

RELIABLE | PRECISE | COMPACT



PRECISION COUPLINGS

EXACT AND BACKLASH FREE FOR PRECISION SERVO AND STEPPER DRIVE APPLICATIONS.

WHO WE ARE.

ABOVE ALL R+W IS: THE PERFECT COUPLING.

When R+W Antriebselemente GmbH was first established in 1990 in Klingenberg, Germany, there were three people on board. The head office is still there, but we are now more than 170 people, with subsidiaries in the USA, China, Italy, Singapore, France and Slovakia, and are partnered with over 60 well established distributors in more than 40 countries throughout the world. Many developments have led to this success, but most importantly it was brought about by our endless search for the best possible coupling solutions as well as the high esteem in which we hold all of our customers.

WE PROVIDE INSPIRED SOLUTIONS BACKED BY SOUND PLANNING AND DESIGN.

R+W stands for expertise in the development of solutions for precise torque transmission. The focus of our development is on innovative coupling systems for all sectors of precision drive technology. As a leading manufacturer of precision couplings and line shafts, we strive to maintain a permanent status of technology leadership in our field. Our central claim: R+W couplings ensure precision for process reliability and efficiency, and to that end we seek perfection.

Optimized for technology and business, our product portfolio includes:

- ▶ **Bellows couplings**
- ▶ **Elastomer insert couplings**
- ▶ **Ball-detent safety couplings**
- ▶ **Line shaft couplings**
- ▶ **High torque industrial couplings**
- ▶ **Development of customized solutions with collaboration from start to finish, including:**
 - Consultation
 - Conception
 - Engineering analysis
 - Prototyping
 - Manufacturing

DRIVE

D - DYNAMIC

Our staff is trained to always be ready and willing to provide a quick reaction to customer inquiries. Our product, the core of which is based on handling high performance, dynamic applications, is increasingly available for fast delivery.

R - RELIABLE

Many of our products are designed for infinite life with zero maintenance required. With thorough engineering processes in place, and an ISO 9001:2008 certified production facility, we continue to deliver high quality coupling products with a high level of reliability.

I - INNOVATIVE

Our business was founded on developing unique and innovative solutions to common coupling problems. Our staff in turn is constantly developing its work flows to streamline delivery and simplify the process for our customers.

V - VERSATILE

With products successfully applied and deployed in over 125 industry segments, chances are very good that we have an expert on our versatile staff that is familiar with your application requirements.

E - EXPANDING

With double digit annual growth the norm, our company is ever expanding, adding new product offerings and opening new service centers throughout the world all the time.

OTHER R+W COUPLINGS

Aside from the products detailed in this catalog, we also offer quality shaft couplings and torque limiters for high powered industrial drives.

More information on these can be found in our **industrial couplings catalog**.

APPLICATIONS AND DESIGN FEATURES PRECISION COUPLINGS

SIZING AND SELECTION

P. 9

INSTALLATION AND HANDLING

P. 21

TORSIONALLY STIFF BELLOWS COUPLINGS

BK

P. 29

SIZES FROM 2 – 10,000 Nm

AREAS OF APPLICATION

for highly dynamic motion in:

- ▶ Machine tools
- ▶ Test stands
- ▶ Packaging machinery
- ▶ Printing machinery
- ▶ Paper converting machinery
- ▶ Labeling machinery
- ▶ Textile machinery
- ▶ Sorting machinery
- ▶ Automation equipment

FEATURES

- ▶ torsionally stiff
- ▶ low moment of inertia
- ▶ zero backlash
- ▶ highly concentric
- ▶ naturally very well balanced
- ▶ precise transmission
- ▶ infinite life
- ▶ wear and maintenance free
- ▶ easy to install

TORSIONALLY STIFF MINIATURE BELLOWS COUPLINGS

MK

P. 49

SIZES FROM 0.05 – 10 Nm

AREAS OF APPLICATION

for precise transmission of angular motion and torque in:

- ▶ Linear actuators
- ▶ Semiconductor machinery
- ▶ Medical devices
- ▶ Lab automation systems
- ▶ Micro pumps
- ▶ Test and measurement systems

FEATURES

- ▶ zero backlash
- ▶ torsionally stiff
- ▶ precise transmission
- ▶ infinite life
- ▶ easy to install

SIZING AND SELECTION

According to
DIN 740 part 2

SIZING AND SELECTION

BELLOWS COUPLINGS



SYMBOLS

- T_{KN} = Rated torque of the coupling (Nm)
- T_{AS} = Peak torque of the drive system
e.g. max. acceleration torque of drive (Nm)
or max. braking torque of load (Nm)
- J_L = Total load inertia
(e.g. spindle + slide + workpiece + 1/2 of coupling) (kgm²)
- J_A = Total driving inertia
(motor [including gear ratio] + 1/2 of coupling) (kgm²)
- C_T = Torsional stiffness of the coupling (Nm/rad)
- f_e = Natural frequency of the two mass system (Hz)
- f_{er} = Excitation frequency of the drive (Hz)
- φ = Torsional deflection (degree)

Shock or Load Factor S_A		
uniform load	non-uniform load	highly dynamic load
1	2	3-4
Common factor for servo drives in machine tools: $S_A = 2-3$		

ACCORDING TO TORQUE

Couplings are normally sized for the highest torque to be regularly transmitted. The peak torque of the application should not exceed the rated torque of the coupling. The following calculation provides an approximation of the minimum required coupling size, and allows for the maximum rated speed and misalignment to exist in the application:

$$T_{KN} \cong 1.5 \cdot T_{AS} \text{ (Nm)}$$

ACCORDING TO ACCELERATION TORQUE

A more detailed calculation takes acceleration and the driving and driven moments of inertia into account. A strong inertia ratio diminishes the effect of the load factor in the sizing calculation.

$$T_{KN} \cong T_{AS} \cdot S_A \cdot \frac{J_L}{J_A + J_L} \text{ (Nm)}$$

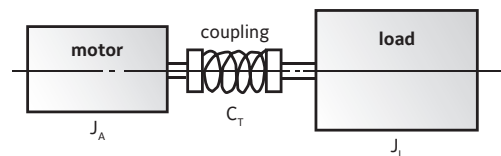
ACCORDING TO RESONANT FREQUENCY

The torsional natural frequency of the coupling must be significantly higher or lower than that of the equipment. For the mechanical substitution model the two mass system applies.

$$f_e = \frac{1}{2 \cdot \pi} \sqrt{C_T \cdot \frac{J_A + J_L}{J_A \cdot J_L}} \text{ (Hz)}$$

In practice the following applies: $f_e \geq 2 \cdot f_{er}$

Two Mass System



ACCORDING TO TORSIONAL DEFLECTION

To calculate transmission error as a result of torsional stress:

$$\varphi = \frac{180}{\pi} \cdot \frac{T_{AS}}{C_T} \text{ (degree)}$$



SIZES FROM 2 - 10,000 Nm

BACKLASH FREE, TORSIONALLY STIFF

METAL BELLOWS COUPLINGS

GENERAL INFORMATION ABOUT R+W BELLOWS COUPLINGS:



SERVICE LIFE

R+W bellows couplings are fatigue resistant and wear free for an infinite service life, as long as the technical limits are not exceeded.

FIT CLEARANCE

Overall shaft / hub clearance of 0.01 - 0.05 mm

ROTATIONAL SPEED

Standard up to 10,000 rpm.
Over 10,000 rpm in finely balanced version; up to grade ISO G=2.5 is available.

TEMPERATURE RANGE

-30 to +100° C

SPECIAL SOLUTIONS

Various materials, tolerances, dimensions and performance ratings available for custom applications on request.

ATEX (Optional)

For use in hazardous zones 1/21 and 2/22, the metal bellows has been authorized under directive 94/9/EG and is available with certification.

TORSIONALLY STIFF BELLOWS COUPLINGS SIZES FROM 2 - 10,000 Nm

MODEL		FEATURES	
BK2		<p>with clamping hub from 15 - 10,000 Nm</p> <ul style="list-style-type: none"> ▶ easy to mount ▶ available in multiple lengths ▶ low moment of inertia 	Page 34
BKH		<p>with fully split clamping hub from 15 - 4,000 Nm</p> <ul style="list-style-type: none"> ▶ radial mounting possible ▶ easy to install onto pre-aligned shafts ▶ low moment of inertia 	Page 35
BKL		<p>economy class with clamping hub from 2 - 500 Nm</p> <ul style="list-style-type: none"> ▶ economy design ▶ optional self-opening clamp system ▶ low moment of inertia 	Page 36
BKS		<p>with clamping hub from 15 - 500 Nm</p> <ul style="list-style-type: none"> ▶ all stainless steel construction ▶ temperatures up to 300°C ▶ easy to mount 	Page 37

MODEL

FEATURES

BKC



**economy class with clamping hub
from 15 - 500 Nm**

Page 38

- ▶ low moment of inertia
- ▶ compact design
- ▶ optional self-opening clamp system

BKM



**with clamping hub
from 20 - 1,000 Nm**

Page 39

- ▶ high torque density
- ▶ ultra compact
- ▶ lowest moment of inertia of all clamping hub designs

BK3



**with conical clamping hub
from 15 - 10,000 Nm**

Page 40

- ▶ high clamping pressure
- ▶ modern design for removal system
- ▶ highly reliable

BK4



**for tapered shafts
from 15 - 150 Nm**

Page 41

- ▶ standard 1:10 taper with feather keyway
- ▶ special designs on request



TORSIONALLY STIFF BELLOWS COUPLINGS

SIZES FROM 2 - 10,000 Nm

MODEL	FEATURES	
 	with clamping hub and blind mate connection from 15 - 1,500 Nm <ul style="list-style-type: none">▶ backlash free with two piece design▶ easy installation and removal▶ available as separate components	Page 42
 	with conical clamping ring and blind mate connection from 15 - 1,500 Nm <ul style="list-style-type: none">▶ eliminates need for screw access holes▶ self centering hubs for highly concentric mounting▶ easy installation and removal	Page 43
 	with expanding shaft from 15 - 300 Nm <ul style="list-style-type: none">▶ for hollow shaft mounting▶ save space and cost▶ solution for mismatched shaft/bore diameters	Page 44
 	with ISO flange mounting from 50 - 2,600 Nm <ul style="list-style-type: none">▶ for flange output gearboxes▶ allows for continuous hollow through axis with some right angle gearbox designs▶ compact layout	Page 45

MODEL

FEATURES

BK1



**with simple flange mounting
from 15 - 10,000 Nm**

- ▶ for adapting the metal bellows to custom drive components
- ▶ custom flange patterns available

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BK2

WITH CLAMPING HUB

15 - 10,000 Nm

ABOUT



FEATURES

- ▶ easy to mount
- ▶ Optional: bolt tensioning system in size 800 and up
- ▶ light weight and low moment of inertia

DESIGN

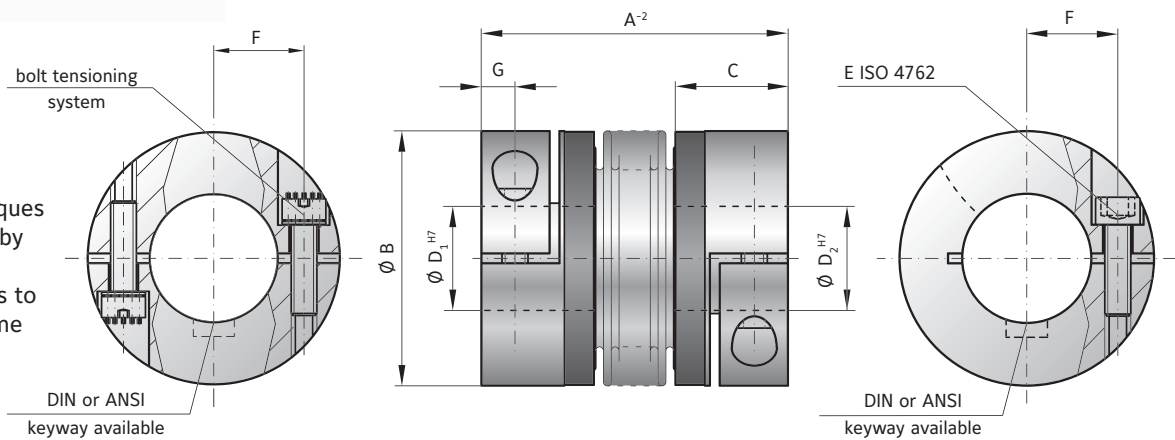
Two clamping hubs concentrically mounted to flexible bellows. Brief overloads of up to 1.5x the rated torque are acceptable.

MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Hubs:** see table

NEW

Advantage: reduce screw tightening torques by up to 90% by using multiple smaller screws to create the same tension.



MODEL BK2

SIZE	15	30	60	80	150	200	300	500	800	1500	4000	6000	10000
Rated torque (Nm) T_{KN}	15	30	60	80	150	200	300	500	800	1500	4000	6000	10000
Overall length (mm) A^{-2}	59 66 99	69 77 113	83 93 130	94 106 143	95 107 144	105 117 163	111 125 200	133 146 169	140 179	166 230	225 252	288	
Outside diameter (mm) B	49	55	66	81	81	90	110	124	134	157	200	253	303
Fit length (mm) C	22	27	31	36	36	41	43	51	45	55	85	107	129
Inside diameter possible from \varnothing to \varnothing H7 (mm) D_1/D_2	8-28	10-30	12-35	14-42	19-42	22-45	24-60	35-60	40-75	50-80	50-90	60-140	70-180
Fastening screw ISO 4762 E	M5	M6	M8	M10	M10	M12	M12	M16	2x M16*	2x M20*	2x M24*	2x M24*	2x M30*
Tightening torque of the fastening screw (Nm)	8	15	40	50	70	120	130	200	250	470	1200	1200	2400
Distance between centerlines (mm) F	17	19	23	27	27	31	39	41	2x48	2x55	2x65	2x90	2x117
Distance (mm) G	6.5	7.5	9.5	11	11	12.5	13	16.5	18	22.5	28	35	42
Moment of inertia (10^{-3} kgm ²) J_{ges}	0.06 0.07 0.08	0.12 0.13 0.14	0.32 0.35 0.4	0.8 0.85 0.9	1.9 2 2.1	3.2 3.4 3.6	7.6 7.9 8.3	14.3 14.6 14.8	16.2 17	43 45	165 495	1214	
Hub material	Al optional steel	Al optional steel	Al optional steel	Al optional steel	steel optional AL	steel optional AL	steel optional AL	steel optional AL	steel	steel	steel	steel	steel
Approximate weight (kg)	0.16	0.26	0.48	0.8	1.85	2.65	4	6.3	5.7	11.5	28.8	49.4	80.9
Torsional stiffness (10^3 Nm/rad) C_T	20 15 14	39 28 27	76 55 54	129 85 84	175 110 97	191 140 135	450 350 340	510 500 400	780 711	1304 1180	3400 5700	10950	
Axial \pm (mm)	1 2 3	1 2 3	1.5 2 3	2 3 4	2 3 4	2 3 4	2.5 3.5 4.5	2.5 3.5 4.5	3.5 4.5	3.5 4.5	3.5 4.5	3 3	
Lateral \pm (mm)	0.15 0.2	1 0.2 0.25	1 0.2 0.25	1 0.2 0.25	1 0.2 0.25	1 0.25 0.3	1 0.25 0.3	1 0.3 0.35	1 0.35 1	0.35 1	0.4 0.4	0.4 0.4	
Angular \pm (degree)	1 1.5 2	1 1.5 2	1 1.5 2	1 1.5 2	1 1.5 2	1 1.5 2	1 1.5 2	1 1.5 2	1 1.5 2	1 1.5 2	1 1.5 2	1 1.5 2	
Axial spring stiffness (N/mm) C_a	25 15 84	50 30 118	72 48 165	48 32 144	82 52 130	90 60 280	105 71 605	70 48 85	100 285	320 440	565 1030	985	
Lateral spring stiffness (N/mm) C_r	475 137 140	900 270 224	1200 420 337	920 290 401	1550 435 500	2040 610 750	3750 1050 1200	2500 840 614	2000 1490	3600 1700	6070 19200	21800	

* 180° opposed in each clamping hub.

ABOUT

FEATURES

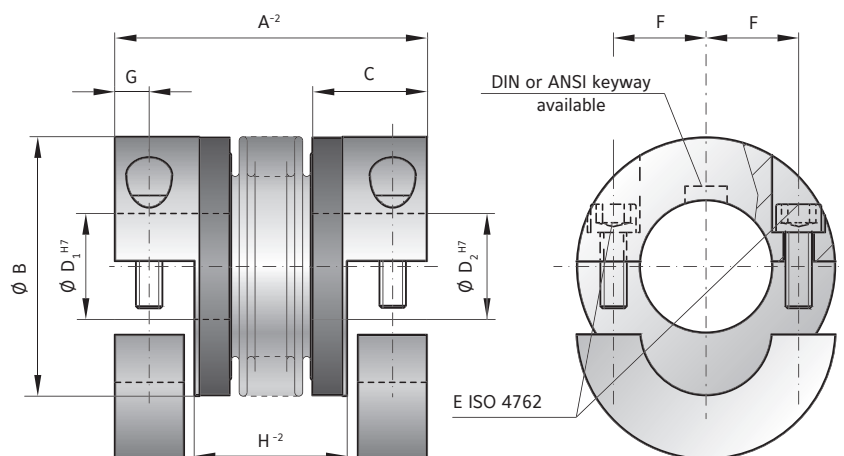
- ▶ radial mounting possible
- ▶ easy installation onto pre-aligned shafts
- ▶ low moment of inertia

DESIGN

Two split clamping hubs with two screws in each. Brief overloads of up to 1.5x the rated torque are acceptable.

MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Hubs:** see table



MODEL BKH

SIZE	15		30		60		80		150		200		300		500		800		1500		4000	
Rated torque (Nm)	15		30		60		80		150		200		300		500		800		1500		4000	
Overall length (mm)	A ⁻² 59 66		69 77		83 93		94 106		95 107		105 117		111 125		133 146		140 166		225			
Outside diameter (mm)	B 49		55		66		81		81		90		110		124		134		157		200	
Fit length (mm)	C 22		27		31		36		36		41		43		51		45		55		85	
Inside diameter possible from Ø to Ø H7 (mm)	D ₁ /D ₂ 8-28		10-30		12-35		14-42		19-42		22-45		24-60		35-60		40-75		50-80		50-90	
Fastening screw ISO 4762	E M5		M6		M8		M10		M10		M12		M12		M16		M16		M20		M24	
Tightening torque of the fastening screw (Nm)	E 8		15		40		50		70		120		130		200		250		470		1200	
Distance between centerlines (mm)	F 17		19		23		27		27		31		39		41		48		55		65	
Distance (mm)	G 6.5		7.5		9.5		11		11		12.5		13		16.5		18		22.5		28	
Distance (mm)	H ⁻² 29 36		35 43		41 51		47 59		48 60		51 63		55 69		62 75		65.5 71		107			
Moment of inertia (10 ⁻³ kgm ²)	J _{ges} 0.07 0.08		0.14 0.15		0.23 0.26		0.65 0.67		2.5 3.2		4.5 5.4		8.5 10.5		17.3 19.6		24.3		49.2		165	
Hub material	Al optional steel		Al optional steel		Al optional steel		Al optional steel		steel optional AL		steel optional AL		steel optional AL		steel optional AL		steel		steel		steel	
Approximate weight (kg)	0.15		0.3		0.4		0.8		1.7		2.5		4		7.5		7		12		28	
Torsional stiffness (10 ³ Nm/rad)	C _T 20 15		39 28		76 55		129 85		175 110		191 140		450 350		510 500		780		1304		3400	
Axial ± (mm)	Max. values 1 2		1 2		1.5 2		2 3		2 3		2 3		2.5 3.5		2.5 3.5		3.5 3.5		3.5 3.5		3.5	
Lateral ± (mm)	0.15 0.2		0.2 0.25		0.2 0.25		0.2 0.25		0.2 0.25		0.25 0.3		0.3 0.25		0.3 0.35		0.35 0.35		0.35 0.35		0.4	
Angular ± (degree)	1 1.5		1 1.5		1 1.5		1 1.5		1 1.5		1 1.5		1 1.5		1 1.5		1.5 1.5		1.5 1.5		1.5	
Axial spring stiffness (N/mm)	C _a 25 15		50 30		72 48		48 32		82 52		90 60		105 71		70 48		100		320		565	
Lateral spring stiffness (N/mm)	C _r 475 137		900 270		1200 420		920 290		1550 435		2040 610		3750 1050		2500 840		2000		3600		6070	

ORDERING EXAMPLE	BK2 / BKH	80	94	20	22.23	XX
Model	●					
Size		●				
Overall length mm			●			Special designation only (e.g. anodized hubs).
Bore D1 H7				●		
Bore D2 H7					●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. BKH / 80 / 94 / 20 / 22.23 / XX; XX=finely balanced for 25,000 rpm)						

BKL

WITH CLAMPING HUB

2 - 500 Nm



ABOUT

FEATURES

- ▶ easy to mount
- ▶ light weight and low moment of inertia
- ▶ economical design

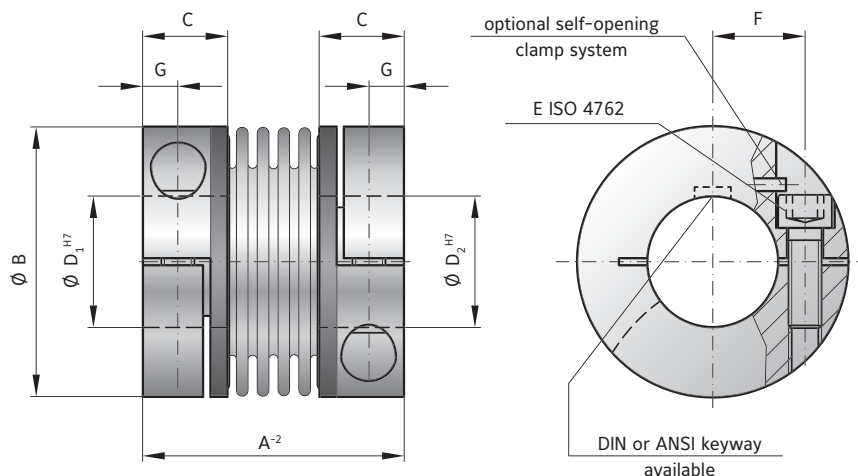
DESIGN

Two clamping hubs concentrically mounted to flexible bellows. Brief overloads of up to 1.5x the rated torque are acceptable.

MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Hubs:** see table

Optional: self-opening clamp system to open the bore during installation and removal by backing out the clamping screw.



MODEL BKL

SIZE			2	4.5	10	15	30	60	80	150	300	500
Rated torque (Nm)	T_{KN}		2	4.5	10	15	30	60	80	150	300	500
Overall length (mm)	A^{-2}		30	40	44	58	68	79	92	92	109	114
Outside diameter (mm)	B		25	32	40	49	56	66	82	82	110	123
Fit length (mm)	C		10.5	13	13	21.5	26	28	32.5	32.5	41	42.5
Inside diameter possible from \emptyset to \emptyset H7 (mm)	$D_{1/2}$		4-12.7	6-16	6-24	8-28	10-32	14-35	16-42	19-42	24-60	35-62
Fastening screw ISO 4762			M3	M4	M4	M5	M6	M8	M10	M10	M12	M16
Tightening torque of the fastening screw (Nm)	E		2.3	4	4.5	8	15	40	70	85	120	200
Distance between centerlines (mm)	F		8	11	14	17	20	23	27	27	39	41
Distance (mm)	G		4	5	5	6.5	7.5	9.5	11	11	13	17
Moment of inertia (10^{-3} kgm ²)	J_{ges}		0.002	0.007	0.016	0.065	0.12	0.3	0.75	1.8 0.8	7.5 3.1	11.7 4.9
Hub material			AL optional steel	AL optional steel	AL optional steel	AL optional steel	AL optional steel	AL optional steel	AL optional steel	steel optional AL	steel optional AL	steel optional AL
Approximate weight (kg)			0.02	0.05	0.06	0.16	0.25	0.4	0.7	1.7 0.75	3.8 1.6	4.9 2.1
Torsional stiffness (10^3 Nm/rad)	C_T		1.5	7	9	23	31	72	80	141	157	290
Axial \pm (mm)		Max. values	0.5	1	1	1	1	1.5	2	2	2	2.5
Lateral \pm (mm)			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Angular \pm (degree)			1	1	1	1	1	1	1	1	1	1
Axial spring stiffness (N/mm)	C_a		8	35	30	30	50	67	44	77	112	72
Lateral spring stiffness (N/mm)	C_r		50	350	320	315	366	679	590	960	2940	1450

ORDERING EXAMPLE	BKL	80	26	22.23	XX
Model	●				Special designation only (e.g. anodized hubs).
Size		●			
Bore D1 H7			●		
Bore D2 H7				●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. BKL / 80 / 26 / 22.23 / XX; XX=finely balanced for 25,000 rpm)					



WITH STAINLESS STEEL CLAMPING HUB

15 - 500 Nm

ABOUT

FEATURES

- ▶ for high temperatures and aggressive media
- ▶ compact design
- ▶ easy to mount

MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Hubs:** high grade stainless steel

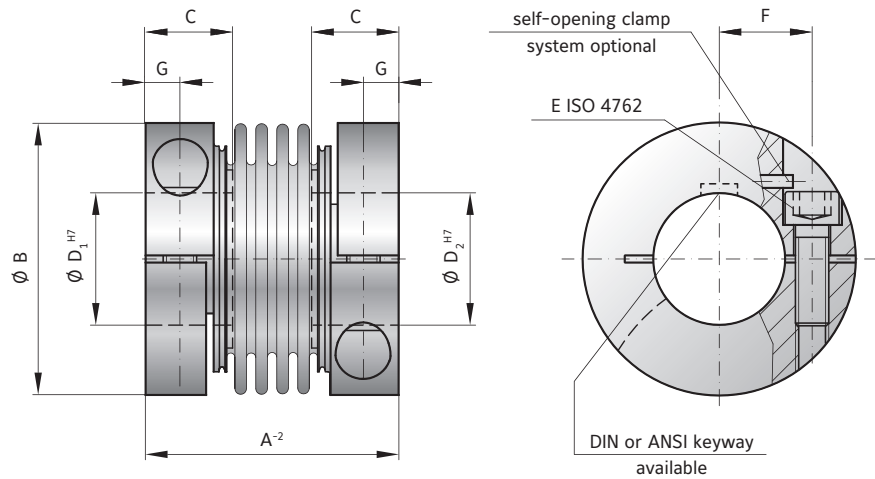
- ▶ **Screws:** Grade 12.9 Geomet coated (alternate materials on request)

DESIGN

Two clamping hubs concentrically mounted to flexible bellows. Brief overloads of up to 1.5x the rated torque are acceptable. From -40° to +300°C operating temperature.



Optional: self-opening clamp system to open the bore during installation and removal by backing out the clamping screw.



BELLOWS COUPLINGS BK

MODEL BKS

SIZE			15	30	60	150	300	500
Rated torque (Nm)	T_{KN}		15	30	60	150	300	500
Overall length (mm)	A^2		45	52	66	76	89	95
Outside diameter (mm)	B		49	56	66	82	110	123
Fit length (mm)	C		17	20	24	30	34	35
Inside diameter* possible from \emptyset to \emptyset H7 (mm)	D_1/D_2		12-28	14-32	16-35	19-42	24-60	32-75
Fastening screw ISO 4762			M5	M6	M8	M10	M12	M12
Tightening torque of the fastening screw (Nm)	E		8	15	40	75	120	125
Distance between centerlines (mm)	F		17.5	20	23	27	39	45
Distance (mm)	G		6	7.5	9.5	11	13	13
Moment of inertia (10^{-3} kgm ²)	$J_{ges.}$		0.1	0.2	0.53	1.5	5.5	8.1
Approximate weight (kg)			0.27	0.42	0.78	1.5	2.9	3.5
Torsional stiffness (10^3 Nm/rad)	C_T		23	31	72	141	157	290
Axial \pm (mm)		Max. values	1	1	1.5	2	2	2.5
Lateral \pm (mm)			0.2	0.2	0.2	0.2	0.2	0.2
Angular \pm (degree)			1	1	1	1	1	1
Axial spring stiffness (N/mm)	C_a		30	50	67	77	112	72
Lateral spring stiffness (N/mm)	C_r		315	366	679	960	2940	2200
Speed max. with G = 2.5 balancing (min ⁻¹)			60,000	50,500	50,000	40,500	40,000	30,000

* Smaller bore diameter available at reduced torque capacity

ORDERING EXAMPLE	BKS	15	20	19.05	XX
Model	●				
Size		●			Special designation only (e.g. special bore tolerance).
Bore D1 H7			●		
Bore D2 H7				●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. BKS / 15 / 20 / 19.05 / XX; XX=finely balanced for 25,000 rpm)					



ABOUT

FEATURES

- ▶ for space restricted installations
- ▶ light weight and low moment of inertia
- ▶ easy to mount

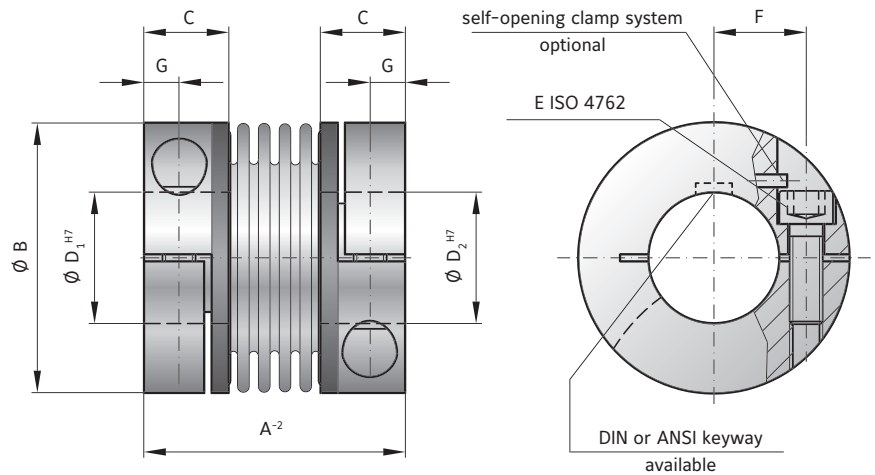
DESIGN

Two clamping hubs concentrically mounted to flexible bellows. Brief overloads of up to 1.5x the rated torque are acceptable.

MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Hubs:** see table

Optional: self-opening clamp system to open the bore during installation and removal by backing out the clamping screw.



MODEL BKC

SIZE			15	30	60	150	300	500
Rated torque (Nm)	T_{KN}		15	30	60	150	300	500
Overall length (mm)	A^{-2}		48	58	67	78	94	100
Outside diameter (mm)	B		49	56	66	82	110	123
Fit length (mm)	C		16.5	21	23	27.5	34	34
Inside diameter possible from \emptyset to \emptyset H7 (mm)	D_1/D_2		8-28	12-32	14-35	19-42	24-60	32-75
Fastening screw ISO 4762			M5	M6	M8	M10	M12	M12
Tightening torque of the fastening screw (Nm)	E		8	15	40	75	120	125
Distance between centerlines (mm)	F		17.5	20	23	27	39	45
Distance (mm)	G		6.5	7.5	9.5	11	13	13
Moment of inertia (10^{-3} kgm ²)	$J_{res.}$		0.05	0.1	0.26	0.65	6.3	9
Hub material			AL	AL	AL	AL	steel	steel
Approximate weight (kg)			0.13	0.21	0.37	0.72	3.26	3.52
Torsional stiffness (10^3 Nm/rad)	C_T		23	31	72	141	157	290
Axial \pm (mm)	Max. values		1	1	1.5	2	2	2.5
Lateral \pm (mm)			0.2	0.2	0.2	0.2	0.2	0.2
Angular \pm (degree)			1	1	1	1	1	1
Axial spring stiffness (N/mm)	C_a		30	50	67	77	112	72
Lateral spring stiffness (N/mm)	C_r		315	366	679	960	2940	2200
Speed max. with G = 2.5 balancing (min ⁻¹)			80,000	70,000	60,000	50,000	40,000	30,000

ORDERING EXAMPLE	BKC	60	26	22.23	XX
Model	●				Special designation only (e.g. special bore tolerance).
Size		●			
Bore D1 H7			●		
Bore D2 H7				●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. BKC / 60 / 26 / 22.23 / XX; XX=finely balanced for 25,000 rpm)					

ULTRA COMPACT AND STIFF WITH CLAMPING HUB 20 - 1,000 Nm



ABOUT

FEATURES

- ▶ extremely compact
- ▶ high torque density
- ▶ low mass and moment of inertia

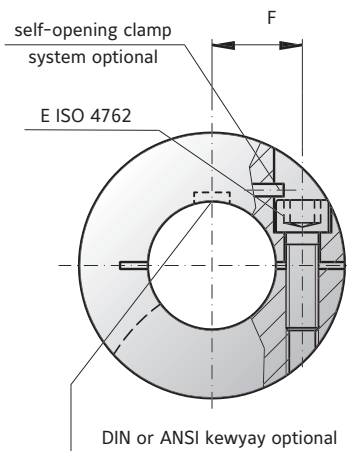
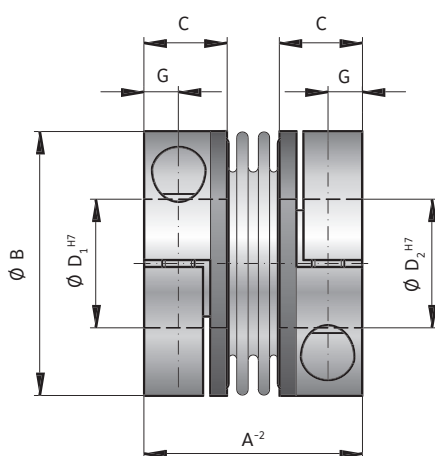
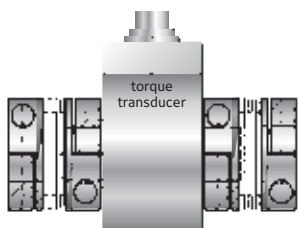
MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Hubs:** see table

DESIGN

Two clamping hubs concentrically mounted to flexible bellows.
Brief overloads of up to 1.5x the rated torque are acceptable.

Key application:
For mounting on a torque transducer.



MODEL BKM

SIZE			20	200	400	1000
Rated torque (Nm)	T_{KN}		20	200	400	1000
Overall length (mm)	A^{-2}		40	59	75	89
Outside diameter (mm)	B		49	66	82	110
Fit length (mm)	C		16.5	23	27.5	34
Inside diameter possible from \varnothing to \varnothing H7 (mm)	$D_{1/2}$		15-28	24-35	32-42	40-60
Fastening screw ISO 4762			M5	M8	M10	M12
Tightening torque of the fastening screw (Nm)	E		8	40	60	130
Distance between centerlines (mm)	F		17	23	27	39
Distance (mm)	G		6	9.5	11	13
Moment of inertia (10^{-3} kgm ²)	$J_{ges.}$		0.05	0.18	0.62	7.2
Hub material			AL	AL	AL	steel
Approximate weight (kg)			0.13	0.4	0.7	3.5
Torsional stiffness (10^3 Nm/rad)	C_T		41.9	138	170	570
Axial \pm (mm)	Max. values		1	1.5	1	2
Lateral \pm (mm)			0.06	0.08	0.1	0.1
Angular \pm (degree)			0.5	0.5	0.5	0.5
Axial spring stiffness (N/mm)	C_a		55.8	153	114	148
Lateral spring stiffness (N/mm)	C_r		3,710	11,000	6,058	9,010
Speed max. with G = 2.5 balancing min ⁻¹			80,000	60,000	50,000	40,000

ORDERING EXAMPLE	BKM	20	20	19.05	XX
Model	●				Special designation only (e.g. special bore tolerance).
Size		●			
Bore D1 H7			●		
Bore D2 H7				●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. BKM / 20 / 20 / 19.05 / XX; XX=finely balanced for 25,000 rpm)					

BK3

WITH CONICAL CLAMPING SYSTEM

15 - 10,000 Nm



ABOUT

FEATURES

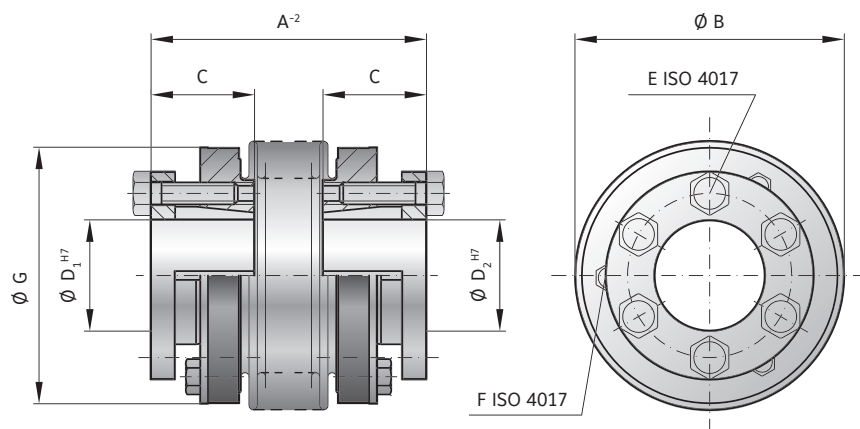
- ▶ high clamping pressure
- ▶ high torque version
- ▶ modern design for removal system

MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Hubs:** steel

DESIGN

Two conical clamping hubs concentrically mounted to flexible bellows. Brief overloads of up to 1.5x the rated torque are acceptable.



MODEL BK3

SIZE		15	30	60	150	200	300	500	800	1500	4000	6000	10000	
Rated torque (Nm)	T_{KN}	15	30	60	150	200	300	500	800	1500	4000	6000	10000	
Overall length (mm)	A^{-2}	48 55	57 65	66 76	75 87	78 90	89 103	97 110	114	141	195	210	217	
Outside diameter (mm)	B	49	55	66	81	90	110	124	133	157	200	253	303	
Fit length (mm)	C	19	22	27	32	32	41	41	50	61	80	85	92	
Inside diameter possible from \emptyset to \emptyset H7 (mm)	$D_{1/2}$	10-22	12-23	12-29	15-38	15-44	24-56	24-60	30-60	35-70	50-100	60-140	70-180	
Fastening screw ISO 4017	E	6 x M4	6 x M5	6 x M5	6 x M6	6 x M6	6 x M8	6 x M8	6 x M10	6 x M12	6 x M16	6 x M16	8 x M16	
Tightening torque of the fastening screw (Nm)		4	6	8	12	14	18	25	40	70	120	150	160	
Jack screw ISO 4017	F	3 x M4	3 x M4	3 x M5	3 x M5	3 x M6	3 x M6	3 x M6	3 x M8	6 x M8	6 x M10	6 x M10	8 x M10	
Outside diameter of hub (mm)	G	49	55	66	81	90	110	122	116	135	180	246	295	
Moment of inertia (10^{-3} kgm ²)	J_{ges}	0.07 0.08	0.15 0.16	0.39 0.41	1.2 1.6	1.7 2.5	5.1 5.9	9.1 9.9	13.2	34.9	85.5	254	629	
Approximate weight (kg)		0.25	0.4	0.7	1.2	1.8	3	4.2	5.6	8.2	23	32.6	45.5	
Torsional stiffness (10^3 Nm/rad)	C_T	20 15	39 28	76 55	175 110	191 140	450 350	510 500	780	1304	3400	5700	10950	
Axial \pm (mm)	Max. values	1 2	1 2	1.5 2	2 3	2 3	2.5 3.5	2.5 3.5	3.5	3.5	3.5	3	3	
Lateral \pm (mm)		0.15 0.2	0.2 0.25	0.2 0.25	0.2 0.25	0.25 0.3	0.25 0.3	0.3 0.35	0.3 0.35	0.35	0.35	0.4	0.4	0.4
Angular \pm (degree)		1 1.5	1 1.5	1 1.5	1 1.5	1 1.5	1 1.5	1 1.5	1 1.5	1.5	1.5	1.5	1.5	1.5
Axial spring stiffness (N/mm)	C_a	25 15	50 30	72 48	82 52	90 60	105 71	70 48	100	320	565	1030	985	
Lateral spring stiffness (N/mm)	C_r	475 137	900 270	1200 420	1500 435	2040 610	3750 1050	2500 840	2000	3600	6070	19200	21800	

ORDERING EXAMPLE	BK3	60	76	20	22.23	XX
Model	●					
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Bore D2 H7					●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. BK3 / 60 / 76 / 20 / 22.23 / XX; XX=K6 bore tolerance on D1)						

BK4

FOR TAPERED SHAFTS 15 - 150 Nm



ABOUT

FEATURES

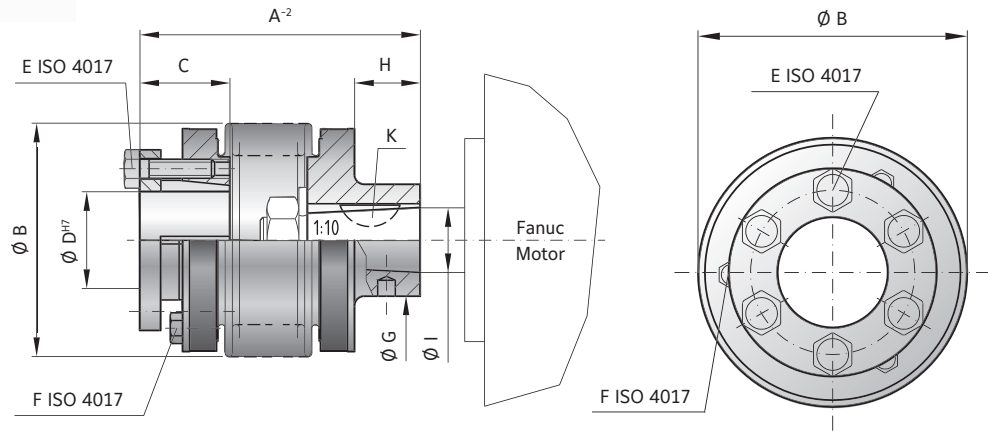
- ▶ for tapered shafts
- ▶ easy to mount and dismount
- ▶ high installed concentricity

MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Hubs:** steel

DESIGN

Conical clamping system opposite 1:10 tapered bore with feather keyway. Brief overloads of up to 1.5x the rated torque acceptable.



MODEL BK4

SIZE	15		30		60		150		
Rated torque (Nm)	T_{KN}	15	30	60	150				
Overall length (mm)	A^{-2}	47	54	68	76	72	82	82	94
Outside diameter (mm)	B	49	55	66	81				
Fit length (mm)	C	19	22	27	32				
Inside diameter possible from \varnothing to $\varnothing H7$ (mm)	D	10-22	12-23	12-29	15-37				
Fastening screw ISO 4017	E	6 x M4	6 x M5	6 x M5	6 x M6				
Tightening torque of the fastening screw (Nm)		4	6	8	12				
Jack screw ISO 4017	F	3 x M4	3 x M4	3 x M5	3 x M5				
Outside diameter of hub (mm)	G	20	27	30	30				
Hub length (mm)	H	8.5	22	18	20				
Moment of inertia (10^{-3} kgm^2)	J_{ges}	0.10	0.12	0.22	0.27	0.58	0.61	1.1	1.4
Approximate weight (kg)		0.25	0.4	0.8	1.35				
Torsional stiffness (10^3 Nm/rad)	C_T	20	15	39	28	76	55	175	110
Axial \pm (mm)	Max. values	1	2	1	2	1.5	2	2	3
Lateral \pm (mm)		0.15	0.2	0.2	0.25	0.2	0.25	0.2	0.25
Angular \pm (degree)		1	1.5	1	1.5	1	1.5	1	1.5
Axial spring stiffness (N/mm)	C_a	25	15	50	30	72	48	82	52
Lateral spring stiffness (N/mm)	C_r	475	137	900	270	1200	420	1500	435
Cone \varnothing (Fanuc-Motor) (mm)	I	11	16	16	16	16	16	16	16
Key width (mm)	K	4	5	5	5	5	5	5	5

ORDERING EXAMPLE	BK4	150	82	20	XX
Model	●				
Size		●			
Overall length mm			●		
Bore D1 H7				●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. BK4 / 150 / 82 / 20 / XX; XX=finely balanced for 25,000 rpm)					

BK5

BLIND MATE WITH CLAMPING HUB

15 - 1,500 Nm

ABOUT

FEATURES

- ▶ easy installation and removal
- ▶ electrically and thermally isolating
- ▶ absolutely backlash free assembly

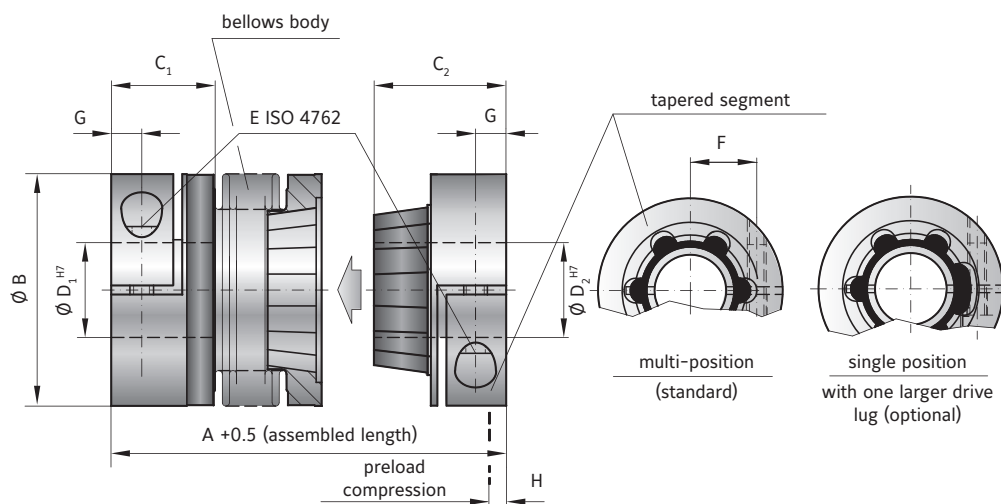
MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Hubs:** up through size 80 Aluminum, size 150 and up steel

- ▶ **Tapered male segment:** high strength plastic

DESIGN

Two clamping hubs, one of which has a tapered male projection for blind mate connection. Brief overloads of up to 1.5x the rated torque are acceptable.



MODEL BK5

SIZE		15	30	60	80	150	300	500	800	1500
Rated torque (Nm)	T_{KN}	15	30	60	80	150	300	500	800	1500
Overall length (inserted) (mm)	$A^{+0.5}$	60, 67	71, 79	85, 95	94, 106	95, 107	114, 128	136, 149	150, 172	172, 194
Outside diameter (mm)	B	49	55	66	81	81	110	124	133	157
Fit length (mm)	C_1	22	27	32	36	36	43	51	45	55
Fit length (mm)	C_2	28	33	39	43	43	52	61	74	94
Inside diameter possible from Ø to Ø H7 (mm)	D_1	8-28	10-30	12-32	14-42	14-42	24-60	35-60	40-75	50-80
Inside diameter possible from Ø to Ø H7 (mm)	D_2	8-22	10-25	12-32	14-38	14-38	24-58	35-60	40-62	50-75
Fastening screw ISO 4762	E	M5	M6	M8	M10	M10	M12	M16	2 x M16**	2 x M20**
Tightening torque of the fastening screw (Nm)		8	15	40	50	70	130	200	250	470
Distance between centerlines (mm)	F	17	19	23	27	27	39	41	2 x 48**	2 x 55**
Distance (mm)	G	6.5	7.5	9.5	11	11	13	16.5	18	22.5
Preload compression (mm)	H	0.2 - 1.0	0.5 - 1.0	0.5 - 1.5	0.5 - 1.5	0.5 - 1.5	0.5 - 1.5	1.0 - 2.0	1.0 - 2.5	0.5 - 1.5
Axial recovery force at maximum pretensioning (N)		20, 12	50, 30	70, 45	48, 32	82, 52	157, 106	140, 96	200, 650	
Moment of inertia (10^{-3} kgm ²)	J_{ges}	0.07, 0.08	0.14, 0.15	0.23, 0.26	0.65, 0.67	2.2, 2.4	7.4, 7.9	13.7, 14.4	21.5, 14.4	51.4, 15.3
Approximate weight (kg)		0.1, 0.1	0.3, 0.3	0.4, 0.4	0.9, 0.9	1.8, 1.8	4, 4	6.5, 6.7	9, 9	15.3, 15.3
Torsional stiffness (10^3 Nm/rad)	C_t	10, 8	20, 14	38, 28	65, 43	88, 55	225, 175	255, 245	400, 400	650, 650
Axial* ± (mm)	Max. values	0.5, 1	0.5, 1	0.5, 1	1, 1	1, 2	1, 2	1.5, 2	2.5, 3.5	3, 2
Lateral ± (mm)		0.15, 0.2	0.2, 0.25	0.2, 0.25	0.2, 0.25	0.2, 0.25	0.2, 0.25	0.25, 0.3	0.3, 0.35	0.35, 0.35
Angular ± (degree)		1, 1.5	1, 1.5	1, 1.5	1, 1.5	1, 1.5	1, 1.5	1, 1.5	1, 1.5	1.5, 1.5
Lateral spring stiffness (N/mm)	C_r	475, 137	900, 270	1200, 420	920, 290	1550, 435	3750, 1050	2500, 840	2000, 2000	3600, 3600

*in addition to maximum allowable pretension **180° opposed in each clamping hub.

ORDERING EXAMPLE	BK5	30	71	18	19	XX
Model	●					
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Bore D2 H7					●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. BK5 / 30 / 71 / 18 / 19 / XX; XX=finely balanced for 25,000 rpm)						

BK6

BLIND MATE WITH CONICAL CLAMPING RING 15 - 1,500 Nm

ABOUT

FEATURES

- ▶ axial mounting possible
- ▶ easy installation and removal
- ▶ naturally very well balanced due to self centering clamping ring system
- ▶ absolutely backlash free assembly

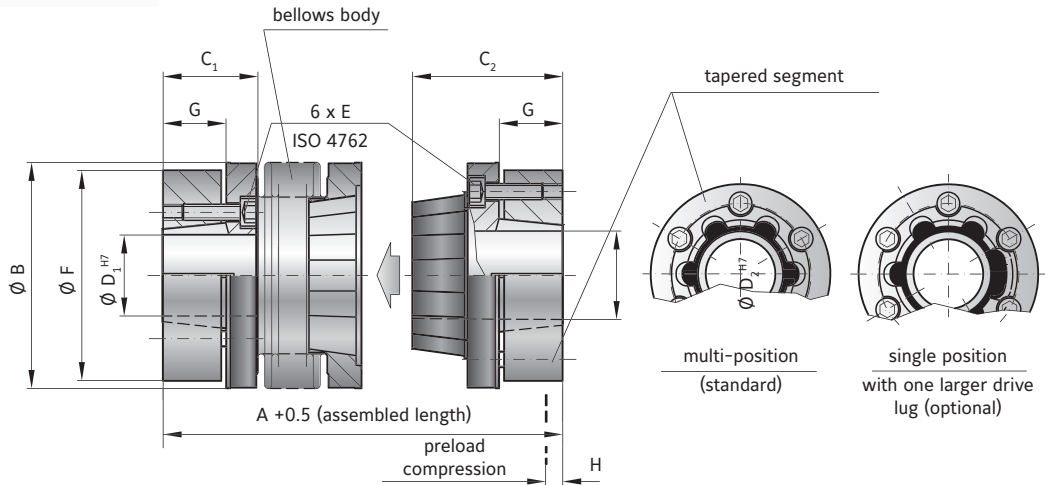
MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Hubs:** steel

- ▶ **Tapered male segment:** high strength plastic

DESIGN

Two conical clamping ring hubs, one of which has a tapered male projection for blind mate connection. Brief overloads of up to 1.5x the rated torque are acceptable.



MODEL BK6

SIZE			15	30	60	150	300	500	800	1500
Rated torque (Nm)	T_{KN}		15	30	60	150	300	500	800	1500
Overall length (gesteckt) (mm)	$A^{+0.5}$		58 65	68 76	79 89	97 109	113 127	132 145	140	158
Outside diameter (mm)	B		49	55	66	81	110	124	133	157
Fit length (mm)	C_1		13.5	21.5	18	23.5	27	32	42	53
Fit length (mm)	C_2		29	34	39	49.5	59	68	74	90.5
Inside diameter possible from \emptyset to \emptyset H7 (mm)	D_1		10-22	12-24	12-32	15-40	24-56	30-60	40-62	50-75
Inside diameter possible from \emptyset to \emptyset H7 (mm)	D_2		10-22	12-24	12-32	15-40	24-56	30-60	40-62	50-75
Fastening screw ISO 4762			M4	M5	M5	M6	M8	M8	M10	M12
Tightening torque of the fastening screw (Nm)	E		3.5	6.5	8	12	30	32	55	110
Diameter of clamping ring (mm)	F		46.5	51	60	74	102	114	126	146
Clamping ring length (mm)	G		9.5	10.5	11.5	17.5	20	23	27	32
Preload compression (mm)			0.2 - 1.0	0.5 - 1.0	0.5 - 1.5	0.5 - 1.5	0.5 - 1.5	1.0 - 2.0	1.0 - 2.0	0.5 - 1.5
Axial recovery force at maximum pretensioning (N)	H		20 12	50 30	70 45	82 52	157 106	140 96	400	650
Moment of inertia (10^{-3} kgm ²)	J_{GES}		0.1 0.12	0.2 0.25	0.4 0.45	2.0 2.5	5.4 6.1	8.4 9.1	17.5	44
Approximate weight (kg)			0.3 0.32	0.5 0.52	0.82 0.84	1.6 1.7	4.1 4.2	6.0 6.3	8.1	16.2
Torsional stiffness (10^3 Nm/rad)	C_T		10 8	20 14	38 28	88 55	225 175	255 245	400	660
Axial* \pm (mm)			0.5 1	0.5 1	0.5 1	1 1	2 1.5	2 2.5	3.5	2
Lateral \pm (mm)	Max. values		0.15 0.2	0.2 0.25	0.2 0.25	0.2 0.25	0.25 0.3	0.3 0.35	0.35	0.35
Angular \pm (degree)			1 1.5	1 1.5	1 1.5	1 1.5	1 1.5	1 1.5	1.5	1.5
Lateral spring stiffness (N/mm)	C_r		475 137	900 270	1200 420	1550 435	3750 1050	2500 840	2000	3600

* in addition to maximum allowable pretension

Higher torques upon request

ORDERING EXAMPLE	BK6	30	76	18	19	XX
Model	●					
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Bore D2 H7					●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. BK6 / 30 / 76 / 18 / 19 / XX; XX=finely balanced for 25,000 rpm)						

BK7

WITH EXPANDING SHAFT

15 - 300 Nm



ABOUT

FEATURES

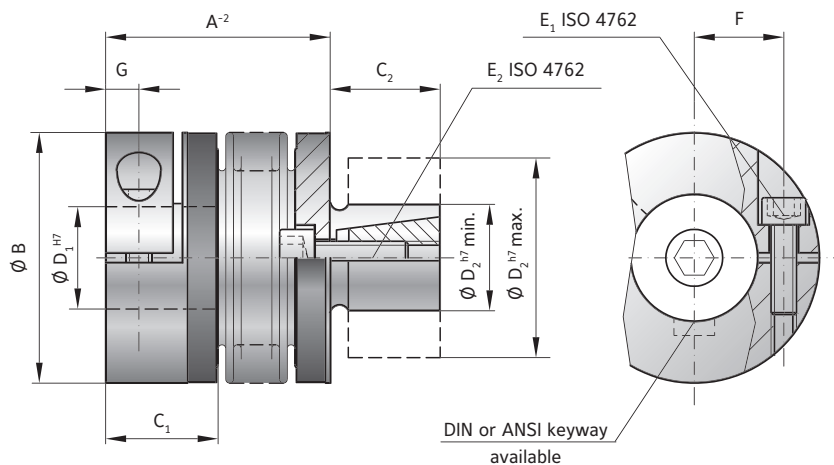
- ▶ for hollow shaft mounting
- ▶ short design saves installation space
- ▶ solution for mismatched shaft / bore

MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Hubs:** see table
- ▶ **Expanding mandrel system:** steel

DESIGN

One clamping hub on one end with an expanding shaft on the other end. Brief overloads of up to 1.5x the rated torque are acceptable.



MODEL BK7

SIZE		15		30		60		150		300		
Rated torque	(Nm)	T_{KN}	15	30	60	150	300					
Overall length	(mm)	A^{-2}	45	52	53	61	62	72	71	83	84	98
Outside diameter	(mm)	B	49	55	66	81	110					
Fit length	(mm)	C_1	22	27	32	36	43					
Fit length	(mm)	C_2	20	25	27	32	45					
Inside diameter possible from \emptyset to \emptyset H7	(mm)	D_1	8-28	10-30	12-35	19-42	30-60					
Shaft diameter from \emptyset to \emptyset h7	(mm)	D_2	13-25	14-30	23-38	26-42	38-60					
Fastening screw ISO 4762		$E_{1/2}$	M5	M6	M8	M10	M12					
Tightening torque of the fastening screw	(Nm)	$E_{1/2}$	8	14	38	65	120					
Distance between centerlines	(mm)	F	17	19	23	27	39					
Distance	(mm)	G	6.5	7.5	9.5	11	13					
Moment of inertia (10^{-3} kgm ²)		J_{ges}	0.07	0.08	0.14	0.15	0.23	0.26	2.2	2.4	6.5	8.9
Hub material			Al	Al	Al	steel	steel					
Approximate weight	(kg)		0.15	0.3	0.4	1.7	4					
Torsional stiffness (10^3 Nm/rad)		C_T	20	15	39	28	76	55	175	110	450	350
Axial \pm (mm)		Max. values	1	2	1	2	1.5	2	2	3	2.5	3.5
Lateral \pm (mm)			0.15	0.2	0.2	0.25	0.2	0.25	0.2	0.25	0.25	0.3
Angular \pm (degree)			1	1.5	1	1.5	1	1.5	1	1.5	1	1.5
Axial spring stiffness	(N/mm)	C_a	20	12	50	30	72	48	82	52	105	71
Lateral spring stiffness	(N/mm)	C_r	315	108	730	230	1200	380	1550	435	3750	1050

ORDERING EXAMPLE	BK7	150	71	32	22.23	XX
Model	●					
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Shaft D2 f7					●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. BK7 / 150 / 71 / 32 / 22.23 / XX; XX=finely balanced for 25,000 rpm)

BK8

WITH ISO FLANGE CONNECTION

50 - 2,600 Nm

ABOUT

FEATURES

- ▶ for ISO flange output gearboxes
- ▶ allows for continuous hollow through axis with some right angle gearbox designs
- ▶ compact design

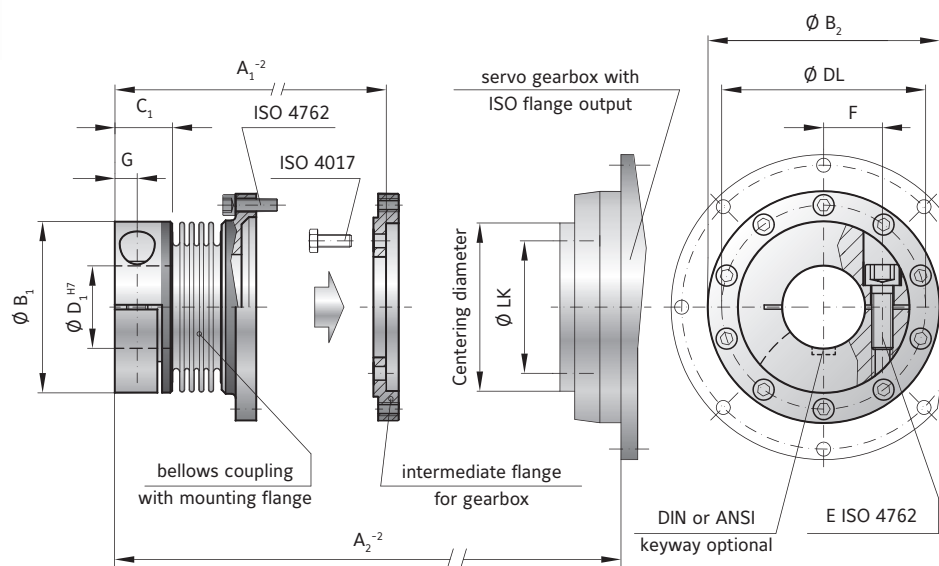
- ▶ **Hubs:** up through size 300 aluminum, size 1500 and up steel
- ▶ **Adapter flange:** steel

MATERIAL

- ▶ **Bellows:** high grade stainless steel

DESIGN

One clamping hub on one end with an integral flange and adapter flange on the other end. Maximum transmittable torque depends on the bore diameter.



MODEL BK8

SIZE		15	60	150	300	1500
Flange centering diameter	(mm)	40 h7	63 h7	80 h7	100 h7	160 h7
Flange bolt circle / thread Ø	(mm)	31.5 / 8 x M5	50 / 8 x M6	63 / 12 x M6	80 / 12 x M8	125 / 12 x M10
Maximum torque*	(Nm)	50	210	380	750	2600
Length -2	(mm) A ₁	48.5	67	72	90	140
Length -2	(mm) A ₂	68	97	101	128	190
Outside diameter of hub	(mm) B ₁	49	66	82	110	157
Flange diameter	(mm) B ₂	63.5	86	108	132	188
Fit length	(mm) C ₁	16.5	23	27.5	34	55
Inside diameter possible from Ø to Ø H7	(mm) D ₁	12-28	14-35	19-42	24-60	50-80
Hub bolt circle	(mm) DL	56.5	76	97	120	170
Fastening threads	(mm)	10 x M4	10 x M5	10 x M6	12 x M6	18 x M8
Fastening screws ISO 4762		1 x M5	1 x M8	1 x M10	1 x M12	2 x M20
Tightening torque of the fastening screw	(Nm) E ₁	8	45	80	120	470
Distance between centerlines	(mm) F	1 x 17.5	1 x 23	1 x 27	1 x 39	2 x 55
Distance	(mm) G	6.5	9.5	11	13	22.5
Approximate weight	(kg)	0.3	0.7	1	2.8	10
Moment of inertia (10 ⁻³ kgm ²)	J _{ges}	0.15	0.65	1.3	5.5	45
Lateral	± (mm)	0.25	0.25	0.25	0.25	0.25
Angular	± (degree)	1	1	1	1	1
Axial	± (mm)	1	1.5	2	2.5	3

* maximum torque transmittable only for brief periods and requires maximum bore for clamping strength

ORDERING EXAMPLE	BK8	60	22.23	67	XX
Model	●				Special designation only (e.g. special bore tolerance).
Size		●			
Bore D1 H7			●		
Overall length mm				●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. BK8 / 60 / 22.23 / 67 / XX; XX=anodized hubs)					

BK1

WITH FLANGE MOUNTING

15 - 10,000 Nm



ABOUT

FEATURES

- ▶ For simple flange mounting to special drive components
- ▶ custom flange patterns available

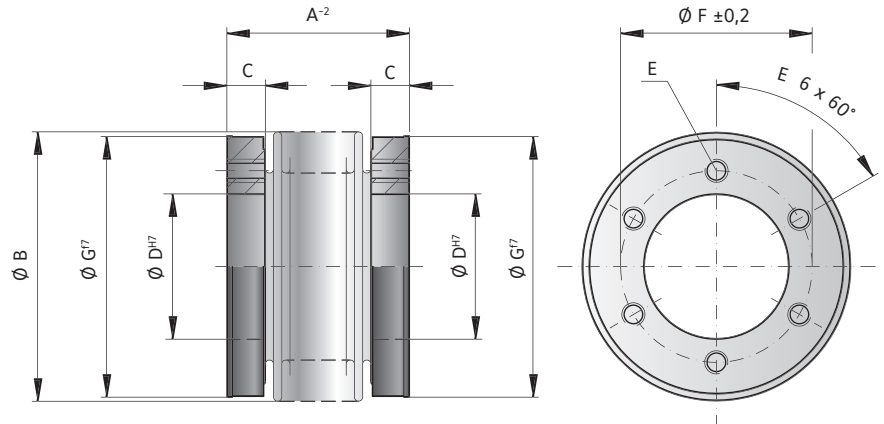
MATERIAL

- ▶ **Bellows:** high grade stainless steel

- ▶ **Hubs:** steel

DESIGN

Two mounting flanges concentrically assembled to the flexible bellows. Brief overloads of up to 1.5x the rated torque are acceptable.



MODEL BK1

SIZE		15	30	60	150	200	300	500	800	1500	4000	6000	10000
Rated torque (Nm)	T_{KN}	15	30	60	150	200	300	500	800	1500	4000	6000	10000
Overall length (mm)	A^{-2}	30 37	36 44	43 53	50 62	53 65	56 70	64 77	81	100	145	138	150
Outside diameter of bellows (mm)	B	49	55	66	81	90	110	124	133	157	200	253	303
Fit length/thread depth (mm)	C	7.5	10	11	13	14.5	15	16	18	22	30	30	36
Inside diameter H7 (mm)	D	25	28	38	50	58	65	70	75	85	100	145	190
Fastening threads	E	6 x M5	6 x M5	6 x M6	6 x M6	6 x M6	6 x M8	6 x M8	6 x M10	6 x M16	6 x M20	8 x M20	8 x M24
Bolt circle diameter ± 0.2 (mm)	F	35	37	46	62	70	80	94	90	110	140	190	234
Outside diameter f7 (mm)	G	49	55	66	81	90	110	122	116	140	182	235	295
Moment of inertia (10^{-3} kgm ²)	J_{ges}	0.07 0.08	0.14 0.15	0.30 0.32	0.90 0.95	1.30 1.40	1.95 2.10	3.0 3.4	4.3	10.6	46	132	350
Approximate weight (kg)		0.15	0.2	0.3	0.6	0.8	1.35	1.8	1.9	3.3	8.9	13.9	23.7
Torsional stiffness (10^3 Nm/rad)	C_T	20 15	39 28	76 55	175 110	191 140	450 350	510 500	780	1304	3400	5700	10950
Axial ± (mm)		1 2	1 2	1.5 2	2 2	3 2	2.5 3.5	2.5 3.5	3.5	3.5	3.5	3	3
Lateral ± (mm)	Max. values	0.15	0.2	0.2	0.25	0.2	0.25	0.25	0.3	0.25	0.3	0.3	0.35
Angular ± (degree)		1	1.5	1	1.5	1	1.5	1	1.5	1	1.5	1.5	1.5
Axial spring stiffness (N/mm)	C_s	25	15	50	30	72	48	82	52	90	60	105	71
Lateral spring stiffness (N/mm)	C_r	475	137	900	270	1200	420	1550	435	2040	610	3750	1050

ORDERING EXAMPLE	BK1	150	62	XX
Model	●			Special designation only (e.g. high speed balancing).
Size		●		
Overall length mm			●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. BK1 / 150 / 62 / XX; XX=finely balanced for 25,000 rpm)				



SPECIAL SOLUTIONS

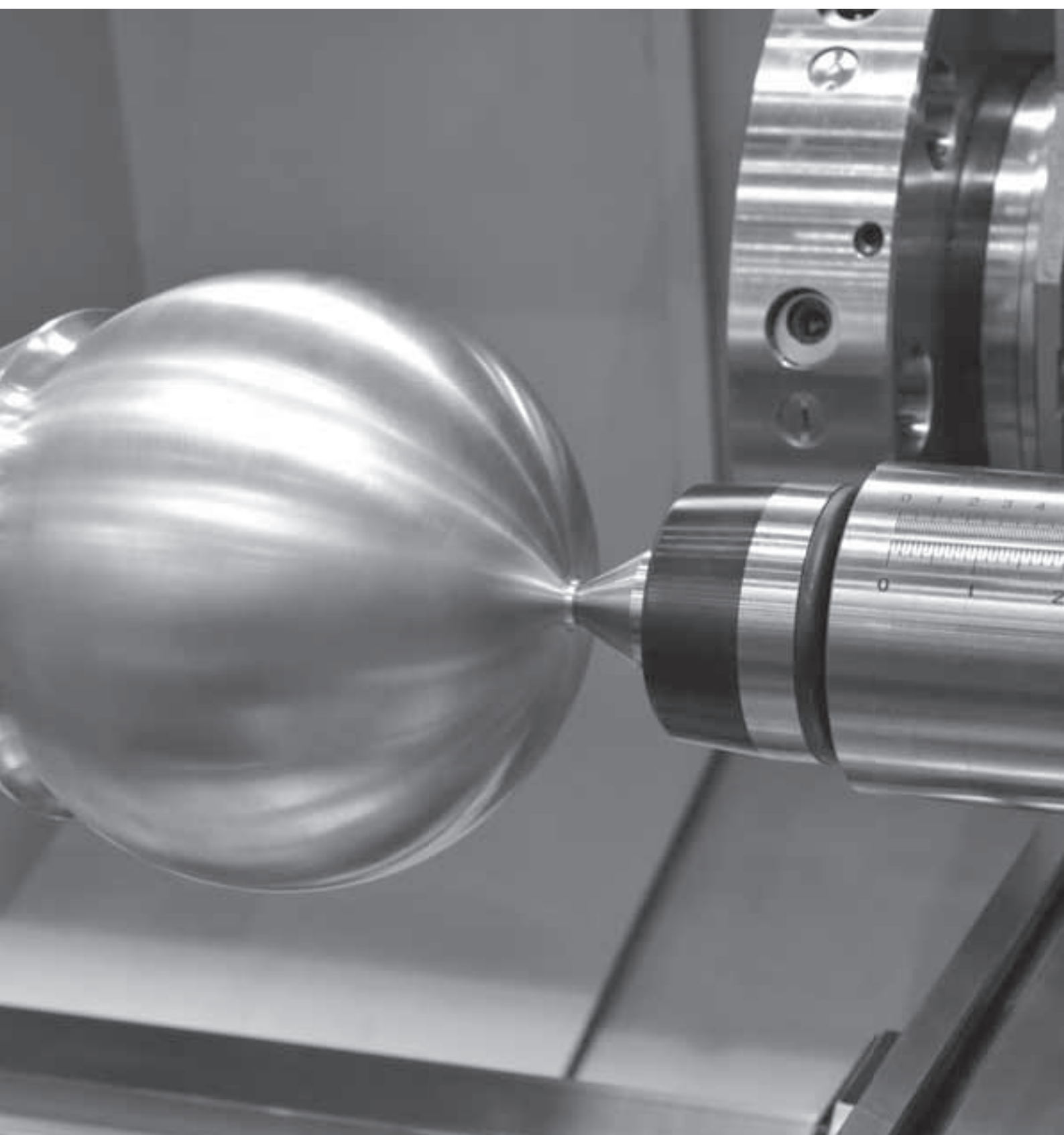
2 - 10,000 Nm

CUSTOMER SPECIFIC FEATURES

Including:

- ▶ Special materials and treatments
- ▶ Custom bellows
- ▶ Specific overall length
- ▶ Internal catches for in case of bellows rupture
- ▶ Many more

Contact us by phone at +49 9372 9864-0





SIZES FROM 0.05- 10 Nm BACKLASH FREE MINIATURE METAL BELLOWS COUPLINGS

GENERAL INFORMATION ABOUT R+W MINIATURE BELLOWS COUPLINGS:



SERVICE LIFE

R+W bellows couplings are fatigue resistant and wear free for an infinite service life, as long as the technical limits are not exceeded.

FIT CLEARANCE

Overall shaft / hub clearance of 0.01 - 0.05 mm

ROTATIONAL SPEED

Standard up to 10,000 rpm.
Over 10,000 rpm in finely balanced version; up to grade ISO G=2.5 is available.

TEMPERATURE RANGE

-30 to +110° C

SPECIAL SOLUTIONS

Various materials, tolerances, dimensions and performance ratings available for custom applications on request.

ATEX (Optional)

For use in hazardous zones 1/21 and 2/22, the metal bellows has been authorized under directive 94/9/EG and is available with certification.

BACKLASH FREE, TORSIONALLY STIFF MINIATURE COUPLINGS SIZES FROM 0.05 - 10 Nm

MODEL

FEATURES

MK1



**with radial set screws
from 0.05 - 10 Nm**

- ▶ large bores available in small size
- ▶ integral dismounting groove eliminates the need for flats on shafts
- ▶ economy design

Page 52

MK2



**with clamping hub
from 0.5 - 10 Nm**

- ▶ easy mounting
- ▶ for highly dynamic applications
- ▶ finely balanced versions up to 90,000 rpm

Page 53

MKH



**with fully split clamping hub
from 0.5 - 10 Nm**

- ▶ lateral mounting possible
- ▶ easy installation and removal
- ▶ allows for pre-alignment of shafts

Page 54

MK3



**with expanding shaft
from 0.5 - 10 Nm**

- ▶ easy installation
- ▶ solution for mismatched shaft / bore diameters
- ▶ saves space and cost

Page 55

MK4



**with radial set screw and blind
mate connection
from 0.5 - 10 Nm**

- ▶ axial installation possible
- ▶ electrically and thermally isolating
- ▶ includes integral dismounting groove

Page 56

MODEL

FEATURES

MK5		<p>with clamping hub and blind mate connection from 0.5 - 10 Nm</p> <ul style="list-style-type: none"> ▶ axial installation possible ▶ electrically and thermally isolating ▶ easy mounting and dismounting 	Page 57
MK6		<p>with expanding shaft and blind mate connection from 0.5 - 10 Nm</p> <ul style="list-style-type: none"> ▶ full axial installation possible ▶ well suited to restricted installation space ▶ solution to mismatched bore / shaft diameters 	Page 58
MKS		<p>with conical clamping ring assemblies from 4.5 - 10 Nm</p> <ul style="list-style-type: none"> ▶ speeds up to 120,000 rpm ▶ naturally very well balanced due in part to self centering clamping system ▶ for high speed high precision applications 	Page 59
BKL		<p>with clamping hub up to 3 Nm</p> <ul style="list-style-type: none"> ▶ low priced ▶ light weight and low moment of inertia ▶ temperatures up to 200° C 	Page 60
FK1		<p>with radial set screw up to 1 Ncm</p> <ul style="list-style-type: none"> ▶ well balanced ▶ sterilizable 	Page 61

MK1

WITH RADIAL SET SCREWS

0.05 - 10 Nm

ABOUT

FEATURES

- ▶ integral dismounting groove eliminates the need for flats on shafts
- ▶ economical design
- ▶ larger bore diameters in a small size possible

▶ **Hubs:** aluminium

DESIGN

Two hubs with radial set screws concentrically mounted to flexible bellows. Speeds up to 20,000 rpm; over 20,000 with finely balanced version.

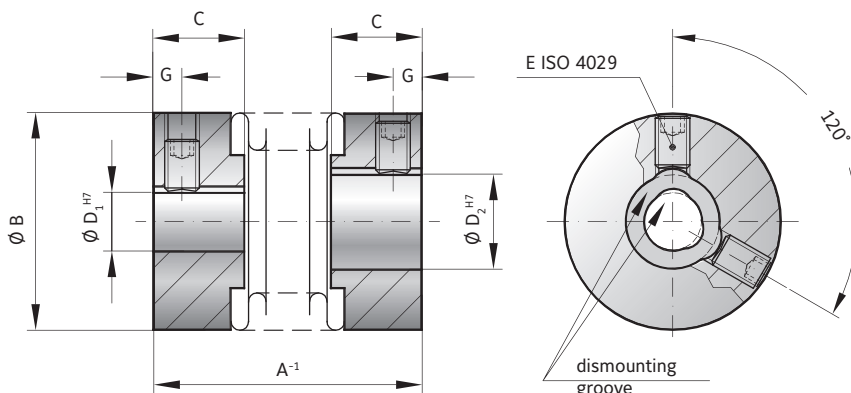
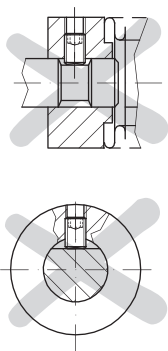
MATERIAL

- ▶ **Bellows:** size 0.5 tombac; sizes 1 and up high grade stainless steel



Advantage:

Bore diameters above 4mm have an integral dismounting groove, which provides clearance over any burr which may be kicked up by the set screw, eliminating the need for flats on shafts.



MODEL MK1

SIZE			0.5	1	5			10			15		20			45		100	
Rated torque	(Nm)	T_{KN}	0.05	0.1	0.5			1.0			1.5		2.0			4.5		10	
Overall length	(mm)	A^{-1}	14	20	20	23	26	22	25	28	24	29	26	31	35	37	45	43	53
Outside diameter	(mm)	B	6.5	10	15			15			19		25			32		40	
Fit length	(mm)	C	4	5	6.5			6.5			7.5		11			13		15	
Inside diameter possible from \emptyset to \emptyset H7	(mm)	$D_{1/2}$	1-3	1-5	3-9			3-9			3-12		3-16			6-22		6-28	
Clamping screw ISO 4029		E	1xM2	1xM2.5	1xM3			1xM3			2xM3		2xM4			2xM5		2xM6	
Tightening torque of the fastening screw	(Nm)	E	0.35	0.75	1.3			1.3			1.3		2.5			4		6	
Distance	(mm)	G	1.5	1.8	2			2			2		2.5			3.5		4	
Moment of inertia	(gcm ²)	$J_{ges.}$	0.1	0.4	1.1	1.2	1.3	1.3	1.8	2	4.7	5.5	15	18	20	65	70	180	220
Approximate weight	(g)		1	5	6	6	6	6	7	8	12	14	22	24	26	54	58	106	114
Torsional stiffness	(Nm/rad)	C_T	50	70	280	210	170	510	380	320	750	700	1200	1300	1200	7000	5000	9050	8800
Axial	(mm)	Max. values	0.4	0.4	0.4	0.5	0.6	0.4	0.5	0.6	0.5	0.7	0.5	0.6	0.7	0.7	1	1	1.2
Lateral	(mm)		0.1	0.15	0.15	0.2	0.25	0.15	0.2	0.25	0.15	0.2	0.15	0.2	0.25	0.2	0.25	0.2	0.3
Angular	(degree)		1	1	1	1.5	2	1	1.5	2	1.5	1.5	1.5	1.5	1.5	2	1.5	2	1.5

ORDERING EXAMPLE	MK1	5	26	4.76	5	XX
Model	●					Special designation only (e.g. high speed balancing).
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Bore D2 H7					●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. MK1 / 5 / 26 / 4.76 / 5 / XX; XX=finely balanced for 25,000 rpm)

MK2

WITH CLAMPING HUB

0.5 - 10 Nm



ABOUT

FEATURES

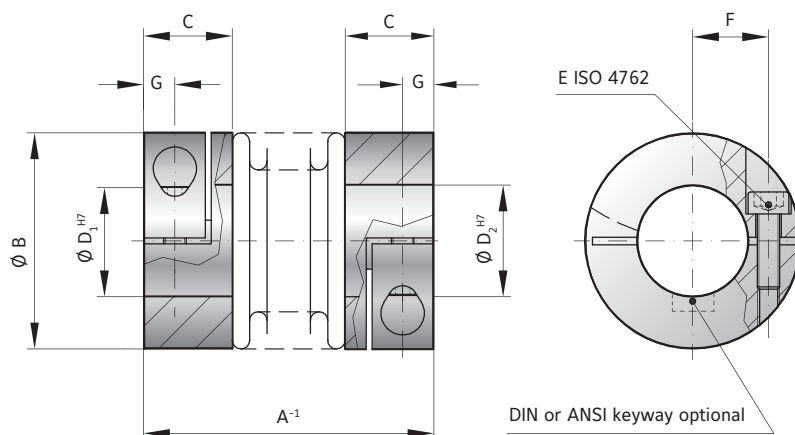
- ▶ for highly dynamic applications
- ▶ easy installation
- ▶ light weight and low moment of inertia

DESIGN

Two clamping hubs concentrically mounted to flexible bellows.

MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Hubs:** aluminium



MINIATURE COUPLINGS MK

MODEL MK2

SIZE		5			10			15		20			45		100	
Rated torque	(Nm) T_{KN}	0.5			1.0			1.5		2.0			4.5		10	
Overall length	(mm) A^{-1}	25	28	31	27	30	33	30	35	35	40	44	46	54	50	60
Outside diameter	(mm) B	15			15			19		25			32		40	
Fit length	(mm) C	9			9			11		13			16		16	
Inside diameter possible from \emptyset to \emptyset H7	(mm) $D_{1/2}$	3-7			3-7			3-8		3-12.7			5-16		5-24	
Fastening screw ISO 4762	(Nm) E	M2			M2			M2.5		M3			M4		M4	
Tightening torque of the fastening screw		0.43			0.43			0.85		2.3			4		4.5	
Distance between centerlines	(mm) F	4.5			4.5			6		8			10		15	
Distance	(mm) G	3			3			3.5		4			5		5	
Moment of inertia	(gcm ²) J_{ges}	2.6	2.8	3	3	3.4	3.6	8.5	9.5	25	27	29	100	108	160	205
Approximate weight	(g)	9	9	9	9	10	11	22	24	36	38	40	74	78	120	130
Torsional stiffness	(Nm/rad) C_T	280	210	170	510	380	320	750	700	1200	1300	1200	7000	5000	9050	8800
Axial	(mm)	0.4	0.5	0.6	0.4	0.5	0.6	0.5	0.7	0.5	0.6	0.7	0.7	1	1	1.2
Lateral	(mm)	0.15		0.2	0.25	0.15	0.2	0.25	0.15	0.2	0.25	0.2	0.2	0.25	0.2	0.3
Angular	(degree)	1		1.5	2	1	1.5	2	1.5	1.5	1.5	2	1.5	2	1.5	2

ORDERING EXAMPLE	MK2	5	25	4.76	5	XX
Model	●					Special designation only (e.g. special bore tolerance).
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Bore D2 H7					●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. MK2 / 5 / 25 / 4.76 / 5 / XX; XX=finely balanced for 25,000 rpm)

WITH FULLY SPLIT CLAMPING HUB

0.5 - 10 Nm



ABOUT

FEATURES

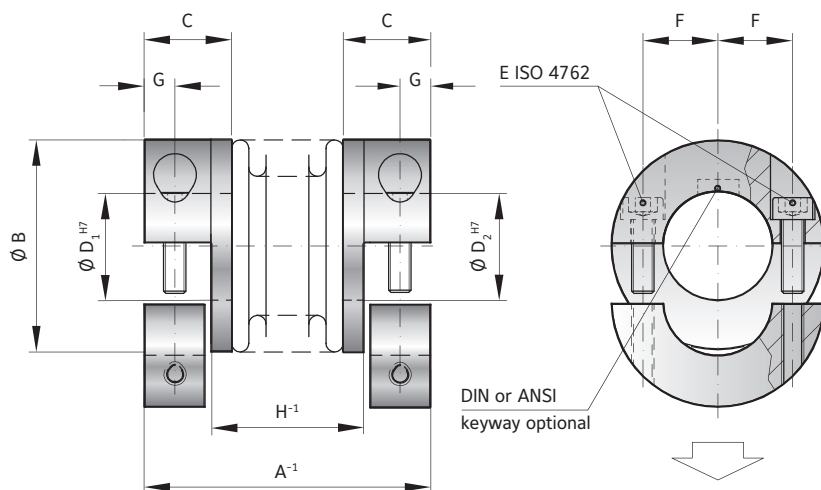
- ▶ mounts laterally
- ▶ allows for pre-alignment of shafts
- ▶ light weight and low moment of inertia

DESIGN

Two fully split clamping hubs, with two screws in each, concentrically mounted to flexible bellows.

MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Hubs:** aluminium



MODEL MKH

SIZE			5			10			15		20			45		100	
Rated torque	(Nm)	T_{KN}	0.5			1.0			1.5		2.0			4.5		10	
Overall length	(mm)	A^{-1}	25	28	31	27	30	33	30	35	35	40	44	46	54	50	60
Outside diameter	(mm)	B	15			15			19		25			32		40	
Fit length	(mm)	C	9			9			11		13			16		16	
Inside diameter possible from \emptyset to \emptyset H7	(mm)	$D_{1/2}$	3-7			3-7			3-8		3-12.7			5-16		5-24	
Fastening screw ISO 4762		E	M2			M2			M2.5		M3			M4		M4	
Tightening torque of the fastening screw	(Nm)		0.43			0.43			0.85		2.3			4		4.5	
Distance between centerlines	(mm)	F	4.5			4.5			6		8			10		15	
Distance	(mm)	G	3			3			3.5		4			5		5	
Distance	(H)	H^{-1}	12	15	18	14	17	20	14.5	19.5	17	22	26	23.5	31.5	27.5	37.5
Moment of inertia	(gcm ²)	J_{ges}	2.6	2.8	3	3	3.4	3.6	8.5	9.5	25	27	29	100	108	160	205
Approximate weight	(g)		9	9	9	9	10	11	22	24	36	38	40	74	78	120	130
Torsional stiffness	(Nm/rad)	C_T	280	210	170	510	380	320	750	700	1200	1300	1200	7000	5000	9050	8800
Axial	(mm)	Max. values	0.4	0.5	0.6	0.4	0.5	0.6	0.5	0.7	0.5	0.6	0.7	0.7	1	1	1.2
Lateral	(mm)		0.15	0.2	0.25	0.15	0.2	0.25	0.15	0.2	0.15	0.2	0.25	0.2	0.25	0.2	0.3
Angular	(degree)		1	1.5	2	1	1.5	2	1.5	1.5	1.5	1.5	2	1.5	2	1.5	2

ORDERING EXAMPLE	MKH	20	35	8	9.53	XX
Model	●					Special designation only (e.g. special bore tolerance).
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Bore D2 H7					●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. MKH / 20 / 35 / 8 / 9.53 / XX; XX=finely balanced for 25,000 rpm)						

MK3

WITH EXPANDING SHAFT

0.5 - 10 Nm



ABOUT

FEATURES

- ▶ for hollow shaft mounting
- ▶ easy to install
- ▶ light weight and low moment of inertia

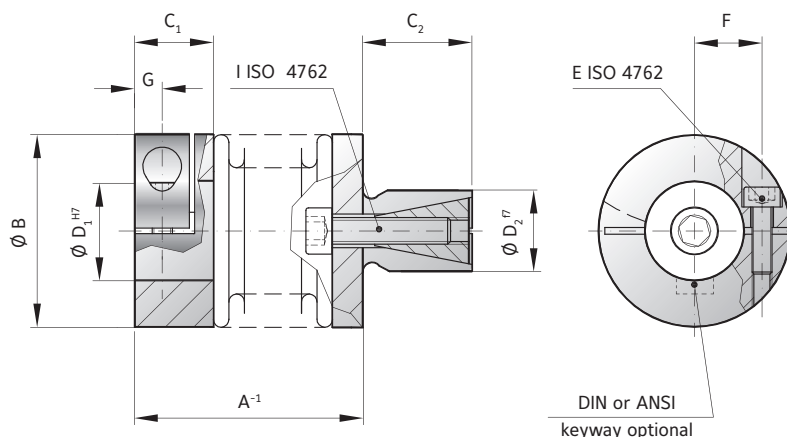
MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Clamping hub:** aluminium

▶ **Expanding shaft:** steel

DESIGN

One clamping hub with one clamping screw, one expanding shaft system, both concentrically mounted to flexible bellows.



MINIATURE COUPLINGS MK

MODEL MK3

SIZE		5			10			15		20			45		100	
Rated torque	(Nm) T_{KN}	0.5			1			1.5		2			4.5		10	
Overall length	(mm) A^{-1}	20	23	26	22	25	28	24	30	27	33	36	36	44	41	51
Outside diameter	(mm) B	15			15			19		25			32		40	
Fit length	(mm) C_1	9			9			11		13			16		16	
Shaft length	(mm) C_2	10			10			12		12			15		20	
Inside diameter possible from \emptyset to $\emptyset H7$	(mm) D_1	3-7			3-7			4-8		4-12.7			5-16		6-24	
Standard shaft possible from \emptyset to $\emptyset f7$	(mm) D_2	8-10			8-10			10-14		10-16			14-20		16-24	
Fastening screw ISO 4762		M2			M2			M2.5		M3			M4		M4	
Tightening torque of the fastening screw	(Nm) E	0.43			0.43			0.85		2.3			4		4.5	
Distance between centerlines	(mm) F	4.5			4.5			6		8			10		15	
Distance	(mm) G	3			3			3.5		4			5		5	
Fastening screw ISO 4762		M3			M3			M4		M4			M5		M6	
Tightening torque of the fastening screw	(Nm) I	1.5			1.5			3		4			6.5		11	
Moment of inertia	(gcm ²) J_{ges}	2.6	2.8	3.0	3.0	3.4	3.6	8.5	9.5	25	27	29	100	108	160	205
Torsional stiffness	(Nm/rad) C_T	280	210	170	510	380	320	750	700	1200	1300	1200	7000	5000	9050	8800
Axial	(mm)	0.4	0.5	0.6	0.4	0.5	0.6	0.5	0.7	0.5	0.6	0.7	0.7	1	1	1.2
Lateral	(mm)	Max. values	0.15	0.2	0.25	0.15	0.2	0.25	0.15	0.2	0.25	0.2	0.2	0.25	0.2	0.3
Angular	(degree)		1	1.5	2	1	1.5	2	1.5	1.5	1.5	2	1.5	2	1.5	2

ORDERING EXAMPLE	MK3	20	36	6.35	12	XX
Model	●					Special designation only (e.g. special bore / shaft tolerance).
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Shaft D2 f7					●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. MK3 / 20 / 36 / 6.35 / 12 / XX; XX=finely balanced for 25,000 rpm)

MK4

BLIND MATE CONNECTION WITH RADIAL SET SCREWS 0.5 - 10 Nm



ABOUT

FEATURES

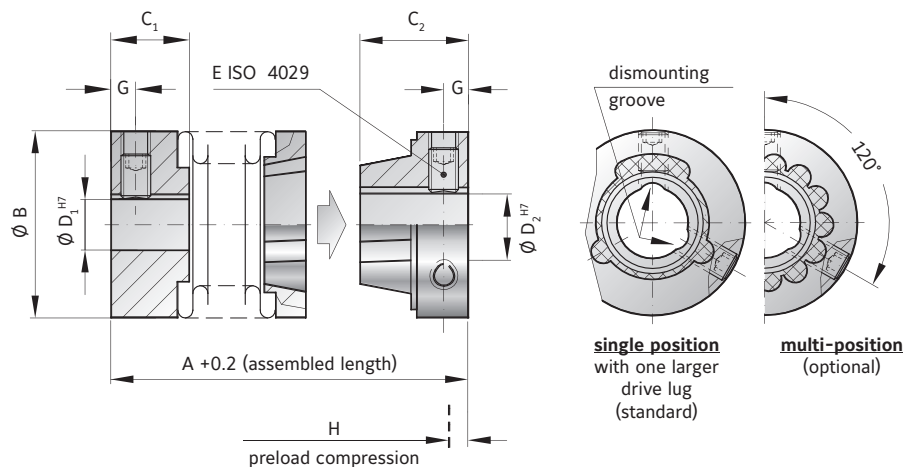
- ▶ easy installation and removal
- ▶ electrically and thermally isolating
- ▶ absolutely backlash free assembly

MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Hubs:** aluminium
- ▶ **Tapered male segment:** high strength plastic

DESIGN

Two hubs with radial set screws, one of which has a tapered male projection for blind mate connection. Speeds up to 20,000 rpm; over 20,000 with finely balanced version.



MODEL MK4

SIZE			5			15		20			45		100	
Rated torque (Nm)	T_{KN}		0.5			1.5		2			4.5		10	
Overall length (inserted) (mm)	$A^{+0.2}$		22	25	28	26	31	28	33	37	39	47	46	56
Outside diameter (mm)	B		15			19		25			32		40	
Fit length (mm)	C_1		6.5			7.5		11			13		15	
Fit length (mm)	C_2		9			10		11			14		16	
Inside diameter possible from ϕ to $\phi H7$ (mm)	D_1		3-9			3-12		3-16			6-22		6-28	
Inside diameter possible from ϕ to $\phi H7$ (mm)	D_2		3-6.35			3-9		3-12.7			6-16		6-20	
Clamping screw ISO 4029			1xM3			2xM3		2xM4			2xM5		2xM6	
Tightening torque of the fastening screw (Nm)	E		1.3			1.3		2.5			4		6	
Distance (mm)	G		2			2		2.5			3.5		4	
Preload compression (mm)	H		0.4			0.5		0.5			0.7		1	
Axial recovery force at max. preload compression (N)			5	3	2	4	3	3	4	3	15	10	25	30
Moment of inertia (gcm^2)	J_{ges}		2.0	2.2	2.5	5.5	6.0	21	23	25	80	85	200	210
Torsional stiffness (Nm/rad)	C_T		280	210	170	750	700	1200	1300	1200	7000	5000	9050	8800
Axial* (mm)			0.4	0.5	0.6	0.5	0.7	0.5	0.6	0.7	0.7	1	1	1.2
Lateral (mm)		Max. values	0.15	0.2	0.25	0.15	0.2	0.15	0.2	0.25	0.2	0.25	0.2	0.3
Angular (degree)			1	1.5	2	1.5	1.5	1.5	1.5	2	1.5	2	1.5	2

* in addition to maximum pre-tensioning

ORDERING EXAMPLE	MK4	20	37	8	9.53	XX
Model	●					
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Bore D2 H7					●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. MK4 / 20 / 37 / 8 / 9.53 / XX; XX=finely balanced for 25,000 rpm)						

MK5

BLIND MATE CONNECTION WITH CLAMPING HUB 0.5 - 10 Nm



ABOUT

FEATURES

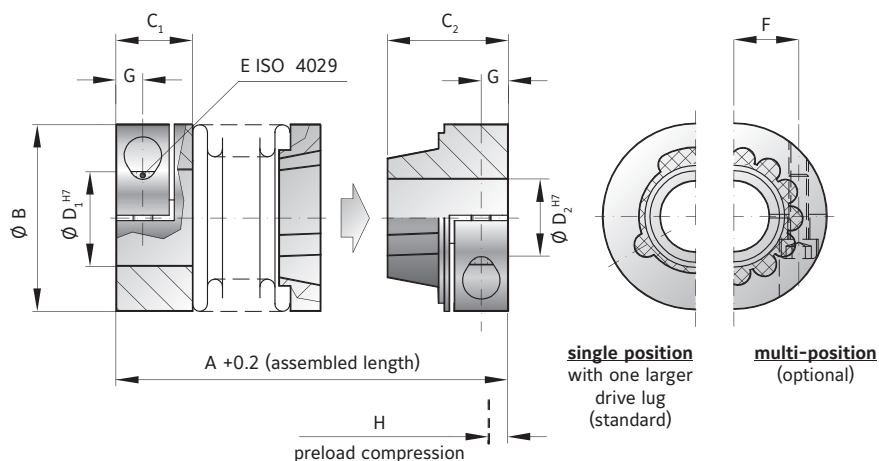
- ▶ easy installation and removal
- ▶ electrically and thermally isolating
- ▶ absolutely backlash free assembly

MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Hubs:** aluminium
- ▶ **Tapered male segment:** high strength plastic

DESIGN

Two clamping hubs, one of which has a tapered male projection for blind mate connection.



MODEL MK5

SIZE		5			15		20			45		100	
Rated torque	(Nm) T_{KN}	0.5			1.5		2			4.5		10	
Overall length (inserted)	(mm) $A^{+0.2}$	27	30	33	34	39	37	43	46	49	57	55	65
Outside diameter	(mm) B	15			19		25			32		40	
Fit length	(mm) C_1	9			11		13			16		16	
Fit length	(mm) C_2	12			14		16			20		21.5	
Inside diameter possible from \emptyset to $\emptyset H7$	(mm) $D_{1/2}$	3-6.35			3-8		3-12.7			5-16		5-20	
Fastening screw ISO 4762	(Nm) E	M2			M2.5		M3			M4		M4	
Tightening torque of the fastening screw		0.43			0.85		2.3			4		4.5	
Distance between centerlines	(mm) F	4.5			6		8			10		15	
Distance	(mm) G	3			3.5		4			5		5	
Preload compression	(mm) H	0.4			0.5		0.5			0.7		1	
Axial recovery force at max. preload compression	(N)	5	3	2	4	3	3	4	3	15	10	25	30
Moment of inertia	(gcm ²) J_{ges}	3.0	3.2	3.5	9.0	10	28	30	33	110	120	220	230
Torsional stiffness	(Nm/rad) C_T	280	210	170	750	700	1200	1300	1200	7000	5000	9050	8800
Axial*	(mm)	0.4	0.5	0.6	0.5	0.7	0.5	0.6	0.7	0.7	1	1	1.2
Lateral	(mm) Max. values	0.15	0.2	0.25	0.15	0.2	0.15	0.2	0.25	0.2	0.25	0.2	0.3
Angular	(degree)	1	1.5	2	1.5	1.5	1.5	1.5	2	1.5	2	1.5	2

* in addition to maximum pretensioning

ORDERING EXAMPLE	MK5	20	37	6	9.53	XX
Model	●					
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Bore D2 H7					●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. MK5 / 20 / 37 / 6 / 9.53 / XX; XX=finely balanced for 25,000 rpm)						

MINIATURE COUPLINGS MK

MK6

BLIND MATE CONNECTION WITH EXPANDING SHAFT 0.5 - 10 Nm



ABOUT

FEATURES

- ▶ easy installation and removal
- ▶ solution for mismatched bore / shaft diameters
- ▶ absolutely backlash free assembly

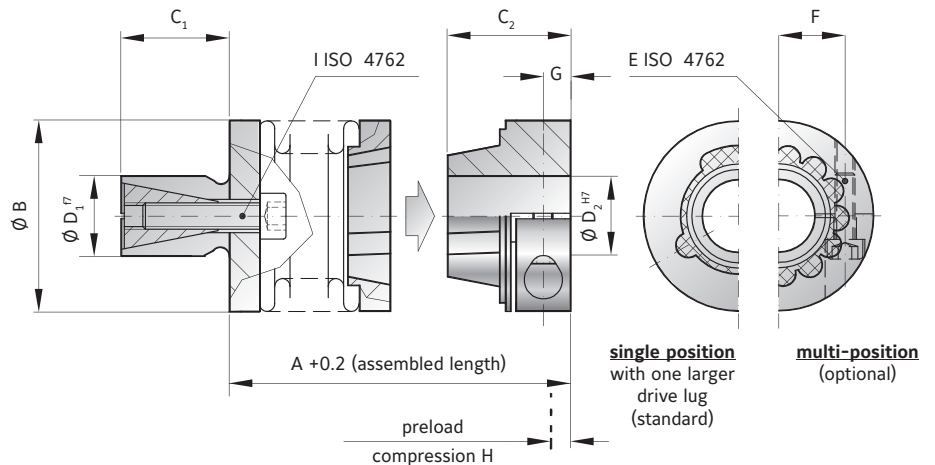
- ▶ **Tapered male segment:** high strength plastic
- ▶ **Clamping hub:** aluminium
- ▶ **Expanding shaft:** steel

MATERIAL

- ▶ **Bellows:** high grade stainless steel

DESIGN

One clamping hub with a tapered male projection for blind mate connection and one expanding shaft system.



MODEL MK6

SIZE			5			15		20			45		100	
Rated torque (Nm)	T_{KN}		0.5			1.5		2			4.5		10	
Overall length (inserted) (mm)	$A^{+0.2}$		22	24	27	27	32	28	34	38	38	46	45	55
Outside diameter (mm)	B		15			19		25			32		40	
Shaft length (mm)	C_1		10			12		12			15		20	
Fit length (mm)	C_2		12			14		16			20		21.5	
Standard shaft \varnothing f7 (mm)	D_1		8-10			10-14		10-16			14-20		16-24	
Inside diameter possible from \varnothing to \varnothing H7 (mm)	D_2		3-6.35			3-8		3-12.7			5-16		5-20	
Fastening screw ISO 4762			M2			M2.5		M3			M4		M4	
Tightening torque of the fastening screw (Nm)	E		0.43			0.85		2.3			4		4.5	
Distance between centerlines (mm)	F		4.5			6		8			10		15	
Distance (mm)	G		3			3.5		4			5		5	
Preload compression (mm)	H		0.4			0.5		0.5			0.7		1	
Axial recovery force at max. preload compression (N)			5	3	2	4	3	3	4	3	15	10	25	30
Fastening screw ISO 4762			M3			M4		M4			M5		M6	
Tightening torque of the fastening screw (Nm)	I		1.5			3		4			6.5		11	
Moment of inertia (gcm^2)	J_{ges}		3.0	3.2	3.5	9.0	10	28	30	33	110	120	220	230
Torsional stiffness (Nm/rad)	C_T		280	210	170	750	700	1200	1300	1200	7000	5000	9050	8800
Lateral (mm)	Max. values		0.15	0.2	0.25	0.15	0.2	0.15	0.2	0.25	0.2	0.25	0.2	0.3
Angular (degree)			1	1.5	2	1.5	1.5	1.5	1.5	2	1.5	2	1.5	2

ORDERING EXAMPLE	MK6	20	28	12	9.53	XX
Model	●					Special designation only (e.g. special bore / shaft tolerance).
Size		●				
Overall length mm			●			
Shaft D1 f7				●		
Bore D2 H7					●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. MK6 / 20 / 28 / 12 / 9.53 / XX; XX=finely balanced for 25,000 rpm)

ABOUT

FEATURES

- ▶ made for high speed
- ▶ self centering conical clamping ring assembly
- ▶ naturally very well balanced

DESIGN

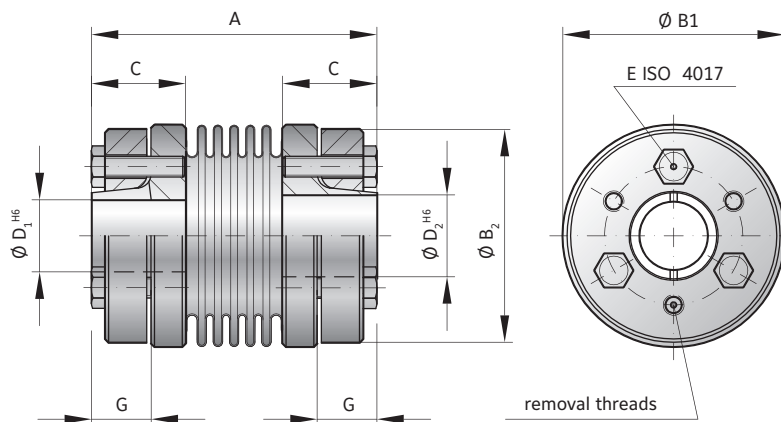
Two conical clamping ring assemblies with three or four screws. Maximum speed up to 120,000 with standard balance grade ISO G=2.5.

MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Hubs and clamping rings:** aluminium



High speed



MINIATURE COUPLINGS MK

MODEL MKS

SIZE			45	100
Rated torque	(Nm)	T_{KN}	4.5	10
Overall length	(mm)	A	42	48
Outside diameter	(mm)	B_1	32	40
Outside diameter of hub	(mm)	B_2	30	38
Fit length	(mm)	C	14	16
Inside diameter possible from \emptyset to \emptyset H6	(mm)	$D_{1/2}$	6-10	8-14
Fastening screw ISO 4017	(mm)		3x M3	4x M3
Tightening torque of the fastening screw	(Nm)	E	1.3	1.3
Distance	(mm)	G	8.5	9.5
Moment of inertia	(gcm ²)	J_{ges}	65	160
Masse	(g)		51	75
Torsional stiffness	(Nm/rad)	C_T	7000	9050
Axial	(mm)		0.5	0.75
Lateral	(mm)	Max. values	0.1	0.05*
Angular	(degree)		0.5	0.5

For speeds beyond 50,000 rpm use reduced misalignment values marked with *

ORDERING EXAMPLE	MKS	45	8	9.53	XX
Model	●				
Size		●			
Bore D1 H6			●		
Bore D2 H6				●	
Special designation only (e.g. special bore tolerance).					
For custom features place an XX at the end of the part number and describe the special requirements (e.g. MKS / 45 / 8 / 9.53 / XX; XX=anodized aluminum hubs)					

BKL/003

ECOFLEX® WITH CLAMPING HUB 3 Nm



ABOUT

FEATURES

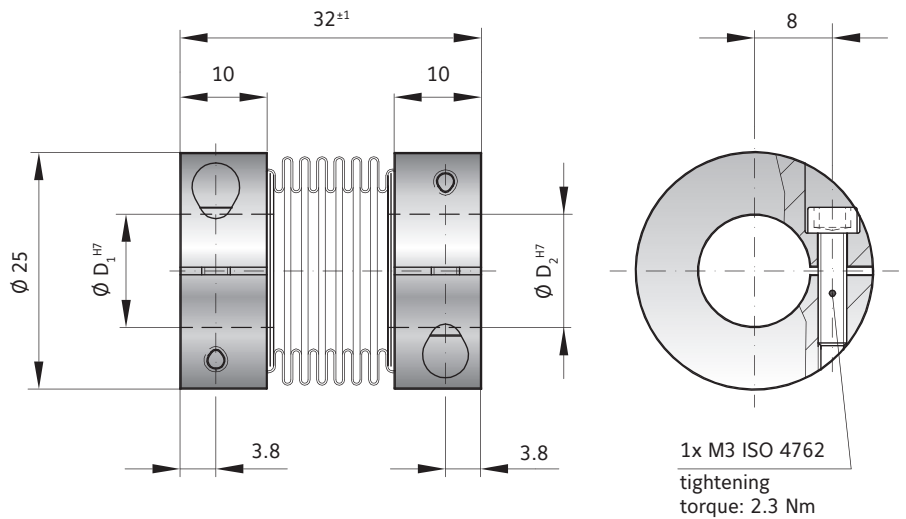
- ▶ economically priced
- ▶ backlash free and torsionally stiff
- ▶ wear free and robust

DESIGN

Two clamping hubs, each with a clamping screw.
Operational from -40 to +200° C

MATERIAL

- ▶ **Bellows:** high grade stainless steel
- ▶ **Hubs:** aluminium



MODEL BKL/003

SIZE			3
Rated torque	(Nm)	T_{KN}	3
Standard bore diameters H7	(mm)	D_1, D_2	3 to 12.7
Moment of inertia	(gcm ²)	$J_{ges.}$	20
Approximate weight	(g)		23
Tightening torque of the fastening screws	(Nm)		2.3
Torsional stiffness	(Nm/rad)	C_T	994
Axial	(mm)	Max. values	1
Lateral	(mm)		0.2
Angular	(degree)		2

ECOFLEX®:
The low cost alternative for encoders, potentiometers, stepper motors, and small servo drives.

ORDERING EXAMPLE	BKL	003	3	6.35	XX
Model	●				
Size		●			
Bore D1 H7			●		
Bore D2 H7				●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. BKL / 003 / 3 / 6.35 / XX; XX=stainless steel hubs)					

Special designation only (e.g. special bore tolerance).

FK1

MICROFLEX WITH RADIAL SET SCREWS

1 Ncm



ABOUT

FEATURES

- ▶ very small dimensions
- ▶ backlash free
- ▶ vibration damping

MATERIAL

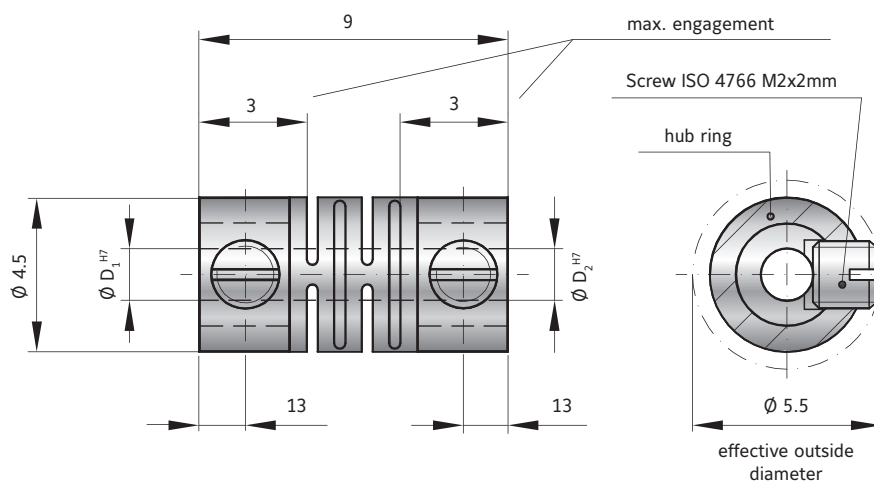
- ▶ **Flex element:** high strength Polyamide
- ▶ **Hubs:** stainless steel

DESIGN

Two hubs with set screws mounted to a flex beam segment. Operational from -35° to +80° C. Speeds up to 20,000 rpm *

SPECIAL SOLUTION

Effective outside diameter can be reduced to 4.5mm through the use of M2x1.5mm screws.

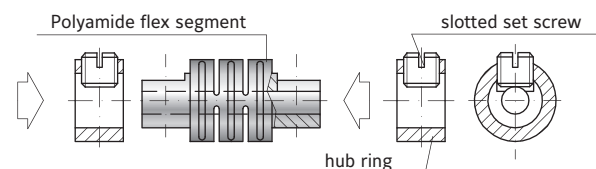


MINIATURE COUPLINGS MK

MODEL FK1/001/9

SIZE			
Rated torque	(Ncm)	T_{KN}	1
Standard bore H7	(mm)	D_1, D_2	1.5 / 1.5 or 2 / 1.5 additional bore diameters available upon request
Moment of inertia	(gcm ²)	J_{ges}	5.39
Approximate weight	(g)		0.47
Torsional stiffness	(Ncm/rad)	C_T	23 (measured at +20° C)
Axial	(mm)	Max. values	0.2
Lateral	(mm)		0.1
Angular	(degree)		1.5

COUPLING ASSEMBLY AND MOUNTING



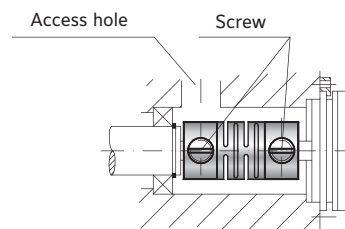
The screw threads through the clamping ring, through a slot in the flexible segment, and down onto the shaft, securing the entire assembly. Including a flat on the shaft can improve torque transmission.

Caution: Always use a precisely calibrated torque wrench during installation.

ORDERING EXAMPLE	FK1	001	9	1.5	1.5	XX
Model	●					Special designation only (e.g. special screw size).
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Bore D2 H7					●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. FK1 / 001 / 9 / 1.5 / 1.5 / XX; XX=M2x1.5mm screws)						

DISMOUNTING

For dismounting, simply loosen the set screws and remove the coupling from the shafts.







**FOR USE IN
HAZARDOUS AREAS**





FOR USE IN HAZARDOUS AREAS PRECISION COUPLINGS

MARKING EXAMPLE

Based on the ATEX markings the product can be certified for suitability under certain conditions.

	II	2G	c	IIA T6	X
	II	2D	c	85°C	X
	Equipment group	Category	Protection type	Explosion group / temperature class / maximum surface temperature	Additional features

Equipment group	Approval type
I	approved for underground operation
II	approved for all other applications

Category	Approved for zone	Zone description
1G	0	Area in which an explosive atmosphere consisting of a mixture of air and flammable gases, vapors, or mists, is present continuously, frequently, or for long periods of time.
2G	1	Area in which the potential exists for an explosive mixture of air and flammable gases, vapors, or mists to occur.
3G	2	Area in which the potential for an explosive mixture of air and flammable gases, vapors, or mists to occur is unlikely and only for a brief duration.
1D	20	Area with the same conditions as zone 0, with powder or dust.
2D	21	Area with the same conditions as zone 1, with powder or dust.
3D	22	Area with the same conditions as zone 2, with powder or dust.

Protection type	Definition
c	Design safety level: ignition hazard is avoided by the product design.

Example classification by occurring gases, mists and vapors according to temperature class and explosion group

Explosion group / temperature class / maximum surface temperature	IIA	IIB (includes IIA)	IIC (includes IIA + IIB)
T1 / 450°C	acetone, ammonia, methane...	natural gas	hydrogen
T2 / 300°C	ethyl alcohol, butane, cyclohexane...	ethylene, ethylene oxide	ethyne (acetylene)
T3 / 200°C	gasoline, diesel fuel, fuel oil...	ethylene glycol, hydrogen sulfide	
T4 / 135°C	acetaldehyde	ethyl ether	
T5 / 100°C			
T6 / 85°C			carbon disulphide

Additional labeling	Definition
X	Special operating conditions
U	Product is only a component in a machine. Conformity therefore shall only be declared after installation.

ATEX BELLOWS COUPLINGS

CONSTRUCTION

Dimensions and materials of the standard models remain largely intact.

PERFORMANCE RATINGS

All permitted misalignment, speed, and torque ratings of the standard models must be reduced by 30%.

OPERATION

ATEX metal bellows couplings must only be operated inside a sealed housing. Both the input and output shafts must be monitored to guarantee shut down in the case of coupling failure.

With blind mate style bellows couplings it is also necessary to guarantee electrical continuity between both shafts. This is necessary due to the electrically isolating properties of the coupling, and the need to prevent sparking from any electrostatic charges.

SAMPLE IDENTIFICATION



Type: BK2/60/EEEx - 2013
II 2G c T4
II 2D c 135°C
Ser.No.: 123456.7
Tech.Ref.No.:2003/003RW



Type: BK5/60/EEEx - 2013
II 2G c T4
II 2D c 135°C
Ser.No.: 123456.7
Tech.Ref.No.:2003/006RW

ATEX ELASTOMER COUPLINGS

CONSTRUCTION

Dimensions and materials of the standard models remain largely intact.

For ATEX elastomer couplings the inserts come in version "D" (Sh65D) which is electrically conductive to provide continuity for any potential electrostatic charges.

PERFORMANCE RATINGS

All permitted misalignment, speed, and torque ratings of the standard models must be reduced by 30%.

OPERATION

In the case of model TX thermoplastic hub elastomer couplings it is also necessary to guarantee electrical continuity between both shafts. This is necessary due to the electrically isolating properties of the coupling, and the need to prevent sparking from any electrostatic charges.

SAMPLE IDENTIFICATION



Type: EK2/60/EEEx - 2013
II 2G c T4
II 2D c 135°C
Ser.No.: 123456.7
Tech.Ref.No.:2003/001RW



Type: TX1/60/EEEx - 2013
II 2G c IIA T6
II 2D c 85°C
Ser.No.: 123456.7
Tech.Ref.No.:2003/001RW



FOR USE IN HAZARDOUS AREAS PRECISION COUPLINGS

ATEX SAFETY COUPLINGS

CONSTRUCTION

Dimensions and materials of the standard models remain largely intact.

Generally full disengagement style safety couplings are used in ATEX environments in order to avoid high temperatures from excess friction after disengagement.

For ES2 safety couplings the inserts come in version "D" (Sh65D) which is electrically conductive to provide continuity for any potential electrostatic charges.

PERFORMANCE RATINGS

All permitted misalignment and speed ratings of the standard models must be reduced by 30%.

OPERATION

ATEX safety couplings must be used with an ATEX proximity switch. The emergency stop function in conjunction with activation of the switch must be fully tested for proper function prior to commissioning of the machine.

When bellows couplings are incorporated they must only be operated inside a sealed housing. Both the input and output shafts must be monitored to guarantee shut down in the case of bellows failure.

With blind mate style bellows couplings it is also necessary to guarantee electrical continuity between both shafts. This is necessary due to the electrically isolating properties of the coupling, and the need to prevent sparking from any electrostatic charges.

SAMPLE IDENTIFICATION

	Type: SK2/60/Ex - 2013 II 2G c T3 II 2D c 200°C Ser.No.: 123456.7 Tech.Ref.No.:2003/004RW
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	Type: ES2/60/(F)Ex - 2013 II 2G c T3 II 2D c 200°C Ser.No.: 123456.7 Tech.Ref.No.:2003/002RW
--	--

ATEX LINE SHAFTS

CONSTRUCTION

Dimensions and materials of the standard models remain largely intact.

For EZ type line shafts the inserts come in version "D" (Sh65D) which is electrically conductive to provide continuity for any potential electrostatic charges.

PERFORMANCE RATINGS

All permitted misalignment, speed, and torque ratings of the standard models must be reduced by 30%.

The allowable operating speed depends on the overall length of the line shaft and is available upon request.

OPERATION

When bellows couplings are incorporated they must only be operated inside a sealed housing. Both the input and output shafts must be monitored to guarantee shut down in the case of bellows failure.

SAMPLE IDENTIFICATION

	Type: EZ2/60/D/Ex - 2013 II 2G c T4 II 2D c 135°C Ser.No.: 123456.7 Tech.Ref.No.:2003/005RW
--	---

	Type: ZA/10/Ex - 2013 II 2G c T4 II 2D c 135°C Ser.No.: 123456.7 Tech.Ref.No.:2005/007RW
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ATEX DISC PACK COUPLINGS

CONSTRUCTION

Dimensions and materials of the standard models remain largely intact.

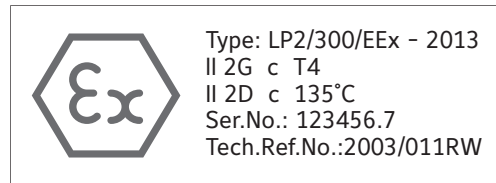
PERFORMANCE RATINGS

All permitted misalignment, speed, and torque ratings of the standard models must be reduced by 30%.

OPERATION

Both the input and output shafts must be monitored to guarantee shut down in the case of disc pack failure.

SAMPLE IDENTIFICATION



Prior to deviating from any of the previous safety instructions please contact R+W.

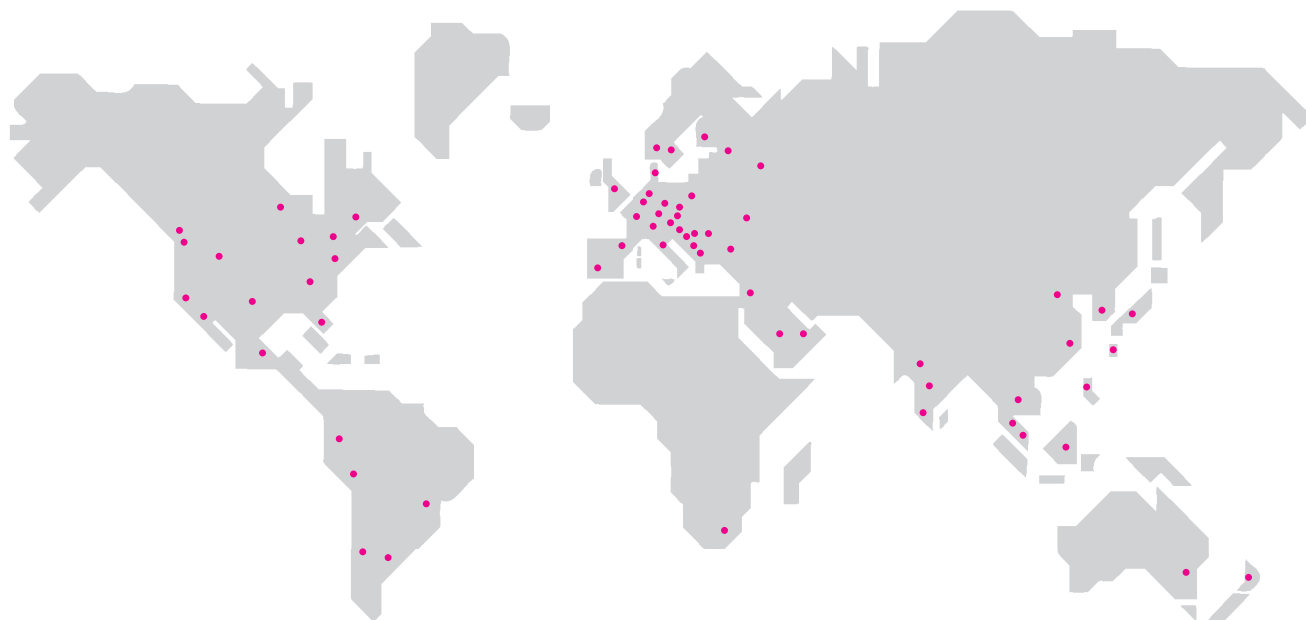
The use of devices and components in explosive areas is governed by the European directives 94/9/EC (for manufacturers) and 1992/92/EC (for operators). The presented products are non-electrical equipment of category 2. All necessary documents and certifications are stored in a known location. The conformity of these products with these guidelines is established and may be declared by the manufacturer.

According to Directive 94/9/EC, delivery of an ATEX coupling requires the inclusion of special installation and operating instructions along with the EC declaration of conformity issued by the manufacturer. All necessary values for installation, operation and removal are included.

All statements made about ATEX conforming products are based on our present knowledge and experience. R+W reserves the right to change technical specifications.

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Version: 03/2014

QUALITY MANAGEMENT

We are certified



according to ISO 9001:2008

D-ZM-16029-01-01 Registration No. 40503432/3

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