DIEQUA Corporation

630-980-1133
diequa.com

- Metal Bellows
- Elastomer Insert
- Torque Limiters
- Line Shafts

Precision Couplings

DIEQUA CORPORATION

OFFERING A PERFECT PRECISION COUPLING

THE COMPANY

DieQua Corporation is a manufacturer and supplier of a wide range of motion control and power transmission drive components. Our focus has always been to provide products that offer superior value, the highest quality, the most unique designs, and the most reliable performance. DieQua continues to develop innovative products to meet the changing technological needs of the industries and customers we serve.

THE PROCESS

DieQua has an enormous product offering. Making a proper selection, or even knowing what is possible can be daunting. Our staff is specifically trained to first listen, and then ask questions, to gain a thorough understanding of your specific and unique application. Then, we help you navigate to the specific product, or even a special design, that will meet or exceed your needs. It is through our consultative approach that we are most helpful to our customers in finding the best design solution.

THE PRODUCT

DieQua has created a precision coupling offering to include Bellow couplings, Precision Elastomer couplings, Line Shaft couplings and Torque Limiters. These products offer a perfect range of precision, torsional stiffness, torque capacity, and protection from misalignment. These couplings are a perfect adjunct to the many gearbox, gear-motor, and mechanical components technologies we offer to the market.

In this catalog you will find:

- **Metal Bellows Couplings**
- **Elastomer Insert Couplings**
- **Ball-Detent Torque Limiter Couplings**
- **Line Shaft Couplings**

APPLICATIONS AND DESIGN FEATURES OF **PRECISION COUPLINGS**

from **4.5 - 500 Nm**

AREAS OF APPLICATION

for highly dynamic motion in:

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

FEATURES

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

from **2 - 660 Nm**

AREAS OF APPLICATION

for vibration damping torque transmission in:

- Packaging machinery
- Pump drives
- Machine tools
- Lift systems
- Conveyors
- Labeling machinery
- Food processing machinery

FEATURES

- vibration damping
- electrically isolating
- backlash free
- calibrated preloaded insert
- concentrically machined hubs

APPLICATIONS AND DESIGN FEATURES OF **PRECISION COUPLINGS**

Series T – Backlash Free Torque Limiters . . . . . pg. 36

from **1 - 650 Nm**

AREAS OF APPLICATION

for overload protection in:

- Machine tools
- Packaging machinery
- Conveyors and feeders
- Metal forming equipment
- Test stands
- Pump drives
- Assembly systems
- Converting equipment
- Wherever rotation and overload exist

FEATURES

- protects from rotating inertia as well as motor torque
- precise torque overload protection
- patented preload for zero backlash
- compact simple design
- low moment of inertia
- extremely fast disengagement
- low residual friction after disengagement

Series L – Backlash Free Line Shafts . . . . . pg. 53

from **10 - 660 Nm**

AREAS OF APPLICATION

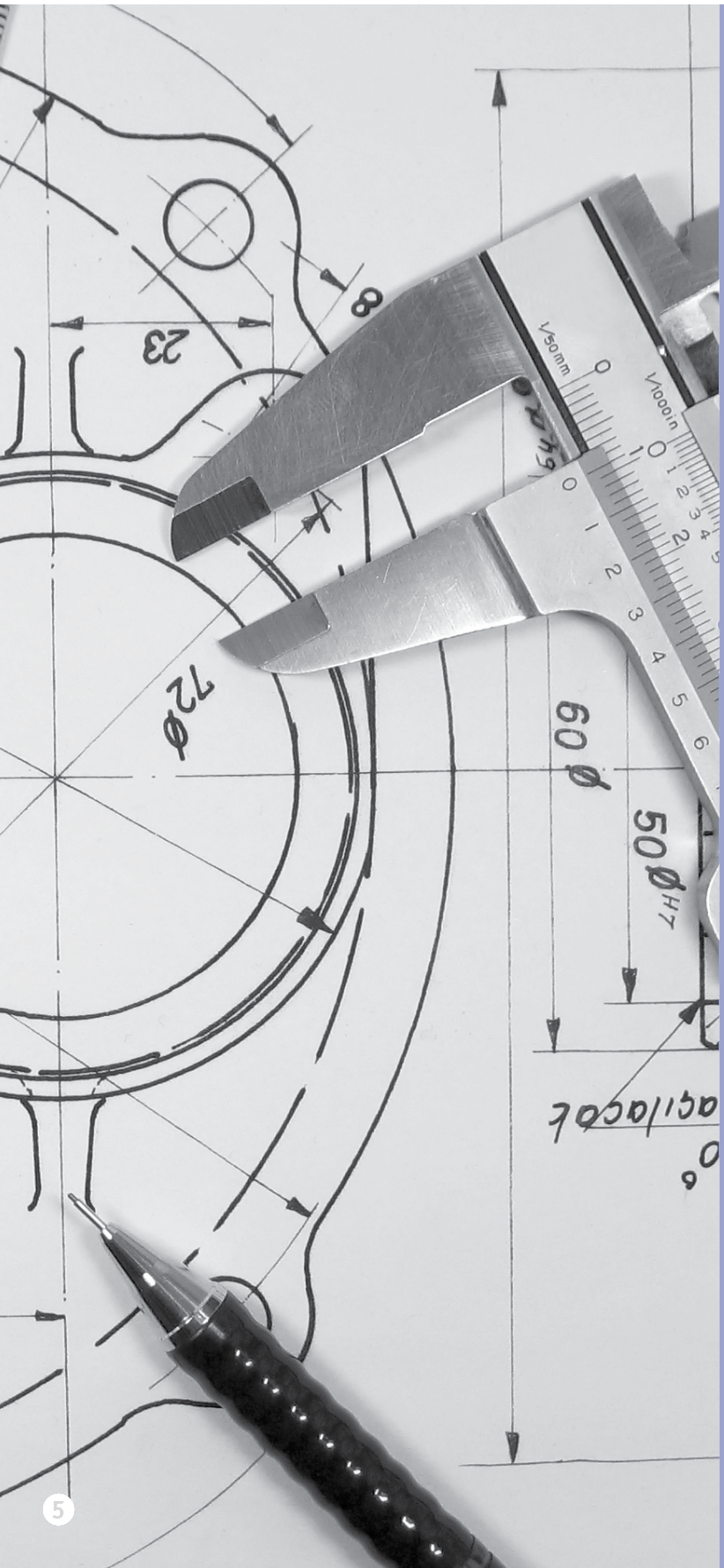
for spanning large distances between shaft ends in:

- Material handling systems
- Printing machinery
- Labeling machinery
- Textile machinery
- Packaging machinery
- Converting equipment
- Lift systems
- Theatre automation
- Gantry systems
- Screw jack systems

FEATURES

- installation and removal without disturbing adjacent equipment
- self-supporting up to 6 meters
- no intermediate support bearing required

SIZING AND SELECTION OF PRECISION COUPLINGS



The following pages contain the nomenclature and specific technical formulas for more precise calculations to determine the torque requirements for a specific type of coupling, and how the torque is applied. Please refer to these formulas when the sizing of a coupling requires a higher degree of precision and consideration.

Should you require technical assistance with any of the calculations please feel free to contact the DieQua technical inside sales staff at 630-980-1133.

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Sizing and Selection

METAL BELLOWS COUPLINGS

SERIES BC

SYMBOLS

T_{KN} = Rated torque of the coupling (Nm)

T_{AS} = Peak torque of the drive system
e.g. max. acceleration torque of drive (Nm)
or max. braking torque of load (Nm)

J_L = Total load inertia
(e.g. spindle + slide + workpiece + 1/2 of coupling) (kgm^2)

J_A = Total driving inertia
(motor [including gear ratio] + 1/2 of coupling) (kgm^2)

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

f_e = Natural frequency of the two mass system (Hz)

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

φ = Torsional deflection (degree)

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

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Sizing and Selection

ACCORDING TO TORQUE

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

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

ACCORDING TO ACCELERATION TORQUE

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

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

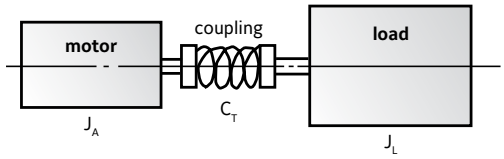
ACCORDING TO RESONANT FREQUENCY

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

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

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

Two Mass System



ACCORDING TO TORSIONAL DEFLECTION

To calculate transmission error as a result of torsional stress:

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

Sizing and Selection

ELASTOMER INSERT COUPLINGS

SERIES EC

SYMBOLS

T_{KN} = Rated torque of the coupling (Nm)
T_{Kmax} = Maximum torque rating of the coupling (Nm)
T_S = Peak torque applied to the coupling (Nm)
T_{AS} = Peak torque of the drive system (Nm)
T_{AN} = Nominal torque of the drive system (Nm)
T_{LN} = Nominal torque of the load (Nm)
P = Drive power (kW)
n = Rotational speed ($min.^{-1}$)
J_A = Total driving inertia (motor [including gear ratio] + 1/2 of coupling) (kgm^2)
J_L = Total load inertia (e.g. spindle + slide + workpiece + 1/2 of coupling) (kgm^2)
J_1 = Moment of inertia of driving coupling half (kgm^2)
J_2 = Moment of inertia of driven coupling half (kgm^2)
m = ratio of the moment of inertia of the drive to the load
υ = Temperature at the coupling (observed radiant heat)
S_υ = Temperature factor
S_A = Load factor
S_Z = Start factor (factor for the number of starts per hour)
Z_h = Number of starts per hour (1/h)

Temperature factor S_υ	A	B	C	E
Temperature (υ)	Sh 98 A	Sh 64 D	Sh 80 A	Sh 64 D
> -30°C to -10°C	1.5	1.3	1.4	1.2
> -10°C to +30°C	1.0	1.0	1.0	1.0
> +30°C to +40°C	1.2	1.1	1.3	1.0
> +40°C to +60°C	1.4	1.3	1.5	1.2
> +60°C to +80°C	1.7	1.5	1.8	1.3
> +80°C to +100°C	2.0	1.8	2.1	1.6
> +100°C to +120°C	–	2.4	–	2.0
> +120°C to +150°C	–	–	–	2.8

Start factor S_Z			
Z_h	up to 120	120 to 240	over 240
S_Z	1.0	1.3	contact us

Shock or Load Factor S_A		
uniform load	non-uniform load	highly dynamic load
1	1.8	2.5

Sizing and Selection

COUPLING SELECTION FOR OPERATION WITHOUT SHOCK OR REVERSAL

The rated torque of coupling (T_{KN}) must be greater than the rated torque of the load (T_{LN}), taking into account the temperature at the coupling (Temperature factor S_υ). Should T_{LN} be unknown, T_{AN} can be used as a substitute in the formula.

Calculation:

$$T_{KN} > T_{AN} \cdot S_\upsilon$$

Supplemental Calculation:

$$T_{AN} = \frac{9{,}550 \cdot P}{n}$$

Sample calculation: (without shock loads)

Coupling conditions
υ = 70° C
S_υ = 1.7 (or 70°/ Elastomer Type A)

Drive for centrifugal pump
T_{AN} = 85 Nm

Calculation: $T_{KN} > T_{AN} \times S_\upsilon$
$T_{KN} > 85 \text{ Nm} \cdot 1{,}7$
$T_{KN} > \underline{144.5 \text{ Nm}}$ ⟶ **Result:** Coupling model EC/150/A (T_{KN} = 160 Nm) is selected.

COUPLING SELECTION FOR OPERATION WITH SHOCK LOADS

Same basic conditions as above. In addition, the maximum torque rating of the coupling (T_{Kmax}) is dictated by peak torque (T_S) due to shock loads.

Calculation:

$$T_{KN} > T_{AN} \cdot S_\upsilon$$

Supplemental Calculation:

$$T_{AN} = \frac{9{,}550 \cdot P}{n}$$

Calculation:

$$T_{Kmax} > T_S \cdot S_Z \cdot S_\upsilon$$

Supplemental Calculation:

$$T_S = \frac{T_{AS} \cdot S_A}{m + 1}$$

$$m = \frac{J_A \cdot J_1}{J_L \cdot J_2}$$

Sizing and Selection

TORQUE LIMITERS

SERIES T

SYMBOLS

T_{KN} = Rated torque of the coupling (Nm)
T_{AN} = Load torque (Nm)
T_{AS} = Peak torque of the motor (Nm)
J_L = Moment of inertia of the load (kgm^2)
J_A = Moment of inertia of the drive (kgm^2)
P_{AN} = Drive power (kW)
α = Angular acceleration ($1/s^2$)
t = Acceleration / deceleration time (s)
ω = Angular velocity (1/s)
n = Drive speed (min^{-1})
s = Screw lead (mm)
F_V = Feed force (N)
η = Spindle efficiency
d_0 = pinion dia. (pulley) (mm)
C_T = Torsional stiffness of the coupling (Nm/rad)
$J_{Masch.}$ = Total load inertia (e.g. spindle + slide + workpiece + 1/2 of coupling) (kgm^2)
$J_{Mot.}$ = Total driving inertia (motor [including gear ratio] + 1/2 of coupling) (kgm^2)
f_e = Natural frequency of the two mass system (Hz)
φ = Torsional deflection (degree)

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

ACCORDING TO DISENGAGEMENT TORQUE

Torque limiters are generally selected according to the required disengagement torque, which must be greater than the torque required for regular operation. The disengagement of the torque limiter is most commonly determined in accordance with the drive data. For this purpose, the following calculation applies:

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

or

$$T_{KN} \geqq 9{,}550 \cdot \frac{P_{AN}}{n} \cdot 1.5\,(Nm)$$

Sizing and Selection

ACCORDING TO ACCELERATION (START-UP WITH NO LOAD)

$$T_{KN} \geqq \frac{J_L}{J_A + J_L} \cdot T_{AS} \cdot S_A \geqq \alpha \cdot J_L \,(Nm)$$

$$\alpha = \frac{\omega}{t} = \frac{\pi \cdot n}{t \cdot 30}$$

ACCORDING TO ACCELERATION WITH LOAD (START-UP UNDER LOAD)

$$T_{KN} \geqq \left[\frac{J_L}{J_A + J_L} \cdot (T_{AS} - T_{AN}) + T_{AN} \right] \cdot S_A \geqq \alpha \cdot J_L + T_{AN} \,(Nm)$$

ACCORDING TO LINEAR FEED FORCE

Spindle Drive (ball screw / lead screw)

$$T_{AN} = \frac{s \cdot F_v}{2{,}000 \cdot \pi \cdot \eta} \,(Nm)$$

Belt Drive / Chain Drive

$$T_{AN} = \frac{d_0 \cdot F_v}{2{,}000} \,(Nm)$$

ACCORDING TO RESONANT FREQUENCY (TB WITH METAL BELLOWS - TE WITH ELASTOMER RING)

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

$$f_e = \frac{1}{2 \cdot \pi} \sqrt{C_T \cdot \frac{J_{Masch} + J_{Mot}}{J_{Masch} \cdot J_{Mot}}} \,(Hz)$$

ACCORDING TO TORSIONAL DEFLECTION (TB WITH METAL BELLOWS - TE WITH ELASTOMER RING)

To calculate transmission error as a result of torsional stress:

$$\varphi = \frac{180}{\pi} \cdot \frac{T_{AN}}{C_T} \,(degree)$$

ACCORDING TO LOAD HOLDING FUNCTION SYSTEM

▶ **Load Holding Version**

The TH and THK models in the load holding version can secure a minimum of 2x their torque setting after disengagement. The TB model can secure only up to the torque rating of the flexible bellows after disengagement.

Sizing and Selection

LINE SHAFTS

SERIES L

SYMBOLS

A = Total length (mm)

AB = Distance between flextures (mm)
AB = (A – 2xN)

Z = Tube length (mm)
Z = (A – 2xH)

H = Length of coupling ends (mm)

N = Length to flexture (mm)

T_{AS} = Peak torque of the drive (Nm)

φ = Torsional deflection (degree)

C_T^B = Torsional stiffness of both flexible elements (Nm/rad)

C_T^{ZWR} = Torsional stiffness per 1m of tubing (Nm/rad)

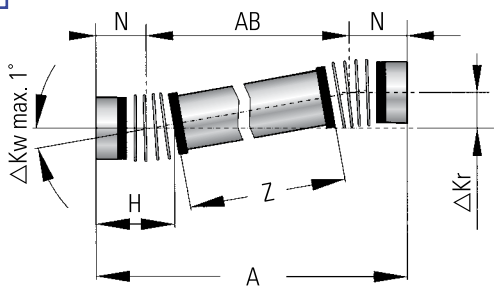
C_T^{ZA} = Total torsional stiffness (Nm/rad)

n_k = Critical speed (1/min.)

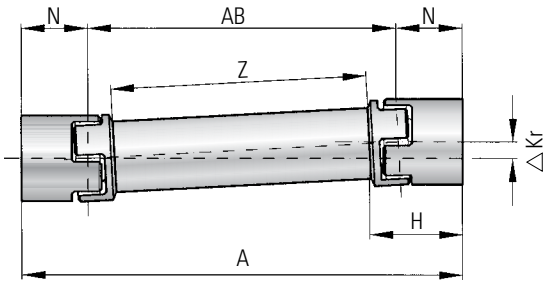
C_{Tdyn}^E = Dynamic torsional stiffness of both elastomer inserts (Nm/rad)

C_{Tdyn}^{EZ} = Total torsional stiffness (Nm/rad)

LB **LBS**



LE



Sizing and Selection

MODEL LB / LBS

Size	Torsional stiffness of both bellows bodies C_T^B (Nm/rad)	Torsional stiffness per 1m of standard tubing C_T^{ZWR} (Nm/rad)	Length of coupling ends LB H (mm)	Length of coupling ends LBS H (mm)	Length to flexture N (mm)	Maximum Axial misalignment Δ Ka (mm)
10	4,525	1,770	44.5	39.5	25	2
30	19,500	6,440	57.5	52	34	2
60	38,000	11,500	71	64	41	3
150	87,500	24,000	78	72	47	4
200	95,500	73,000	86	–	52	4
300	250,500	220,000	94	83	56	4
500	255,000	297,000	110	96	66	5

Table 1

MODEL LE

Size	Torsional stiffness of both flexible elements		Torsional stiffness per 1m of tubing	Working length LE	Length to flexture	Max. axial misalignment
	Elastomer insert A C_T^B (Nm/rad)	Elastomer insert B C_T^B (Nm/rad)	C_T^{ZWR} (Nm/rad)	H (mm)	N (mm)	Δ Ka (mm)
5	150	350	503	25	18	1,5
10	270	825	727	34	26	2
20	1,270	2,220	1,770	46	33	4
60	3,970	5,950	6,440	63	49	4
150	6,700	14,650	11,500	73	57	4
300	11,850	20,200	24,000	86	67	4
450	27,700	40,600	73,000	99	78	4

Table 2

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Sizing and Selection

LINE SHAFTS

SERIES L

MAXIMUM TRANSMITTABLE TORQUE BY BORE DIAMETER (Nm)

Size	Ø 6	Ø 8	Ø 12	Ø 16	Ø 19	Ø 25	Ø 30	Ø 32	Ø 35	Ø 45	Ø 50	Ø 55	Ø 60	Ø 65	Ø 70	Ø 75	Ø 80	Ø 90	Ø 120	Ø 140
5	4	10	15																	
10	6	12	20	32																
20		30	35	40	50	65														
60				65	120	150	180	200												
150					180	240	270	300	330											
300					300	340	450	520	570	630										
450							630	720	770	900	1120	1180	1350							

TEMPERATURE FACTOR S

Temperature (φ)		> -30° to -10°	> -10° to +30°	> +30° to +40	> +40° to +60°	> +60° to +80°	> +80° to +100°	> +100° to +120°
Sh 98 A	A	1.5	1.0	1.2	1.4	1.7	2.0	–
Sh 64 D	B	1.7	1.0	1.1	1.3	1.5	1.8	2.4

ACCORDING TO TORSIONAL STIFFNESS

Condition: Line shaft LB, size 150, T_{AS} = 150 Nm
Wanted: Total torsional stiffness C_T^{ZA}

$$(C_T^{ZA}) = \frac{87{,}500 \text{ Nm/rad} \times (24{,}000 \text{ Nm/rad} / 1.344 \text{ m})}{87{,}500 \text{ Nm/rad} + (24{,}000 \text{ Nm/rad} / 1.344 \text{ m})} = 14{,}830 \text{ [Nm/rad]}$$

$$(C_T^{ZA}) = \frac{C_T^{B} \cdot (C_T^{ZWR}/Z)}{C_T^{B} + (C_T^{ZWR}/Z)} \text{ (Nm/rad)}$$

ACCORDING TO TORSIONAL DEFLECTION

Condition: Line shaft LB, size 150, T_{AS} = 150 Nm
Wanted: Torsional deflection at maximum acceleration torque T_{AS}

Measurement (A) of Line Shaft - 1.5m
Length (Z) of Tubing = A-(2xH) = 1.344m

$$\varphi = \frac{180 \text{ x } 150 \text{ Nm}}{\pi \text{ x } 14{,}830 \text{ Nm/rad}} = 0.579°$$

With a maximum torque of 150 Nm the torsional deflection is 0.579°

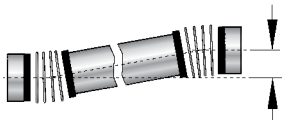
$$\varphi = \frac{180 \cdot T_{AS}}{\pi \cdot C_T^{ZA}} \text{ (degree)}$$

Sizing and Selection

ACCORDING TO MAXIMUM MISALIGNMENT

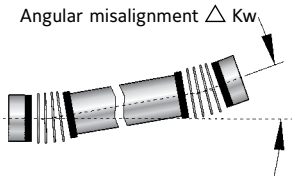
LB
LBS

Lateral misalignment △ Kr



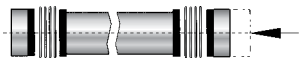
$$\Delta Kr_{max} = \tan \Delta \frac{Kw}{2} \cdot AB$$
$$AB = A - 2xN$$

Angular misalignment △ Kw



$$\triangle Kw_{max.} = 2°$$

Axial misalignment △ Ka



See table 1+2
Pages 13

LE

DIEQUA CALCULATION PROGRAM

Using proprietary software, DieQua will calculate the specific mechanical details of exactly the model you plan to use. Overall length, tube materials (e.g. steel, aluminum), and other factors are used to determine a number of performance values unique to your line shaft coupling.

Critical speed	n_k	=	1/min.
Torsional stiffness of tubing	C_T^{ZWR}	=	Nm/rad
Overall stiffness	C_T^{ZA}	=	Nm/rad
Torsional deflection	φ	=	degree-min-sec
Total Weight	m	=	kg
Moment of inertia	J	=	kgm^2
Maximum misalignment	△ Kr	=	mm

INSTALLATION AND HANDLING OF PRECISION COUPLINGS

The following pages contain information on how the various coupling types are properly mounted and installed. The information is presented in a graphical format to visually explain how best to use each coupling type.

SHAFT/AXIS MISALIGNMENT

Exact alignment of the shaft axes extends the service life of the coupling and adjacent components by minimizing reaction loads from misalignment.

FIT CLEARANCE

Overall shaft/hub clearance of 0.01 - 0.05 mm

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Installation and Handling

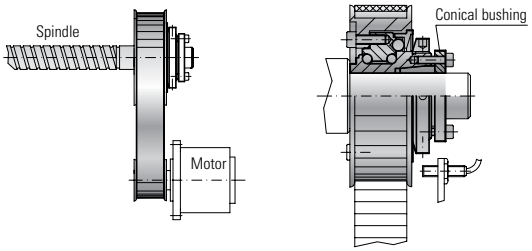
The installation and operating instructions are an integral part of the DieQua coupling. Please read carefully and follow all instructions. Failure to comply with these procedures could result in poor performance and / or failure of the coupling. Installation should be performed by a qualified technician.

INDIRECT DRIVES

SAFETY COUPLINGS / TORQUE LIMITERS – SERIES T

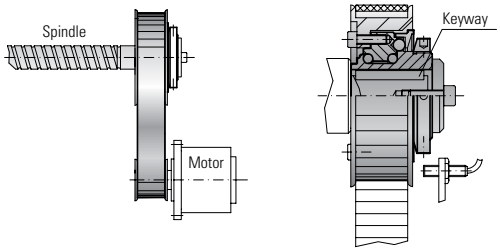
Drive components (e.g. timing belt sprockets) must be centered on the output flange prior to mounting. Please also refer to the maximum overhung load ratings and locations provided on page 43. If the overhung load is beyond the capacity of the coupling bearings, an additional bearing can be mounted on the shaft to support the overhung load.

TH



WITH CONICAL CLAMPING SYSTEM

THK



WITH KEYWAY ONLY

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DIRECT DRIVES

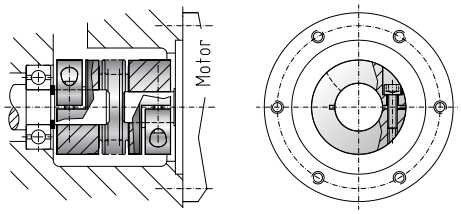
METAL BELLOWS COUPLINGS – SERIES BC

DieQua bellows couplings are flexible shaft couplings. The flexible, torsionally rigid, stainless steel bellows provides backlash free torque transmission while compensating for lateral, axial, and angular misalignment, with very low restoring forces. A number of different hub designs are available to suit a variety of application requirements.

BC

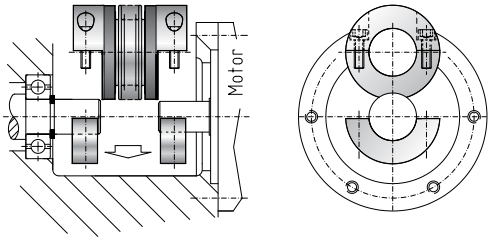
BCC

BCE



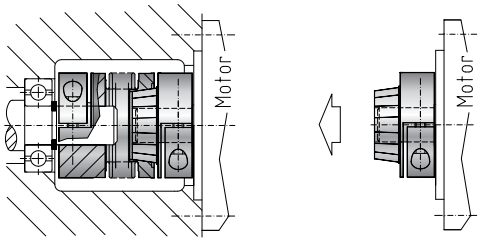
WITH CLAMPING HUB

BCS



WITH FULLY SPLIT CLAMPING HUB

BCB



WITH CLAMPING HUB AND BLIND MATE CONNECTION

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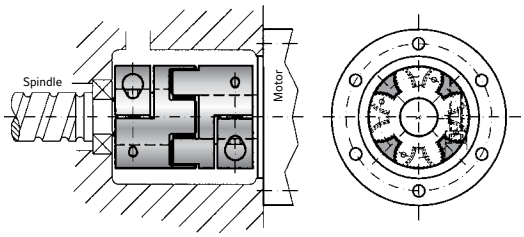
Installation and Handling

ELASTOMER INSERT COUPLINGS – SERIES EC

The equalizing element of EC couplings is the elastomer insert. It transmits torque without backlash or vibration. The elastomer insert defines the characteristics of the entire drive system. The coupling is backlash free due to a pretensioning of the elastomer insert between the two coupling halves. The EC Series couplings compensate for lateral, angular, and axial misalignment.

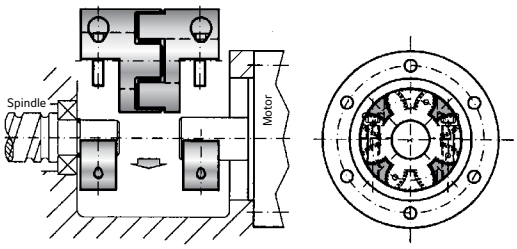
EC

ECC



WITH CLAMPING HUB

ECS



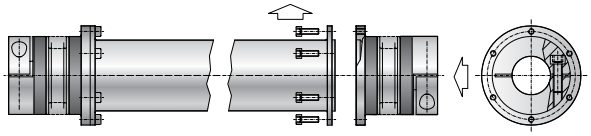
WITH FULLY SPLIT CLAMPING HUB

Installation and Handling

LINE SHAFTS – SERIES L

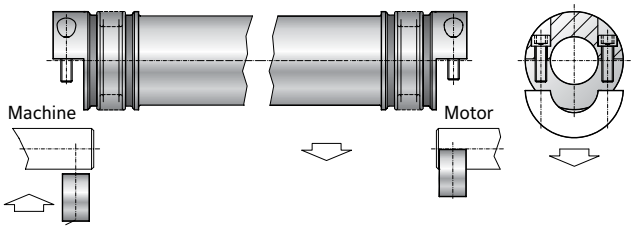
DieQua line shafts are flexible shaft couplings for spanning longer distances between shaft ends. The compensation elements (bellows or elastomer) compensate for lateral, axial, and angular shaft misalignment. Torque transmission is backlash free with high torsional stiffness (bellows) or vibration damping (elastomer). In the case of bellows couplings, the tube is carried over a special support system which transfers the weight back to the hubs.

LB



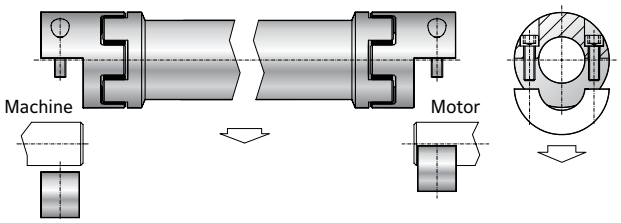
WITH CLAMPING HUB

LBS



WITH FULLY SPLIT CLAMPING HUB

LE

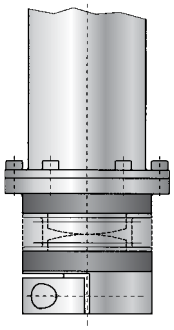


WITH FULLY SPLIT CLAMPING HUB

VERTICAL INSTALLATION

LB

LBS



- In vertical installations a special support transfers the weight to the bottom hub.
- This support system is available for all sizes.
- Please note, "for vertical installation" when ordering.

SERIES BC

BACKLASH FREE, TORSIONALLY STIFF, METAL BELLOWS COUPLINGS
4.5 - 500 Nm

SERVICE LIFE
DieQua bellows couplings are fatigue resistant and wear free for an infinite service life, as long as the technical performance limits are not exceeded.

FIT CLEARANCE
Overall shaft/hub clearance of 0.01 - 0.05 mm

ROTATIONAL SPEED
Standard up to 10,000 rpm.

TEMPERATURE RANGE
-30 to +100° C

SPECIAL SOLUTIONS
Various materials, tolerances, dimensions and performance ratings are available for custom applications upon request.

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

DIEQUA Corporation
630-980-1133
diequa.com

SERIES BC

TORSIONALLY STIFF **METAL BELLOWS COUPLINGS**
4.5 - 500 Nm

MODEL		FEATURES	
BC		**with clamping hub** **from 15 - 500 Nm** ▶ easy to mount ▶ availalbe in multiple lengths ▶ low moment of inertia	Page 23
BCS		**with split clamping hub** **from 15 - 500 Nm** ▶ radial mounting possible ▶ easy to install onto pre-aligned shafts ▶ low moment of inertia	Page 24
BCE		**economy class with clamping hub** **from 4.5 - 500 Nm** ▶ easy to mount ▶ optional self-opening clamp system ▶ low moment of inertia	Page 25
BCC		**compact design with clamping hub** **from 15 - 500 Nm** ▶ for space restricted installations ▶ light weight ▶ low moment of inertia ▶ easy to mount	Page 26
BCB		**with clamping hub and** **blind mate connection** **from 15 - 500 Nm** ▶ backlash free with two piece design ▶ easy installation and removal ▶ available as separate components	Page 27

BC

BELLOWS COUPLING WITH CLAMPING HUB

15 – 500 Nm

PROPERTIES

FEATURES

- easy to mount
- light weight and low moment of inertia

MATERIAL

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

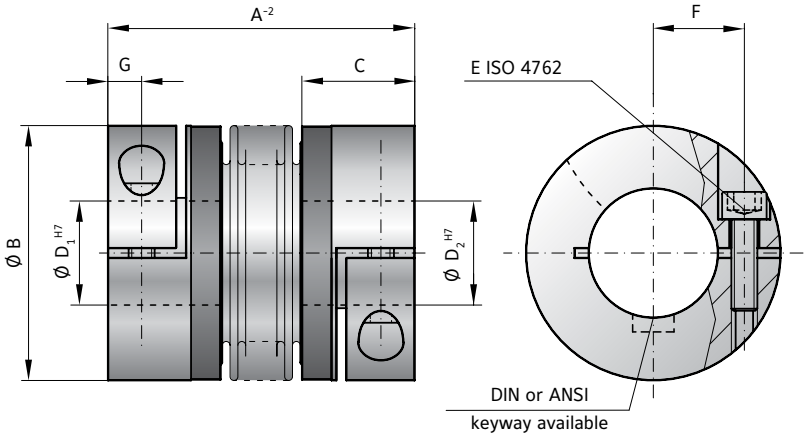
DESIGN

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

ORDERING EXAMPLE

see page 24

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



MODEL BC

SIZE		15			30			60			80			150			200			300			500		
Rated torque (Nm)	T_{KN}	15			30			60			80			150			200			300			500		
Overall length (mm)	A^{-2}	59	66	99	69	77	113	83	93	130	94	106	143	95	107	144	105	117	163	111	125	200	133	146	169
Outside diameter (mm)	B	49			55			66			81			81			90			110			124		
Fit length (mm)	C	22			27			31			36			36			41			43			51		
Inside diameter possible from Ø to Ø H7 (mm)	D_1/D_2	8-28			10-30			12-35			14-42			19-42			22-45			24-60			35-60		
Fastening screw ISO 4762	E	M5			M6			M8			M10			M10			M12			M12			M16		
Tightening torque of the fastening screw (Nm)	E	8			15			40			50			70			120			130			200		
Distance between centerlines (mm)	F	17			19			23			27			27			31			39			41		
Distance (mm)	G	6.5			7.5			9.5			11			11			12.5			13			16.5		
Moment of inertia (10^{-3} kgm²)	J_{ges}	0.06	0.07	0.08	0.12	0.13	0.14	0.32	0.35	0.4	0.8	0.85	0.9	1.9	2	2.1	3.2	3.4	3.6	7.6	7.9	8.3	14.3	14.6	14.8
Hub material		Al optional steel			Al optional steel			Al optional steel			Al optional steel			steel optional AL			steel optional AL			steel optional AL			steel optional AL		
Approximate weight (kg)		0.16			0.26			0.48			0.8			1.85			2.65			4			6.3		
Torsional stiffness (10^3 Nm/rad)	C_T	20	15	14	39	28	27	76	55	54	129	85	84	175	110	97	191	140	135	450	350	340	510	500	400
Axial ± (mm)	Max. values	1	2	3	1	2	3	1.5	2	3	2	3	4	2	3	4	2	3	4	2.5	3.5	4.5	2.5	3.5	4.5
Lateral ± (mm)	Max. values	0.15	0.2	1	0.2	0.25	1	0.2	0.25	1	0.2	0.25	1	0.2	0.25	1	0.25	0.3	1	0.25	0.3	1	0.3	0.35	1
Angular ± (degree)	Max. values	1	1.5	2	1	1.5	2	1	1.5	2	1	1.5	2	1	1.5	2	1	1.5	2	1	1.5	2	1	1.5	2
Axial spring stiffness (N/mm)	C_a	25	15	84	50	30	118	72	48	165	48	32	144	82	52	130	90	60	280	105	71	605	70	48	85
Lateral spring stiffness (N/mm)	C_r	475	137	140	900	270	224	1200	420	337	920	290	401	1550	435	500	2040	610	750	3750	1050	1200	2500	840	614

* 180° opposed in each clamping hub.

BCS

BELLOWS COUPLING WITH SPLIT CLAMPING HUB

15 - 500 Nm

PROPERTIES

FEATURES

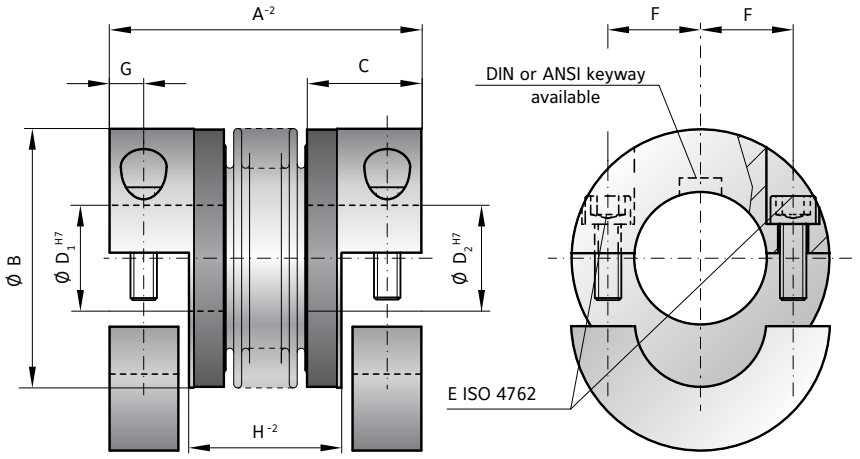
- radial mounting possible
- easy installation onto pre-aligned shafts
- low moment of inertia

DESIGN

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

MATERIAL

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



MODEL BCS

SIZE			15		30		60		80		150		200		300		500	
Rated torque	(Nm)	T_{KN}	15		30		60		80		150		200		300		500	
Overall length	(mm)	A^{-2}	59	66	69	77	83	93	94	106	95	107	105	117	111	125	133	146
Outside diameter	(mm)	B	49		55		66		81		81		90		110		124	
Fit length	(mm)	C	22		27		31		36		36		41		43		51	
Inside diameter possible H7	from Ø to Ø (mm)	D_1/D_2	8-28		10-30		12-35		14-42		19-42		22-45		24-60		35-60	
Fastening screw ISO 4762		E	M5		M6		M8		M10		M10		M12		M12		M16	
Tightening torque of the fastening screw	(Nm)		8		15		40		50		70		120		130		200	
Distance between centerlines	(mm)	F	17.5		19		23		27		27		31		39		41	
Distance	(mm)	G	7		7.5		9.5		12		12		12.5		14		16.5	
Distance	(mm)	H^{-2}	29	36	35	43	41	51	47	59	48	60	50	62	55	69	61	75
Moment of inertia	(10^{-3} kgm²)	J_{ges}	0.07	0.08	0.14	0.15	0.23	0.26	0.65	0.67	2.5	3.2	4.5	5.4	8.5	10.5	17.3	19.6
Hub material			AL optional steel		AL optional steel		AL optional steel		AL optional steel		steel optional AL		steel optional AL		steel optional AL		steel optional AL	
Approximate weight	(kg)		0.15		0.3		0.4		0.8		1.7		2.5		4		7.5	
Torsional stiffness	(10^3 Nm/rad)	C_T	20	15	39	28	76	55	129	85	175	110	191	140	450	350	510	500
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
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
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
Axial spring stiffness	(N/mm)	C_a	25	15	50	30	72	48	48	32	82	52	90	60	105	71	70	48
Lateral spring stiffness	(N/mm)	C_r	475	137	900	270	1200	420	920	290	1550	435	2040	610	3750	1050	2500	840

ORDERING EXAMPLE	BC / BCS	80	94	20	22.23	XX
Model	●					Special designation only (e.g. anodized hubs).
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Bore D2 H7					●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. BCS / 80 / 94 / 20 / 22.23 / XX; XX=finely balanced for 25,000 rpm)

BCE

BELLOWS COUPLING WITH CLAMPING HUB

4.5 - 500 Nm

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

PROPERTIES

FEATURES

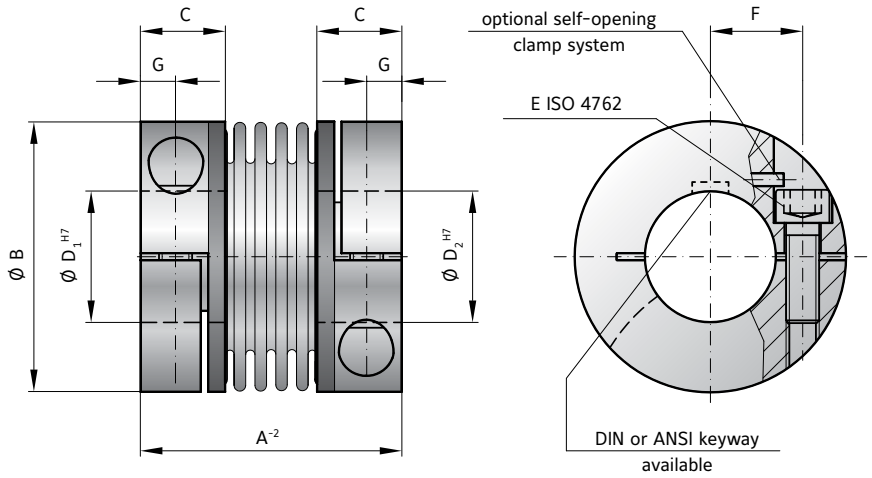
- easy to mount
- light weight and low moment of inertia

MATERIAL

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

DESIGN

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



MODEL BCE

SIZE			4.5	10	15	30	60	80	150	300	500
Rated torque	(Nm)	T_{KN}	4.5	10	15	30	60	80	150	300	500
Overall length	(mm)	A^{-2}	40	44	58	68	79	92	92	109	114
Outside diameter	(mm)	B	32	40	49	56	66	82	82	110	123
Fit length	(mm)	C	13	13	21.5	26	28	32.5	32.5	41	42.5
Inside diameter possible from Ø to Ø H7	(mm)	$D_{1/2}$	6-16	6-24	8-28	10-32	14-35	16-42	19-42	24-60	35-62
Fastening screw ISO 4762		E	M4	M4	M5	M6	M8	M10	M10	M12	M16
Tightening torque of the fastening screw	(Nm)	E	4	4.5	8	15	40	70	85	120	200
Distance between centerlines	(mm)	F	11	14	17	20	23	27	27	39	41
Distance	(mm)	G	5	5	6.5	7.5	9.5	11	11	13	17
Moment of inertia	(10^{-3} kgm²)	$J_{ges.}$	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	steel optional AL	steel optional AL	steel optional AL
Approximate weight	(kg)		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	7	9	23	31	72	80	141	157	290
Axial	± (mm)	Max. values	1	1	1	1	1.5	2	2	2	2.5
Lateral	± (mm)	Max. values	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Angular	± (degree)	Max. values	1	1	1	1	1	1	1	1	1
Axial spring stiffness	(N/mm)	C_a	35	30	30	50	67	44	77	112	72
Lateral spring stiffness	(N/mm)	C_r	350	320	315	366	679	590	960	2940	1450

ORDERING EXAMPLE	BCE	80	26	22.23	XX
Model	●				Special designation only (e.g. anodized hubs).
Size		●			
Bore D1 H7			●		
Bore D2 H7				●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. BCE / 80 / 26 / 22.23 / XX; XX=finely balanced for 25,000 rpm)

BCC

COMPACT DESIGN WITH CLAMPING HUB

15 - 500 Nm

PROPERTIES

FEATURES

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

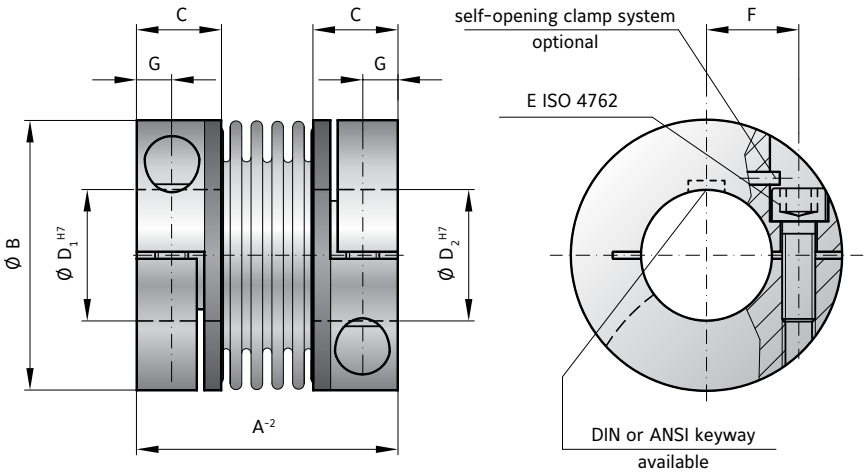
DESIGN

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

MATERIAL

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

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



MODEL BCC

SIZE			15	30	60	150	300	500
Rated torque	(Nm)	T_{KN}	15	30	60	150	300	500
Overall length	(mm)	A^{-2}	48	58	67	78	94	100
Outside diameter	(mm)	B	49	56	66	82	110	123
Fit length	(mm)	C	16.5	21	23	27.5	34	34
Inside diameter possible from 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 centerlines	(mm)	F	17.5	20	23	27	39	45
Distance	(mm)	G	6.5	7.5	9.5	11	13	13
Moment of inertia	(10^{-3} kgm²)	$J_{ges.}$	0.05	0.1	0.26	0.65	6.3	9
Hub material			AL	AL	AL	AL	steel	steel
Approximate weight	(kg)		0.13	0.21	0.37	0.72	3.26	3.52
Torsional stiffness	(10^3 Nm/rad)	C_T	23	31	72	141	157	290
Axial	± (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	(min^{-1})		80,000	70,000	60,000	50,000	40,000	30,000

ORDERING EXAMPLE	BCC	60	26	22.23	XX
Model	●				Special designation only (e.g. special bore tolerance).
Size		●			
Bore D1 H7			●		
Bore D2 H7				●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. BCC / 60 / 26 / 22.23 / XX; XX=finely balanced for 25,000 rpm)

BCB BLIND MATE COUPLING WITH CLAMPING HUB

15 - 500 Nm

PROPERTIES

FEATURES

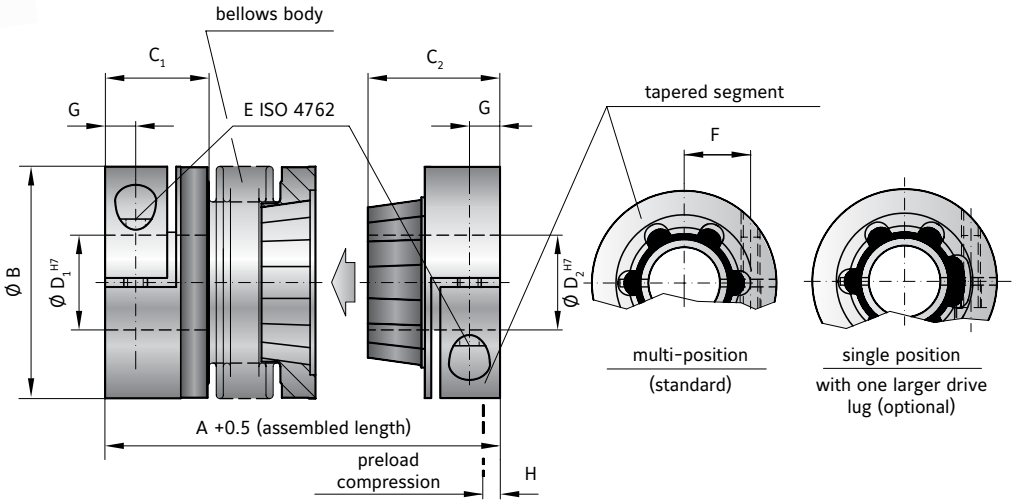
- easy installation and removal
- electrically and thermally isolating
- absolutely backlash free assembly

MATERIAL

- **Bellows:** high grade stainless steel
- **Hubs:** up through size 80 Aluminum, size 150 and up steel
- **Tapered male segment:** high strength reinforced plastic polymer

DESIGN

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



MODEL BCB

SIZE			15		30		60		80		150		300		500	
Rated torque	(Nm)	T_{KN}	15		30		60		80		150		300		500	
Overall length (inserted)	(mm)	$A^{+0,5}$	60	67	71	79	85	95	94	106	95	107	114	128	136	149
Outside diameter	(mm)	B	49		55		66		81		81		110		124	
Fit length	(mm)	C_1	22		27		31		36		36		43		51	
Fit length	(mm)	C_2	28		33		39		43		43		52		61	
Inside diameter possible from Ø to Ø H7	(mm)	D_1	8-28		10-30		12-35		14-42		14-42		24-60		35-60	
Inside diameter possible from Ø to Ø H7	(mm)	D_2	8-22		10-25		12-32		14-38		14-38		24-58		35-60	
Fastening screw ISO 4762		E	M5		M6		M8		M10		M10		M12		M16	
Tightening torque of the fastening screw	(Nm)	E	8		15		40		50		70		130		200	
Distance between centerlines	(mm)	F	17		19		23		27		27		39		41	
Distance	(mm)	G	6.5		7.5		9.5		11		11		13		16.5	
Preload compression	(mm)	H	0.2 - 1.0		0.5 - 1.0		0.5 - 1.5		0.5 - 1.5		0.5 - 1.5		0.5 - 1.5		1.0 - 2.0	
Axial recovery force at pretensioning	maximum (N)	H	20	12	50	30	70	45	48	32	82	52	157	106	140	96
Moment of inertia	(10^{-3} kgm²)	J_{ges}	0.07	0.08	0.14	0.15	0.23	0.26	0.65	0.67	2.2	2.4	7.4	7.9	13.7	14.4
Approximate weight	(kg)		0.1	0.1	0.3	0.3	0.4	0.4	0.9	0.9	1.8	1.8	4	4	6.5	6.7
Torsional stiffness	(10^3 Nm/rad)	C_T	10	8	20	14	38	28	65	43	88	55	225	175	255	245
Axial*	± (mm)	Max. values	0.5	1	0.5	1	0.5	1	1	2	1	2	1.5	2	2.5	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	0.3	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
Lateral spring stiffness	(N/mm)	C_r	475	137	900	270	1200	420	920	290	1550	435	3750	1050	2500	840

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

ORDERING EXAMPLE	BCB	30	71	18	19	XX
Model	●					Special designation only (e.g. special bore tolerance).
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Bore D2 H7					●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. BCB / 30 / 71 / 18 / 19 / XX; XX=finely balanced for 25,000 rpm)

SERIES EC

BACKLASH FREE, ELASTOMER INSERT COUPLINGS
2 - 660 Nm

SERVICE LIFE
When properly selected, handled, and installed, these couplings are maintenance free with infinite service life.

FIT CLEARANCE
Overall shaft/hub clearance of 0.01 - 0.05 mm

DESIGN FEATURES
Elastomer insert is press fit for zero backlash; standard versions are electrically isolating.

SPECIAL SOLUTIONS
Various materials, tolerances, dimensions and performance ratings are available for custom applications upon request.

ATEX (Optional)
For use in hazardous zones 1/21 and 2/22, the elastomer coupling has been authorized under directive 94/9/EG and is available with certification.

DIEQUA Corporation
630-980-1133
diequa.com

SERIES EC

BACKLASH FREE
ELASTOMER INSERT COUPLINGS
2 - 660 Nm

MODEL		FEATURES	
EC		**with clamping hub** **from 6 - 660 Nm** ▶ high concentricity ▶ backlash free ▶ easy mounting	Page 32
ECC		**with compact clamping hub** **from 2 - 660 Nm** ▶ compact design ▶ low moment of inertia ▶ easy mounting	Page 33
ECS		**with split clamping hub** **from 4 - 660 Nm** ▶ for lateral installation ▶ allows for pre-aligned shafts ▶ easy mounting	Page 34
ECX		**with intermediate spacer** **from 2 - 660 Nm** ▶ high lateral misalignment ▶ easy to mount ▶ vibration damping	Page 35

DIEQUA Corporation
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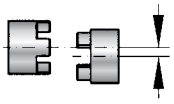
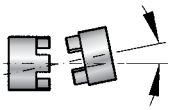
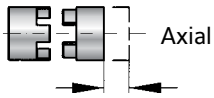
diequa.com

GENERAL INFORMATION
DIEQUA ELASTOMER INSERT COUPLINGS

AXES OF MISALIGNMENT


Lateral


Angular


Axial

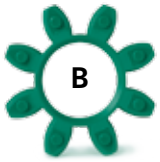
FUNCTION

The equalizing element of the EC coupling is the elastomer insert. It transmits torque without backlash or vibration. The elastomer insert defines the characteristics of the entire drive system.

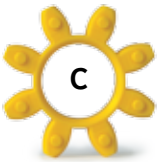
Backlash is eliminated by the press fit of the elastomer into the hubs. Through variation of the Shore hardness of the elastomer insert, the coupling system can be optimized for the ideal torsional characteristics.

SIZES 2 - 450

Shore hardness 98 Sh A



Shore hardness 64 Sh D



Shore hardness 80 Sh A

Shore hardness 65 Sh D

Shore hardness 64 Sh D

DESCRIPTION OF THE ELASTOMER INSERTS

Type	Shore hardness	Color	Material	Relative damping (Ψ)	Temperature range	Features
A	98 Sh A	blue	TPU	0.4 - 0.5	-30°C to +100°C	high damping
B	64 Sh D	green	TPU	0.3 - 0.45	-30°C to +120°C	high torsional stiffness
C	80 Sh A	yellow	TPU	0.3 - 0.4	-30°C to +100°C	very high damping
D*	65 Sh D	black	TPU	0.3 - 0.45	-10°C to + 70°C	electrically conductive
E	64 Sh D	beige	Hytrel	0.3 - 0.45	-50°C to +150°C	temperature resistant

* The electrical conductivity of the elastomer material is to prevent the electrostatic charging of the elastomer coupling system, to reduce the risk of sparking in operation. ATEX technical data is available upon request.

The values of the relative damping were determined at 10 Hz and +20˚ C.

DIEQUA Corporation
630-980-1133
diequa.com

GENERAL INFORMATION
DIEQUA ELASTOMER INSERT COUPLINGS

SIZES EC

SIZE		5			10			20			60			150		
Type (Elastomer insert)		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Static torsional stiffness (Nm/rad)	C_T	150	350	53	260	600	90	1140	2500	520	3290	9750	1400	4970	10600	2000
Dynamic torsional stiffness (Nm/rad)	C_{Tdyn}	300	700	106	541	1650	224	2540	4440	876	7940	11900	2072	13400	29300	3590
Lateral (mm)	Max. values	0.08	0.06	0.2	0.1	0.08	0.22	0.1	0.08	0.25	0.12	0.1	0.25	0.15	0.12	0.3
Angular (Degree)		1	0.8	1.2	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2
Axial (mm)		±1			±1			±2			±2			±2		

SIZE		300			450		
Type (Elastomer insert)		A	B	C	A	B	C
Static torsional stiffness (Nm/rad)	C_T	12400	18000	3000	15100	27000	4120
Dynamic torsional stiffness (Nm/rad)	C_{Tdyn}	23700	40400	6090	55400	81200	11600
Lateral (mm)	Max. values	0.18	0.14	0.35	0.2	0.18	0.35
Angular (Degree)		1	0.8	1.2	1	0.8	1.2
Axial (mm)		±2			±2		

Static torsional stiffness at 50% T_{KN}
Dynamic torsional stiffness at T_{KN}

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EC

ELASTOMER COUPLING WITH CLAMPING HUB
6 - 660 Nm

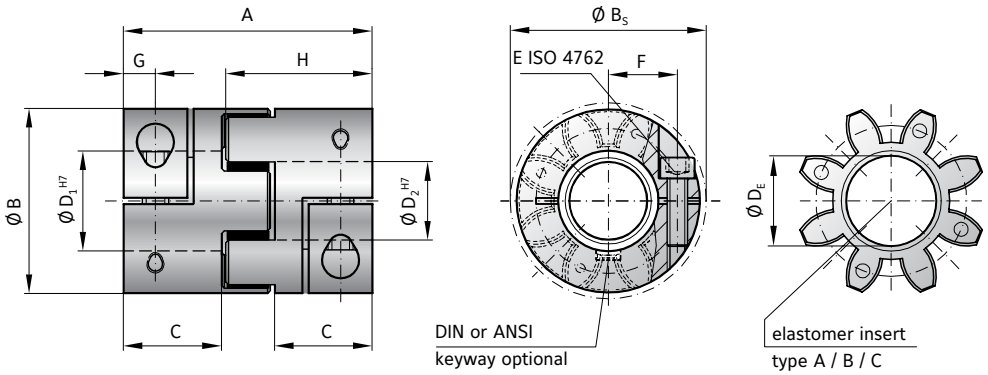
PROPERTIES

FEATURES
- easy mounting
- highly concentric assembly
- vibration damping

MATERIAL
- **Hubs:** high strength aluminum
- **Elastomer:** wear resistant thermally stable TPU

DESIGN
Two concentrically machined hubs with curved jaws and clamping screws.

ORDERING EXAMPLE
see page 35



MODEL EC

SIZE		20			60			150			300			450		
Type (Elastomer insert)		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Rated torque (Nm)	T_{KN}	17	21	6	60	75	20	160	200	42	325	405	84	530	660	95
Max. torque* (Nm)	T_{Kmax}	34	42	12	120	150	35	320	400	85	650	810	170	1060	1350	190
Overall length (mm)	A	66			78			90			114			126		
Outside diameter (mm)	B	42			56			66.5			82			102		
Outside diameter with screw head (mm)	B_S	44.5			57			68			85			105		
Mounting length (mm)	C	25			30			35			45			50		
Inside diameter range H7 (mm)	$D_{1/2}$	8 - 25			12 - 32			19 - 36			20 - 45			28 - 60		
Inside diameter of elastomer (mm)	D_E	19.2			26.2			29.2			36.2			46.2		
Clamping screw (ISO 4762)	E	M5			M6			M8			M10			M12		
Tightening torque of the clamping screw (Nm)	E	8			15			35			70			120		
Distance between centers(mm)	F	15.5			21			24			29			38		
Distance (mm)	G	8.5			10			12			15			17.5		
Hub length (mm)	H	39			46			52.5			66			73		
Moment of inertia per hub (10^{-3} kgm²)	J_1/J_2	0.016			0.05			0.13			0.4			0.9		
Approx. weight (kg)		0.15			0.35			0.6			1.1			1.7		
Speed standard (min^{-1})		12,500			11,000			10,000			9,000			8,000		
Speed balanced ($10^3 min^{-1}$)		45	60	35	31	31	25	22	26	18	22	26	16	16	17	12

For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts see page 30 - 31.

* Maximum transmittable torque of the clamping hub depends on the bore diameter

Size	Ø 8	Ø 16	Ø 19	Ø 25	Ø 30	Ø 32	Ø 35	Ø 45	Ø 50	Ø 55	Ø 60
20	20	35	45	60							
60		50	80	100	110	120					
150			120	160	180	200	220				
300			200	230	300	350	380	420			
450					420	480	510	600	660	750	850

Higher torque possible with keyways

ECC ELASTOMER COUPLING WITH COMPACT CLAMPING HUB

2 - 660 Nm

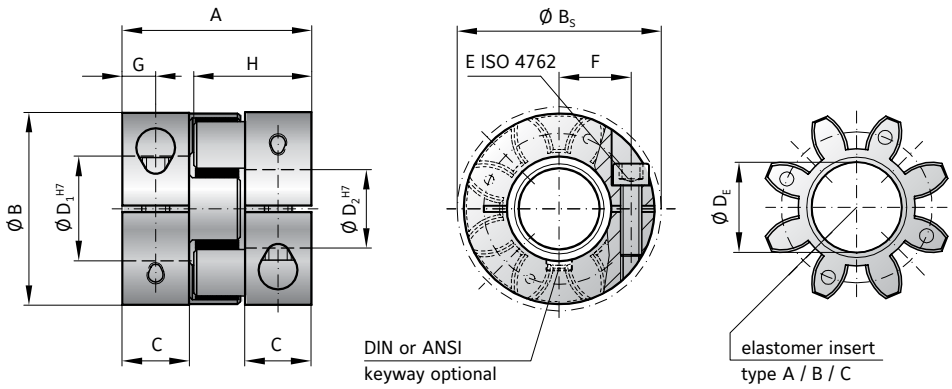
PROPERTIES

FEATURES
- short overall length
- easy mounting
- vibration damping

MATERIAL
- **Hubs:** high strength aluminum
- **Elastomer:** wear resistant thermally stable TPU

DESIGN
Two concentrically machined hubs with curved jaws and clamping screws.

ORDERING EXAMPLE
see page 35



MODEL ECC

SIZE		5			10			20			60			150			300			450		
Type (Elastomer insert)		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Rated torque (Nm)	T_{KN}	9	12	2	12.5	16	4	17	21	6	60	75	20	160	200	42	325	405	84	530	660	95
Max. torque* (Nm)	T_{Kmax}	18	24	4	25	32	6	34	42	12	120	150	35	320	400	85	650	810	170	1060	1350	190
Overall length (mm)	A	26			32			50			58			62			86			94		
Outside diameter (mm)	B	25			32			42			56			66.5			82			102		
Outside diameter with screw head (mm)	B_S	25			32			44.5			57			68			85			105		
Mounting length (mm)	C	8			10.3			17			20			21			31			34		
Inside diameter range H7 (mm)	$D_{1/2}$	4 - 12.7			4 - 16			8 - 25			12 - 32			19 - 36			20 - 45			28 - 60		
Inside diameter of elastomer (mm)	D_E	10.2			14.2			19.2			26.2			29.2			36.2			46.2		
Clamping screw (ISO 4762)	E	M3			M4			M5			M6			M8			M10			M12		
Tightening torque of the clamping screw (Nm)	E	2			4			8			15			35			70			120		
Distance between centers (mm)	F	8			10.5			15.5			21			24			29			38		
Distance (mm)	G	4			5			8.5			10			11			15			17.5		
Hub length (mm)	H	16.7			20.7			31			36			39			52			57		
Moment of inertia per hub (10^{-3} kgm²)	J_1/J_2	0.002			0.003			0.01			0.04			0.08			0.3			0.66		
Approx. weight (kg)		0.02			0.05			0.12			0.3			0.5			0.9			1.5		
Speed standard (min^{-1})		15,000			13,000			12,500			11,000			10,000			9,000			8,000		
Speed balanced ($10^3 min^{-1}$)		57	65	43	53	63	40	45	60	35	31	31	25	22	26	18	22	26	16	16	17	12

For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts see page 30 - 31.

* Maximum transmittable torque of the clamping hub depends on the bore diameter

Size	Ø 3	Ø 4	Ø 5	Ø 8	Ø 16	Ø 19	Ø 25	Ø 30	Ø 32	Ø 35	Ø 45	Ø 50	Ø 55	Ø 60
2	0.2	0.8	1.5	2.5										
5		1.5	2	8										
10			4	12	32									
20				20	35	45	60							
60					50	80	100	110	120					
150						120	160	180	200	220				
300						200	230	300	350	380	420			
450								420	480	510	600	660	750	850

Higher torque possible with keyways.

ECS

ELASTOMER COUPLING WITH SPLIT CLAMPING HUB
4 - 660 Nm

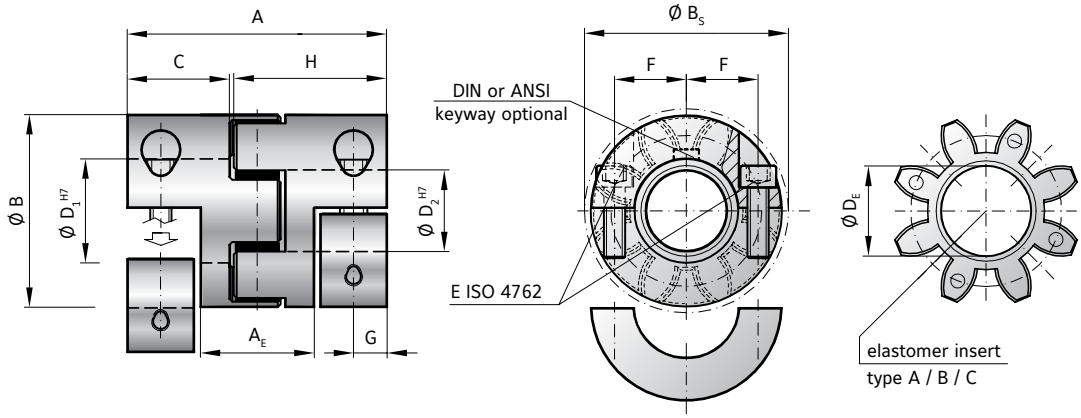
PROPERTIES

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

MATERIAL
- **Hubs:** high strength aluminum
- **Elastomer:** wear resistant thermally stable TPU

DESIGN
Two concentrically machined, fully split hubs with curved jaws and clamping screws.

ORDERING EXAMPLE
see page 35



MODEL ECS

SIZE			10			20			60			150			300			450		
Type (Elastomer insert)			A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Rated torque	(Nm)	T_{KN}	12.6	16	4	17	21	6	60	75	20	160	200	42	325	405	84	530	660	95
Max. torque*	(Nm)	T_{Kmax}	25	32	6	34	42	12	120	150	35	320	400	85	650	810	170	1060	1350	190
Overall length	(mm)	A	53			66			78			90			114			126		
Length of center section	(mm)	A_E	20			28.8			34			38			50			52		
Outside diameter	(mm)	B	32			42			56			66.5			82			102		
Outside diameter with screw head	(mm)	B_S	32			44.5			57			68			85			105		
Mounting length	(mm)	C	20			25			30			35			45			50		
Inside diameter range H7	(mm)	$D_{1/2}$	6 - 16			8 - 25			12 - 32			19 - 36			20 - 45			28 - 60		
Inside diameter of elastomer	(mm)	D_E	14.2			19.2			26.2			29.2			36.2			46.2		
Clamping screw (ISO 4762)		E	4 x M4			4 x M5			4 x M6			4 x M8			4 x M10			4 x M12		
Tightening torque of the clamping screw	(Nm)		4			8			15			35			70			120		
Distance between centers	(mm)	F	10.5			15.5			21			24			29			38		
Distance	(mm)	G/G_1	7.5			8.5			10			12			15			17.5		
Hub length	(mm)	H/H_1	31			39			46			52.5			66			73		
Moment of inertia per hub	(10^{-3} kgm^2)	J_1/J_2	0.005			0.02			0.06			0.1			0.4			1		
Approx. weight	(kg)		0.08			0.15			0.35			0.6			1.1			1.7		
Speed standard	(min^{-1})		13,000			12,500			11,000			10,000			9,000			8,000		
Speed balanced	(10^3min^{-1})		53	63	40	45	60	35	31	31	25	22	26	18	22	26	16	16	17	12

For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts see page 30 - 31.

* Maximum transmittable torque of the clamping hub depends on the bore diameter

Size	Ø 6	Ø 8	Ø 16	Ø 19	Ø 25	Ø 30	Ø 32	Ø 35	Ø 45	Ø 50	Ø 55	Ø 60
10	6	12	32									
20		30	40	50	65							
60			65	120	150	180	200					
150				180	240	270	300	330				
300				300	340	450	520	570	630			
450						630	720	770	900	1120	1180	1350

Higher torque possible with keyways

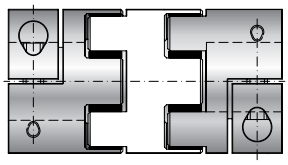
ECX ELASTOMER INTERMEDIATE SPACER
2 - 660 Nm

PROPERTIES

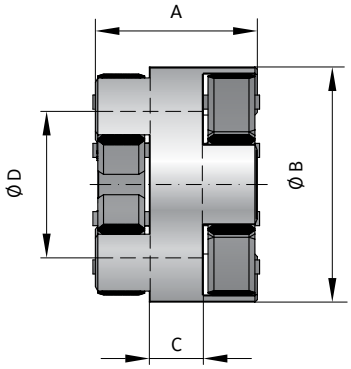
FEATURES
- high lateral misalignment
- easy to mount
- combine with any two hub designs

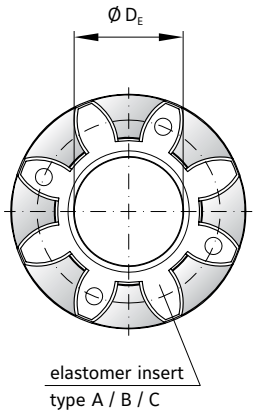
MATERIAL
- **Hubs:** high strength aluminum
- **Elastomer:** wear resistant thermally stable TPU

DESIGN
A concentrically machined spacer with curved jaws. 2x elastomer segments press fit for zero backlash; standard versions are electrically isolating.



Model EC with ECX Spacer





MODEL ECX

SIZE			5			10			20			60			150			300			450		
Type (Elastomer insert)			A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Rated torque	(Nm)	T_{KN}	9	12	2	12.5	16	4	17	21	6	60	75	20	160	200	42	325	405	84	530	660	95
Max. torque	(Nm)	T_{Kmax}	18	24	4	25	32	6	34	42	12	120	150	35	320	400	85	650	810	170	1060	1350	190
Overall length	(mm)	A	26			30			39			48			53			62			86		
Outside diameter	(mm)	B	25			32			42			56			66.5			82			102		
Hub length	(mm)	C	9			9			10			16			18			20			40		
Inside diameter	(mm)	D	15			18			25			32			38			45			60		
Inside diameter of elastomer	(mm)	D_E	10.2			14.2			19.2			26.2			29.2			36.2			46.2		
Moment of inertia	(10^{-3} kgm²)	J_1/J_2	0.0005			0.002			0.008			0.03			0.05			0.1			0.6		
Approx. weight	(kg)		0.02			0.04			0.09			0.21			0.33			0.58			1.38		
Speed standard	(min^{-1})		15,000			13,000			12,500			11,000			10,000			9,000			8,000		

For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts see page 30 - 31.

ORDERING EXAMPLE	ECX	60	A	XX
Model	●			Special designation only (e.g. non-standard length).
Size		●		
Elastomer insert type			●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. ECX / 60 / A / XX; XX=anodized aluminum)				

ORDERING EXAMPLE	EC | ECC | ECS	60	A	12.7	24	XX
Model	●					Special designation only (e.g. special bore tolerance).
Size		●				
Elastomer insert type			●			
Bore D1 H7				●		
Bore D2 H7					●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. ECS / 60 / A / 12.7 / 24 / XX; XX=anodized aluminum)						

SERIES T

BACKLASH FREE TORQUE LIMITERS
1 - 700 Nm

SERVICE LIFE
As long as the technical limits are not exceeded, these couplings are wear and maintenenace free.

FIT CLEARANCE
Overall shaft/hub clearance of 0.01 - 0.05 mm

SPECIAL SOLUTIONS
Various materials, tolerances, dimensions and performance ratings are available for custom applications upon request.

ATEX (Optional)
For use in hazardous zones 1/21 and 2/22, the elastomer coupling has been authorized under directive 94/9/EG and is available with certification.

DIEQUA Corporation
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SERIES T

BACKLASH FREE **TORQUE LIMITERS**
1 - 650 Nm

MODEL		FEATURES	
TH		**with conical clamping bushing for indirect drives from 5 - 650 Nm** ▶ integral bearing to support sprockets, gears, and other drive elements ▶ compact simple design ▶ adjustable torque settings	page 44
THK		**with keyway connection for indirect drives from 5 - 650 Nm** ▶ integral bearing to support sprockets, gears, and other drive elements ▶ compact simple design ▶ adjustable torque settings	page 46
TB		**with clamping hubs and bellows coupling for direct drives from 5 - 500 Nm** ▶ easy to mount ▶ compensation for shaft misalignment ▶ adjustable torque settings	page 48
TE		**with clamping hubs and elastomer coupling for direct drives from 1 - 500 Nm** ▶ easy to mount ▶ vibration damping ▶ compensation for shaft misalignment ▶ adjustable torque settings	page 49

SERIES T

BACKLASH FREE **TORQUE LIMITERS**
10 - 700 Nm

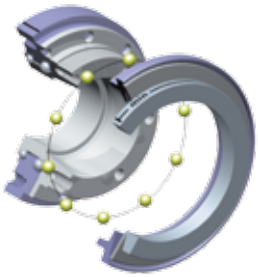
MODEL		FEATURES	
TA		**with clamping hub for indirect drives from 10 - 700 Nm** ▶ integral bearing to support sprockets, gears, and other drive elements ▶ adjustable torque settings ▶ ultra compact, low inertia version	page 50
TAE		**with clamping hubs and elastomer coupling for direct drives from 10 - 700 Nm** ▶ easy to mount ▶ vibration damping ▶ compensation for shaft misalignment ▶ adjustable torque settings ▶ ultra compact, low inertia version	page 51
ACCESSORIES		**Accessories for torque limiters**	page 52

AVAILABLE FUNCTION SYSTEMS

SINGLE POSITION - W

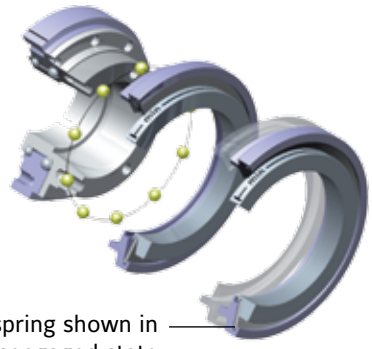
Standard Version

- after the overload condition has been removed the clutch will automatically re-engage precisely at its original orientation.
- maintains synchronous shaft positioning.
- switch plate moves at disengagement to signal overload.
- patented preload for zero backlash; suitable for high precision drives.



MULTI-POSITION 60° - D

- after the overload condition has been removed the clutch will automatically re-engage at one of multiple angular intervals, standard is every 60°.
- immediate availability of the machine after overload disengagement.
- switch plate moves at disengagement to signal overload.
- optional re-engagement intervals of 30, 45, 90, 120°.
- patented preload for zero backlash; suitable for high precision drives.

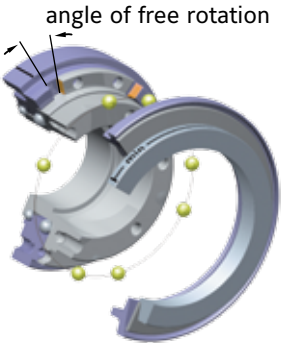


spring shown in disengaged state

FULL DISENGAGEMENT - F

- spring snaps over center, eliminating residual force on the ball-detent system.
- complete separation at overload, allowing shafts to spin freely until they are stopped.
- switch plate moves at disengagement to signal overload.
- coupling requires manual re-engagement at multiple available intervals (60 degrees standard; alternate engagement intervals on request).
- well suited for higher speed applications.

Note: Coupling can be disengaged manually. Contact DieQua for details.



LOAD HOLDING / LOAD BLOCKING - G

- overload detection device.
- only limited free rotation after overload disengagement, beyond which the clutch remains engaged and will continue to drive.
- re-engages automatically when reversed back into original disengagement position.
- switch plate moves at disengagement to signal overload.
- useful in lift systems and other applications where the load must be supported after a brief torque release.

GENERAL INFORMATION
TORQUE LIMITERS

SINGLE POSITION - W / MULTI-POSITION - D
LOAD HOLDING / LOAD BLOCKING - G

Note: Automatic re-engagement only occurs at low speed.

GENERAL INFORMATION

DieQua safety couplings operate as spring loaded ball-detent clutches. They protect drive components (e.g. motors, transmissions, and spindles) from damage caused by machine crashes and other forms of overload.

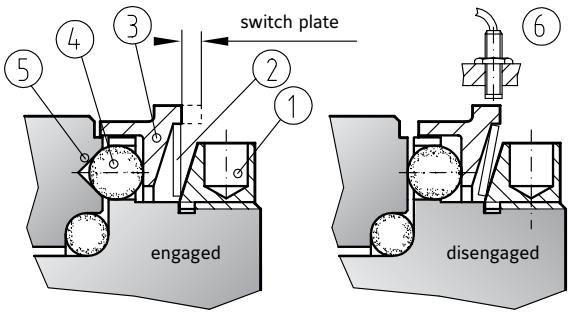
- The torque is transmitted by hardened balls (4) loaded into conical detents (5).
- The balls are loaded into the detents by the spring disc system (2) across the switch plate (3).
- The disengagement torque is continuously adjustable via the torque adjustment nut (1).
- At overload the balls exit their detents, moving the switch plate (3) and disc spring system (2) back away from the detents, separating the input from the output of the safety coupling.
- The movement of the switch plate (3) can be detected by a proximity switch (6) to signal the drive to shut down.

FUNCTION OF THE BALL-DETENT SYSTEM

TH **TA** **TB** **TE**

SINGLE POSITION - W / MULTI-POSITION - D

In these designs the disc spring system continues to apply a light residual pressure when in its disengaged state. This pressure is sufficient to cause automatic re-engagement after the torque has been reduced to a level below the torque setting of the safety coupling.



① Torque adjustment nut
② Disc spring system
③ Switch plate
④ Drive ball
⑤ Conical detent
⑥ Proximity switch

TH **TB** **TE**

LOAD HOLDING / LOAD BLOCKING - G

The input and output of the safety coupling are only allowed limited free rotation after disengagement. This free rotation is sufficient to allow the switch plate to move and the overload condition to be signaled. The input and output remain coupled and continue to rotate together.

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GENERAL INFORMATION
TORQUE LIMITERS

FULL DISENGAGEMENT - F

Only attempt re-engagement when the machine is stopped.

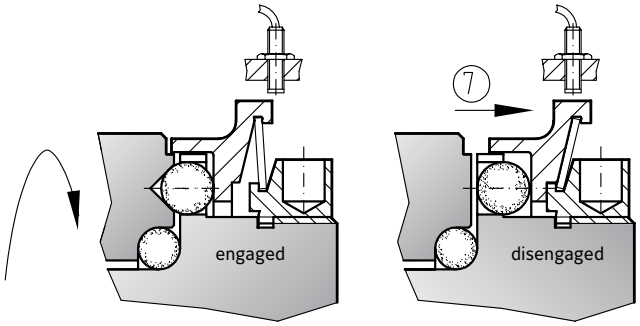
FUNCTION OF THE BALL-DETENT SYSTEM

TH **TE** **TB**

FULL DISENGAGEMENT - F

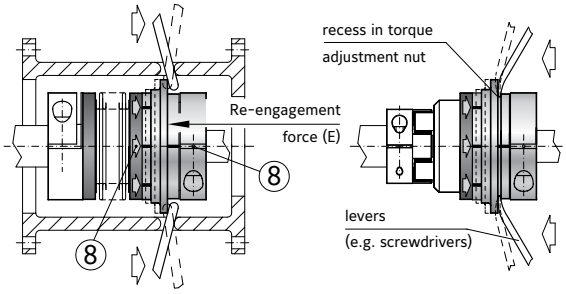
In the full disengagement version the spring system (7) snaps over center, eliminating residual force on the ball-detent system. This causes a complete separation at overload, allowing shafts to spin freely until they are stopped.

▶ Re-engagement must be performed manually (see figure at right).



The DieQua full disengagement safety coupling can be re-engaged at any of 6 intervals by pressing the spring system back into its locked position. The re-engagement intervals are indicated by reference markings (8) on the coupling.

From size 60 and up a recess is included in the torque adjustment nut, allowing for 2 levers to be used in a self contained fashion, as shown in the figure on the right.



up to size 30 **size 60 and up**

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BEHAVIOR AND CHARACTERISTICS

SPRING SYSTEM

DieQua safety couplings work exclusively with a disc spring system with a special characteristic. Prior to the the torque adjustment nut coming into contact with the disc springs and applying pressure (1) no torque transmission is possible. Once the spring is loaded, the active range of the spring system had been reached, with the spring rate declining as further compression takes place, both prior to, and during disengagement (2). Once completely depressed, the spring system is rigid (3).

As the safety coupling is in the process of disengaging, the spring force continues to decline. This advantage guarantees the shortest possible disengagement times (1-2 msec), very low wear while running disengaged, and very low residual friction in general (2-5%).

IMPORANT!

The minimum and maximum torque values of the DieQua safety couplings are at the limits of the active range of the disc spring system. Therefore it is critical not to exceed the specified torque adjustment range.

ROTATIONAL SPEED

The rotational speed at disengagement significantly influences the service life of the coupling. At lower speeds the coupling can handle many thousands of disengagements with no degradation to performance. Please contact DieQua for details if applying the safety coupling to a high speed shaft.

WEAR

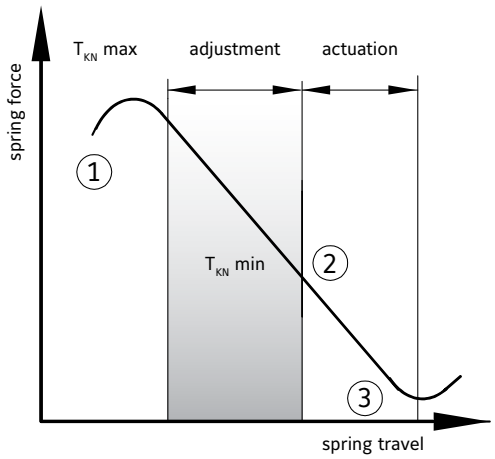
In its engaged state the safety coupling is completely wear free. Service life can be extended significantly by taking measures to stop shaft rotation quickly after disengagement.

MAINTENANCE

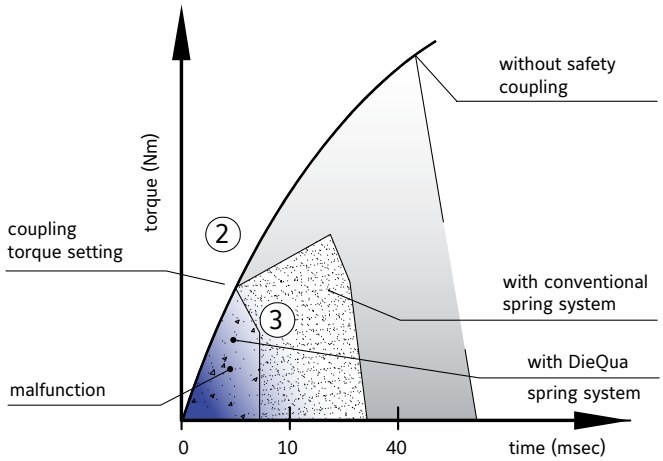
The DieQua safety couplings are maintenance free and lubricated for life.

SPRING CHARACTERISTIC

special design



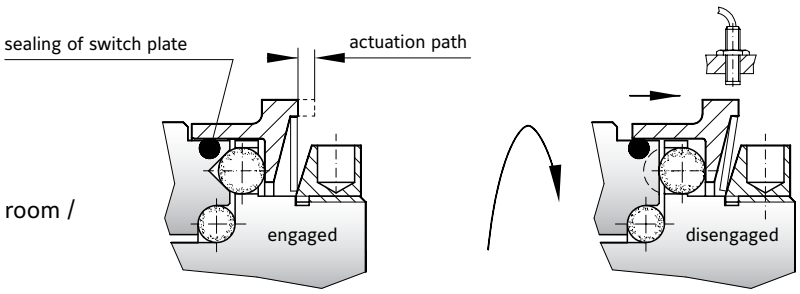
DISENGAGEMENT



SAFETY COUPLING WITH SEAL (OPTIONAL)

Benefits of sealing:

- Protection from harmful contaminants
- No leakage of grease
- Recommended for harsh environments or clean room / sanitary application requirements



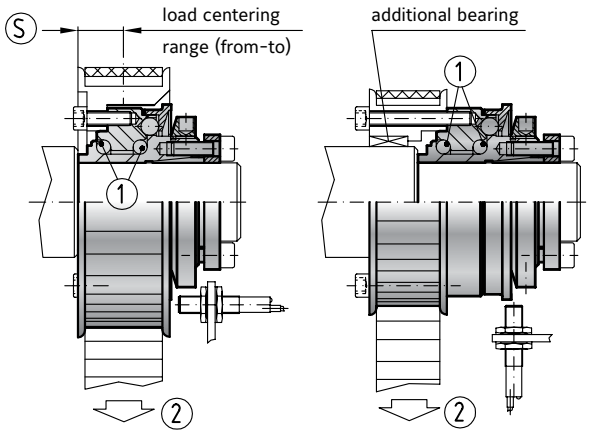
RADIAL LOADS
SAFETY COUPLINGS

TH | **THK** | **TA**

The models listed above have an integral bearing (1) to support the drive attachment (e.g. timing belt or chain sprocket, gear, or hand wheel). The maximum radial load (2) is listed in the table below.

If the center of the overhung load is located within dimension range (S) no additional bearing support is necessary. For offset mounting additional bearings can be used to support the load. This is useful in cases where the attached component is too small to fit over the coupling output flange or has a large width.

Depending on the installation space, ball, roller or needle bearings can all be used.



SIZE TH / THK	15	30	60	150	200	300	500
Max. radial load (N)	1400	1800	2300	3000	3500	4500	5600
(S) from-to (mm)	7-17	10-24	10-24	12-24	12-26	12-28	16-38

SIZE TA	30	60	150	300
Max. radial load (N)	800	1000	1200	1600
(S) from-to (mm)	4-14	5-18	6-20	6-23

TH

COUPLING WITH CONICAL CLAMP
5 - 650 Nm

PROPERTIES

MATERIAL
- **Clutch system:** hardened steel
- **Conical clamping bushing size 15 - 500:** steel

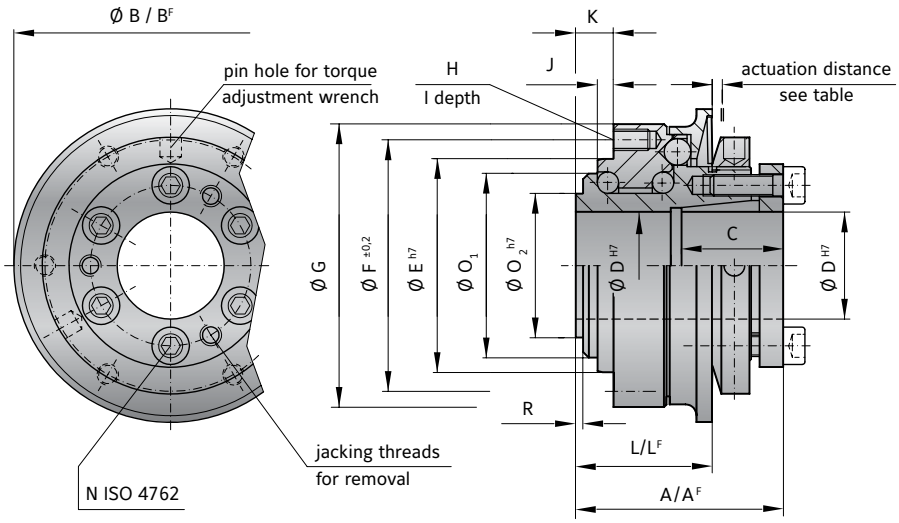
DESIGN
Size 15 - 500 with conical clamping bushing and six screws.
Clutch system: spring loaded ball-detent principle. Operable temperature range from -30 to +120° C.

AVAILABLE FUNCTION SYSTEMS
- W = Single postion / automatic re-engagement (standard)
- D = Multi-position / automatic re-engagement
- G = Load holding / load blocking
- F = Full disengagement / manual re-engagement

ORDERING EXAMPLE
see page 45

STANDARD DESIGN | SIZE 15 - 500

Standard with conical clamping bushing



MODEL TH

SIZE			15	30	60	150	200	300	500
Adjustment range available from - to (approx. values)	(Nm)	T_{KN}	5-15 12-25 20-40 35-70	5-20 10-30 20-60 50-100	10-30 25-80 50-115	20-70 45-150 80-225	30-90 60-160 140-280 250-400	100-200 150-240 220-440	80-200 200-350 320-650
Adjustment range available from - to (approx. values) ("F" Version)	(Nm)	T_{KN}	7-15	8-20 or 16-30	10-30 20-40 30-60	20-60 40-80 80-150	80-140 or 130-200	120-180 160-300 300-450	50-150 100-300 250-500
Overall length	(mm)	A	40	50	54	58	63	70	84
Overall length ("F" Version)	(mm)	A^F	40	50	54	58	66	73	88
Actuation ring Ø	(mm)	B	55	65	73	92	99	120	135
Actuation ring Ø, ("F" Version)	(mm)	B^F	62	70	83	98	117	132	155
Clamping fit length	(mm)	C	19	22	27.5	32	32	41	41
Inner diameter from Ø to Ø H7	(mm)	D	8-22	12-22	12-29	15-37	20-44	25-56	25-56
Pilot diameter h7	(mm)	E	40	47	55	68	75	82	90
Bolt-hole circle diameter ± 0.2	(mm)	F	47	54	63	78	85	98	110
Flange outside diameter -0.2	(mm)	G	53	63	72	87	98	112	128
Thread		H	6xM4	6xM5	6xM5	6xM6	6xM6	6xM8	6xM8
Thread depth	(mm)	I	6	8	9	10	10	10	12
Centering length -0.2	(mm)	J	3	5	5	5	5	6	9
Distance	(mm)	K	8	11	11	12	12	15	21
Distance	(mm)	L	27	35	37	39	44	47	59
Distance, ("F" Version)	(mm)	L^F	27	37	39	41.5	47	51.5	68
Distance		M							
Screw ISO 4762		N	6xM4	6xM5	6xM5	6xM6	6xM6	6xM8	6xM8
Tightening torque	(Nm)		4	6	8	12	14	18	25
Outside diameter clamp ring Ø	(mm)	O							
Diameter	(mm)	O_1	35	42	49	62	67	75	84
Diameter h7	(mm)	O_2	27	32	39	50	55	65	72
Distance between centers	(mm)	P							
Distance	(mm)	R	2.5	2.5	2.5	2.5	3	3	4
Moment of inertia	($10^{-3}kgm^2$)	J_{ges}	0.15	0.25	0.50	1.60	2.70	5.20	8.6
Approx. weight	(kg)		0.4	0.7	1.0	1.3	2.0	3.0	4.0
Actuation distance	(mm)		1.5	1.7	1.7	1.9	2.2	2.2	2.2

A^F, B^F, L^F = Full disengagement / manual re-engegement version (F)

ORDERING EXAMPLE	TH	10	W	12.7	4	2-6	XX
Model	●						Special designation only (e.g. special bore / keyway dimensions).
Size		●					
Function system			●				
Bore D1 H7				●			
Disengagement torque Nm					●		
Torque adjustment range Nm						●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. TH / 10 / W / 12.7 / 4 / 2-6 / XX; XX=stainless steel)

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COUPLING WITH KEYWAY CONNECTION
5 - 650 Nm

PROPERTIES

MATERIAL
- **Clutch system:** hardened steel

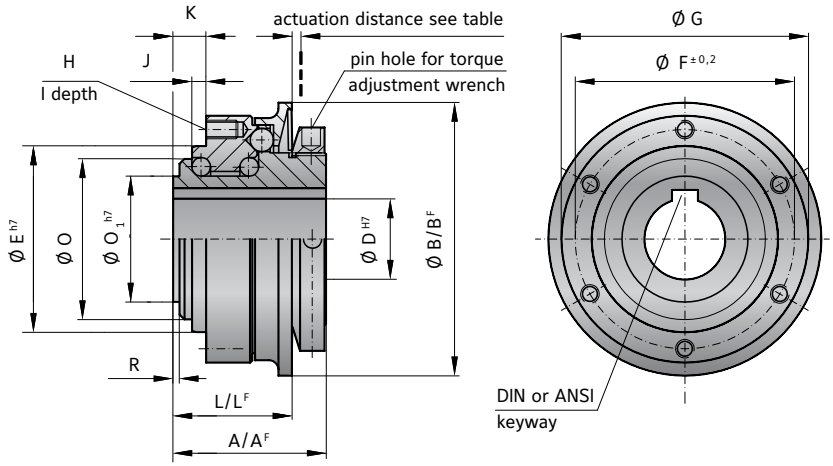
DESIGN
With DIN 6885 or ANSI B17.1 keyway. Clutch system: spring loaded ball-detent principle. Operable temperature range from -30 to +120˚ C.

AVAILABLE FUNCTION SYSTEMS
- W = Single postion / automatic re-engagement (standard)
- D = Multi-position / automatic re-engagement
- G = Load holding / load blocking
- F = Full disengagement / manual re-engagement

ORDERING EXAMPLE
see page 47

STANDARD DESIGN | SIZE 15 - 500

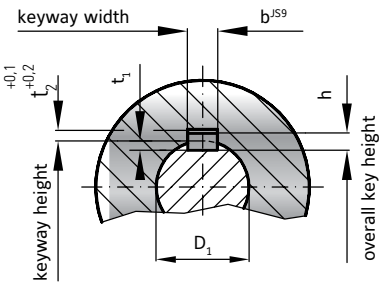
Standard with keyway mounting



KEYWAY ACCORDING TO DIN 6885 (DIEQUA STANDARD)

D_1	from	6	8	10	12	17	22	30	38	44	50	58	65	75	85	95
	to	8	10	12	17	22	30	38	44	50	58	65	75	85	95	110
b^{JS9}		2	3	4	5	6	8	10	12	14	16	18	20	22	25	28
h		2	3	4	5	6	7	8	8	9	10	11	12	14	14	16
t_1		1.2	1.8	2.5	3	3.5	4	5	5	5.5	6	7	7.5	9	9	10
t_2	+0,1 / +0,2	1	1.4	1.8	2.3	2.8	3.3	3.3	3.3	3.8	4.3	4.4	4.9	5.4	5.4	6.4

Bore diameters specified as common inch sizes receive standard keyways according to ANSI B17.1. Special keyway dimensions are also available upon request.



MODEL THK

SIZE			15	30	60	150	200	300	500
Adjustment range available from - to (approx. values)	(Nm)	T_{KN}	5-15 12-25 20-40 35-70	5-20 10-30 20-60 50-100	10-30 25-80 50-115	20-70 45-150 80-225	30-90 60-160 140-280 250-400	100-200 150-240 220-440	80-200 200-350 320-650
Adjustment range available from - to (approx. values) ("F" Version)	(Nm)	T_{KN}	7-15	8-20 or 16-30	10-30 20-40 30-60	20-60 40-80 80-150	80-140 or 130-200	120-180 160-300 300-450	50-150 100-300 250-400
Overall length A	(mm)	A	34	43	46	48.5	54	57	71.5
Overall length ("F" Version)	(mm)	A^F	34	43	46	48.5	57	60	75
Actuation ring Ø	(mm)	B	55	65	73	92	99	120	135
Actuation ring Ø, ("F" Version)	(mm)	B^F	62	70	83	98	117	132	155
Inner diameter from Ø to Ø H7	(mm)	D	8-19	12-25.4	12-30	15-38	20-44	25-50	25-58
Pilot diameter h7	(mm)	E	40	47	55	68	75	82	90
Bolt-hole circle diameter ± 0.2	(mm)	F	47	54	63	78	85	98	110
Flange outside diameter -0.2	(mm)	G	53	63	72	87	98	112	128
Thread		H	6xM4	6xM5	6xM5	6xM6	6xM6	6xM8	6xM8
Thread depth	(mm)	I	6	8	9	10	10	10	12
Centering length -0.2	(mm)	J	3	5	5	5	5	6	9
Distance	(mm)	K	8	11	11	12	12	15	21
Distance	(mm)	L	27	35	37	39	44	47	59
Distance, ("F" Version)	(mm)	L^F	27	37	39	41.5	47	51.5	68
Diameter	(mm)	O	35	42	49	62	67	75	84
Diameter h7	(mm)	O_1	27	32	39	50	55	65	72
Distance	(mm)	R	2.5	2.5	2.5	2.5	3	3	4
Moment of inertia	(10^{-3}kgm²)	J_{ges}	0.15	0.25	0.50	1.60	2.70	5.20	8.6
Approx. weight	(kg)		0.4	0.7	1.0	1.3	2.0	3.0	4.0
Actuation distance	(mm)		1.5	1.5	1.7	1.9	2.2	2.2	2.2

A^F, B^F, L^F = Full disengagement / manual re-engegement version (F)

*Ø 12 mm only available with shallow keyway (height = 1.2mm$^{+0.2}$)

* bore diameter < 6 mm delivered without keyway

ORDERING EXAMPLE	THK / TA	10	W	15.88	4	2-6	XX
Model	●						Special designation only (e.g. special bore / keyway dimensions).
Size		●					
Function system			●				
Bore D1 H7				●			
Disengagement torque Nm					●		
Torque adjustment range Nm						●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. THK / 10 / W / 15.88 / 4 / 2-6 / XX; XX=stainless steel)

TB

COUPLING WITH CLAMPING HUBS
5 - 500 Nm

PROPERTIES

MATERIAL

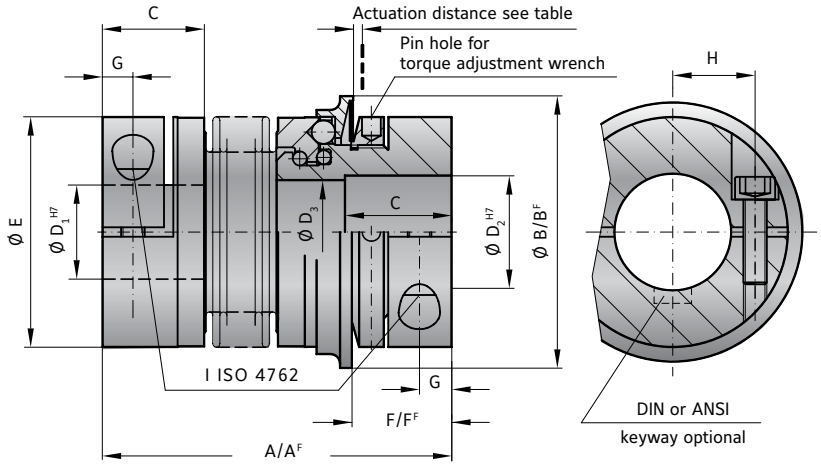
- **Bellows:** high grade stainless steel
- **Clutch system:** hardened steel
- **Clamping hubs:** up to size 80 aluminum, size 150 and up steel

DESIGN

Two clamping hubs with one clamping screw in each. Clutch system: spring loaded ball-detent principle. Operable temperature range from -30 to +100° C.

AVAILABLE FUNCTION SYSTEMS

- W = Single postion
- D = Multi-position
- G = Load holding / load blocking
- F = Full disengagement / manual re-engagement



MODEL TB

SIZE		15		30		60		80		150		200		300		500	
Adjustment range available from - to (approx. values) (Nm)	T_{KN}	5-10 or 8-20		10-25 or 20-40		10-30 or 25-80		20-70 or 30-90		20-70 45-150 80-180		30-90 60-160 120-240		100-200 150-240 200-320		80-200 200-350 300-500	
Adjustment range available from - to (approx. values) ("F" Version) (Nm)	T_{KN}	7-15		8-20 or 16-30		20-40 or 30-60		20-60 or 40-80		20-60 40-80 80-150		80-140 or 130-200		120-180 or 160-300		60-150 100-300 250-500	
Overall length (mm)	A	75	82	87	95	102	112	115	127	116	128	128	140	139	153	163	177
Overall length, ("F" Version) (mm)	A^F	75	82	87	95	102	112	117	129	118	130	131	143	142	156	167	181
Actuation ring Ø (mm)	B	55		65		73		92		92		99		120		135	
Actuation ring Ø, ("F" Version) (mm)	B^F	62		70		83		98		98		117		132		155	
Clamping fit length (mm)	C	22		27		31		35		35		40		42		51	
Inside diameter from Ø to Ø H7 (mm)	D_1/D_2	10-26		12-30		15-32		19-42		19-42		24-45		30-60		35-60	
Diameter (mm)	D_3	21.1		24.1		32.1		36.1		36.1		42.1		58.1		60.1	
Outside diameter of coupling (mm)	E	49		55		66		81		81		90		110		123	
Distance (mm)	F	19		24		28		31		31		35		35		45	
Distance, ("F" Version) (mm)	F^F	19		22		29		31		30		33		35		43	
Distance (mm)	G	6.5		7.5		9.5		11		11		12.5		13		17	
Distance between centers (mm)	H	17		19		23		27		27		31		39		41	
Screw ISO 4762	I	M5		M6		M8		M10		M10		M12		M12		M16	
Tightening torque (Nm)		8		15		40		50		70		120		130		200	
Approx. weight (kg)		0.4		0.6		1.0		2.0		2.4		4.0		5.9		9.6	
Moment of inertia (10^{-3} kgm²)	J_{ges}	0.10	0.15	0.27	0.32	0.75	0.80	1.80	1.90	2.50	2.80	5.10	5.30	11.5	11.8	22.8	23.0
Torsional stiffness (10^3 Nm/rad)	C_T	20	15	39	28	76	55	129	85	175	110	191	140	420	350	510	500
Lateral ± (mm)	max. values	0.15	0.20	0.20	0.25	0.20	0.25	0.20	0.25	0.20	0.25	0.25	0.30	0.25	0.30	0.30	0.35
Angular ± (Degree)		1	1.5	1	1.5	1	1.5	1	1.5	1	1.5	1.5	2	1.5	2	2	2.5
Lateral spring stiffness (N/mm)		475	137	900	270	1200	420	920	255	1550	435	2040	610	3750	1050	2500	840
Actuation distance (mm)		1.5		1.5		1.7		1.9		1.9		2.2		2.2		2.2	

A^F, B^F, L^F = Full disengagement / manual re-engegement version (F)

* keyway with max. bore only in clamping hub possible.

Larger versions available upon request.

Ordering example, see page 52.

TE

PRESS-FIT ELASTOMER WITH CLAMPING HUB

1 - 500 Nm

PROPERTIES

MATERIAL

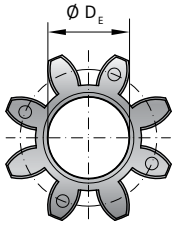
- **Clutch system:** hardened steel
- **Hub D1:** high strength aluminum
- **Hub D2:** up to size 60 high strength aluminum, size 150 and up steel
- **Elastomer insert:** wear resistant thermally stable TPU
- **Available Systems:** W, D, F, G

DESIGN

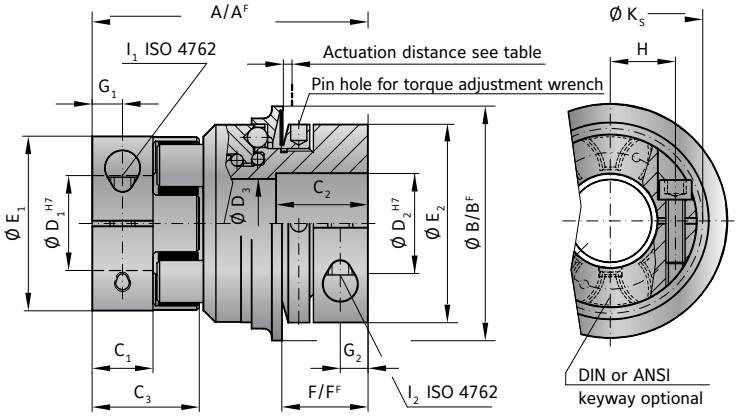
Two clamping hubs with one clamping screw in each and concave driving jaws. Backlash free, vibration damping, electrically isolating elastomer insert press fit into the jaw sets. Clutch system: spring loaded ball-detent principle.

ORDERING EXAMPLE

see page 52



Size 5-450
elastomer insert
type A / B, for details
see page 31



MODEL TE

Size			5		10		20		60		150		300		450	
Type (Elastomer insert)			A	B	A	B	A	B	A	B	A	B	A	B	A	B
Rated torque	(Nm)	T_{KN}	9	12	12.5	16	17	21	60	75	160	200	325	405	530	660
Max. torque*	(Nm)	T_{Kmax}	18	24	25	32	34	42	120	150	320	400	650	810	1060	1350
Adjustment range possible from -to	(Nm)	T_{KN}	1-3 or 3-6		2 - 6 or 4 - 12		10 - 25 or 20 - 40		10 - 30 or 25 - 80		20 - 70 45 - 150 80 - 180		100 - 200 150 - 240 200 - 320		80 - 200 200 - 350 300 - 500	
Adjustment range ("F" Version) possible from -to	(Nm)	T_{KN}^F	2.5 - 4.5		2 - 5 or 5 - 10		8 - 20 or 16 - 30		20 - 40 or 30 - 60		20 - 60 40 - 80 80 - 150		120 - 180 or 180 - 300		60 - 150 100 - 300 250 - 500	
Overall length	(mm)	A	50		60		86		96		106		140		164	
Overall length ("F" Version)	(mm)	A_F	50		60		86		96		108		143		168	
Actuation ring Ø	(mm)	B	35		45		65		73		92		120		135	
Outside diameter of actuation ring ("F" Version)	(mm)	B_F	42		51.5		70		83		98		132		155	
Clamping fit length	(mm)	C_1	8		10.3		17		20		21		31		34	
Fit length	(mm)	C_2	14		16		27		31		35		42		51	
Length of hub	(mm)	C_3	16.7		20.7		31		36		39		52		57	
Inside diameter from Ø to Ø H7	(mm)	D_1	4 - 12.7**		5 - 16**		8 - 25		12 - 32		19 - 36		20 - 45		28 - 60	
Inside diameter from Ø to Ø H7	(mm)	D_2	6 - 14**		6 - 20**		12 - 30		15 - 32		19 - 42		30 - 60		35 - 60	
Diameter Ø	(mm)	D_3	14.1		20.1		24.1		32.1		36.1		58.1		60.1	
Inside diameter (Elastomer insert)	(mm)	D_E	10.2		14.2		19.2		26.2		29.2		36.2		46.2	
Diameter of the hub	(mm)	E_1	25		32		42		56		66.5		82		102	
Diameter of the hub	(mm)	E_2	19		40		55		66		81		110		123	
Distance	(mm)	F	15		17		24		28		31		35		45	
Distance ("F" Version)	(mm)	F_F	14		16		22		29		30		35		43	
Distance	(mm)	G_1	4		5		8.5		10		11		15		17.5	
Distance	(mm)	G_2	5		5		7.5		9.5		11		13		17	
Distance between centers	(mm)	H_1	8		10.5		15		21		24		29		38	
Screws (ISO 4762)		I_1	M3		M4		M5		M6		M8		M10		M12	
Tightening torque	(Nm)		2		4.5		8		15		35		70		120	
Distance between centers D2 side	(mm)	H_2	10		15		19		23		27		39		41	
Screws (ISO 4762)		I_2	M4		M4		M6		M8		M10		M12		M16	
Tightening torque	(Nm)		4		4.5		15		40		70		130		200	
Diameter with screwhead	(mm)	K_S	25		32		44.5		57		68		85		105	
Approx. weight	(kg)		0.2		0.3		0.6		1.0		2.4		5.8		9.3	
Moment of inertia	(10^{-3} kgm^2)	J_{ges}	0.02		0.06		0.25		0.7		2.3		11		22	
Actuation distance	(mm)		0.8		1.2		1.5		1.7		1.9		2.2		2.2	

For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts see page 31. A^F, B^F, L^F = Full disengagement / manual re-engegement version (F)

* Maximum transmittable torque of the clamping hub depends on the bore diameter see table on page 32.
** keyway with max. bore only in clamping hub possible.

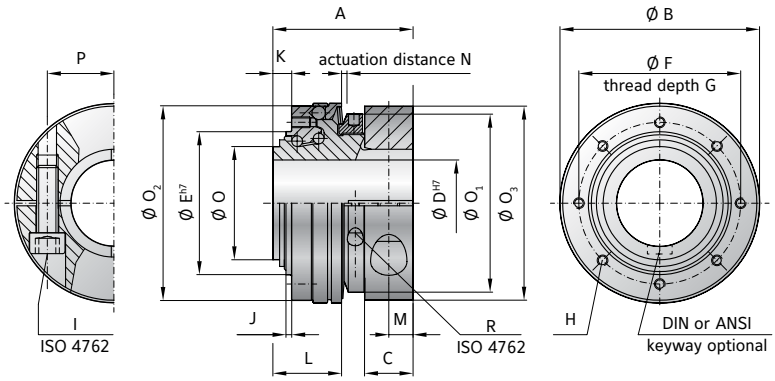
TA

COUPLING WITH CLAMPING COLLAR
10 - 700 Nm

PROPERTIES

DESIGN
With clamping collar and a single clamping screw.
Clutch system: spring loaded ball-detent principle. Operable temperature range from -30 to +120° C.

AVAILABLE FUNCTION SYSTEMS
- W = Single postion / automatic re-engagement (standard)
- D = Multi-position / automatic re-engagement



MODEL TA

SIZE			30	60	150	300
Adjustment range* from - to	(Nm)	T_{KN}	10-35 30-80 40-135	30-80 60-120 100-200	40-100 100-200 150-300	200-350 300-450 400-550 550-700
Overall length	(mm)	A	45	53	63	72
Actuation ring Ø	(mm)	B	63	74	92	118
Clamping fit length	(mm)	C	15	18	22	24
Bore diameter from Ø to Ø H7	(mm)	D	12-30	16-35	19-42	22-60
Pilot diameter h7	(mm)	E	43	53	68	85
Bolt-hole circle diameter ± 0.2	(mm)	F	48	60	75	95
Thread depth +1	(mm)	G	5	6	7	9
Fastening threads		H	8x M4	8x M4	8x M5	8x M6
Screw ISO 4762		I	M6	M8	M10	M12
Tightening torque	(Nm)		15	40	75	130
Centering length -0.2	(mm)	J	2	2	3	3
Distance	(mm)	K	6	7	9	9
Distance to actuation ring edge	(mm)	L	23	26	32	36
Distance	(mm)	M	7.5	9	11	12
Actuation distance	(mm)	N	1.3	1.5	1.8	2
Ø Base element	(mm)	O	35	42	54	70
Ø Adjustment nut	(mm)	O_1	55	66	82	100
Ø Flange -0.2	(mm)	O_2	58	72	87	110
Ø Clamp ring	(mm)	O_3	59	72	90	114
Distance between centers	(mm)	P	21.5	25	33	41
Adjustment nut's clamp screw ISO 4762		R	M3	M3	M3	M4
Tightening torque	(Nm)		2	2	2	4.5
Approx. weight	(kg)		0.3	0.5	0.8	1.5
Approx. moment of inertia at D max	(10^{-3} Kgm²)	J_{ges}	0.15	0.3	1	3

*Maximum transmittable torque of the clamping hub depends on the bore diameter / see table below.
Ordering example, see page 47.

MAXIMUM TRANSMITTABLE TORQUE IN RELATION TO BORE DIAMETER

SIZE	Ø 12	Ø 15	Ø 20	Ø 25	Ø 30	Ø 35	Ø 40	Ø 45	Ø 50	Ø 55	Ø 60
30	30	55	80	110	130						
60		80	120	160	200	220					
150			200	250	300	350	400	450			
300				350	430	510	590	670	750	830	910

Higher torque possible with keyway.

TAE

PRESS-FIT ELASTOMER WITH CLAMPING HUB

10 - 700 Nm

PROPERTIES

DESIGN

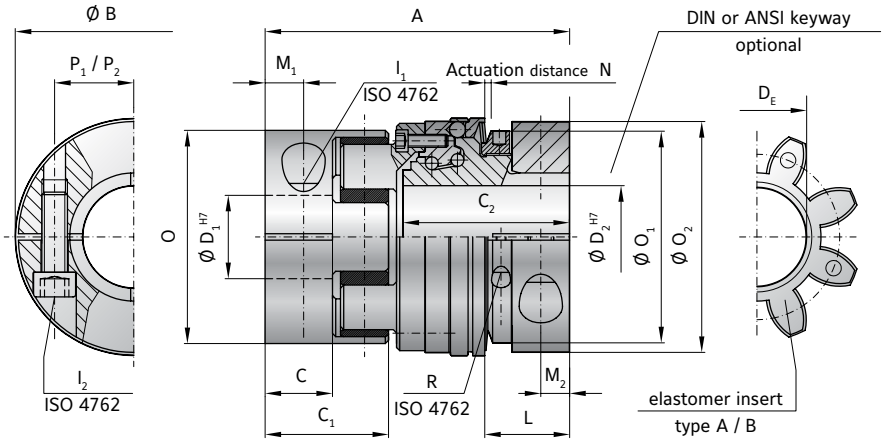
Clamping collar with clamping screw. Clamping hub with concave driving jaws and clamping screw. Backlash free, vibration damping, electrically isolating elastomer insert press fit into the jaw sets. Clutch system: spring loaded ball-detent principle, in a special compact, low inertia design.

AVAILABLE FUNCTION SYSTEMS

- W = Single postion / automatic re-engagement (standard)
- D = Multi-position / automatic re-engagement

ORDERING EXAMPLE

see page 52



MODEL TAE

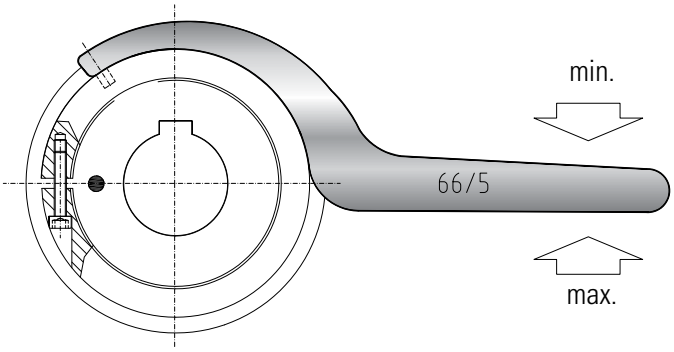
SIZE			30		60		150		300	
Type (elastomer insert)			A	B	A	B	A	B	A	B
Rated torque		T_{KN}	60	75	160	200	325	405	530	660
Max. torque		$T_{KN\ max}$	120	150	320	400	650	810	1060	1350
Adjustment range* possible from -to	(Nm)	T_{KN}	10-35 30-80 40-135		30-80 60-120 100-200		40-100 100-200 150-300		200-350 300-450 400-550 550-700	
Overall length	(mm)	A	85		93		122		135	
Actuation ring diameter	(mm)	B	63		74		92		118	
Hub length (coupling hub end)	(mm)	C/C_1	20 / 36		21 / 39		31 / 52		34 / 57	
Length of hub (torque limiting portion)		C_2	45		53		63		72	
Bore diameter from Ø to Ø H7	(mm)	D_1/D_2	12-32 /12-30		16-36 / 16-35		19-45 / 19-42		22-60 / 22-60	
Inner diameter (elastomer insert)		D_E	26.2		29.2		36.2		46.2	
ISO 4762 screw, coupling side / torque limiter side		I_1/I_2	M6		M8		M10		M12	
Tightening torque	(Nm)		15		40		75		130	
Distance to actuation ring edge	(mm)	L	22		26		32		35	
Distance	(mm)	M_1/M_2	10 / 7.5		12 / 9		15 / 11		17.5 / 12	
Actuation distance	(mm)	N	1.3		1.5		1.8		2	
Clamping hub Ø, elastomer coupling		O	56		66.5		82		102	
Ø Adjustment nut		O_1	55		66		82		100	
Clamping hub Ø, safety coupling		O_2	59		72		90		112	
Distance to clamping screw, coupling side / torque limiter side		P_1/P_2	21 / 21.5		24 / 25		29 / 33		38 / 41	
Adjustment nut's clamp screw ISO 4762		R	M3		M3		M3		M4	
Tightening torque	(Nm)		2		2		2		4.5	
Approx. weight	(kg)		0.4		0.8		1.5		2.9	
Approx. moment of inertia at D max.(10^{-3} Kgm²)		J_{ges}	0.3		1		1.8		5	
Static torsional rigidity	(Nm/rad)		3290	9750	4970	10600	12400	18000	15100	27000
Dynamic torsional rigidity	(Nm/rad)		7940	11900	13400	29300	23700	40400	55400	81200
Lateral ±	approx. (mm)		0.12	0.1	0.15	0.12	0.18	0.14	0.2	0.18

ACCESSORIES FOR TH/TB/TE/TA
TORQUE LIMITERS

DIEQUA SPANNER WRENCH FOR TORQUE ADJUSTMENT

TH **TB** **TE** **TA**

For smaller couplings the spanner wrench is not necessary. In sizes 1.5/2/4.5/10 the torque adjustment nut is easily turned with a screw or pin.



ORDER NUMBERS

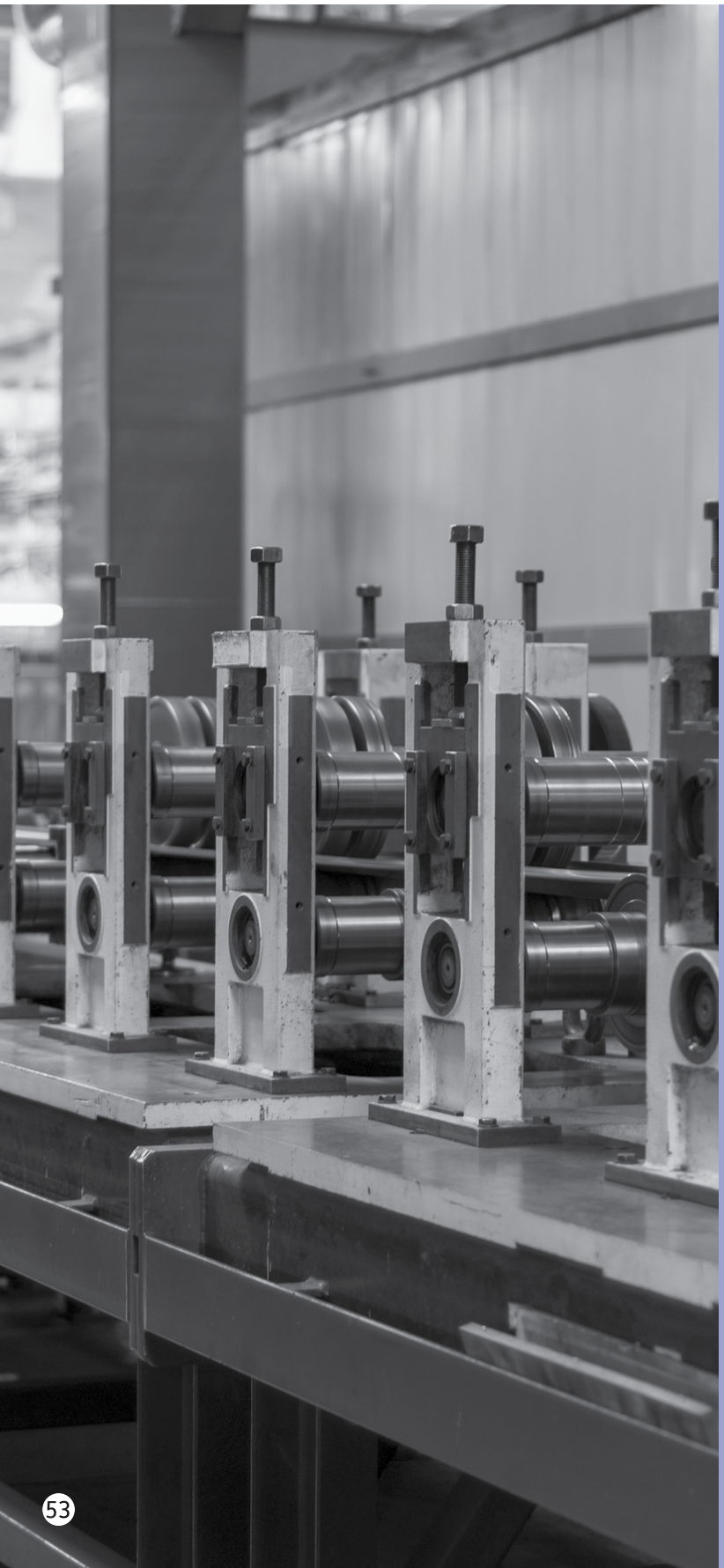
COUPLING SIZE	TH / TB Single postion Multi-position Load holding	TH / TB Full disengagement	TE Single postion Multi-position Load holding	TE Full disengagement	TA Single postion Multi-position
15	49/4	49/4	–	–	–
20	–	–	55/4	55/4	–
30	55/4	55/4	–	-	55/4
60	66/5	66/5	66/5	66/5	66/5
80	82/5	82/5	–	-	–
150	82/5	82/5	82/5	82/5	82/5
200	90/6	98/5	–	–	–
300	114/6	114/6	114/6	114/6	100/6
450	–	–	126/8	126/8	–
500	126/8	126/8	–	–	–

ORDERING EXAMPLE	TB / TE / TAE	60	W	30	20	80	40-100	XX
Model	●							Special designation only (e.g. special bore / keyway dimensions).
Size		●						
Function system			●					
Bore D1 H7				●				
Bore D2 H7					●			
Disengagement torque Nm						●		
Torque adjustment range Nm							●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. TB / 60 / W / 30 / 20 / 80 / 40-100; XX=special dual keyway)

DIEQUA Corporation
630-980-1133
diequa.com

SERIES L



BACKLASH FREE LINE SHAFTS
10 - 660 Nm

SERVICE LIFE
DieQua line shafts are wear and maintenance free for an infinite service life, as long as the performance limits are not exceeded.

FIT CLEARANCE
Overall shaft/hub clearance of 0.01 - 0.05 mm

ROTATIONAL SPEED
After selecting overall length A, please contact DieQua for maximum speed.

SPECIAL SOLUTIONS
Various materials, tolerances, dimensions and performance ratings are available for custom applications upon request.

ATEX (Optional)
For use in hazardous zones 1/21 and 2/22, DieQua line shafts have been authorized under directive 94/9/EG and are available with certification.

DIEQUA Corporation
630-980-1133
diequa.com

SERIES L

BACKLASH FREE, TORSIONALLY STIFF **LINE SHAFTS**
10 - 660 Nm

MODEL FEATURES

LB

with clamping hub
from 10 - 500 Nm

- installation and removal possible without disturbing other machine components
- standard lengths up to 6 meters
- no intermediate support bearings required

page 55

LBS

with split clamping hub
from 10 - 500 Nm

- complete coupling system mounts laterally for very easy installation and removal
- standard lengths up to 6 meters
- no intermediate support bearings required

page 56

LE

with split clamping hub
from 12.5 - 660 Nm

- standard lengths up to 4 meters
- no intermediate support bearings required
- complete coupling system mounts laterally for very easy installation and removal

page 57

LB

LINE SHAFT WITH CLAMPING HUB

10 – 500 Nm

PROPERTIES

FEATURES

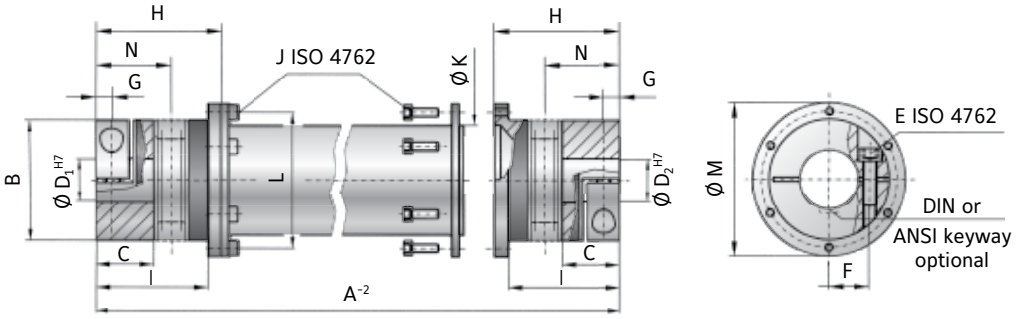
- for spanning larger distances between shaft ends
- standard lengths up to 6 meters
- no intermediate support bearings required
- extremely straight and laterally stiff intermediate tube

MATERIAL

- **Bellows:** high grade stainless steel
- **Intermediate tube:** up to size 150 aluminum, size 300 and up steel
- **Hubs:** up to size 60 aluminum, size 150 and up steel

DESIGN

Two clamping hubs with a single clamping screw in each. A special support system carries the weight of the tube on the hubs. Operable temperature range from -30 to +100 °C.



MODEL LB

SIZE			10	30	60	150	200	300	500
Rated torque	(Nm)	T_{KN}	10	30	60	150	200	300	500
Overall length min. to max.	(mm)	A^{-2}	110 - 6000	140 - 6000	170 - 6000	190 - 6000	210 - 6000	250 - 6000	260 - 6000
Outside diameter clamping hub	(mm)	B	40	55	66	81	90	110	123
Fit length	(mm)	C	16	27	31	35.5	40.5	43	50
Inside diameter from Ø to Ø H7	(mm)	$D_{1/2}$	5 - 20	10 - 28	12 - 32	19 - 42	22 - 45	30 - 60	35 - 60
With keyway max. Ø H7	(mm)	$D_{1/2}$	17	23	29	36	45	60	60
ISO 4762 clamping screw		E	M4	M6	M8	M10	M12	M12	M16
Tightening torque	(Nm)	E	5	15	40	70	110	130	200
Distance between centers	(mm)	F	15	19	23	27	31	39	41
Distance	(mm)	G	5	7.5	9.5	11	12.5	13	17
Length bellows body	(mm)	H	44.5	57.5	71	78	86	94	110
Distance	(mm)	I	38.5	51	61	69	75.5	81	96
ISO 4762 clamping screw		J	4x M4	6x M4	6x M5	8x M6	8x M6	8x M8	8x M8
Tightening torque	(Nm)	J	3	4	7	10	12	30	30
Outside diameter tube section	(mm)	K	35	50	60	76	90	100	110
Bolt hole circle Ø	(mm)	L	45	62.5	71.5	88	100	120	132
Outside diameter flange	(mm)	M	52	70	80	98	110	135	148
Shaft average value	(mm)	N	25	34	41	47	52	56	66

For maximum misalignment values see pages 12 - 15.

ORDERING EXAMPLE	LB	10	1551	18	19.05	XX
Model	●					Special designation only (e.g. special bore tolerance).
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Bore D2 H7					●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. LB / 10 / 1551 / 18 / 19.05 / XX; XX=anodized aluminum)

LBS

LINE SHAFT WITH SPLIT CLAMPING HUB

10 – 500 Nm

PROPERTIES

FEATURES

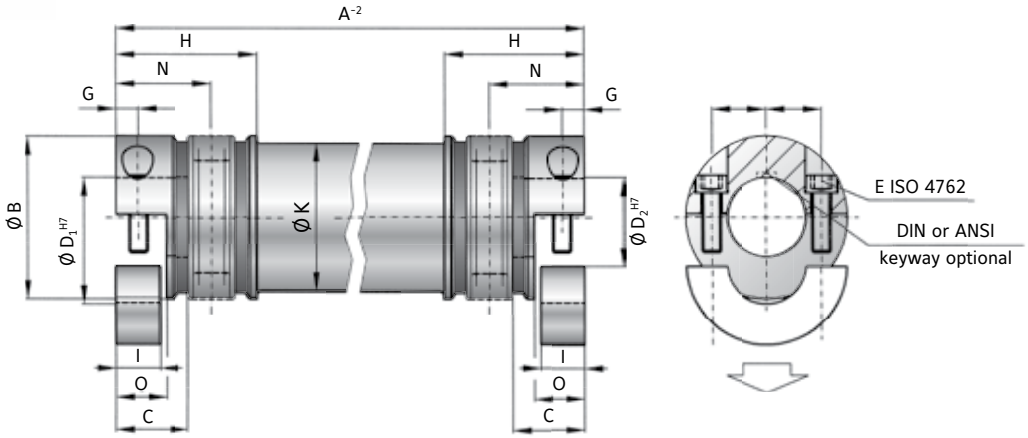
- for spanning larger distances between shaft ends
- standard lengths up to 6 meters
- no intermediate support bearings required
- extremely straight and laterally stiff intermediate tube

MATERIAL

- **Bellows:** high grade stainless steel
- **Intermediate tube:** up to size 150 aluminum, size 300 and up steel
- **Hubs:** up to size 60 aluminum, size 150 and up steel

DESIGN

Two clamping hubs with two clamping screws in each. A special support system carries the weight of the tube on the hubs. Operable temperature range from -30 to +100 °C.



MODEL LBS

SIZE			10	30	60	150	300	500
Rated torque	(Nm)	T_{KN}	10	30	60	150	300	500
Overall length min. to max.	(mm)	A^{-2}	100 - 6000	130 - 6000	160 - 6000	180 - 6000	240 - 6000	250 - 6000
Outside diameter clamping hub	(mm)	B	40	55	66	81	110	123
Fit length	(mm)	C	16	27	31	34.5	42	50
Inside diameter from Ø to Ø H7	(mm)	$D_{1/2}$	5 - 20	10 - 28	12 - 32	19 - 42	30 - 60	35 - 60
Max. inside diameter clamping hub	(mm)	D_{max}	24	30	32	42	60	60
With keyway - max Ø H7	(mm)	$D_{1/2}$	17	23	29	36	60	60
ISO 4762 clamping screws		E	M4	M6	M8	M10	M12	M16
Tightening torque	(Nm)		5	15	40	70	130	200
Distance between centers	(mm)	F	15	19	23	27	39	41
Distance	(mm)	G	5	7.5	9.5	12	14	17
Length bellows body	(mm)	H	39.5	52	64	72	83	96
Clamping length	(mm)	I	10	15	19	22	28	33.5
Outside diameter tube section	(mm)	K	35	50	60	76	100	110
Length	(mm)	O	11.5	17	21	24	30	35.5
Shaft average value	(mm)	N	25	34	41	47	56	66

For maximum misalignment values see pages 12 - 15.

ORDERING EXAMPLE	LBS	10	1551	18	19.05	XX
Model	●					Special designation only (e.g. special bore tolerance).
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Bore D2 H7					●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. LBS / 10 / 1551 / 18 / 19.05 / XX; XX=anodized aluminum)

LE

LINE SHAFT WITH SPLIT CLAMPING HUB

12.5 – 660 Nm

PROPERTIES

FEATURES

- easy installation and removal
- standard lengths up to 4 meters
- no intermediate support bearings required

MATERIAL

- **Hubs:** high strength aluminum
- **Intermediate tube:** high strength aluminum
- **Elastomer insert:** wear resistant, thermally stable TPU

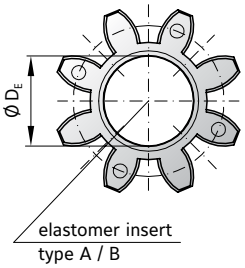
DESIGN

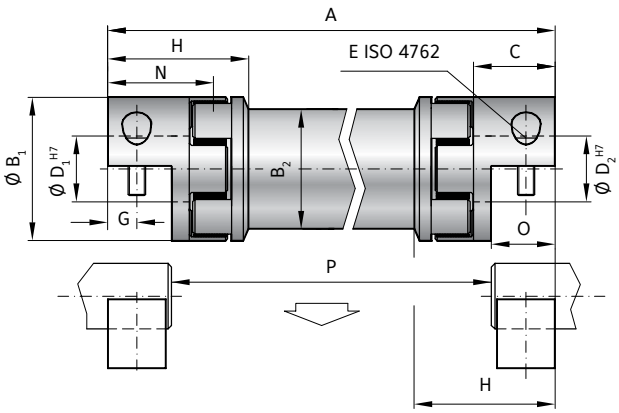
Two split clamping hubs, with two clamping screws in each, and concave driving jaws. Backlash free, vibration damping, electrically isolating elastomer inserts press fit into the hubs. Precision intermediate tube with a high level of straightness and lateral stiffness.

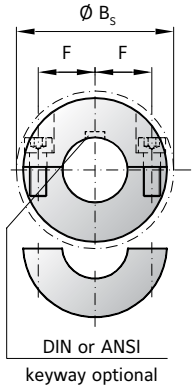
ORDERING EXAMPLE

see page 58

DESIGN | SIZE 10 – 450







For details on the elastomer inserts see pages 32

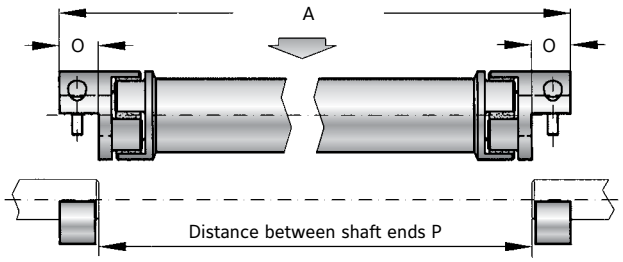
MODEL LE

SIZE		10		20		60		150		300		450	
Type (Elastomer insert)		A	B	A	B	A	B	A	B	A	B	A	B
Rated torque (Nm)	T_{KN}	12.5	16	17	21	60	75	160	200	325	405	530	660
Max. torque* (Nm)	T_{Kmax}	25	32	34	42	120	150	320	400	650	810	1060	1350
Overall length (mm)	A	95 - 4,000		130 - 4,000		175 - 4,000		200 - 4,000		245 - 4,000		280 - 4,000	
Outside diameter hub (mm)	B_1	32		42		56		66.5		82		102	
Outside diameter tube (mm)	B_2	28		35		50		60		76		90	
Outside diameter with screwhead(mm)	B_S	32		44.5		57		68		85		105	
Fit length (mm)	C	20		25		40		47		55		65	
Inside diameter range from Ø to Ø H7 (mm)	$D_{1/2}$	5 - 16		8 - 25		14 - 32		19 - 36		19 - 45		24 - 60	
Max. inside diameter (Elastomer insert) (mm)	D_E	14.2		19.2		26.2		29.2		36.2		46.2	
Mounting screw ISO 4762	E	4 x M4		4 x M5		4 x M6		4 x M8		4 x M10		4 x M12	
Tightening torque (Nm)		4		8		15		35		70		120	
Distance between centers (mm)	F	10.5		15.5		21		24		29		38	
Distance (mm)	G/G_1	7.5		8.5		15		17.5		20		25	
Coupling length(mm)	H	34		46		63		73		84		97	
Moment of inertia per hub (10^{-3} kgm²)	J_1/J_2	0.01		0.02		0.15		0.21		1.02		2.3	
Inertia of tube per meter(10^{-3} kgm²)	J_3	0.075		0.183		0.66		1.18		2.48		10.6	
Combined dynamic torsional stiffness of the inserts(Nm/rad)	C_{Tdyn}^{E}	270	825	1,270	2,220	3,970	5,950	6,700	14,650	11,850	20,200	27,700	40,600
Torsional stiffness of tube per meter (Nm/rad)	C_T^{ZWR}	321		1,530		6,632		11,810		20,230		65,340	
Shaft average value (mm)	N	26		33		49		57		67		78	
Length (mm)	O	16.6		18.6		32		37		42		52	

* Maximum transmittable torque of the clamping hub depends on the bore diameter (see page 32).
For maximum misalignment values see pages 12 - 15.

INSTALLATION

The overall length A is best determined as the distance between shaft ends P plus 2x dimension O.



ORDERING EXAMPLE	LE	20	1200	A	24	19.05	XX
Model	●						Special designation only (e.g. special bore tolerance).
Size		●					
Overall length mm			●				
Elastomer insert type				●			
Bore D1 H7					●		
Bore D2 H7						●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. LE / 20 / 1200 / A / 24 / 19.05 / XX; XX=anodized aluminum)

The DieQua Advantage

DieQua Corporation has been a manufacturer and supplier of precision motion control components since 1980. We offer the widest range of servo gearhead and speed reducing solutions available from a single source. Featuring right angle and inline designs with multiple backlash precision levels, the largest number of ratios, and several mounting and output options, we have the drive that meets your needs.

Sales

DieQua has established a network of sales associates and high tech distributors, supported by our inside sales team, to provide personal service to our valued customers.

Customer Service

DieQua is dedicated to being your most valuable supplier. From technical support to on-time delivery, you can count on DieQua to be a reliable extension of your design team.

Engineering

DieQua has several decades of combined experience specifying rotary motion control components. This assures the proper identification and selection for your unique requirements.

Manufacturing

DieQua manufactures or assembles the majority of the products we provide. This adds valuable flexibility to provide reliable and cost effective on-time delivery of your production orders.

Warehousing

DieQua maintains an extensive inventory of common gearheads and servo motor connection components to provide quick delivery of prototypes, small orders and spare parts.

Special Designs

DieQua offers component dimension modifications or complete special designs. These capabilities compliment our philosophy of offering the best possible solution available.

DIEQUA Corporation
Motion Components and Engineering Services

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