MULTI CROSS RILLO
High flexilble tyre coupling
with taper bushings

D2C
Designed to Customer

Your drive is our strength. Your strength is our drive.

Contents

D2C – Designed to Customer

The principle of Designed to Customer describes the recipe for success of REICH-KUPPLUNGEN: Utilizing our product knowledge, our customers are supplied with couplings which are developed and tailor-made to their specific requirements. The designs are mainly based on modular components to provide effective and efficient customer solutions. The unique form of close cooperation with our partners includes consultation, design, calculation, manufacture and integration into existing environments. Adapting our manufacturing to customer-specific production and utilizing global logistics concepts provides better after sales service - worldwide. This customer-oriented concept applies to both standard products and production in small batch sizes.

The company policy of REICH-KUPPLUNGEN embraces, first and foremost, principles such as customer satisfaction, flexibility, quality, prompt delivery and adaptability to the requirements of our customers.

REICH-KUPPLUNGEN supplies not only a coupling, but a solution: Designed to Customer.

General technical description

MULTI CROSS RILLO couplings are highly torsionally flexible tyre couplings with progressive torsional deflection characteristic. The salient feature of the MULTI CROSS RILLO shaft couplings is that the coupling hubs are supplied with commercially available taper bushes for nominal torques of up to 11500 Nm. This allows easy and time saving mounting of the coupling hubs on the shaft. Special tools are not required.

The torque transmission element of the MULTI CROSS RILLO coupling is a rubber tyre reinforced with fabric plies. This tyre transmits the torque without torsional backlash, it is wear-resistant and maintenance-free. The rubber tyre is slit, thus permitting easy radial installation with no need for axial movement of the coupled machines.

MULTI CROSS RILLO shaft couplings reduce torque surges substantially. In applications where torsional vibrations occur the stresses in the drive trains are minimized thanks to their high torsional flexibility.
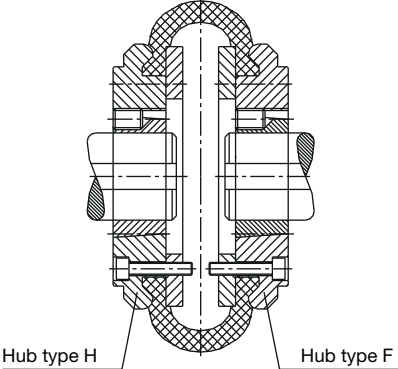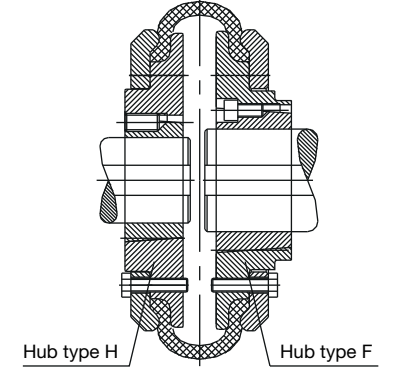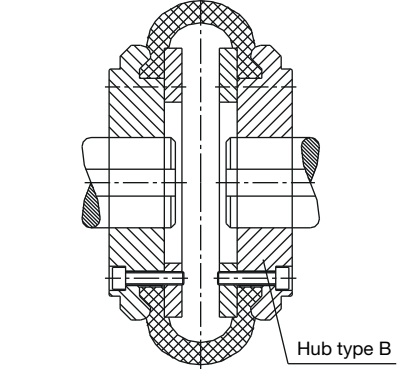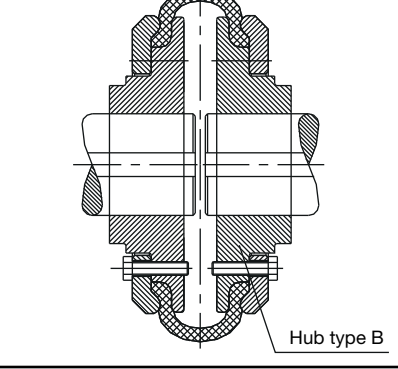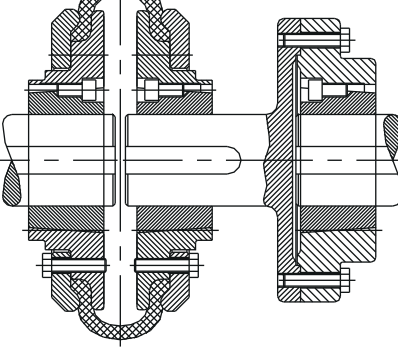
The use of a rubber tyre as the transmission element compensates to a large extent for axial, radial and angular shaft displacements.

The most important attributes and advantages of the highly flexible MULTI CROSS RILLO couplings

- High torsional flexibility with progressive torsional deflection characteristic

- High compensating capability for axial, radial and angular misalignments

- Easy and time saving mounting of the coupling hubs thanks to the use of taper bushes

- Radial change of the rubber element without axial movement of the coupled machines

- Backlash-free torque transmission even in case of alternating directions of rotation

- High torsional vibration and shock load damping capability

- Noise level insulation

- Wear-resistant and maintenance-free

MULTI CROSS RILLO shaft coupling types

Hub type H — Hub type F	**MULTI CROSS RILLO** Shaft couplingswith taper bushes **Sizes MCR 40 to 60** T_{KN} = 24 to 125 Nm Hub type H: taper bush connection from outside Hub type F: taper bush connection from inside
Hub type H — Hub type F	**MULTI CROSS RILLO** Shaft couplingswith taper bushes **Größen MCR 70 to 220** T_{KN} = 250 to 11500 Nm Hub type H: taper bush connection from outside Hub type F: taper bush connection from inside
Hub type B	**MULTI CROSS RILLO** Shaft couplings **Größen MCR 40 to 60** T_{KN} = 25 to 125 Nm Hub type B: without taper bush
Hub type B	**MULTI CROSS RILLO** Shaft couplings **Größen MCR 70 to 250** T_{KN} = 250 to 14500 Nm Hub type B: without taper bush
	MULTI CROSS RILLO Couplings with spacers **Größen MCR 40 to 140** T_{KN} = 25 to 2350 Nm The flange hub is also available without taper bush on request..

MULTI CROSS RILLO coupling layout

2 Rubber tyre, highly flexible elastic element

3 Clamp ring

4 Taper bush

1 Coupling hub type F,H or B

5 Fastening bolts
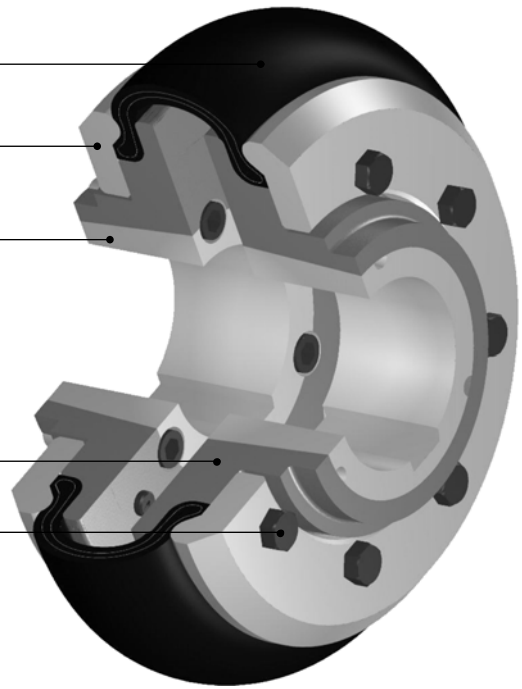
MULTI CROSS RILLO couplings have
no fail safe device.

Item	Specification	Material
1	Coupling hub	GGG 40
2	Rubber tyre	a) Standard version: Natural rubber tyre b) flame-resistant and antistatic: Chloroprene tyre
3	Clamp ring	Steel/GGG 40
4	Taper bush	GG 25
5	Fastening bolt	Grade 8.8

Technical details

Coupling size	Nominal torque T_{KN} Nm	Maximum torque T_{Kmax} Nm	Fatigue torque $T_{KW [10Hz]}$ Nm	Dynamic torsional stiffness C_T Nm/rad	Relative damping Ψ -	Maximum speed n_{max} rpm	Permissible shaftdisplacement [1]		
							axial ΔK_a mm	radial ΔK_r mm	winklig ΔK_w mm
MCR 40	25	65	11	285	0.9	5500	1.3	1.1	5.7
MCR 50	65	160	26	745	0.9	4500	1.7	1.3	7.0
MCR 60	125	320	53	1500	0.9	4000	2.0	1.6	8.7
MCR 70	250	490	81	2350	0.9	3600	2.3	1.9	10.0
MCR 80	380	760	125	3600	0.9	3100	2.6	2.1	12.0
MCR 90	500	1100	185	5200	0.9	3000	3.0	2.4	13.0
MCR 100	670	1500	250	7200	0.9	2600	3.3	2.6	15.0
MCR 110	880	2150	355	10000	0.9	2300	3.7	2.9	16.0
MCR 120	1350	3550	590	17000	0.9	2050	4.0	3.2	18.0
MCR 140	2350	5650	940	28000	0.9	1800	4.6	3.7	22.0
MCR 160	3800	9350	1560	44500	0.9	1600	5.3	4.2	24.0
MCR 180	6300	16500	2750	78500	0.9	1500	6.0	4.8	28.0
MCR 200	9300	23500	3900	110000	0.9	1300	6.6	5.3	30.0
MCR 220	11500	33000	5550	160000	0.9	1100	7.3	5.8	33.0
MCR 250	14500	42500	7100	200000	0.9	1000	8.2	6.6	37.0

[1] see explanation on page 12

Selection of the proper coupling size

The coupling size should be adequately to ensure that the permissible coupling load is not exceeded in any operating condition encountered. For drives which are not subjected to periodically recurring vibratory torque loads, the coupling design may be selected based on the driving torque with reference to the corresponding service factors.

For specific applications which are subject to periodically recurring high vibratory torques such as combustion engines, piston pumps and compressors, please consult us. Upon request and receipt of your pertinent technical details, we would be pleased to provide a torsional vibration analysis for your specific application.

Calculate the driving torque T_{AN}
Given a driving power P_{AN} and a coupling speed n_{AN}, the driving torque is calculated as follows:

$$T_{AN} \, [Nm] = 9550 \, \frac{P_{AN} \, [kW]}{n_{AN} \, [rpm]}$$

Select the coupling size
The nominal torque capacity T_{KN} of the coupling shall be at least equal to the max. drive torque T_{AN} while taking the service factors into account

$$T_{KN} \geq T_{AN} \cdot S_A$$

Nominal torque capacity T_{KN} in Nm, T_{AN} in Nm, service factor S_A as per table below

Service factor: S_A	Type of operation of the driven machine		
Prime mover	Load		
	uniform	medium shock	heavy shock
Electric motors, turbines, hydraulic motors	1.00	1.75	2.50
Combustion engines 4 – 6 cylinders	1.25	2.00	2.75
Combustion engines 1 – 3 cylinders	1.50	2.25	3.00

Service factor S_A allows for up to 25 starts per hour. For up to 120 starts per hour, the service factor shall be increased by 0.75.

Uniform loads: Agitators (light liquids), centrifugal pumps, blowers and fans (T ≤ 100 Nm), belt conveyors, screw pumps, filling machines, light-weight centrifuges.

Medium shock loads: Agitators (viscous liquids) construction machinery, blowers and fans (T ≤ 1000 Nm), mixers, conveyors, planing machines, plastics industry machinery, textile machines, heavy centrifuges.

Heavy shock loads: Agitators (light liquids), centrifugal pumps, blowers and fans (T ≤ 100 Nm), belt conveyors, screw pumps, filling machines, light-weight centrifuges.

Verify the maximum torque capacity T_{Kmax}
The max. coupling torque capacity T_{Kmax} must be greater than any max. torque T_{max} encountered in operation

$$T_{Kmax} \geq T_{Kmax}$$

Permissible ambient temperature range

$$- 25 \, °C \leq \vartheta \leq + 70 \, °C$$

For applications at higher ambient temperatures, please consult us

Calculation example:

Required: A MULTI CROSS RILLO shaft coupling for driving a planing machine positioned between the electric motor and the gearbox.

Electric motor $P_M = 75$ kW, speed $n_M = 1485$ min^{-1}, power requirement of the planing machine $P_{AN} = 60$ kW, up to 60 starts/hr, ambient temperature 25 °C

Solution: The MULTI CROSS RILLO coupling shall be designed for $P_{AN} = 60$ kW and with a service factor of $S_A = 2,5$ (1,75 as per table plus 0,75 for a starting frequency of more than 25).

Therefore $T_{AN} = 9550 \cdot P_{AN} \, / \, n_{AN} = 9550 \cdot 60$ kW / 1485 min^{-1} = 385 Nm and
$T_{KN} \geq T_{AN} \cdot S_A \ = \ 385$ Nm $\cdot \ 2,5 = 965$ Nm.

The MULTI CROSS RILLO coupling MCR 120 FF at $T_{KN} = 1350$ Nm should be selected for the present application.

Assignment to IEC standard motors

MULTI CROSS RILLO shaft couplings for IEC Standard motors acc. to DIN 42637/1

Motor size	Motor power at ~3000 rpm		Coupling	Motor power at ~1500 rpm		Couo-ling	Motorpower at ~1000 rpm		Coupling	Motor power at ~750 rpm		Coup-ling	Cyl. shaft extension D x L [mm]	
	power P [kW]	torque T [Nm]	MCR	power P [kW]	torque T [Nm]	MCR	power P [kW]	torque T [Nm]	MCR	power P [kW]	torque T [Nm]	MCR	3000 rpm	≤ 1500 rpm
56	0.09	0.29	40	0.06	0.38	40							9 x 20	
	0.12	0.38	40	0.09	0.57	40								
63	0.18	0.57	40	0.12	0.76	40							11 x 23	
	0.25	0.80	40	0.18	1.1	40								
71	0.37	1.2	40	0.25	1.6	40							14 x 30	
	0.55	1.8	40	0.37	2.4	40								
80	0.75	2.4	40	0.55	3.5	40	0.37	3.5	40				19 x 40	
	1.1	3.5	40	0.75	4.8	40	0.55	5.3	40					
90 S	1.5	4.8	50	1.1	7.0	50	0.75	7.2	50				24 x 50	
90 L	2.2	7.0	50	1.5	9.6	50	1.1	11	50					
100 L	3	9.6	50	2.2	14	50	1.5	14	50	0.75	10	50	28 x 60	
				3	19	50				1.1	14	50		
112 M	4	13	50	4	25	50	2.2	21	50	1.5	19	50		
132 S	5.5	18	60	5.5	35	60	3	29	60	2.2	28	60	38 x 80	
	7.5	24	60											
132 M	-	-	-	7.5	48	60	4	38	60	3	38	60		
							5.5	53	60					
160 M	11	35	70	11	70	70	7.5	72	70	4	51	70	42 x 110	
	15	48	70							5.5	70	70		
160 L	18.5	59	70	15	96	70	11	105	70	7.5	96	70		
180 M	22	70	70	18.5	118	70	-	-	-	-	-	-	48 x 110	
180 L	-	-	-	22	140	70	15	143	80	11	140	70		
200L	30	96	80	30	191	80	18.5	177	80	15	191	80	55 x 110	
	37	118	80				22	210	80					
225 S	-	-	-	37	236	90	-	-	-	18.5	236	90	55 x 110	60 x 140
225 M	45	143	80	45	287	100	30	287	100	22	280	90		
250 M	55	175	80	55	350	100	37	353	100	30	382	100	60 x 140	65 x 140
280 S				75	478	110	45	430	110	37	471	120	65 x 140	75 x 140
280 M				90	573	120	55	525	120	45	573	120		
315 S				110	700	120	75	716	120	55	700	120	65 x 140	80 x 170
315 M				132	840	140	90	860	140	75	955	140		
315 L				160	1019	140	110	1051	140	90	1146	140		
				200	1273	140	132	1261	140	110	1401	160		
355 L				250	1592	160	160	1528	160	132	1681	160	75 x 140	95 x 170
				315	2006	160	200	1910	160	160	2037	160		
							250	2388	180	200	2547	180		
400L				355	2260	180	315	3008	180	250	3183	180	80 x 170	100 x 200
				400	2547	180								

This assignment takes usual loads, service factor S_A = 1,75 into account. For other loads, a design according to „Selection of the proper coupling size" on page 6 is required. For plants with predominant periodic excitation, the design shall either comply with DIN 740 part 2, or a torsional vibration analysis shall be conducted. The analysis could be provided by us on request.

Power ratings

Speed rpm	Size	40	50	60	70	80	90	100	110	120	140	160	180	200	220	250
		Power rating [kW]														
100		0.25	0.69	1.31	2.62	3.98	5.2	7.1	9.2	14.1	24.6	39.8	66	97	120	152
200		0.50	1.38	2.62	5.24	7.96	10.5	14.2	18.4	28.3	49.2	79.6	132	195	241	304
300		0.75	2.07	3.93	7.85	11.94	15.7	21.4	27.6	42.4	73.8	119	198	292	361	455
400		1.01	2.76	5.24	10.47	15.92	20.9	28.5	36.9	56.5	98.4	159	264	390	482	607
500		1.26	3.46	6.54	13.09	19.90	26.2	35.6	46.1	70.7	123	199	330	487	602	759
600		1.51	4.15	7.85	15.71	23.87	31.4	42.7	55.3	84.8	148	239	396	584	723	911
740		1.86	5.11	9.69	19.37	29.4	38.7	52.7	68.2	105	182	294	488	721	891	1124
800		2.01	5.5	10.5	20.9	31.8	41.9	57.0	73.7	113	197	318	528	779	963	1215
960		2.41	6.6	12.6	25.1	38.2	50.3	68.4	88.5	136	236	382	633	935	1156	1458
1200		3.02	8.3	15.7	31.4	47.7	62.8	85.4	111	170	295	477	792	1169		
1480		3.72	10.2	19.4	38.7	58.9	77.5	105	136	209	364	589	976			
1600		4.0	11.1	20.9	41.9	63.7	83.8	114	147	226	394	637				
1800		4.5	12.4	23.6	47.1	71.6	94.2	128	166	254	443					
2000		5.0	13.8	26.2	52.4	79.6	105	142	184	283						
2200		5.5	15.2	28.8	57.6	87.5	115	157	203							
2400		6.0	16.6	31.4	62.8	95.5	126	171								
2600		6.5	18.0	34.0	68.1	103	136	185								
2800		7.0	19.4	36.6	73.3	111	147									
2960		7.4	20.5	38.7	77.5	118	155									
3100		7.8	21.4	40.6	81.2	123										
3600		9.0	24.9	47.1	94.2											

The given power ratings apply to theservice factor $S_A = 1,0$,see page 6.
For other service conditions and/orother power ratings, the design shouldbe selected according to page 6.
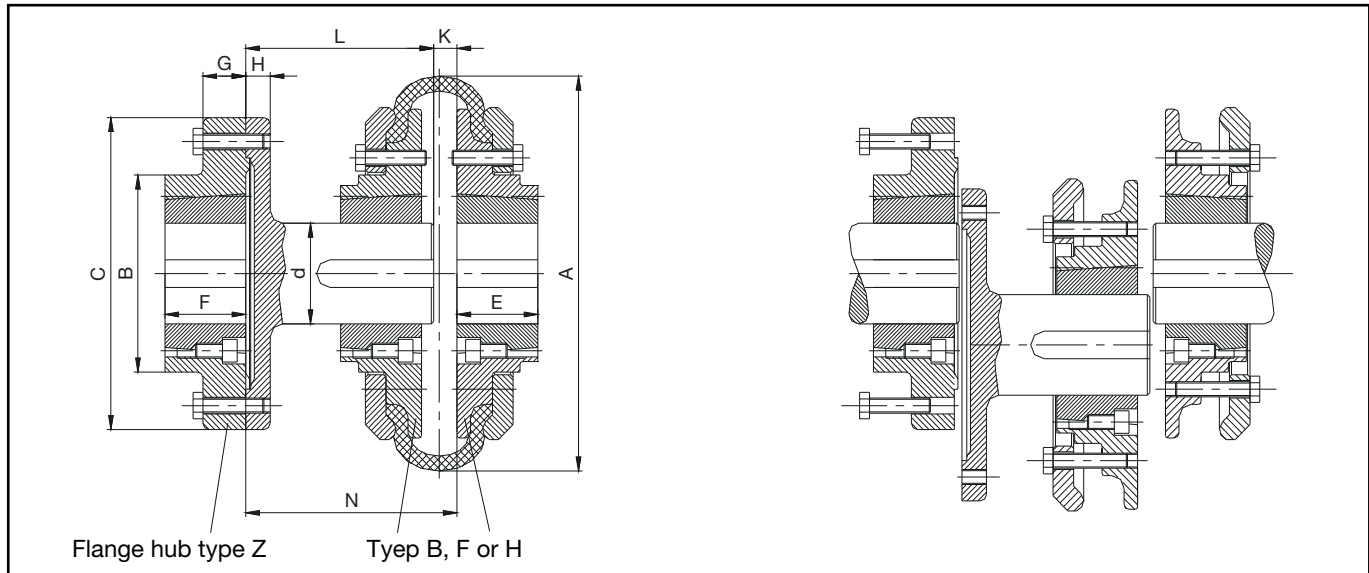
MULTI CROSS RILLO shaft couplings

Type B	Type F	Type H			Type B	Type F	Typ He	
	Sizes MCR 40 to 60					Sizes MCR 70 to 220		
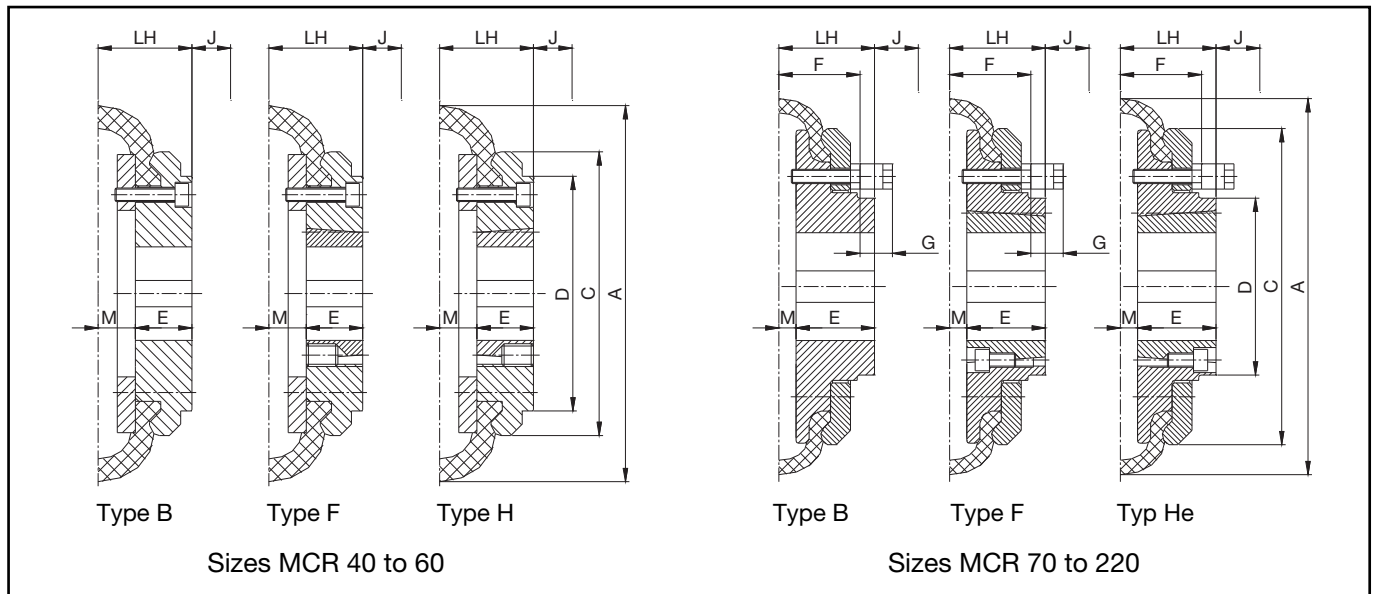
Coupling size	Hub type	Taper bush	Bore max. mm	A mm	C mm	D mm	LH mm	M mm	E mm	F mm	G[2] mm	J[3] mm	Mass[1] kg	Moment of inertia [1] kgm²
MCR 40	B	-	32	104	82	-	33	11	22	-	-	-	1.0	0.001
	F	1008	32				33		22			29	0.9	0.001
	H	1008	32				33		22			29	0.9	0.001
MCR 50	B	-	38	133	100	79	45	13	32	-	-	-	1.9	0.002
	F	1210	32				38		25			38	1.4	0.002
	H	1210	32				38		25			38	1.4	0.002
MCR 60	B	-	45	165	125	70	55	17	38	-	-	-	3.5	0.005
	F	1610	40			103	42		25			38	2.3	0.004
	H	1610	40			103	42		25			38	2.3	0.004
MCR 70	B	-	50	187	144	80	47	12	35	100	13	-	3.2	0.006
	F	2012	50				44		32			42	2.6	0.005
	H	1610	40				42		25			38	2.7	0.005
MCR 80	B	-	60	211	167	98	55	13	42	108	16	-	5.2	0.021
	F	2517	60			97	58		45			48	4.2	0.012
	H	2012	50			98	45		32			42	4.4	0.014
MCR 90	B	-	70	235	188	112	64	14	50	120	16	-	7.5	0.025
	F	2517	60			108	60		45			48	6.4	0.025
	H	2517	60			108	60		45			48	6.4	0.025
MCR 100	B	-	80	254	216	125	71	14	57	124	16	-	10.9	0.073
	F	3020	75			120	66		51			55	8.6	0.042
	H	2517	60			113	66		45			48	9.4	0.047
MCR 110	B	-	90	279	233	128	75	13	62	124	16	-	13.5	0.105
	F	3020	75			134	64		51			55	10.9	0.064
	H	3020	75			134	64		51			55	10.9	0.064
MCR 120	B	-	100	314	264	143	85	15	70	134	16	-	19.2	0.163
	F	3525	90			140	80		65			67	15.2	0.123
	H	3020	75			140	66		51			55	16.3	0.127
MCR 140	B	-	130	359	311	178	111	16	95	146	17	-	31.8	0.452
	F	3525	90				82		65			67	25.8	0.373
	H	3525	90				82		65			67	25.8	0.373
MCR 160	B	-	140	402	345	187	117	15	102	156	19	-	42.5	0.737
	F	4030	100			197	92		77			80	34.3	0.594
	H	4030	100			197	92		77			80	34.3	0.594
MCR 180	B	-	150	470	398	200	137	23	114	188	19	-	57.6	1.302
	F	4535	110			205	112		89			89	47.2	1.078
	H	4535	110			205	112		89			89	47.2	1.078
MCR 200	B	-	150	508	429	200	138	24	114	206	19	-	71.5	1.847
	F	4535	110			205	113		89			89	61.0	1.592
	H	4535	110			205	113		89			89	61.0	1.592
MCR 220	B	-	160	562	474	218	155	28	127	236	20	-	90.0	2.829
	F	5040	125			223	130		102			92	77.0	2.431
	H	5040	125			223	130		102			92	77.0	2.431
MCR 250	B	-	190	628	532	254	162	30	132	250	25	-	112.0	3.645

[1] Mass and moment of inertia for complete coupling, including tyre and taper bush
[2] G = Space required for removing and changing the rubber tyre
[3] J = Space required for fixing and removing the bushes and clamp rings

MULTI CROSS RILLO shaft couplings with spacers

Flange hub type Z   Tyep B, F or H

Coupling size	Taper bush			Bohrung				A	C	D	d	E			F	L	K	N		Mass[1]	Moment of inertia [1]
	Type F	Type H	Type Z	Type B max. mm	Type F max. mm	Type H max. mm	Type Z max. mm	mm	mm	mm	mm	Type B mm	Type F mm	Type H mm	Type Z mm	min. mm	min. mm	von mm	bis mm	kg	kgm²
MCR 40 Z²)	1008	1008	1210	32	22	22	32	104	83	118	25	22	22	22	25	65	6	80		2.6	0.010
									83	118	25					77	6	100		2.6	0.010
			1610				40		80	127	32				25	88	9	100	113	3.2	0.014
									80	127	32					128	9	140	150	3.4	0.015
MCR 50 Z	1210	1210	1610	38	32	32	40	133	80	127	32	32	25	25	25	85	9	100	116	3.2	0.014
																125	9	140	156	3.4	0.015
MCR 60 Z	1610	1610	1610	45	40	40	40	165	80	127	32	38	25	25	25	78	9	100	124	3.2	0.014
																118	9	100	164	3.4	0.015
MCR 70 Z³)	2012	1610	2517	50	50	40	60	187	125	180	48	35	32	25	45	80	9	100	114	7.8	0.075
																120	9	140	154	8.4	0.080
																160	9	180	194	9.0	0.084
MCR 80 Z	2517	2012	2517	60	60	50	60	211	123	178	48	42	45	32	45	78	9	100	117	7.8	0.075
																116	9	140	158	8.4	0.080
																156	9	180	198	9.0	0.084
MCR 90 Z	2517	2517	2517	70	60	60	60	235	123	178	48	50	45	45	45	116	9	140	158	8.4	0.080
																156	9	180	198	9.0	0.084
MCR 100 Z	3020	2517	3020	80	75	60	75	254	146	216	60	57	51	45	51	116	9	140	158	14.5	0.202
																156	9	180	198	15.4	0.212
MCR 110 Z	3020	3020	3020	90	75	75	75	279	146	216	60	62	51	51	51	116	9	140	158	14.5	0.202
																156	9	180	198	15.4	0.212
MCR 120 Z	3525	3020	3525	100	90	75	90	314	178	248	80	70	65	51	63	114	9	140	160	22.2	0.331
																154	9	180	200	23.8	0.350
MCR 140 Z	3525	3525	3525	130	90	90	90	359	178	248	80	95	65	65	63	111	9	140	163	22.2	0.331
																151	9	180	203	23.8	0.350

Dimensions G and H on request. Further dimensions see MCR shaft couplings on page 9

[1] Mass and moment of inertia for complete coupling, including tyre and taper bush

²) MCR 40 B coupling half for spacer shaft required

³) MCR 70 F coupling half for spacer shaft required

Ordering information

The following parts are required for a complete MULTI CROSS RILLO shaft coupling:

a) 2 coupling halves, each consisting of hub (type F, H or B), clamp ring, fastening bolts
b) 1 rubber tyre
c) bFor hub type F or H: taper bush size with indication of the bore dimensions; e.g. bush 3020 with 65 mm bore, corresponding designation: 3020.65, for hub type B only bore diameter requested

Ordering example: 1 MULTI CROSS RILLO shaft coupling size MCR 100 FH

consisting of

1 coupling half MCR 100 F (hub, clamp ring and set of fastening bolts)
1 coupling half MCR 100 H (hub, clamp ring and set of fastening bolts)
1 rubber tyre MCR 100
1 taper bush 3020.65 (keyway acc. to DIN 6885/1)
1 taper bush 2517.48 (keyway acc. to DIN 6885/1)

The following parts are required for a complete MULTI CROSS RILLO shaft coupling with spacer:

a) 2 coupling halves, each consisting of hub (type F or H), clamp ring, fastening bolts
b) 1 rubber tyre
c) For hub type F or H: taper bush size with indication of the bore dimensions; e.g. bush 2517 with 48 mm bore, corresponding designation: 2517.48, for hub type B only bore diameter requested
d) Flange hub with specification of the taper bush size and the motor shaft diameter, spacer (with indication of the required length L, see page 10) and fastening bolts. The flange hub is also available without a taper bush but with cylindrical bore on request.

Ordering example: 1 MULTI CROSS RILLO coupling with spacer shaft size MCR 90 FF Z

consisting of

2 coupling halves MCR 90 F (hub, clamp ring and set of fastening bolts)
1 rubber tyre MCR 90
1 taper bush 2517.48 (keyway acc. to DIN 6885/1) dimension d, see page 10
1 taper bush 2517.48 (keyway acc. to DIN 6885/1) for pump shaft
1 spacer shaft with L =116 mm
1 flange hub MCR 90 Z
1 taper bush 2517.55 (keyway acc. to DIN 6885/1)

Available taper bushes

Taper bushes mount MULTI CROSS RILLO couplings in a shrink-fit-like manner on the shafts. The taper bushes shown beloware available from stock.

Taper bushes are also available with inch bores.

No.	Metric bores and keyways acc. to DIN 6885/1																
1008	9	10	11	12	14	16	18	19	20	22							
1210	11	12	14	16	18	19	20	22	24	25	28	30	32				
1610	14	16	18	19	20	22	24	25	28	30	32	35	38	40	42		
2012	14	16	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50
2517	16	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	55	60
3020	25	28	30	32	35	38	40	42	45	48	50	55	60	65	70	75	
3525	35	38	40	42	45	48	50	55	60	65	70	75	80	85	90		
4030	40	42	45	48	50	55	60	65	70	75	80	85	90	95	100		
4535	55	60	65	70	75	80	85	90	95	100	105	110					
5040	70	75	80	85	90	95	100	105	110	115	120	125					

Permissible shaft displacements of MULTI CROSS RILLO couplings

ΔK_a, ΔK_r, ΔK_w
see technical details
on page 5
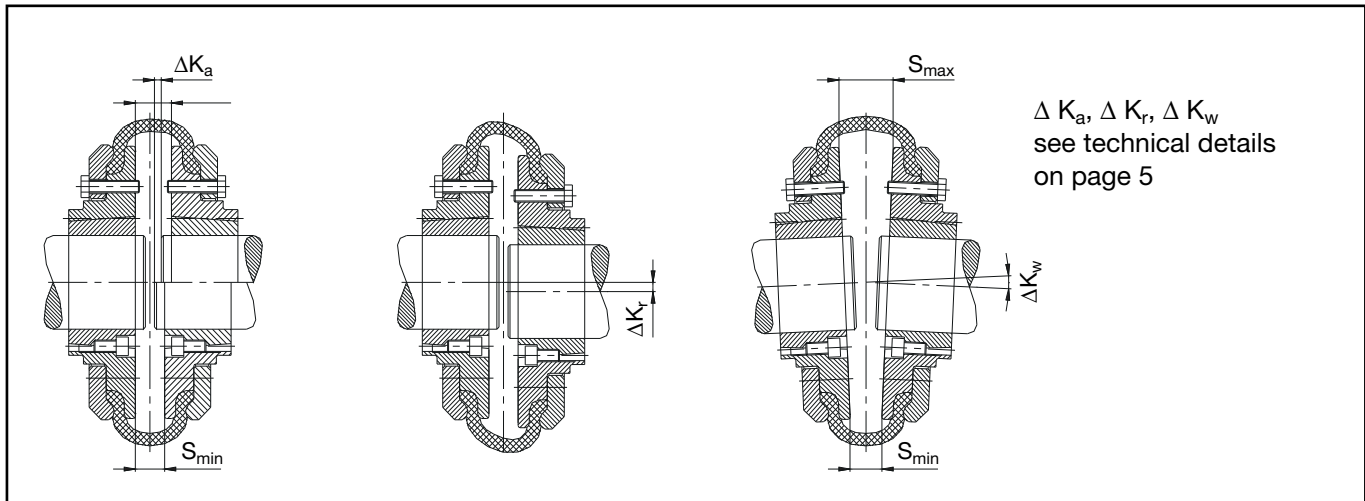
The indicated values for ΔK_w [mm] = $S_{max} - S_{min}$ (page 5) correspond to an angular displacement of $\Delta K_w = 4°$. This permissible angular shaft displacement is the max. angular misalignment of the coupling halves which may only be fully utilized when no axial and radial misalignments exists. An angular displacement of $\Delta K_w = 2°$ is permissible when axial and radial misalignments of ½ ΔK_a and ½ ΔK_r are present.

Mounting instructions for MULTI CROSS RILLO shaft couplings

1. The outer taper of the bush and the hub bore with inner taper shall be bright and free from grease prior to assembly. Any preservatives shall be removed completely.

2. Insert the bush into the coupling hub making sure that all connecting bores are lined up. This means that the threaded half holes shall be opposite the plain half holes (Fig. 1).

3. Lightly oil or grease the mounting screws and screw them in loosely. Do not tighten the screw yet (Fig. 2).

4. Push the coupling hub with inserted taper bush onto the cleaned shaft with key and position it properly so that the clearance M (see Table 1 and Fig. 3) is maintained. Attach the (outer or inner) clamp ring loosely prior to assembly of the hub.

5. Tighten the screws uniformly with a torque wrench to half of the specified tightening torque M_{A2} (Table 2).

6. Hold a piece of wood or brass against the bush and hit it lightly with a hammer and tighten the screws to the specified tightening torque M_{A2} (Table 2). Repeat, if necessary.
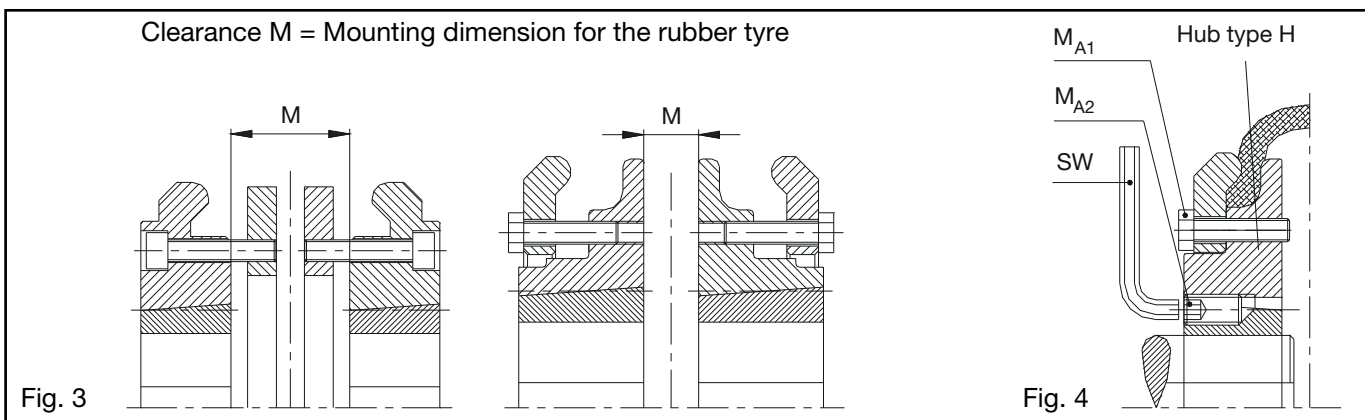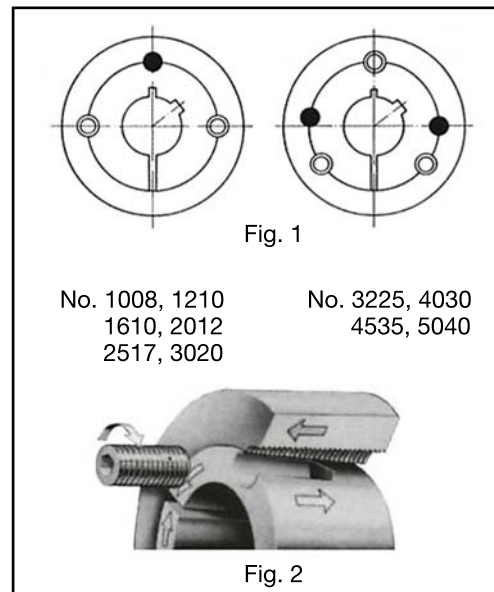

Fig. 1

No. 1008, 1210
1610, 2012
2517, 3020

No. 3225, 4030
4535, 5040

Fig. 2

Clearance M = Mounting dimension for the rubber tyre

M

M

M_{A1}

M_{A2}

SW

Hub type H

Fig. 3

Fig. 4

Table 1: Clearance M and tightening torques for mounting the clamp ring

Coupling size MCR	40	50	60	70	80	90	100	110	120	140	160	180	200	220	250
Clearance M [mm]	22	25	33	23	25	27	27	25	29	32	30	46	48	55	59
Screw size	M5	M6	M6	M8	M8	M10	M10	M10	M12	M12	M16	M16	M16	M20	M20
Number of screws	4	4	10	10	12	12	12	12	12	16	16	20	24	24	28

Tightening torque MA_1 on request.

Table 2: Tightening torques for mounting the taper bushes

Coupling size MCR	40	50	60 70	70 80	80 90 100	100 110 120	120 140	160	180 200	200
Taper bush Nr.	1008	1210	1610	2012	2517	3020	3525	4030	4535	5040
Screw size B.S.W. *)	$^1/_4$ x 13	$^3/_8$ x 16	$^3/_8$ x 16	$^7/_{16}$ x 22	$^1/_2$ x 25	$^5/_8$ x 32	$^1/_2$ x 38	$^5/_8$ x 45	$^3/_4$ x 51	$^7/_8$ x 57
Tightening torque M_{A2} [Nm]	5.7	20	20	31	49	92	115	172	195	275
Screw size SW [mm]	3	5	5	6	6	8	10	12	14	14

*) No. 1008/1210/1610/2012/2517/ 3020 set screw ; *) Nr. 3525/4030/4535/5040 socket head cap screws

Removing the coupling hubs with taper bushes

1. Loosen and remove all screws. Depending on the taper bush size, screw 1 or 2 greased screws into the half threaded push-off holes of the taper bush (Fig. 5).

2. Tighten the screws uniformly until the bush detaches from the hub..

3. BThe hub can be pulled off the shaft together with the taper bush as soon as the taper bush is detached.
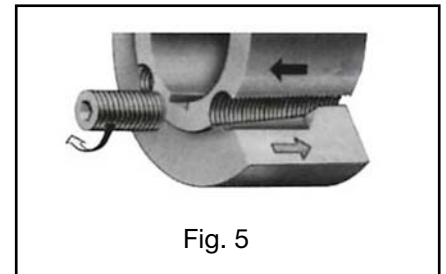

Fig. 5

Instructions for inserting the rubber tyre

1. Make sure that the coupling hubs are positioned at right angles on the shaft ends. Align the coupling hubs to each other in the axial, radial and angular directions. See also permissible shaft displacements on pages 5 and 12. The radial and angular displacements should be kept as small as possible, particularly in high speed applications.

2. Pull the rubber tyre that is slit for assembly apart and place it over the coupling hub. Make sure that the tyre lies completely against the hub. If not, apply light hammer blows onto the outer contours of the tyre. After completion of the assembly, a gap as specified in Table 3 shall exist between the ends of the rubber tyre.

3. Fit the remaining clamp rings, if any, and tighten the screws hand-tight. Thereafter, tighten them uniformly in an alternating sequence (half a turn each) until the specified tightening torque M_{A1} (Table 1 on page 13 and Fig. 4 on page 12) is reached.


Gap
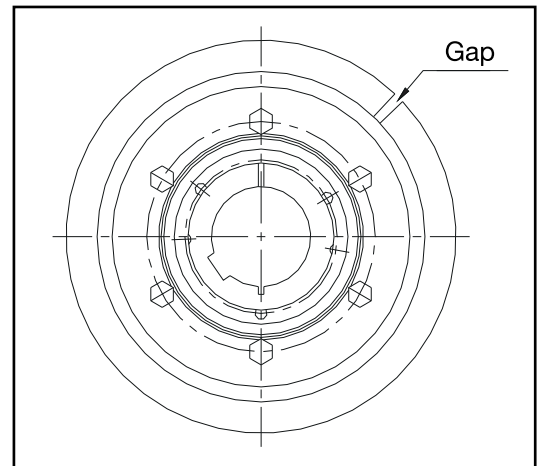
Table 3

Coupling size MCR	40 to 60	70 to 120	140 to 160	180 to 250
Rubber tyre gap [mm]	2	3	5	6

Mounting instructions for MULTI CROSS RILLO shaft couplings with spacer

1. According to the mounting instructions for MULTI CROSS RILLO shaft coupling hubs with taper bushes shall be mounted completely on the shaft ends. It is important to make sure that the coupling hubs are flush with the shaft ends to enable subsequent assembly or disassembly of the spacer.

2. Mount the flange hub properly on the shaft. It is important to ensure that the flange hub does not protrude from the shaft end.

3. Mount the spacer (with the coupling hub placed on the top) to the flange hub using the proper tightening torque M_{A3} (Table 4).

4. Align the MULTI CROSS RILLO coupling and insert the tyre according to the above instructions.

Table 4: Tightening torques for mounting the spacers

Coupling size MCR	40		50	60	70	80	90	100	110	120	140
Screw size	M6	M8	M8	M8	M10	M10	M10	M16	M16	M16	M16
Number of screws	6	6	6	6	6	6	6	8	8	8	8
Tightening torque M_{A3} [Nm]	10	25	25	25	50	50	50	210	210	210	210

Hub type Z   Hub type B/F/H   Hub type B/F/H
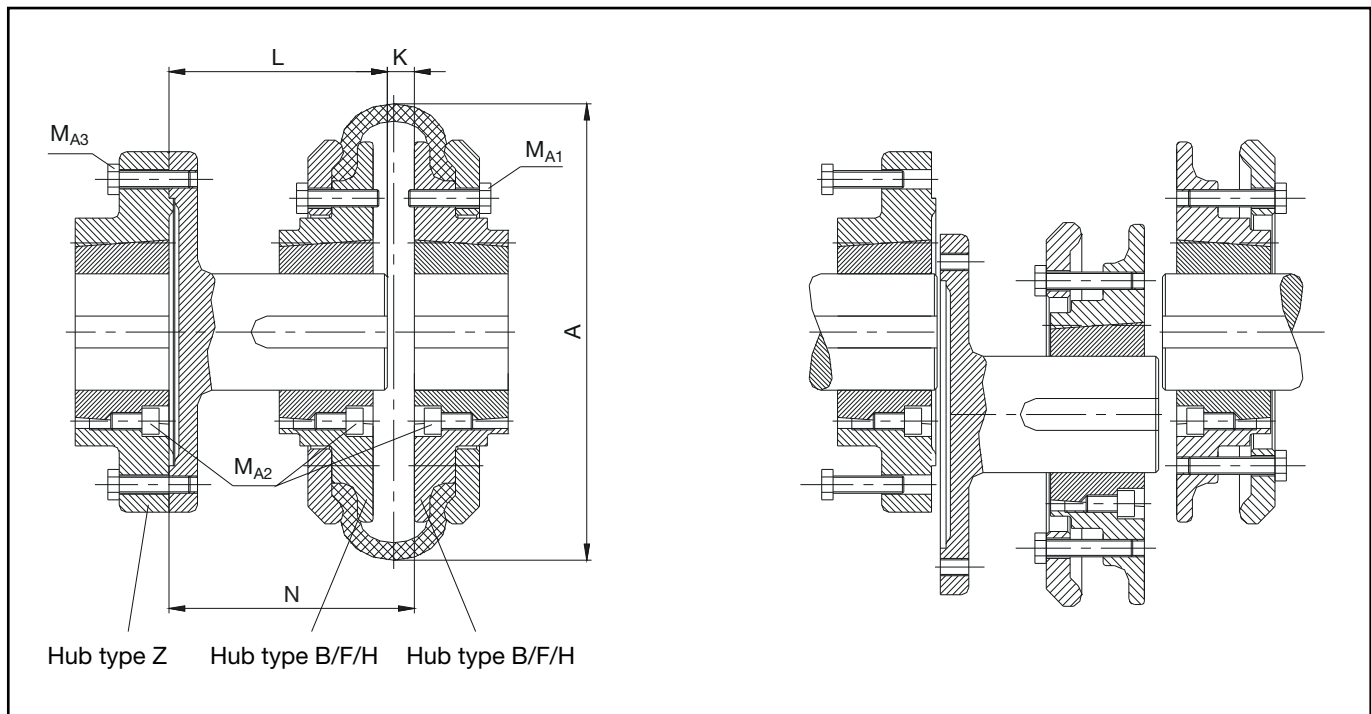
For dimensions L, N, K and A see page 10

Technical note:

The technical data applies only to the complete coupling or the corresponding coupling elements. It is the customer's/user's responsibility to ensure there are no inadmissible loads acting on all the components. Especially existing connections, like bolt connections, have to be checked regarding the transmittable torque, if necessary other measures, e.g. additional reinforcement by pins, may be required. It is the customer's/user's responsibility to make sure the dimensioning of the shaft and keyed or other connection, e.g. shrinking or clamping connection, is correct.

REICH-KUPPLUNGEN have an extensive programme of couplings and coupling systems to cover nearly every drive configuration. Furthermore customized solutions can be developed and be manufactured also in small series or as prototypes. Calculation programmes are available for coupling selection and sizing. - Please challenge us!

Safety precautions
It is the customer's and user's responsibility to observe the national and international safety rules and laws. Proper safety devices must be provided for the coupling to prevent accidental contact.

Check all bolted connections for the correct tightening torque and fit after a short running period preferably after a test run.

Questionnaire

(Please return copy of this sheet duly filled in)

From (stamp)

Contact person: _____

Department: _____

Tel.:_____ Fax:_____

**Maschinenfabrik
Dipl.-Ing. Herwarth Reich GmbH
Post box 10 20 66**

D - 44720 Bochum

Inquiry: ☐   **Order:** ☐

_____

_____

General system details:

Environmental conditions/place of installation: _____

_____

Load: uniform ☐   medium shock ☐   heavy shock ☐

Ambient temperature at the coupling: _____ °C

Daily period of operation: _____ hours/day

Starting frequency: _____ per hours

Displacement:

ΔK_a: _____ mm / ΔK_r: _____ mm / ΔK_w: _____ °

Input side:

Prime mover: Diesel engine / hydraulic / electric motor

Others: _____

Nominal power:_____ kW at speed: _____ rpm

Speed range: from _____ to _____ rpm
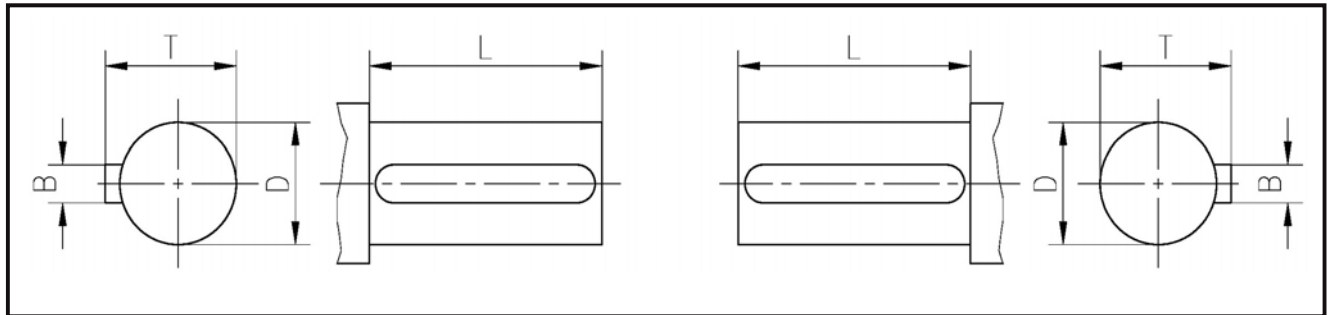
Max. starting/shock torque:_____ Nm

Output side:

Driven machine: _____

Nominal power:_____kW

Max. load torque: _____ Nm

In case of uneven torque load:

from_____ to _____ Nm

Balancing: yes ☐   no ☐

Balancing speed: _____ rpm / grade: G =_____

Balancing with keyway: yes ☐   no ☐

Annotations: _____

_____

Shaft dimensions:

Further coupling design specifications (e.g. with brake drum/brake disc/material): _____

_____

_____

Further details of the complete system / principle sketch of installation situation: