LOW COST AND RELIABLE.

ECONOMY CLASS BELLOWS COUPLINGS

SERIES BKL | 2 - 500 Nm





THE ULTIMATE COUPLING FROM 2 - 500 Nm

www.rwcouplings.com



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 guiet, 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:

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

T_{KN} = rated torque of coupling

(Nm)

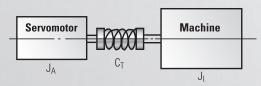
 T_{AS} = peak torque of motor

(Nm)

According to resonance frequency:

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

2-mass-system



$$f_{e} = \frac{1}{2 \cdot \pi} \sqrt{C_{T} \cdot \frac{J_{A} + J_{L}}{J_{A} \cdot J_{L}}} \quad (Hz)$$

As a value of practice is valid: $f_{\rho} \ge 2 \times f_{\rho r}$

 C_T = torsional stiffness of the coupling

= resonance frequency of the 2-mass-system = frequency of the drive

(Hz) (Hz)

(Nm/rad)

According to torsional stiffness:

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

$$\phi = \frac{180}{\pi} \cdot \frac{T_{AS}}{C_{T}} \quad \text{(degrees)}$$

= angle of turn

(degrees)

= 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.

shock or load factor

 $S_A = 1$ (uniform load)

 $S_{\Delta} = 2$ (non-uniform load)

 $S_A = 3-4$ (shocking load)

Values for $S_{\Delta} = 2-3$ are usual for servo drives on machine tools.

$$T_{KN} \ \ge T_{AS} \ \cdot \ S_A \ \cdot \ \frac{J_L}{J_A + J_L} \hspace{0.5cm} \text{(Nm)}$$

 T_{KN} = rated torque of coupling

(Nm)

 $T_{\Delta S}$ = max. acceleration torque on the drive face

(Nm) - or max. deceleration torque on the load face (Nm) (kgm²)

J_I = machine's moment of inertia

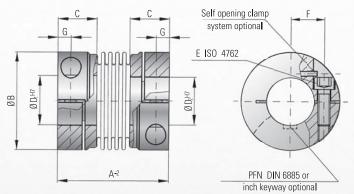
(Spindle + slide + workpiece +

half of coupling)

= motor's moment of inertia







Properties:

Material:

Design:

Temperature

Backlash:

Service life:

Non standard:

easy to mount

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

Bellows made of highly flexible high-grade stainless steel

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.

range: -30 to +100° C (3,6 F to 237 F)

Absolutely backlash-free due to frictional

clamped connection.

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.

> Custom designs with varied tolerances, keyways, non-standard material and bellows are available

> > 3

upon request.

Ordering example BKL / 80 / 26 / 22 / XX Model Series/Nm Ø D1 H7 Ø D2 H7 non standard

Madal DVI		Series									
Model BKL		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)	А	30	40	44	58	68	79	92	92	109	114
Outer diameter (mm)	В	25	32	40	49	56	66	82	82	110	123
Fit length (mm)	С	10.5	13	13	21.5	26	28	32.5	32.5	41	42.5
Inner diameter possible from \emptyset to \emptyset H7 (mm)	D½	4-13	6-16	6-24	8-28	12-32	14-35	16-42	19-42	24-60	35-62
ISO 4762 fastening screw		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 centers (mm)	F	8	11	14	17	20	23	27	27	39	41
(mm)	G	4	5	5	6.5	7.5	9.5	11	11	13	17
Moment of inertia (10 ⁻³ kgm²)	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.	0.5	1	1	1	1	1.5	2	2	2	2.5
lateral (mm)	values	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)	Ca	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)



Experience and Know-how for your special requirements.

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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 NmBore diameters 4 - 62 mm



LINE SHAFTS Series ZA/ZAE

From 10 – 4.000 Nm Bore diameters 10 – 100 mm Available up to 6 mtr. length



MINIATURE BELLOWS COUPLINGS Series MK

From 0.05 - 10 NmBore diameters 1 - 28 mmSingle piece or press-fit design



SERVO-INSERT-COUPLINGS SERVOMAX Series EK

From $5-2.000\,\mathrm{Nm}$, Shaft diameters $5-80\,\mathrm{mm}$ 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