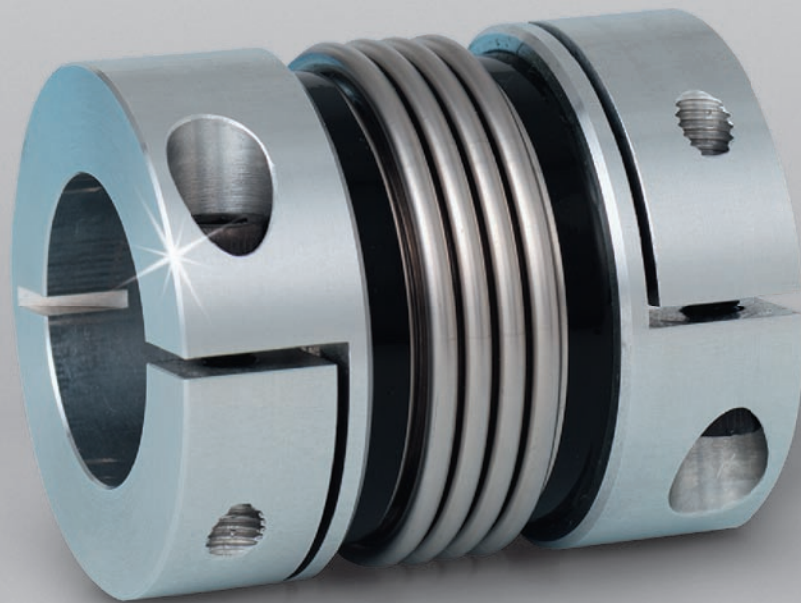


LOW COST AND RELIABLE.

ECONOMY CLASS BELLOWS COUPLINGS

SERIES BKL | 2 – 500 Nm



R+W[®]
COUPLING TECHNOLOGY

THE ULTIMATE COUPLING FROM 2 – 500 Nm

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MODEL BKL

Areas of application:

for high dynamic servo drives of:

- Machine tools
- CNC milling / grinding machines
- Woodworking machines
- Assembly machines
- Automated plants
- Textile machines
- Industrial robots
- Processing machines
- Printing machinery
- Packaging machines

Properties:

- high degree of torsional stiffness
- compensates axial, lateral and angular misalignment combined with quiet, smooth operation
- exact angular transmission of motion and torque
- infinite life and maintenance free

The selection process for model series BKL

■ According to torque:

In most cases the couplings are rated according to the maximum peak torque to be regularly transmitted.

The peak torque may not exceed the rated torque of the coupling.

By rated torque we assume: the torque that is continuously transmitted within the specified acceptable speed and misalignment ranges.

The following calculation has proven to be a good rule of thumb:

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

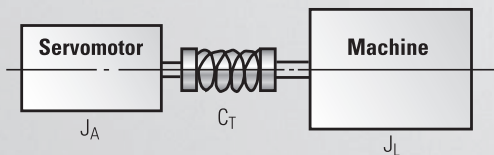
T_{KN} = rated torque of coupling (Nm)

T_{AS} = peak torque of motor (Nm)

■ According to resonance frequency:

For the mech. substitutional model of the 2-mass-system is valid:

2-mass-system



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

As a value of practice is valid: $f_e \geq 2 \times f_{er}$

C_T = torsional stiffness of the coupling (Nm/rad)

f_e = resonance frequency of the 2-mass-system (Hz)

f_{er} = frequency of the drive (Hz)

■ According to torsional stiffness:

Transmission errors due to the torsional load on the metal bellows:

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

φ = angle of turn (degrees)

C_T = torsional stiffness of coupling (Nm/rad)

T_{AS} = max. torque (Nm)

■ According to acceleration torques:

For precise rating, the acceleration torque and moments of inertia of the entire machine or plant have to be taken into consideration.

In the case of servo motors ensure that their acceleration or deceleration torque is higher than their nominal torque by a multiple.

S_A = shock or load factor

$S_A = 1$ (uniform load)

$S_A = 2$ (non-uniform load)

$S_A = 3-4$ (shocking load)

Values for $S_A = 2-3$ are usual for servo drives on machine tools.

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

T_{KN} = rated torque of coupling (Nm)

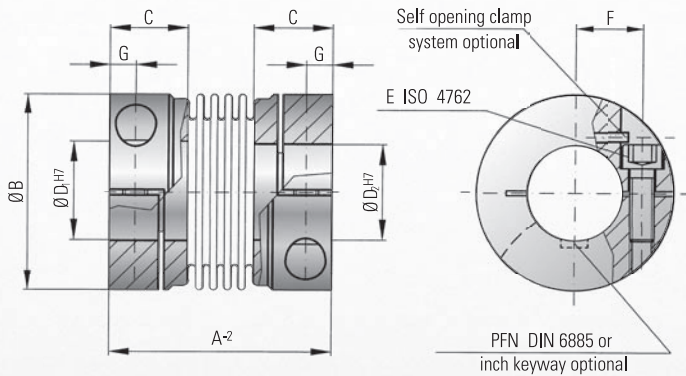
T_{AS} = max. acceleration torque on the drive face (Nm)

- or max. deceleration torque on the load face (Nm)

J_L = machine's moment of inertia (kgm²)
(Spindle + slide + workpiece + half of coupling)

J_A = motor's moment of inertia

optional
stainless
steel



Ordering example

BKL / 80 / 26 / 22 / XX

Model
Series/Nm
Ø D1 H7
Ø D2 H7
non standard

Properties:

- easy to mount
- suited for space restricted installations
- low moment of inertia
- economically priced

Material:

Bellows made of highly flexible high-grade stainless steel

Design:

Hub material see technical specifications table
With a single radial clamping screw per hub ISO 4762.

Self opening clamp system optional:
Loosening the clamping screw applies force to the pin, which will force the clamp into the open position for easy mounting and dismounting.

Temperature

range:

-30 to +100° C (3,6 F to 237 F)

Backlash:

Absolutely backlash-free due to frictional clamped connection.

Service life:



These couplings have an infinite life and are maintenance-free if the technical specifications are not exceeded.

Tolerance:

On the hub/shaft connection 0.01 to 0.05 mm.

Non standard:

Custom designs with varied tolerances, keyways, non-standard material and bellows are available upon request.

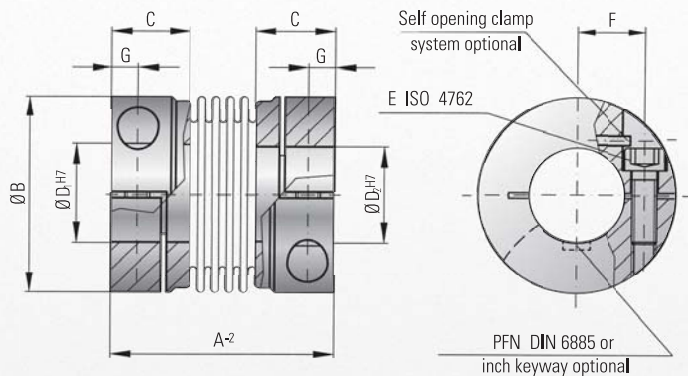
Model BKL		Series										
		2	4.5	10	15	30	60	80	150	300	500	
Rated torque (Nm)	T_{KN}	2	4.5	10	15	30	60	80	150	300	500	
Overall length (mm)	A	30	40	44	58	68	79	92	92	109	114	
Outer diameter (mm)	B	25	32	40	49	56	66	82	82	110	123	
Fit length (mm)	C	10.5	13	13	21.5	26	28	32.5	32.5	41	42.5	
Inner diameter possible from Ø to Ø H7 (mm)	$D\frac{1}{2}$	4-13	6-16	6-24	8-28	12-32	14-35	16-42	19-42	24-60	35-62	
ISO 4762 fastening screw	E	M3	M4	M4	M5	M6	M8	M10	M10	M12	M16	
Tightening torque of the fastening screw (Nm)		2.3	4	4.5	8	15	40	70	85	120	200	
Distance between centers (mm)	F	8	11	14	17	20	23	27	27	39	41	
	G	4	5	5	6.5	7.5	9.5	11	11	13	17	
Moment of inertia (10^{-3} kgm ²)	J_{total}	0.002	0.01	0.02	0.05	0.09	0.18	0.54	1.8 0.65	7.5 2.68	9.0 4.85	
Hub material (standard) (steel on request)		AL	AL	AL	AL	AL	AL	AL	Steel optional AL	Steel optional AL	Steel optional AL	
Approx. weight (kg)		0.02	0.05	0.08	0.13	0.3	0.4	0.7	1.6 0.8	3.8 1.7	4.8 2.2	
Torsional stiffness (10^3 Nm/rad)	C_T	1.5	7	9	23	31	72	80	141	157	290	
axial  (mm)	Max. values	0.5	1	1	1	1	1.5	2	2	2	2.5	
lateral  (mm)		0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.20	
axial spring stiffness (N/mm)	C_a	8	35	30	30	50	67	44	77	124	35	
lateral spring stiffness (N/mm)	C_r	50	350	320	315	366	679	590	960	2940	1450	

max. angular misalignment 1 degree (1 Nm = 8.85 in lbs)

optional
stainless
steel

MODEL BKC

TECHNICAL SPECIFICATIONS



Ordering example

BKC / 60 / 26 / 22 / XX

Model
Series/Nm
Ø D1 H7
Ø D2 H7
non standard



compact version

Properties:

- compact design
- easy to mount
- suited for space restricted installations
- low moment of inertia
- economically priced

Material:

Bellows made of highly flexible high-grade stainless steel

Hub material see technical specifications table

Design:

With a single radial clamping screw per hub ISO 4762.

Self opening clamp system optional:
Loosening the clamping screw applies force to the pin, which will force the clamp into the open position for easy mounting and dismounting.

Temperature range:

-30 to +100° C (3,6 F to 237 F)

Backlash:

Absolutely backlash-free due to frictional clamped connection.

Service life:

These couplings have an infinite life and are maintenance-free if the technical specifications are not exceeded.

Tolerance:

On the hub/shaft connection 0.01 to 0.05 mm.

Non standard:

Custom designs with varied tolerances, keyways, non-standard material and bellows are available upon request.

Model BKC			15	30	60	150	300	500
Rated torque (Nm)	T_{KN}		15	30	60	150	300	500
Overall length (mm)	A		48	58	67	78	94	100
Outer diameter (mm)	B		49	56	66	82	110	123
Fit length (mm)	C		16,5	21	23	27,5	34	34
Inner diameter possible from Ø to Ø H7 (mm)	D½		8-28	12-32	14-35	19-42	24-60	32-75
ISO 4762 fastening screw			M5	M6	M8	M10	M12	M12
Tightening torque of the fastening screw (Nm)	E		8	15	40	75	120	125
Distance between centers (mm)	F		17	20	23	27	39	45
	G		6	7,5	9,5	11	13	13
Moment of inertia (10^{-3} kgm ²)	J_{total}		0.05	0.09	0.18	0.65	7.2	8.7
Hub material (standard) (steel on request)			AL	AL	AL	AL	Steel	Steel
Approx. weight (kg)			0.13	0.3	0.4	0.8	3.5	4.5
Torsional stiffness (10^3 Nm/rad)	C_T		23	31	72	141	157	290
axial (mm)	Max. values		1	1	1,5	2	2	2,5
lateral (mm)			0.15	0.15	0.15	0.15	0.15	0.20
axial spring stiffness (N/mm)	C_a		30	50	67	77	124	35
lateral spring stiffness (N/mm)	C_r		315	366	679	960	2940	1450

max. angular misalignment 1 degree (1 Nm = 8.85 in lbs)

**Experience and
Know-how
for your special
requirements.**

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TGA-ZM-05-91-00
Registration No. 9605022

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THE R+W-PRODUCT RANGE



TORQUE LIMITERS Series SK

From 0,1 – 2.800 Nm, Bore diameters 4 – 100 mm
Available as a single position, multi-position, load holding, or full disengagement version
Single piece or press-fit design



BELLOWS COUPLINGS Series BK

From 15 – 10.000 Nm
Bore diameters 10 – 180 mm
Single piece or press-fit design



BELLOWS COUPLINGS ECONOMY CLASS Series BKL

From 2 – 500 Nm
Bore diameters 4 – 62 mm



LINE SHAFTS Series ZA/ZE

From 10 – 4.000 Nm
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Available up to 6 mtr. length



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From 0,05 – 10 Nm
Bore diameters 1 – 28 mm
Single piece or press-fit design



SERVO-INSERT-COUPLINGS SERVOMAX Series EK

From 5 – 2.000 Nm, Shaft diameters 5 – 80 mm
backlash-free, press-fit design



LINEAR COUPLINGS Series LK

From 70 – 2.000 N
Thread M5 – M16



POLYAMID COUPLINGS MICROFLEX Series FK 1

Rated torque 1 Ncm
Bore diameters 1 – 1,5 mm