Reich Kupplungen

Dipl.-Ing. Herwarth Reich GmbH

D2C
Designed to Customer

MULTI MONT ASTRA

Torsionally flexible claw coupling with or without taper bush

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





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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.

Edition February 2013

The present MULTI MONT edition renders parts of the previous MULTI MONT catalogues obsolete.
All dimensions in millimeters.
We reserve the right to change dimensions and/or design details without prior notice.

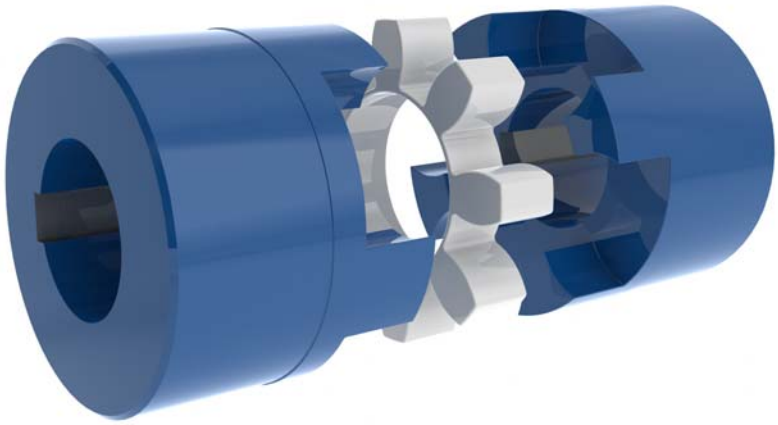
General technical description
Flexible MULTI MONT ASTRA Coupling

Type series MMA-W

The flexible Reich MULTI MONT ASTRA coupling is a fail-safe claw coupling with flexible element for a torsionally flexible shaft connection. The advantages of the all over machined MULTI MONT ASTRA coupling, and of the claw flanks in particular, are the precise running characteristic and the extended service life.

MULTI MONT ASTRA couplings are fail-safe up to the breaking torque of the claws and thus ensure maximum operational safety.

The N version of the flexible coupling element offers a hardness of 92° Shore A (white) and the S version a hardness of 98° Shore A (blue). The salient features of the flexible coupling element are not only its high resistance to wear and tear but also to oil, ozone and aging. Shocks, torsional vibrations and noise are efficiently absorbed thanks to the inherent flexibility. The flexible element of the coupling is dimensioned such that radial, axial and angular movements are compensated for between the two coupling halves. The fixed position of the flexible element allows axial deformation so that no detrimental axial loads can act upon the machine bearings even if vibratory torques are encountered. The flexible element of the MULTI MONT ASTRA coupling is designed for continuous loads at up to 90°C and short-time loads at up to 120 °C. Even temperatures as low as –40°C are acceptable.



Minimum outside diameters combined with a maximum bore guarantee both, low weights and low moments of inertia. The flexible MULTI MONT ASTRA coupling, being of the plug-in type, is designed for ease of alignment. The balancing quality complies with the DIN-ISO 1940 G 16 quality range.

MMA-T series with taper bushes

Combining the advantages of a flexible coupling with the advantages of a taper bush system, the MULTI MONT ASTRA coupling of the MMA-T series lends itself well to quick and easy assembly when torsionally flexible shaft connections and compensation of shaft alignment errors are required. The MMA-T series with taper bushes offers the distinct advantage that even in the event of major shaft tolerances, backlash-free and axial fixing on the shaft is ensured. In addition, the slide fit facilitates axial alignment of the coupling. The flexible element can be changed by axial movement of the coupling halves with no need for removing connected machinery.

The Reich MULTI MONT ASTRA coupling finds its applications in general engineering in all places where a reliable shaft connection is demanded between the motor and the driven machine.

Salient features and advantages of the MULTI MONT ASTRA claw coupling

- compensate axial-, radial- and angular misalignments
- absorb shocks and vibrations
- faile safe and withstand high overloads
- well suited as plug-in type couplings ensuring ease of assembly and alignment
- maintenance-free

Technical details

Size	Max. Speed at V = 40 m/s rpm	Element version N			Element version S			Max. shaft displacement [2]		
		Nominal torque T_{KN} Nm	Max. torque T_{Kmax} Nm	Alternating torque T_{KW} Nm	Nominal torque T_{KN} Nm	Max. torque T_{Kmax} Nm	Alternating torque T_{KW} Nm	radial ΔK_r mm	axial ΔK_a mm	angular[1] ΔK_w °
19	19000	10	20	2.6	17	34	4.4	0.20	1.2	1.2
24	14000	35	70	9	60	120	16	0.22	1.4	0.9
28	11800	95	190	25	160	320	42	0.25	1.5	0.9
38	9500	190	380	49	325	650	85	0.28	1.8	1.0
42	8000	265	530	69	450	900	117	0.32	2.0	1.0
48	7100	310	620	81	525	1050	137	0.36	2.1	1.1
55	6300	410	820	105	685	1370	178	0.38	2.2	1.1
65	5600	625	1250	163	940	1880	245	0.42	2.6	1.2
75	4750	1280	2560	333	1920	3840	499	0.48	3.0	1.2
90	3750	2400	4800	624	3600	7200	936	0.50	3.4	1.2

Torques for coupling fit with keyway

[1] For a speed of 1500 rpm, for other speeds see page 5 [2] For an ambient temperature of 30°C

Selection of the proper 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 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 drives with combustion engines or prime movers which are subject to periodically recurring vibratory torques, the final selection of the coupling should be verified by a full torsional vibration analysis which will be conducted by us on request.

1. Calculate the driving torque T_{AN}

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

2. Determine the nominal torque capacity T_{KN} of the coupling based on the driving torque T_{AN} with reference to the service factors

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

3. The max. torque capacity T_{Kmax} of the coupling shall be at least equal to the maximum torque T_{max} encountered in operation while taking the temperature factor S_t into account

$$T_{Kmax} \geq T_{max} \cdot S_t$$

4. The torsional vibration analysis for verifying the proper coupling selection shall prove that the permissible continuous vibratory torque capacity T_{KW} of the coupling is at least equal to the maximum vibratory torque T_W which occurs in the operating speed range with reference to temperature and frequency

$$T_{KW\,(10Hz)} \geq T_w \cdot S_t \cdot S_f$$

The frequency factor S_f takes the frequency dependence of the permissible continuous vibratory torque capacity $T_{KW\,(10\,Hz)}$ at operating frequency f into account

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

Service factors

Load classification factor Sm

Prime mover	Load classification of the driven machine		
	U	M	H
Electric motors, turbines, hydraulic motors	1	1.25	1.75
Combustion engines ≥ 4 cylinders cyclic variation ≥ 1 : 100	1.25	1.5	2.0

U = uniform load M = medium shock load H = heavy shock load

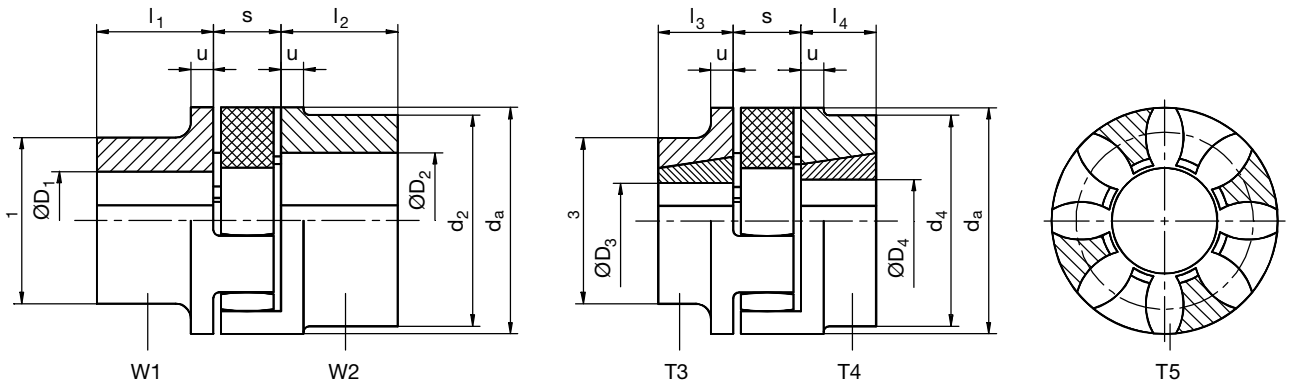
Temperature facto S_t

Ambient temperature	-20 °C	+40 °C	+60 °C	+80 °C
S_t	1.0	1.2	1.5	1.8

Starting factor S_z

Starting frequency per hour.	30	60	120	240	> 240
S_z	1.0	1.1	1.2	1.3	on request

Dimensions table



MMA-W series

Size	Part W1				Part W2						
	D_1		d_1	l_1	D_2		d_2	l_2	d_a	u	s
	min.	max.			min.	max.					
19	-	19	32	25	17	24	40	25	40	5	16
24	-	24	40	30	22	28	48	30	55	6	18
28	-	28	48	35	26	38	65	35	65	7	20
38	10	38	66	45	36	45	78	45	80	8	24
42	12	42	75	50	40	55	94	50	95	10	26
48	13	48	85	56	46	60	104	56	105	11	28
55	18	55	98	65	53	70	118	65	120	13	30
65	20	65	115	75	63	75	134	75	135	14	35
75	28	75	135	85	73	90	158	85	160	16	40
90	38	90	160	100	88	100	180	100	200	19	45

Keyways acc. to DIN 6885/1, tolerance zone JS9

MMA-T series

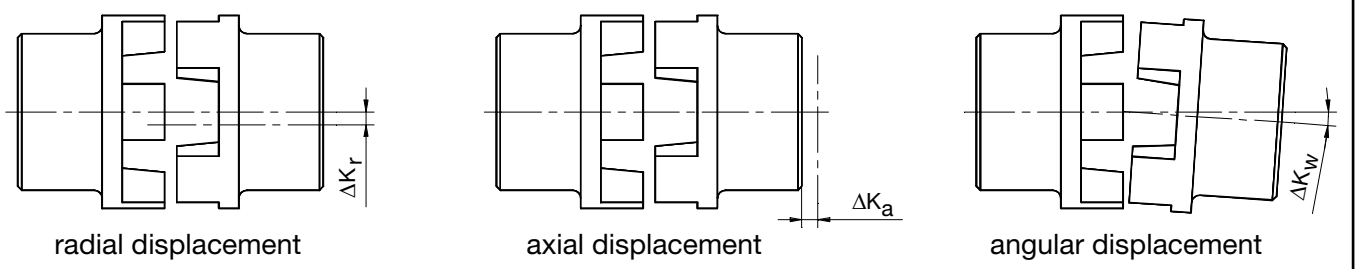
Size	Part T3					Part T4				
	D_3		Taper bush No.	d_3	l_3	D_4		Taper bush No.	d_4	l_4
	min.	max.				min.	max.			
19	-	-	-	-	-	-	-	-	-	-
24	10	22	1008	55	22	10	22	1008	55	22
28	10	25	1108	65	22	10	25	1108	65	22
38	10	25	1108	78	22	10	25	1108	78	22
42	14	40	1610	94	25	14	40	1610	94	25
48	14	40	1615	104	38	14	40	1615	104	38
55	14	50	2012	118	32	14	50	2012	118	32
65	14	50	2012	126	32	16	60	2517	134	45
75	16	60	2517	158	45	25	75	3020	158	51
90	25	75	3020	160	51	35	90	3535	180	89

Parts W1, W2, T3 and T4 can be combined with each other as desired.

Ordering example

	Sizee	Element version	Part	Bore	Part	Bore
MMA	42	N.	W1.	42.	T4.	38

Permissible displacements

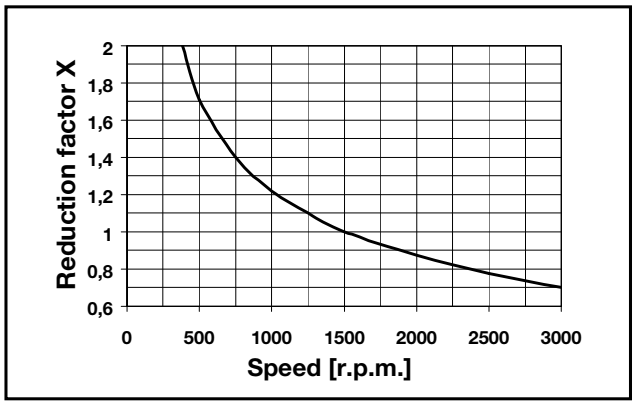


The permissible displacement values as given in the „Technical details“ table are dependent on the rotational speed and decrease when different types of displacement occur simultaneously.

Rule: $\frac{\Delta W_r}{\Delta K_r} + \frac{\Delta W_a}{\Delta K_a} + \frac{\Delta W_w}{\Delta K_w} \leq X$

$\Delta K_{r/a/w}$ = permissible radial, axial or angular displacement of the shafts or coupling halves (see „Technical details“ table).

$\Delta W_{r/a/w}$ = measured radial, axial or angular displacement of the shaft or coupling halves.



Weights and moments of inertia

Size	Weight kg				Moment of inertia kgm^2			
	Part W1	Part W2	Part W3	Part W4	Part W1	Part W2	Part W3	Part W4
19	0.16	0.21	-	-	0.00003	0.00005	-	-
24	0.32	0.40	0.39	0.39	0.00011	0.00015	0.00017	0.00017
28	0.52	0.76	0.55	0.55	0.00024	0.00049	0.00032	0.00032
38	1.1	1.4	0.86	0.86	0.00087	0.0013	0.00074	0.00074
42	1.7	2.3	1.4	1.4	0.0018	0.0031	0.0017	0.0017
48	2.8	3.1	2.5	2.5	0.0031	0.0052	0.0037	0.0037
55	3.7	4.6	2.7	2.7	0.0062	0.010	0.0054	0.0054
65	5.7	7.0	3.4	4.8	0.013	0.019	0.0082	0.012
75	8.8	11	6.8	7.3	0.027	0.041	0.023	0.026
90	15	18	9.5	16	0.068	0.090	0.044	0.081

Weights and moments of inertia apply to medium bore diameters including taper bushes

Materials

Parts W1, W2, T3, T4 and taper bushes made of GG-25 – flexible element part 5 made of Hytrel.

Taper bushes

each with keyway acc. to DIN 6885/1 / tolerance zone JS9.

Taper bush No.	Length [mm]	Width across flats [mm]	Bolt tightening torque [Nm]	Bore diameters of available taper bushes [mm]																			
1008	22	3	5,6	10	11	12	14	16	18	19	20	22											
1108	22	3	5,6	10	11	12	14	16	18	19	20	22	24	25									
1610	25	5	20	14	16	18	19	20	22	24	25	28	30	32	35	38	40						
1615	38	5	20	14	16	18	19	20	22	24	25	28	30	32	35	38	40						
2012	32	5	31	14	16	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50		
2517	45	6	48	16	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	55	60	
3020	51	8	90	25	28	30	32	35	38	40	42	45	48	50	55	60	65	70	75				
3535	89	10	90	35	38	40	42	45	48	50	55	60	65	70	75	80	85	90					

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.

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