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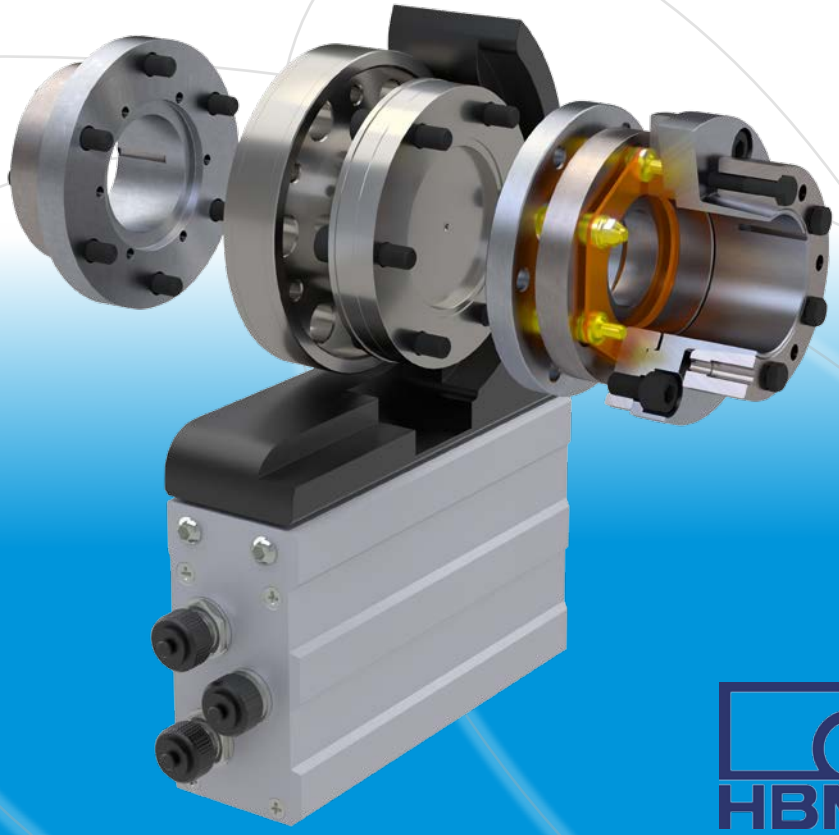

HBM

ROBA®-DS 9110 / 9210

P.9110.V02.EN

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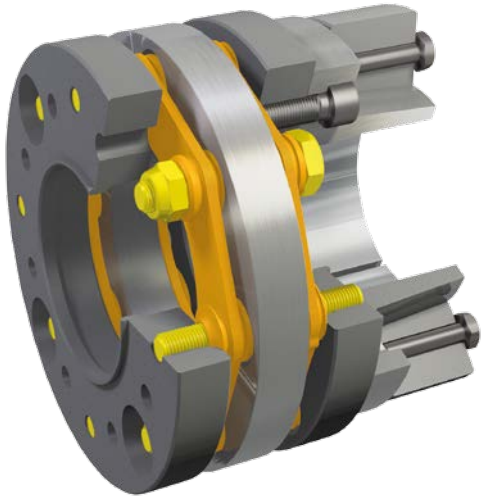
ROBA®-DS – The backlash-free, torsionally rigid shaft coupling for HBM torque transducers

Characteristics and Advantages

- High precision and reliability
- Optimum running smoothness
- High speeds
- Robust and highly dynamic
- Different designs for optimum set-up



Design

ROBA®-DS disk pack couplings of the type series 9110 and 9210 are especially adapted for the attachment of HBM torque transducers. Different types of construction and flexible combination possibilities permit the integration of measurement flanges in almost every test stand and drive constellation (see the Installation and Operational Instructions B.9110._ _).

Function

ROBA®-DS disk pack couplings compensate for **axial, radial** and **angular shaft misalignments.** Torque measurement flanges are precision transducers, using which the measurement of extremely small measurement uncertainties can be realised. However, for this purpose several prerequisites are necessary. One of the most important prerequisites is the minimisation of the parasitic loads affecting the transducer, which amongst other things are caused by alignment errors in the drive line. The use of the ROBA®-DS as a torsionally rigid and backlash-free compensating coupling provides the optimum prerequisites in order to achieve exact measurement results of the torque transducer.

Constructional Designs

Standard constructional designs – Type 9110._

Preferred type of construction (external shrink disk hub)	Type of construction, internal shrink disk hub	Sandwich construction
Compact design	When the set-up of the measurement line from the load side is only possible via a shrink disk hub with internal clamping	Type of construction with maximum shaft misalignment compensation whilst simultaneously being the shortest possible type of construction
Low mass moment of inertia design	Higher mass moment of inertia compared to the “Preferred type of construction”	
Quick installation	Complex installation in comparison to the “Preferred type of construction” as a result of the intermediate flange required	
External clamping of the shrink disks	-	External clamping of the shrink disks

Preferred variant is the shortest and most rigid design.

The couplings are balanced according to DIN ISO 1940 to a balance quality of G 2.5 at n = 3000 rpm.

High-speed constructional design for high speeds – Type 9210._

The individual parts are manufactured to a high level of accuracy (Quality IT5), with restricted shaft run-out and axial run-out tolerance.

The couplings are balanced according to DIN ISO 1940 to a balance quality of G 2.5 at n = 5000 rpm.

Contents

Assignment of the Torque Transducers

Measurement flange company HBM		ROBA®-DS Size
TB2	100 Nm	16 F
	200 Nm	16
	500 Nm	64
	1000 Nm	64
	2000 Nm	300
	3000 Nm	300
	5000 Nm	500
	10,000 Nm	850
T12HP (T12) (T10FS)	100 Nm	16 F
	200 Nm	16
	500 Nm	64
	1000 Nm	64
	2000 Nm	300
	3000 Nm	300
	5000 Nm	500
	10,000 Nm	850
T40B (T40)	50 Nm	16 F
	100 Nm	16 F
	200 Nm	16
	500 Nm	64
	1000 Nm	64
	2000 Nm	300
	3000 Nm	300
	5000 Nm	500
	10,000 Nm	850
T10F	50 to 10,000 Nm	on request
T40HS	100 to 3000 Nm	on request
T40MS	500 to 2000 Nm	on request
T40FM	15,000 to 80,000 Nm	on request 1) 2)
T40FH	100,000 to 300,000 Nm	on request 1) 2)

The “internal shrink disk hub” construction and the “sandwich construction” are not possible for the previous model, the torque transducer Type T40.
This restriction does not apply to the torque transducer Type T40B.

1) In this torque range, the shaft coupling must be assigned according to the application.
2) See pages 12 – 13

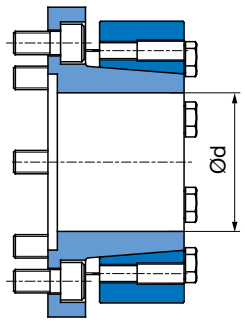
Shrink Disk Hubs

Frictionally-locking transmittable torques

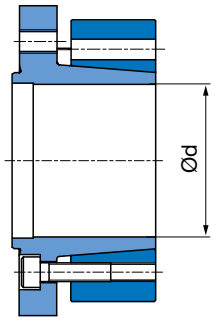
Shrink disk hubs	Bore Ød [mm]	Size * 16 F	16	64	300	500	850
Frictionally-locking transmittable torques T_R [Nm]	25	320		-	-	-	-
	28	368		-	-	-	-
	30	403		-	-	-	-
in relation to max. speed Type 9110._	32	442		-	-	-	-
	35	506		-	-	-	-
	38	579		-	-	-	-
	40	632		-	-	-	-
	42	689		-	-	-	-
Suitable for H6 / h6	45	782		1935	-	-	-
	50	-		2241	3101	-	-
	55	-		2591	3472	-	-
at max. speed Type 9210._ transmittable torque reduces by approx. 30 %	60	-		2988	3883	4679	-
	65	-		3436	4340	5136	-
	68	-		3730	4637	5430	-
	70	-		3938	4845	5635	7726
Suitable for H5 / h5	75	-		-	5402	6177	8354
	80	-		-	6016	6768	9088
	85	-		-	6687	7411	9850
other tolerances, e.g. for motor shaft tolerance ‘k’ or ‘m’, possible on request	90	-		-	-	8107	10,670
	100	**Attention!** Please observe the permitted coupling torques of the coupling size used.		-	-	9674	12,500
	110				-	-	14,606
	120	-		-	-	-	17,008

Shrink disk hub “Standard”

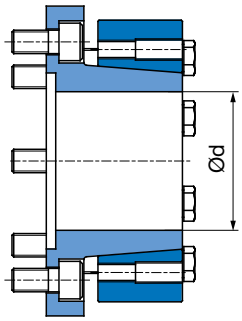
External clamping



Internal clamping



Shrink disk hub “High-Speed”



Order Number

Size *	Shrink disk hub	Bore
16		Ød
64		Bore area, see
300		page 5 (Type 9110.1)
500		page 6 (Type 9110.2)
850	Dimensions, see page 8 (Type 9110) page 11 (Type 9210)	page 10 (Type 9210.1)

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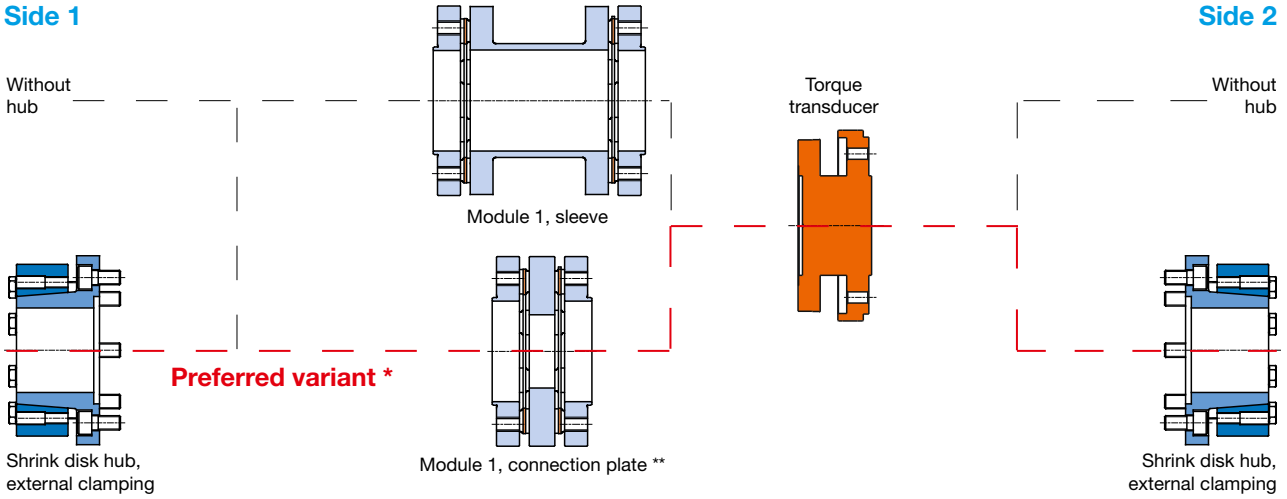
Clamping	
1	external
2	internal (only for shrink disk hub “Standard” Type 9110)

* The shrink disk hubs Sizes 16 and 16F are identical.

Preferred Type of Construction (External Shrink Disk Hub)

Standard design
Type 9110._ _ _00



The shrink disk hub (side 1) with module 1 is supplied as a finished assembly.

* The "preferred variant" is the shortest and most rigid design.
** Does not correspond to the former HBM ID. number 1-4411.011_ (see page 11)

The depicted connection screws are included in delivery. The screws for the left flange of the torque transducer are not included in delivery.

Technical Data

ROBA®-DS Size					16 F	16	64	300	500	850
Nominal torque			T_{KN}	[Nm]	190	300	1100	3500	5800	10,000
Peak torque [1]			T_{KS}	[Nm]	285	450	1650	5250	8700	14,250
Oscillation range acc. DIN 50100 (peak - peak)			T_{KSB}	[Nm]	380	600	2200	7000	11,600	20,000
Outer diameter			D	[mm]	102	102	132	178	210	252
Minimum hub bore			d_{min}	[mm]	25 H6	25 H6	45 H6	50 H6	60 H6	70 H6
Maximum hub bore			d_{max}	[mm]	45 H6	45 H6	70 H6	85 H6	100 H6	120 H6
Maximum speed [2]			n_{max}	[rpm]	18,000	18,000	15,000	12,000	10,000	8000
Permitted misalignments	Perm. angular misalignment [3]		ΔK_w	[°]	1.0	0.7	0.6	0.5	0.5	0.5
	Perm. axial displacement [4]		ΔK_a	[mm]	1.1	0.8	1.1	1.2	1.4	1.6
	Perm. radial misalignment [4]	Module 1, connection plate	ΔK_{VP}	[mm]	0.30	0.20	0.25	0.25	0.35	0.40
		Module 1, sleeve	ΔK_{HL}	[mm]	1.0	0.7	1.0	1.25	1.35	1.7
Spring Rigidities	Torsion [4]	Module 1, connection plate	$C_{T\,VP}$	[10^3 Nm/rad]	72.5	90	600	1740	5950	10,300
		Module 1, sleeve	$C_{T\,HL}$	[10^3 Nm/rad]	65	78.5	463	1176	3312	5006
	Angular spring rigidity [3]		C_w	[Nm/rad]	229	285	1850	6980	11,250	18,580
	Axial spring rigidity [3]		C_a	[N/mm]	235	525	1325	1400	1195	2640
Mass moments of inertia	Shrink disk hub, external clamping (with max. bore)			[10^{-3} kgm²]	1.53	1.53	8.49	34.47	81.00	203.74
	Module 1, connection plate			[10^{-3} kgm²]	1.86	1.85	10.78	50.46	110.42	274.68
	Module 1, sleeve			[10^{-3} kgm²]	2.19	2.18	14.04	68.70	150.99	369.21
Weights	Shrink disk hub, external clamping (with max. bore)			[kg]	1.16	1.16	3.34	8.03	13.36	23.36
	Module 1, connection plate			[kg]	1.44	1.43	4.06	11.51	17.49	30.03
	Module 1, sleeve			[kg]	1.77	1.76	5.31	15.77	24.50	42.99

1) Valid for unchanging load direction, max. load cycle ≤ 10^5
2) For speeds of more than 5000 rpm, a limitation of the misalignment to max. 30 % is necessary.
3) The values refer to 1 disk pack.
4) The values refer to couplings with 2 disk packs.

Order Number

Size	Hub side 1		Hub side 2		Bore	Bore
16 F to 850	Without	0	0	Without	side 1 Ød	side 2 Ød
	Shrink disk hub, external clamping	1	1	Shrink disk hub, external clamping		

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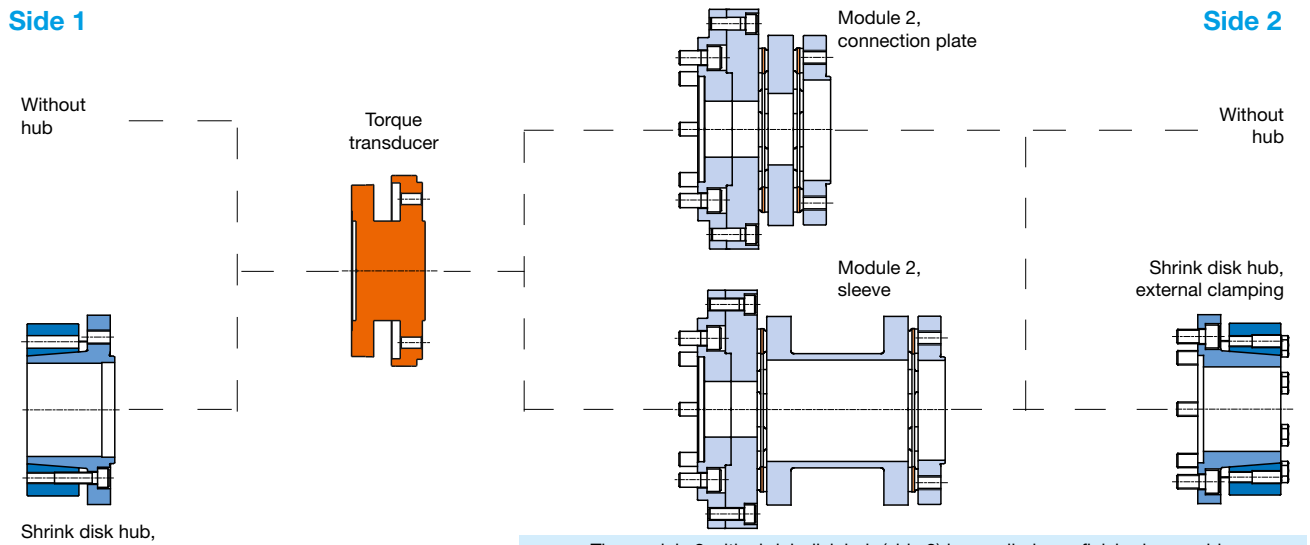
Attachment measurement flange side 1
Module 1, connection plate ** 1
Module 1, sleeve 2

Type of Construction, Internal Shrink Disk Hub

Standard design
Type 9110._ _0_0



The module 2 with shrink disk hub (side 2) is supplied as a finished assembly.

The depicted connection screws are included in delivery.
The screws for the left flange of the torque transducer are not included in delivery.

Technical Data

ROBA®-DS Size					16 F	16	64	300	500	850
Nominal torque		T_{KN}	[Nm]		190	300	1100	3500	5800	10,000
Peak torque [1]		T_{KS}	[Nm]		285	450	1650	5250	8700	14,250
Oscillation range acc. DIN 50100 (peak - peak)		T_{KSB}	[Nm]		380	600	2200	7000	11,600	20,000
Outer diameter		D	[mm]		102	102	132	178	210	252
Minimum hub bore		d_{min}	[mm]		25 H6	25 H6	45 H6	50 H6	60 H6	70 H6
Maximum hub bore		d_{max}	[mm]		45 H6	45 H6	70 H6	85 H6	100 H6	120 H6
Maximum speed [2]		n_{max}	[rpm]		18,000	18,000	15,000	12,000	10,000	8000
Permitted misalignments	Perm. angular misalignment [3]	ΔK_w	[°]		1.0	0.7	0.6	0.5	0.5	0.5
	Perm. axial displacement [4]	ΔK_a	[mm]		1.1	0.8	1.1	1.2	1.4	1.6
	Perm. radial misalignment [4] Module 2, connection plate	ΔK_{VP}	[mm]		0.30	0.20	0.25	0.25	0.35	0.40
	Perm. radial misalignment [4] Module 2, sleeve	ΔK_{HL}	[mm]		1.0	0.7	1.0	1.25	1.35	1.7
Spring Rigidities	Torsion [4] Module 2, connection plate	$C_{T\ VP}$	[10^3 Nm/rad]		72.5	90	600	1740	5950	10,300
	Torsion [4] Module 2, sleeve	$C_{T\ HL}$	[10^3 Nm/rad]		65	78.5	463	1176	3312	5006
	Angular spring rigidity [3]	C_w	[Nm/rad]		229	285	1850	6980	11,250	18,580
	Axial spring rigidity [3]	C_a	[N/mm]		235	525	1325	1400	1195	2640
Mass moments of inertia	Shrink disk hub, external clamping (with max. bore)		[10^{-3} kgm²]		1.53	1.53	8.49	34.47	81.00	203.74
	Shrink disk hub, internal clamping (with max. bore)		[10^{-3} kgm²]		1.51	1.51	8.03	32.33	78.33	198.19
	Module 2, connection plate		[10^{-3} kgm²]		7.73	7.72	31.46	77.37	233.86	540.13
	Module 2, sleeve		[10^{-3} kgm²]		8.07	8.06	34.71	130.96	274.43	634.67
Weights	Shrink disk hub, external clamping (with max. bore)		[kg]		1.16	1.16	3.34	8.03	13.36	23.36
	Shrink disk hub, internal clamping (with max. bore)		[kg]		1.17	1.17	3.16	7.55	12.94	22.65
	Module 2, connection plate		[kg]		3.78	3.77	9.18	20.32	31.19	50.27
	Module 2, sleeve		[kg]		4.11	4.10	10.43	24.62	38.20	63.22

1) Valid for unchanging load direction, max. load cycle ≤ 10^5
2) For speeds of more than 5000 rpm, a limitation of the misalignment to max. 30 % is necessary.
3) The values refer to 1 disk pack.
4) The values refer to couplings with 2 disk packs.

Order Number

Size	Hub side 1		Hub side 2		Bore	Bore
16 F to 850	Without	0	0	Without	side 1 Ød	side 2 Ød
	Shrink disk hub, internal clamping	2	1	Shrink disk hub, external clamping		

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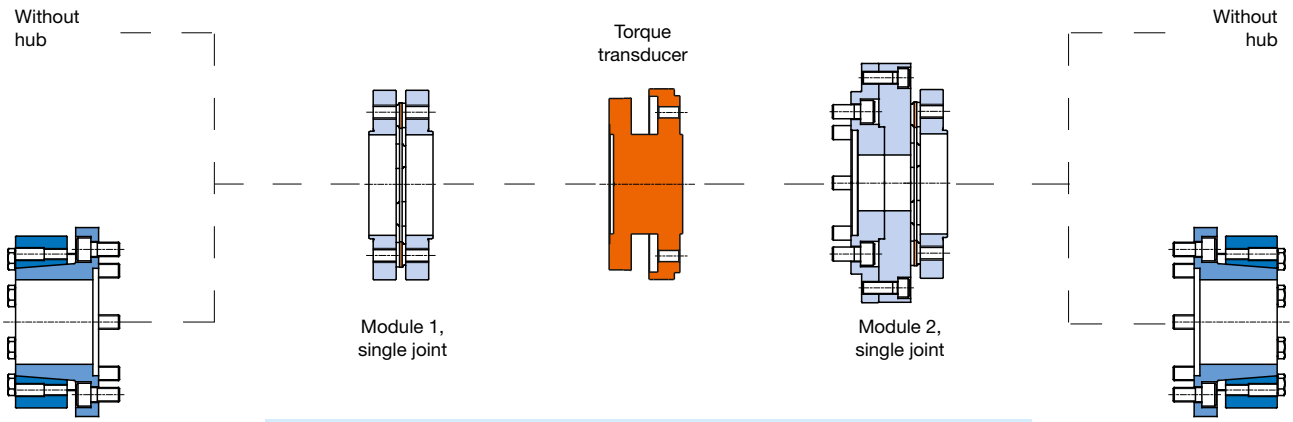
Attachment measurement flange side 2	
1	Module 2, connection plate
2	Module 2, sleeve

Sandwich Construction

Standard design
Type 9110._ _330

Side 1 **Side 2**



The shrink disk hub (side 1) with module 1 and module 2 with the shrink disk hub (side 2) are supplied as finished assemblies respectively.

Technical Data

The depicted connection screws are included in delivery.
The screws for the left flange of the torque transducer are not included in delivery.

ROBA®-DS Size				16 F	16	64	300	500	850
Nominal torque		T_{KN}	[Nm]	190	300	1100	3500	5800	10,000
Peak torque [1]		T_{KS}	[Nm]	285	450	1650	5250	8700	14,250
Oscillation range acc. DIN 50100 (peak - peak)		T_{KSB}	[Nm]	380	600	2200	7000	11,600	20,000
Outer diameter		D	[mm]	102	102	132	178	210	252
Minimum hub bore		d_{min}	[mm]	25 H6	25 H6	45 H6	50 H6	60 H6	70 H6
Maximum hub bore		d_{max}	[mm]	45 H6	45 H6	70 H6	85 H6	100 H6	120 H6
Maximum speed [2]		n_{max}	[rpm]	18,000	18,000	15,000	12,000	10,000	8000
Permitted misalignments	Perm. angular misalignment [3]	ΔK_w	[°]	1.0	0.7	0.6	0.5	0.5	0.5
	Perm. axial displacement [4]	ΔK_a	[mm]	1.1	0.8	1.1	1.2	1.4	1.6
	Perm. radial misalignment [4] [5]	ΔK_r	[mm]	1.6	1.1	1.1	1.1	1.3	1.5
Spring Rigidities	Torsion [4] Modules 1 and 2 [6]	C_T	[10^3 Nm/rad]	72.5	90	600	1740	5950	10,300
	Angular spring rigidity [3]	C_w	[Nm/rad]	229	285	1850	6980	11,250	18,580
	Axial spring rigidity [3]	C_a	[N/mm]	235	525	1325	1400	1195	2640
Mass moments of inertia	Shrink disk hub, external clamping (with max. bore)		[10^{-3} kgm²]	1.53	1.53	8.49	34.47	81.00	203.74
	Module 1, single joint		[10^{-3} kgm²]	1.37	1.37	6.52	31.92	71.86	177.88
	Module 2, single joint		[10^{-3} kgm²]	7.24	7.24	27.20	94.14	195.30	443.34
Weights	Shrink disk hub, external clamping (with max. bore)		[kg]	1.16	1.16	3.34	8.03	13.36	23.36
	Module 1, single joint		[kg]	0.96	0.96	2.35	7.35	11.11	19.46
	Module 2, single joint		[kg]	3.30	3.30	7.48	16.19	24.81	39.69

1) Valid for unchanging load direction, max. load cycle ≤ 10^5
2) For speeds of more than 5000 rpm, a limitation of the misalignment to max. 30 % is necessary.
3) The values refer to 1 disk pack.
4) The values refer to couplings with 2 disk packs.
5) The values refer to the length of the measurement flange T40B.
6) The torque transducer is not taken into consideration.

Order Number

Size 16 F to 850	Hub side 1		Hub side 2		Bore side 1 Ød	Bore side 2 Ød
	Without Shrink disk hub, external clamping	0 1	0 1	Without Shrink disk hub, external clamping		
▽		▽	▽		▽	▽
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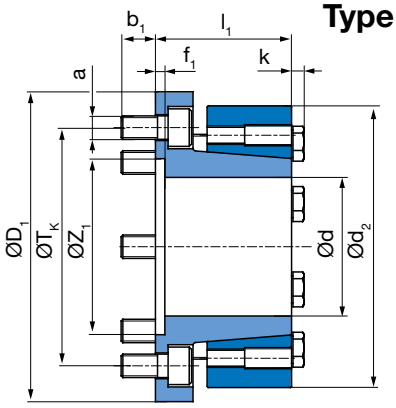
Dimensions of the Components

Shrink disk hub, external clamping

Type 9110.10000

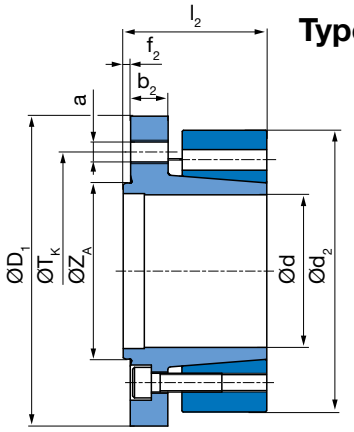
Size	16 F	16	64	300	500	850
a	6x M8		8x M10	8x M12	8x M14	8x M16
b_1	9.6		14.6	21	20	26.6
d_2	77		120	164	198	234
f_1	3.5		4	5	4	4
k	3.5		5.3	5.3	6.4	7.5
l_1	38		58	70	80	98
D_1	102		132	167	193	240
T_K	84		101.5	130	155.5	196
Z_i	57 H6		75 H6	90 H6	110 H6	140 H6



Shrink disk hub, internal clamping

Type 9110.20000

Size	16 F	16	64	300	500	850
a	6x M8		8x M10	8x M12	8x M14	8x M16
b_2	13		16	21	25	30
d_2	77		120	164	198	234
f_2	3		3	3	2.5	3
l_2	41		61	72	82.5	101
D_1	102		132	167	193	240
T_K	84		101.5	130	155.5	196
Z_A	57 g6		75 g6	90 g6	110 g6	140 g6

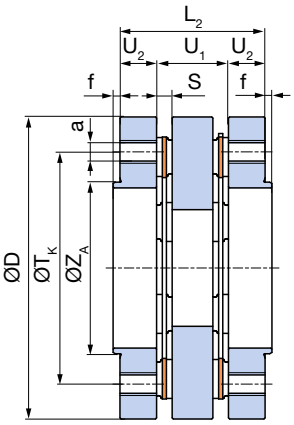


Module 1, connection plate*

Type 9110._ _100

* Does not correspond to the former HBM ID. number 1-4411._ _ _ _ (see page 11)

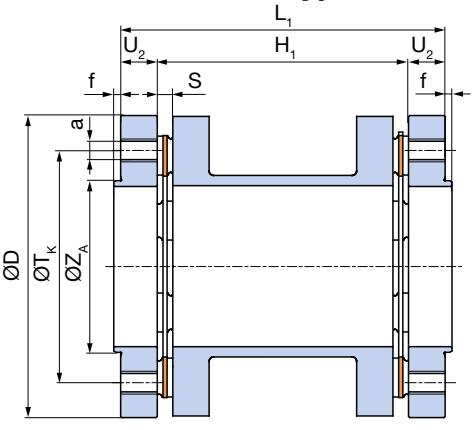
Size	16 F	16	64	300	500	850
a	6x M8	6x M8	8x M10	8x M12	8x M14	8x M16
f	3	3	3	2.5	2.5	3
D	99	99	132	178	210	252
L_2	46.2	41.2	63.4	88	100	116
S	7.1	4.6	6.8	11.2	12	14
T_K	84	84	101.5	130	155.5	196
U_2	10	10	16	22	25.5	29
U_1	26.2	21.2	31.4	44	49	58
Z_A	57 g6	57 g6	75 g6	90 g6	110 g6	140 g6



Module 1, sleeve

Type 9110._ _200

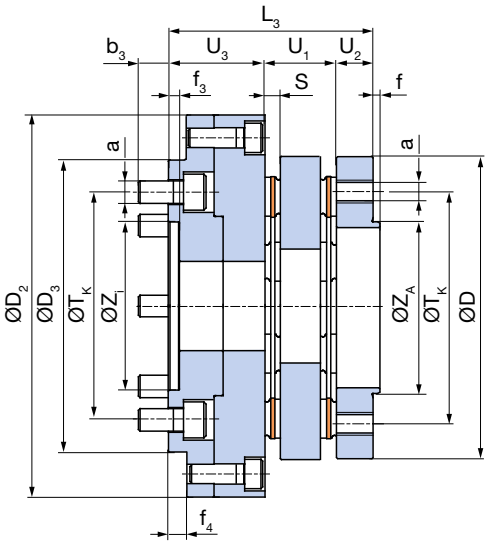
Size	16 F	16	64	300	500	850
a	6x M8	6x M8	8x M10	8x M12	8x M14	8x M16
f	3	3	3	2.5	2.5	3
D	99	99	132	178	210	252
L_1	90.2	85.2	142.6	204.4	221	278
S	7.1	4.6	6.8	11.2	12	14
T_K	84	84	101.5	130	155.5	196
H_1	70.2	65.2	110.6	160.4	170	220
U_2	10	10	16	22	25.5	29
Z_A	57 g6	57 g6	75 g6	90 g6	110 g6	140 g6



Module 2, connection plate

Type 9110._ _010

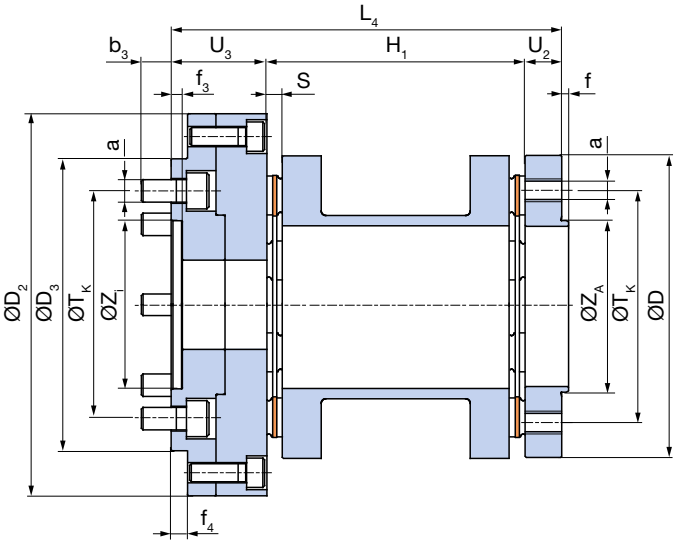
Size	16 F	16	64	300	500	850
a	6x M8	6x M8	8x M10	8x M12	8x M14	8x M16
b_3	12	12	13,5	19	19	24
f	3	3	3	2,5	2,5	3
f_3	4	4	5	3	3,5	6
f_4	9,5	9,5	7,5	7	7	7
D	99	99	132	178	210	252
D_2	132	132	170	220	250	300
D_3	102	102	130	164	188	240
L_3	69,7	64,7	89,5	113,5	132	145
S	7,1	4,6	6,8	11,2	12	14
T_K	84	84	101,5	130	155,5	196
U_1	26,2	21,2	31,4	44	49	58
U_2	10	10	16	22	25,5	29
U_3	33,5	33,5	42,1	47,5	57,5	58
Z_A	57 g6	57 g6	75 g6	90 g6	110 g6	140 g6
Z_i	57 H6	57 H6	75 H6	90 H6	110 H6	140 H6



Module 2, sleeve

Type 9110._ _020

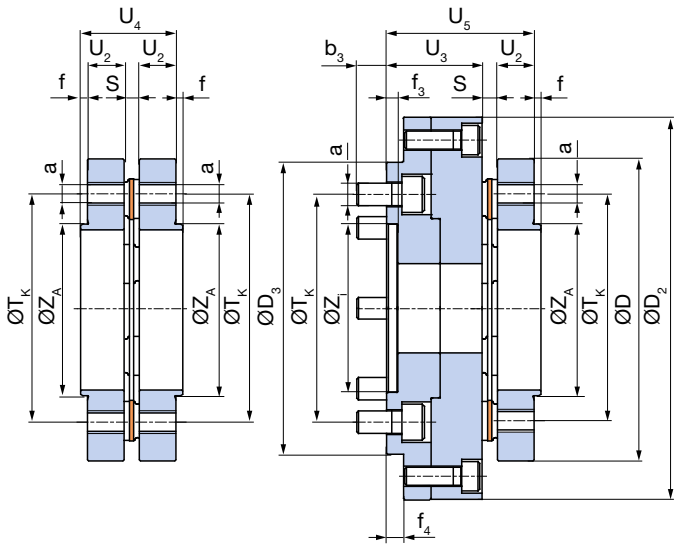
Size	16 F	16	64	300	500	850
a	6x M8	6x M8	8x M10	8x M12	8x M14	8x M16
b_3	12	12	13,5	19	19	24
f	3	3	3	2,5	2,5	3
f_3	4	4	5	4	3,5	6
f_4	9,5	9,5	7,5	7	7	7
D	99	99	132	178	210	252
D_2	132	132	170	220	250	300
D_3	102	102	130	164	188	240
H_1	70,2	65,2	110,6	160,4	170	220
L_4	113,7	108,7	168,7	229,9	253	307
S	7,1	4,6	6,8	11,2	12	14
T_K	84	84	101,5	130	155,5	196
U_2	10	10	16	22	25,5	29
U_3	33,5	33,5	42,1	47,5	57,5	58
Z_A	57 g6	57 g6	75 g6	90 g6	110 g6	140 g6
Z_i	57 H6	57 H6	75 H6	90 H6	110 H6	140 H6



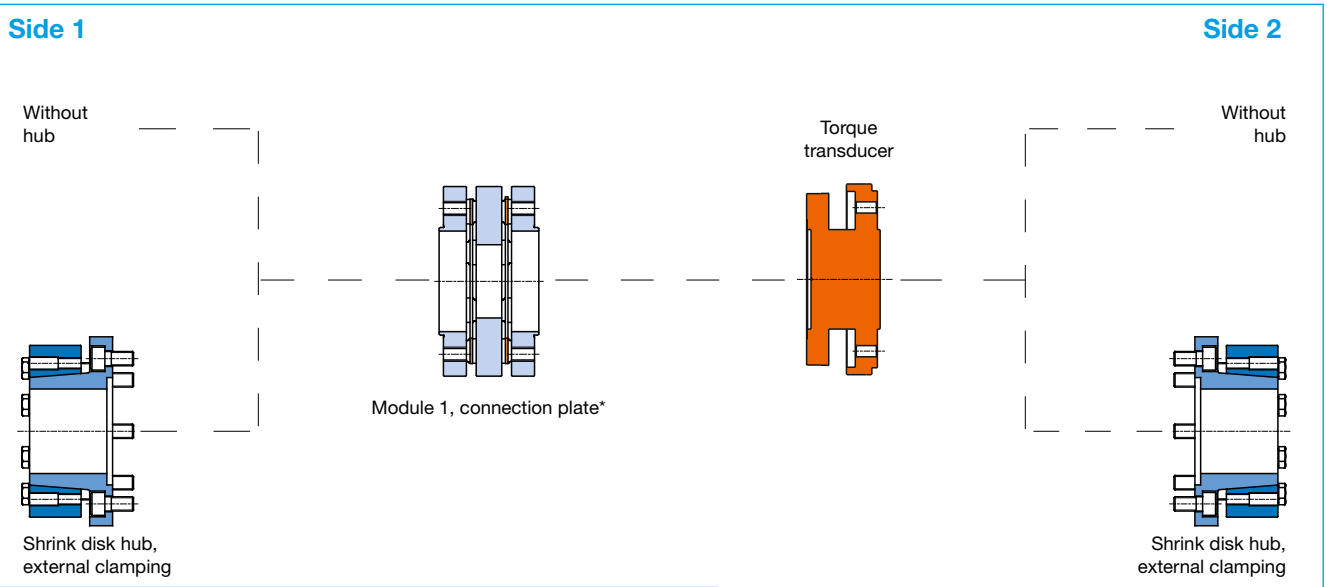
Module 1, single joint / module 2, single joint for integrated measurement flange

Type 9110._ _330

Size	16 F	16	64	300	500	850
a	6x M8	6x M8	8x M10	8x M12	8x M14	8x M16
b_3	12	12	13,5	19	19	24
f	3	3	3	2,5	2,5	3
f_3	4	4	5	4	3,5	6
f_4	9,5	9,5	7,5	7	7	7
D	99	99	132	178	210	252
D_2	132	132	170	220	250	300
D_3	102	102	130	164	188	240
S	7,1	4,6	6,8	11,2	12	14
T_K	84	84	101,5	130	155,5	196
U_2	10	10	16	22	25,5	29
U_3	33,5	33,5	42,1	47,5	57,5	58
U_4	27,1	24,6	38,8	55,2	63	72
U_5	50,6	48,1	64,9	80,7	95	101
Z_A	57 g6	57 g6	75 g6	90 g6	110 g6	140 g6
Z_i	57 H6	57 H6	75 H6	90 H6	110 H6	140 H6



High-speed Constructional Design Type 9210._ _100



* Does not correspond to the former HBM ID. number 1-4411.011_ (see page 11)

The depicted connection screws are included in delivery. The screws for the left flange of the torque transducer are not included in delivery.

Technical Data

ROBA®-DS Size				16 F	16	64	300	500	850
Nominal torque		T_{KN}	[Nm]	190	300	1100	3500	5800	10,000
Peak torque [1]		T_{KS}	[Nm]	285	450	1650	5250	8700	14,250
Oscillation range acc. DIN 50100 (peak - peak)		T_{KSB}	[Nm]	380	600	2200	7000	11,600	20,000
Outer diameter		D	[mm]	102	102	132	178	210	252
Minimum hub bore		d_{min}	[mm]	25 H5	25 H5	45 H5	50 H5	60 H5	70 H5
Maximum hub bore		d_{max}	[mm]	45 H5	45 H5	70 H5	85 H5	100 H5	120 H5
Maximum speed		n_{max}	[rpm]	30,000	30,000	25,000	20,000	16,000	13,000
Permitted misalignments	Perm. angular misalignment [2]	ΔK_w	[°]	0.3	0.2	0.2	0.16	0.16	0.16
	Perm. axial displacement [3]	ΔK_a	[mm]	0.2	0.2	0.3	0.4	0.4	0.5
	Perm. radial misalignment [3] Module 1, connection plate	ΔK_{VP}	[mm]	0.06	0.06	0.08	0.08	0.11	0.13
Spring Rigidities	Torsion [3] Module 1, connection plate	$C_{T\ VP}$	[10^3 Nm/rad]	72.5	90	600	1740	5950	10,300
	Angular spring rigidity [2]	C_w	[Nm/rad]	229	285	1850	6980	11,250	18,580
	Axial spring rigidity [2]	C_a	[N/mm]	235	525	1325	1400	1195	2640
Mass moments of inertia	Shrink disk hub, external clamping (with max. bore)		[10^{-3} kgm²]	1.53	1.53	8.49	34.47	81.00	203.74
	Module 1, connection plate		[10^{-3} kgm²]	1.86	1.85	10.78	50.46	110.42	274.68
Weights	Shrink disk hub, external clamping (with max. bore)		[kg]	1.16	1.16	3.34	8.03	13.36	23.36
	Module 1, connection plate		[kg]	1.44	1.43	4.06	11.51	17.49	30.03

1) Valid for unchanging load direction, max. load cycle ≤ 10^5
2) The values refer to 1 disk pack.
3) The values refer to couplings with 2 disk packs.

Order Number

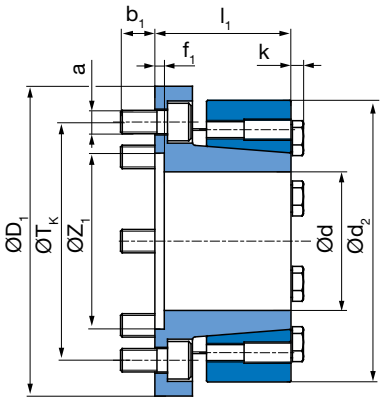
Size 16 F to 850	**Hub side 1** Without Shrink disk hub, external clamping	**0** **1**	**Hub side 2** **0** Without **1** Shrink disk hub, external clamping	**Bore** side 1 Ød	**Bore** side 2 Ød
▽		▽	▽	▽	▽
__ / 9 2 1 0 . __		__	1 0 0 / __	/ __	

Dimensions of the Components

Shrink disk hub, external clamping

Type 9210.10000

Size	16 F	16	64	300	500	850
a	6x M8		8x M10	8x M12	8x M14	8x M16
b_1	9.6		14.6	21	20	26.6
d_2	77		120	164	198	234
f_1	3.5		4	5	4	4
k	3.5		5.3	5.3	6.4	7.5
l_1	38		58	70	80	98
D_1	102		132	167	193	240
T_K	84		101.5	130	155.5	196
Z_i	57 H5		75 H5	90 H5	110 H5	140 H5

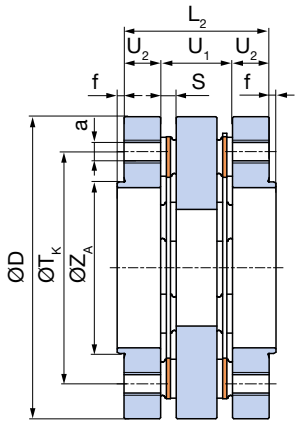


Module 1, connection plate *

Type 9210._ _100 *

* Does not correspond to the former HBM ID. number 1-4411.011_ (see page below)

Size	16 F	16	64	300	500	850
a	6x M8	6x M8	8x M10	8x M12	8x M14	8x M16
f	3	3	3	2.5	2.5	3
D	99	99	132	178	210	252
L_2	46.2	41.2	63.4	88	100	116
S	7.1	4.6	6.8	11.2	12	14
T_K	84	84	101.5	130	155.5	196
U_2	10	10	16	22	25.5	29
U_1	26.2	21.2	31.4	44	49	58
Z_A	57 g5	57 g5	75 g5	90 g5	110 g5	140 g5



Module according to Former HBM ID. Number 1-4411.011_

These designs can still be obtained for replacement directly from *mayr*® power transmission.

mayr® article no.	8200430	8198450	8195550	8200508	8200434
HBM article no.	1-4411.0110	1-4411.0111	1-4411.0112	1-4411.0113	1-4411.0114
ROBA®-DS Size	16	64	300	500	850
Dimensions on request					

ROBA®-DS for High Torques – Sizes 2200 to 11000

ROBA®-DS with conical connection

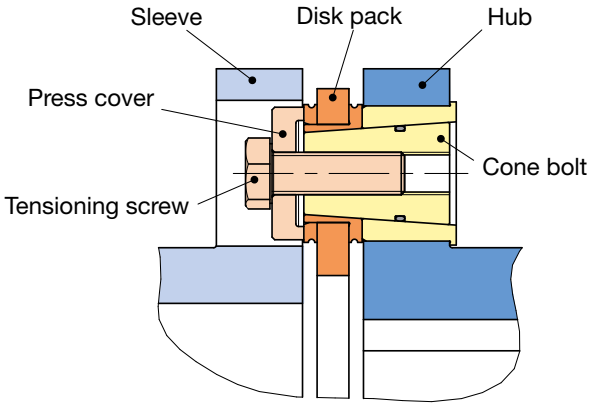
On the ROBA®-DS with conical connection, the disk pack is connected via positive-locking with the hubs, the flanges or the sleeves. Externally conical bolts are pulled into conical bores in the attachment parts and the collar bushings of the disk packs by tensioning screws. The conical shape produces forces which widen the collar bushings and the attachment parts radially elastically, thus guaranteeing a backlash-free connection of the disk pack.

For this backlash-free, positive locking connection, far lower screw tightening torques are required in comparison to standard frictionally locking connections. This makes installation substantially easier.

The disk packs and the sleeves can be installed and de-installed radially without having to move the respective aggregates.

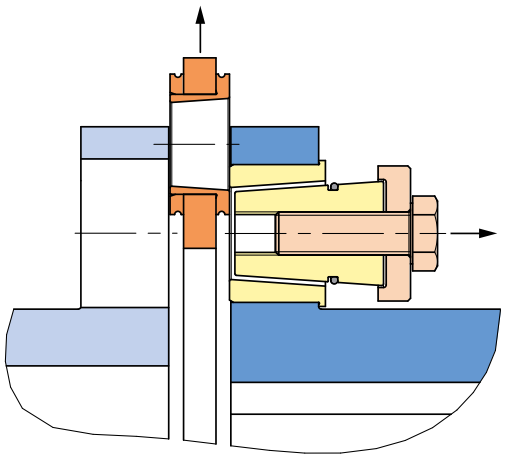
- Low screw tightening torques
- Can be installed / de-installed radially
- Easy and quick installation / de-installation
- No hydraulic installation tools required; can be installed with a torque wrench
- Backlash-free torque transmission
- FEM-optimized disk shape
- High torsional rigidity
- High performance density
- Compensation of axial, angular and radial misalignments
- Wear and maintenance-free
- High flexibility through customer-specific hubs and sleeves

Easy installation and de-installation



Conical connection in installed condition

When installed, the cone bolt is pulled by the tensioning screw into the conical core.



De-installation

For de-installation of the disk pack, the tensioning screw is screwed out and together with the press cover screwed into the cone bolt on the opposite side. This loosens the cone bolt and it can be pulled back axially. In this way, the disk pack and the sleeve can be de-installed radially.

ROBA®-DS for High Torques – Measurement Flange Variants

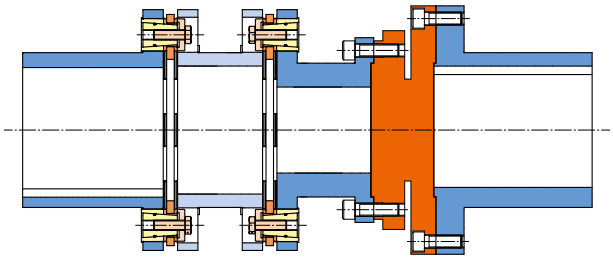


Fig. 1a

Figs. 1a and 1b:
Classic structure for applications with measurement flange. The screw connection on the measurement flange is accessible from the outside. The measurement flange is tied rigidly to the hub.

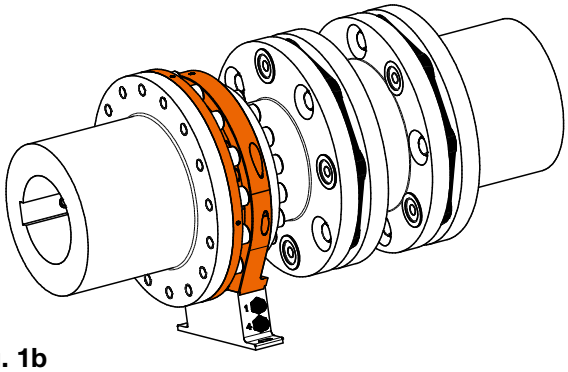


Fig. 1b

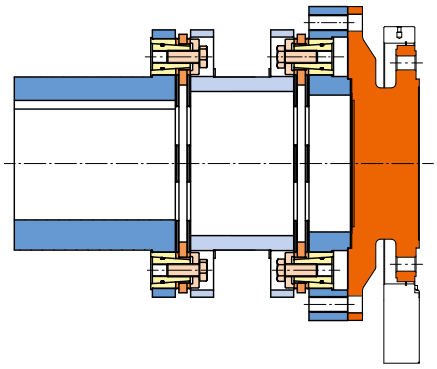


Fig. 2

Direct installation of the measurement flange onto the input or output. This produces a very rigid connection.

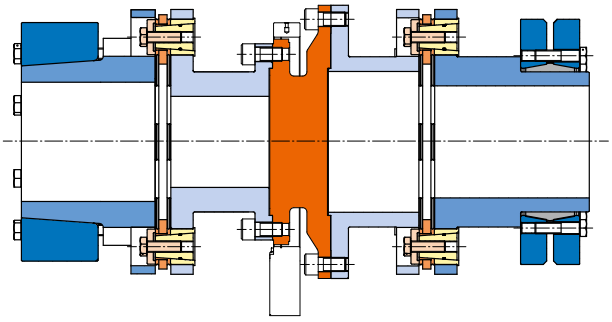


Fig. 3

The measurement flange is positioned between the two disk packs. This way, the measurement flange can be de-installed radially with the sleeve, for example for calibration, without de-installing the hubs. Backlash-free shaft-hub connection via shrink disk hub or hub with external shrink disks ensures maximum precision.

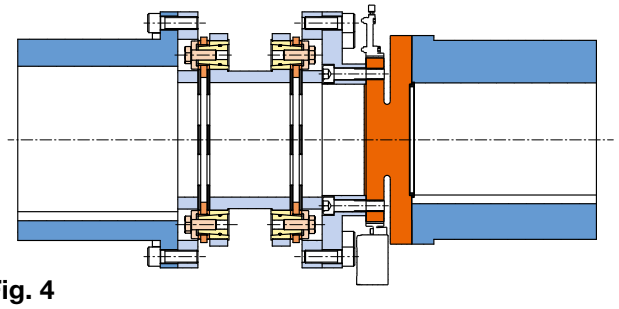


Fig. 4

Diverse connection variants can be implemented through externally bolted flange hubs or internally bolted measurement flanges, e.g. combinations of very different shaft diameters / measurement flange sizes.

Technical Explanations

Coupling alignment

Exact coupling alignment reduces the reaction forces and therefore increases the lifetime of the coupling and the shaft bearing.
This will ensure that the measurement line/drive line runs far more smoothly.

Permitted misalignment of the shaft ends

Should several types of misalignment occur simultaneously, they will influence each other, i.e. the permitted misalignment values are dependent on one another. The sum of the actual misalignment as a percentage of the maximum value must not exceed 100%, see example.

Example (see Table on page 10 and Fig. 5):

ROBA®-DS Size 300, Type 9210.11100

= > An **axial displacement** of ΔK_a = 0.16 mm equates to **40 %** of the permitted maximum value ΔK_a = 0.4 mm.

= > A simultaneously occurring **angular misalignment** in the disk pack of ΔK_w = 0.048° equates to **30 %** of the permitted maximum value ΔK_w = 0.16°.

= > From this, a still-permitted **radial misalignment** of ΔK_r = **30 %** results from the maximum value ΔK_r = 0.08 mm, i.e. maximum **0.024 mm** is permitted.

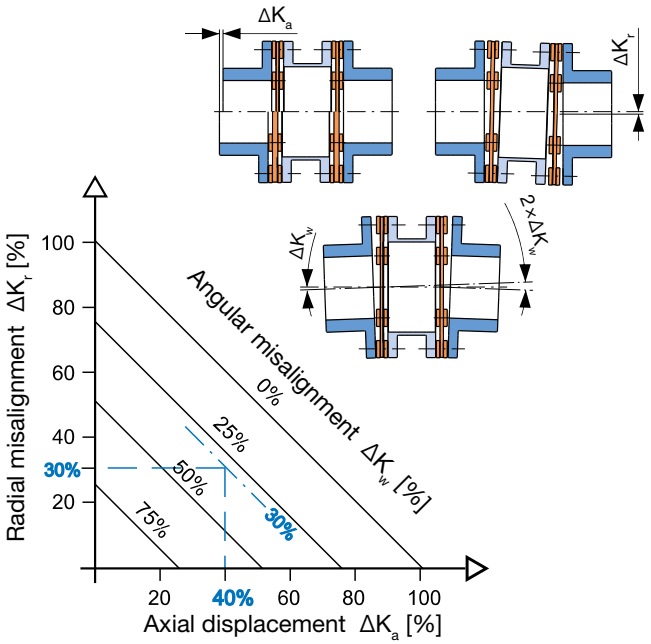


Fig. 5

Valid standards

Coupling characteristic values according to DIN 740, Part 2, Section 2.1.
Stress dimensions according to DIN 740, Part 2, Sections 2.2 and 3 (dimensioning of the coupling for special applications).
Coupling dynamically balanced according to ISO 1940.

General guidelines for installation

The disk packs of the coupling must not be overexpanded beyond the stated permitted flexibilities!

Installation position

The ROBA-DS® shaft coupling with the torque measurement flange can be operated in any installation position (horizontal or vertical). In case of vertical operation, please make sure that the permitted axial force is not exceeded by the test stand-side masses.

Product Summary

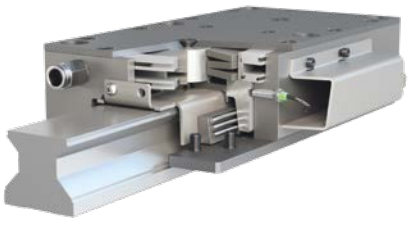
Torque Limiters/Overload Clutches

- **EAS®-Compact®/EAS®-NC/EAS®-smartic®**
  Positive locking and completely backlash-free torque limiting clutches
- **EAS®-reverse**
  Reversing re-engaging torque limiting clutch
- **EAS®-element clutch/EAS®-elements**
  Load-disconnecting protection against high torques
- **EAS®-axial**
  Exact limitation of tensile and compressive forces
- **EAS®-Sp/EAS®-Sm/EAS®-Zr**
  Load-disconnecting torque limiting clutches with switching function
- **ROBA®-slip hubs**
  Load-holding, frictionally locked torque limiting clutches
- **ROBA®-contitorque**
  Magnetic continuous slip clutches
- **EAS®-HSC/EAS®-HSE**
  High-speed torque limiters for high-speed applications

Shaft Couplings

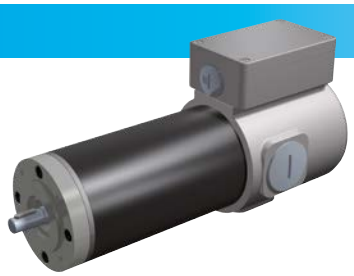
- **smartflex®/primeflex®**
  Perfect precision couplings for servo and stepping motors
- **ROBA®-ES**
  Backlash-free and damping for vibration-sensitive drives
- **ROBA®-DS/ROBA®-D**
  Backlash-free, torsionally rigid all-steel couplings
- **ROBA®-DSM**
  Cost-effective torque-measuring couplings

Electromagnetic Brakes/Clutches



- **ROBA-stop® standard**
  Multifunctional all-round safety brakes
- **ROBA-stop®-M motor brakes**
  Robust, cost-effective motor brakes
- **ROBA-stop®-S**
  Water-proof, robust monoblock brakes
- **ROBA®-duplostop®/ROBA®-twinstop®/ROBA-stop®-silenzio®**
  Doubly safe elevator brakes
- **ROBA®-diskstop®**
  Compact, very quiet disk brakes
- **ROBA®-topstop®**
  Brake systems for gravity loaded axes
- **ROBA®-linearstop**
  Backlash-free brake systems for linear motor axes
- **ROBA®-guidestop**
  Backlash-free holding brake for profiled rail guides
- **ROBATIC®/ROBA®-quick/ROBA®-takt**
  Electromagnetic clutches and brakes, clutch brake units

DC Drives



- **tendo®-PM**
  Permanent magnet-excited DC motors

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04/10/2018 GC/SC