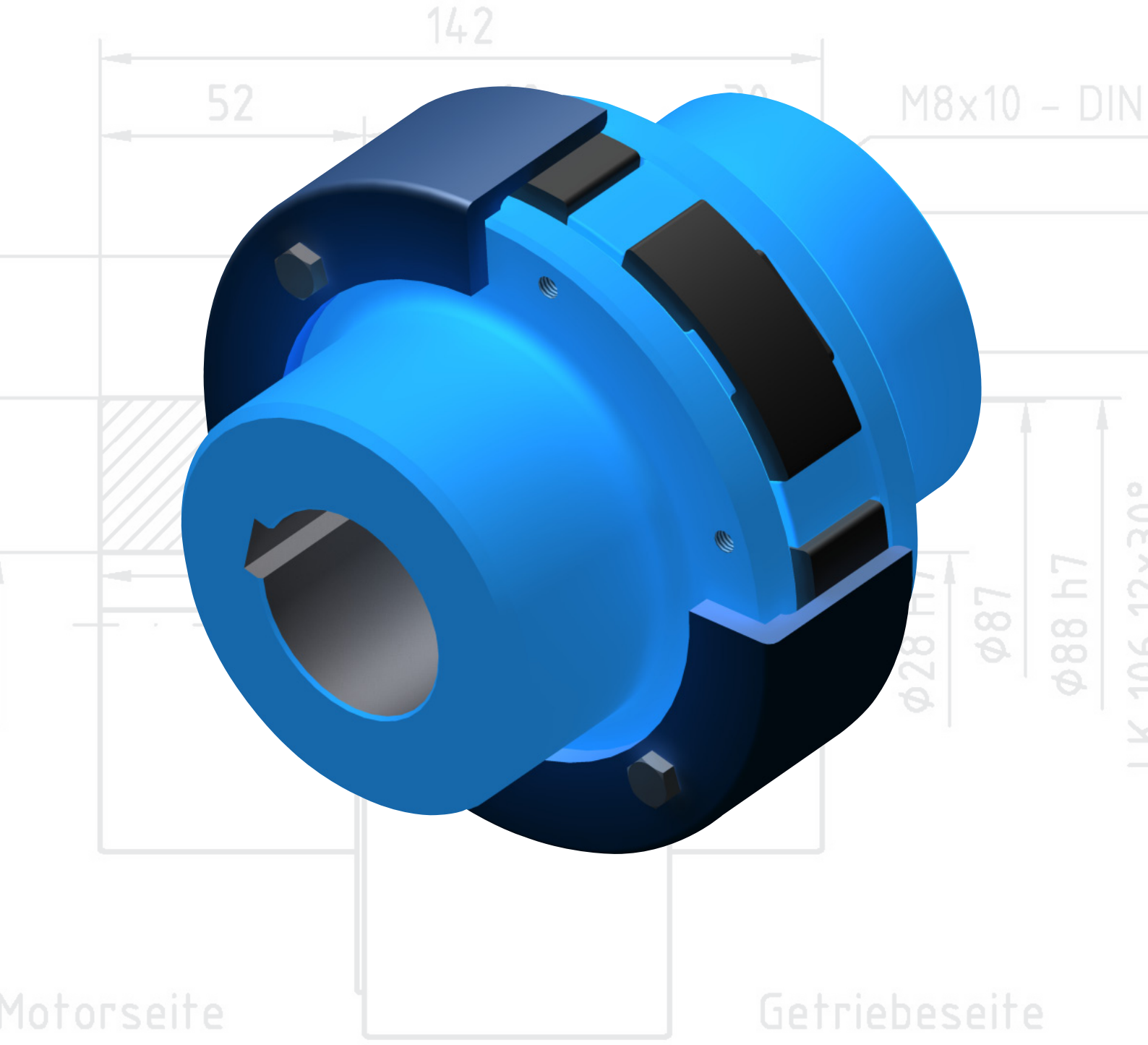
KoRo·IBS
MOVING AND BRAKE SYSTEM



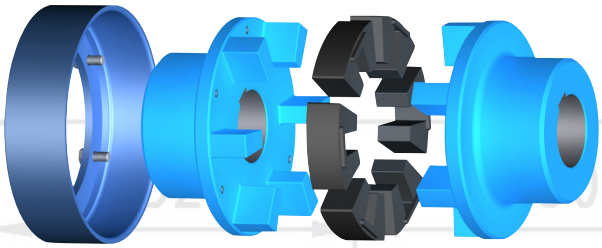
Torsionally elastic couplings

KoRo·IBS
MOVING AND BRAKE SYSTEM

Torsionally elastic couplings

Industrial Brakes · Thrusters · Pressure Oil Pumps · Couplings · Hydraulic Buffers · Cellular Buffers
Rail Pliers · Sheaves · Hook Blocks · Crane Rail Wheels · Rail Clamps · Reparation · Service

Torque from 40 Nm to 20.000 Nm



Special features:

- Compensate for axial, radial and angular misalignment
- Absorb shock loads
- High overload
- Damping of shocks and vibrations
- Possible removal of the elastic elements without axial displacement of the coupling hub
- Easy to assemble and align
- Maintance free
- Adaptation in almost every possible installation situation
- Available with flanged brake drum
- Available with flanged brake disk

The couplings (type MMS) compensate for axial, radial, and angular misalignment. Thus they can compensate shaft misalignment as a result of inaccurate mounting, setting of foundation, or changes in height or length due to thermal influence.

The couplings operate with transmission elements form-fit and absorb shock-loads. The flexible transmission elements are made of a rubber material (NR-SBR 75-80° Shore A – element design SN) suitable for temp. from -40°C to +80°C. Different rubber material with different hardness can be delivered on request.

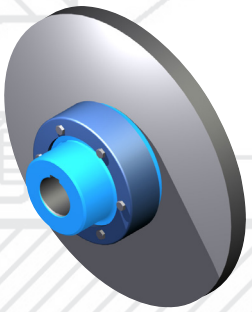
In case of smaller sizes up to size 63 the elastic elements are designed as anular gear. Bigger couplings use six rubber elements. Two rubber blocks are linked to the outer belt.

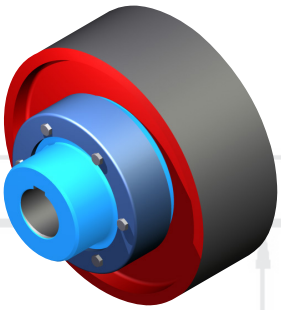
The separately fixed retaining cap, a special feature of all couplings type MMS which allows a radial change of the flexible elements without axial movement of the coupling hubs.

The couplings are provided with progressive torsional properties with good damping characteristics with regard to torsional vibration and load shock.

Standard version:

- MMS – Design made of ductile iron GGG40
- MMSI – Design made of steel C45





Design	Designation	Material
MMS	Hub	GGG40
MMSI		C45
MMS MMSI	**Retaining cap** Size 10-16 Size 25-400 Size 630-1600	 Polyamid Steel sheet GGG40/St 52-3
	flexible annular gear flexible saddle elements	NR-SBR 75 Sh.A
MMS, MMSI	Brake disk	St 52-3
MMS	Brake drum	till Ø 315: St 52-3 from Ø 315: GGG50
MMSI		GGG40, St 52-3

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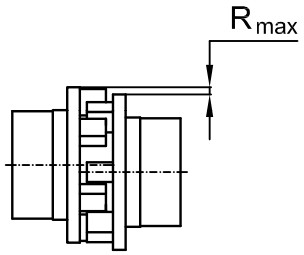
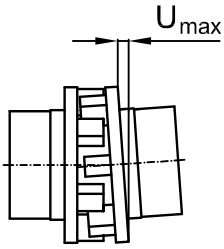
Mounting – Alignment tolerances

The given alignment tolerances should only be considered as approx. values in order to keep the assembly work involved with reasonable limits and in view of the fact that the compensating capacity of the coupling depends to a large extent on the rotational speeds and loads applied.

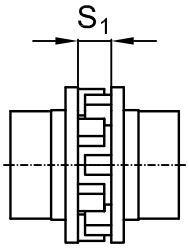
radial alignment



angular alignment



axial alignment



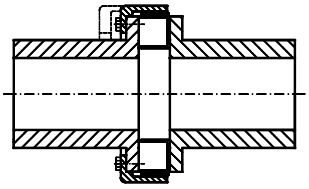
Picture: Alignment

Size	4	6.3	10	16	25	40	63	100	160	250	400	630	1000	1600
R_{max} [mm]	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.8
U_{max} [mm]	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2
S_1 ± [mm]	18±1	20±1	17±1	19±1	22±1	26±1	30±1	35±1	$41^{+1.2}_{-1}$	$47^{+1.2}_{-1}$	$56^{+1.5}_{-1}$	$64^{+1.5}_{-1}$	75^{+2}_{-1}	85^{+2}_{-1}

Relation of types

The standard coupling series consist of couplings for a torque range from 40 – 20,000 Nm. Couplings with higher torques are available on request. Further types are available on request. The examples mentioned below represent some applications. The data sheets are available on request.

Simple compact claw coupling

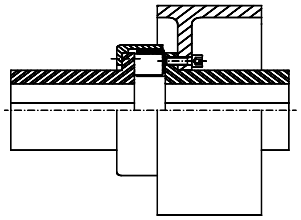


Series: MMS…W

Special feature:

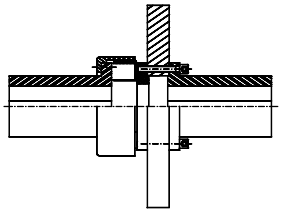
The assembly and disassembly of the elastic coupling elements are possible without axial movement of the coupling shafts!

Brake drum coupling with brake drum for drum brake, dimensions acc. to DIN 15 431



Series: MMS…WBT

Brake drum coupling with Disk brakes for brake caliper



Series: MMS…WBS

Choice of coupling size

The coupling size should be adequately dimensioned to ensure that the permissible coupling load is not exceeded in any operating condition encountered. For drives without periodically recurring vibratory torque stress / loads the coupling design may be selected based on the drive torque with reference to the corresponding service factors.

For drives with combustion engines or prime movers which are subject to periodically recurring vibratory torques the final choice of the coupling should be verified by a full torsional vibration analysis which will be done on request.

❶ Calculation of the drive torque T_{AN}

$$T_{AN}[Nm] = 9550 \cdot \frac{P\ (kW)}{n\ (1/min)}$$

❷ Determination of the nominal torque capacity T_{KN} of the coupling based on the drive torque T_{AN} with reference to service factors.

$$T_{KN} \geq T_{AN} \times S_m \times S_t \times S_z$$

❸ The torsional vibration analysis for verifying the proper coupling choice shall prove that the admissible continuous vibratory torque capacity T_{KW} of the coupling is at least equal to the max. vibratory torque T_W which occurs at the operation speed range with reference to temperature and frequency.

$$T_{KW(10Hz)} \geq T_W \times S_t \times S_f$$

❹ The frequency factor S_f takes the frequency dependence of the admissible continuous vibratory torque capacity T_{KW} (10 Hz) at operating frequency f into account.

$$S_f = \sqrt{\frac{f}{10}}$$

Service factors

Operation factor S_m					
Prime mover			**Load by the driven machine**		
			G	**M**	**S**
Electro motors, Turbines, Hydraulic motors			1.25	1.6	2.0
Combustion engines ≥ 4 cylinders Cyclic vibration ≥ 1: 100			1.5	2.0	2.5
Temperature factor S_t					
Ambient temperature	**-40°C +30°C**	**+40°C**	**+60°C**	**+80°C**	**>+80°C**
S_t	1.0	1.1	1.4	1.8	on request
Starting factor S_z					
Starting frequency per hour		**30**	**60**	**120**	**240**
S_z		1.0	1.1	1.2	1.3

Calculation example

A coupling shall be installed between an e-motor (P = 100 kW at n = 1480 min^{-1}) and a belt conveyor gearbox.

operation mode (med. Shock load) $S_{m.}$ = 1.8
ambient temperature <60°C S_t = 1.3
starting frequency 240/h S_z = 1.3

$$T_{AN} = 9550 \frac{100\ kW}{1480\ min^{-1}} = 645\ Nm$$

Coupling:

$T_{KN} = T_{AN} \times S_m \times S_t \times S_z$
= 645 Nm x 1.8 x 1.3 x1.3
= 1962 Nm

Selected coupling:

MMS 250 SNW with T_{KN} = 2500 Nm
> 1962 Nm

Technical Data

Size MMS MMSI	Technical data for standard versions SN [1]								max. rotational speed [min^{-1}]
	T_{KN} [Nm]	$T_{K\,max}$ [Nm]	T_{KW} (10Hz) [Nm]	dyn. Torsional stiffness C_{Tdyn} x 10³ [Nm/rad]				rel. damping ψ	
				0.25T KN	0.5T KN	0.75T KN	1.0T KN		
25	250	750	130	3.5	5.0	11.0	23	1.8	5700
40	400	1200	210	5.0	7.5	18.0	37	1.8	5100
63	630	1890	330	7.0	10.0	25.0	60	1.8	4500
100	1250	3000	530	15.0	25.0	55.0	120	1.8	3900
160	2000	4800	840	25.0	35.0	90.0	190	1.8	3400
250	3000	7500	1300	35.0	55.0	130.0	280	1.8	3000
400	5000	12000	2100	50.0	70.0	200.0	500	1.8	2700
630	7500	18900	3300	120.0	170.0	380.0	700	1.8	2300
1000	12500	30000	5000	230.0	280.0	600.0	1100	1.8	2000
1600	20000	48000	8400	290.0	410.0	950.0	1900	1.8	1760

Size	MMS Weights and mass of inertia [2] for lengths L_W with max. bores			MMSI Weights and mass of inertia for length L_{Wmax} with medium bores		
	L_W max.	M [kg]	J [kgm²]	L_W max.	M [kg]	J [kgm²]
25	136	4.2	0.007	242	9,7	0.0150
40	148	5.7	0.011	246	12	0.0236
63	164	8.2	0.023	250	16.3	0.0413
100	185	11.7	0.044	315	25.2	0.0780
160	205	16.6	0.078	321	31.9	0.1301
250	225	23.3	0.140	387	47.2	0.2454
400	250	32.5	0.256	396	62.7	0.4218
630	296	62.0	0.737	484	107,8	0.9844
1000	335	90.5	1.413	495	148.7	1.8612
1600	373	131.0	2.689	505	199,0	3.3681

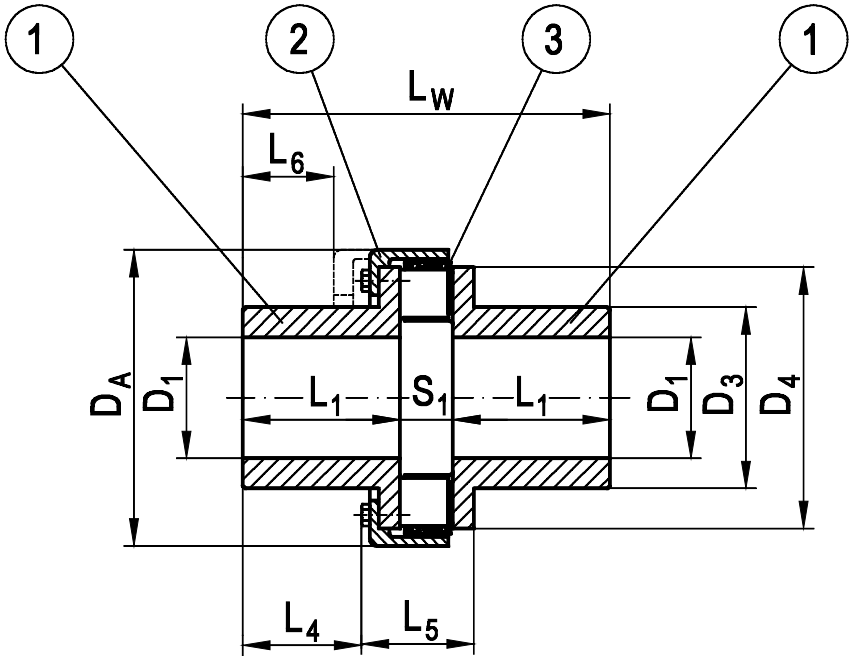
1) Other versions with technical data on request
2) Data for lengths and bores on request

Admissible rotational speed

The max. speeds specified in “technical details“ only refer to actual coupling components. For brake drum and brake disk combined couplings the following speeds n_{max} in min^{-1} are permissible.

Diameter BT/BS	200	250	315	400	500	630	710	800	1000	Material
Brake Drum BT n_{max} [min^{-1}]	5250	4200	3300	2600	2100	1650	1450	-	-	GGG 40/50
Brake Disk BS n_{max} [min^{-1}]	7000	6000	4800	3800	3000	2400	2150	1900	1500	St 52-3

Torsionally Elastic Coupling
Type MMS-W



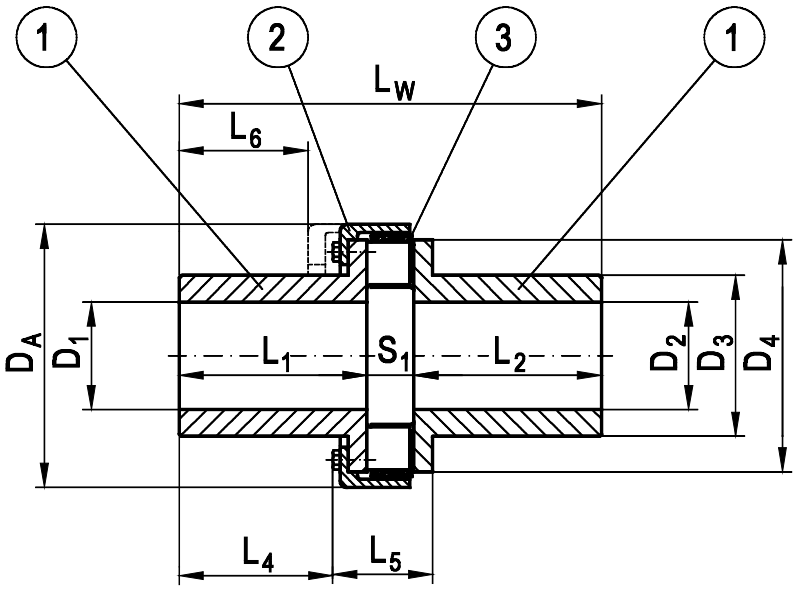
Picture: coupling MMS - W

MMS – Basic version		
Part	Designation	Material
1	**Hub**	GGG 40
2	**Retaining cap** Size MMS 25 - 40 Size MMS 40 - 400 Size MMS 630 - 1600	 Steel plate Steel plate/ GGG40 GGG 40/ St 52-3
3	Elast. toothed ring SN Elast. saddle elements SN	NR-SBR 75 Shore A

Size		D_A	D_1 predrilled	D_1 max	D_3	D_4	L_1	L_4	L_5	L_6	L_w	S_1
MMS	**25**	134	Undrilled, precentered	60	88	120	57	34	53	21	136	22
MMS	**40**	155		65	96	135	61	35	60	21	148	26
MMS	**63**	175		75	110	152	67	40	67	22	164	30
MMS	**100**	196		80	120	173	75	45	77	22	185	35
MMS	**160**	223		85	130	198	82	48	89	21	205	41
MMS	**250**	252		100	145	223	89	51	100	20	225	47
MMS	**400**	290		105	160	251	97	56	114	17	250	56
MMS	**630**	330	56	130	200	294	116	80	118	25	296	64
MMS	**1000**	378	68	150	225	338	140 [1)]	90	137	25	335	75
MMS	**1600**	432	88	170	255	390	160 [1)]	104	147	31	373	85

[1)] Exposition does not correspond to real construction.

Torsionally Elastic Coupling
Type MMSI-W



Picture: coupling MMSI - W

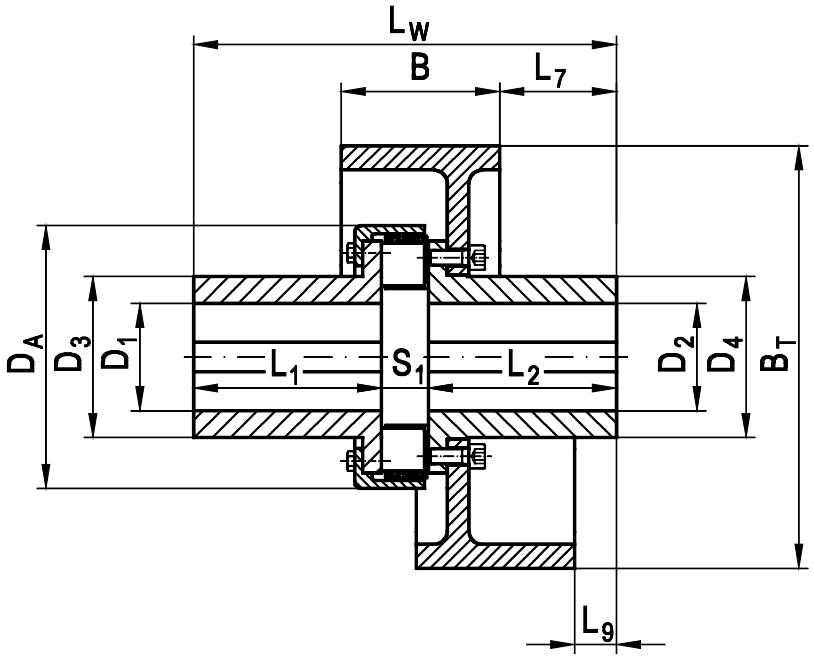
MMSI – Basic version		
Part	Designation	Material
1	**Hub**	C45
2	**Retaining cap** Size MMS 25 - 40 Size MMS 40 - 400 Size MMS 630 - 1600	 Steel plate Steel plate/ GGG40 GGG 40/ St 52-3
3	Elast. toothed ring SN Elast. saddle elements SN	NR-SBR 75 Shore A

Size		D_A	D_1 Motor Side min	D_2 Gear Side max	D_3	D_4	L_1 Motor Side max	L_2 Gear Side max	L_4	L_5	L_6	L_w max	S_1
MMSI	**25**	139	Undrilled, precentered	60	87	120	110		89	51	74	242	22
MMSI	**40**	155		65	94	135	110		88	57	70	246	26
MMSI	**63**	174		75	110	152	110		87	63	65	250	30
MMSI	**100**	195		80	120	173	140		111	76	87	315	35
MMSI	**160**	222		85	130	198	140		116	87	79	321	41
MMSI	**250**	250		100	145	223	170		133	99	101	387	47
MMSI	**400**	284		105	160	251	170		139	112	100	396	56
MMSI	**630**	328	56	130	192	294	210		174	118	119	484	64
MMSI	**1000**	378	75	150	225	338	210		160	137	95	495	75
MMSI	**1600**	432	85	170	255	390	210		156	147	83	505	85

Brake drum couplings

The flexible elements can be easily fitted and removed radially with no need for axial movement of the coupled machines after the retaining cap has been released and withdrawn. The alternative possibilities of mounting the brake drum provide the dimension L_7 or L_9.

For higher requirements, i.e. rule-optimized drives, precise and low torsional designs are available on request from size MMS 100 onwards.



Picture: Brake drum coupling Type MMS…WBT

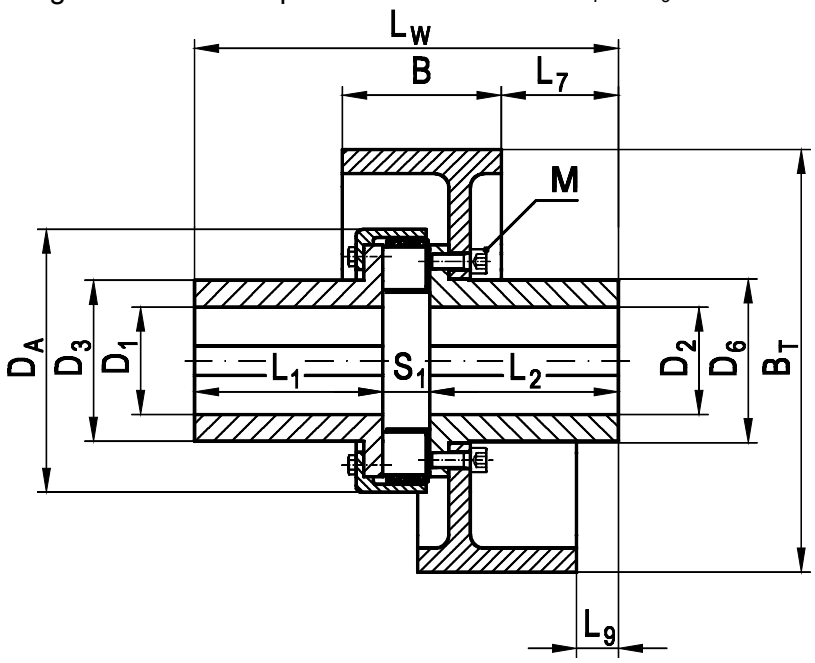
Size		B_T	B	D_A	D_1/ D_2 undrilled	D_1/ D_2 max	D_3	D_4	L_1 norm.	L_1 long	L_2	L_7	L_9	L_w norm.	L_w long	S_1
MMS	**25**	200	75	134		60	88	87	57	110	11	71	40	189	242	22
MMS	**40**	200	75	155		65	96	94	61	110	11	71	40	197	246	26
MMS	**40**	250	95	155		65	96	94	61	110	11	56	35	197	246	26
MMS	**63**	250	95	175		75	11	11	67	110	11	55	34	207	250	30
MMS	**63**	315	118	175		75	11	11	67	110	11	61	5	207	250	30
MMS	**100**	315	118	196		80	12	12	75	140	14	87	31	250	315	35
MMS	**160**	315	118	223		85	13	13	82	140	14	87	31	263	321	41
MMS	**160**	400	150	223		85	13	13	82	140	14	70	11	263	321	41
MMS	**250**	400	150	252		100	14	14	89	170	17	98	39	306	387	47
MMS	**250**	500	190	252		100	14	14	89	170	17	75	22	306	387	47
MMS	**400**	500	190	290		105	16	16	97	170	17	73	20	323	396	56
MMS	**400**	630	236	290		105	16	16	97	170	17	41	0	323	396	56
MMS	**630**	500	190	330	56	130	20	19	116	210	21	11	59	390	484	64
MMS	**630**	630	236	330	56	130	20	19	116	210	21	80	39	390	484	64
MMS	**630**	710	265	330	56	130	20	19	116	210	21	70	20	390	484	64
MMS	**1000**	630	236	378	68	150	22	22	140[1)]	210[1)]	21	67	26	405	475	75
MMS	**1000**	710	265	378	68	150	22	22	140[1)]	210[1)]	21	57	7	405	475	75
MMS	**1600**	710	265	432	88	170	25	25	160[1)]	210[1)]	21	50	0	423	473	85

Undrilled, precentered

[1)] Exposition does not correspond to real construction.

Brake drum couplings

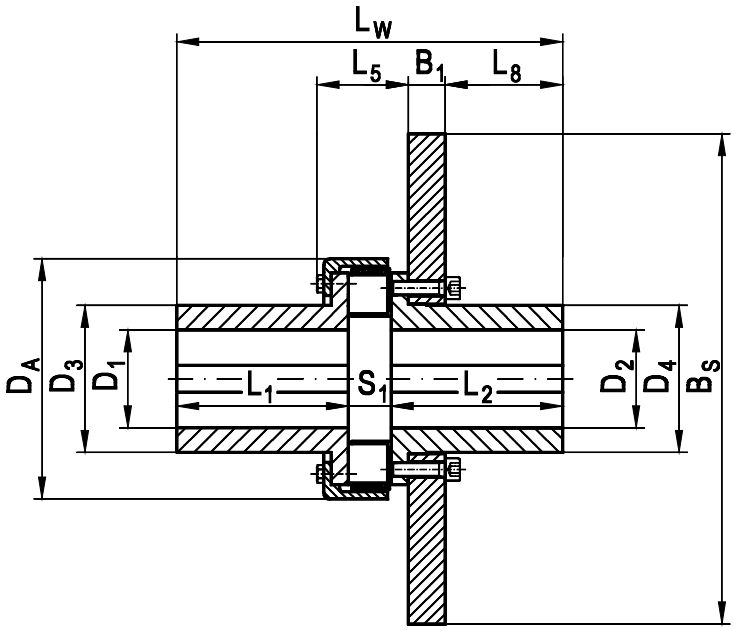
The flexible elements can be easily fitted and removed radially with no need for axial movement of the coupled machines after the retaining cap has been released and withdrawn. The alternative possibilities of mounting the brake drum provide the dimension L_7 or L_9.



Picture: Brake drum coupling type MMSI…WBT

Size		B_T	B	D_A	D_1 max. Motor Side	D_2 max. Gear Side	D_3	D_6 h7	L_1 max. Motor Side	L_2 max. Gear Side	L_7	L_9	L_W max.	S_1	M
MMSI	**25**	160	60	139	60		87	87	110		77	57	242	22	M 8
MMSI	**25**	200	75	139	60		87	87	110		71	40	242	22	M 8
MMSI	**40**	200	75	155	65		94	94	110		69	38	246	26	M 8
MMSI	**40**	250	95	155	65		94	94	110		56	35	246	26	M 8
MMSI	**63**	250	95	174	75		110	110	110		56	35	250	30	M 8
MMSI	**63**	315	118	174	75		110	110	110		61	15	250	30	M 8
MMSI	**100**	250	95	195	80		120	120	140		82	61	315	35	M 12
MMSI	**100**	315	118	195	80		120	120	140		87	31	315	35	M 12
MMSI	**160**	315	118	222	85		130	130	140		87	31	321	41	M 12
MMSI	**160**	400	150	222	85		130	130	140		70	11	321	41	M 12
MMSI	**250**	400	150	250	100		145	145	170		98	39	387	47	M 12
MMSI	**250**	500	190	250	100		145	145	170		75	22	387	47	M 12
MMSI	**400**	400	150	284	105		160	160	170		96	27	396	56	M 16
MMSI	**400**	500	190	284	105		160	160	170		73	20	396	56	M 16
MMSI	**400**	630	236	284	105		160	160	170		41	0	396	56	M 16
MMSI	**630**	500	190	328	130		192	192	210		111	58	484	64	M 16
MMSI	**630**	630	236	328	130		192	192	210		80	39	484	64	M 16
MMSI	**630**	710	265	328	130		192	192	210		70	20	484	64	M 16
MMSI	**1000**	630	236	378	150		225	225	210		67	26	495	75	M 20
MMSI	**1000**	710	265	378	150		225	225	210		57	7	495	75	M 20
MMSI	**1600**	710	265	432	170		255	255	210		50	0	505	85	M 20

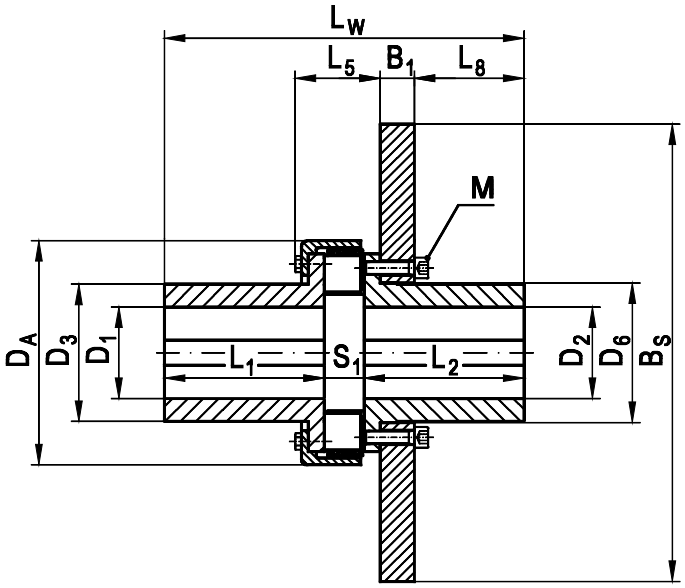
Disk brake coupling brake disk for brake caliper



Picture: coupling type MMS…WBS

Size	B_S	B_1	D_A	D_1/ D_2 undrilled	D_1/ D_2 max	D_3	D_4	L_1 norm.	L_1 long	L_2	L_5 max	L_8	L_w norm.	L_w long	S_1
MMS 40	315	30	155	Undrilled, precentered	65	96	94	61	110	110	60	85,5	197	246	26
MMS 63	355	30	175		75	110	110	67	110	110	65	84,5	207	250	30
MMS 63	400	30	175		75	110	110	67	110	110	65	84,5	207	250	30
MMS 100	450	30	196		80	120	120	75	140	140	79	110,5	250	315	35
MMS 100	500	30	196		80	120	120	75	140	140	79	110,5	250	315	35
MMS 160	450	30	223		85	130	130	82	140	140	90	110,5	263	321	41
MMS 160	500	30	223		85	130	130	82	140	140	90	110,5	263	321	41
MMS 160	560	30	223		85	130	130	82	140	140	90	110,5	263	321	41
MMS 250	500	30	252		100	145	145	89	170	170	101	138,5	306	387	47
MMS 250	560	30	252		100	145	145	89	170	170	101	138,5	306	387	47
MMS 250	630	30	252		100	145	145	89	170	170	101	138,5	306	387	47
MMS 400	560	30	290		105	160	160	97	170	170	115	136,5	323	396	56
MMS 400	630	30	290		105	160	160	97	170	170	115	136,5	323	396	56
MMS 400	710	30	290		105	160	160	97	170	170	115	136,0	323	396	56
MMS 630	630	30	330	56	130	200	192	116	210	210	121	175,5	390	484	64
MMS 630	710	30	330	56	130	200	192	116	210	210	121	175,0	390	484	64
MMS 630	800	30	330	56	130	200	192	116	210	210	121	175,0	390	484	64
MMS 1000	710	30	378	68	150	225	225	140	210	210	139	162,0	405	475	75
MMS 1000	800	30	378	68	150	225	225	140	210	210	139	162,0	405	475	75
MMS 1000	1000	40	378	68	150	225	225	140	210	210	139	157,0	405	475	75
MMS 1600	1000	40	432	88	170	255	252	160	210	210	148	150,0	423	473	85

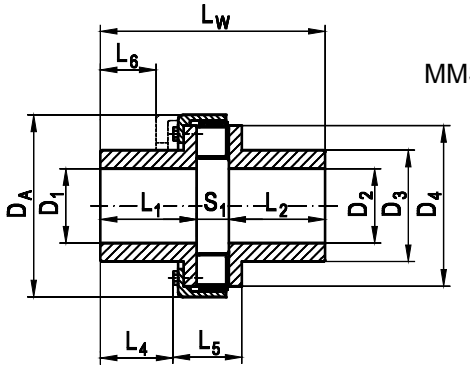
Disk brake coupling with brake disk for brake caliper



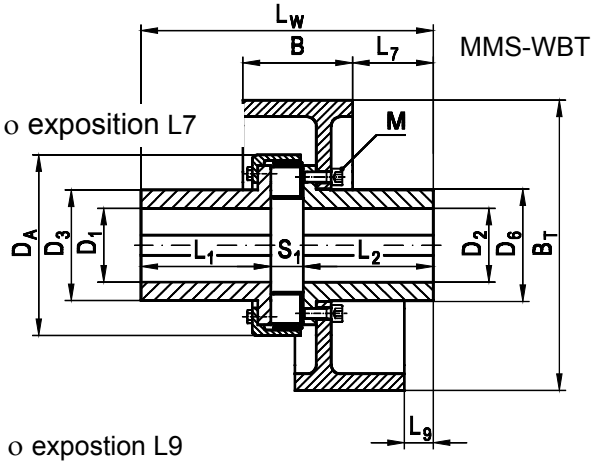
Picture: Brake disk coupling type MMSI…WBS

Size	B_S	B_1	D_A	D_1 max	D_2 max	D_3	D_6 h7	L_1 max	L_2 max	L_5 max	L_8	L_w	S_1	M
				Motor Side	Gear Side			Motor Side	Gear Side					
MMSI 25	315	30	139	60		87	87	110		51	72	242	22	M 8
MMSI 40	315	30	155	65		94	94	110		58	70	246	26	M 8
MMSI 40	355	30	155	65		94	94	110		58	70	246	26	M 8
MMSI 63	355	30	174	75		110	110	110		68	70	250	30	M 8
MMSI 63	400	30	174	75		110	110	110		68	70	250	30	M 8
MMSI 100	400	30	195	80		120	120	140		76	96	315	35	M 12
MMSI 100	450	30	195	80		120	120	140		76	96	315	35	M 12
MMSI 100	500	30	195	80		120	120	140		76	96	315	35	M 12
MMSI 160	450	30	222	85		130	130	140		87	96	321	41	M 12
MMSI 160	500	30	222	85		130	130	140		87	96	321	41	M 12
MMSI 160	560	30	222	85		130	130	140		87	96	321	41	M 12
MMSI 250	450	30	250	100		145	145	170		102	124	387	47	M 12
MMSI 250	500	30	250	100		145	145	170		102	124	387	47	M 12
MMSI 250	560	30	250	100		145	145	170		102	124	387	47	M 12
MMSI 250	630	30	250	100		145	145	170		102	124	387	47	M 12
MMSI 400	560	30	284	105		160	160	170		117	122	396	56	M 16
MMSI 400	630	30	284	105		160	160	170		117	122	396	56	M 16
MMSI 400	710	30	284	105		160	160	170		117	122	396	56	M 16
MMSI 630	630	30	328	130		192	192	210		120	160	484	64	M 16
MMSI 630	710	30	328	130		192	192	210		120	160	484	64	M 16
MMSI 630	800	30	328	130		192	192	210		120	160	484	64	M 16
MMSI 1000	710	30	378	150		225	225	210		140	147	495	75	M 20
MMSI 1000	800	30	378	150		225	225	210		140	147	495	75	M 20
MMSI 1000	1000	30	378	150		225	225	210		140	147	495	75	M 20
MMSI 1600	1000	30	432	170		255	255	210		150	141	505	85	M 20

Torsionally Elastic Coupling
Application Questionnaire



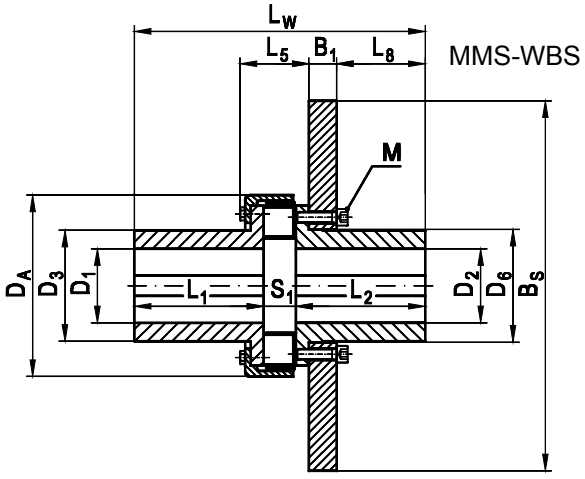
MMS-W



MMS-WBT

o exposition L7

o expostion L9



MMS-WBS

Torsionally elastic coupling

Please insert requested data**:**

1. o MMS-W o MMS-WBT o MMS-WBS
2. Material of hubs o C45 o GGG40
3. Capacity (kW)
4. Speed (min)
5. Accumulation frequency per hour
6. Ambient temperature (°C)
7. Hub bore D1 (mm)
8. Hub bore D2 (mm)
9. Hub length L1 (mm)
10. Hub length L2 (mm)

Please fax to: **0049 2302 70 78 7 10**

(Stamp of Sender)

Mischellaneous: