

VERSATILE AND PRECISE.

MINIATURE METAL BELLOWS COUPLINGS

SERIES MK | 0.05 – 10 Nm



R+W[®]
COUPLING TECHNOLOGY

THE ULTIMATE COUPLING FROM 0.05 – 10 Nm

www.rwcouplings.com

BACKLASH FREE MINIATURE BELLOWS COUPLINGS

Areas of application:

Ideal for precise transmission of angular motion and torque in applications including:

- Optical encoders
- Potentiometers
- Tachometers
- Small servo motors
- Stepper motors
- Measurement systems

Features:

- zero backlash
- torsionally rigid
- precise transmission of angular motion and torque
- infinite life
- wear and maintenance free
- compensates for axial, angular and lateral misalignment
- easy assembly

MODELS

FEATURES

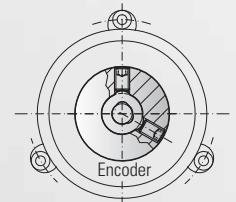
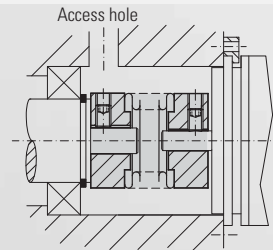
APPLICATION EXAMPLES

MK1



with radial set screws from 0.05-10 Nm

- cost effective design
- integral "dismounting groove"
- mounting groove or flatted shaft is not required



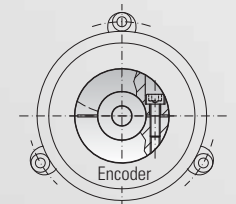
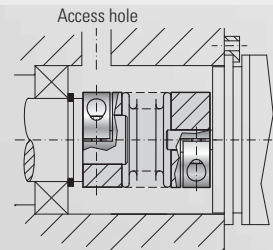
see page 4

MK2



with clamping hubs from 0.5-10 Nm

- easy assembly
- for highly dynamic applications
- finely balanced up to 90,000 rpm available



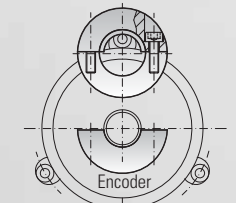
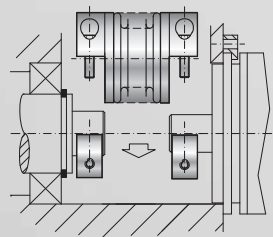
see page 5

MKH



with fully split hubs from 0.5-10 Nm

- for lateral mounting
- multiple lengths available
- suited for pre-aligned shafts



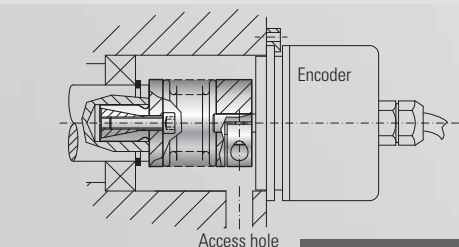
see page 6

MK3



with expanding shaft from 0.5-10 Nm

- compact design
- for easy hollow shaft mounting
- adapts mismatched shaft and bore diameters



see page 7

optional
stainless
steel

MODELS

FEATURES

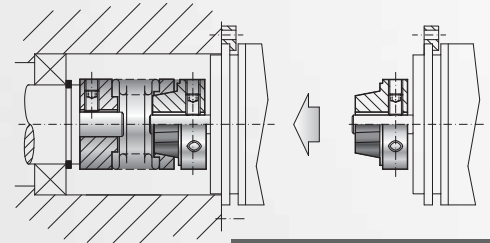
APPLICATION EXAMPLES

MK4



**with radial set screws
from 0.5-10 Nm**

- wear free, press fit connection
- electrically and thermally isolating
- integral "dismounting groove"
- mounting groove or flatted shaft is not required
- easy mounting and dismounting



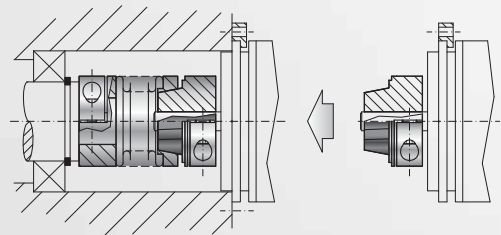
see page 8

MK5



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

- wear free, press fit connection
- electrically and thermally isolating
- easy mounting and dismounting



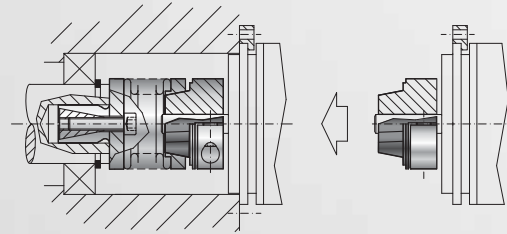
see page 9

MK6



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

- wear free, press fit connection
- compact design
- for easy hollow shaft mounting
- saves assembly space and cost
- adapts mismatched shaft and bore diameters



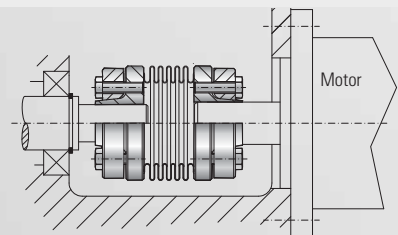
see page 10

MKS



**with conical clamping rings
from 4.5-10 Nm**

- balanced to 120,000 rpm
- high operational dependability
- for highly dynamic applications



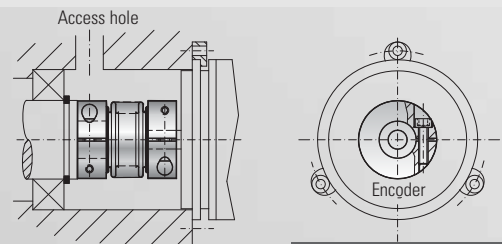
see page 11

BKL



**with clamping hubs
up to 3 Nm**

- extremely cost effective
- easy mounting and dismounting
- temperatures up to 200° C



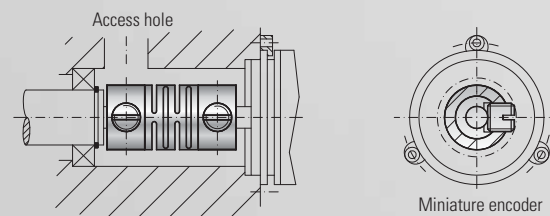
see page 12

FK1



**with set screws
up to 1 Ncm**

- extremely compact design
- for miniature applications

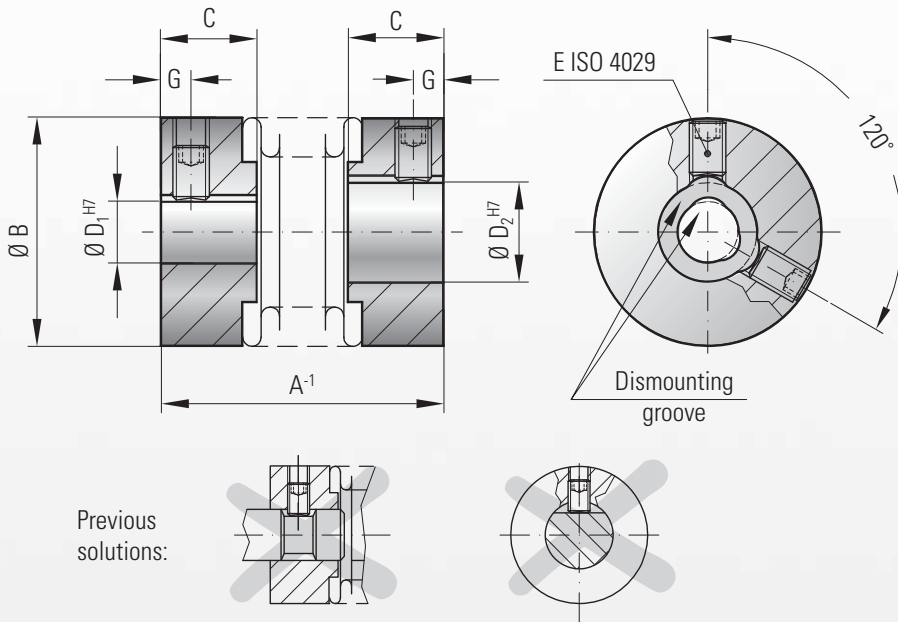


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MODEL MK1

TECHNICAL SPECIFICATIONS



Previous solutions:

Ordering example

MK1 / 5 / 26 / 4 / 5 / XX

Model
Series
Overall length
Bore $\emptyset D_1 H7$
Bore $\emptyset D_2 H7$
Non standard e.g. stainless steel



with radial set screws

Features:

- backlash free and torsionally rigid
- cost effective design
- low moment of inertia
- compensates for 3 types of misalignment
- mounting groove or flatted shaft is not required due to integral "dismounting groove"

Material:

Bellows made from highly flexible, high grade stainless steel; hubs made from aluminum

Design:

With 1x or 2x ISO 4029 radial set screw per hub and integral "dismounting groove"

Temperature range:

-30 to +110° C (-22 to +230° F)

Speeds:

Up to 20,000 rpm; in excess of 20,000 rpm with finely balanced version

Service life:

Maintenance free with infinite life when operated within the technical specifications

Fit tolerance:

Overall clearance between hub and shaft
0.01-0.08 mm

Non standard applications:

Custom designs with various tolerances, keyways, materials, dimensions, etc. available upon request

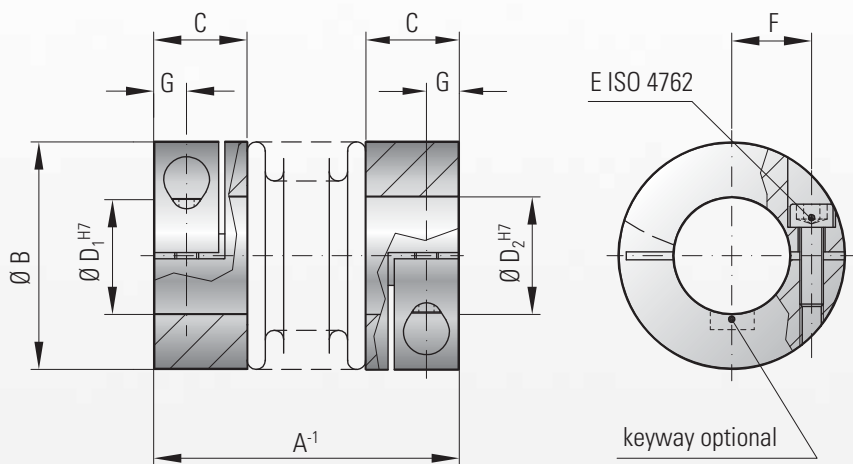
| Model MK 1 | | Series | | | | | | | | | | | | | | | | | | |
|---|---------------------|-------------|------|--------|------|-----|------|------|-----|------|------|-----|------|------|------|------|------|------|------|-----|
| | | 0.5 | | 1 | | 5 | | | 10 | | | 15 | | 20 | | 45 | | 100 | | |
| Rated torque | (Nm) | T_{KN} | 0.05 | 0.1 | 0.5 | | | 1.0 | | | 1.5 | | 2.0 | | 4.5 | | 10 | | | |
| Overall length | (mm) | A | 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 | | | |
| Standard bore H7 | (mm) | $D_{1/2}$ | 2 | 3 | 6 | | | 6 | | | 6/10 | | 6/10 | | 10 | | 10 | | | |
| Clamping screw ISO 4029 | | | 1xM2 | 1xM2.5 | 1xM3 | | | 1xM3 | | | 2xM3 | | 2xM4 | | 2xM5 | | 2xM6 | | | |
| Tightening torque of the assembly screws | (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_{total} | 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 | |
| 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 | \pm (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 | \pm (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 | 0.25 | 0.3 |
| Angular | \pm (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 | 2 |

1 Nm = 8.85 in lbs



MODEL MK2

TECHNICAL SPECIFICATIONS



with clamping hubs

Features:

- with frictional clamp connection
- for highly dynamic applications
- backlash free and torsionally rigid
- low moment of inertia
- compensates for 3 types of misalignment

Material:

Bellows made from highly flexible, high grade stainless steel; hubs made from aluminum

Design

With a single ISO 4762 radial clamping screw per hub

Temperature range:

-30 to +110° C (-22 to +230° F)

Speeds:

Up to 10,000 rpm; in excess of 10,000 rpm with finely balanced version (up to $G = 2.5$)

Service life:

Maintenance free with infinite life when operated within the technical specifications

Fit tolerance:

Overall clearance between hub and shaft 0.01-0.05 mm

Non standard applications:

Custom designs with various tolerances, keyways, materials, dimensions, etc. available upon request

Ordering example

MK2 / 5 / 25 / 4 / 5 / XX

Model
Series
Overall length
Bore $\emptyset D_1$ H7
Bore $\emptyset D_2$ H7
Non standard e.g. stainless steel

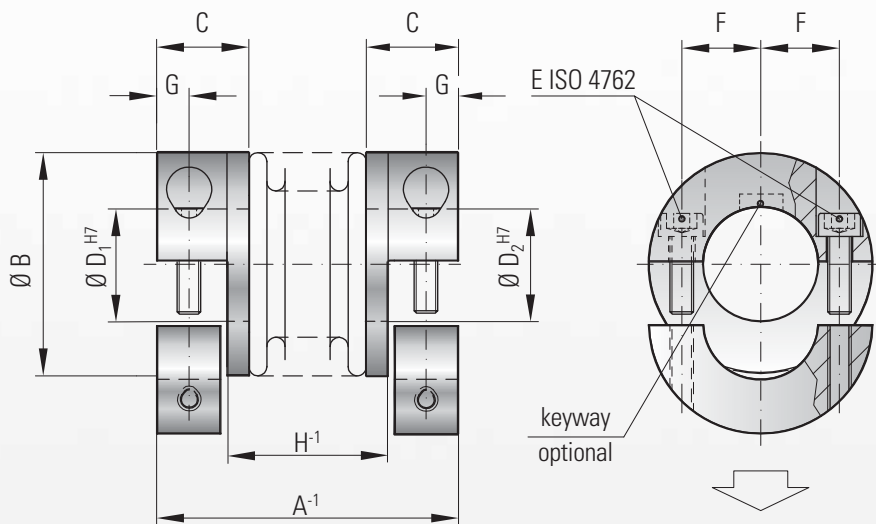
| Model MK 2 | | Series | | | | | | | | | | | | | | | | | |
|--|-------------|------------|-----|------|------|------|------|------|------|--------|------|------|------|------|------|------|------|-----|-----|
| | | 5 | | | 10 | | | 15 | | 20 | | | 45 | | 100 | | | | |
| Rated torque (Nm) | T_{KN} | 0.5 | | | 1.0 | | | 1.5 | | 2.0 | | | 4.5 | | 10 | | | | |
| Overall length (mm) | A | 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 | | | | |
| Standard bore H7 (mm) | $D_{1/2}$ | 6 | | | 6 | | | 6 | | 6/10 | | | 10 | | 10 | | | | |
| Fastening screw ISO 4762 | E | M2 | | | M2 | | | M2.5 | | M3 | | | M4 | | M4 | | | | |
| Tightening torque of the fastening screws (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 | | | | |
| Moment of inertia (gcm ²) | J_{total} | 2.6 | 2.8 | 3 | 3 | 3.4 | 3.6 | 8.5 | 9.5 | 25 | 27 | 29 | 100 | 108 | 160 | 205 | | | |
| 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 | Max. values | ± (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 | 0.15 | 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 | 2 | 1.5 | 2 | 1.5 | 2 | 1.5 | 2 |

1 Nm = 8.85 in lbs



MODEL MKH

TECHNICAL SPECIFICATIONS



Ordering example

MKH / 20 / 35 / 8 / 10 / XX

Model
Series
Overall length
Bore $\varnothing D1 H7$
Bore $\varnothing D2 H7$
Non standard e.g. stainless steel



with fully split hubs

Features:

- for lateral mounting
- easy mounting and dismounting
- lightweight and low inertia
- suited for pre-aligned shafts

Material:

Bellows made from highly flexible, high grade stainless steel; hubs made from aluminum

Design:

With fully removable split hubs and 2x ISO 4762 clamping screws per hub

Temperature range:

-30 to +110° C (-22 to +212° F)

Speeds:

Up to 10,000 rpm; in excess of 10,000 rpm with finely balanced version (up to $G = 2.5$)

Service life:

Maintenance free with infinite life when operated within the technical specifications

Brief overloads:

Acceptable up to 1.5x the rated torque

Fit tolerance:

Overall clearance between hub and shaft 0.01-0.05 mm

Non standard applications:

Custom designs with various tolerances, keyways, materials, dimensions, etc. available upon request

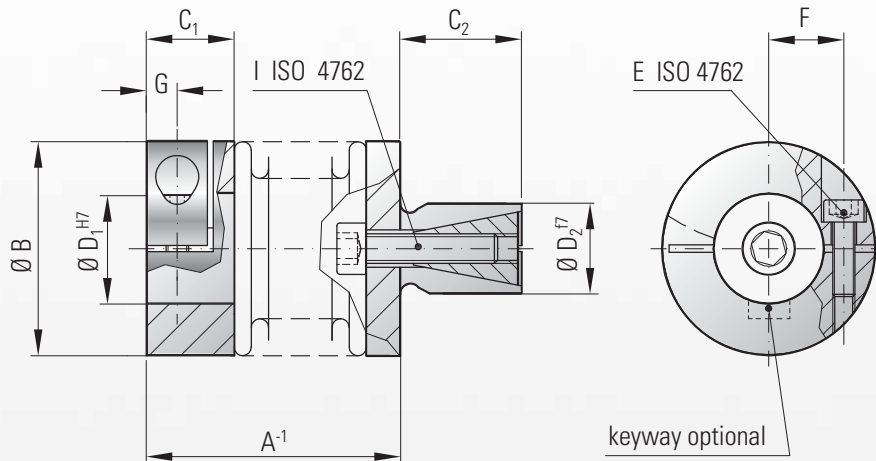
| Model MKH | | Series | | | | | | | | | | | | | | | |
|--|-------------|-------------|-----|------|------|-----|------|------|------|--------|------|------|------|------|------|------|------|
| | | 5 | | | 10 | | | 15 | | 20 | | 45 | | 100 | | | |
| Rated torque (Nm) | T_{KN} | 0.5 | | | 1.0 | | | 1.5 | | 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 \varnothing to $\varnothing H7$ (mm) | $D_{1/2}$ | 3-7 | | | 3-7 | | | 3-8 | | 3-12.7 | | 5-16 | | 5-24 | | | |
| Standard bore H7 (mm) | $D_{1/2}$ | 6 | | | 6 | | | 6 | | 6/10 | | 10 | | 10 | | | |
| Fastening screw ISO 4762 | E | M2 | | | M2 | | | M2.5 | | M3 | | M4 | | M4 | | | |
| Tightening torque of the fastening screws (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 (mm) | 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_{total} | 2.6 | 2.8 | 3 | 3 | 3.4 | 3.6 | 8.5 | 9.5 | 25 | 27 | 29 | 100 | 108 | 160 | 205 | |
| Weight (g) | max. values | 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) | max. values | 1 | 1.5 | 2 | 1 | 1.5 | 2 | 1.5 | 1.5 | 1.5 | 1.5 | 2 | 1.5 | 2 | 1.5 | 2 | |

1 Nm = 8.85 in lbs

optional
stainless steel

MODEL MK3

TECHNICAL SPECIFICATIONS



with expanding shaft

Features:

- backlash free and torsionally rigid
- compensates for 3 types of misalignment
- for easy hollow shaft mounting
- adapts mismatched shaft and bore diameters
- low moment of inertia

Material:

Bellows made from highly flexible, high grade stainless steel; clamping hub made from aluminum; expanding shaft and cone made from steel

Design:

With a single ISO 4762 radial clamping screw on one hub; shaft with internal cone for expansion

Temperature range:

-30 to +110° C (-22 to +230° F)

Speeds:

Up to 10,000 rpm; in excess of 10,000 rpm with finely balanced version

Service life:

Maintenance free with infinite life when operated within the technical specifications

Fit tolerance:

Overall clearance between hub and shaft
0.01-0.05 mm

Non standard applications:

Custom designs with various tolerances, keyways, materials, dimensions, etc. available upon request

Recommended bore tolerance for expanding shaft: H7

Ordering example

MK3/20 / 36 / 6 / 12 / XX

Model
Series
Overall length
Bore Ø D1 H7
Shaft Ø D2 f7
Non standard e.g. stainless steel

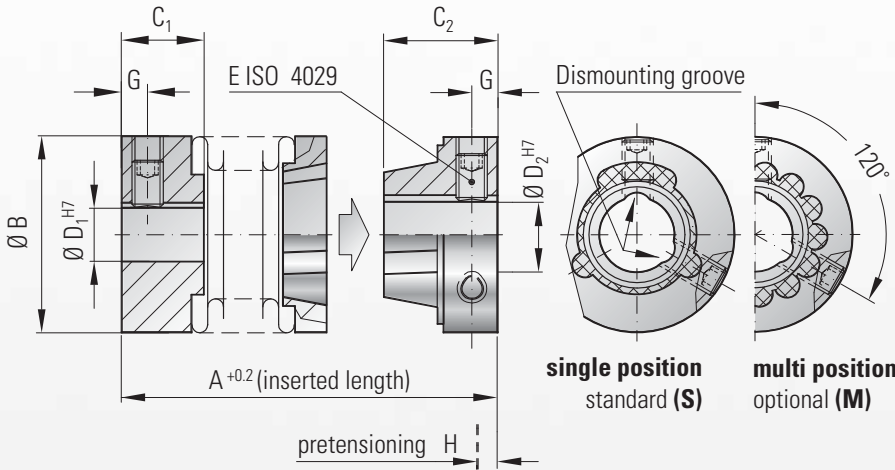
| Model MK3 | | Series | | | | | | | | | | | | | | | |
|--|-------------|--------|-----|------|------|-----|------|------|-----|--------|------|------|------|------|------|------|--|
| | | 5 | | | 10 | | | 15 | | 20 | | | 45 | | 100 | | |
| Rated torque (Nm) | T_{KN} | 0.5 | | | 1 | | | 1.5 | | 2 | | | 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 Ø to Ø H7 (mm) | D_1 | 3-7 | | | 3-7 | | | 4-8 | | 4-12.7 | | | 5-16 | | 6-24 | | |
| Standard bore H7 (mm) | D_1 | 6 | | | 6 | | | 6 | | 6/10 | | | 10 | | 10 | | |
| Standard shaft f7 (mm) | D_2 | 8 | | | 8 | | | 10 | | 12 | | | 14 | | 16 | | |
| Fastening screw ISO 4762 | | M2 | | | M2 | | | M2.5 | | M3 | | | M4 | | M4 | | |
| Tightening torque of the fastening screws (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 screws (Nm) | I | 1.5 | | | 1.5 | | | 3 | | 4 | | | 6.5 | | 11 | | |
| Moment of inertia (gcm ²) | J_{total} | 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) | 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 | |

1 Nm = 8.85 in lbs



MODEL MK4

TECHNICAL SPECIFICATIONS



Ordering example

MK4/20 / 37 / 8 / 10 / XX

Model
Series
Overall length
Bore Ø D1 H7
Bore Ø D2 H7
Non standard e.g. multi position re-engagement



blind mate with radial set screws

Features:

- electrically and thermally isolating
- wear and maintenance free
- easy mounting and dismounting
- absolutely backlash free and torsionally rigid
- low moment of inertia
- compensates for 3 types of misalignment

Material:

Bellows made from highly flexible, high grade stainless steel; hubs and bellows side adapter plate made from aluminum; tapered male segment made from glass reinforced plastic molded directly onto the hub

Design:

With 1x or 2x ISO 4029 radial set screw per hub and integral "dismounting groove"; with blind mate, press fit connection

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

Speeds: Up to 20,000 rpm; in excess of 20,000 rpm with finely balanced version

Service life:

Maintenance free with infinite life when operated within the technical specifications

Fit tolerance:

Overall clearance between hub and shaft
0.01-0.08 mm

Non standard applications:

Custom designs with various tolerances, keyways, materials, dimensions, etc. available upon request

| Model MK 4 | Series | | | | | | | | | | | | | |
|---|-------------|--|--------|-----|------|------|-----|--------|------|------|------|------|------|------|
| | 5 | | | 15 | | 20 | | | 45 | | 100 | | | |
| Rated torque (Nm) | T_{KN} | | 0.5 | | 1.5 | | 2 | | | 4.5 | | 10 | | |
| Overall length (inserted) (mm) | A | | 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 Ø to Ø H7 (mm) | D_1 | | 3-9 | | | 3-12 | | 3-16 | | | 6-22 | | 6-28 | |
| Inside diameter possible from Ø to Ø H7 (mm) | D_2 | | 3-6.35 | | | 3-9 | | 3-12.7 | | | 6-16 | | 6-20 | |
| Standard bore H7 (mm) | $D_{1/2}$ | | 6 | | | 6 | | 6/10 | | | 10 | | 10 | |
| Fastening screw ISO 4029 | E | | 1xM3 | | | 2xM3 | | 2xM4 | | | 2xM5 | | 2xM6 | |
| Tightening torque of the fastening screws (Nm) | E | | 1.3 | | | 1.3 | | 2.5 | | | 4 | | 6 | |
| Distance (mm) | G | | 2 | | | 2 | | 2.5 | | | 3.5 | | 4 | |
| Approximate pretensioning (mm) | H | | 0.4 | | | 0.5 | | 0.5 | | | 0.7 | | 1 | |
| Axial recovery force at maximum pretensioning (N) | | | 5 | 3 | 2 | 4 | 3 | 3 | 4 | 3 | 15 | 10 | 33 | 46 |
| Moment of inertia (gcm ²) | J_{total} | | 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) | Max. values | | 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) | Max. values | | 1 | 1.5 | 2 | 1.5 | 1.5 | 1.5 | 1.5 | 2 | 1.5 | 2 | 1.5 | 2 |

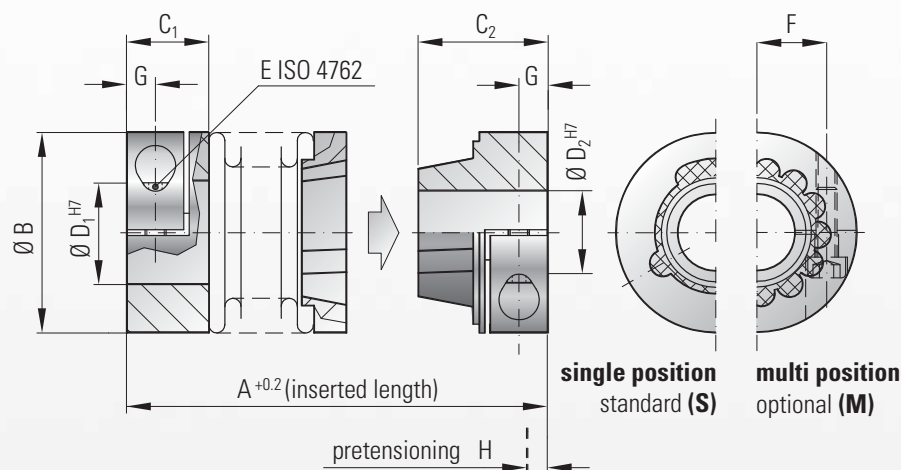
1 Nm = 8.85 in lbs

* in addition to maximum pretensioning

optional
stainless steel

MODEL MK5

TECHNICAL SPECIFICATIONS



Ordering example

MK5/20 / 37 / 6 / 10 / XX

Model
Series
Overall length
Bore Ø D1 H7
Bore Ø D2 H7
Non standard e.g. multi position re-engagement



blind mate with clamping hubs

Features:

- electrically and thermally isolating
- wear and maintenance free
- easy mounting and dismounting
- absolutely backlash free and torsionally rigid
- low moment of inertia
- compensates for 3 types of misalignment

Material:

Bellows made from highly flexible, high grade stainless steel; hubs and bellows side adapterplate made from aluminum; tapered male segment made from glass reinforced plastic molded directly onto the hub

Design:

With a single ISO 4762 radial clamping screw per hub; with blind mate, press fit connection

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

Speed:

Up to 10,000 rpm; in excess of 10,000 rpm with finely balanced version

Service life:

Maintenance free with infinite life when operated within the technical specifications

Fit tolerance:

Overall clearance between hub and shaft
0.01-0.05 mm

Non standard applications:

Custom designs with various tolerances, keyways, materials, dimensions, etc. available upon request

| Model MK 5 | | Series | | | | | | | | | | | |
|---|-------------|--------|-----|------|------|-----|--------|------|------|------|------|----------------|------|
| | | 5 | | | 15 | | 20 | | | 45 | | 100 | |
| Rated torque (Nm) | T_{KN} | 0.5 | | | 1.5 | | 2 | | | 4.5 | | 10 | |
| Overall length (inserted) (mm) | A | 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 Ø to Ø H7 (mm) | $D_{1/2}$ | 3-6.35 | | | 3-8 | | 3-12.7 | | | 5-16 | | 5-20 (D1, -24) | |
| Standard bore H7 (mm) | $D_{1/2}$ | 6 | | | 6 | | 6/10 | | | 10 | | 10 | |
| Fastening screw ISO 4762 | E | M2 | | | M2.5 | | M3 | | | M4 | | M4 | |
| Tightening torque of the fastening screws (Nm) | | 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 | |
| Approximate pretensioning (mm) | H | 0.4 | | | 0.5 | | 0.5 | | | 0.7 | | 1 | |
| Axial recovery force at maximum pretensioning (N) | | 5 | 3 | 2 | 4 | 3 | 3 | 4 | 3 | 15 | 10 | 33 | 46 |
| Moment of inertia (gcm ²) | J_{total} | 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) | Max. values | 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 | 0.15 | 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 |

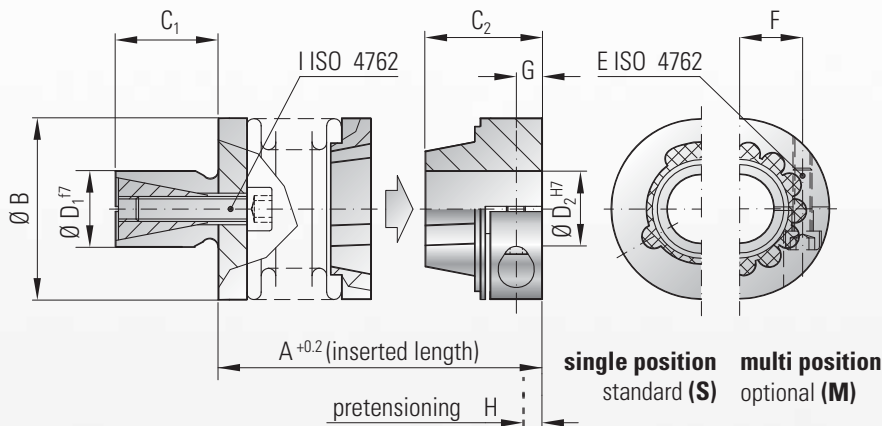
1 Nm = 8.85 in lbs

* in addition to maximum pretensioning



MODEL MK6

TECHNICAL SPECIFICATIONS



blind mate with expanding shaft

Features:

- electrically and thermally isolating
- wear and maintenance free
- compensates for 3 types of misalignment
- easy mounting and dismounting
- backlash free and torsionally rigid
- low moment of inertia

Material:

Bellows made from highly flexible, high grade stainless steel; clamping hub and bellows side adapter plate made from aluminum; expanding shaft and cone made from steel; tapered male segment made from glass reinforced plastic molded directly onto the hub

Design:

With a single ISO 4762 radial clamping screw on one hub; shaft with internal cone for expansion; with blind mate, press fit connection

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

Speed: Up to 10,000 rpm; in excess of 10,000 rpm with finely balanced version

Service life:

Maintenance free with infinite life when operated within the technical specifications

Fit tolerance:

Overall clearance between hub and shaft 0.01-0.05 mm

Ordering example

MK6/20 / 28 / 12 / 12 / XX

- Model
- Series
- Overall length (mm)
- Shaft \varnothing D1 f7
- Bore \varnothing D2 H7
- Non standard e.g. multi position re-engagement

| Model MK 6 | | Series | | | | | | | | | | | |
|--|-------------|--------|-----|------|------|-----|--------|------|------|------|------|------|------|
| | | 5 | | | 15 | | 20 | | | 45 | | 100 | |
| Rated torque (Nm) | T_{KN} | 0.5 | | | 1.5 | | 2 | | | 4.5 | | 10 | |
| Overall length (inserted) (mm) | A | 21 | 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 | |
| Standard shaft \varnothing f7 (mm) | D_1 | 8 | | | 10 | | 12 | | | 14 | | 16 | |
| Fit length (mm) | C_2 | 12 | | | 14 | | 16 | | | 20 | | 21.5 | |
| Inside diameter possible from \varnothing to \varnothing H7 (mm) | D_2 | 3-6.35 | | | 3-8 | | 3-12.7 | | | 5-16 | | 5-20 | |
| Standard bore H7 (mm) | D_2 | 6 | | | 6 | | 6/10 | | | 10 | | 10 | |
| Fastening screw ISO 4762 | | M2 | | | M2.5 | | M3 | | | M4 | | M4 | |
| Tightening torque of the fastening screws (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 | |
| Approximate pretensioning (mm) | H | 0.4 | | | 0.5 | | 0.5 | | | 0.7 | | 1 | |
| Axial recovery force at maximum pretensioning (N) | | 5 | 3 | 2 | 4 | 3 | 3 | 4 | 3 | 15 | 10 | 33 | 46 |
| Fastening screw ISO 4762 | | M3 | | | M4 | | M4 | | | M5 | | M6 | |
| Tightening torque of the fastening screws (Nm) | I | 1.5 | | | 3 | | 4 | | | 6.5 | | 11 | |
| Moment of inertia (gcm ²) | J_{total} | 3.0 | 3.2 | 3.5 | 9.0 | 10 | 28 | 30 | 33 | 110 | 120 | 220 | 230 |
| Torsional stiffness \pm (Nm/rad) | C_T | 280 | 210 | 170 | 750 | 700 | 1200 | 1300 | 1200 | 7000 | 5000 | 9050 | 8800 |
| Lateral \pm (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 \pm (degree) | | 1 | 1.5 | 2 | 1.5 | 1.5 | 1.5 | 1.5 | 2 | 1.5 | 2 | 1.5 | 2 |

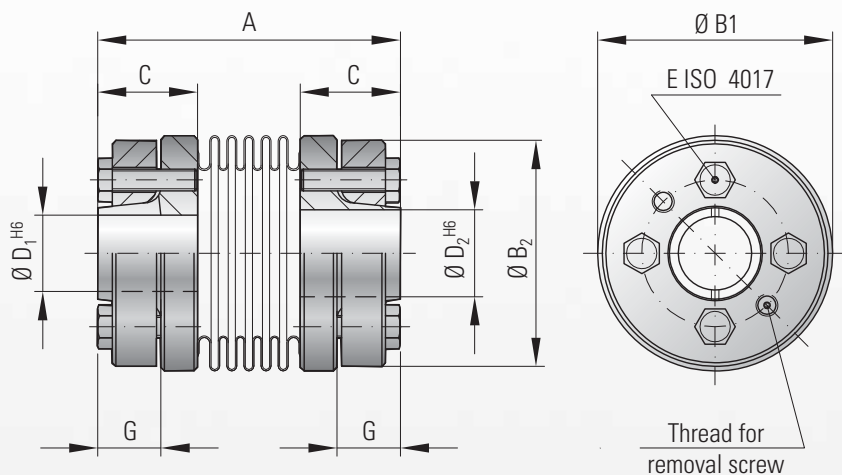
1 Nm = 8.85 in lbs

optional
stainless
steel

High speed

MODEL MKS




TECHNICAL SPECIFICATIONS



Ordering example

MKS/45 / 10 / 8 / XX

Model
Series
Bore Ø D1 H6
Bore Ø D2 H6
Non standard e.g. anodized

| Model MKS | | | Series | |
|--|-------------|-------|--------|-----|
| | | | 45 | 100 |
| Rated torque (Nm) | T_{KN} | 4.5 | 10 | |
| Overall length (mm) | A | 42 | 48 | |
| Outside diameter (mm) | B_1 | 32 | 40 | |
| Hub diameter (mm) | B_2 | 30 | 38 | |
| Fit length (mm) | C | 14 | 16 | |
| Inside diameter possible from Ø to Ø H6 (mm) | $D_{1/2}$ | 6-10 | 8-14 | |
| Standard bore Ø H6 (mm) | $D_{1/2}$ | 10 | 12 | |
| Fastening screw ISO 4017 (mm) | | 3x M3 | 4x M3 | |
| Tightening torque of the fastening screws (Nm) | E | 1.3 | 1.3 | |
| Distance (mm) | G | 8.5 | 9.5 | |
| Moment of inertia (gcm^2) | J_{total} | 65 | 160 | |
| Approximate weight (g) | | 51 | 75 | |
| Torsional stiffness (Nm/rad) | C_T | 7000 | 9050 | |
| Axial  ± (mm) | max. values | 0.5 | | |
| Lateral  ± (mm) | | 0.1 | 0.05* | |
| Angular  ± (degree) | | 0.5 | | |

1 Nm = 8.85 in lbs

Note: It is very important to precisely align the shafts when operating at high speeds.

For speeds over 50,000 please refer to specifications marked with an asterisk*



with conical clamping rings

Features:

- for high speed applications
- compensates for 3 types of misalignment
- high strength conical clamping connection
- for highly dynamic applications

Material:

Bellows made from highly flexible, high grade stainless steel; hubs and conical clamping rings made from high strength aluminum

Design:

Hubs with conical clamping rings, each with 3/4x ISO 4017 fastening screws

Temperature range:

-30 to +110° C (-22 to +230° F)

Balancing grade:

Standard balancing grade G = 2.5 (higher balancing grade upon request)

Speeds:

Maximum 120,000 rpm*

Service life:

Maintenance free with infinite life when operated within the technical specifications

Fit tolerance:

Overall clearance between hub and shaft
0.01-0.025 mm

Non standard applications:

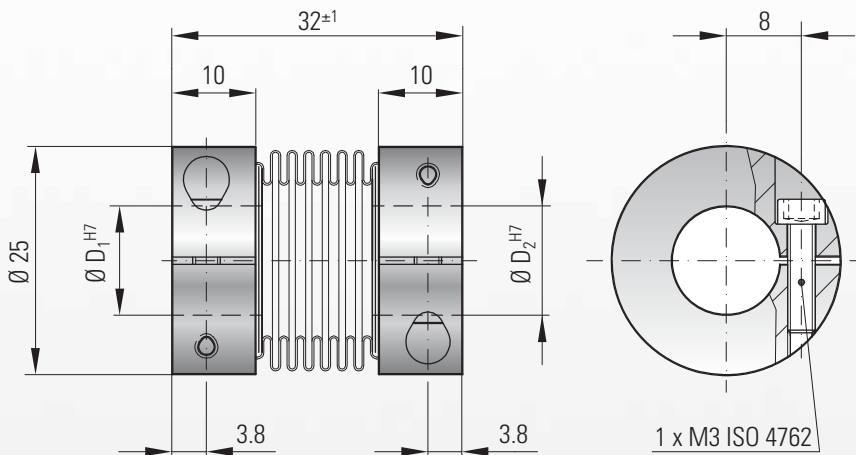
Custom designs with various tolerances, materials, dimensions, etc. available upon request



low cost

MODEL BKL 003

TECHNICAL SPECIFICATIONS



ECOFLEX®

Features:

- low cost
- backlash free and torsionally rigid
- compensates for 3 types of misalignment
- wear free and robust

Material:

Bellows made from highly flexible, high grade stainless steel; clamping hubs made from high strength aluminum

Design:

With a single ISO 4762 radial clamping screw per hub

Temperature range:

-40 to +200° C (-40 to +392° F)

Speeds:

Up to 10,000 rpm; in excess of 10,000 rpm with finely balanced version

Service life:

Maintenance free with infinite life when operated within the technical specifications

Fit tolerance:

Overall clearance between hub and shaft
0.01-0.05 mm

ECOFLEX®: The cost effective option for encoders, potentiometers, stepper motors and small servo motors.

Ordering example

BKL/ 003 / 3 / 5 / XX

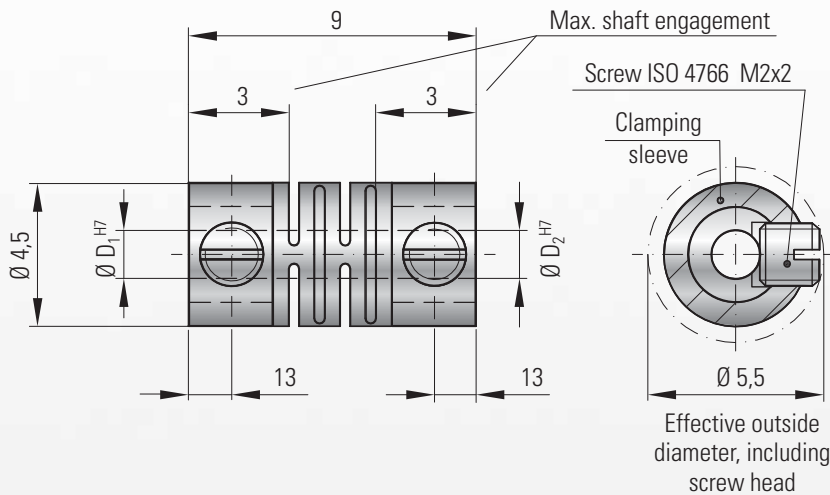
Model
Series
Bore Ø D1 H7
Bore Ø D2 H7
Non standard e.g. anodized

| Model BKL 003 | | Series | |
|--|-------------|--|--|
| | | 3 | |
| Rated torque (Nm) | T_{KN} | 3 | |
| Standard bore diameters H7 (mm) | D_1, D_2 | 3 / 4 / 4.76 / 5 / 6 / 6.35 / 7 / 8 / 9 / 9.53 / 10 / 11 / 12 / 12.7 | |
| Moment of inertia (gcm ²) | J_{total} | 20 | |
| Approximate weight (g) | | 23 | |
| Tightening torque of the fastening screws (Nm) | | 2.3 | |
| Torsional stiffness (Nm/rad) | C_T | 994 | |
| Axial | ± (mm) | 1 | |
| Lateral | ± (mm) | 0.2 | |
| Angular | ± (degree) | 2 | |

1 Nm = 8.85 in lbs

MODEL FK1 001/9

TECHNICAL SPECIFICATIONS



Ordering example

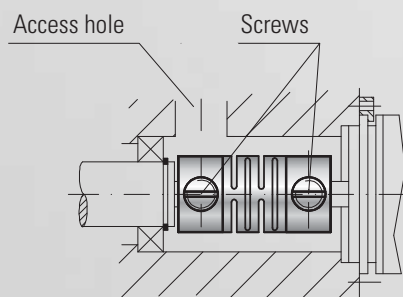
FK1 / 001 / 9 / 1.5 / 1.5 / XX

Model
Series
Overall length (mm)
Bore Ø D1 H7
Bore Ø D2 H7
Non standard e.g. custom screws

| Model FK1 001/9 | | Series | |
|---------------------|---------------------|-------------|--|
| 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_{total} | 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) | | |
| Angular | ± (degree) | | |
| | | | 1.5 |

Dismounting

To dismount the coupling, simply loosen the setscrews. The coupling can now be removed from the shaft.



MICROFLEX with clamping rings

Features:

- extremely compact design
- compensates for 3 types of misalignment
- backlash free
- vibration damping

Material:

Flexible element made from polyamide; clamping rings made from stainless steel

Design:

The flexible element is molded and includes the shaft bores; ISO 4766 screws are threaded into the clamping rings

Temperature range: -35 to +90° C (-31 to +194° F)

Speeds: maximum 20,000 rpm

Service life:

Maintenance free with infinite life when operated within the technical specifications

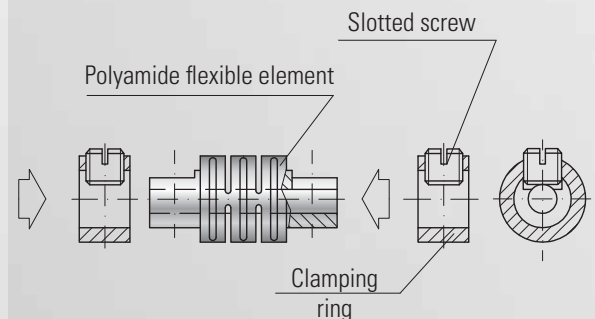
Fit tolerance:

Overall clearance between hub and shaft 0.01-0.025 mm

Custom Solutions:

The effective outside diameter can be reduced by using a shaft with a flat. Custom M2 x 1.5 screws can also be used to reduce the effective diameter of the coupling to 4.5 mm (additional charge)

Coupling Design & Assembly



The set screw is securely guided through the clamping ring, which is partially supported by the flexible element. The set screw contacts the shaft directly. A flat on the shaft can improve the torque transmission.

Caution: Always use proper tools to tighten the set screws

ASSEMBLY INSTRUCTIONS

Mounting Preparation

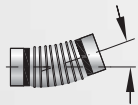
Mounting Preparation:

The bellows can tolerate up to 1.5x the catalog misalignment values prior to installation, and any excess bending stress is to be avoided. Ensure that the shafts and bores are free of burrs and debris. Shaft and bore (and keyway) dimensions should be inspected prior to installation.

The overall clearance between the shaft and hub should be 0.01 to 0.05mm. This clearance fit, along with a thin film of oil on the shaft, are recommended in order to ease the installation process. This has no negative effect on the clamping force.

Caution: Greases with molybdenum disulfate or other high pressure additives nor other sliding greases should not be used.

Maximum Misalignment Values



Angular misalignment ΔK_w



Lateral misalignment ΔK_r

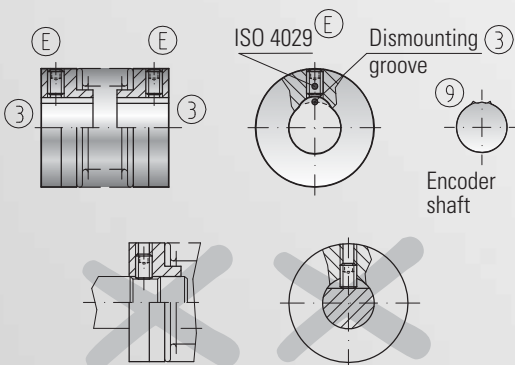


Axial misalignment ΔK_a



Caution: Excessive lateral misalignment is detrimental to the fatigue life of the metal bellows. Precise alignment significantly increases the service life of the coupling, reduces restoring loads placed on adjacent equipment, and results in smooth, vibration free operation.

Set Screw Connection: Model MK1 + MK4



Installation:

Slide the coupling completely onto one shaft. Once the coupling is in the proper axial position, tighten the set screw(s) according to the tightening torque value specified in the data sheet. Insert the second shaft to the correct axial position and tighten the set screws (shown below) to the recommended tightening torque values.

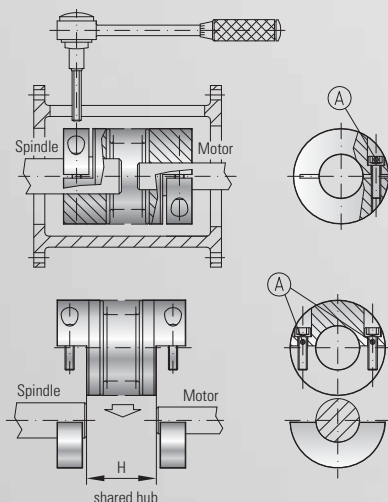
Series 1 - 10: 1x set screw per hub

Series 15 - 100: 2x set screws per hub, 120° apart

Removal:

Loosen the set screw (E). The dismounting groove (3) allows for clearance of the hub over any burr in the shaft (9) created by the set screw (E).

Clamping Hub Connection: Model MK2 + MKH + MK5 + BKL 003



Installation:

Slide the coupling completely onto one shaft. Once the coupling is in the proper axial position, tighten the clamping screw(s) according to the tightening torque value specified in the data sheet. Insert the second shaft into the second clamping hub, ensuring that the bellows is in a relaxed state once the adjacent equipment is installed, and that the coupling is evenly spaced between the two shafts.



Caution: Ensure that the shafts are fully engaged through the fit lengths of the clamping hubs.

Ensure that the shaft misalignment does not exceed the maximum values specified in the catalog. Tighten the clamping screw(s) according to the tightening torque value specified in the data sheet.

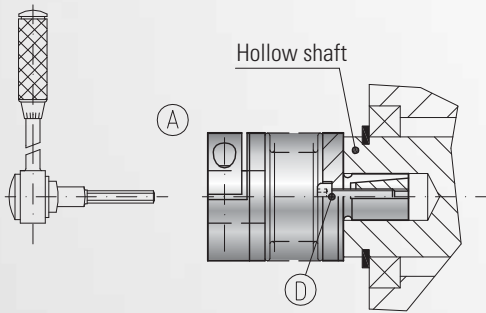
Removal:

Loosen the clamping screws (A). Remove the coupling from the shafts.



INSTALLATION INSTRUCTIONS

Expanding Shaft Connection: Model MK3 + MK6



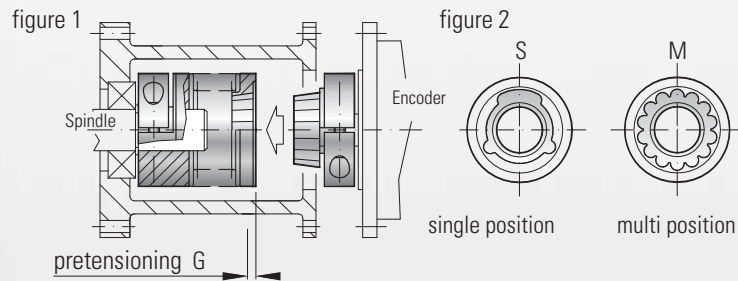
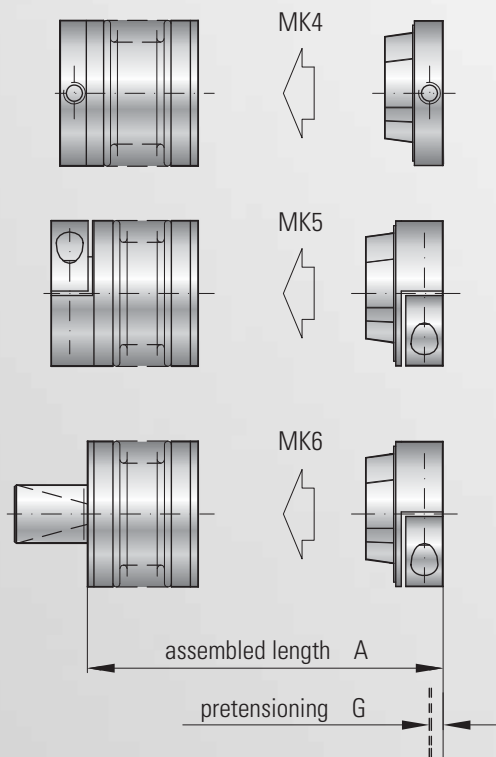
Installation:

Completely insert the expanding shaft hub into its respective bore. Tighten the fastening screw (D) to the torque value specified in the data sheet. Insert the male shaft (e.g. encoder shaft) into the clamping hub of the bellows body and tighten the clamping screw (A) to the torque value specified in the data sheet.

Removal:

To remove the coupling, first loosen both screws (A/D). Axial pressure applied to the screw (D) will cause the internal cone to be released from the expanding shaft.

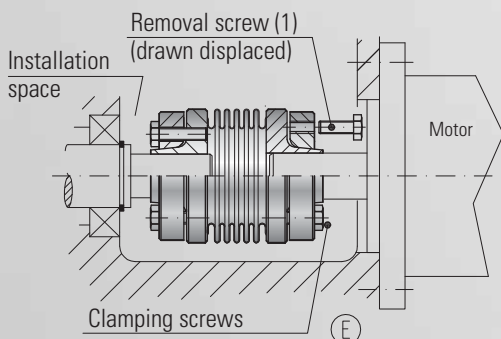
Blind Mate Connection: Model MK4 + MK5 + MK6



Installation:

Caution! It is extremely important that the overall length of the installed coupling is taken into consideration during the assembly process. Models MK4, MK5 and MK6 are blind mate, press fit couplings. They operate free of backlash only if properly pretensioned. First mount the female segment (bellows body) to its respective shaft or bore. Then loosely mount the male segment onto its respective shaft so that it slides axially on the shaft, though with some friction. Temporarily assemble the coupled equipment so that the male segment is moved by the bellows body to the correct axial position on its shaft (figure 1). Remove the drive component and make note of the axial position of the male segment. Slide the male segment toward the end of the shaft by the pretensioning distance (G) and tighten the clamping screw to the torque value specified in the data sheet. Two versions of the blind mate connection are available: single position and multi position (figure 2).

Conical Clamping Hub Connection: Model MKS



Installation:

Care must be taken that the clamping screws (E) are evenly tightened in a crosswise pattern multiple times around, and with increasing torque. The final tightening torque values (specified on page 11) must be precisely applied with a torque wrench.

The clamping screws are also secured with thread retainer (e.g. Loctite 243).

The installation space should allow for access to tighten the clamping screws, depending on what type of screw will be used (e.g. ISO 4017 / DIN 915).

Removal:

Once the clamping screws have been removed they can be inserted into the adjacent removal threads and used to jack the conical ring away from the conical hub.

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backlash-free, press-fit design



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From 2 – 810 Nm
Shaft diameters 3 – 45 mm



LINEAR COUPLINGS **Series LK**

From 70 – 2,000 N
Thread M5 – M16



POLYAMIDE COUPLINGS **MICROFLEX** **Series FK 1**

Rated torque 1 Ncm
Bore diameters 1.5 – 2 mm