TORSIONALLY RIGID AND FLEXIBLE

BK

BELLOWS COUPLINGS

SERIES BK | 2 – 10,000 Nm

R+W®
COUPLING TECHNOLOGY

THE ULTIMATE COUPLING FROM 2 – 10,000 Nm

www.rw-america.com

TORSIONALLY STIFF METAL BELLOWS COUPLINGS

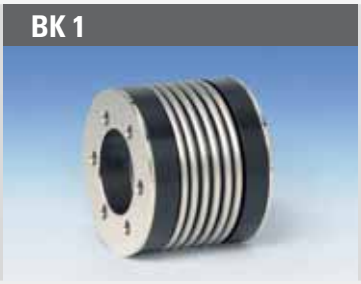
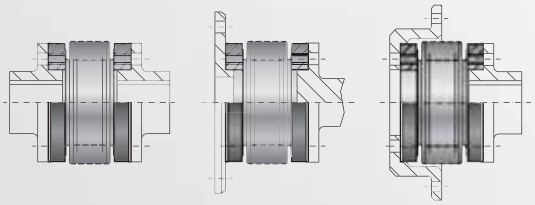
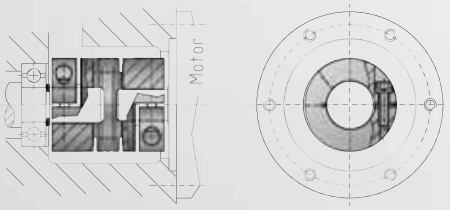
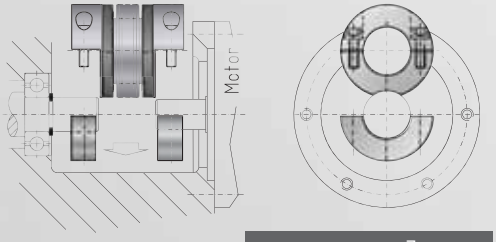
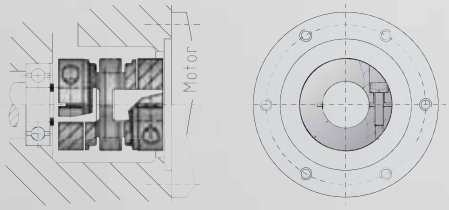
Areas of Application:

Highly dynamic axis of:

- Servo drives
- CNC axes
- Robotic axes
- Manipulators
- Linear actuators
- Automation plants
- Sheet metal cutting machines
- Printing machinery
- Packaging machinery
- Woodworking machinery
- Textile machinery
- Metal cutting machines
- Stone cutting machines
- Gear grinding machines

Properties of the Product Range:

- compact
- zero backlash
- high torsional stiffness
- exact transmission of angular motion and torque
- infinite life
- wear and maintenance free
- high operation dependability
- multiple mounting possibilities
- easy mounting and dismounting
- compensation for axial, lateral and angular shaft misalignment accompanied by quiet, uniform operation
- low restoring forces
- balanced for high speeds

MODEL	PROPERTIES	APPLICATION EXAMPLES
BK 1 	**with flange mounting from 15-10,000 Nm** ■ special design application	 see page 5
BK 2 	**with clamping hub from 15-1,500 Nm** ■ easy to mount ■ suited for space restricted installations ■ low moment of inertia ■ finely balanced up to 40,000 rpm available	 see page 6
BKH 	**with split hub from 15-1,500 Nm** ■ for radial mounting ■ suited for space restricted installations ■ low moment of inertia ■ finely balanced up to 40,000 rpm available	 see page 7
BKL 	**Economy Class with clamping hub from 2-500 Nm** ■ low cost version ■ self opening clamping system optional ■ low moment of inertia	 see page 8

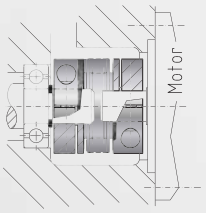
optional stainless steel

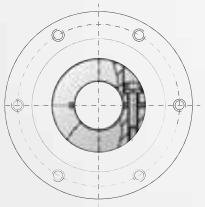
MODEL	PROPERTIES	APPLICATION EXAMPLES

BKC

Economy Class with clamping hub from 15-500 Nm

- speeds of up to 80000 rpm
- compact design
- self opening clamping system optional



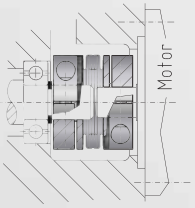


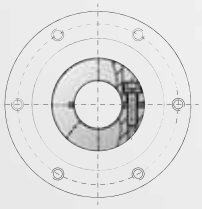
see page 9

BKM

with clamping hub from 2-1000 Nm

- high transmittable torques, while maintaining a compact design
- easy to mount
- Lowest moment fo inertia



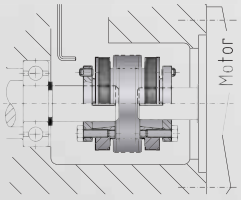


see page 10

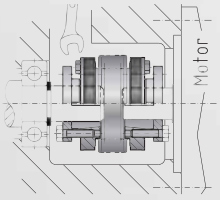
BK 3

with tapered conical sleeves from 15-10,000 Nm

- high clamping forces
- high degree of operating dependability
- new draw-off device suited for space restricted installations



Approach to date



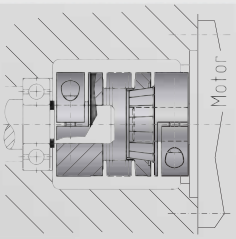
The new approach

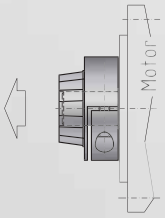
see page 11

BK 5

with tapered press-fit connection from 15-1,500 Nm

- absolutely backlash-free
- easy mounting and dismounting
- wear-free press fit connection
- electrically and thermally insulated



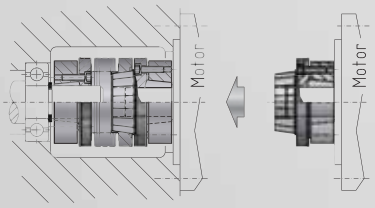


see page 12

BK 6

with conical sleeve and tapered press-fit connection from 15-1,500 Nm

- for axial mounting
- absolutely backlash-free
- easy mounting and dismounting
- wear-free press-fit connection
- electrically and thermally insulated



see page 13

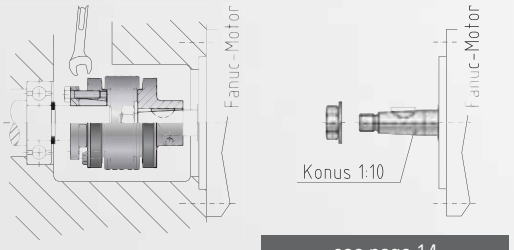
TORSIONALLY STIFF METAL BELLOWS COUPLINGS

MODEL	PROPERTIES	APPLICATION EXAMPLES

BK 4

for Fanuc-drives
from 15-150 Nm

- for conical shaft mounting
- easy to assemble
- high clamping forces, due to conical sleeves

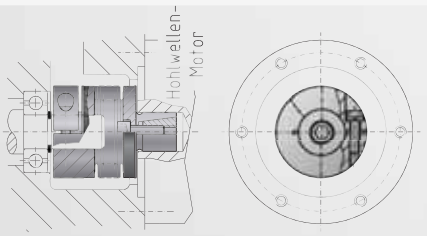


see page 14

BK 7

with expanding shaft
from 15-300 Nm

- for hollow shaft mounting
- suited for space restricted installations
- easy mounting

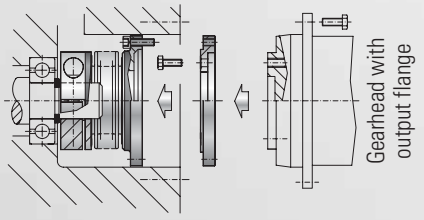


see page 15

BK 8

for ISO-Flange mounting
from 15-2.600 Nm

- for ISO Gearheads or output flanges
- backlash free and high torsional rigid
- high transmittable torques while maintaining a compact design

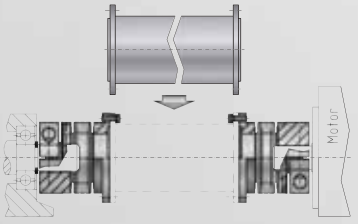


see page 16

ZA

Line shafts with clamping hub
from 10-4,000 Nm

- removable intermediate tube section
- no additional bearing neccessary
- standard length up to 6 m



see separate catalog

ATEX

for use in
explosive environments

- available for the full product range
- for hazardous areas 1/21 and 2/22 bellows couplings are registered according to the directive ATEX 95a

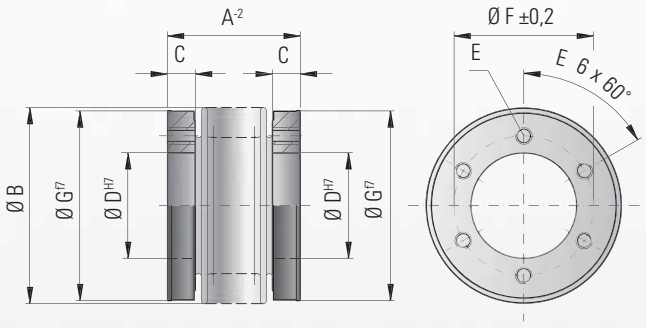
see page 17

optional stainless steel

MODEL **BK1**

BACKLASH-FREE, TORSIONALLY STIFF METAL BELLOWS COUPLINGS

with flange mounting



Properties: ■ special design application

Material: Bellows made of highly flexible high grade stainless steel, hub material: steel

Design: The hubs have six threaded metric mounting holes, and the ID and OD are concentrically machined to ISO H7 tolerances.

Hubs with custom bore size, mounting threads and bolt circles are available upon request.

Temperature range: -30 to +110° C (-22 F to 230 F)

Speeds: Up to 10,000 rpm, in excess of 10,000 with finely balanced version.

Service life: These couplings are maintenance-free if the technical limits are not exceeded

Backlash: Absolutely backlash-free due to bolted connection.

Brief overloads: Acceptable up to 1.5 times the value specified.

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

Ordering example

BK1/ 150 / 62 /XX

- Model
- Series / Nm
- Overall length
- Non standard e.g. stainless steel

Model BK 1			Series																			
			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	
Outer 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	
Inner diameter H7	(mm)	D	25		28		38		50		58		65		70		75	85	100	145	190	
Fastening threads 6x		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	
Hub bolt circle ± 0.2	(mm)	F	35		37		46		62		70		80		94		90	110	140	190	234	
Outer diameter f7	(mm)	G	49		55		66		81		90		110		122		116	140	182	235	295	
Moment of inertia	(10^{-3} kgm²)	J_{total}	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	
Approx. 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)	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	± (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	0.35	0.35	0.4	0.4	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	1.5	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	1550	435	2040	610	3750	1050	2500	840	2000	3600	6070	19200	21800	

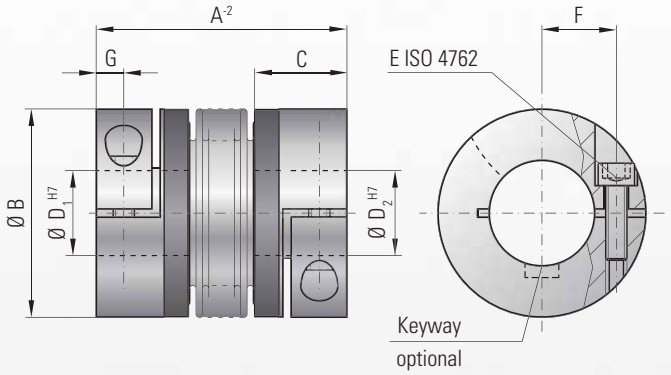
(1Nm ≙ 8.85 in lbs)

optional stainless steel

MODEL **BK2**

BACKLASH-FREE, TORSIONALLY STIFF METAL BELLOWS COUPLINGS

with clamping hub



Properties:
- easy to mount
- suited for space restricted installations
- low moment of inertia

Material: Bellows made of highly flexible high-grade stainless steel, hub material: see table below

Design: With a single radial clamping screw per hub ISO 4762. Any imbalance of the clamping hubs is compensated for by balancing bores located on the inside of the hub.

Temperature range: -30 to +110° C (-22 F to 230 F)

Speeds: Up to 10,000 rpm, in excess of 10,000 available with a finely balanced version.

Service life: These couplings are maintenance-free if the technical ratings are not exceeded.

Backlash: Absolutely backlash-free due to frictional clamp connection.

Brief overloads: Acceptable up to 1.5 times the value specified.

Tolerance: On the hub/shaft connection 0.01 to 0.05 mm

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

Ordering example

BK2 / 80 / 94 / 20 / 25.4 / XX

- Model
- Series / Nm
- Overall length
- Ø D1 H7
- Ø D2 H7
- Non standard e.g. stainless steel

Model BK 2		Series																			
		15		30		60		80		150		200		300		500		800	1500
Rated torque (Nm)	T_{KN}	15		30		60		80		150		200		300		500		800	1500
Overall length (mm)	A^{-2}	59	66	69	77	83	93	94	106	95	107	105	117	111	125	133	146	140	166
Outer diameter (mm)	B	49		55		66		81		81		90		110		124		134	157
Fit length (mm)	C	22		27		31		36		36		41		43		51		45	55
Inner diameter possible from Ø to Ø H7 (mm)	D_1/D_2	8-28		10-30		12-32		14-42		19-42		22-45		24-60		35-60		40-75	50-80
Fastening screw ISO 4762	E	M5		M6		M8		M10		M10		M12		M12		M16		2xM16	2xM20
Thightening torque of the fastening screw (Nm)	E	8		15		40		50		70		120		130		200		250	470
Distance between centers (mm)	F	17		19		23		27		27		31		39		41		2x48	2x55
Distance (mm)	G	6.5		7.5		9.5		11		11		12.5		13		16.5		18	22.5
Moment of inertia (10^{-3} kgm²)	J_{total}	0.06	0.07	0.12	0.13	0.32	0.35	0.8	0.85	1.9	2	3.2	3.4	7.6	7.9	14.3	14.6	16.2	43
Hub material (standard) (steel on request)		Al optional steel		Al optional Stahl		Al optional Stahl		Al optional Stahl		steel optional Al		steel optional Al		steel optional Al		steel optional Al		steel	steel
Approx. weight (kg)		0.16		0.26		0.48		0.8		1.85		2.65		4		6.3		5.7	11.5
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
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
lateral ± (mm)	Max. values	0.15	0.2	0.2	0.25	0.2	0.25	0.2	0.25	0.2	0.25	0.25	0.3	0.25	0.3	0.3	0.35	0.35	0.35
angular ± (degree)	Max. values	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
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
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

(1Nm ≙ 8.85 in lbs)

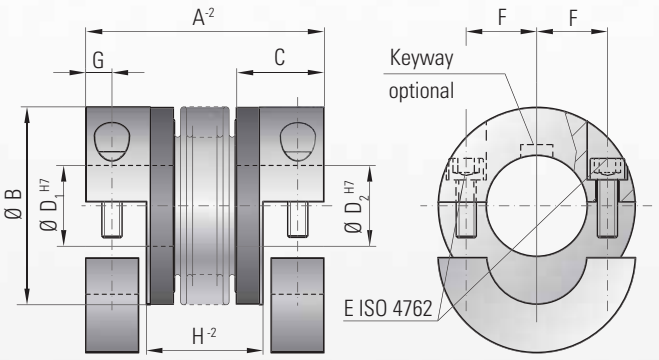
* two screws each hub, 180° apart

optional stainless steel

MODEL **BKH**

BACKLASH-FREE, TORSIONALLY STIFF METAL BELLOWS COUPLINGS

with split hub



Properties:
- easy to mount
- suited for space restricted installations
- low moment of inertia

Material: Bellows made of highly flexible high-grade stainless steel. Hub material see table

Design: Both clamping hubs are completely separable, due to split hubs and two radial screws ISO 4762 on each hub. Any imbalance of the clamping hubs is compensated for by balancing bores located on the inside of the hub.

Temperature range: -30 to +110° C (-22 F to 230 F)

Speeds: Up to 10,000 rpm, in excess of 10,000 available with a finely balanced version.

Service life: These couplings are maintenance-free if the technical ratings are not exceeded.

Backlash: Absolutely backlash-free due to frictional clamp connection.

Brief overloads: Acceptable up to 1.5 times the value specified.

Tolerance: On the hub/shaft connection 0.01 to 0.05 mm

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

Ordering example

BKH / 80 / 94 / 20 / 25.4 / XX

- Model
- Series / Nm
- Overall length
- Ø D1 H7
- Ø D2 H7
- Non standard e.g. stainless steel

Model BKH			Series																			
			15		30		60		80		150		200		300		500		800		1500	
Rated torque	(Nm)	T_{KN}	15		30		60		80		150		200		300		500		800		1500	
Overall length	(mm)	A^{-2}	59	66	69	77	83	93	94	106	95	107	105	117	111	125	133	146	140		166	
Outer diameter	(mm)	B	49		55		66		81		81		90		110		124		134		157	
Fit length	(mm)	C	22		27		31		36		36		41		43		51		45		55	
Inner diameter possible from Ø to Ø H7	(mm)	D_1/D_2	8-28		10-30		12-32		14-42		19-42		22-45		24-60		35-60		40-75		50-80	
Fastening screw ISO 4762		E	M5		M6		M8		M10		M10		M12		M12		M16		M16		M20	
Thightening torque of the fastening screw	(Nm)		8		15		40		50		70		120		130		200		250		470	
Distance between centers	(mm)	F	17		19		23		27		27		31		39		41		48		55	
Distance	(mm)	G	6.5		7.5		9.5		11		11		12.5		13		16.5		18		22.5	
Distance	(mm)	H^{-2}	29	36	35	43	41	51	47	59	48	60	51	63	55	69	62	75	65.5		71	
Moment of inertia	(10^{-3} kgm²)	J_{total}	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	
Hub material (standard) (steel on request)			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	
Approx. weight	(kg)		0.15		0.3		0.4		0.8		1.7		2.5		4		7.5		7		12	
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	
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	
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	0.25	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	
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	
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	

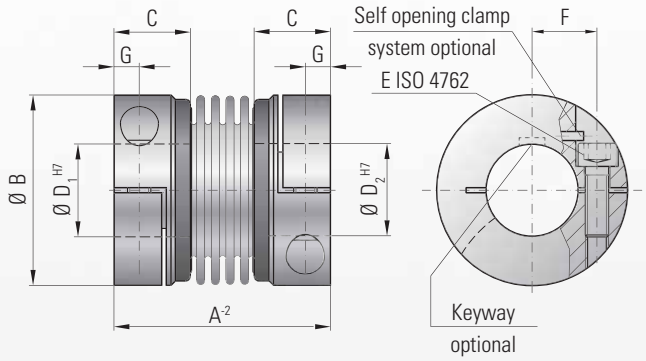
(1Nm ≙ 8.85 in lbs)

optional stainless steel

MODEL **BKL**

BACKLASH-FREE, TORSIONALLY STIFF METAL BELLOWS COUPLINGS

with clamping hub



Properties:
- easy to mount
- low moment of inertia
- economically priced

Material: Bellows made of highly flexible high-grade stainless steel. Hub material see table

Design: With a single ISO 4762 radial clamping screw per hub.
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 (-22 F to 212 F)

Speeds: Up to 10,000 rpm, in excess of 10,000 with a finely balanced version.

Backlash: Absolutely backlash-free due to frictional clamped connection.

Brief overloads: Acceptable up to 1.5 times the value specified.

Service life: These couplings have an infinite life and are maintenance-free if the technical ratings 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, bellows and ATEX designs are available upon request.

Ordering example

BKL / 80 / 26 / 22 / XX

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

Model BKL			Series									
			2	4,5	10	15	30	60	80	150	300	500
Rated torque	(Nm)	T_{KN}	2	4.5	10	18	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)	$D_{1/2}$	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		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
Distance	(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	0.007	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
Approx. 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	± (mm)	Max. values	0.5	1	1	1	1	1.5	2	2	2	2.5
lateral	± (mm)		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
angular	± (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

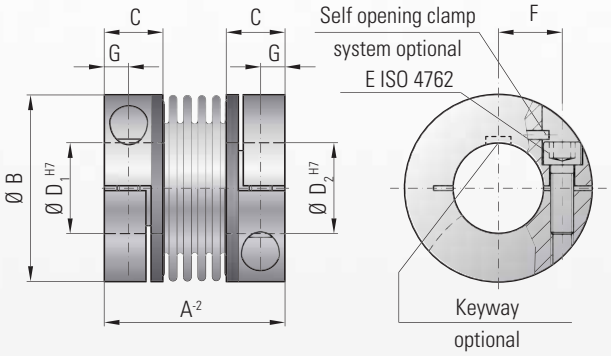
(1Nm ≙ 8.85 in lbs)

optional stainless steel

MODEL **BKC**

BACKLASH-FREE, TORSIONALLY STIFF METAL BELLOWS COUPLINGS

compact version with clamping hub



Properties:
- for high speeds
- easy to mount
- suited for space restricted installations
- low moment of inertia

Material: Bellows made of highly flexible high-grade stainless steel. Hub material see table.

Design: With a single ISO 4762 radial clamping screw per hub.
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 (-22 F to 212 F)

Speeds: Standard up to 10,000
Option 1: In excess of 10,000 rpm with a finely balanced version
Option 2: in excess of 30,000 rpm, with balancing grade G = 2.5 (see table)

Backlash: Absolutely backlash-free due to frictional clamped connection.

Service life: These couplings have an infinite life and are maintenance-free if the technical ratings 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, bellows and ATEX designs are available upon request.

Ordering example

BKC / 60 / 26 / 22 / XX

- Model
- Series Nm
- Ø D1 H7
- Ø D2 H7
- non standard eg. stainless steel

Model BKC			Series					
			15	30	60	150	300	500
Rated torque	(Nm)	T_{KN}	18	30	60	150	300	500
Overall length	(mm)	A^{-2}	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)	D_1/D_2	8-28	12-32	14-35	19-42	24-60	32-75
Fastening screw ISO 4762		E	M5	M6	M8	M10	M12	M12
Tightening torque of the fastening screw	(Nm)		8	15	40	75	120	125
Distance between centers	(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} kgm²)	J_{total}	0.05	0.1	0.26	0.65	6.3	9
Hub material			AL	AL	AL	AL	steel	steel
Approx. 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	± (mm)	Max. values	1	1	1.5	2	2	2.5
lateral	± (mm)		0.2	0.2	0.2	0.2	0.2	0.2
angular	± (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	(rpm)		80000	70000	60000	50000	40000	30000

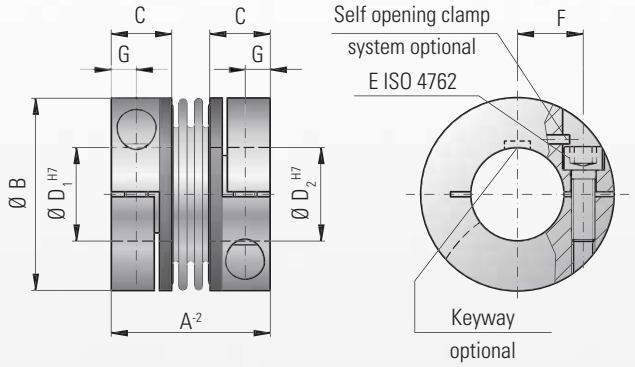
(1Nm ≙ 8.85 in lbs)

optional stainless steel

MODEL **BKM**

BACKLASH-FREE, TORSIONALLY STIFF METAL BELLOWS COUPLINGS

rigid and compact, with clamping hub



Properties:
- compact design for high torques
- easy to mount
- suited for space restricted installations
- low moment of inertia

Material: Bellows made of highly flexible high-grade stainless steel. Hub material see table.

Design: With a single ISO 4762 radial clamping screw per hub. **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 (-22 F to 212 F)

Speeds: Standard up to 10,000
Option 1: In excess of 10,000 rpm with a finely balanced version
Option 2: in excess of 30,000 rpm, with balancing grade G = 2.5 (see table)

Backlash: Absolutely backlash-free due to frictional clamped connection.

Service life: These couplings have an infinite life and are maintenance-free if the technical ratings 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, bellows and ATEX designs are available upon request.

Ordering example

BKM / 20 / 24 / 15 / XX

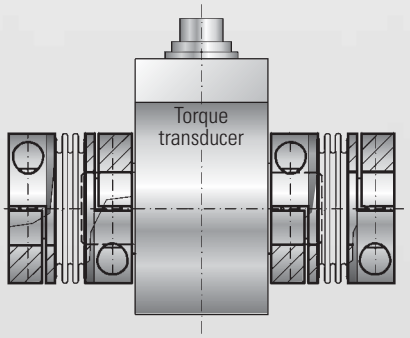
- Model
- Series Nm
- Ø D1 H7
- Ø D2 H7
- non standard

Model BKM			Series			
			20	200	400	1000
Rated torque	(Nm)	T_{KN}	20	200	400	1000
Overall length coupling	(mm)	A^{-2}	40	59	75	89
Outer diameter	(mm)	B	49	66	82	110
Fit length	(mm)	C	16.5	23	27.5	34
Inner diameter possible from Ø to Ø H7	(mm)	$D_{1/2}$	15-28	24-35	32-40	40-60
Fastening screw ISO 4762		E	M5	M8	M10	M12
Tightening torque of the fastening screw	(Nm)		8	40	60	130
Distance between centers	(mm)	F	17	23	27	39
Distance	(mm)	G	6	9,5	11	13
Moment of inertia	(10^{-3} kgm²)	J_1	0.05	0.18	0.62	7.2
Hub material			AL	AL	AL	steel
Approx. weight	(kg)		0.13	0.4	0.7	3.5
Torsional stiffness	(10^3 Nm/rad)	C_T	41.9	138	170	1210
axial	± (mm)	max. value	1	1.5	1	2
lateral	± (mm)		0.06	0.08	0.1	0.1
angular	± (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	(rpm)		80000	60000	50000	40000

(1Nm ≙ 8.85 in lbs)

Mounting example

Possible mounting with a torque transducer



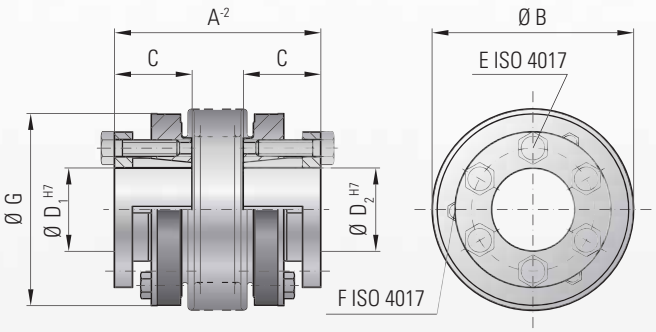
smaller bores ($D_{1/2}$) at reduced torque capacities on request.

optional stainless steel

MODEL **BK3**

BACKLASH-FREE, TORSIONALLY STIFF METAL BELLOWS COUPLINGS

with tapered conical sleeves



Properties:
- high clamping forces
- high degree of operating dependability
- new draw off device suited for space restricted installations

Material: Bellows made of highly flexible high-grade stainless steel, the hub material is steel.

Design: With tapered conical sleeves and strong, captive ISO 4017 draw-off screws.

Temperature range: -30 to +110° C (-22 F to 230 F)

Speeds: Up to 10,000 rpm, in excess of 10,000 available with a finely balanced version.

Service life: These couplings are maintenance-free if the technical ratings are not exceeded.

Backlash: Absolutely backlash-free due to frictional clamp connection.

Brief overloads: Acceptable up to 1.5 times the value specified.

Tolerance: On the hub/shaft connection 0.01 to 0.05 mm

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

Ordering example

BK3 / 60 / 76 / 20 / 22 / XX

- Model
- Series / Nm
- Overall length
- Ø D1 H7
- Ø D2 H7
- Non standard e.g. stainless steel

Model BK 3			Series																			
			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	
Outer diameter of bellows	(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	
Inner diameter from Ø to Ø H7	(mm)	D_1/D_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 screws ISO 4017		E	6x M4		6x M5		6x M5		6x M6		6x M6		6x M8		6x M8		6x M10	6x M12	6x M16	6x M16	8x M16	
Tightening torque of the fastening screws	(Nm)		4		6		8		12		14		18		25		40	70	120	150	160	
Draw-off screw 3x ISO 4017		F	3x M4		3x M4		3x M5		3x M5		3x M6		3x M6		3x M6		3x M8	6xM8	6xM10	6xM10	8xM10	
Outer diameter of hub	(mm)	G	49		55		66		81		90		110		122		116	135	180	246	295	
Moment of inertia	(10^{-3} kgm²)	J_{total}	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	
Approx. weight	(kg)		0.25		0.4		0.8		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	± (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	± (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	0.35	0.35	0.4	0.4	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	1.5	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	

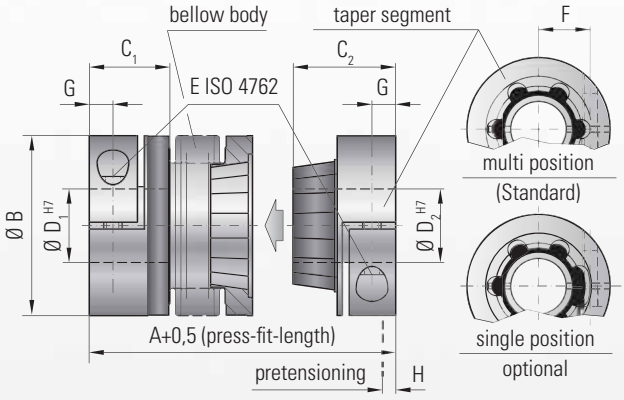
(1Nm ≙ 8.85 in lbs)

optional stainless steel

MODEL **BK5**

BACKLASH-FREE, TORSIONALLY STIFF METAL BELLOWS COUPLINGS

Press-fit, with clamping hub



Properties:

Temperature range: -30 to +110° C (-22 F to 230 F)

Speeds: Up to 10,000 rpm, over 10,000 rpm available with a finely balanced version.

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

Backlash: Absolutely backlash-free due to frictional clamp connection and axial pretensioning of the tapered press-fit segments.

Brief overloads: Acceptable up to 1.5 times the value specified.

Tolerance: On the hub/shaft connection 0.01 to 0.05 mm

Material BK 5: Bellows made of highly flexible, high-grade stainless steel; clamping hubs up to series 80 aluminium, and 150 and up steel. Tapered segment on hub face: glass-fiber reinforced plastic molded onto an aluminium hub.

Design BK 5: One side with a single radial clamping screw ISO 4762. One side includes backlash-free clamping hub and tapered press-fit device. Any imbalance of the clamping hub, is compensated with balancing bores located on the inside of the hub.

Design details BK 5 / BK 6

- absolutely backlash-free and torsionally rigid
- easy mounting and dismounting
- electrically and thermally insulated
- wear-free and maintenance-free
- low moment of inertia
- compensation for misalignment

Ordering example BK 5 / BK 6

BK5 / 30 / 71 / 18 / 19 / XX

- Model
- Series / Nm
- Overall length
- Ø D1 H7
- Ø D2 H7
- Non standard e.g. stainless steel

Model BK 5			Series																	
			15		30		60		80		150		300		500		800		1500	
Rated toque	(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	
Outer 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	
Inner diameter from 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	
Inner diameter from 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		2xM16*		2xM20*	
Tightening torque	(Nm)		8		15		40		50		70		130		200		250		470	
Distance between centers	(mm)	F	17		19		23		27		27		39		41		2x48*		2x55*	
Distance	(mm)	G	6.5		7.5		9.5		11		11		13		16.5		18		22.5	
Pretensioning approx.	(mm)	H	0.2 up to 1.0		0.5 up to 1.0		0.5 up to 1.5		0.5 up to 1.5		0.5 up to 1.5		0.5 up to 1.5		1.0 up to 2.0		1.0 up to 2.5		0.5 up to 1.5	
Axial recovery force of coupling max.	(N)		20	12	50	30	70	45	48	32	82	52	157	106	140	96	200		650	
Mass moment of inertia	(10^3 kgm²)	J_{total}	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	26.2		51.4	
Approx. 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	8.2		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		650	
axial*	± (mm)	Max. values	0.5	1	0.5	1	0.5	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	0.25	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	1.5		1.5	
Lateral spring stiffness	(N/mm)	C_r	475	137	900	270	1200	420	920	290	1550	435	3750	1050	2500	840	2000		3600	

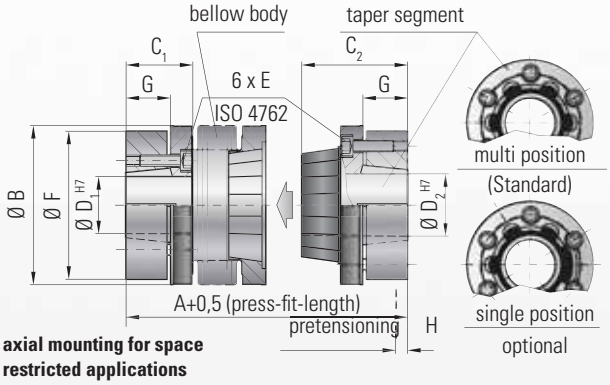
(1Nm ≙ 8.85 in lbs) * allowed following maximum pretensioning * two screws each hub, 180° apart
Higher torques on request

optional stainless steel

MODEL **BK6**

BACKLASH-FREE, TORSIONALLY STIFF METAL BELLOWS COUPLINGS

Press-fit, with conical sleeve



axial mounting for space restricted applications

Material BK 6:

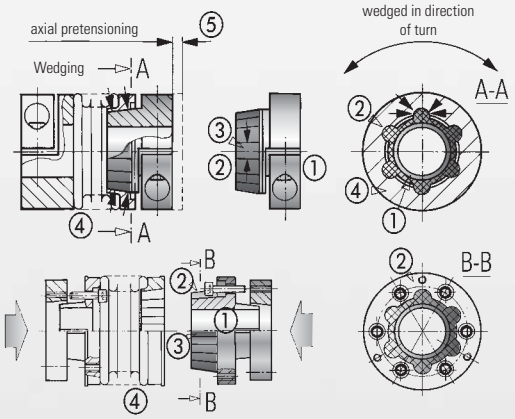
Bellows made of highly flexible, high-grade stainless steel; conical sleeves and tapered segment on bellows face are made of steel.

Tapered segment on hub face: glass-fiber rein forced plastic molded onto a steel hub.

Design BK 6:

One side concial sleeve with 6 fastening screws ISO 4762 and 3 draw-off threads. One side with backlash-free tapered concial sleeve with press-fit connection and 3 draw-off screws

Design details BK 5 / BK 6



Due to the press-fit design the complete drive unit can be simply pulled away when servicing is required.

Six self-centering, tapered drive projections (2) have been formed into the plastic conical element, which has been molded onto an aluminium hub (1). The six axially arranged projections are configured conically in a longitudinal direction (3). The mating piece consits of a metal bellows with a tapered female mounting element (4). Absolutely backlash-free torque transmission is ensured due to the axial pretensioning (5) of the metal bellows during its mounting. This slight pretensioning has no negative influence on the operation of the metal bellows coupling or of the shaft bearing.

Material description of the plastic segment:

This is a glass-fiber reinforced plastic of the duromer group. With a glass-fiber content of 65% it achives a strength and rigidity roughly that of steel.

Model BK 6			Series													
			15		30		60		150		300		500		800	1500
Rated torque	(Nm)	T_{KN}	15		30		60		150		300		500		800	1500
Overall length (inserted)	(mm)	$A^{+0,5}$	58	65	68	76	79	89	97	109	113	127	132	145	140	158
Outer diameter	(mm)	B	49		55		66		81		110		124		133	157
Fit length	(mm)	C_1	13.5		16.5		18		23.5		27		32		42	53
Fit length	(mm)	C_2	29		34		39		49.5		59		68		74	90.5
Inner diameter from Ø to Ø H7	(mm)	D_1	10-22		12-24		12-32		15-40		24-56		30-60		40-62	50-75
Inner diameter from Ø to Ø H7	(mm)	D_2	10-22		12-24		12-32		15-40		24-56		30-60		40-62	50-75
Fastening screw ISO 4762		E	M4		M5		M5		M6		M8		M8		M10	M12
Tightening torque	(Nm)		3.5		6.5		8		12		30		32		55	110
Diameter of clamping cone	(mm)	F	46.5		51		60		74		102		114		126	146
Konuslänge	(mm)	G	9.5		10.5		11.5		17.5		20		23		27	32
Pretensioning approx.	(mm)	H	0.2 up to 1.0		0.5 up to 1.0		0.5 up to 1.5		0.5 up to 1.5		0.5 up to 1.5		1.0 up to 2.0		1.0 up to 2.0	0.5 up to 1.5
Axial recovery force of coupling max.	(N)		20	12	50	30	70	45	82	52	157	106	140	96	400	650
Moment of inertia	(10^{-3} kgm²)	J_{total}	0.1	0.12	0.2	0.25	0.4	0.45	2.0	2.5	5.4	6.1	8.4	9.1	19.5	44
Approx. 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	9.4	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*	± (mm)	Max. values	0.5	1	0.5	1	0.5	1	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	0.25	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	1.5	1.5
Lateral spring stiffness	(N/mm)	C_r	475	137	900	270	1200	420	1550	435	3750	1050	2500	840	2000	3600

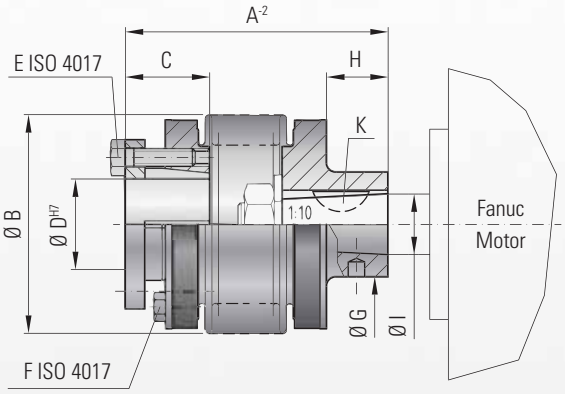
(1Nm ≙ 8.85 in lbs) * allowed following maximum pretensioning Higher torques on request.

optional stainless steel

MODEL **BK4**

BACKLASH-FREE, TORSIONALLY STIFF METAL BELLOWS COUPLINGS

for Fanuc-Motore



Properties:
- for conical shafts
- easy mounting and dismounting
- high degree of operating dependability

Material: Bellows made of highly flexible high-grade stainless steel, the hub material is steel.

Design: Spindle-side:
With conical sleeve and strong captive ISO 4017 draw-off screws

Motor-side:
Conical hub 1 : 10 and a keyway.

Temperature range: -30 to +110° C (-22 F to 230 F)

Speeds: Up to 10,000 rpm, over 10,000 rpm available with a finely balanced version.

Service life: These couplings are maintenance-free if the technical ratings are not exceeded.

Backlash: Absolutely backlash-free due to frictional clamp connection.

Brief overloads: Acceptable up to 1.5 times the value specified.

Tolerance: On the hub/shaft connection 0.01 to 0.05 mm

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

Ordering example

BK4 / 150 / 82 / 20 / XX

- Model
- Series / Nm
- Overall length
- Ø D H7
- Non standard e.g. stainless steel

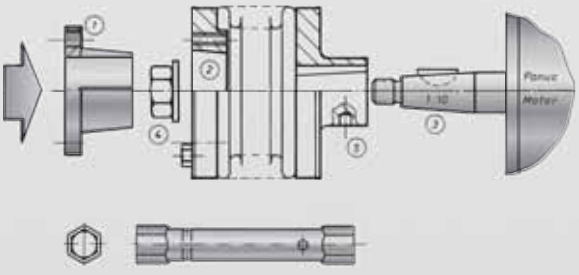
Model BK 4			Series							
			15		30		60		150	
Rated torque	(Nm)	T_{KN}	15		30		60		150	
Overall length	(mm)	A^{-2}	47	54	68	76	72	82	82	94
Outer diameter of bellows	(mm)	B	49		55		66		81	
Fit length	(mm)	C	19		22		27		32	
Inner diameter from Ø to Ø H7	(mm)	D	10-22		12-23		12-29		15-37	
Fastening screws 6x ISO 4017		E	M4		M5		M5		M6	
Tightening torque of the fastening screws	(Nm)		4		6		8		12	
Draw-off screw 3x ISO 4017		F	M4		M4		M5		M5	
Shaft diameter	(mm)	G	20		27		30		30	
Shaft length	(mm)	H	8.5		22		18		20	
Moment of inertia	(10^{-3} kgm²)	J_{total}	0.10	0.12	0.22	0.27	0.58	0.61	1.1	1.4
Approx. 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	± (mm)	Max. values	1	2	1	2	1.5	2	2	3
lateral	± (mm)		0.15	0.2	0.2	0.25	0.2	0.25	0.2	0.25
angular	± (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 Ø (Fanuc Motor)	(mm)	I	11		16		16		16	
Keyway width	(mm)	K	4		5		5		5	

Higher torques on request. (1Nm ≙ 8.85 in lbs)

Technical instructions:

Before mounting the coupling, the concial sleeve (1) has to be removed. After sliding the coupling on to the motor shaft (3) the nut (4) can be put on through the bellows body (4).

To tighten the nut a special DIN 896 B key is used. The bore (5) is used for holding the coupling while tightening the nut.



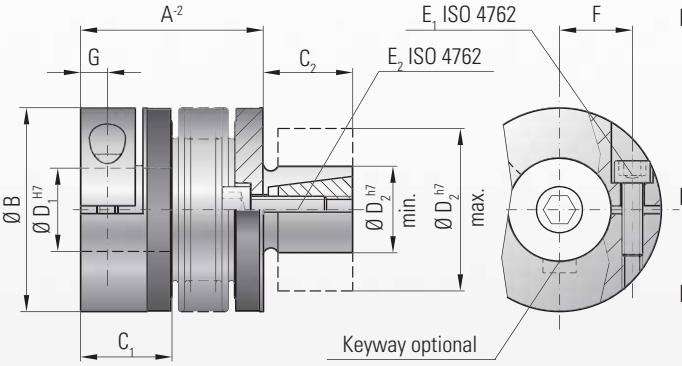
Key DIN 896 B

optional stainless steel

MODEL **BK7**

BACKLASH-FREE, TORSIONALLY STIFF METAL BELLOWS COUPLINGS

with expanding shaft



Properties:

- compact design, conserves space while saving cost
- easy mounting
- backlash-free and torsionally rigid
- low moment of inertia
- compensation for misalignment

Material: Bellows made of highly flexible high-grade stainless steel, hub material: see table, Expanding hub and cone (steel).

Design: On one side with a single radial clamping screw ISO 4762. On one side an expanding shaft with tapered clamping element.

Temperature range: -30 to +110° C (-22 F to 230 F)

Speeds: Up to 10,000 rpm, over 10,000 rpm available with a finely balanced version.

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

Backlash: Absolutely backlash-free due to frictional clamp connection.

Brief overloads: Acceptable up to 1.5 times the value specified.

Tolerance: On the hub/shaft connection 0.01 to 0.05 mm

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

Ordering example

BK7 /150 / 71 / 32 / 35 / XX

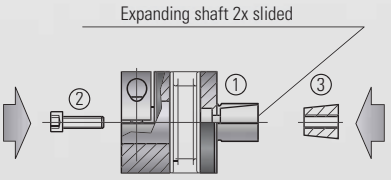
- Model
- Series / Nm
- Overall length
- Ø D1 H7
- Ø D2 h7
- non standard

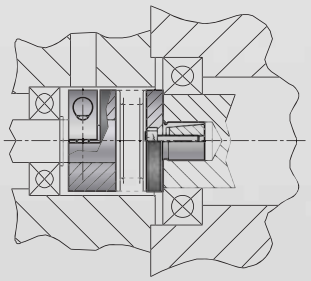
Model BK 7		Series									
		15		30		60		150		300	
Rated toque (Nm)	T_{KN}	15		30		60		150		300	
Overall length (inserted) (mm)	A^{-2}	45	52	53	61	62	72	71	83	84	98
Outer diameter (mm)	B	49		55		66		81		110	
Fit length (mm)	C_1	22		27		32		36		43	
Fit length (mm)	C_2	20		25		27		32		45	
Inner diameter from Ø to Ø H7 (mm)	D_1	8-28		10-30		12-35		19-42		30-60	
Shaft diameter from Ø to Ø 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 centers (mm)	F	17		19		23		27		39	
Distance (mm)	G	6.5		7.5		9.5		11		13	
Moment of inertia (10^{-3} kgm²)	J_{total}	0.07	0.08	0.14	0.15	0.23	0.26	2.2	2.4	6.5	8.9
Hub material (standard) (steel on request)		Al		Al		Al		steel		steel	
Approx. 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 ± (mm)	Max. values	1	2	1	2	1.5	2	2	3	2.5	3.5
lateral ± (mm)		0.15	0.2	0.2	0.25	0.2	0.25	0.2	0.25	0.25	0.3
angular ± (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

(1Nm ≙ 8.85 in lbs)

Installation instructions:

By tightening the screw through the bellow body, the shaft is caused to expand. The coupling is designed for high dynamic hollow shaft connections eg. gear boxes. Recommended bore tolerance: ISO H7

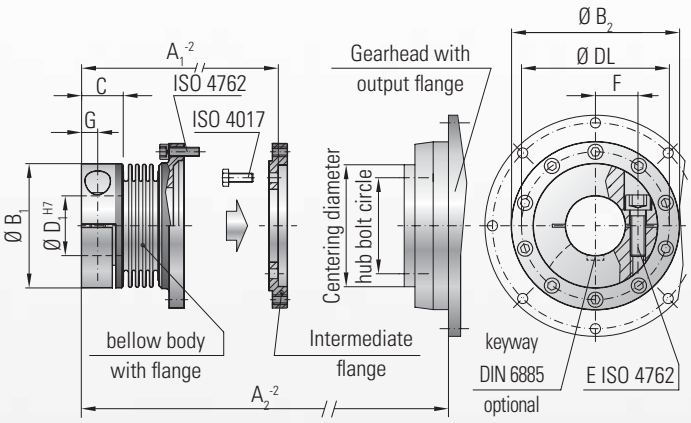




optional stainless steel

MODEL **BK8**

BACKLASH-FREE, TORSIONALLY STIFF METAL BELLOWS COUPLINGS



Properties:

Material:

Design:

Speed:

Temperature range:

Fit tolerance:

Non standard:

Flange mounting

- zero backlash and high torsional rigidity
- easy assembly
- suited for space restricted installations
- compact design

The hubs are made of aluminium, series 300 and 1500 made of steel. Bellows are made of highly flexible, high-grade stainless steel. Intermediate flange made of steel (standard).

One side with a clamping hub and a single radial clamping screw ISO 4762.
One side with a flange-connection and a seperate intermediate flange.

Up to 10,000 rpm.

-30 to +110° C (-22 F to 220 F)

On the hub/shaft connection 0.01 to 0.05 mm.

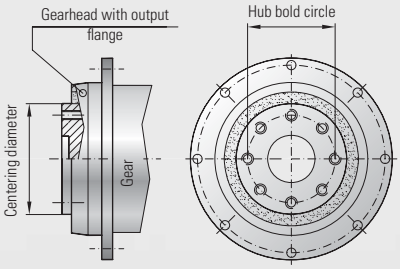
Custom designs with varied tolerances, keyways, non-standard material and bellows are available upon request.

Ordering example

BK8 / 15 / 24 / 40 / XX

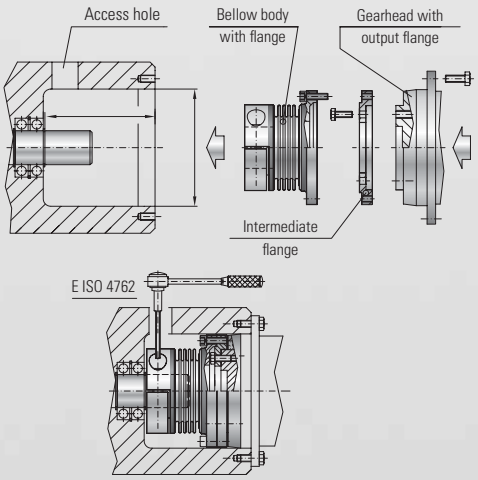
- Model
- Series
- Ø D1 H7
- Flange centerin diameter Ø 40 h7
- non standard ga. VA material

Gearhead with output flange



The bolt circle will be drilled acc. to the gear head

Mounting and dismounting



Model BK 8			Series 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 8x M5	50 8x M6	63 12x M6	80 12x M8	125 12x M10
Max. torque*	(Nm)		50	210	380	750	2600
Length -2	(mm)	A	48.5	67	72	90	140
Length -2	(mm)	A_1	68	97	101	128	190
Outher diameter	(mm)	B	49	66	82	110	157
Flange diameter	(Nm)	B_1	63.5	86	108	132	188
Fit length	(mm)	C	16.5	23	27.5	34	55
Inner diameter possible from Ø to Ø H7	(mm)	D	12-28	14-35	19-42	24-60	50-80
Hub bolt circle	(mm)	DL	56.5	76	97	120	170
Fastening threads			10 x M4	10 x M5	10 x M6	12 x M6	16 x M8
Fastening screws ISO 4762		E	1 x M5	1 x M8	1 x M10	1 x M12	2 x M20
Tightening torque	(Nm)		8	45	80	120	470
Distance	(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
Approx. weight	(kg)	I	0.3	0.7	1	2.8	10
Moment of inertia	(10^{-3} kgm²)	J_{ges}	0.15	0.65	1.3	5.5	45
Lateral	± (mm)	Max. value	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

*max. torque transmittable for a short-therm period on max. diameter (D).

(1Nm ≙ 8.85 in lbs)

optional stainless steel

MODELL **ATEX**

FOR USE IN HAZARDOUS AREAS AND EXPLOSIVE ATMOSPHERE

AT mosphere EX plosible

The ATEX 95a is regulated by the new European directive. Generally the explosive atmosphere is classified in 3 different zones.

Zone 0:
A place in which an explosive atmosphere consists of a mixture of air and flammable substances in the form of gas, vapor or mist and is present frequently, continuously or for extended periods.

Zone 20:
Is relevant for an explosive atmosphere in the form of clouds of combustible dust in air under the same conditions as above.

Zone 1:
Described as a place in which an explosive atmosphere consists of a mixture of air with flammable substances in the form of gas, vapor or mist, and is likely to occur in normal operation occasionally.

Zone 21:
Is relevant for an explosive atmosphere in the form of clouds of combustible dust in air under the same conditions as above.

Zone 2:
A place in which an explosive atmosphere consists of a mixture of air with flammable substances in the form of gas, vapor or mist and is not likely to occur in normal operation but, if it does occur, it will persist for only a short period.

Zone 22:
Relevant for an explosive atmosphere in the form of a cloud of combustible dust in air under the same conditions as above.

For the classified zones 1/21 and 2/22 the metal bellows couplings BK-EEX do have an accreditation according to ATEX 95a

Mounting, Design:

For security reasons all misalignment values and torque ratings are decreased by 20%

Installation and Operation instructions:

Installation and operating instructions are an essential part of the BK-EEx metal bellows couplings.

Including the following facts:
- Design of the BK EEx metal bellows couplings
- Exact tightening torques and misalignment values
- How to put in operation
- Maintenace intervals
- Trouble shooting
- Marking of the coupling
- Declaration of conformity

Identification:

All BK-EEx couplings are permanent labeled to display manufacturer and accreditation data.

Example Accreditation data:

Type: BKL 150 EEx-2003
II 2 G D
EEx cT4/135°C
Ser.No.: A 44305
Tech.Ref.No.:2003/003RW

Assembling the BK-EEX metal bellows couplings

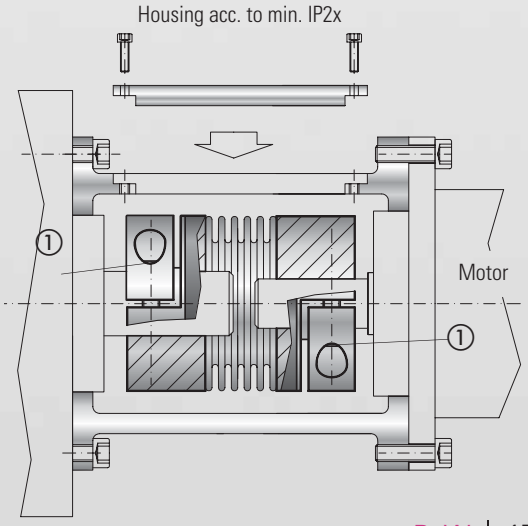
The coupling cross section is insulated throughout the outside under the use of a flange or cover plate. The cover has to be electrical conductive.

Min. sealing according to IP2X

Tolerance: On the hub/shaft connection must be within 0,01-0,05 mm

Assembling: To ensure a safe clamping, the tightening torque rates of the clamping screws (1) must be noticed at any time.

ATTENTION!
A permanent observation of the driving and driven side must be ensured.
A shut off must follow right afterwards.



optional stainless steel

THE SELECTION

THE SELECTION PROCESS FOR TORSIONALLY RIGID METAL BELLOWS COUPLINGS

According to Torque

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

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

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

The following calculation has proven itself 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 uf motor (Nm)

According to Acceleration Torques

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

In the case of servo motors ensure that their acceleration or deceleration torque is greater than their 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 on the driving element (Nm)

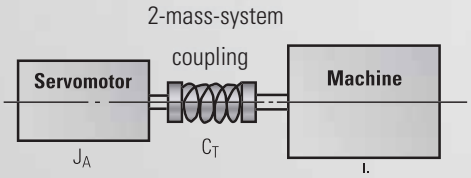
- or max. deceleration torque of the load (Nm)

J_L = maschine moment of inertia (Spindle + slide + workpiece+ half of coupling) (kgm^2)

J_A = motor´s moment of inertia (kgm^2)

According to Resonace Frequency

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



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

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

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

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

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

According to Torsional Stiffness

Transmission errors due to the torsional load:

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

φ = Torsional deflection (degrees)

C_T = torsional stiffness of coupling (Nm/rad)

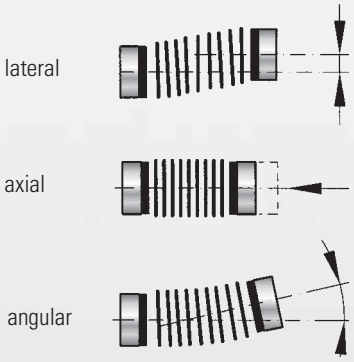
T_{AS} = max. torque (Nm)

optional stainless steel

INSTALLATION INSTRUCTIONS

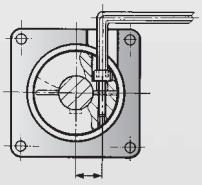
SERIES BK

Misalignments



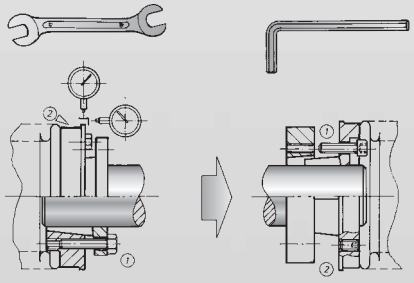
- When mounting the coupling ensure that the metal bellows has not been damaged or bent.
- During mounting, the torque and axis misalignments may exceed 2 times the rating without the performance of the coupling being effected.
- However, for continuous operation, the axial and lateral misalignments specified in the catalog must not be exceeded. Only then will the coupling provide infinite performance.
- **Lateral axis misalignment requires special attention (see table values).**
- In the case of models BK 2/3/4/5/6 the tolerance between shaft/hub connection must not exceed 0.01 and 0.05 mm.
- Prior to mounting check for smooth running of the coupling hub on the shaft.
- Prior to mounting, make sure that the shaft is slightly oiled. Shaft keyways have no effect upon the function of the clamp connection.

Model BK 2 / BK 5 page 6 / page 10



- The torque values of the fastening screws must be precisely applied in order to ensure secure clamping of the hubs.
- The dimensions for application of the coupling bolt access hole can be found under „F" and „G" in the table.
- No additional securing of the screw is necessary. Loosening of the fastening screws is sufficent to dismount the coupling.

Model BK 3 / BK 4 / BK 6 page 8 / page 9 / page 11

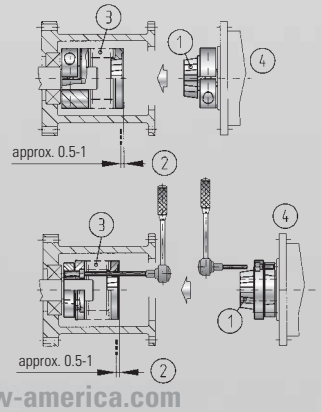


- It is absolutely essential that the fastening screws (1) are evenly tightened.
- Perform tightening of the fastening screws crosswise in order to avoid any distortion of the coupling hubs.
- Extraction of the tapered bushings for repair purposes is possible by means of 3x captive hexagonal draw-off screws (2).
- When dismounting assure during draw off that consistent unscrewing of the 3x hexagon screws is maintained.

  The alignment surfaces on the outer faces of the hubs are for the purpose of checking hub distortion during mounting and for retromeasurement of shaft misalignment.

  Caution! An increase of tension on the tapered bushings is still achievable even after the screws have been tightened several times crosswise (max.3 times). This must be avoided without fail, otherwise destruction of the clamp connection may result.

Model BK 5 / BK 6 page 10 / page 11



- The press-fit couplings do not need access holes on the intermediate flange. Model BK 6 will be mounted axially.
- The six axially arranged projections (1) are configured conically in a longtitudinal direction. Due to this an axial pretensioning (2) is needed.
  The metal bellows (3) is used as a spring
- Please maintain the pretensioning values which are printed in the table (page 8 + 9)

  Caution! When mounting the drive unit the pretensioning must be achieved.

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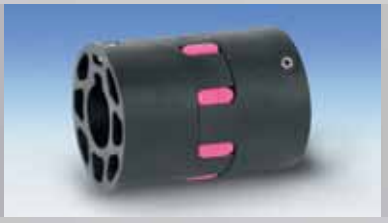
backlash-free, press-fit design



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Series FK 1

Rated torque 1 Ncm
Bore diameters 1 – 1.5 mm

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QUALITY MANAGEMENT
We are certified
according to ISO 9001:2000

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

A043/11/08/1.500