

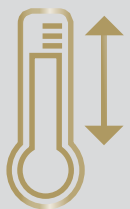
# ArcOflex – shaft coupling Type 314

Drive  
elements are  
our world.

## ArcOflex - shaft coupling - Type 314

### Characteristics and features

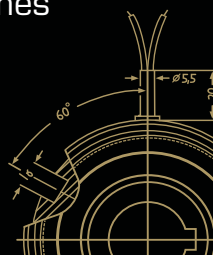
- backlash and torsionally stiff free metal disc coupling
- wear-free and maintenance-free
- high misalignment values
- high strength and bending elasticity stainless steel disc pack
- membrane shape is optimized with finite element design methods
- small resultant restoring forces
- transmitted torque up to 23.000 Nm, depending on the angular misalignment
- higher torque possible for special designs
- recommended temperature range: -35 °C to 150 °C  
use outside of this spectrum on request
- single and double joint designs
- spacer made of CFK/GFK or stainless steel on request
- spacer also possible in use case-related lengths
- on request with ATEX-approval  $\text{Ex}$  II 2GD c IIC X / I M2 c (hub design 1 or 2)  
or  $\text{Ex}$  II 3GD c IIC X (hub design 4)



Mönninghoff power transmission represents an infinite variant diversity that is applied by all areas of modern mechanical engineering.

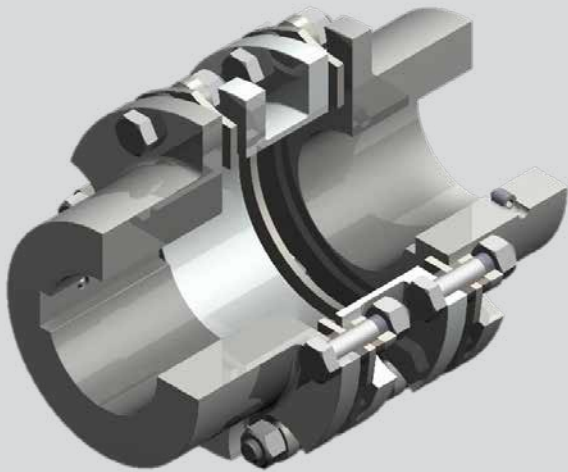
Our technologies are mostly designed to operate under extreme conditions. We offer high precision products for medical robotics, fail-proof security for aerospace technology or synchronization solutions for the packaging or printing industry.

We thus address customers who have the highest standards for their own machines or systems. To them, we can offer highly complex, application-specific solutions.



### Match code

Mönninghoff shaft couplings are indicated by the following match code:



### 314 . A . B . C

- A** coupling size
- B** design
- C** options of mounting and integrating

other individual characteristics:

- bore size with keyways

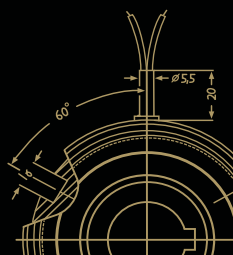
According to these characteristics, we design individual solutions concerning transmitted torque, engaging behavior or rotation speed.

Our engineers can assist with finding an application-specific coupling at any time. Together, we can develop individual and innovative solutions for extreme operating conditions.

### Ordering example

Mönninghoff ArcOflex coupling  
Type 314.55.2.1

Bore d                    42 mm H7, keyway acc. to DIN 6885/1  
Bore d<sub>1</sub>                55 mm H7, keyway acc. to DIN 6885/1



### Coupling size

When dimensioning a Mönninghoff ArcOflex coupling, several technical preconditions should be considered:

- Membrane coupling transmit torque without virtually any dampening. Therefore the size must be determined so that a possible peak torque - caused by drive or load - does not exceed the specified nominal torque  $T_{KN}$ . We recommend that the torque which have been determined theoretically are corrected with the appropriate safety or operating factor.

$$T_{KN} > T \cdot K_B \text{ oder } T_{KN} > T \cdot K_S$$

- As misalignment reduces the transmitted torque of the coupling, the values specified for  $T_{KN}$  in the table must be taken into consideration depending on the angle of displacement. In the case of alternating operation and the demand for backlash free torque transmission, the alternating torque may not be exceeded.

$$T_{KW} > T \cdot K_B \text{ oder } T_{KW} > T \cdot K_S$$

- In the case of servo-drives and inverter controlled drives, possible maximum torque must be taken into consideration due to the interaction between motor and controller.

$$T_{Motor} = \frac{9550 \cdot P_{Motor}}{n}$$

- If clamping hubs or clamping elements are used, the max. torque which can be transmitted by the clamping connection must be taken into consideration.

$T$  = torque

$T_{KN}$  = nominal torque

$T_{Kw}$  = alternating torque

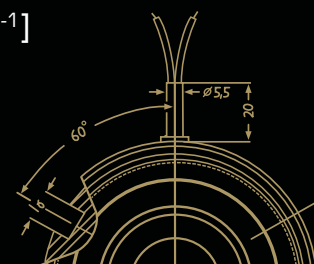
$K_B$  = operating factor

$K_S$  = shock factor

$T_{Motor}$  = torque of the motor

$P_{Motor}$  = power of the motor [kW]

$n$  = max. speed [ $\text{min}^{-1}$ ]



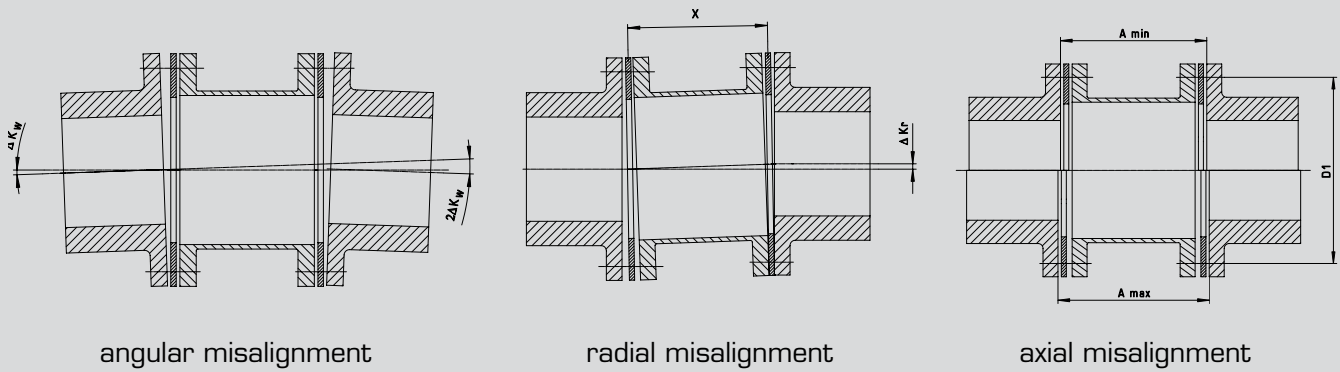
## ArcOflex - shaft coupling - Type 314

### Coupling size - starting factor

If the starting factor is bigger than 2 times of the coupling torque, or there are more than 50 starts/stops per hour, consult our technical department.

### Coupling size - angular misalignment factor

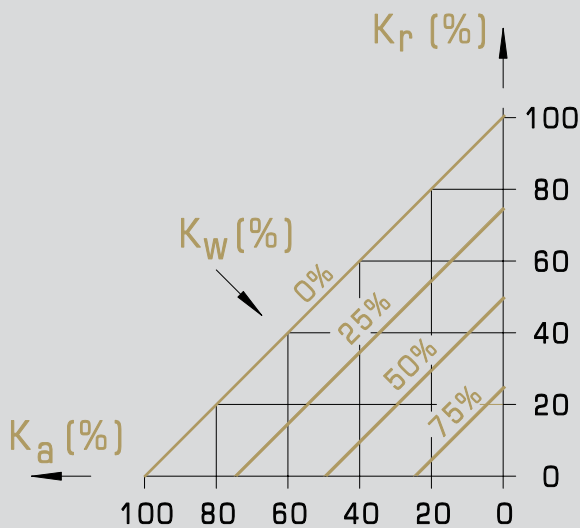
When calculating the angular misalignment factor, the radial and axial misalignment must also be taken into account.



angular misalignment

radial misalignment

axial misalignment



$$\Delta K_{\text{total}} = \Delta K_a + \Delta K_r + \Delta K_w \leq 100\%$$

modification of  $\Delta K_a$  [mm] and  $\Delta K_r$  [mm] in  $\Delta K_{wa}$  [°] and  $\Delta K_{wr}$  [°]

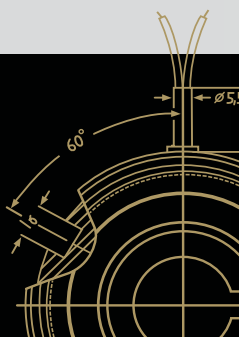
$$\Delta K_{wa} = \arcsin \frac{\Delta K_a}{0,75 \cdot D_1} [^\circ]$$

$$\Delta K_{wr} = \arcsin \frac{\Delta K_r}{x} [^\circ]$$

$$\Delta K_{wg} = \Delta K_w + \Delta K_{wa} + \Delta K_{wr} [^\circ]$$

X = distance of membrane  
 $K_{wg}$  = total angular misalignment

$K_{wa}$  = angular misalignment axial  
 $K_{wr}$  = angular misalignment radial



### Technical data

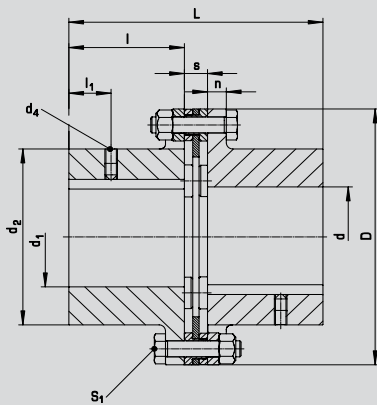
Size			55	65	75	80	85	90	98	120		
torque at angular misalignment per membrane package	$T_{KN}$	0,50°	800	1200	1800	2800	4500	6000	9000	23000		
		1,00°	600	900	1400	2000	2500	3000	4000	12000		
		1,30°	400	600	1000	1500	—	—	—	—		
torque alternating at max. misalignment	$T_{KW}$	[Nm]	250	300	550	850	1600	1900	3500	4100		
max. misalignment	angular	type 1.1	1,3	1,3	1,3	1,3	1	1	1	1		
		type 2.1	2,6	2,6	2,6	2,6	2	2	2	2		
	axial	type 1.1	1,0	1,1	1,3	1,3	1,0	1,2	1,4	1,7		
		type 2.1	2,0	2,2	2,6	2,6	2,0	2,4	2,8	3,4		
	radial	type 1.1	not allowed									
		type 2.1	1,75	2,15	2,5	2,55	2,0	2,5	2,0	3		
	type 4.1	1,0	1,2	1,4	1,5	1,1	1,4	1,5	1,9			
max. speed		n [min <sup>-1</sup> ]	6700	5900	5100	4750	4300	4000	3400	2800		
inertia	type 1.1	I [10 <sup>-3</sup> kg m <sup>2</sup> ]	6,1	11,8	23,8	36,5	57	83	174	570		
			type 2.1	10,2	18,7	37,5	59	95	138	294	882	
weight	type 1.1	[kg]	4,2	6,4	9,6	12,5	15,5	19,5	30	63,1		
			type 2.1	5,7	8,5	12,5	16,5	21	27	42	85,7	
torsional stiffness	type 1._	CT [106 Nm/rad]	0,40	0,81	0,73	0,92	1,31	2,98	5,99	15,3		
		type 2._	CK [106 Nm/rad]	0,17	0,34	0,33	0,41	0,58	1,25	2,43	6,12	
axial stiffness	type 2._	Ca [N/mm]	60	60	55	60	125	110	150	200		
screws S1	size		M 8	M 8	M 10	M 12	M 16	M 16	M 20	M 20		
		tightening torque [Nm]	33	33	65	115	280	280	550	550		
screws S2	size		M 10	M 10	M 16	M 16	—	—	—	—		
		tightening torque [Nm]	75	75	220	220	—	—	—	—		
bore d, d <sub>1</sub> H7	type_1	style X	min.	25	30	35	35	40	45	50	80	
			max.	65	75	85	90	100	110	120	150	
		style Y & Z	min.	25	30	35	35	40	45	50	80	
			max.	55	65	75	80	85	90	100	120	
		type_2	style X	max.	50	60	65	65	75	75	100	125
			style Y & Z	max.	35	50	55	60	65	70	80	100
	type_4	min.	25	30	40	40	—	—	—	—		
		max.	52	65	65	72	—	—	—	—		
	dimensions	D	[mm]	128	145	168	180	200	215	250	310	
			D <sub>1</sub>	112	128	148	158	170	185	214	260	
			d <sub>2</sub>	88	103	117	125	134	147	164	210	
			d <sub>3</sub> H7	8	8	11	13	17	17	21	21	
d <sub>4</sub>			M 6	M 6	M 8	M 8	M 10	M 12	M 12	M 12		
d <sub>5</sub>			80	94	108	116	124	130	149	186		
d <sub>6</sub>			77	90	104	112	119	128	145	180		
L			121	141	164	175	175	200	223	264		
L <sub>1</sub>			206	246	286	300	300	340	370	452		
L <sub>2</sub>			160	190	220	232	233	263	288	350		
L <sub>3</sub>			114	134	154	164	166	186	206	248		
L <sub>7</sub>			170	200	233	246	246	281	309	373		
L <sub>8</sub>			124	144	167	179	179	204	227	271		
L <sub>9</sub>			127	147	167	178	185	205	228	270		
l			55	65	75	80	80	90	100	120		
l <sub>1</sub>			20	25	30	30	30	35	40	40		
l <sub>2</sub>			74	94	108	110	110	120	124	164		
l <sub>4</sub>			18	18	18	21	22	22	27	30		
l <sub>5</sub>	38	48	55	56	56	61	63	85				
l <sub>6</sub>	4	4	4	4	6	6	6	8				
k			5,5	5,5	7	8	10	10	13	13		
m	min.		38	38	46	54	61	66	79	79		
n			9	9	9	12	13	13	18	18		
s			11	11	14	15	15	20	23	24		



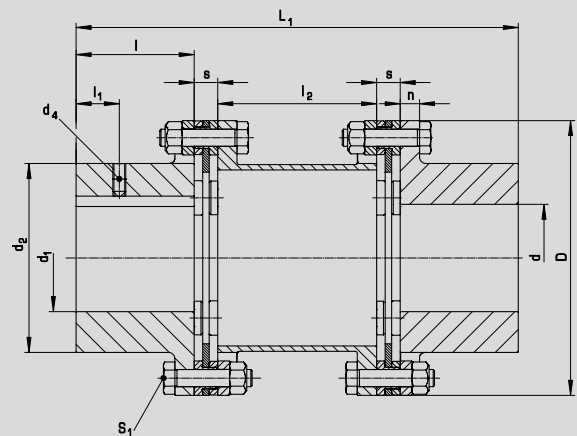
### Design

The Mönninghoff ArcOflex coupling is offered in different designs

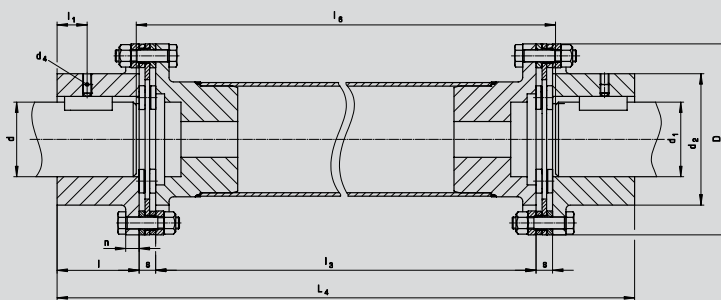
- equalization of axial and angular misalignment with single joint design
- additional equalization of radial misalignment with double joint design



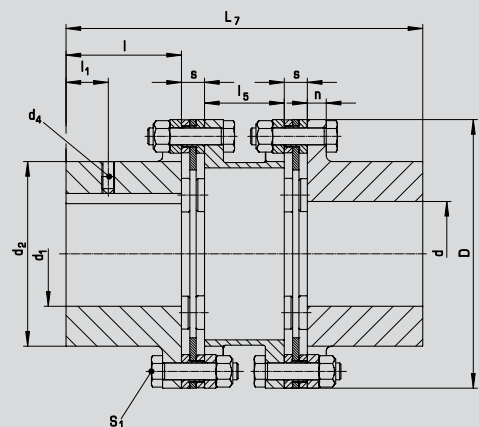
Design 1: single joint



Design 2: double joint with standard spacer

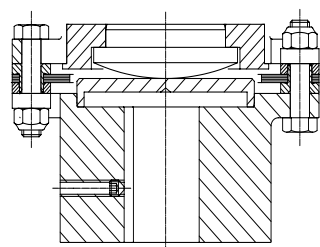


Design 3: double joint with variable spacer



Design 4: double joint with small spacer

### Vertical assembling

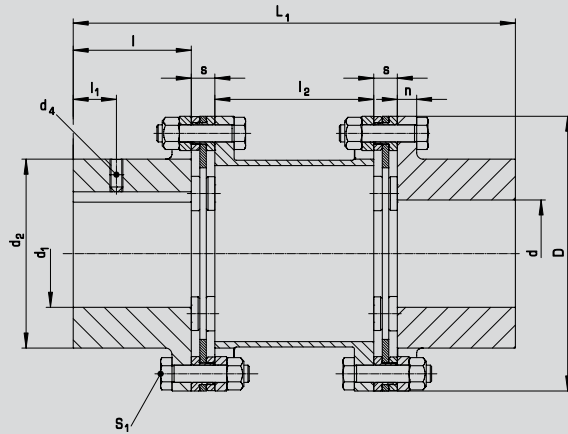


- when vertical assembling is required, an additional support has to be used between the lower hub and spacer
- please order: for vertical assembling

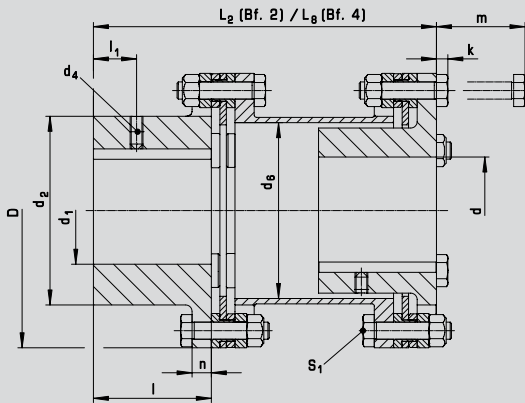


### Design & style

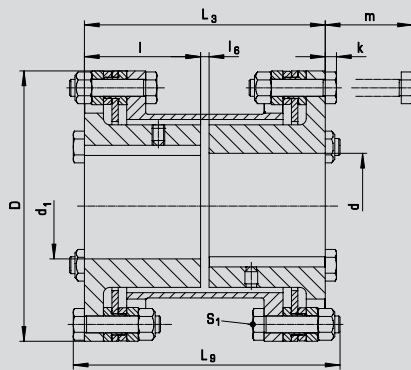
There are different styles of installing the ArcOflex coupling. According to the mounting style, the total coupling length varies.



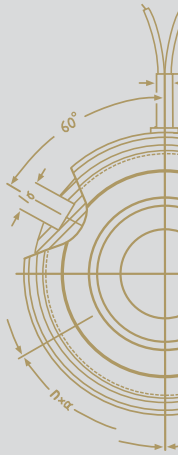
Type 2, style X:  
Alignment of both hubs to the outside



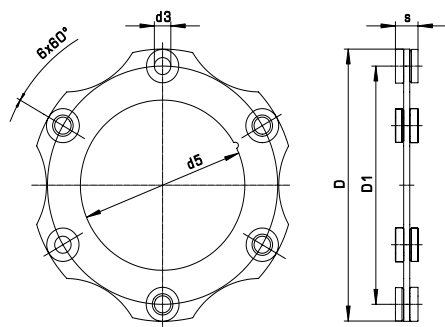
Type 2, style Y:  
Alignment of one hub to the inside



Type 2, style Z:  
Alignment of both hubs to the inside



### Styles & disc pack



#### Disc pack

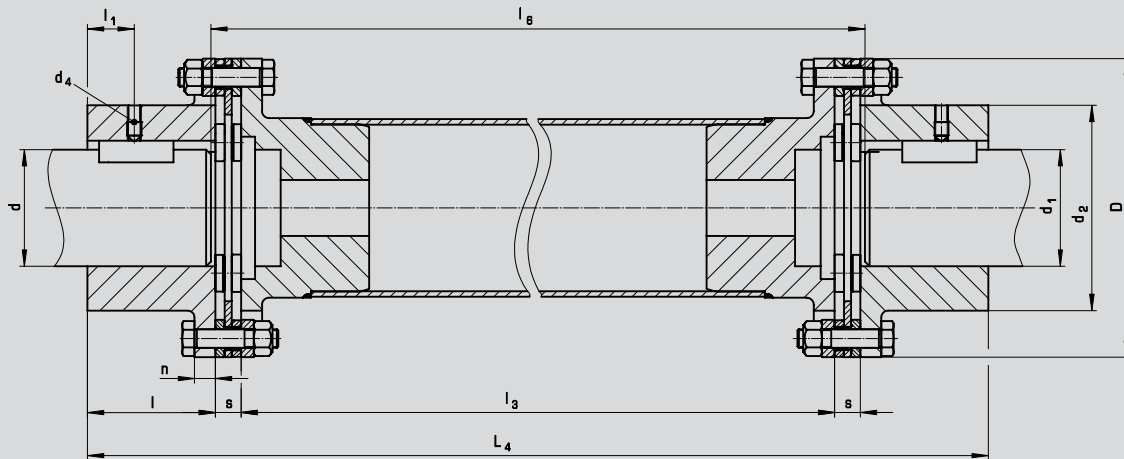
- stainless steel
- connected via fitting screws
- optimized with finite element design methods

Radial assembling of the disc pack is only possible in design X.

## ArcOflex - shaft coupling - Type 314

### Spacer coupling design 3

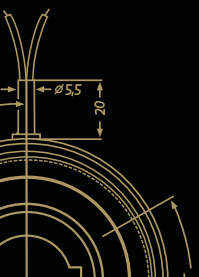
The double joint design with variable length has some additional properties of the spacer to consider.



- stainless steel or CFK/GFK possible
- length changes through temperature variations
- limitation of spacer length to 2900 mm is due to the manufacturing process
- further limitation of the spacer length is due to critical speed
- when vertical assembling is required, an additional support has to be used

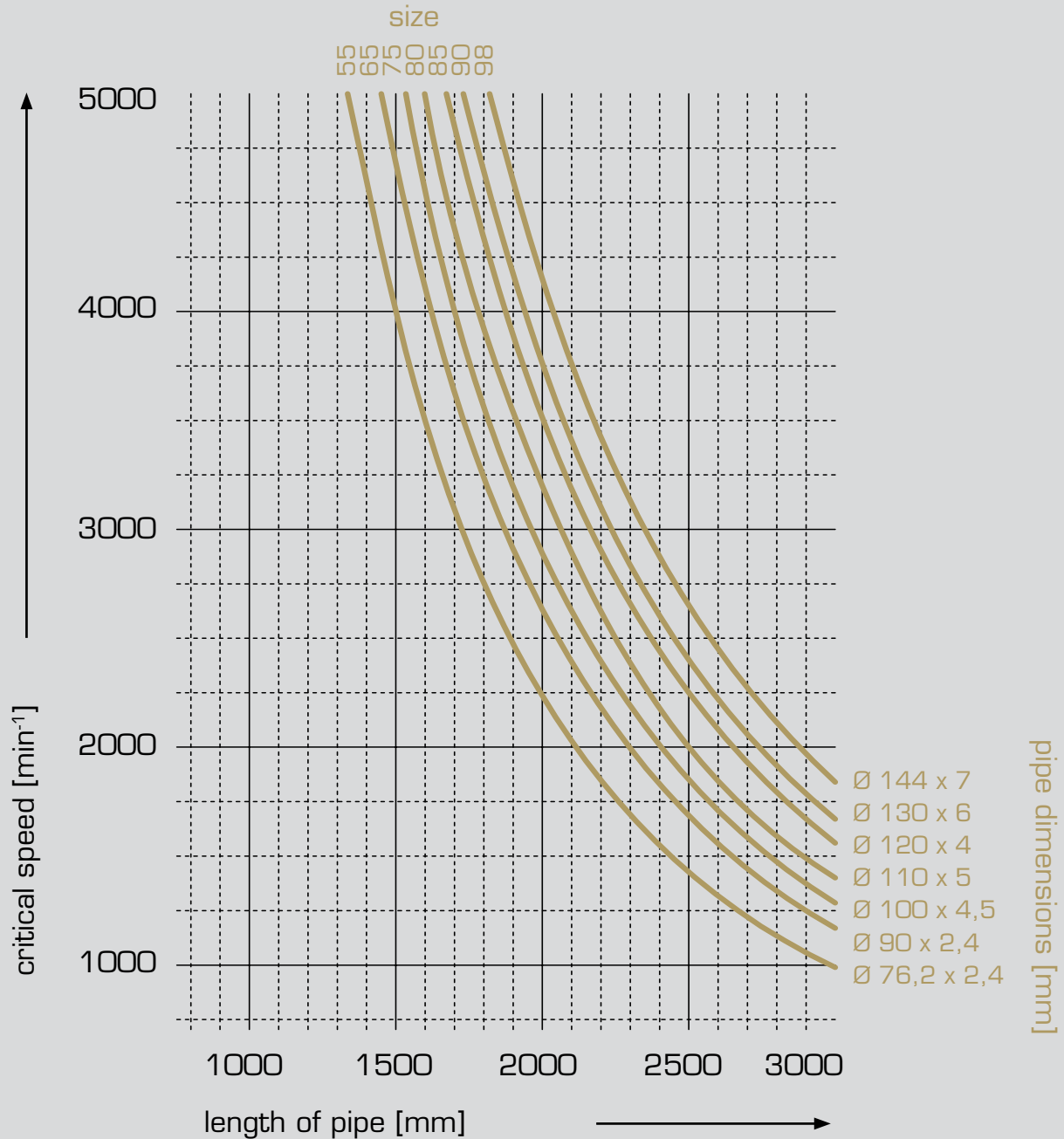
### Technical data

Size		55	65	75	80	85	90	98
torque		see previous pages						
max. speed	n [min <sup>-1</sup> ]	see diagramm „critical speed for design 3“						
inertia	by l <sub>3</sub> = 1000 mm	17,13	31,55	66,97	104,1	146	226,15	436
	per 100 mm	0,6	1,0	2,4	3,6	3,9	7,1	11,1
weight	by l <sub>3</sub> = 1000 mm	13,7	21	,5	27,7	35,8	39,9	53,5
	per 100 mm	0,436	0,52	1,06	1,3	1,14	1,83	2,36
torsional stiffness, pipe	CR [106 Nm/rad]	61:13	101:13	247:13	365:13	393:13	720:13	1134:13
bore d, d1 H7, keyway acc. to DIN 6885/1	min.	25	30	35	35	40	45	50
	max.	65	75	85	90	100	110	120
dimensions	D [mm]	128	145	168	180	200	215	250
	d <sub>2</sub>	88	103	117	125	134	147	164
	d <sub>4</sub>	M 6	M 6	M 8	M 8	M 10	M 12	M 12
	l	55	65	75	80	80	90	100
	l <sub>1</sub>	20	25	30	30	30	35	40
	l <sub>3</sub>	max. 2900 mm						
	l <sub>6</sub>	distance between shaft ends						
	L <sub>4</sub>	must be given in ordering						
	s	11	11	14	15	15	20	23

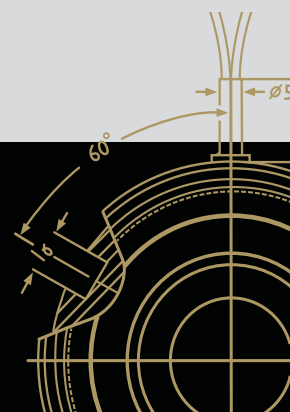


### Operating speed design 3

The critical speed of the shaft coupling changes according to the length of the spacer.



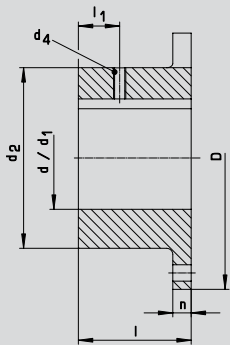
**Our product is the know-how,  
with hardware as an added bonus.**



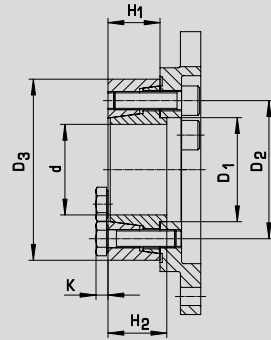
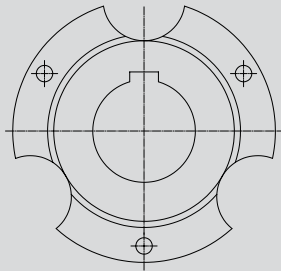
## ArcOflex - shaft coupling - Type 314

### Mounting and integrating options

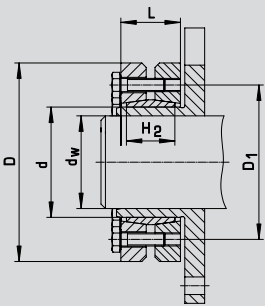
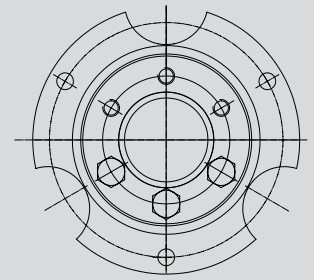
Each combination of hub with keyway, clamping set, shrinking disc or clamping hub is possible for installation of the Mönninghoff ArcOflex coupling.



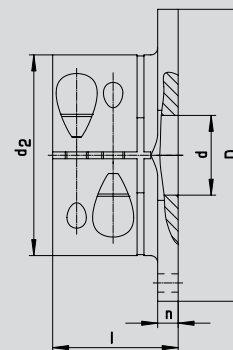
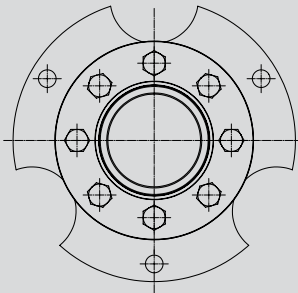
hub with keyway



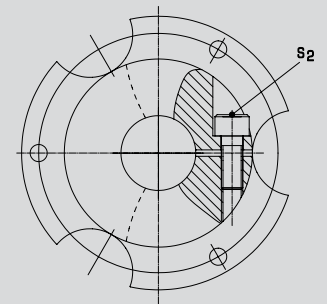
clamping set



shrink disc



clamping hub



These following common hub combinations are considered in the Mönninghoff type code for orders

(1) hub with keyway / hub with keyway

(2) clamping set / clamping set

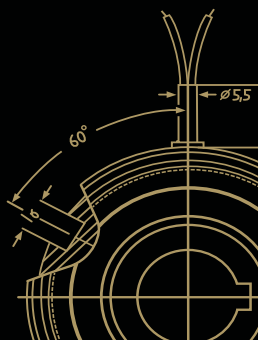
(3) shrink disc / shrink disc

(4) clamping hub / clamping hub

(5) hub with keyway / clamping set

(6) hub with keyway / clamping hub

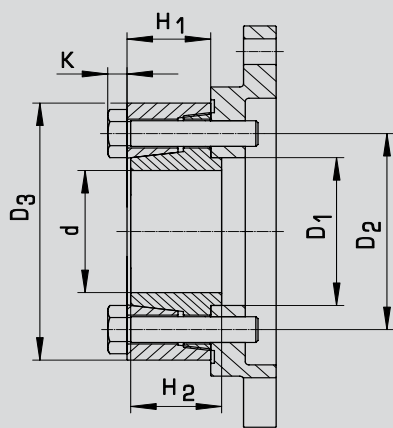
(7) clamping set / clamping hub



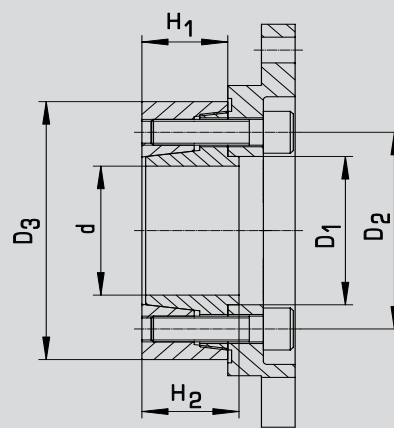
### Clamping set dimensions

It is recommended to use an ArcOgrip clamping set for a backlash free connection

- Type 354 is mounted from the outside via a hexagon head screw
- Type 356 is mounted from the inside via a socket head screw



Type .\_.2:  
Clamping set C  
Type 354

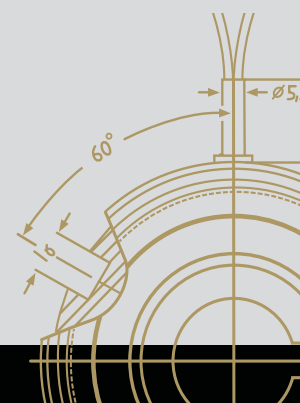


Type .\_.2:  
Clamping set A  
Type 356

d [mm]	D <sub>1</sub> [mm]	D <sub>2</sub> [mm]	D <sub>3</sub> [mm]	H <sub>1</sub> [mm]	H <sub>2</sub> [mm]	K	T <sub>kmax</sub> [Nm]	Screws	T <sub>A</sub> [Nm]	Weight [kg]
12	12	24	35	11	11,5	4	50	3 x M6	12	0,1
14	14	26	36	12	11,5	4	70	3 x M6	12	0,1
15	15	28	41	15	16	4	80	3 x M6	12	0,1
16	16	28	41	15	16	4	80	3 x M6	12	0,1
18	18	30	44	15	16	4	130	4 x M6	12	0,1
19	19	32	47	15	16	4	140	4 x M6	12	0,2
20	20	32	47	15	16	4	140	4 x M6	12	0,2
22	22	36	50	19	20	4	200	5 x M6	12	0,2
24	24	36	50	19	20	4	200	5 x M6	12	0,2
25	25	36	50	19	20	4	200	5 x M6	12	0,2
26	32	44	60	19	21	4	300	6 x M6	12	0,3
28	32	44	60	19	21	4	300	6 x M6	12	0,3
30	32	44	60	19	21	4	300	6 x M6	12	0,3
32	38	52	72	21	23	5,5	450	5 x M8	29	0,5
35	38	52	72	21	23	5,5	500	5 x M8	29	0,5
36	38	52	72	21	23	5,5	500	5 x M8	29	0,5
38	46	61	80	23	25	5,5	720	6 x M8	29	0,6
40	46	61	80	23	25	5,5	750	6 x M8	29	0,9
42	46	61	80	23	25	5,5	750	6 x M8	29	0,6
44	53	68	90	25	27	5,5	1300	8 x M8	29	0,9
45	53	68	90	25	27	5,5	1300	8 x M8	29	0,9
48	53	68	90	25	27	5,5	1300	8 x M8	29	0,9
50	53	68	90	25	27	5,5	1300	8 x M8	29	0,9
52	58	72	100	27	29	5,5	1600	8 x M8	29	1,2
55	58	72	100	27	29	5,5	1600	8 x M8	29	1,2
60	63	80	110	27	29	5,5	2000	8 x M8	29	1,4
62	74	86	115	27	30	5,5	2100	9 x M8	29	1,4
65	74	86	115	27	30	5,5	2100	9 x M8	29	1,4
70	74	86	115	27	30	5,5	2100	9 x M8	29	1,4
75	84	100	138	29	32	7	4000	10 x M10	58	2,2
80	84	100	138	29	32	7	4000	10 x M10	58	2,2
85	94	114	155	35	38	7	5700	12 x M10	58	3,4
90	94	114	155	35	38	7	5700	12 x M10	58	3,4
95	104	124	170	40	43	8	8400	12 x M12	100	5
100	104	124	170	40	43	8	8400	12 x M12	100	5

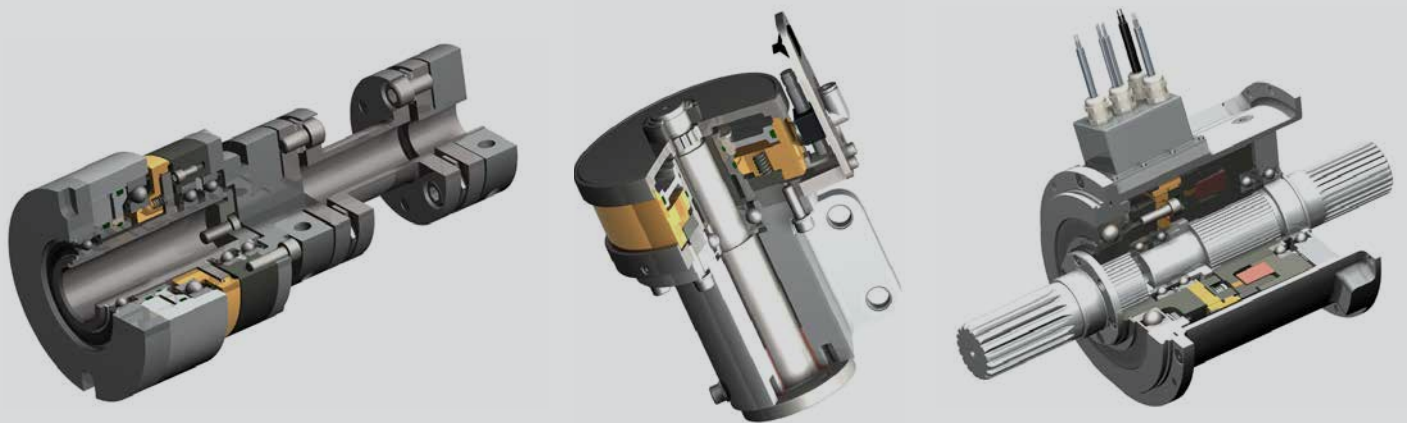
### Estimated operating factors for torsionally rigid shaft couplings

	Operating factor KB			shock factor $K_s$
	electric motors turbines hydraulic motors	piston engines with more than 2 zylinders	piston engines with 1 or 2 zylinders	
<b>building construction machines</b>	2,1	2,5	3	4
<b>chemical industry</b>				
agitators (semi-liquid material)	1,7	2,1	2,6	3,5
agitators (liquid material)	1	1,4	1,7	2,5
centrifuges	1,35	1,75	2,2	2,5
pipeline pumps	1,7	2,1	2,6	4
<b>conveyors and lifts</b>				
goods lifts	1,7	2,1	2,6	4
passenger lifts	1,7	2,1	2,6	3,5
belt conveyors	1,7	2,1	2,6	3,5
<b>blowers, ventilators</b>	1,35	1,75	2,2	2,5
<b>generators, transformers</b>	1	1,4	1,7	3
<b>wood-plastic industry machinery</b>				
planing machines	1,7	2,1	2,6	4
woodworking machines	1	1,4	1,7	4
mixers	1,7	2,1	2,6	3
extruders	1,7	2,1	2,6	4
<b>cranes</b>	1,7	2,1	2,6	4
<b>metal working machines</b>				
presses	2,4	2,8	3,3	5
machine tools	1,7	2,1	2,6	3
<b>food industry machinery</b>				
kneading machines	1,7	2,1	2,6	3
mills	2,4	2,8	3,3	4,5
packaging machines	1	1,4	1,7	2
<b>paper machines</b>				
pulp grinders	2,4	2,8	3,3	4
shredder	2,4	2,8	3,3	4
presses, rolls	2,4	2,8	3,3	4
calenders	1,7	2,1	2,6	3,5
<b>pumps</b>				
piston pumps	2,4	2,8	3,3	4,5
centrifugal pumps	1,35	1,75	2,2	3
<b>stone and clay working machines</b>				
mills, breakers	2,4	2,8	3,3	6
rotary ovens	2,4	2,8	3,3	4
<b>textile machines</b>				
looms	1,7	2,1	2,6	3
winders	1,7	2,1	2,6	3
<b>compressors</b>				
pistons compressors	2,4	2,8	3,3	4
turbo compressors	1,7	2,1	2,6	2,5
<b>metal rolling mills</b>				
shears	2,4	2,8	3,3	5,5
plate-mill lines	2,4	2,8	3,3	5
cold rolling mills	2,4	2,8	3,3	5
rolling mill adjusters	1,7	2,1	2,6	4
winding machines	1,7	2,1	2,6	4
continuous casting plant	2,4	2,8	3,3	5
<b>laundries</b>	1,7	2,1	2,6	2,5

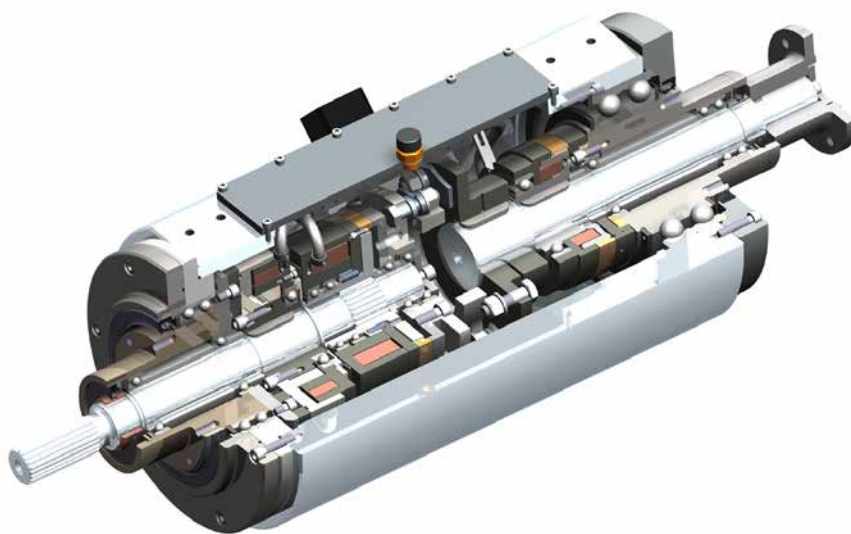


### You need more?

Mönninghoff couplings can be combined with a variety of many other power transmission elements. Such complex high-tech systems can solve any application-specific tasks and can fulfill any customer-specific wishes.



In many cases, a combination of different drive elements is needed to solve the applications particular problems and difficulties. Being not just supplier but technological partner to our customers, our extensive engineering is part of extraordinary and challenging power transmission projects.



**Our product is the know-how,  
with hardware as an added bonus.**

