D2C
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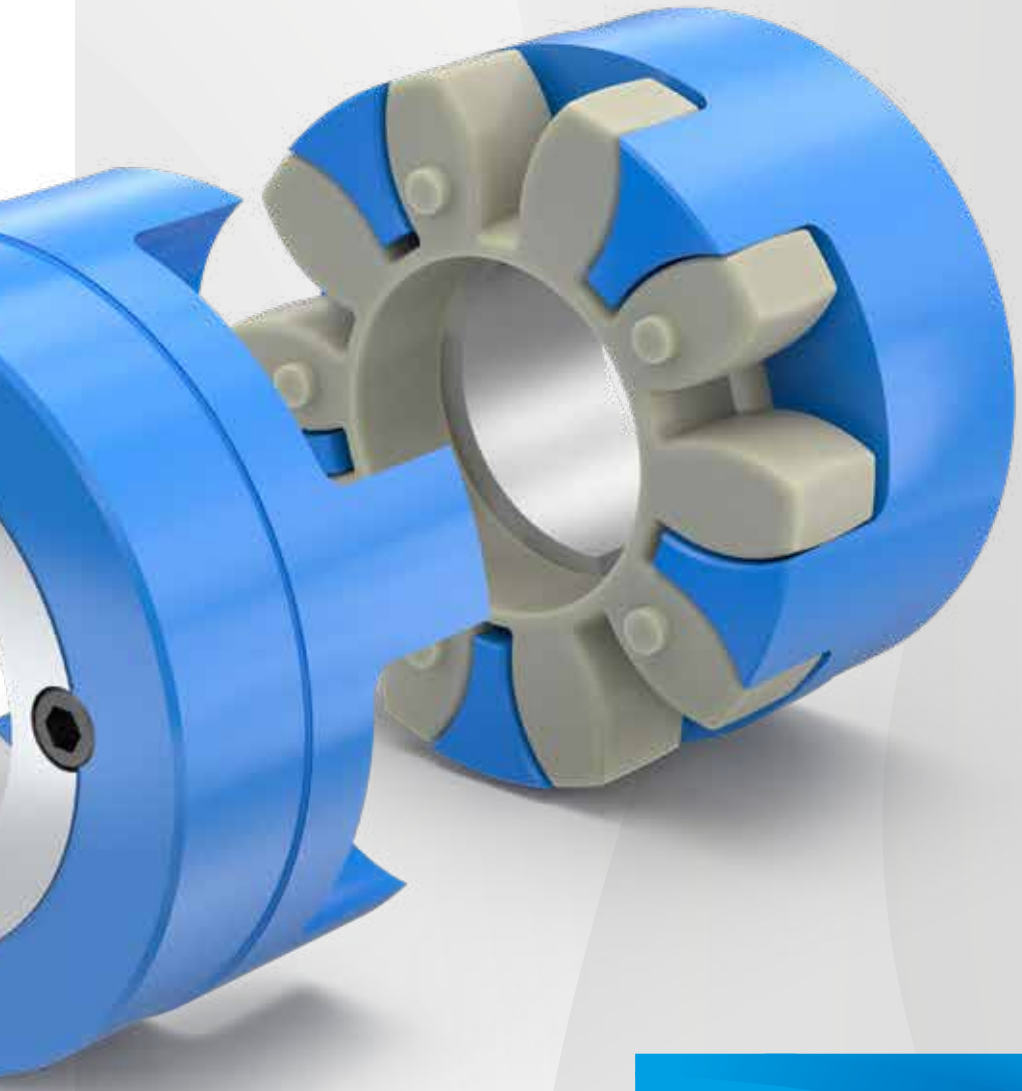

MULTI MONT ASTRA

Flexible Claw Coupling with and without Taper Bushes

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SIMPLY **POWERFUL.**

D2C – Designed to Customer

The guiding principle of Designed to Customer is the recipe for success behind REICH. In addition to the catalogue products, we supply our customers with couplings developed to their specific requirements. The designs are mainly based on modular components to provide effective and efficient customer solutions. The special nature of our close cooperation with our partners ranges from; consulting, development, design, manufacture and integration to existing environments, to customer-specific production, logistics concepts and after-sales service - worldwide.
This customer-oriented concept applies to both standard products and production in small batch sizes.

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

REICH provides you with not only a coupling, but a solution:
Designed to Customer – SIMPLY **POWERFUL.**

D2C
Designed to Customer

MULTI MONT ASTRA

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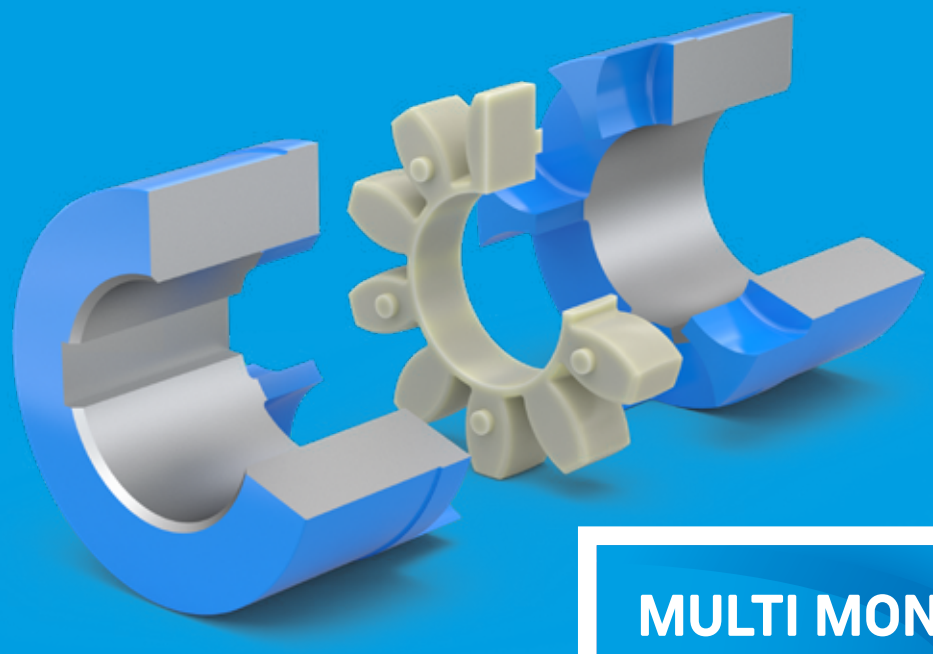
MULTI MONT ASTRA

General Technical Description



MULTI MONT ASTRA-W

Nominal torques from 10 Nm to 3 600 Nm

MULTI MONT ASTRA

Flexible Claw Coupling

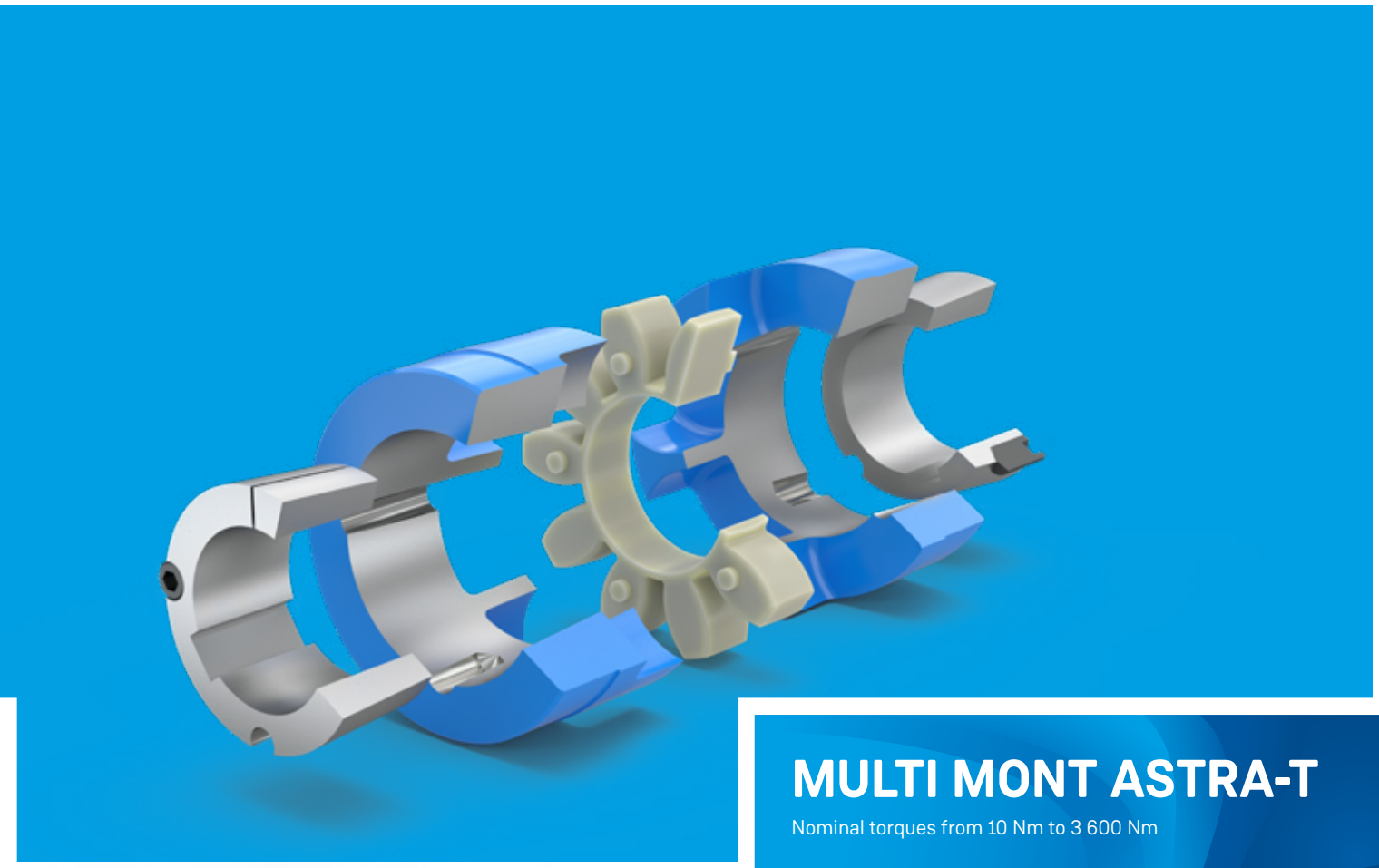
The flexible MULTI MONT ASTRA coupling (short form: MMA) is a fail-safe claw coupling with flexible element for a torsionally flexible shaft connection. The advantage of the comprehensively machined MULTI MONT ASTRA coupling, and of the claw flanks in particular, is the precision of the running characteristic 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 is available in a hardness of 92° Shore A (white) and the S version in a hardness of 98° Shore A (red). It is characterised by a resistance to wear and tear and also to oil, ozone and ageing. Shocks, torsional vibrations and noise are efficiently absorbed thanks to the flexibility of the coupling.
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 allows for a continuous load up to 80 °C. Application at low temperatures down to -20 °C permissible.

Minimum outside diameters combined with a maximum bore guarantee both, low weights and low moments of inertia. The flexible MULTI MONT ASTRA coupling is designed for plug-in mounting and for ease of alignment. The balancing quality complies with the DIN ISO 21940 quality range G16.

The MULTI MONT ASTRA coupling type MMA-T combines the advantages of the flexible coupling with the advantages of a taper bush system: quick and easy assembly for torsionally flexible connection of shafts and compensation of shaft misalignments. The MMA -T type with taper bushes offers the distinct advantage



MULTI MONT ASTRA-T

Nominal torques from 10 Nm to 3 600 Nm

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 easily changed by axial movement of the coupling halves with no need for removing connected machinery. MULTI MONT ASTRA coupling finds its applications in general engineering in all places where a reliable shaft connection is required between the motor and the driven machine.

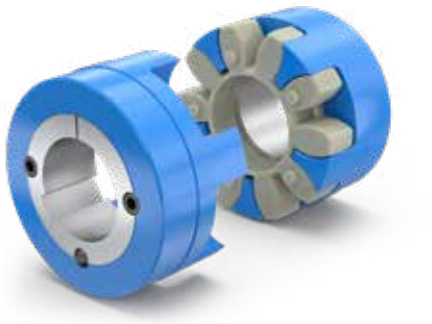
MULTI MONT ASTRA
Advantages

Salient features and advantages of the MULTI MONT ASTRA claw coupling:

- Compensation of axial, radial and angular displacements
- Shock and vibration damping
- Fail safe and withstand high overloads
- Ease of assembly and alignment
- Maintenance-free

MULTI MONT ASTRA

General Technical Data



Standard Type

Torques for coupling fit with keyway

Coupling size	Max. speed at V = 40 m/s	Element version N			Element version S			Permissible shaft displacement [2]		
		Nominal torque	Maximum torque	Alternating torque	Nominal torque	Maximum torque	Alternating torque	Axial	Radial	Angular [1]
		T_{KN}	$T_{K\,max}$	T_{KW}	T_{KN}	$T_{K\,max}$	T_{KW}	ΔK_a	ΔK_r	ΔK_w
	[min^{-1}]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[mm]	[mm]	[°]
19	19000	10	20	2.6	17	34	4.4	1.2	0.20	1.2
24	14000	35	70	9	60	120	16	1.4	0.22	0.9
28	11800	95	190	25	160	320	42	1.5	0.25	0.9
38	9500	190	380	49	325	650	85	1.8	0.28	1.0
42	8000	265	530	69	450	900	117	2.0	0.32	1.0
48	7100	310	620	81	525	1050	137	2.1	0.36	1.1
55	6300	410	820	105	685	1370	178	2.2	0.38	1.1
65	5600	625	1250	163	940	1880	245	2.6	0.42	1.2
75	4750	1280	2560	333	1920	3480	499	3.0	0.48	1.2
90	3750	2400	4800	624	3600	7200	936	3.4	0.50	1.2

i 1) For speeds 1500 min^{-1}, alternative speeds see pages 10 - 11

2) For ambient temperature 30 °C

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 any of the components. In particular, existing connections, e.g. bolted connections, must be checked with regard to the torques to be transmitted. If necessary, further measures, such as additional reinforcement with pins, may be necessary. 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. All components that can rust are protected against corrosion as standard.

REICH have an extensive range of couplings and coupling systems to cover nearly every drive configuration. Customized solutions can be developed and manufactured even in small batches or as prototypes. In addition calculation programs are available for all necessary dimensioning.

MULTI MONT ASTRA

Selection of the Coupling Size

The coupling size should be selected to ensure that the permissible coupling load is not exceeded in any operating condition encountered. For drives which are not subject to periodically recurring fatigue torques 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.

In selecting the coupling size the following should be satisfied:

The **nominal torque of the coupling T_{KN}** must be taken into account at every temperature and operating load of the coupling, whilst observing the service factors S (e.g: temperature factor S_t) shall be at least equal to the maximum nominal torque on the drive side T_{AN}; the temperature in the immediate vicinity of the coupling must be taken into account.

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

The **nominal torque on the drive side T_{AN}** is calculated with the driving power P_{AN} and the coupling speed n_{AN}.

$$T_{AN}\,[Nm] = 9550 \frac{P_{AN}\,[kW]}{n_{AN}\,[min^{-1}]}$$

The **maximum torque capacity of the coupling, $T_{K\,max}$** shall be at least equal to the highest torque T_{max} encountered in operation while taking the temperature factor S_t into account.

$$T_{K\,max} \geq T_{max} \cdot S_t$$

A continuous torsional vibration analysis to verify the coupling selection should confirm that the permissible **continuous fatigue torque T_{KW}** is at least equal to the highest fatigue torque T_W under reversing stresses encountered throughout the operating speed range while taking into account the temperature and frequency.

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

The **frequency factor S_f** allows for the frequency dependence of the permissible continuous fatigue torque under reversing stresses $T_{KW\,(10\,Hz)}$ with an operating frequency f_x.

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

MULTI MONT ASTRA

Service Factors

Load classification S_m

Prime mover	Load classification of the driven machine		
	G (uniform load)	M (medium load)	S (heavy load)
Electric motors, turbines, hydraulic motors	1.0	1.25	1.75

Start-up factor S_z

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

Temperature factor S_t

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

MULTI MONT ASTRA

Assignment of the Load Classification Factors to the Type of Driven Machine

G =	uniform load
M =	medium load
S =	heavy load

For drives with periodic excitation of the machinery, the coupling selection shall be verified by means of a full torsional vibration analysis.

	EXCAVATORS
S	Bucket conveyors
S	Travelling gears (caterpillar)
M	Travelling gears (rails)
M	Manoeuvring winches
M	Suction pumps
S	Bucket wheels
S	Cutter heads
M	Slewing gears
	BUILDING MACHINERY
M	Hoists
S	Concrete mixers
M	Road construction machinery
	CHEMICAL INDUSTRY
M	Cooling drums
M	Mixers
G	Agitators (light liquids)
M	Agitators (viscous liquids)
M	Drying drums
G	Centrifuges (light-weight)
M	Centrifuges (heavy)
	OIL INDUSTRY
M	Pipeline pumps
S	Rotary drilling equipment
	CONVEYORS
M	Hauling winches
S	Hoists
M	Link conveyors
G	Belt conveyors (bulk material)
S	Belt conveyors (piece goods)
M	Belt bucket conveyors
M	Chain conveyors
M	Circular conveyors
M	Goods lifts
G	Flour bucket conveyors
M	Passenger lifts
M	Apron conveyors
M	Screw conveyors
M	Ballast elevators
S	Inclined hoists
M	Steel belt conveyors
M	Troughed chain conveyors
	BLOWERS, FANS[1)]
G	Lobe blowers P:n ≤ 0.007
M	Lobe blowers P:n ≤ 0.07
S	Lobe blowers P:n > 0.07
G	Blowers (axial/centrif.) P:n ≤ 0.007
M	Blowers (axial/centrif.) P:n ≤ 0.07
S	Blowers (axial/centrif.) P:n > 0.07
G	Cooling tower fans P:n ≤ 0.007
M	Cooling tower fans P:n ≤ 0.07
S	Cooling tower fans P:n > 0.07
G	Induced draught fans P:n ≤ 0.007
M	Induced draught fans P:n ≤ 0.07
S	Induced draught fans P:n > 0.07
G	Turbo blowers P:n ≤ 0.007
M	Turbo blowers P:n ≤ 0.07
S	Turbo blowers P:n > 0.07

	GENERATORS, TRANSFORMERS
S	Frequency transformers
S	Generators
S	Welding generators
	RUBBER MACHINERY
S	Extruders
S	Calenders
S	Pug mills
M	Mixers
S	Rolling mills
	WOOD WORKING MACHINES
S	Barkers
M	Planing machines
S	Wood working machines
S	Saw frames
	CRANES
S	Luffing gears
S	Travelling gears
S	Hoisting gears
M	Slewing gears
M	Derricking jib gears
	PLASTIC INDUSTRY MACHINER
S	Extruders
S	Calenders
M	Mixers
M	Crushers
	METAL WORKING MACHINES
M	Sheet metal bending machines
S	Plate straightening machines
S	Hammers
S	Metal planing machines
S	Presses
S	Shears
S	Forging presses
S	Punch presses
G	Counter shafts, line shafts
M	Machine tools, main drives
G	Machine tools, auxiliary drives
	FOOD INDUSTRY MACHINERY
G	Filling machines
M	Kneading machines
M	Mashing apparatus, crystallizers
G	Packaging machines
M	Cane crushers
M	Cane knives
S	Cane mills
M	Sugar beet cutters
M	Sugar beet washing machines
	PAPER MACHINES
S	Couches
S	Glazing cylinders
S	Pulpers
S	Pulp grinders
S	Calenders
S	Wet presses
S	Willows
S	Suction presses
S	Suction rolls
S	Drying cylinders
	PUMPS
S	Reciprocating pumps
G	Centrifugal pumps (light liquids)
M	Centrifugal pumps (viscous liquids)
S	Plunger pumps
S	Pressure pumps
	STONE AND CLAY WORKING MACHINES
S	Breakers
S	Rotary kilns
S	Hammer mills
S	Ball mills
S	Tube mills
S	Beater mills
S	Brick presses
	TEXTILE MACHINES
M	Batchers
M	Printing and dyeing machines
M	Tanning vats
M	Willows
M	Looms
	COMPRESSORS
S	Reciprocating compressors
M	Centrifugal compressors
	METAL ROLLING MILLS
S	Plate shears
M	Plate tilters
S	Ingot pushers
S	Block- and slab lines
S	Ingot handling machinery
M	Wire drawing benches
S	Descaling machines
S	Sheet mills
S	Heavy and medium plate mills
M	Winding machines (strip and wire)
S	Cold rolling mills
M	Chain transfers
S	Billet shears
M	Cooling beds
M	Cross transfers
M	Roller tables (light)
S	Roller tables (heavy)
M	Roller straighteners
S	Tube welding machines
M	Trimming shears
S	Cropping shears
S	Continuous casting plants
M	Roller adjustment drives
S	Manipulators
	LAUNDRIES
M	Tumblers
M	Washing machines
	WATER TREATMENT
M	Aerators
G	Screw pumps

1) P = power of the driven machine in kW // n = speed in min^{-1}

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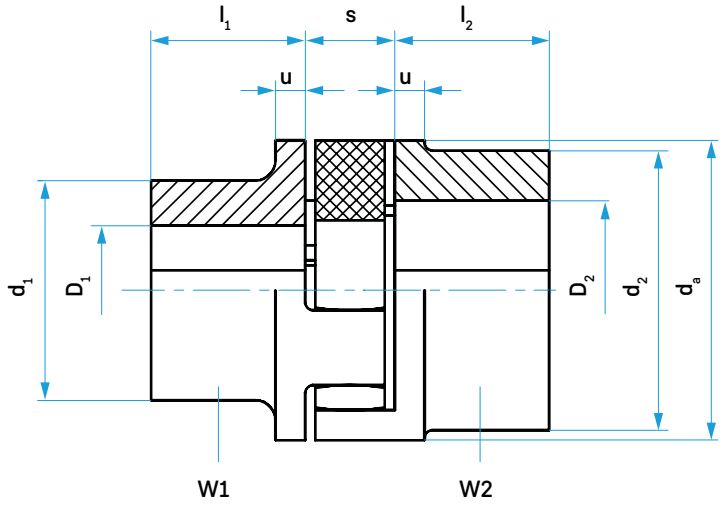
Type MMA-W



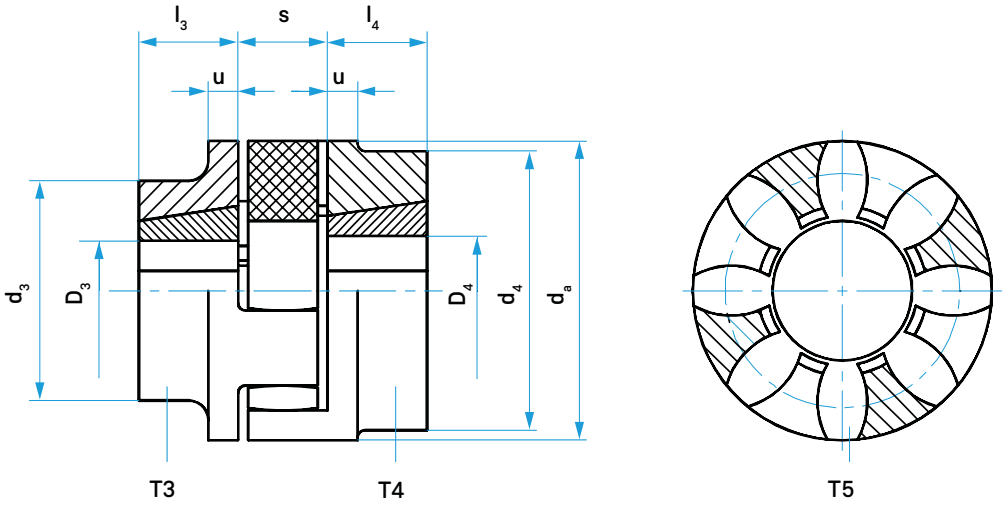
Coupling details

Coupling 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

MULTI MONT ASTRA

Type MMA-T



Coupling details

Coupling size	Part T3					Part T4				
	D_3		Taper bush	d_3	l_3	D_4		Taper bush	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

Coupling size	Element version according to “General Technical Data”	Part	Bore diameter	Part	Bore diameter
MMA 42	N.	W1.	42.	T4.	38

Coupling designation: MMA 42 N. W1. 42. T4. 38

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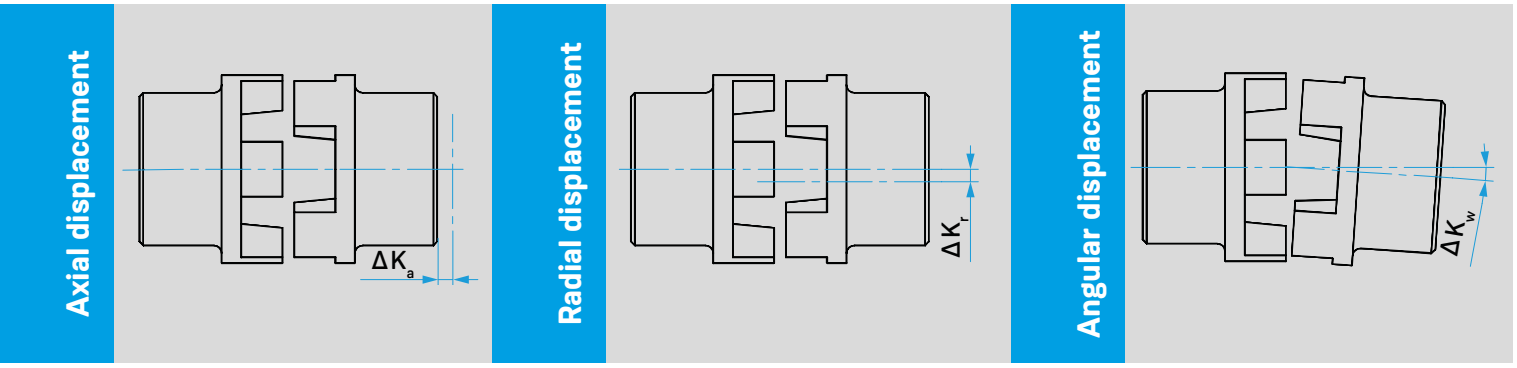
Permissible Displacement Values

The permissible displacement values as given in the “General Technical Data” table are dependent on the rotational speed and decrease when displacement occurs simultaneously.

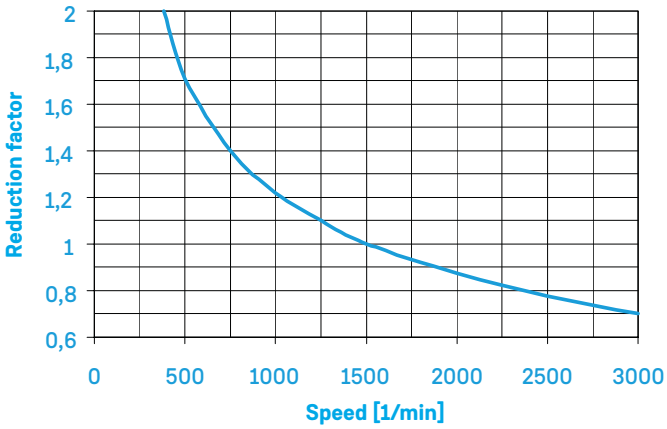


Rule: $\frac{\Delta W_r}{\Delta K_r} + \frac{\Delta W_a}{\Delta K_a} + \frac{\Delta W_w}{\Delta K_w} \leq X$

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

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

Diagram



MULTI MONT ASTRA

Claw Coupling

Weights and moments of inertia

Coupling size	Weight [kg]				Moments of inertia [kgm^2]			
	Part W1	Part W2	Part T3	Part T4	Part W1	Part W2	Part T3	Part T4
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	1.10	1.40	0.86	0.86	0.00087	0.0013	0.00074	0.00074
42	1.70	2.30	1.40	1.40	0.0018	0.0031	0.0017	0.0017
48	2.80	3.10	2.50	2.50	0.0031	0.0052	0.0037	0.0037
55	3.70	4.60	2.70	2.70	0.0062	0.010	0.0054	0.0054
65	5.70	7.00	3.40	4.80	0.013	0.019	0.0082	0.012
75	8.80	11.00	6.80	7.30	0.027	0.041	0.023	0.026
90	15.00	18.00	9.50	16.00	0.068	0.090	0.044	0.081

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

Materials Overview

Part No.	Designation	Materials
W1, W2, T3, T4, taper bushes	–	Grey cast iron GG25
T5	Flexible element	Hytrel

Available taper bushes

metric bores with keyway acc. to DIN 6885/1 - Tolerance zone JS9.

Taper bush TB-No.	Length [mm]	Width across flats [mm]	Bolt tightening torque [Nm]	Bore diameters of available tapered 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	20.0	14	16	18	19	20	22	24	25	28	30	32	35	38	40	-	-	-	-	-
1615	38	5	20.0	14	16	18	19	20	22	24	25	28	30	32	35	38	40	-	-	-	-	-
2012	32	5	31.0	14	16	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	-
2517	45	6	48.0	16	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	55	60
3020	51	8	90.0	25	28	30	32	35	38	40	42	45	48	50	55	60	65	70	75	-	-	-
3535	89	10	90.0	35	38	40	42	45	48	50	55	60	65	70	75	80	85	90	-	-	-	-

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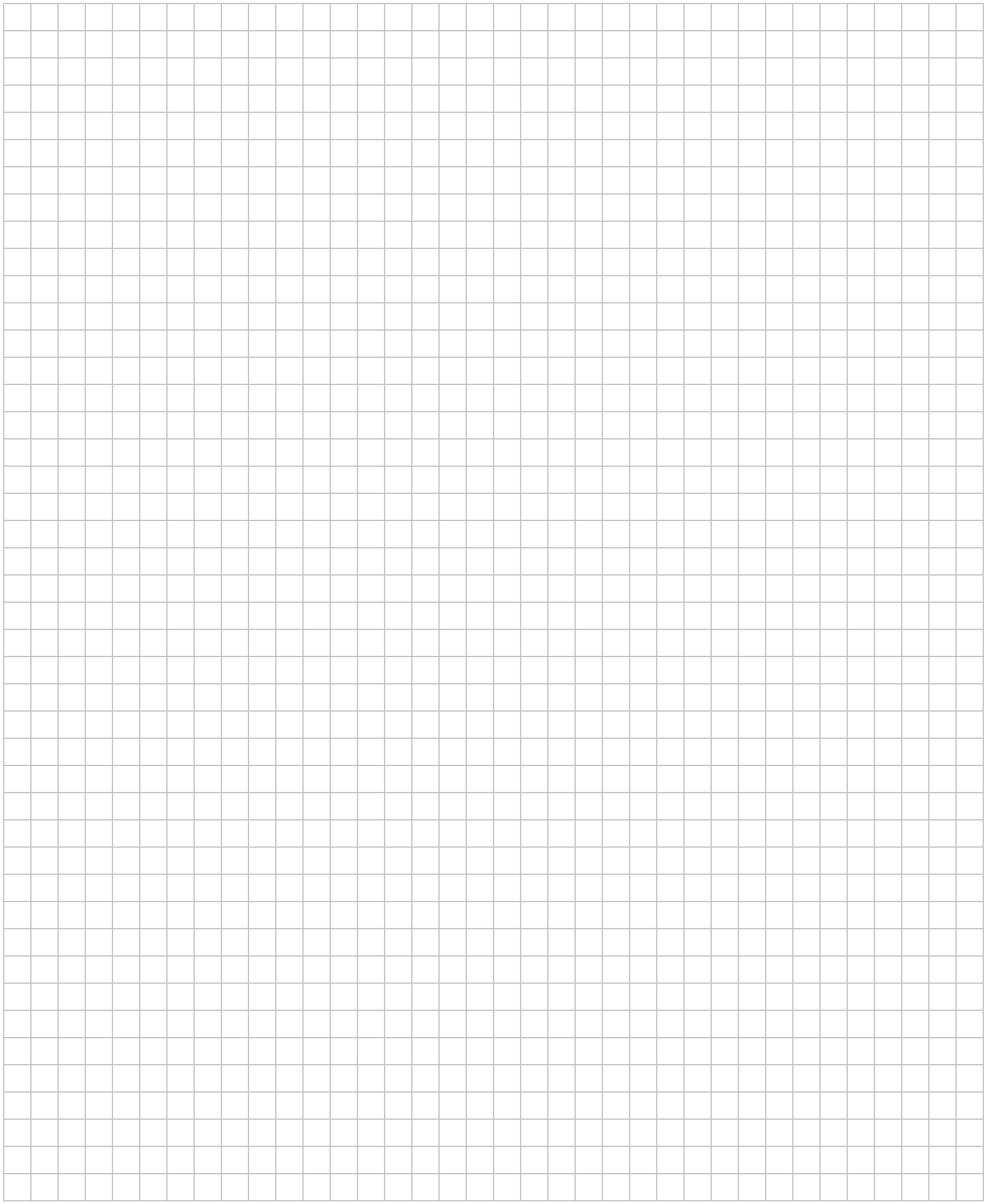
Notes



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Industrial solutions:

- Power generation
- Mobile applications
- Test benches
- Pumps & compressors
- Industry
- Ship & port engineering

Headquarter:

Dipl.- Ing. Herwarth Reich GmbH
Vierhausstrasse 53 · 44807 Bochum
+49 234 95916-0
mail@reich-kupplungen.com
www.reich-kupplungen.com

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