
		with sleeve S	ΔK_{rH}	[mm]	$(H_S - S) \times 0{,}0174$					
Spring stiffness	torsion [7]	disk pack	$C_{T\,LP}$	[10^3 Nm/rad]	145	280	301	748	1135	1920
		tube sleeve S	$C_{T\,H\,rel.}$	[10^6 Nm mm/rad]	19	34	71	108	217	415
	angular spring stiffness [8]			[Nm/rad]	229	248	298	876	1089	1990

Dimensions [mm]

Size	16	25	40	64	100	160
d_1	50	60	70	80	100	115
d_3	33	41	46	51	66	76
H_1	70	80	96	116	136	140
H_S	acc. customer specifications					
h_1	50	60	70	80	100	110
L	87,1	97,2	118,4	139,6	160	181,6
L_2	106,2	116,4	140,8	167,2	188	215,2
L_4	150	170	206	246	286	310
L_6	dependent on H_S					
l	40	45	55	65	75	85
S	7,1	7,2	8,4	9,6	10	11,6
U	7	7	8	10	10	12
U_1	26,2	26,4	30,8	37,2	38	45,2

Mass moments of Inertia J [10^{-3} kgm²]

Size	16	25	40	64	100	160
Disk pack [9]	0,08	0,12	0,26	0,74	1,19	3,27
Hub [10]	0,27	0,55	1,16	2,58	6,18	12,51
Connecting plate	0,23	0,44	0,95	2,30	4,60	9,72
Sleeve 1	0,32	0,61	1,38	3,02	6,10	12,96
Sleeve S with H_S = 1000 mm	2,11	3,77	7,81	12,62	24,98	49,43
Sleeve S per 1000 mm tube	1,93	3,43	7,12	10,86	21,86	41,61

Weight [kg]

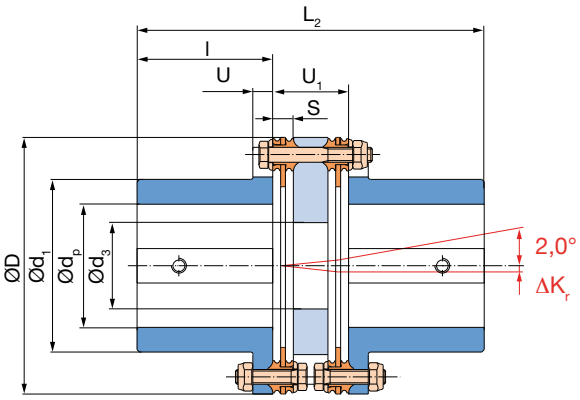
Size	16	25	40	64	100	160
Disk pack [9]	0,08	0,09	0,15	0,29	0,35	0,67
Hub [10]	0,46	0,69	1,02	1,72	2,83	4,25
Connecting plate	0,31	0,43	0,68	1,19	1,96	2,96
Sleeve 1	0,39	0,54	0,93	1,46	2,04	3,38
Sleeve S with H_S = 1000 mm	3,63	4,42	6,82	8,09	10,22	16,83
Sleeve S per 1000 mm tube	3,48	4,22	6,51	7,50	9,47	15,34

1) Valid for alternating loads as well as max. permitted shaft misalignment.
2) Valid for one rotational direction, max. stress ≤ 10^5.
3) Not valid for coupling with sleeve S.
4) The permitted misalignments may not simultaneously reach their maximum values.
5) The values refer to couplings with 2 disk packs.
6) Only permitted as a static or virtually static value.
7) The C_T-value of a double-jointed coupling can be roughly calculated as follows:

$$C_{T\,tot.} = \frac{1}{\frac{2}{C_{T\,LP}} + \frac{H_S\,[mm] - 2\,S\,[mm]}{C_{T\,Hrel.}}}$$

8) The values refer to 1 disk pack.
9) Mass moments of inertia and weights are valid for 1 disk pack.
10) Mass moments of inertia and weights are valid for maximum bore.

Double-jointed coupling with connecting plate and key hubs



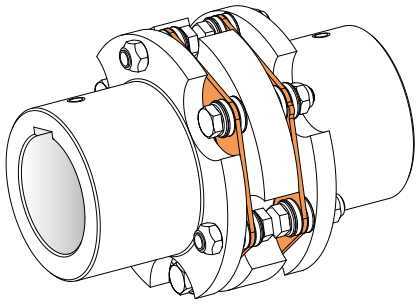
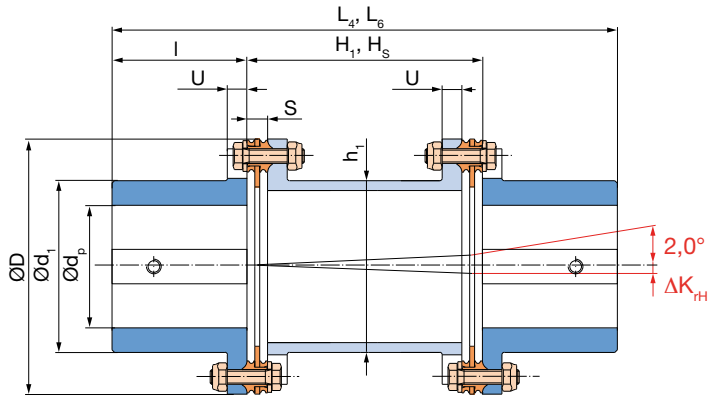


Fig. 30: Type 951.001

Double-jointed coupling with sleeve 1 or sleeve S (special length) and key hubs



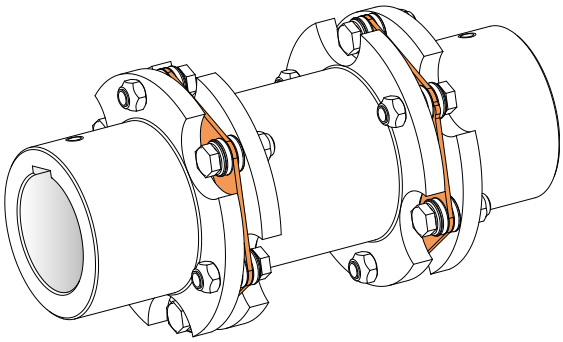


Fig. 31: Type 951.002 (Sleeve 1: H_1, L_4), Type 951.003 (Sleeve S: H_S, L_6)

Order Number

__ / 9 5 __ . 0 0 __ / __ / __ / __ / __								
Sizes 16 to 160	Single-jointed coupling Double-jointed coupling	**0** **1**	Single-jointed coupling Connecting plate Sleeve 1 Sleeve S Sleeve GKR (page 52) Sleeve CRP (page 52)	**0** **1** **2** **3** **4** **5**	**Bore* Hub 1 ø** (Dim. page 26)	**Bore* Hub 2 ø** (Dim. page 26)	**Sleeve length H_S** [mm] for special sleeves S / GKR /CRP	**Operating speed n_S** [rpm]

Example: 16 / 951.001 / Hub 1 – ø 25 H7 / Hub 2 – ø 25 H7

*Standard H7, other tolerances possible

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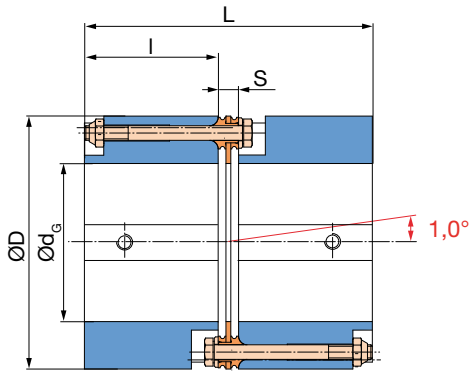
Single-jointed coupling with key hubs, large



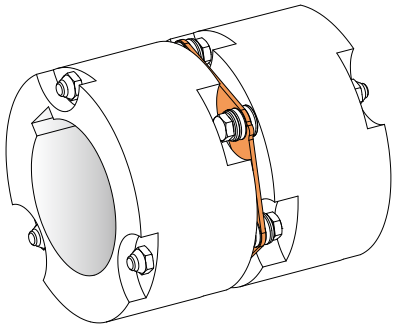


Fig. 32: Type 950.110

Technical Data and Main Dimensions					Size					
					16	25	40	64	100	160
Nominal torque [1]			T_{KN}	[Nm]	190	290	450	720	1000	1600
Peak transient torque [2]			T_{KS}	[Nm]	285	435	675	1080	1500	2400
Outer diameter			D	[mm]	77	89	104	123	143	167
Minimum hub bore			$d_{G\,min}$	[mm]	30	35	45	55	65	75
Maximum hub bore			$d_{G\,max}$	[mm]	45	55	65	75	95	110
Maximum speed [3]			n_{max}	[rpm]	13600	11800	10100	8500	7300	6200
Permitted misalignments [4]	permitted axial misalignment [5] [6]		ΔK_a	[mm]	1,1	1,3	1,5	1,8	2,1	2,5
	permitted radial misalignment [5]	with connecting plate	ΔK_r	[mm]	0,3	0,3	0,4	0,45	0,45	0,55
		with sleeve 1	ΔK_{rH}	[mm]	1,0	1,2	1,5	1,8	2,1	2,2
		with sleeve S	ΔK_{rH}	[mm]	$(H_S - S) \times 0{,}0174$					
Spring stiffness	torsion [7]	disk pack	$C_{T\,LP}$	[10^3 Nm/rad]	145	280	301	748	1135	1920
		tube sleeve S	$C_{T\,H\,rel.}$	[10^6 Nm mm/rad]	19	34	71	108	217	415
	angular spring stiffness [8]			[Nm/rad]	229	248	298	876	1089	1990

Dimensions [mm]

Size	16	25	40	64	100	160
d_3	33	41	46	51	66	76
H_1	70	80	96	116	136	140
H_S	acc. customer specifications					
h_1	50	60	70	80	100	110
L	87,1	97,2	118,4	139,6	160	181,6
L_2	106,2	116,4	140,8	167,2	188	215,2
L_4	150	170	206	246	286	310
L_6	dependent on H_S					
l	40	45	55	65	75	85
S	7,1	7,2	8,4	9,6	10	11,6
U	7	7	8	10	10	12
U_1	26,2	26,4	30,8	37,2	38	45,2

Mass moments of Inertia J [10^{-3} kgm^2]

Size	16	25	40	64	100	160
Disk pack [9]	0,08	0,12	0,26	0,74	1,19	3,27
Hub [10]	0,86	1,71	3,89	8,98	18,12	36,00
Connecting plate	0,23	0,44	0,95	2,30	4,60	9,72
Sleeve 1	0,32	0,61	1,38	3,02	6,10	12,96
Sleeve S with H_S = 1000 mm	2,11	3,77	7,81	12,62	24,98	49,43
Sleeve S per 1000 mm tube	1,93	3,43	7,12	10,86	21,86	41,61

Weight [kg]

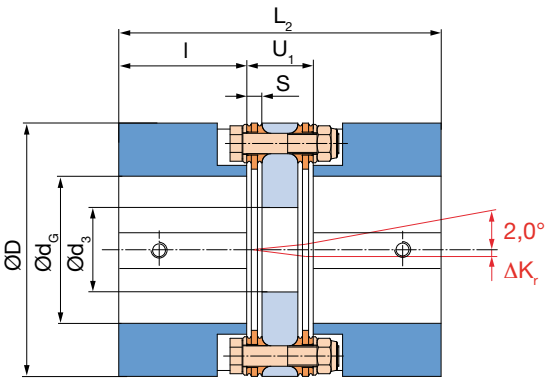
Size	16	25	40	64	100	160
Disk pack [9]	0,08	0,09	0,15	0,29	0,35	0,67
Hub [10]	0,87	1,26	2,08	3,47	4,94	7,23
Connecting plate	0,31	0,43	0,68	1,19	1,96	2,96
Sleeve 1	0,39	0,54	0,93	1,46	2,04	3,38
Sleeve S with H_S = 1000 mm	3,63	4,42	6,82	8,09	10,22	16,83
Sleeve S per 1000 mm tube	3,48	4,22	6,51	7,50	9,47	15,34

1) Valid for alternating loads as well as max. permitted shaft misalignment.
2) Valid for one rotational direction, max. stress ≤ 10^5.
3) Not valid for coupling with sleeve S.
4) The permitted misalignments may not simultaneously reach their maximum values.
5) The values refer to couplings with 2 disk packs.
6) Only permitted as a static or virtually static value.
7) The C_T-value of a double-jointed coupling can be roughly calculated as follows:

$$C_{T\,tot.} = \frac{1}{\frac{2}{C_{T\,LP}} + \frac{H_S\,[mm] - 2\,S\,[mm]}{C_{T\,Hrel.}}}$$

8) The values refer to 1 disk pack.
9) Mass moments of inertia and weights are valid for 1 disk pack.
10) Mass moments of inertia and weights are valid for maximum bore.

Double-jointed coupling with connecting plate and key hubs, large



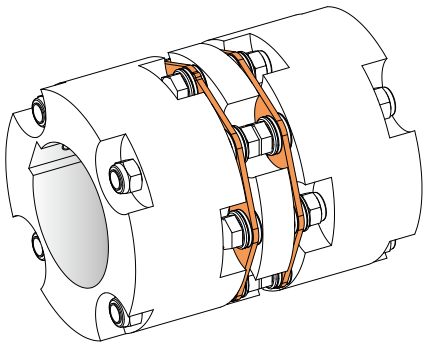
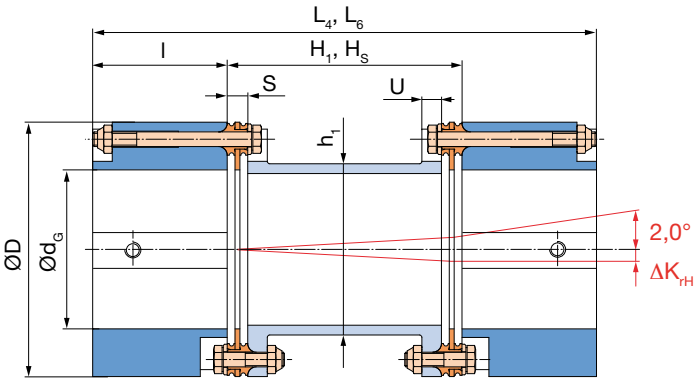


Fig. 33: Type 951.111

Double-jointed coupling with sleeve 1 or sleeve S (special length) and key hubs, large



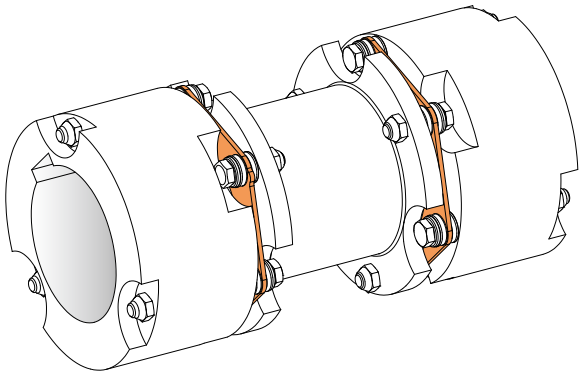


Fig. 34: Type 951.112 (Sleeve 1: H_1, L_4), Type 951.113 (Sleeve S: H_S, L_6)

Order Number

__	/	9	5	__	.	1	1	__	/	__	/	__	/	__	/	__
△				△				△		△		△		△		△

Sizes 16 to 160	Single-jointed coupling Double-jointed coupling	**0** **1**	Single-jointed coupling Connecting plate Sleeve 1 Sleeve S Sleeve GKR (page 52) Sleeve CRP (page 52)	**0** **1** **2** **3** **4** **5**	**Bore* Hub 1 ø** (Dim. page 28)	**Bore* Hub 2 ø** (Dim. page 28)	**Sleeve length H_S** [mm] for special sleeves S / GKR /CRP	**Operating speed n_s** [rpm]

Example: 25 / 950.110 / Hub 1 – ø 45 H7 / Hub 2 – ø 45 H7

*Standard H7, other tolerances possible

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Options and Variants on Intermediate Shafts

Intermediate shafts

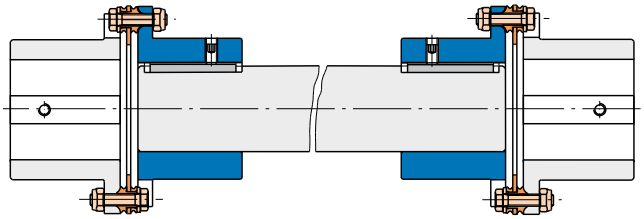

Fig. 68

Variable bridges over any shaft distances via adapted steel solid shafts, mounted between two standard hubs.
Please observe the bend-critical speeds!

GRP sleeves

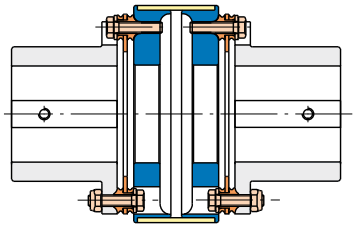

Fig. 69

Glass-fibre reinforced plastic sleeves for couplings in leakage current-isolated design.
Fulfils the highest demands on insulation quality (CTI 600).

Axial separable sleeves

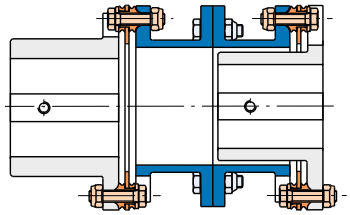

Fig. 70

This design allows radial dismantling of input and output without axial misalignment.
Preferred solution on large coupling in connection with inner key hubs

Poly-cardanic design

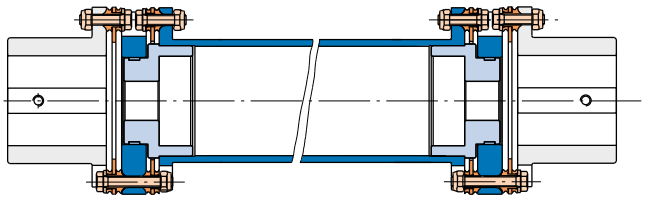

Fig. 71

For applications with large axial misalignment, e.g. caused by:

- Normal load or overload on the connected system parts
- Ground changes between the foundations
- Temperature differences
- Axial backlash due to wear on the bearing

Safe Against Overload Damage

Combination with EAS®-Compact®

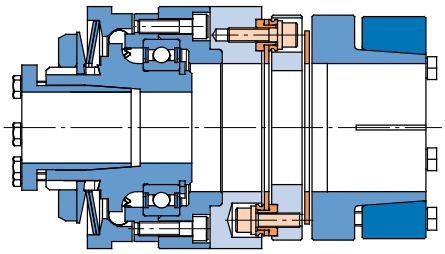

Fig. 72

- Safety clutches in the construction Types Ratchetting, Synchronous or Overload
- Flexible adaptation of construction length for connection of shafts with different shaft distances
- Perfectly suited for demands of high torsional rigidity or high speeds

Torque range	5 - 3000 Nm
Switch-off accuracy	± 5 %
Load disconnecting	
Number of overload occurrences	high
Time demand for repeat operation start-up	0
Danger of drive shaft damage	no

Combination with EAS®-element coupling

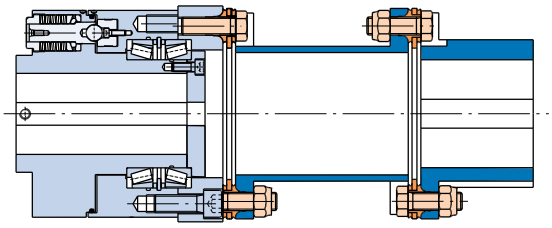

Fig. 73

- Complete separation of input and output on overload
- Particularly suitable for heavy, fast-running drives with large rotating masses
- Maximum torsional rigidity at highest performance density

Torque range	250 - 24000 Nm
Switch-off accuracy	± 5 %
Load disconnecting	
Number of overload cases	high
Time demand for repeat operation start-up	1 minute
Danger of drive shaft damage	no

Combination with ROBA®-slip hub

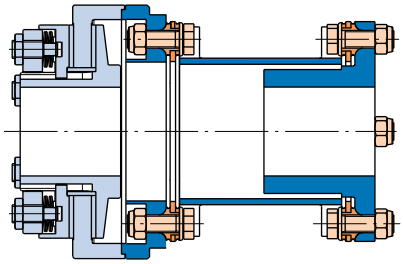

Fig. 74

- Overload protection with load holding function
- Compensation of individual dynamic peaks (resonances, start-up peaks) without operational interruptions
- Slip control recommended for protection against thermic overload

Torque range	2 - 24000 Nm
Switch-off accuracy	± 20 %
Last holding	
Number of overload cases	very high
Time demand for repeat operation start-up	0
Danger of drive shaft damage	no

Shrink disk hub with integrated overload protection

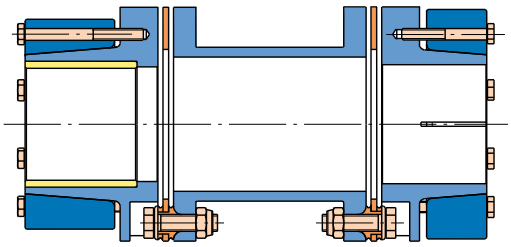

Fig. 75

- Modified shrink disk hub with integrated slip bushing
- Suitable for protection against individual, very short dynamic torque peaks
- Not suitable for longer slipping times / high slipping speeds

Torque range	190 - 24000 Nm
Switch-off accuracy	± 20 % [1]
Load holding	
Number of overload cases	very low
Time demand for repeat operation start-up	dismantling and installation of coupling
Danger of drive shaft damage	yes

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1) Tolerance only in limited application conditions – please contact the manufacturer.

Installation Examples

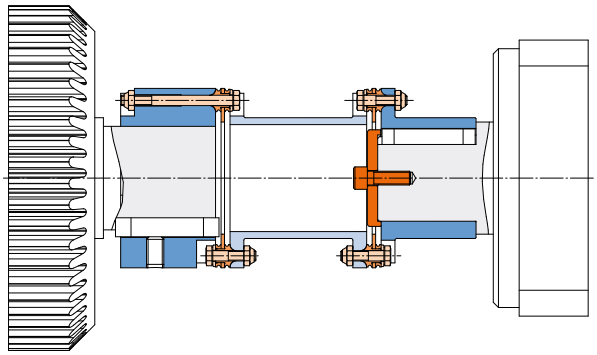

Fig. 76

Axial securement of key hubs via press cover

When using key hubs with transition tolerance and backlash tolerance, additional securement of the hubs is necessary. A positive-locking, extremely robust securement is achieved via press cover and clamping screws.

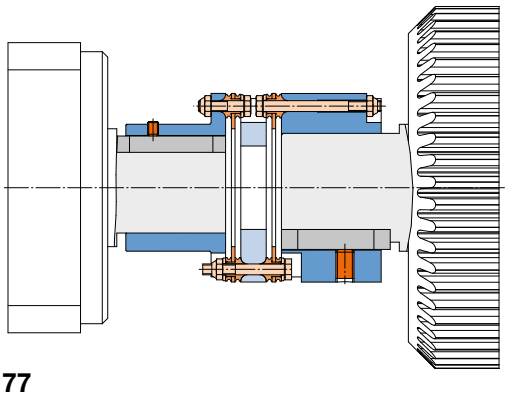

Fig. 77

Axial securement of key hubs via adjusting screw

When using adjusting screws, radial force is achieved on the key via positive locking. This securement is of advantage in particular for partly assembled couplings and limited space conditions.

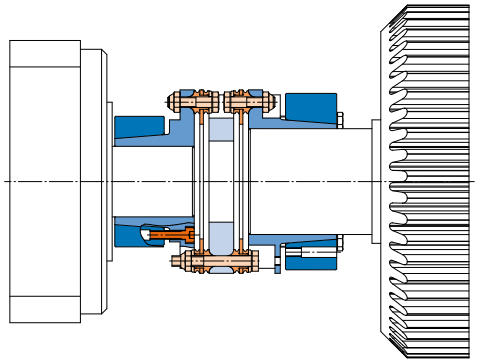

Fig. 78

Hub installation directly next to the housing wall with internally-clamping shrink disk hub

The ROBA®-DS coupling can be installed directly next to the housing wall by using an internally-clamping shrink disk hub. For this, a backlash-free shaft/hub connection is achieved in very limited space conditions.

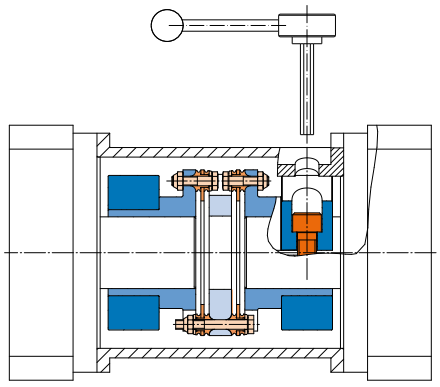

Fig. 79

Coupling installation in closed housing

By using clamping ring hubs, ROBA®-DS couplings can even be installed in areas very difficult to reach. A positive-locking connection to the shaft is achieved via a radial socket set screw. An opening in the gear bell housing is to be designed for the Allen wrench.

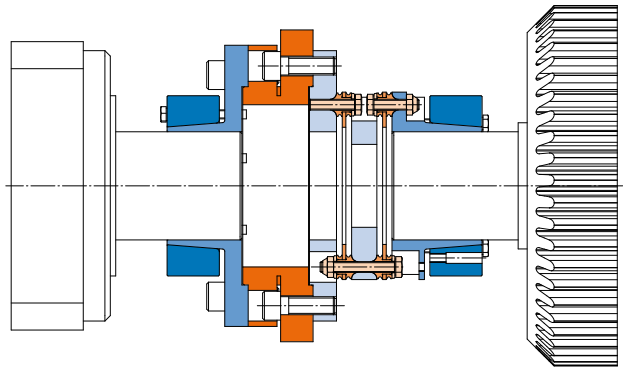

Fig. 80

Integration of measuring flange with adapting flanges

By using special adapting flanges, different measuring flanges (for torque measurement) can be integrated into ROBA®-DS couplings.

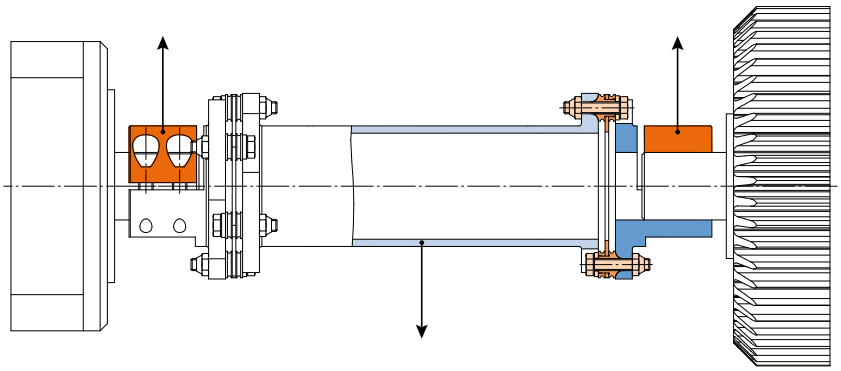

Fig. 81

Radial installation/dismantling with split clamping hubs

By using split clamping hubs, it is possible to install or dismantle ROBA®-DS couplings radially without misaligning the motor or gear box.

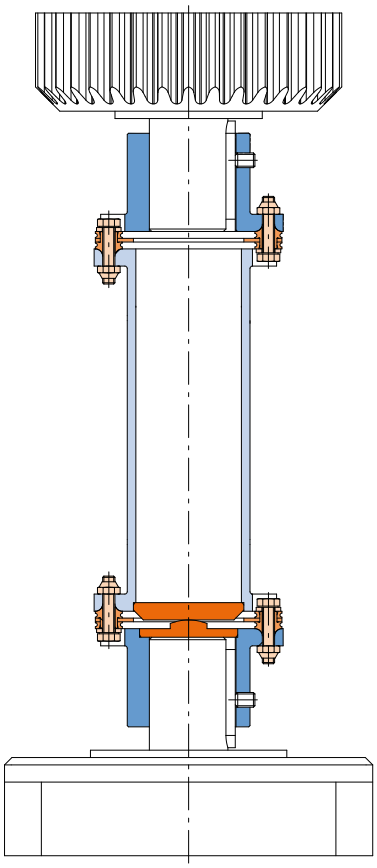

Fig. 82

Vertical support for special sleeve

For vertical or sloping installation of ROBA®-DS couplings with long intermediate sleeves, a “vertical support” is required. Using this device, the sleeve weight force is transferred directly from the sleeve onto the hub instead of via the disk packs onto the hub.

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Size Selection

Coupling size selection

1. Direct coupling selection

If the user knows all the torques affecting the coupling during operation and if temperatures do not rise above 150°C (100°C on sizes 3 to 15), a coupling should be selected whose nominal torque lies above the maximum in-operation torques according to the catalogue.

If shaft misalignment is present, no further limitations are necessary.

For ROBA®-DS couplings from size 16 onwards, no further limitations are necessary if alternating torques are present.

Please observe the alternating torques shown on page 4 for coupling sizes 3 to 15.

Please also observe the level and torsional direction of the start-up torque. This may be maximum 1.5 x the permitted coupling nominal torque. The torsional direction should remained unchanged, the maximum permitted amount of stress must be smaller than 1 x 10^5.

2. Calculation for coupling selection using drive performance and service factor f_B

If the user knows the application data of his drive line, we recommend dimensioning using performance and speed of the main engine as well as the service and temperature factors.

$$T_{KN} \geq \frac{9550 \times P \times f_B \times f_t}{n}$$

Term definitions:

T_{KN} [Nm]	Coupling nominal torque
P [kW]	Main engine nominal performance
f_B	Service factor according to Table 2, page 55
f_t	Temperature factor according to Fig. 85, page 54
n [rpm]	Drive machine nominal speed

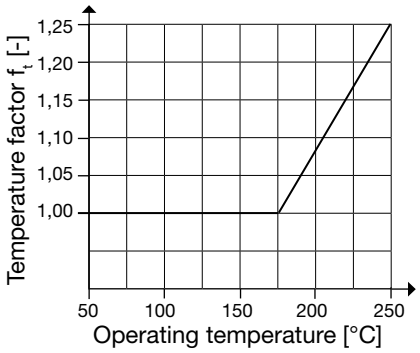

Fig. 85: Temperature factor f_t

Calculation Example

The ROBA®-DS coupling is to be dimensioned for a piston pump drive run via an electromotor. The following application data is available:

Main engine:	**Electromotor**
Nominal capacity	P = 13 kW
Nominal speed	n = 1450 rpm
Max. start-up torque	T_{Amax} = 2,5 x the motor nominal torque

Main engine: **Piston pump**

Maximum ambient temperature 60 °C

=> Required coupling nominal torque T_{KN}:

$$T_{KN} \geq \frac{9550 \times 13 \times 1{,}9 \times 1{,}0}{1450}$$

T_{KN} ≥ 162,7 Nm

Load class from Table 1, page 55: *III*
Service factor f_B from Table 2, page 55: *1,9*
Temperature factor f_t from Fig. 85, page 54: *1,0*

=> Required coupling peak transient torque T_{KS}:

$$T_{Nom} = \frac{9550 \times 13}{1450}$$

T_{Nom} = 85,6 Nm

T_{Amax} = 2,5 × T_{Nom} *Max. start-up torque: T_{Amax} = 2,5 x the motor nominal torque*

T_{KS} ≥ T_{Amax} ≥ **214,1 Nm**

=> Selected coupling size:
ROBA®-DS 16 with a nominal torque **T_{KN}** of **190 Nm** and a peak transient torque **T_{KS}** of **285 Nm**.

Classification of Work Machines into Load Classes	
Construction machinery	
- Concrete blenders	II
- Chain conveyors	III
- Chain carriages	III
- Crushers	III
Chemical industry	
- Mixers (thick fluids)	II
- Mixers (thin fluids)	I
- Centrifuges	II
- Blenders	II
Fans/vents	II
Generators/convertors	
- Frequency convertors	I
- Generators	II
Foodstuffs machines	
- Kneading machines	II
- Mills	III
- Packaging machines	II
Paper machines	III
Compressors	II
Conveyor systems	
- Conveyor belts	II
- Sloping elevators	III
- Goods elevators	II
- Passenger elevators	II
Wood/plastic processing	
- Planing machines	II
- Reciprocating saws	III
- Extruders	II
- Blenders	II
Crane systems	II
Metal processing	
- Punching/Pressing	III
- Machine tools	II
Pumps	
- Centrifugal pump (thin fluids)	I
- Centrifugal pump (thick fluids)	II
- Pistons/plunger pumps	III
Textile machines	II
Washing machines	II

Table 1: Load Classes

Main engine	Work Machine Load Class I	II	III
Electromotor, turbine, hydraulic motor	1,1	1,4	1,9
Piston machine with more than 3 cylinders	1,4	1,7	2,2
Piston machine with up to 3 cylinders	1,7	2,0	2,5

Table 2: Service factor f_B

Technical Explanations

Permitted shaft misalignments

- ROBA®-DS single-jointed couplings (Type 950._ _ _ and Type 952._ _ _) compensate for angular and axial shaft misalignments.
- ROBA®-DS double-jointed couplings (Type 951._ _ _ and Type 953._ _ _) compensate for angular, radial and axial shaft misalignments (Fig. 86).
- If more than one misalignment type occurs simultaneously, they affect each other. The permitted misalignment values are dependent on one another, see Fig. 87. The sum of the actual misalignments – in percent of the maximum value – may not exceed 100 %.

Example (see Table on page 20 and Fig. 87):

ROBA®-DS, size 40, Type 951.002

=> **Axial misalignment** occurrence: ΔK_a = 0,6 mm, which is **40 %** of the permitted maximum value ΔK_a = 1,5 mm

=> **Angular misalignment** occurrence**:** in disk pack: ΔK_w = 0,3°, which is **30 %** of the permitted maximum value ΔK_w = 1,0°

=> **Permitted radial misalignment**: ΔK_r = **30 %** of the permitted maximum value ΔK_r = 1,5 mm => ΔK_r = 0,45 mm

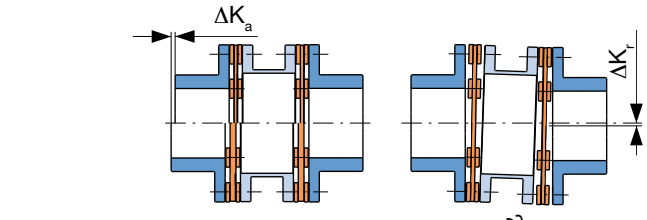

Fig. 86

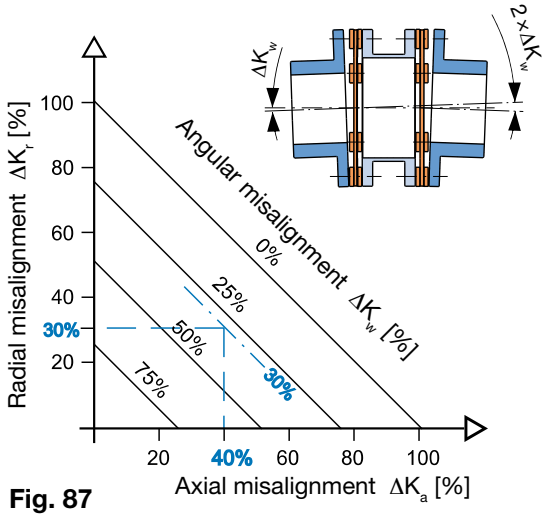

Fig. 87

◁ Backlash-free servo couplings Page 4
◁ Backlash-free All-steel couplings Page 8
◁ Variable length Sleeve S/CRP sleeve/Options Page 44
◁ Safe Against Overload Page 47
◁ Installation Examples Page 50
◁ Integrated Torque Measurement Page 52
◁ Dimensioning, Size Selection Page 54

Permitted Speeds (Bend-critical Speeds) on Sleeve S, GKR Sleeve and CRP Sleeve (Figs. 88, 89, 90)

Permitted speed on special sleeve ROBA®-DS Type 95_._ _ 3 (Sleeve S)

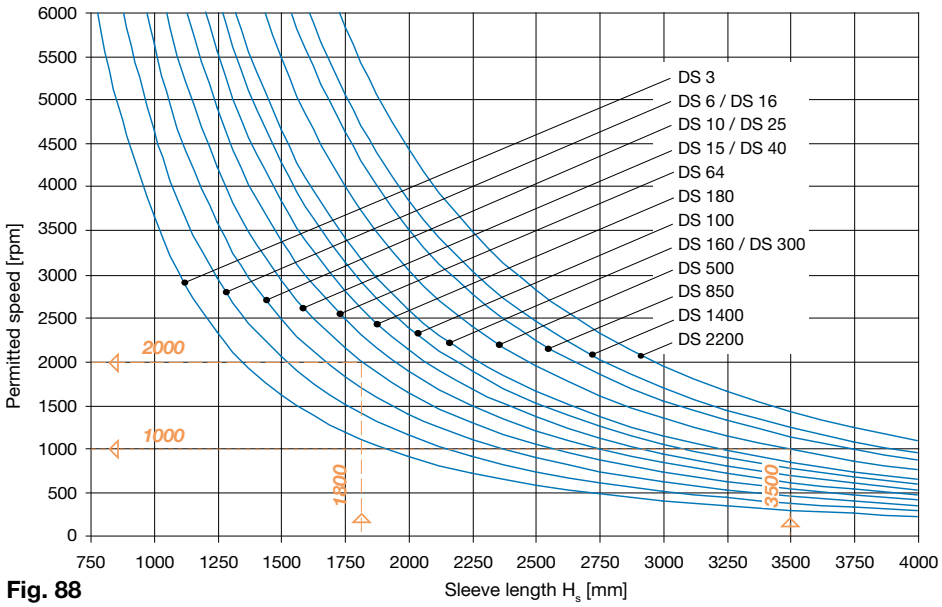

Fig. 88

Examples (Fig. 88)

- ROBA®-DS, Size 40:

Sleeve length: H_s = **1800 mm**
= > permitted speed:
2000 rpm

- ROBA®-DS, Size 500:

Sleeve length: H_s = **3500 mm**
= > permitted speed:
1000 rpm

Permitted speed on special sleeve ROBA®-DS Type 95_._ _ 4 (Sleeve GKR)

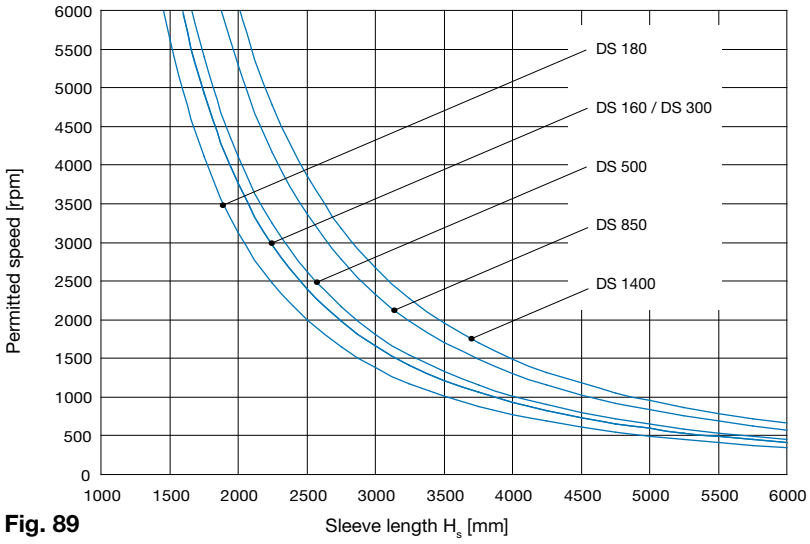

Fig. 89

Permitted speed on special sleeve ROBA®-DS Type 95_._ _ 5 (Sleeve CFK)

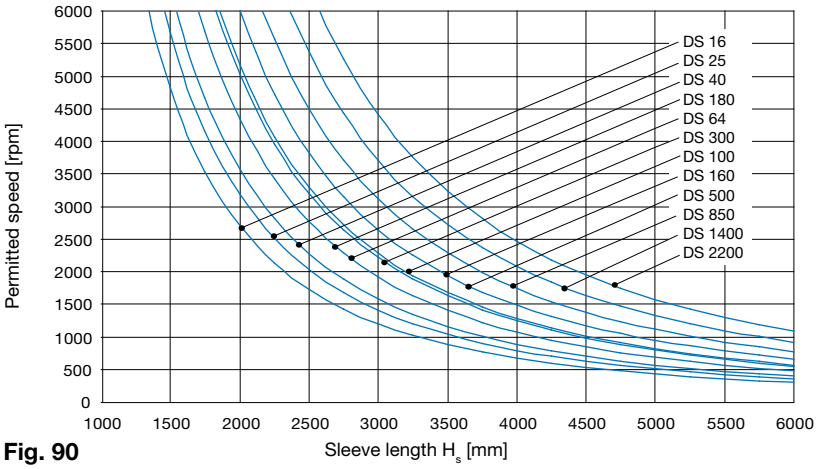

Fig. 90

Using the coupling at high speeds

- Please keep to the maximum speeds defined in the catalogue. Higher speeds are only permitted after contacting the manufacturers.
- Please operate designs with sleeve S, GKR sleeves and CRP sleeves at sub-critical levels (see Figs. 88, 89 and 90).
- Both hub variants clamping hub/clamping ring hub and split clamping hub may only be used within a limited speed range. At very high speeds, shrink disk hubs and key hubs (press tolerance) should be used.
- We recommend balancing the coupling in individual parts or complete.
- Shafts misalignments should be kept as low as possible for smoother system running.
- When using double cardanic shafts, axial animation of the middle coupling part is possible due to operating speed and misalignment. In order to avoid this animation, please minimise the shaft misalignment.
- When connecting very high mass inertias via ROBA®-DS couplings (in particular double-jointed couplings with long sleeves), the torsion-critical natural frequency and speeds must be observed.

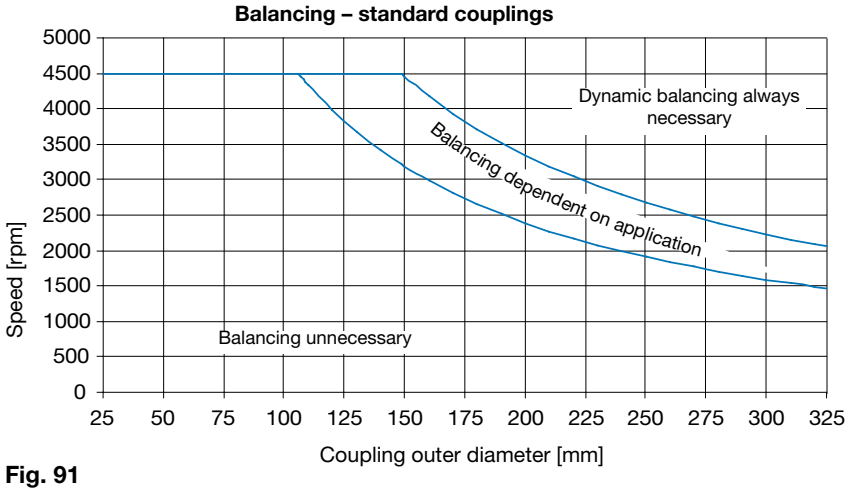

Fig. 91

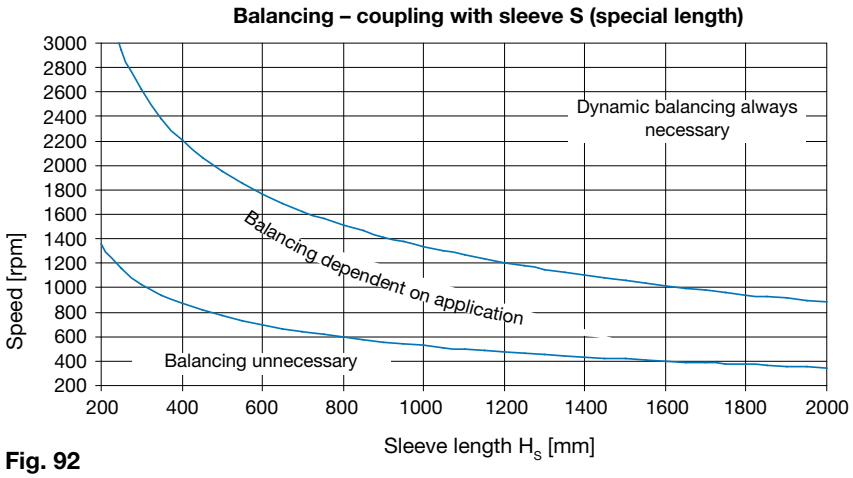

Fig. 92

Balancing the Coupling

- Not necessary for most applications.
- For a decision whether balancing must take place, please evaluate the following points:
  - Coupling circumferential speed (Fig. 91)
  - Length of special sleeve (Fig. 92)
  - Necessary balance quality
- The smooth running of a machine is not only maintained due to the balance quality of the coupling, but also, to at least the same extent, to parameters such as:
  - stiffness and distance from the adjacent bearing,
  - sensitivity and mass of the whole system

  Figs. 51 or 92 only show reference values as recommendations for balancing.
- All parts of the ROBA®-DS couplings, except for the sleeve S are machined on all sides. They are therefore in the range G 6.3 according to ISO DIN 1940 at medium speeds.
- When ordering the coupling with a special sleeve, please always state the coupling operating speed.
- When there are higher demands on the balance quality, balancing individual parts of the complete installed coupling is possible. The hubs should be designed with a finish bore.

State of Delivery

- Delivery in partly assembled parts and /or individual parts
- Corrosion protection: phosphation, disk pack made of rustproof steel.
- Hub designs: pilot bored or finish bored.
- Bore: tolerance H7 (other tolerances possible)
- Shaft run-out and axial run-out tolerances: 0,03 mm (Fig. 93)
- Key hub: keyway according to DIN 6885 pages 1 or 3

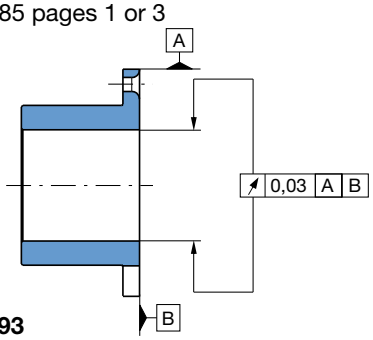

Fig. 93

Temperature Resistance

- Temperature resistant in range -40 °C up to +250 °C (-20 °C up to +100 °C for sizes 3 to 15).
- At temperatures above +120 °C, the self-locking hexagon nuts should be replaced by self-locking all-steel nuts according to EN ISO 7042.
- Couplings with CRP sleeves can be used at temperatures of -20 °C up to +80 °C

Installation Position

- Horizontal installation
- On vertical or sloping installations and when using long sleeves, we recommend using vertical supports (Fig. 82, page 51).
- The vertical support and the hub centerings in the hub and the sleeve are produced manufacturer-side.

Short Description – Hub Installation

Please find a detailed installation description in the Installation and Operational Instructions for the product.

Hub installation 95_.0_ _ or 95_.1_ _ (hubs with keyway, Fig. 94)

- Mount the hubs onto the shaft using a suitable device.
- Axial securement:
  - a set screw (adjusting screw) presses radially onto the key,
  - a press cover and screw are screwed into the shaft threaded centre hole.
- The shaft tolerance should be adapted to the application:
  - alternating rotational direction: press tolerance,
  - operation in one direction: transition tolerance or backlash tolerance

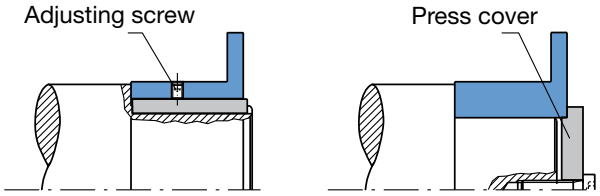

Fig. 94

Hub installation 95_.2_ _ / 95_.3_ _ / 95_.9 _ _ (Hubs with shrink disk) 95_.4_ _ (hubs with clamping ring)

- Mount the hubs onto the shafts using a suitable installation device and bring them into the correct position.
- Tighten the clamping screws one after the other in 3 to max. 6 tightening turns using a torque wrench.

  Guidelines!
  - The contact surfaces between the shrink disk and the hub and the clamping ring and hub have been greased manufacturer-side.
  - The hub bores and shaft ends are grease-free.
  - Greasy or oily bores or shafts do not transmit the maximum coupling torque!
  - The shaft must not have a keyway.
  - Shaft surface: finely turned or ground (Ra = 0,8 µm).
  - Shaft material: yield point at least 350 N/mm², e.g. St60, St70, C45, C60.
  - Recommended shaft tolerance:

    Dependent on application and hub Type. See Table of frictionally-locking torques on pages 48/49.

Hub or coupling installation Type 95_.8_ _ (Split clamping hubs)

- Partly assemble the coupling, observing the Point “Coupling Installation” (page 58).
- Loosen the partly assembled split shells from the hub.
- Place the coupling from above onto the shafts and partly assemble with the split shells (Fig. 95).
- Tighten the clamping screws crosswise in several procedures. Please ensure that the gap “X” on both sides of the hub is the same (Fig. 96).

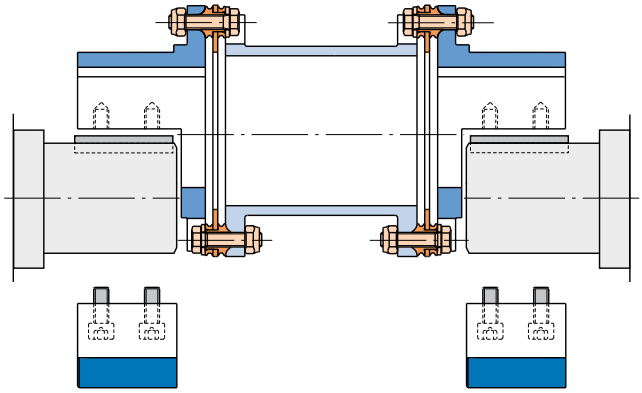

Fig. 95

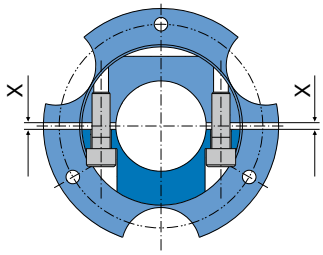

Fig. 96

Short Description – Coupling Installation

Please find a detailed installation description in the Installation and Operational Instructions for the product. The following installation description is for the ROBA®-DS couplings from size 16.

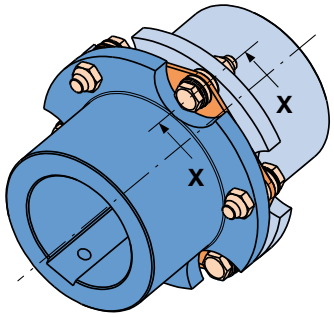

Fig. 97

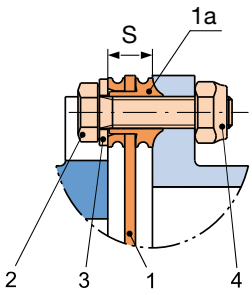

Fig. 98 Detail „X“

- Screw the disk packs (1, Bild 98) over lightly-oiled hexagon head screws (2), washers (3) and hexagon nuts (4) alternately with the sleeve and the hubs.
- Producing the pre-tension force on the disk pack (1) usually takes place* via the hexagon nut (4). Please avoid twisting the disk pack (1) (secure screw (2) against turning).
- The hexagon nuts (4) or hexagon head screws (2) must be tightened crosswise and in several sequences to the full tightening torque M_a. For the appropriate tightening torques for each sequence, please see the appropriate Installation and Operational Instructions.

Please Observe!
The radius of the collar bushings (Part 1a, Fig. 98, Detail “X”) must lie in the hub and sleeve grooves.

*The head of the hexagon head screw (2) with the washer (3) must always lie against the disk pack (1).