Installation and Operational Instructions for ROBA® DS Couplings Type 95^{0}_{1}. _ _ _ (disk pack HF) Sizes 16 – 2200 (B.9.7.EN)

Translation of the Original Operational Instructions

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.

Contents

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Safety and Guideline Signs

CAUTION

Danger of injury to personnel and damage to machines

Please Observe!
Guidelines on important points

Attention! Possible property damage can be the consequence.

Observe the safety regulations in the Installation and Operational Instructions for the multi-gateway!

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 initial operation 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 ROBA® DS couplings accord with the known technical specifications and are operationally safe at the time of delivery.
Without a conformity evaluation, 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.

CAUTION

- ❒ If the ROBA® DS couplings are modified.
- ❒ If the relevant standards for safety and / or installation conditions are ignored.

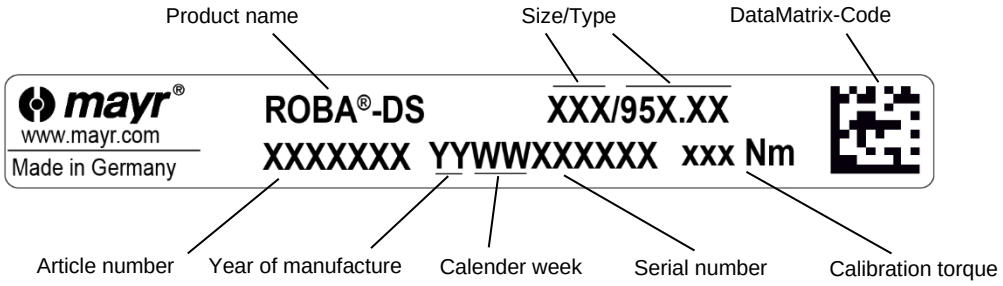
User-implemented Protective Measures

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

To prevent injury or damage, only specialist personnel are allowed to work on the components. They must be familiar with the dimensioning, transport, installation, initial operation, maintenance and disposal according to the relevant standards and regulations.
Please read the Installation and Operational Instructions carefully prior to installation and initial operation of the device.

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

Type Tag



Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Summary of Constructional Designs for Sizes 16 to 160

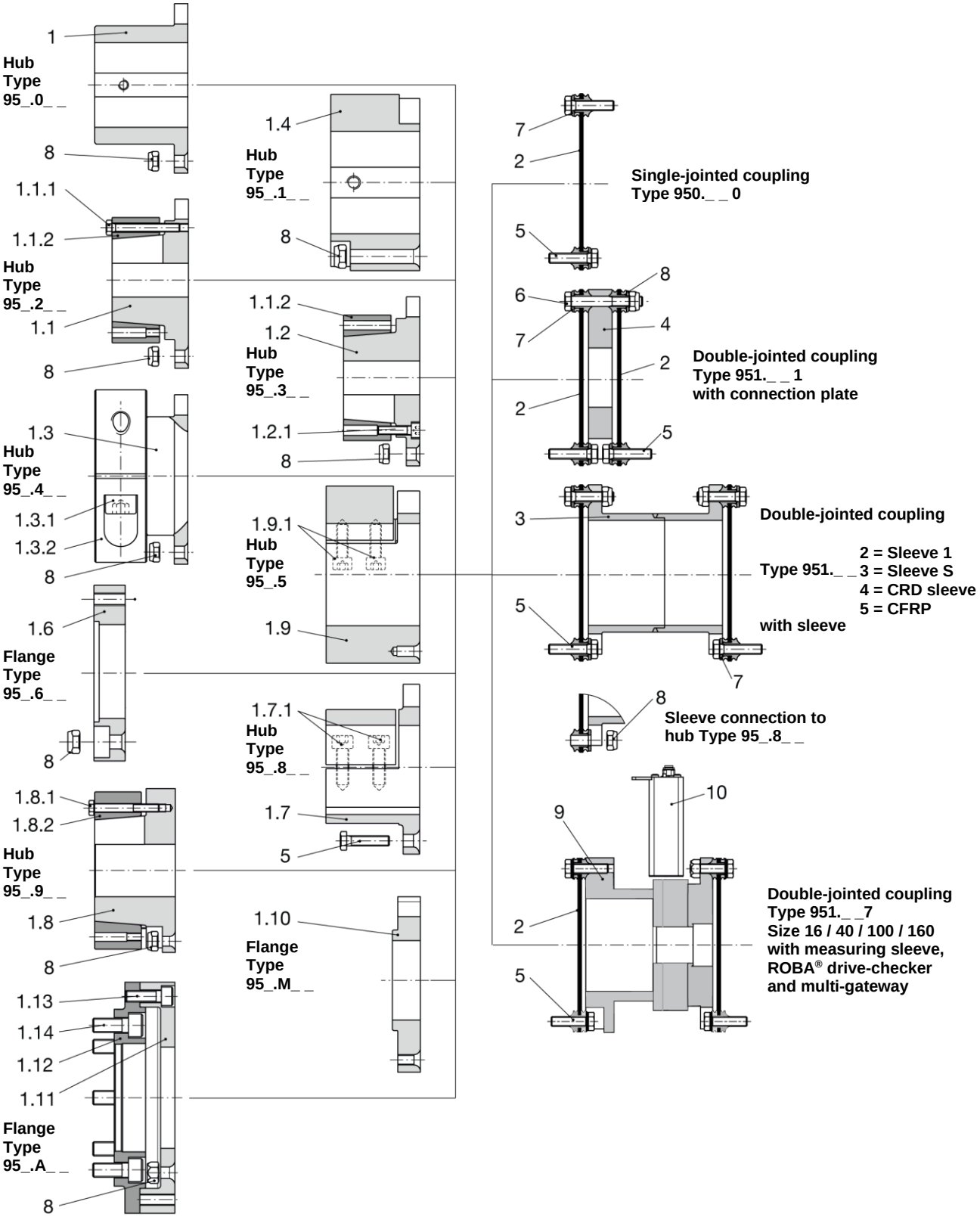


Fig. 1

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Summary of Constructional Designs for Sizes 180 to 2200

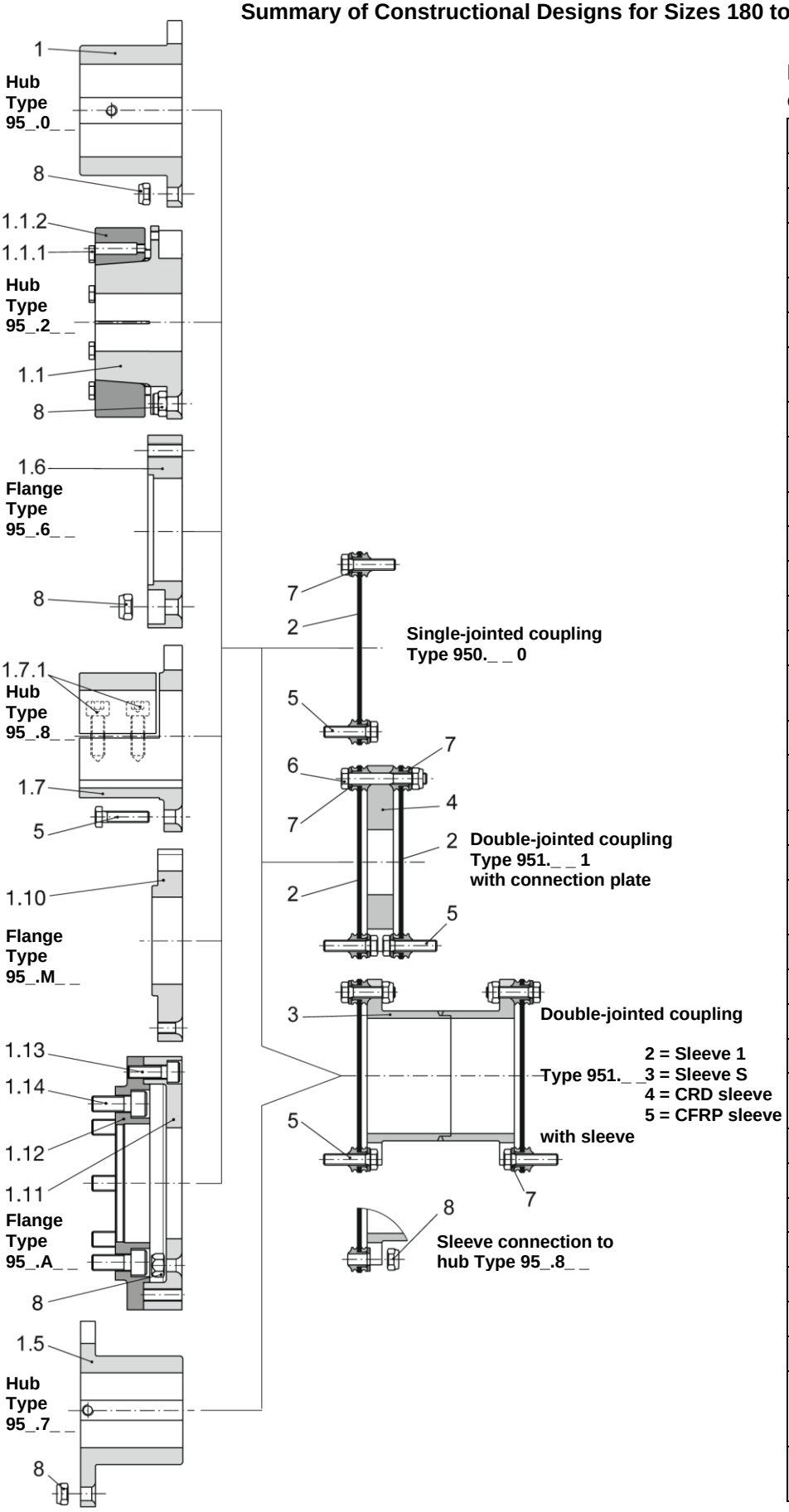


Fig. 2

Parts List (Sizes 16 – 2200)

Only use *mayr*® original parts

Item	Name
1	Hub Type 95_.0_ _
1.1	Hub Type 95_.2_ _
1.1.1	Hexagon head screws for hubs Type 95_.2_ _
1.1.2	Shrink disk
1.2	Hub Type 95_.3_ _
1.2.1	Cap screws for hubs Type 95_.3_ _
1.3	Hub Type 95_.4_ _
1.3.1	Cap screw for hubs Type 95_.4_ _
1.3.2	Clamping ring
1.4	Hub Type 95_.1_ _
1.5	Hub Type 95_.7_ _
1.6	Flange Type 95_.6 _ _
1.7	Hub Type 95_.8_ _
1.7.1	Cap screws for hubs Type 95_.8_ _
1.8	Hub Type 95_.9_ _
1.8.1	Hexagon head screws for hubs Type 95_.9_ _
1.8.2	Shrink disk
1.9	Hub Type 95_.5_ _
1.9.1	Cap screws for hubs Type 95_.5_ _
1.10	Flange M Type 95_.M _ _
1.11	Flange A Type 95_.A _ _
1.12	Adaptor flange
1.13	Cap screws
1.14	Cap screws for measurement flange connection
2	Disk pack
3	Sleeve
4	Connection plate
5	Hexagon head screw
6	Hexagon head screw
7	Washer
8	Hexagon nut
9	Measuring sleeve Type 951._ _ 7 ROBA® drive-checker (Description in B.0539006)
10	multi-gateway (Description in B.0539006)

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Table 1a: Technical Data for Sizes 16 to 160

ROBA® DS Size		16	25	40	64	100	160
$d_{P\,max}$ Hub Type 95_.0 (1)	[mm]	32	40	50	55	70	80
$d_{G\,max}$ Hub Type 95_.1 (1.4)	[mm]	45	55	65	75	95	110
$d_{S\,max}$ Hub Type 95_.2/3 (1.1/2)	[mm]	26	36	45	45	55	65
$d_{KR\,max}$ Hub Type 95_.4 (1.3)	[mm]	35	40	45	55	68	80
$d_{K\,max}$ Hub Type 95_.5 (1.9)	[mm]	45	52	60	70	90	100
$d_{H\,max}$ Hub Type 95_.8 (1.7)	[mm]	28	32	40	45	60	75
$d_{SG\,max}$ Hub Type 95_.9 (1.8)	[mm]	45	52	60	70	90	100
Coupling nominal torque T_{KN} 1) Valid for changing load direction as well as for max. permitted shaft misalignment	[Nm]	190	290	450	720	1000	1600
Coupling peak torque T_{KS} Valid for unchanging load direction, max. load cycles ≤ 10^5	[Nm]	285	435	675	1080	1500	2400
Max. speed n_{max}	[rpm]	13600	11800	10100	8500	7300	6200
Distance dimension “S”	[mm]	7.1 ±0.2	7.2 ±0.2	8.4 ±0.2	9.6 ±0.25	10 ±0.25	11.6 ±0.25
Axial displacement ΔK_a 2) Values refer to couplings with 2 disk packs. Only permitted as a static or virtually static value.	[mm]	±1.1	±1.3	±1.5	±1.8	±2.1	± 2.5
Radial misalignment ΔK_r for Type 951._ _ 1	[mm]	0.3	0.3	0.4	0.45	0.45	0.55
Radial misalignment ΔK_r for Type 951._ _ 2	[mm]	1.0	1.2	1.5	1.8	2.1	2.2
Radial misalignment ΔK_r for Type 951._ _ 3 2)	[mm]	$(H_S - S) \times 1.74 \times 10^{-2}$					
Radial misalignment for single-jointed coupling		If there is only one disk pack, the shafts must be aligned precisely.					
Angular misalignment ΔK_w per disk pack 2)	[°]	1	1	1	1	1	1

1) For split clamping hubs (Type 95_.8_ _), the following applies:
Valid for unchanging load direction as well as for max. permitted shaft misalignment.
When the load direction changes, max. 60% of the stated nominal torque is permitted.

2) For Types 951._ _4 and 951._ _5, the permitted shaft misalignments must be reduced to one-third of the Table values.

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Table 1b: Overview of Screws and Respective Tightening Torques (Sizes 16 to 160)

ROBA® DS Size	16	25	40	64	100	160
Hexagon head screws Item 1.1.1 (Hub Type 95_.2_ _) Tightening torque [Nm]	M5x30 6	M5x35 6	M5x40 8.5	M6x45 10	M8x50 25	M8x55 25
Cap screws Item 1.2.1 (Hub Type 95_.3_ _) Tightening torque [Nm]	M5x18 6	M5x18 6	M5x20 8.5	M6x20 10	M8x22 25	M8x25 25
Cap screws Item 1.3.1 (Hub Type 95_.4_ _) Tightening torque [Nm]	M8x25 41	M10x30 83	M12x35 145	M14x40 230	M16x50 355	M18x55 485
Cap screws Item 1.7.1 (Hub Type 95_.8_ _) Tightening torque [Nm]	M6x18 14.9	M8x25 24	M8x25 36	M10x30 71	M12x35 102	M12x35 122
Hexagon head screws Item 1.8.1 (Hub Type 95_.9_ _) Tightening torque [Nm]	M5x30 6	M5x35 6.5	M5x40 8.5	M6x45 14	M8x50 25	M8x55 32
Cap screws Item 1.9.1 (Hub Type 95_.5_ _) Tightening torque [Nm]	M6x25 17.4	M8x25 42	M10x35 83	M12x40 122	M12x45 143	M14x50 220
Cap screws Item 1.13 [3] (Flange Type 95_.A_ _) Tightening torque [Nm]	M5x20 7.6	- -	M6x25 13.2	M8x25 32	- -	- -
Cap screws Item 1.14 [3] [4] (Adaptor flange Type 95_.A_ _) Tightening torque [Nm]	M8x20 37	- -	M8x25 37	M10x25 74	- -	- -
Hexagon head screws Item 5 Hexagon nut Item 8 Tightening torque [Nm]	M5x23 8.5	M5x23 8.5	M6x25 14	M8x30 35	M8x30 35	M10x40 69
Hexagon head screws Item 5 (Hub Type 95_.1_ _) Hexagon nut Item 8 Tightening torque [Nm]	M5x45 8.5	M5x50 8.5	M6x65 14	M8x70 35	M8x80 35	M10x90 69
Hexagon head screws Item 5 (Hub Type 95_.5_ _) Hexagon nut Item 8 Tightening torque [Nm]	M5x18 8.5	M5x20 8.5	M6x22 14	M8x30 35	M8x30 35	M10x35 69
Hexagon head screws Item 5 (Flange Type 95_.A_ _) Hexagon nut Item 8 Tightening torque [Nm]	M5x23 8.5	- -	M6x25 14	M8x30 35	- -	- -
Hexagon head screws Item 5 (Flange Type 95_.M_ _) Hexagon nut Item 8 Tightening torque [Nm]	M5x18 8.5	- -	M6x22 14	M8x25 35	- -	- -
Hexagon head screws Item 6 Hexagon nut Item 8 Tightening torque [Nm]	M5x35 8.5	M5x35 8.5	M6x45 14	M8x50 35	M8x50 35	M10x65 69
Hexagon head screws Item 6 (Flange Types 95_.M_ _ and 95_.M_ _) Hexagon nut Item 8 Tightening torque [Nm]	M5x35 8.5	- -	M6x45 14	M8x50 35	- -	- -
Adjusting screws for hub Type 95_.0_ _ with hub bore Tightening torque [Nm]	M5 ≤22 2 / M6 >22 4.1	M5 ≤22 2 / M6 >22 4.1	M6 4.1	M8 8.5	M10 14	M12 35
Adjusting screws for hub Type 95_.1_ _ Tightening torque [Nm]	M8 8.5	M8 8.5	M10 14	M10 14	M12 35	M12 35

3) The screws (Items 1.13 and 1.14) must be protected using a screw-securing product, e.g. Loctite 243.
4) For this, please observe the guidelines in the Installation Instructions of the measurement flange manufacturer.

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Table 2a: Technical Data for Sizes 180 to 2200

ROBA® DS Size		180	300	500	850	1400	2200
$d_{P\,max}$ Hub Type 95_.0 (1)	[mm]	75	90	105	120	140	170
$d_{S\,max}$ Hub Type 95_.2/3 (1.1/2)	[mm]	75	85	100	120	140	170
$d_{Pi\,max}$ hub Type 95_.7 (1.5)	[mm]	55	70	85	95	110	130
$d_{H\,max}$ Hub Type 95_.8 (1.7)	[mm]	65	80	95	110	120	150
Coupling nominal torque T_{KN} [1] valid for changing load direction as well as for max. permitted shaft misalignment	[Nm]	2100	3500	5800	9500	15000	24000
Coupling peak torque T_{KS} Valid for unchanging load direction, max. load cycles ≤ 10^5	[Nm]	3150	5250	8700	14250	22500	36000
Max. speed n_{max} (only on Types 95_.8_ _ / 95_._ 8 _)	[rpm]	7300 (5100)	6200 (4300)	5200 (3600)	4400 (3100)	3800 (2600)	3300 (2300)
Distance dimension “S”	[mm]	11.2 ±0.25	11.2 ±0.25	12 ±0.25	14 ±0.25	16 ±0.25	17.8 ±0.25
Axial displacement ΔK_a [2] Values refer to couplings with 2 disk packs. Only permitted as a static or virtually static value.	[mm]	±1.0	±1.2	±1.4	±1.6	±1.9	±2.2
Radial misalignment ΔK_r for Type 951._ _ 1	[mm]	0.25	0.25	0.35	0.4	0.5	0.55
Radial misalignment ΔK_r for Type 951._ _ 2	[mm]	1.2	1.25	1.35	1.7	2	2.6
Radial misalignment ΔK_r for Type 951._ _ 3 [2]	[mm]	$(H_S - S) \times 8.73 \times 10^{-3}$					
Radial misalignment for single-jointed coupling		If there is only one disk pack, the shafts must be aligned precisely.					
Angular misalignment ΔK_w per disk pack [2]	[°]	0.5	0.5	0.5	0.5	0.5	0.5

1) For split clamping hubs (Type 95_.8_ _), the following applies:
Valid for unchanging load direction as well as for max. permitted shaft misalignment.
The split clamping hubs are only available with keyway acc. DIN 6885. They transmit only 30 – 40 % of the value T_{KN} using frictional locking.
Larger torques are transmitted via positive locking with the key.
The hubs are not suitable for changing load direction.

2) For Types 951._ _4 and 951._ _5, the permitted shaft misalignments must be reduced to one-third of the Table values.

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Table 2b: Overview of Screws and Respective Tightening Torques (Sizes 180 to 2200)

ROBA® DS Size	180	300	500	850	1400	2200
Hexagon head screws Item 1.1.1 (Hub Type 95_.2_ _) Tightening torque [Nm]	M8x55 25	M8x60 35	M10x70 56	M12x80 93	M14x100 144	M14x120 196
Cap screws Item 1.7.1 (Hub Type 95_.8_ _) Tightening torque [Nm]	M10x35 48	M12x40 83	M14x45 133	M16x55 200	M20x60 410	M20x70 450
Cap screws Item 1.13 [3] (Flange Type 95_.A_ _) Tightening torque [Nm]	- -	M10x35 63	M12x45 109	M14x50 174	- -	- -
Cap screws Item 1.14 [3] [4] (Adaptor flange Type 95_.A_ _) Tightening torque [Nm]	- -	M12x30 127	M14x35 200	M16x35 310	- -	- -
Hexagon head screws Item 5 Hexagon nut Item 8 Tightening torque [Nm]	M10x40 69	M12x45 120	M16x50 240	M20x60 450	M24x70 760	M24x75 900
Hexagon head screws Item 5 (Flange Type 95_.A_ _) Hexagon nut Item 8 Tightening torque [Nm]	- -	M12x40 120	M16x50 240	M20x60 450	- -	- -
Hexagon head screws Item 5 (Flange Type 95_.M_ _) Hexagon nut Item 8 Tightening torque [Nm]	- -	M12x35 120	M16x40 240	M20x45 450	- -	- -
Hexagon head screws Item 6 Hexagon nut Item 8 Tightening torque [Nm]	M10x60 69	M12x65 120	M16x75 240	M20x95 450	M24x110 760	M24x120 900
Hexagon head screws Item 6 (Flange Types 95_.M_ _ and 95_.M_ _) Hexagon nut Item 8 Tightening torque [Nm]	- -	M12x65 120	M16x75 240	M20x95 450	- -	- -
Adjusting screws for hub Type 95_.0_ _ with hub bore Tightening torque [Nm]	M12 ≤ 65 35 | M10 > 65 14	M12 35	M12 35	M16 90	M16 90	M16 90
Adjusting screws for hub Type 95_.7_ _ Tightening torque [Nm]	M10 14	M12 35	M12 35	M16 90	M16 90	M16 90

3) The screws (Items 1.13 and 1.14) must be protected using a screw-securing product, e.g. Loctite 243.
4) For this, please observe the guidelines in the Installation Instructions of the measurement flange manufacturer.

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Table 3: Transmittable Torques on Clamping Ring Hubs (1.3)
- dependent on bore - suitable for H7/h6 - Sizes 16 to 160

Bore	Size 16	25	40	64	100	160
Ø20	126	-	-	-	-	-
Ø22	138	199	-	-	-	-
Ø25	168	226	327	-	-	-
Ø28	201	253	366	523	-	-
Ø30	216	290	420	561	-	-
Ø32	230	325	470	598	785	-
Ø35	251	355	515	700	859	-
Ø38	-	386	559	798	932	-
Ø40	-	406	588	840	1050	1256
Ø45	-	-	661	945	1240	1413
Ø50	-	-	-	1050	1378	1680
Ø55	-	-	-	1155	1516	1940
Ø60	-	-	-	-	1654	2117
Ø65	**Attention!** Please observe the permitted coupling torques of the coupling size used.			-	1792	2293
Ø68				-	1874	2399
Ø70	-	-	-	-	-	2470
Ø80	-	-	-	-	-	2822

Table 4: Transmittable Torques on Clamping Hubs (1.9)
- dependent on bore - suitable for H7/h6 - Sizes 16 to 160

Bore	Size 16	25	40	64	100	160
Ø20	183	-	-	-	-	-
Ø22	202	354	-	-	-	-
Ø25	229	402	604	-	-	-
Ø28	257	450	677	821	-	-
Ø30	275	483	725	880	-	-
Ø32	293	515	773	938	1102	-
Ø35	321	563	846	1026	1205	-
Ø38	348	611	918	1114	1309	-
Ø40	367	643	967	1173	1378	1839
Ø42	385	676	1015	1232	1447	1931
Ø45	412	724	1087	1319	1550	2069
Ø48	-	772	1160	1407	1653	2207
Ø50	-	804	1208	1466	1722	2299
Ø52		836	1257	1525	1791	2391
Ø55	-	-	1329	1613	1894	2529
Ø60	-	-	1450	1759	2066	2759
Ø65	-	-	-	1906	2239	2989
Ø68	-	-	-	1994	2342	3127
Ø70	-	-	-	2053	2411	3219
Ø75	-	-	-	-	2583	3449
Ø80	-	-	-	-	2755	3679
Ø85	**Attention!** Please observe the permitted coupling torques of the coupling size used.			-	2927	3909
Ø90				-	3100	4139
Ø95	-	-	-	-	-	4369
Ø100	-	-	-	-	-	4599

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Table 5: Transmittable Torques on Shrink Disk Hubs, Large (1.8)
- dependent on bore - suitable for H7/g6 - Sizes 16 to 160

Bore	Size 16	25	40	64	100	160
Ø25	339	-	-	-	-	-
Ø28	404	-	-	-	-	-
Ø30	448	-	-	-	-	-
Ø32	492	526	-	-	-	-
Ø35	558	602	-	-	-	-
Ø38	620	679	-	-	-	-
Ø40	659	730	873	-	-	-
Ø42	694	780	937	-	-	-
Ø45	738	851	1036	1268	-	-
Ø48	-	913	1132	1394	-	-
Ø50	-	948	1195	1480	-	-
Ø52	-	978	1255	1565	-	-
Ø55	-	-	1338	1691	2074	-
Ø60	-	-	1454	1890	2366	-
Ø65	-	-	-	2065	2658	3246
Ø70	-	-	-	2204	2943	3618
Ø75	**Attention!** Please observe the permitted coupling torques of the coupling size used.			-	3213	3991
Ø80				-	3458	4353
Ø85				-	3666	4695
Ø90	-	-	-	-	3828	5007
Ø100	-	-	-	-	-	5497

Table 6: Transmittable Torques on Shrink Disk Hubs (1.1/1.2)
- dependent on bore - suitable for H7/g6 - Sizes 16 to 2200

Bore	Size 16	25	40	64	100	160	180	300	500	850	1400	2200
Ø14	158	-	-	-	-	-	-	-	-	-	-	-
Ø16	186	-	-	-	-	-	-	-	-	-	-	-
Ø20	240	283	-	-	-	-	-	-	-	-	-	-
Ø22	269	320	-	-	-	-	-	-	-	-	-	-
Ø25	312	375	429	-	-	-	-	-	-	-	-	-
Ø28	-	428	495	-	-	-	-	-	-	-	-	-
Ø30	-	468	546	704	-	-	-	-	-	-	-	-
Ø32	-	509	600	769	-	-	-	-	-	-	-	-
Ø35	-	568	669	863	1057	-	-	-	-	-	-	-
Ø38	-	-	741	960	1176	-	-	-	-	-	-	-
Ø40	-	-	796	1031	1269	1783	-	-	-	-	-	-
Ø42	-	-	852	1104	1366	1919	2234	-	-	-	-	-
Ø45	-	-	932	1206	1500	2107	2453	-	-	-	-	-
Ø50	-	-	-	-	1692	2400	2794	3569	-	-	-	-
Ø55	-	-	-	-	1889	2680	3150	4024	-	-	-	-
Ø60	-	-	-	-	-	2967	3488	4500	5970	-	-	-
Ø65	-	-	-	-	-	3263	3835	5177	6629	-	-	-
Ø68	-	-	-	-	-	-	4072	5658	7108	-	-	-
Ø70	-	-	-	-	-	-	4255	6334	7500	10723	-	-
Ø75	-	-	-	-	-	-	4627	7348	8156	11719	-	-
Ø80	-	-	-	-	-	-	-	8453	8830	12750	17942	-
Ø85	-	-	-	-	-	-	-	9652	9523	13750	19444	-
Ø90	-	-	-	-	-	-	-	-	10234	14777	21000	-
Ø100	-	-	-	-	-	-	-	-	11542	16665	23683	29036
Ø110	-	-	-	-	-	-	-	-	-	18607	26442	32418
Ø120	**Attention!** Please observe the permitted coupling torques of the coupling size used.						-	-	-	20603	29279	35896
Ø130							-	-	-	-	32195	39471
Ø140							-	-	-	-	35191	43144
Ø150	-	-	-	-	-	-	-	-	-	-	-	46920
Ø160	-	-	-	-	-	-	-	-	-	-	-	50798
Ø170	-	-	-	-	-	-	-	-	-	-	-	54783

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Table 7: Transmittable Torques on Split Clamping Hubs (1.7)
- dependent on bore - suitable for H7/g6 - Sizes 16 to 160

Bore	Size 16	25	40	64	100	160
Ø18	130	-	-	-	-	-
Ø20	144	-	-	-	-	-
Ø22	158	198	-	-	-	-
Ø25	180	225	326	-	-	-
Ø28	202	252	365	-	-	-
Ø30	-	270	391	623	-	-
Ø32	-	288	418	665	-	-
Ø35	-	-	457	727	897	-
Ø38	-	-	496	790	973	-
Ø40	-	-	522	831	1025	1218
Ø42	-	-	-	873	1076	1279
Ø45	-	-	-	935	1153	1370
Ø50	-	-	-	-	1281	1522
Ø55	-	-	-	-	1409	1675
Ø60				-	1537	1827
Ø65				-	-	1979
Ø68				-	-	2071
Ø70	-	-	-	-	-	2131
Ø75	-	-	-	-	-	2284

Attention! Please observe the permitted coupling torques of the coupling size used.

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Function – Application

ROBA® DS couplings are shaft connections for torsionally rigid, backlash-free torque transmission. At the same time they compensate for angular misalignments and axial displacements on single-jointed couplings (Type 950._ _ _), and additionally for radial misalignments on double-jointed couplings (Type 951._ _ _).
ROBA® DS couplings of the Type series 95_.**A**_ _ and 95_.**M**_ _ are especially designed for the attachment of HBM torque transducers or similar measurement flanges.

State of Delivery

The ROBA® DS couplings are delivered in individual parts and pre-assembled units.

All screw connections must be checked and pre-tensioned during the final installation to a torque value according to Table 1b and Table 2b.

Except for the disk pack (2), all parts are phosphated and therefore have a basic corrosion protection.
All hub designs can be delivered either pilot bored or finish bored. The preferred bore tolerance is H7; deviating bores are possible (please contact the manufacturer).
The key hubs (Items 1, 1.4 and 1.5) additionally have a keyway acc. DIN 6885 sheet 1 or 3, as well as an adjusting screw for axial securement.
The split clamping hub (Item 1.7) on Sizes 180 to 2200 is also additionally designed with a keyway according to DIN 6885 sheet 1 or 3.

Temperature Resistance

Due to their all-steel design, ROBA® DS couplings are temperature-resistant within a range from -40 °C up to +250 °C.
Couplings with CFRP sleeves can be used in the temperature range from -20°C to +80 °C.
Couplings with measuring sleeve ROBA® drive-checker (9) and multi-gateway (10) can be used in the temperature range from -20 °C to +60 °C.

Storage

The couplings are delivered preserved and can be stored in dry rooms protected from the weather for 6 to 9 months.

Damp storage rooms are not suitable.
In order to exclude condensation, the relative air humidity should ideally total maximum 65 %.

Installation Position

ROBA® DS couplings are designed for horizontal installation. In case of vertical or inclined installation, on long sleeves (sleeves S/CRD/CFRP) the sleeve's own weight must be supported with a vertical support (Fig. 4).
This vertical support including both centerings in the hub and in the sleeve is produced at the place of manufacture.

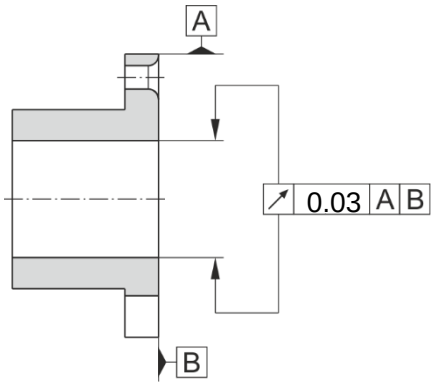


Fig. 3

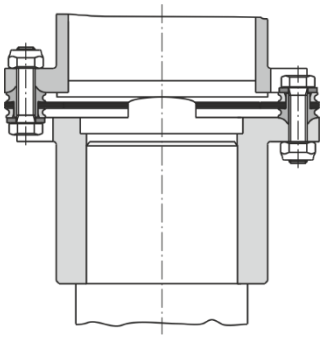


Fig. 4

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Guidelines on Hub Bore and Shaft

General Guidelines:

- ❑ The maximum bore diameter according to Tables 1a and 2a may not be exceeded.
- ❑ The hub bores are usually produced with tolerance H7. The required shaft tolerance depends on the hub type used as well as on the basic overall load configuration.
  - **Shrink disk hubs/Clamping ring hubs/Split clamping hubs/ Clamping hubs: h6/g6**
  - **Key hubs: r6/s6 (alternating rotational direction), k6/n6 (one-way rotational direction)**
- ❑ The recommended bore tolerances are to be produced using the position and tolerance width as references; at the same time, please keep to the shaft run-out and axial run-out tolerances of 0.03 mm (see Fig. 3).
- ❑ After producing the finish bore, please clean it using suitable cleaning agents.
- ❑ The shaft surfaces should be finely turned or ground (Ra = 0.8 µm).
- ❑ The required yield point for the shafts used is at least 350 N/mm² (St60, St70, C45, C60).

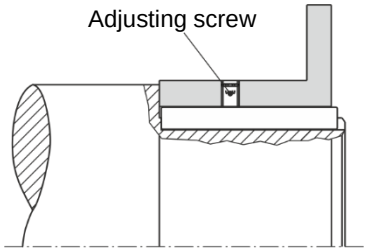


Fig. 5

Please observe the following when boring the hub with keyway (Items 1, 1.4, 1.5 and 1.7) Types 95_.0_ _ / 95_.1_ _ / 95_.7_ _ and 95_.8_ _:

- ❑ The specified form (DIN 6885 sheet 1 or 3) and position of the keyway.

  Position of the keyway on Type:

  95_.0_ _ (Item 1) aligned with a fixing hole

  95_.1_ _ (Item 1.4) 25° offset to a fixing hole

  951.7_ _ (Item 1.5) 45° offset to a fixing hole
- ❑ For axial securement, please provide an additional adjusting screw (ISO 4029 - 45H) as an alternative to a press cover (see Figs. 5 and 6).
  The adjusting screw dimensions and tightening torques stated in Tables 1b and 2b must be kept to.
  On split clamping hubs (1.7), no axial securement is necessary.

Please observe the following when boring the shrink disk and clamping ring hubs (Items 1.1, 1.2, 1.3 and 1.8) Types 95_.2_ _ / 95_.3_ _ / 95_.4_ _ and 95_.9_ _:

- ❑ The shrink disk hubs or clamping ring hubs are generally delivered greased and pre-assembled. For production of the finish bore, the clamping ring or the shrink disk is de-installed and the hub is de-greased.
- ❑ Deburr the hubs, in particular in the area of the slots.
- ❑ Clean and re-grease the hubs in the clamping ring or shrink disk contact areas.
  Permitted grease: Klüber Alltemp QNB 50

Guidelines on Measurement Flange Connection

General Guidelines:

- ❑ The operator is responsible for providing the screws for one side of the measurement flange connection.
  The required tightening torques can be seen in the Installation Instructions of the measurement flange manufacturer.
  Please observe the maximum screw-in depths for the screw connection to the flange M (Item 1.10) acc. Table 8.
- ❑ The screw connection (Item 1.14) must be protected using a screw-securing product, e.g. Loctite 243.

Table 8: Maximum Screw-in Depths for Customer-side Screws

ROBA® DS Size	Flange M (Item 1.10)
16	8 – 11
40	8 – 13
64	10 – 15
300	12 – 22
500	15 – 25
850	20 – 30

Table 9: Assignment to Nominal Torque for HBM Torque Transducers TB2 / T10FS / T12 / T12HP / T40B

Measurement flange Nominal torque	ROBA® DS Size	
50 Nm	16	40
100 Nm	16	40
200 Nm	16	40
500 Nm	64	
1000 Nm	64	
2000 Nm	300	
3000 Nm	300	
5000 Nm	500	
10000 Nm	850	

The assignment according to Table 9 only indicates the geometric compatibility of the flanges. In addition, it must be assessed whether the coupling nominal torque is sufficient for the application.

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Flange Installation

Please refer to Figs. 1 and 2 for the arrangement of the various individual components.

Flange Installation Type 95_.A_ _ (Flange A)

a) Loosen the cap screws (1.13) and separate flange A (1.11) and adaptor flange (1.12).
The cap screws (1.14) are now accessible.

b) Produce a screw connection between the measurement flange and the adaptor flange (1.12).
Please observe the specifications of the measurement flange manufacturer regarding the tightening torques required for the connection (cap screws Item 1.14).

c) Screw flange A (1.11) and adaptor flange (1.12) back together. Tighten the cap screws (1.13) to the torque specified in Table 1b or 2b.

Flange Installation Type 95_.M_ _ (Flange M)

1. Produce a screw connection between the measurement flange and flange M (1.10). Please observe the tightening torques of the measurement flange manufacturer and the screw-in depths acc. Table 8.

Hub Installation

Please refer to Figs. 1 and 2 for the arrangement of the various individual components.

Hub Installation Types 95_.2_ _ / 95_.3_ _ / 95_.9 _ _ (Hubs with Shrink Disk) and Types 95_.4_ _ (Hubs with Clamping Ring)

- ❑ The force transmission of the shrink disk hubs or the clamping ring hubs (1.1/1.2/1.3/1.8) takes place using frictional locking. The contact surfaces between the shrink disk and the hub as well as between the clamping ring and the hub are greased manufacturer-side.
- ❑ The hub bores and the shaft ends must be completely grease-free during installation. Greasy or oily bores or shafts do not transmit the maximum coupling torque.
- ❑ Please make sure that the key sits securely for designs with keyway.
- ❑ The hub and the shrink disk (1.1.2/1.8.2) or the clamping ring (1.3.2) must be completely relaxed; if necessary, loosen the screws (1.1.1/1.2.1/1.3.1/1.8.1) by several thread turns.

Hub Installation Types 95_.2_ _ / 95_.3_ _ / 95_.9 _ _ (Hubs with Shrink Disk)

a) Mount the hubs (1.1/1.2/1.8) onto the shafts using a suitable device and bring them into the correct position.

b) Tighten the tensioning screws (1.1.1/1.2.1/1.8.1) using a torque wrench evenly and **one after the other in 3 to max. 6 tightening sequences** to the torque stated in Table 1b or 2b.

For De-installation:

a) Loosen all tensioning screws (1.1.1/1.2.1/1.8.1) in several sequences by several thread turns.

b) Screw out the tensioning screws located next to the tapped extracting holes and screw them into the tapped extracting holes up to their limits.
On Sizes 180 – 2200, only one hub with outer clamping is offered. Additional threads are provided on the hub (1.1/1.8) as well as on the shrink disk (1.1.2/1.8.2) in order to extract the shrink disk (1.1.2/1.8.2).

Please take the axial space requirements for the tensioning screws to be screwed into the tapped extracting holes into account (length of the hexagon head screws Item 1.1.1 / Item 1.8.1, see Tables 1 and 2).

c) Tighten the tensioning screws (1.1.1/1.2.1/1.8.1) evenly and step-wise so that the shrink disk (1.1.2/1.8.2) is loosened from the hub.

Hub Installation Type 95_.4_ _ (Hubs with Clamping Ring)

a) Mount the hubs (1.3) onto the shafts using a suitable device and bring them into the correct position.

b) Tighten the clamping screw (1.3.1) using a torque wrench to the torque stated in Table 1b.

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Hub Installation Type 95_.5_ _ (Clamping Hubs)

- ❑ The hub bores and the shaft ends must be completely grease-free during installation. Greasy or oily bores or shafts do not transmit the maximum coupling torque.
- ❑ The shafts must not have a keyway.
- ❑ The clamping hub (1.9) must be completely relaxed; if necessary, loosen the screws (1.9.1) by several thread turns.

a) Mount the hubs (1.9) onto the shafts using a suitable device and bring them into the correct position.

b) Tighten the clamping screws (1.9.1) using a torque wrench to the torque stated in Table 1b.

Hub Installation Types 95_.0_ _ / 95_.1_ _ / 951.7_ _ (Hubs with Keyway)

a) Mount the hubs (1 / 1.4 / 1.5) onto the shafts using a suitable device and secure them axially (Fig. 6). Axial securement takes place using a set screw (adjusting screw), which presses radially onto the key; or via a press cover and a screw, screwed into the shaft threaded center hole.

b) The key must lie over the entire length of the hub.

c) Please make sure that the key sits securely in the shaft.

Hub or Coupling Installation Type 95_.8_ _ (Split Clamping Hubs)

On Type 950.8_0, no radial installation is possible due to the angular correlation of both hubs (1.7).
On Type 951.8_ _, radial installation is only possible if the half-shell is axially moved by a minimum dimension “a” (Fig. 8 / Table 10).

a) Partly assemble the coupling, observing the Point “Coupling Installation” (page 13).

b) Loosen the pre-assembled half-shells from the hubs (1.7), **making sure that their correlation to the hub is maintained.**

c) Place the coupling from above onto the shafts and pre-assemble it with the respective half-shells (Fig. 8).

d) Tighten the cap screws (1.7.1) cross-wise and in several tightening sequences to the tightening torque stated in Table 1b. Please make sure that the gap "X" (Fig. 7) has the same size on both hub sides.
If necessary, re-adjust it.

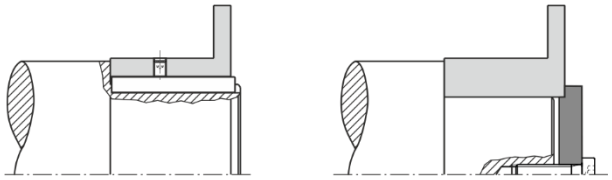


Fig. 6

Table 10: Minimum Dimension “a” [mm]

Size	Types 951._ _ 2 / 3 / 4 / 5 (Sleeve)	Type 951._ _ 1 (Connection plate)
16	0	3.5
25	0	1.5
40	0	1
64	0	3
100	0	2.5
160	0	8
180	1.5	7.5
300	1.5	9.5
500	3	10
850	4.5	14
1400	2	15
2200	5	18

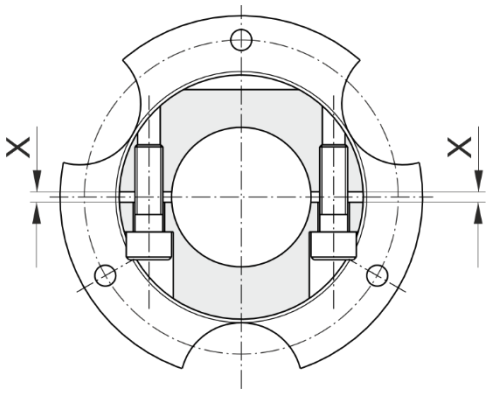


Fig. 7

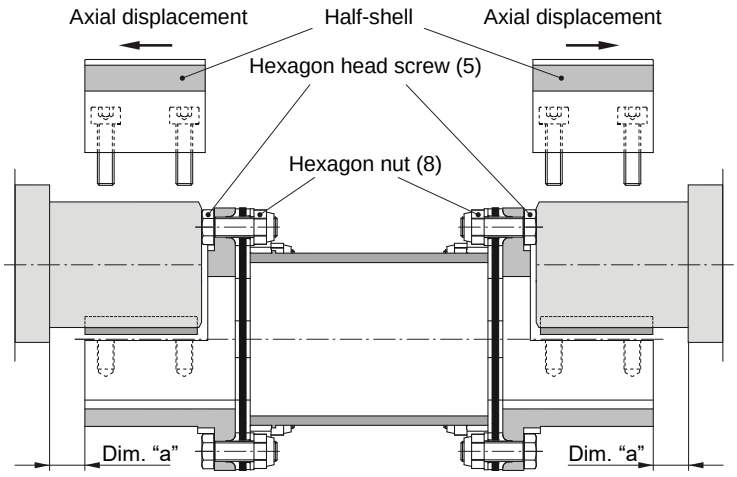


Fig. 8

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Coupling Installation (Figs. 1, 2 and 9)

Only a thin oil film is permitted on the contact surfaces of the disk packs (Fig. 9, detail "X"). If applicable, thick layers of preservative must be removed before installation.

The disk packs (2) are screwed together **alternately** with the sleeve (3) and the hubs or the connection plate (4) / measuring sleeve (9) using lightly oiled hexagon head screws (5 and 6), washers (7) and hexagon nuts (8).

The hexagon nuts (8) or the hexagon head screws (5 and 6) must be tightened in several steps to their full tightening torque acc. Tables 1b or 2b. Please see Table 11 for the respective tightening torques for each step.

Starting with construction size 180, the hexagon nuts (8) and the hexagon head screws (5 and 6) on each connection side must be tightened **cross-wise**.

Table 11

Step	Tightening torque for hexagon nuts (8) or hexagon head screws (5 and 6)
1	30 % of the nominal tightening torque
2	60 % of the nominal tightening torque
3	100 % of the nominal tightening torque

The disk pack (2) must not under any circumstances be distorted when applying the pre-tension force.

The disk pack (2) is always to be inserted in such a way that the collar bushing radius (part 2a, Fig. 9, detail “X”) lies in the hub grooves, the sleeve grooves or the connection plate grooves.

Due to the enlarged diameter of the shrink disks (1.1.2) on Sizes 180 to 2200 and the shrink disks (1.8.2), please make sure that the installation sequence is suitable.
In this way, normal torque wrenches can be used for installation of the disk pack (2).

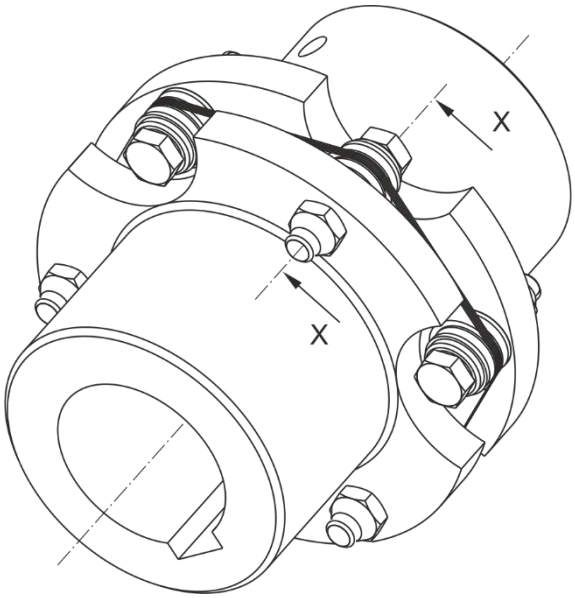


Fig. 9

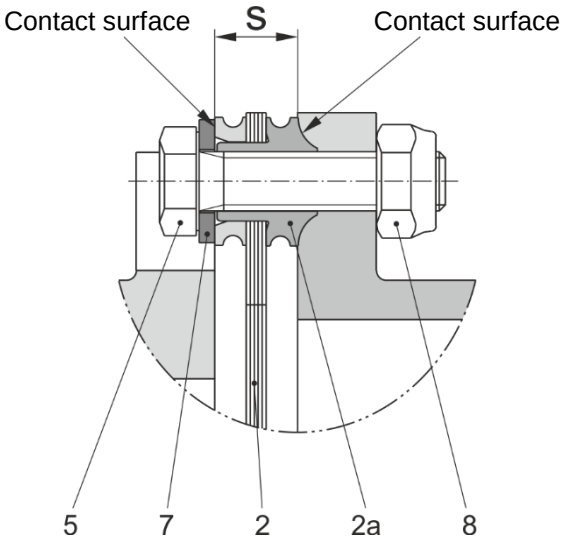


Fig. 9: Detail “X”

CAUTION

In high-speed drives, numerous influences can affect the vibration behavior of the entire drive line. When commissioning the system including the integrated *mayr*® coupling, the entire speed spectrum of the application must be run through in a test run and the vibration behavior must be checked.
During operation, appropriate protective equipment must be provided to ensure that people are protected in case of bursting components.

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

multi-gateway Installation

Installing the multi-gateway (10)

Observe the separate Installation and Operational Instructions B.0539006 for the multi-gateway!

► Attach multi-gateway (10) to the holder provided by the customer

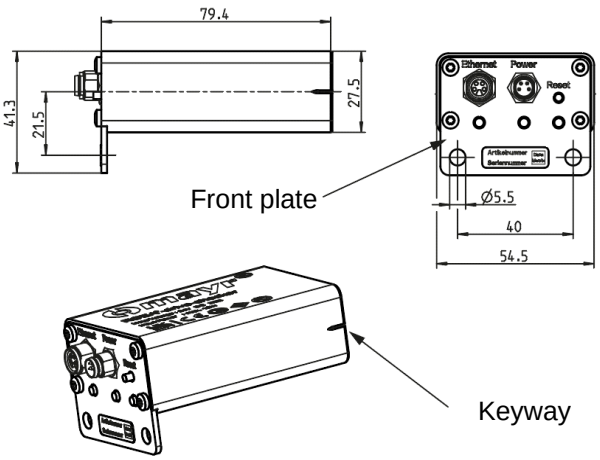
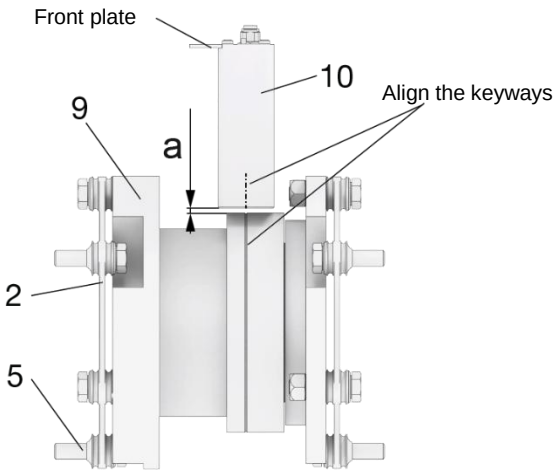


Fig. 9.1

Aligning the multi-gateway

► Axial position: Align the keyway of the multi-gateway (10) with the keyway of the ROBA® drive-checker sleeve (9)

► Radial gap dimension a = 1 – 3 mm



Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Coupling Alignment

Exact coupling alignment reduces the reaction forces and therefore increases the lifetime of the coupling and the shaft bearing.
In most of the applications, coupling alignment using a straight edge in two levels vertical to each other is sufficient.
However, we recommend alignment of the coupling (of the shaft ends) using a dial gauge or laser on drives operating at very high speeds.
In order to prevent axial distortion of the disk packs, the dimension “S” (Fig. 9, detail “X”, Tables 1a or 2a) must be maintained with aligned angular and radial shaft misalignments.

Permitted Shaft Misalignments

ROBA® DS single-jointed couplings (Type 950._ _ _) compensate for angular and axial shaft misalignments.
ROBA® DS double-jointed couplings (Type 951._ _ _) compensate for angular, axial and radial shaft misalignments (Fig. 11) without losing their backlash-free function. However, the permitted shaft misalignments indicated in Table 1a or 2a 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, see Fig. 10. The sum total of the actual misalignments in percent of the maximum value must not exceed 100 % (see example and Fig. 10).

Example:

ROBA® DS, Size 40, Type 951.002
Axial displacement occurrence ΔK_a = 0.6 mm equals 40 % of the permitted maximum value ΔK_a = 1.5 mm
Angular misalignment occurrence in the disk pack ΔK_w = 0.3° equals 30 % of the permitted maximum value ΔK_w = 1°
=> permitted radial misalignment ΔK_r = 30 % of the maximum value ΔK_r = 1.5 mm => ΔK_r = 0.45 mm

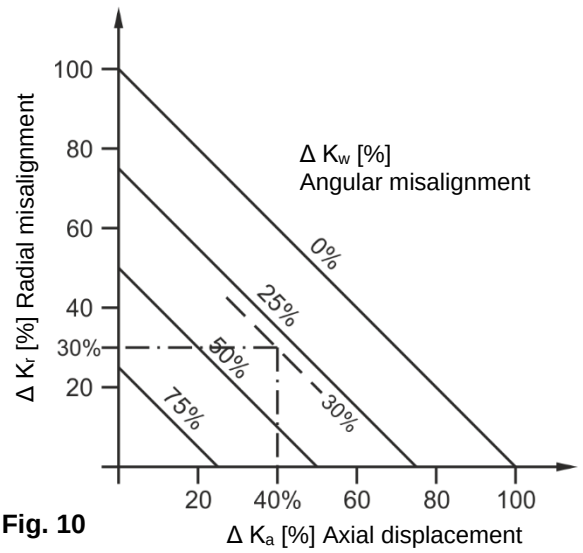


Fig. 10

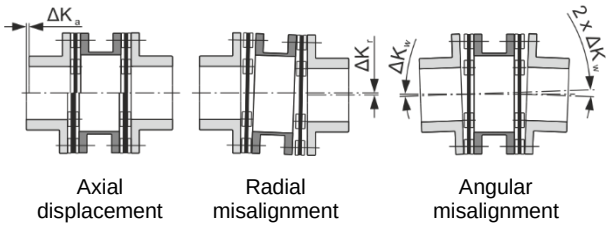


Fig. 11

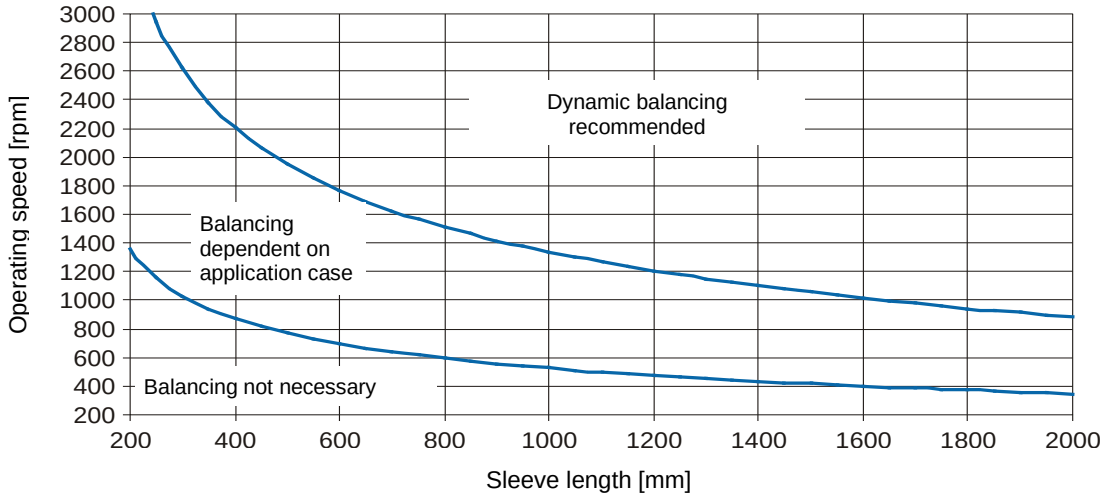
Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Balancing the Coupling

In most applications, balancing the ROBA® DS coupling is not necessary. In general, the following points are crucial when deciding whether the coupling needs balancing:

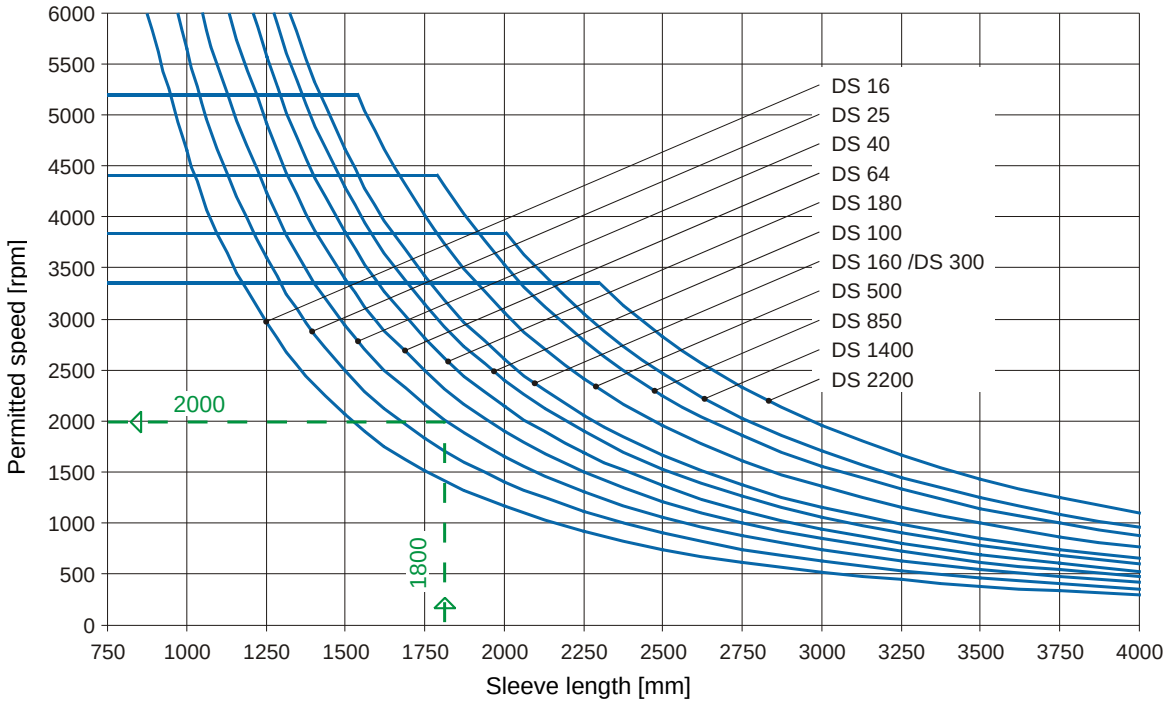
- ❑ Circumferential speed of the coupling
- ❑ Length of the sleeves S/CRD/CFRP (Diagram 1)
- ❑ Required balance quality

Diagram 1: Balancing Couplings with Sleeve S/CRD/CFRP (Special Length)



Smooth running of the machine is not only ensured by the coupling balance quality, but is also influenced by parameters such as rigidity and distance to the adjacent bearings as well as by the sensitivity and mass of the entire construction.
Diagram 1, therefore, only shows reference values as recommendations for balancing.
All parts of the ROBA® DS couplings, except the sleeves S/CRD/CFRP, are machined on all sides, and therefore lie in the range G6.3 acc. DIN ISO 1940 at medium speeds (1500 rpm).
If higher demands are placed on the balance quality, it is possible to balance individual parts or even the entire installed coupling (on request). However, for this option, the hubs must have a finish bore.

Diagram 2: Permitted Speeds (Bend-critical) for Sleeves S Type 951._ _3



Example:
Size 40, sleeve length H_S = 1800 mm = > permitted speed 2000 rpm.

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Diagram 3: Permitted Speeds (Bend-critical) for Sleeves CRD Type 951._ _4

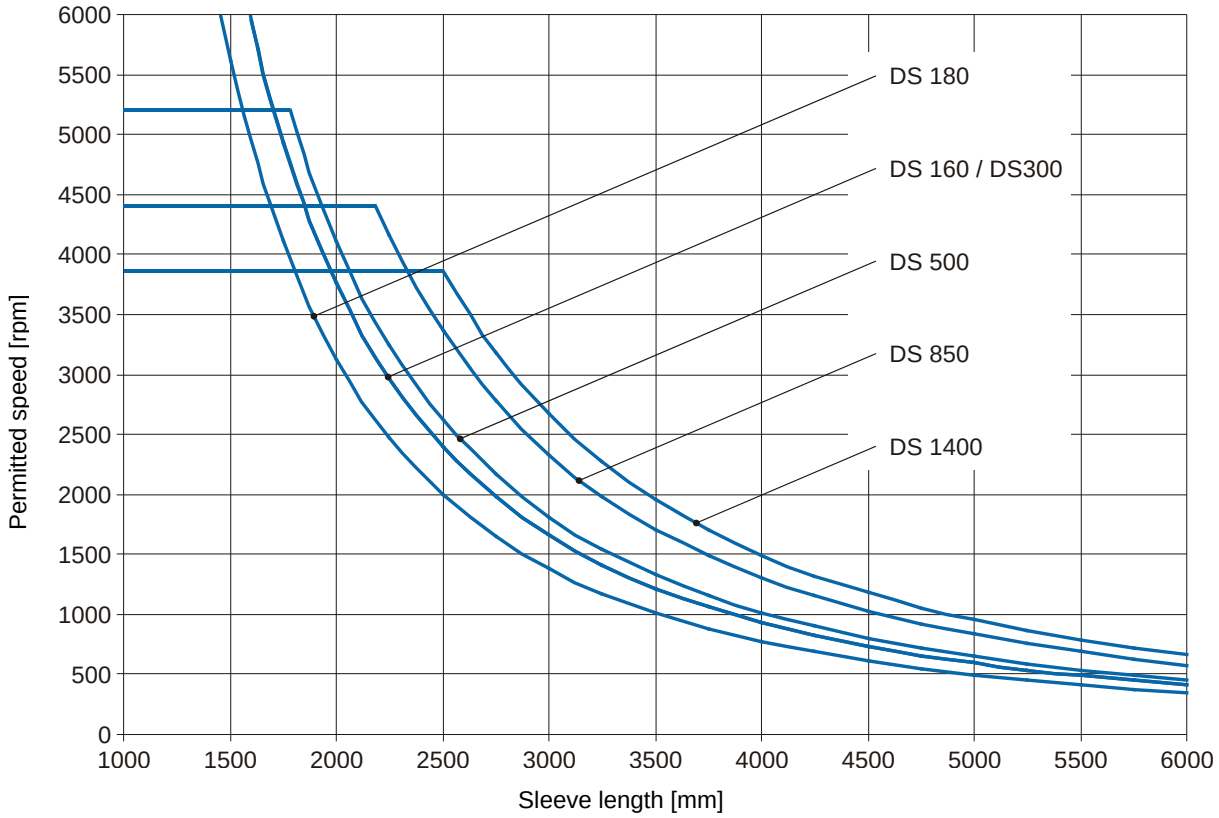
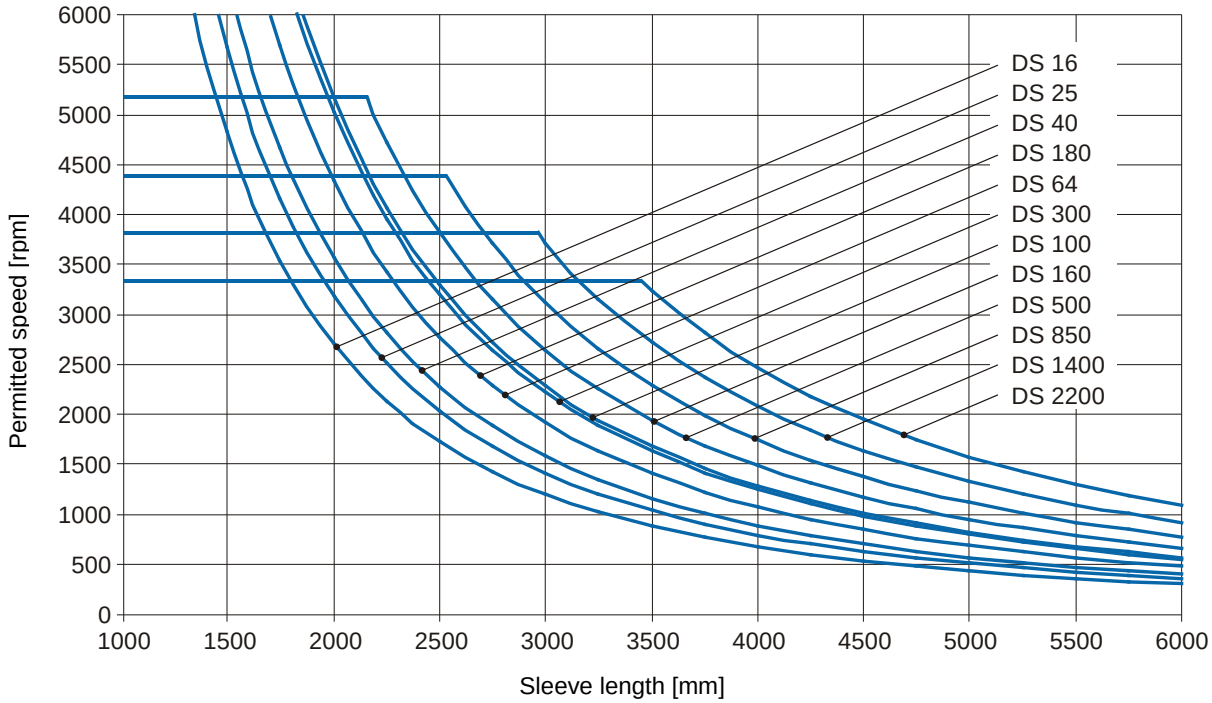


Diagram 4: Permitted Speeds (Bend-critical) for Sleeves CFRP Type 951._ _5



Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de

Maintenance

ROBA® DS couplings are largely maintenance-free.

The following maintenance and inspection intervals are to be maintained:

1.) Visual inspection, inspection of the installation parameters (misalignment and tightening torques) and the coupling running behavior **before initial operation.**

2.) Check the tightening torques produced **after 5 to 10 operating hours.**

3.) Visual inspection, torsional backlash, inspection of the misalignment and the tightening torques, coupling running behavior **after 1000 h, at the latest after 3 months.**

4.) If no irregularities or wear are found during the maintenance and inspection interval defined in point 3.), further inspection intervals can, with unchanged operating parameters, take place **after 4000 operating hours or after maximum 12 months.**

In extreme coupling ambient or operating conditions, the maintenance and inspection intervals should be shortened.

Disposal

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

Electronic Components

Products which have not been disassembled can be disposed of under Code No. 160214 (mixed materials) or components under Code No. 160216 (Code No. acc. 200/532/EC), or can be disposed of by a certified disposal firm.

Malfunctions / Breakdowns

Malfunction	Possible Causes	Solutions
Changes in running noise and / or vibration occurrence	Incorrect alignment, incorrect installation	1) Set the system out of operation 2) Find / resolve the cause of incorrect alignment 3) Check the coupling for wear
	Loose connecting screws, minor fretting corrosion under the screw head and on the disk pack	1) Set the system out of operation 2) Check the coupling parts and replace if damaged 3) Tighten the connecting screws to the specified torque 4) Check the alignment and correct if necessary
	Tensioning and clamping screws or locking set screw for axial hub securement are loose	1) Set the system out of operation 2) Check the coupling alignment 3) Tighten the tensioning and clamping screws for axial hub securement to the required torque or tighten the locking set screw and secure it against self-loosening using sealing lacquer 4) Check the coupling for wear
Disk pack breakage	Disk pack breakage due to high load impacts / overload	1) Set the system out of operation 2) Dismantle the coupling and remove the remainders of the disk packs 3) Check the coupling parts and replace if damaged 4) Find the cause of overload and remove it
	Operating parameters are not appropriate for the coupling performance	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
	Incorrect operation of the system unit	1) Set the system out of operation 2) Dismantle the coupling and remove the remainders of the disk packs 3) Check the coupling parts and replace if damaged 4) Train and advise operating personnel
Disk packs / connecting screws cracks or breakage	Drive vibrations	1) Set the system out of operation 2) Dismantle the coupling and remove the remainders of the disk packs 3) Check the coupling parts and replace if damaged 4) Check the alignment and correct if necessary 5) Find the cause of vibration and remove it

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.

Chr. Mayr GmbH + Co. KG
Eichenstraße 1, D-87665 Mauerstetten, Germany
Phone: +49 8341 804-0, Fax: +49 8341 804-421
www.mayr.com, email: public.mayr@mayr.de