RELIABLE | PRECISE | COMPACT

R+W®
A POPPE + POTTHOFF COMPANY

# PRECISION COUPLINGS

EXACT AND BACKLASH FREE FOR PRECISION SERVO AND STEPPER DRIVE APPLICATIONS.

# WHO WE ARE.

## ABOVE ALL R+W IS:
## THE PERFECT COUPLING.

When R+W Antriebselemente GmbH was first established in 1990 in Klingenberg, Germany, there were three people on board. The head office is still there, but we are now more than 170 people, with subsidiaries in the USA, China, Italy, Singapore, France and Slovakia, and are partnered with over 60 well established distributors in more than 40 countries throughout the world. Many developments have lead to this success, but most importantly it was brought about by our endless search for the best possible coupling solutions as well as the high esteem in which we hold all of our customers.

### WE PROVIDE INSPIRED SOLUTIONS BACKED BY SOUND PLANNING AND DESIGN.

R+W stands for expertise in the development of solutions for precise torque transmission. The focus of our development is on innovative coupling systems for all sectors of precision drive technology. As a leading manufacturer of precision couplings and line shafts, we strive to maintain a permanent status of technology leadership in our field. Our central claim: R+W couplings ensure precision for process reliability and efficiency, and to that end we seek perfection.

Optimized for technology and business, our product portfolio includes:

- **Bellows couplings**
- **Elastomer insert couplings**
- **Ball-detent safety couplings**
- **Line shaft couplings**
- **High torque industrial couplings**
- **Development of customized solutions with collaboration from start to finish, including:**
  - Consultation
  - Conception
  - Engineering analysis
  - Prototyping
  - Manufacturing

## DRIVE

**D - DYNAMIC**

Our staff is trained to always be ready and willing to provide a quick reaction to customer inquiries. Our product, the core of which is based on handling high performance, dynamic applications, is increasingly available for fast delivery.

**R - RELIABLE**

Many of our products are designed for infinite life with zero maintenance required. With thorough engineering processes in place, and an ISO 9001:2008 certified production facility, we continue to deliver high quality coupling products with a high level of reliability.

**I - INNOVATIVE**

Our business was founded on developing unique and innovative solutions to common coupling problems. Our staff in turn is constantly developing its work flows to streamline delivery and simplify the process for our customers.

**V - VERSATILE**

With products successfully applied and deployed in over 125 industry segments, chances are very good that we have an expert on our versatile staff that is familiar with your application requirements.

**E - EXPANDING**

With double digit annual growth the norm, our company is ever expanding, adding new product offerings and opening new service centers throughout the world all the time.

## OTHER R+W COUPLINGS

Aside from the products detailed in this catalog, we also offer quality shaft couplings and torque limiters for high powered industrial drives.

More information on these can be found in our **industrial couplings catalog**.

# SIZING AND SELECTION

According to
DIN 740 part 2

# SAFETY COUPLINGS

SK SL ES

## 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)
$\alpha$ = Angular acceleration $\frac{1}{s^2}$
t = Acceleration / deceleration time (s)
$\omega$ = Angular velocity (1/s)
n = Drive speed ($min^{-1}$)
s = Screw lead (mm)
$F_V$ = Feed force (N)
$\eta$ = 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)
$\varphi$ = 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

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

## ACCORDING TO ACCELERATION (START-UP WITH NO LOAD)

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

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

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

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

## 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 (SK2 / SK3 / SK5 WITH METAL BELLOWS - ES2 / ESL 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 (SK2 / SK3 / SK5 WITH METAL BELLOWS - ES2 / ESL 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 SK1, SKP, and SKN models in the load holding version can secure a minimum of 2x their torque setting after disengagement. The SK2, SK3, and SK5 models can secure only up to the torque rating of the flexible bellows after disengagement.

# SK SL ES

## SIZES FROM 0.1 – 2,800 Nm
## BACKLASH FREE SAFETY COUPLINGS



### GENERAL INFORMATION ABOUT **R+W SAFETY COUPLINGS:**

Optional:

#### SERVICE LIFE

As long as the technical limits are not exceeded these couplings are wear and maintenance free.

#### FIT CLEARANCE

Overall shaft / hub clearance of 0.01 – 0.05 mm

#### SPECIAL SOLUTIONS

Various materials, tolerances, dimensions and performance ratings available for custom applications on request.

#### ATEX (Optional)

For use in hazardous zones 1/21 and 2/22, these safety couplings have been authorized under directive 94/9/EG and are available with certification.

# SK SL ES

## BACKLASH FREE **SAFETY COUPLINGS**
## SIZES FROM **0.1 - 2,800 Nm**

| MODEL | | FEATURES | |
|---|---|---|---|
| **SK1** |  | **with conical clamping bushing (or clamping hub in smaller sizes) for indirect drives from 0.1 - 2,800 Nm**<br>▶ integral bearing to support sprockets, gears, and other drive elements<br>▶ compact simple design<br>▶ adjustable torque settings | Pages 90-91 |
| **SKN** |  | **with clamping hub for indirect drives from 5 - 1,800 Nm**<br>▶ integral bearing to support sprockets, gears, and other drive elements<br>▶ compact simple design<br>▶ adjustable torque settings | Pages 92-93 |
| **SKP** |  | **with keyway mounting for indirect drives from 0.1 - 2,800 Nm**<br>▶ integral bearing to support sprockets, gears, and other drive elements<br>▶ compact simple design<br>▶ adjustable torque settings | Pages 94-95 |
| **SLN** |  | **with clamping hub for indirect drives from 10 - 700 Nm**<br>▶ integral bearing to support sprockets, gears, and other drive elements<br>▶ adjustable torque settings<br>▶ ultra compact, low inertia version | Page 96 |
| **SLP** |  | **with keyway mounting for indirect drives from 10 - 700 Nm**<br>▶ integral bearing to support sprockets, gears, and other drive elements<br>▶ adjustable torque settings<br>▶ ultra compact, low inertia version | Page 97 |

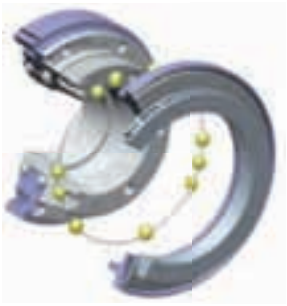
| MODEL | | FEATURES | |
|---|---|---|---|
| **SK2** |  | **with clamping hubs and bellows coupling for direct drives from 0.1 - 1,800 Nm**<br>▶ easy to mount<br>▶ compensation for shaft misalignment<br>▶ adjustable torque settings | Page 98 |
| **SL2** |  | **with clamping hubs and bellows coupling for direct drives from 10 - 400 Nm**<br>▶ easy to mount<br>▶ compensation for shaft misalignment<br>▶ adjustable torque settings<br>▶ ultra compact, low inertia version | Page 99 |
| **SK3** |  | **with conical clamping bushings and bellows coupling for direct drives from 5 - 2,800 Nm**<br>▶ high clamping pressure<br>▶ compensation for shaft misalignment<br>▶ adjustable torque settings | Page 100 |
| **SK5** |  | **with clamping hubs, bellows coupling, and blind mate system for direct drives from 0.1 - 850 Nm**<br>▶ very easy to mount and dismount<br>▶ electrically and thermally isolating<br>▶ adjustable torque settings | Page 101 |

# SK SL ES

## BACKLASH FREE **SAFETY COUPLINGS**
## SIZES FROM **0.1 - 2,800 Nm**

| MODEL | | FEATURES | |
|---|---|---|---|
| **ES2** |  | **with clamping hubs and elastomer coupling for direct drives from 1 - 1,800 Nm**<br>▶ easy to mount<br>▶ vibration damping<br>▶ compensation for shaft misalignment<br>▶ adjustable torque settings | Page 102 |
| **SLE** |  | **with clamping hubs and elastomer coupling for direct drives from 10 - 700 Nm**<br>▶ easy to mount<br>▶ vibration damping<br>▶ compensation for shaft misalignment<br>▶ adjustable torque settings<br>▶ ultra compact, low inertia version | Page 103 |
| **ESL** |  | **with keyway mounting and elastomer coupling for direct drives from 1 - 150 Nm**<br>▶ low cost design<br>▶ vibration damping<br>▶ wear resistant ratcheting ball design | Pages 104-105 |
| **ACCESSORIES** | | **Accessories for safety couplings** | Pages 107-111 |

# AVAILABLE FUNCTION SYSTEMS
## SAFETY COUPLINGS



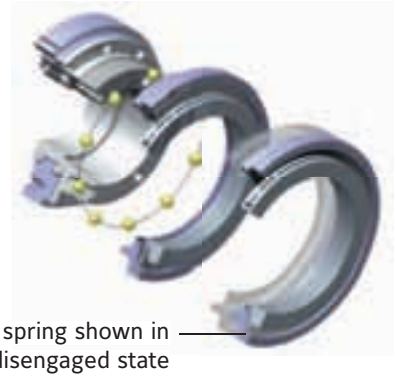
### SINGLE POSITION

**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

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

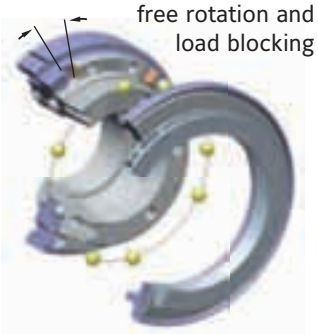


spring shown in disengaged state

### FULL DISENGAGEMENT

- 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 to higher speed applications

**Note:** Coupling can be disengaged manually. Contact R+W for details.



free rotation and load blocking

### LOAD HOLDING / LOAD BLOCKING

- overload detection device
- only limited free rotation after overload disengagement, beyond which the clutch is fully blocked
- 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
# **SAFETY COUPLINGS**

## SINGLE POSITION
## MULTI-POSITION
## LOAD HOLDING

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

## GENERAL INFORMATION

R+W 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.

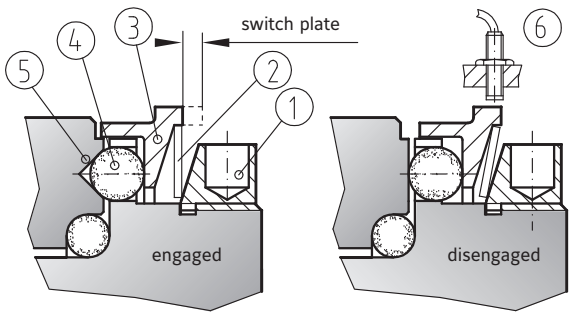
- The torque is transmitted by hardened balls (4) loaded into conical detents (5).
- The balls are loaded into the detents by the spring disc system (2) across the switch plate (3).
- The disengagement torque is continuously adjustable via the torque adjustment nut (1).
- At overload the balls exit their 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

**SK** **SL** **ES 2**

### SINGLE POSITION / MULTI-POSITION

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

**SK** **ES 2**

### LOAD HOLDING / LOAD BLOCKING

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 (see page 85).

## FULL DISENGAGEMENT

**Only attempt re-engagement when the machine is stopped.**

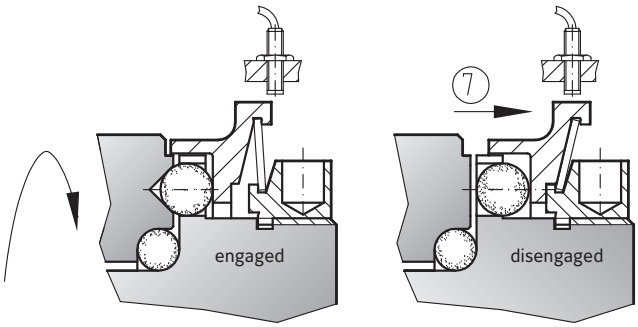
## FUNCTION OF THE BALL-DETENT SYSTEM

**SK** | **ES 2**

### FULL DISENGAGEMENT

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.

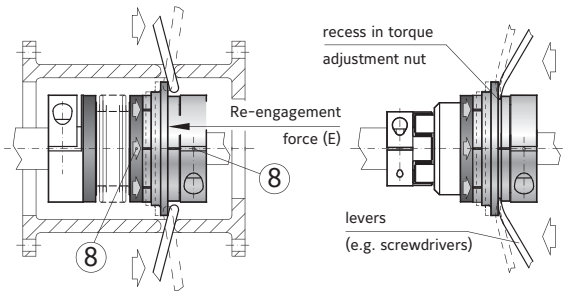
- Re-engagement must be performed manually (see figure at right).




## BALL-DETENT CLUTCHES ARE THE SAME DESIGN IN THE SK AND ES2 SIZES

The R+W 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**

# BEHAVIOR AND CHARACTERISTICS

## SPRING SYSTEM

R+W 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 R+W safety couplings are at the limits of the active range of the disc spring system. Therefore it is critical not to exit the manufacturer 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 R+W for details if applying the safety coupling to a high speed shaft.

## WEAR

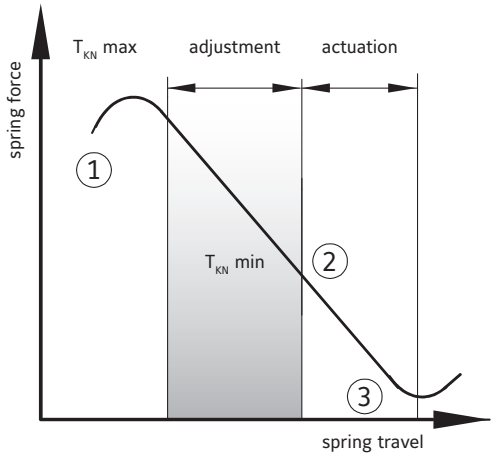
In its engaged state the safety coupling is completely wear free. Service life can be extended significantly by taking measures to stop shaft rotation quickly after disengagement.

## MAINTENANCE

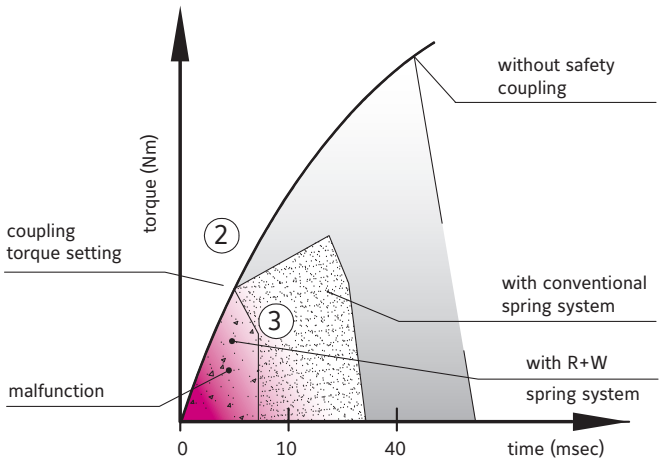
The R+W safety couplings are maintenance free and lubricated for life.

## SPRING CHARACTERISTIC

special design



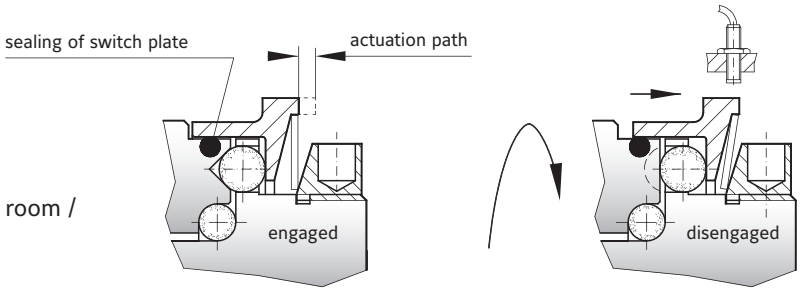

## DISENGAGEMENT




## 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



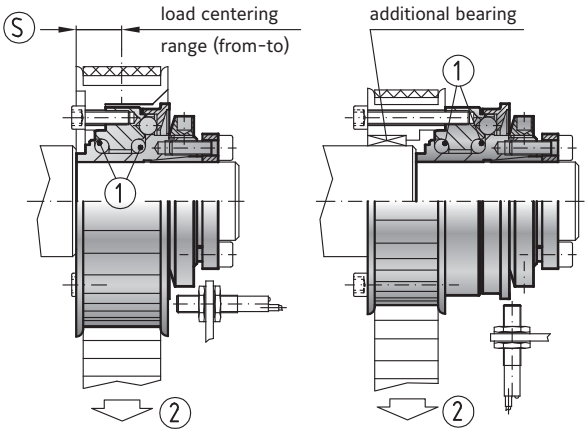
# RADIAL LOADS
## SAFETY COUPLINGS

**SK1** | **SKN** | **SKP** | **SLN** | **SLP**

The models shown 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 SK1/SKN/SKP | 1.5 | 2 | 4.5 | 10 | 15 | 30 | 60 | 150 | 200 | 300 | 500 | 800 | 1500 | 2500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Max. radial load (N)** | 25 | 50 | 100 | 250 | 700 | 900 | 1100 | 1500 | 1700 | 2200 | 2800 | 4000 | 5000 | 7000 |
| **(S) from-to (mm)** | 3-6 | 5-8 | 5-11 | 6-14 | 7-17 | 10-24 | 10-24 | 12-24 | 12-26 | 12-28 | 16-38 | 16-42 | 20-50 | 28-60 |

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

# SK1

# WITH CONICAL CLAMPING BUSHING

0.1 – 2,800 Nm

Timing belt or chain sprocket only included upon request.

## ABOUT

### MATERIAL

- **Clutch system:** hardened steel
- **Clamping ring size 1.5 - 10:** aluminum
- **Conical clamping bushing size 15 - 2500:** steel

### DESIGN

Size 1.5 – 10 with clamping ring and a single clamping screw.
Size 15 – 2500 with conical clamping bushing and six screws.

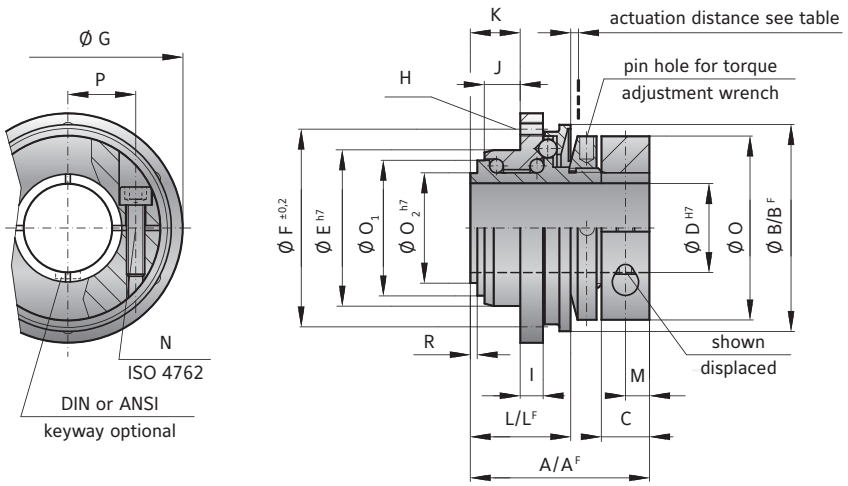
Clutch system: spring loaded ball-detent principle. Operable temperature range from -30 to +120° C.

### 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

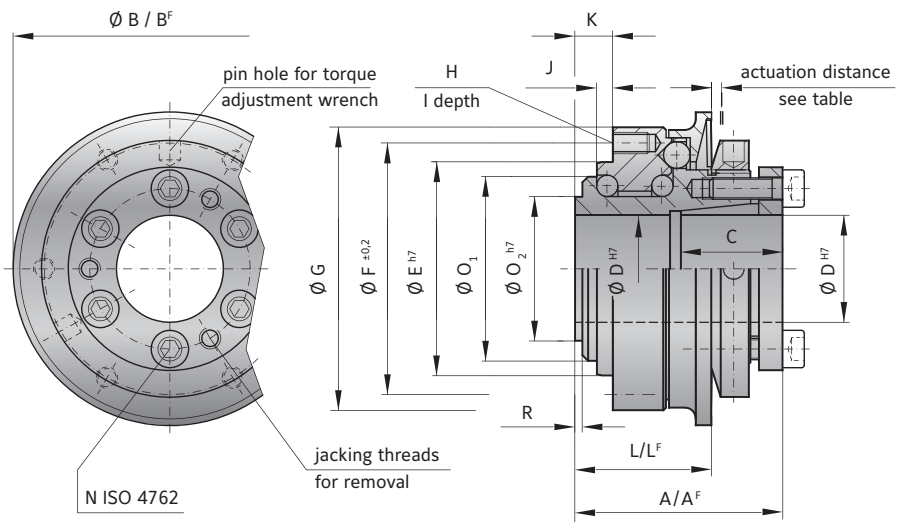
## MINIATURE DESIGN | SIZE 1.5 – 10

**Standard with clamping collar**




## STANDARD DESIGN | SIZE 15 – 2,500

**Standard with conical clamping bushing**



# MODEL SK1

| | | | MINIATURE DESIGN | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SIZE** | | | **1.5** | **2** | **4.5** | **10** | **15** | **30** | **60** | **150** | **200** | **300** | **500** | **800** | **1500** | **2500** |
| Adjustment range available from - to (approx. values) | (Nm) | $T_{KN}$ | 0.1-0.6<br>0.4-1<br>0.8-2 | 0.2-1.5<br>0.5-2.2<br>1.5-3.5 | 1-3<br>2-4.5<br>3-7 | 2-6<br>4-12<br>7-18 | 5-15<br>12-25<br>20-40<br>35-70 | 5-20<br>10-30<br>20-60<br>50-100 | 10-30<br>25-80<br>50-115 | 20-70<br>45-150<br>80-225 | 30-90<br>60-160<br>140-280<br>250-400 | 100-200<br>150-240<br>220-440 | 80-200<br>200-350<br>320-650 | 400-650<br>500-800<br>650-950 | 600-800<br>700-1200<br>1000-1800 | 1500-2000<br>2000-2500<br>2300-2800 |
| Adjustment range available from - to (approx. values) ("F" Version) | (Nm) | $T_{KN}$ | 0.3-0.8<br>or<br>0.6-1.3 | 0.5-2 | 2.5-4.5 | 2-5<br>4-10<br>8-15 | 7-15 | 8-20<br>or<br>16-30 | 10-30<br>20-40<br>30-60 | 20-60<br>40-80<br>80-150 | 80-140<br>or<br>130-200 | 120-180<br>160-300<br>300-450 | 50-150<br>100-300<br>250-500 | 200-400<br>or<br>450-850 | 1000-1250<br>or<br>1250-1500 | 1400-2200<br>or<br>1800-2700 |
| Overall length | (mm) | A | 23 | 28 | 32 | 39 | 40 | 50 | 54 | 58 | 63 | 70 | 84 | 95 | 109 | 146 |
| Overall length ("F" Version) | (mm) | $A^F$ | 23 | 28 | 32 | 39 | 40 | 50 | 54 | 58 | 66 | 73 | 88 | 95 | 117 | 152 |
| Actuation ring Ø | (mm) | B | 23 | 29 | 35 | 45 | 55 | 65 | 73 | 92 | 99 | 120 | 135 | 152 | 174 | 242 |
| Actuation ring Ø, ("F" Version) | (mm) | $B^F$ | 24 | 32 | 42 | 51.5 | 62 | 70 | 83 | 98 | 117 | 132 | 155 | 177 | 187 | 258 |
| Clamping fit length | (mm) | C | 7 | 8 | 11 | 11 | 19 | 22 | 27.5 | 32 | 32 | 41 | 41 | 49 | 61 | 80 |
| Inner diameter from Ø to Ø H7 | (mm) | D | 4-8 | 4-12 | 5-14 | 6-20 | 8-22 | 12-22 | 12-29 | 15-37 | 20-44 | 25-56 | 25-56 | 30-60 | 35-70 | 50-100 |
| Pilot diameter h7 | (mm) | E | 14 | 22 | 25 | 34 | 40 | 47 | 55 | 68 | 75 | 82 | 90 | 100 | 125 | 168 |
| Bolt-hole circle diameter ± 0.2 | (mm) | F | 22 | 28 | 35 | 43 | 47 | 54 | 63 | 78 | 85 | 98 | 110 | 120 | 148 | 202 |
| Flange outside diameter -0.2 | (mm) | G | 26 | 32 | 40 | 50 | 53 | 63 | 72 | 87 | 98 | 112 | 128 | 140 | 165 | 240 |
| Thread | | H | 4xM2 | 4xM2.5 | 6xM2.5 | 6xM3 | 6xM4 | 6xM5 | 6xM5 | 6xM6 | 6xM6 | 6xM8 | 6xM8 | 6xM10 | 6xM12 | 6xM16 |
| Thread depth | (mm) | I | 3 | 4 | 4 | 5 | 6 | 8 | 9 | 10 | 10 | 10 | 12 | 15 | 16 | 24 |
| Centering length -0.2 | (mm) | J | 2.5 | 3.5 | 5 | 8 | 3 | 5 | 5 | 5 | 5 | 6 | 9 | 10 | 13.5 | 20 |
| Distance | (mm) | K | 5 | 6 | 8 | 11 | 8 | 11 | 11 | 12 | 12 | 15 | 21 | 19 | 25 | 34 |
| Distance | (mm) | L | 11 | 15 | 17 | 22 | 27 | 35 | 37 | 39 | 44 | 47 | 59 | 67 | 82 | 112 |
| Distance, ("F" Version) | (mm) | $L^F$ | 11.5 | 16 | 18 | 24 | 27 | 37 | 39 | 41.5 | 47 | 51.5 | 68 | 75 | 94 | 120 |
| Distance | | M | 3.5 | 4 | 5 | 5 | | | | | | | | | | |
| Screw ISO 4762 | | N | 1xM2.5 | 1xM3 | 1xM4 | 1xM4 | 6xM4 | 6xM5 | 6xM5 | 6xM6 | 6xM6 | 6xM8 | 6xM8 | 6xM10 | 6xM12 | 6xM16 |
| Tightening torque | (Nm) | | 1 | 2 | 4 | 4.5 | 4 | 6 | 8 | 12 | 14 | 18 | 25 | 40 | 70 | 120 |
| Outside diameter clamp ring Ø | (mm) | O | 20 | 25 | 32 | 40 | | | | | | | | | | |
| Diameter | (mm) | $O_1$ | 13 | 18 | 21 | 30 | 35 | 42 | 49 | 62 | 67 | 75 | 84 | 91 | 112 | 154 |
| Diameter h7 | (mm) | $O_2$ | 11 | 14 | 17 | 24 | 27 | 32 | 39 | 50 | 55 | 65 | 72 | 75 | 92 | 128 |
| Distance between centers | (mm) | P | 6.5 | 8 | 10 | 15 | | | | | | | | | | |
| Distance | (mm) | R | 1 | 1.3 | 1.5 | 1.5 | 2.5 | 2.5 | 2.5 | 2.5 | 3 | 3 | 4 | 4 | 4.5 | 6 |
| Moment of inertia | ($10^{-3}$kgm²) | $J_{ges}$ | 0.01 | 0.02 | 0.05 | 0.07 | 0.15 | 0.25 | 0.50 | 1.60 | 2.70 | 5.20 | 8.6 | 20 | 31.5 | 210 |
| Approx. weight | (kg) | | 0.03 | 0.065 | 0.12 | 0.22 | 0.4 | 0.7 | 1.0 | 1.3 | 2.0 | 3.0 | 4.0 | 5.5 | 10 | 28 |
| Actuation distance | (mm) | | 0.7 | 0.8 | 0.8 | 1.2 | 1.5 | 1.7 | 1.7 | 1.9 | 2.2 | 2.2 | 2.2 | 2.2 | 3.0 | 3.0 |

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

| **ORDERING EXAMPLE** | **SK1** | **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. SK1 / 10 / W / 12.7 / 4 / 2-6 / XX; XX=stainless steel)** | | | | | | | |

# SKN

# WITH CLAMPING COLLAR

5 – 1,800 Nm

Timing belt or chain sprocket only included upon request.

## ABOUT

### MATERIAL

- **Clutch system:** hardened steel
- **Clamping collar:** up to size 500 aluminum, size 800 and up steel

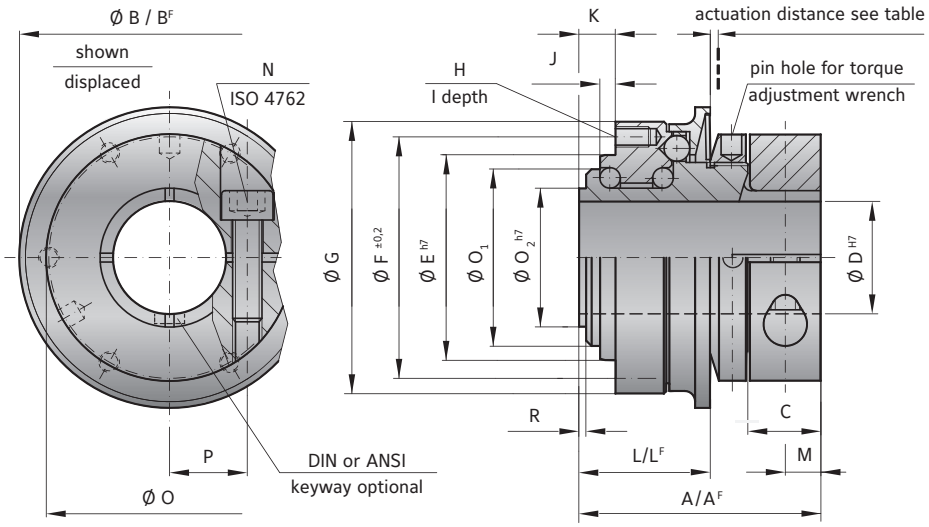
### DESIGN

With clamping ring and one 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
- G = Load holding / load blocking
- F = Full disengagement / manual re-engagement

## STANDARD DESIGN | SIZE 15 - 1,500



# MODEL SKN

| SIZE | | | 15 | 30 | 60 | 150 | 200 | 300 | 500 | 800 | 1500 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 45-150 80-180 | 30-90 60-160 120-240 | 100-200 150-240 200-320 | 80-200 200-350 300-500 | 400-650 500-800 600-850 | 600-800 700-1200 1000-1800 |
| 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 or 160-300 | 50-150 100-300 250-500 | 200-400 or 450-800 | 1000-1250 or 1250-1500 |
| Overall length | (mm) | A | 47 | 59 | 65 | 71 | 80 | 84 | 101 | 115 | 145 |
| Overall length, ("F" Version) | (mm) | $A^F$ | 47 | 59 | 65 | 73 | 83 | 87 | 107 | 126 | 160 |
| Actuation ring Ø | (mm) | B | 55 | 65 | 73 | 92 | 99 | 120 | 135 | 152 | 174 |
| Actuation ring Ø, ("F" Version) | (mm) | $B^F$ | 62 | 70 | 83 | 98 | 117 | 132 | 155 | 177 | 187 |
| Clamping fit length | (mm) | | 13.5 | 16 | 20 | 23 | 26 | 26 | 30 | 35 | 46 |
| Inside diameter from Ø to Ø H7 | (mm) | D | 12-22 | 14-25.4 | 16-32 | 19-40 | 24-44 | 30-56 | 35-60 | 40-62 | 50-72 |
| Inside diameter from Ø to Ø H7 with keyway | (mm) | | 8-19 | 12-22 | 12-30 | 15-36 | 20-44 | 25-50 | 25-54 | 30-56 | 35-65 |
| Pilot diameter h7 | (mm) | E | 40 | 47 | 55 | 68 | 75 | 82 | 90 | 100 | 125 |
| Bolt-hole circle diameter ± 0.2 | (mm) | F | 47 | 54 | 63 | 78 | 85 | 98 | 110 | 120 | 148 |
| Flange outside diameter -0.2 | (mm) | G | 53 | 63 | 72 | 87 | 98 | 112 | 128 | 140 | 165 |
| Thread | | H | 6xM4 | 6xM5 | 6xM5 | 6xM6 | 6xM6 | 6xM8 | 6xM8 | 6xM10 | 6xM12 |
| Thread depth | (mm) | I | 6 | 8 | 9 | 10 | 10 | 10 | 12 | 15 | 16 |
| Centering length -0.2 | (mm) | J | 3 | 5 | 5 | 5 | 5 | 6 | 9 | 10 | 13.5 |
| Distance | (mm) | K | 8 | 11 | 11 | 12 | 12 | 15 | 21 | 19 | 25 |
| Distance | (mm) | L | 27 | 35 | 37 | 39 | 44 | 47 | 59 | 67 | 82 |
| Distance, ("F" Version) | (mm) | $L^F$ | 27 | 37 | 39 | 41.5 | 47 | 51.5 | 68 | 75 | 94 |
| Distance | | M | 6.5 | 7.5 | 9.5 | 11 | 13 | 13 | 14.5 | 18 | 22.5 |
| Screw ISO 4762 | | N | M5 | M6 | M8 | M10 | M12 | M12 | M14 | M16 | M20 |
| Tightening torque | | | 8 | 15 | 40 | 70 | 120 | 130 | 210 | 270 | 500 |
| Clamp ring Ø | | O | 49 | 55 | 67 | 85 | 94 | 110 | 121 | 134 | 157 |
| Diameter | (mm) | $O_1$ | 35 | 42 | 49 | 62 | 67 | 75 | 84 | 91 | 112 |
| Diameter h7 | (mm) | $O_2$ | 27 | 36 | 39 | 50 | 55 | 65 | 72 | 75 | 92 |
| Distance between centers | (mm) | P | 17.5 | 19 | 23.5 | 30 | 32.5 | 39 | 43.5 | 45 | 52 |
| Distance | (mm) | R | 2.5 | 2.5 | 2.5 | 2.5 | 3 | 3 | 4 | 4 | 4.5 |
| Moment of inertia | ($10^{-3}$kgm²) | $J_{ges}$ | 0.15 | 0.25 | 0.50 | 1.60 | 2.70 | 5.20 | 8.60 | 20 | 31.5 |
| Approx. weight | (kg) | | 0.4 | 0.7 | 1.0 | 1.3 | 2.0 | 3.0 | 4.0 | 5.5 | 10 |
| Actuation distance | (mm) | | 1.5 | 1.5 | 1.7 | 1.9 | 2.2 | 2.2 | 2.2 | 2.2 | 3.0 |

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

| ORDERING EXAMPLE | SKN | 60 | W | 19.05 | 60 | 25-80 | 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. SKN / 60 / W / 19.05 / 60 / 25-80 / XX; XX=stainless steel)**

# WITH KEYWAY MOUNTING
0.1 – 2,800 Nm

Timing belt or chain sprocket only included upon request.

## ABOUT

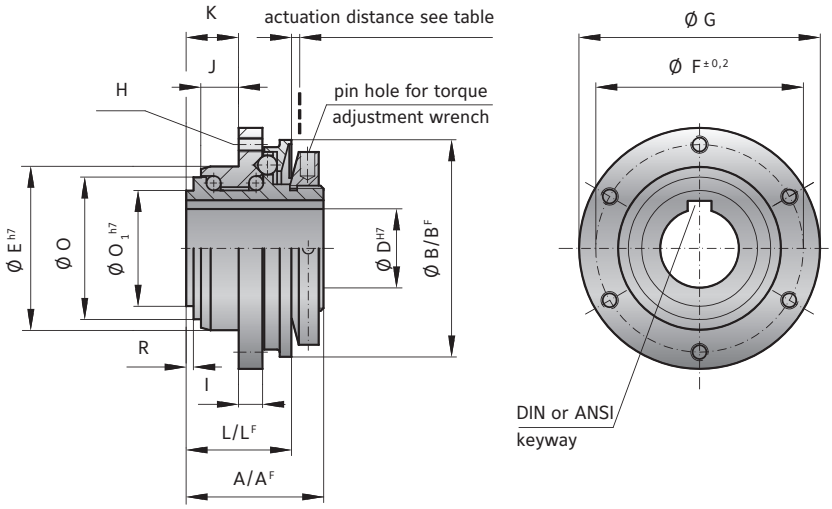
MATERIAL
- **Clutch system:** hardened steel

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

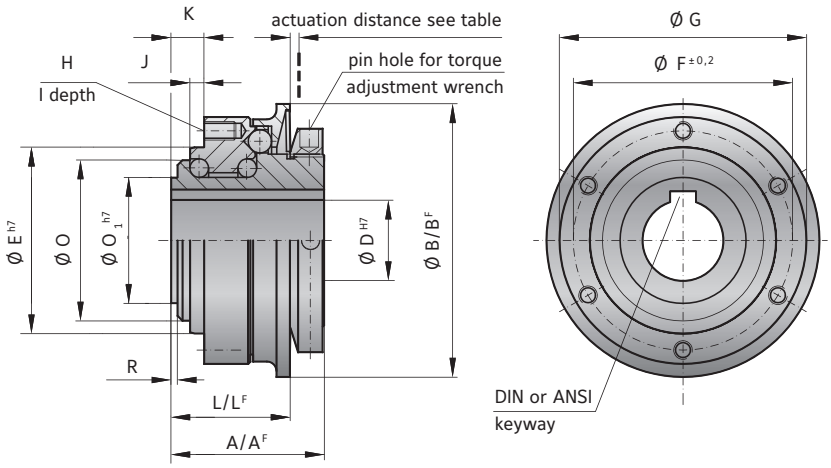
## MINIATURE DESIGN | SIZE 1.5 – 10

**Standard with keyway mounting**




## STANDARD DESIGN | SIZE 15 – 2,500

**Standard with keyway mounting**



# MODEL SKP

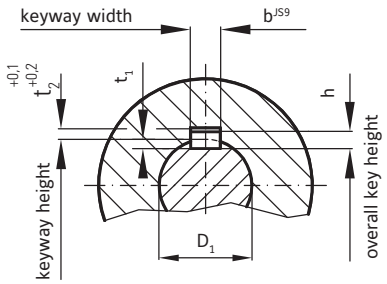
| SIZE | | | MINIATURE DESIGN 1.5 | 2 | 4.5 | 10 | 15 | 30 | 60 | 150 | 200 | 300 | 500 | 800 | 1500 | 2500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjustment range available from - to (approx. values) | (Nm) | $T_{KN}$ | 0.1-0.6<br>0.4-1<br>0.8-2 | 0.2-1.5<br>0.5-2.2<br>1.5-3.5 | 1-3<br>2-4.5<br>3-7 | 2-6<br>4-12<br>7-18 | 5-15<br>12-25<br>20-40<br>35-70 | 5-20<br>10-30<br>20-60<br>50-100 | 10-30<br>25-80<br>50-115 | 20-70<br>45-150<br>80-225 | 30-90<br>60-160<br>140-280<br>250-400 | 100-200<br>150-240<br>220-440 | 80-200<br>200-350<br>320-650 | 400-650<br>500-800<br>650-950 | 600-800<br>700-1200<br>1000-1800 | 1500-2000<br>2000-2500<br>2300-2800 |
| Adjustment range available from - to (approx. values) ("F" Version) | (Nm) | $T_{KN}$ | 0.3-0.8<br>or<br>0.6-1.3 | 0.5-2 | 2.5-4.5 | 2-5<br>4-10<br>8-15 | 7-15 | 8-20<br>or<br>16-30 | 10-30<br>20-40<br>30-60 | 20-60<br>40-80<br>80-150 | 80-140<br>or<br>130-200 | 120-180<br>160-300<br>300-450 | 50-150<br>100-300<br>250-400 | 200-400<br>or<br>450-850 | 1000-1250<br>or<br>1250-1500 | 1400-2200<br>or<br>1800-2700 |
| Overall length A | (mm) | A | 15.5 | 20 | 22 | 28 | 34 | 43 | 46 | 48.5 | 54 | 57 | 71.5 | 80 | 93 | 135 |
| Overall length ("F" Version) | (mm) | $A^F$ | 15.5 | 20 | 22 | 28 | 34 | 43 | 46 | 48.5 | 57 | 60 | 75 | 91 | 110 | 141 |
| Actuation ring Ø | (mm) | B | 23 | 29 | 35 | 45 | 55 | 65 | 73 | 92 | 99 | 120 | 135 | 152 | 174 | 242 |
| Actuation ring Ø, ("F" Version) | (mm) | $B^F$ | 24 | 32 | 42 | 51.5 | 62 | 70 | 83 | 98 | 117 | 132 | 155 | 177 | 187 | 258 |
| Inner diameter from Ø to Ø H7 | (mm) | D | 4-8 | 4-10 | 5-12* | 6-16 | 8-19 | 12-25.4 | 12-30 | 15-38 | 20-44 | 25-50 | 25-58 | 30-60 | 35-73 | 50-95 |
| Pilot diameter h7 | (mm) | E | 14 | 22 | 25 | 34 | 40 | 47 | 55 | 68 | 75 | 82 | 90 | 100 | 125 | 168 |
| Bolt-hole circle diameter ± 0.2 | (mm) | F | 22 | 28 | 35 | 43 | 47 | 54 | 63 | 78 | 85 | 98 | 110 | 120 | 148 | 202 |
| Flange outside diameter -0.2 | (mm) | G | 26 | 32 | 40 | 50 | 53 | 63 | 72 | 87 | 98 | 112 | 128 | 140 | 165 | 240 |
| Thread | | H | 4xM2 | 4xM2.5 | 6xM2.5 | 6xM3 | 6xM4 | 6xM5 | 6xM5 | 6xM6 | 6xM6 | 6xM8 | 6xM8 | 6xM10 | 6xM12 | 6xM16 |
| Thread depth | (mm) | I | 3 | 4 | 4 | 5 | 6 | 8 | 9 | 10 | 10 | 10 | 12 | 15 | 16 | 24 |
| Centering length -0.2 | (mm) | J | 2.5 | 3.5 | 5 | 8 | 3 | 5 | 5 | 5 | 5 | 6 | 9 | 10 | 13.5 | 20 |
| Distance | (mm) | K | 5 | 6 | 8 | 11 | 8 | 11 | 11 | 12 | 12 | 15 | 21 | 19 | 25 | 34 |
| Distance | (mm) | L | 11 | 15 | 17 | 22 | 27 | 35 | 37 | 39 | 44 | 47 | 59 | 67 | 82 | 112 |
| Distance, ("F" Version) | (mm) | $L^F$ | 11.5 | 16 | 18 | 24 | 27 | 37 | 39 | 41.5 | 47 | 51.5 | 68 | 75 | 94 | 120 |
| Diameter | (mm) | O | 13 | 18 | 21 | 30 | 35 | 42 | 49 | 62 | 67 | 75 | 84 | 91 | 112 | 154 |
| Diameter h7 | (mm) | $O_1$ | 11 | 14 | 17 | 24 | 27 | 32 | 39 | 50 | 55 | 65 | 72 | 75 | 92 | 128 |
| Distance | (mm) | R | 1 | 1.3 | 1.5 | 1.5 | 2.5 | 2.5 | 2.5 | 2.5 | 3 | 3 | 4 | 4 | 4.5 | 6 |
| Moment of inertia | ($10^{-3}kgm^2$) | $J_{ges}$ | 0.01 | 0.02 | 0.05 | 0.07 | 0.15 | 0.25 | 0.50 | 1.60 | 2.70 | 5.20 | 8.6 | 20 | 31.5 | 210 |
| Approx. weight | (kg) | | 0.03 | 0.065 | 0.12 | 0.22 | 0.4 | 0.7 | 1.0 | 1.3 | 2.0 | 3.0 | 4.0 | 5.5 | 10 | 28 |
| Actuation distance | (mm) | | 0.7 | 0.8 | 0.8 | 1.2 | 1.5 | 1.5 | 1.7 | 1.9 | 2.2 | 2.2 | 2.2 | 2.2 | 3.0 | 3.0 |

**$A^F$, $B^F$, $L^F$ = Full disengagement / manual re-engegement version (F)** ***Ø 12 mm only available with shallow keyway (height = 1.2mm$^{+0.2}$)

## KEYWAY ACCORDING TO DIN 6885 (R+W 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.




| ORDERING EXAMPLE | SKP | 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. SKP / 10 / W / 15.88 / 4 / 2-6 / XX; XX=stainless steel)**

# SLN

# WITH CLAMPING COLLAR

10 - 700 Nm

**ULTRALIGHT DESIGN**

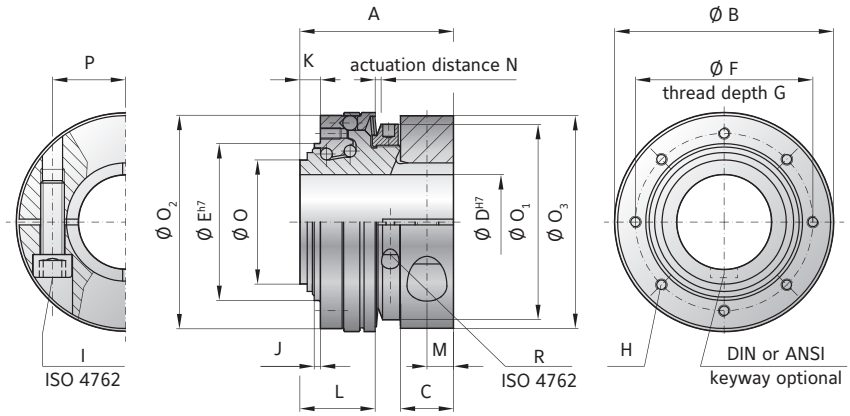
## ABOUT

### 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 SLN

| SIZE | | | 30 | 60 | 150 | 300 |
|---|---|---|---|---|---|---|
| Adjustment range* from - to | (Nm) | $T_{KN}$ | 10-35<br>30-80<br>40-135 | 30-80<br>60-120<br>100-200 | 40-100<br>100-200<br>150-300 | 200-350<br>300-450<br>400-550<br>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 |
| Bore diameter with keyway DIN 6885 from Ø to Ø H7 | | D | 12-25.4 | 16-32 | 19-37 | 22-54 |
| 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

## 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.

# SLP

# WITH KEYWAY MOUNTING

10 – 700 Nm

**ULTRALIGHT DESIGN**

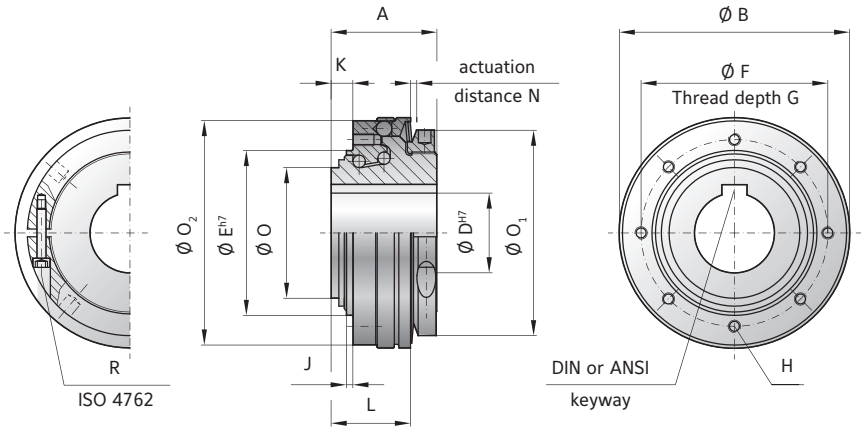
## ABOUT

### 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




## MODEL SLP

| SIZE | | | 30 | 60 | 150 | 300 |
|---|---|---|---|---|---|---|
| Adjustment range* from - to | (Nm) | $T_{KN}$ | 10-35<br>30-80<br>40-135 | 30-80<br>60-120<br>100-200 | 40-100<br>100-200<br>150-300 | 200-350<br>300-450<br>400-550<br>550-700 |
| Overall length | (mm) | A | 30 | 35 | 41 | 48 |
| Actuation ring diameter | (mm) | B | 63 | 74 | 92 | 118 |
| Bore diameter from Ø to Ø H7 | (mm) | D | 12-25.4 (28)* | 16-32 (34)* | 19-44 (46)* | 22-54 (58)* |
| 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 |
| 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 |
| 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 |
| Adjustment nut's clamp screw ISO 4762 | | R | M3 | M3 | M3 | M4 |
| Tightening torque | (Nm) | | 2 | 2 | 2 | 4.5 |
| Approx. weight | (kg) | | 0.2 | 0.35 | 0.7 | 1.1 |
| Approx. moment of inertia at D max. | ($10^{-3}$ kgm²) | $J_{ges}$ | 0.1 | 0.4 | 1.1 | 2.3 |

* maximum bore diameters shown are only available with shallow keyway according to DIN 6885/3 or special heights for inch bores

| ORDERING EXAMPLE | SLN \| SLP | 60 | W | 25.4 | 80 | 60-120 | XX |
|---|---|---|---|---|---|---|---|
| Model | ● | | | | | | Special designation only (e.g. special bore / keyway dimensions). |
| Size | | ● | | | | | |
| Function system | | | ● | | | | |
| Bore D 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. SLN / 60 / W / 25.4 / 80 / 60-120; XX=special dual keyway) | | | | | | | |

# SK2

# WITH CLAMPING HUBS

## 0.1 - 1,800 Nm

## ABOUT

### MATERIAL

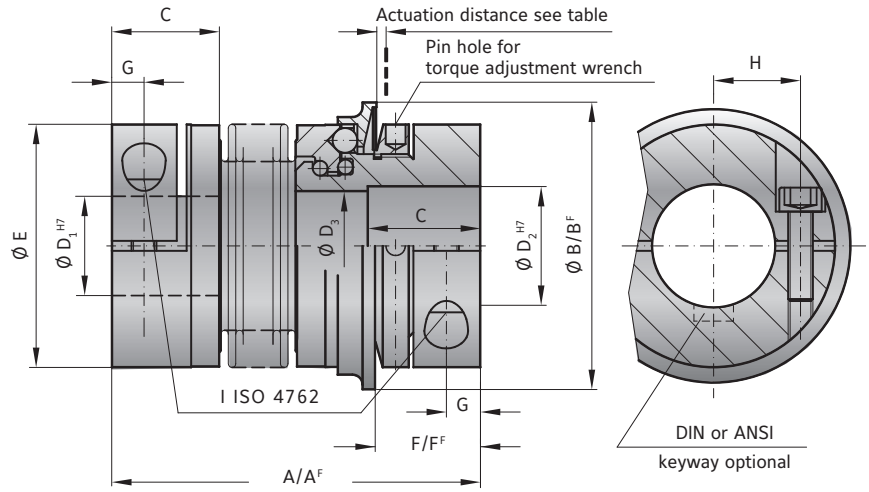
- **Bellows:** high grade stainless steel
- **Clutch system:** hardened steel
- **Clamping hubs:** up to size 80 aluminum, size 150 and up steel

### 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 / automatic re-engagement (standard)
- D = Multi-position / automatic re-engagement
- G = Load holding / load blocking
- F = Full disengagement / manual re-engagement




## MODEL SK2

| SIZE | | 1.5 | 2 | 4.5 | 10 | 15 | 30 | 60 | 80 | 150 | 200 | 300 | 500 | 800 | 1500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjustment range available from - to (approx. values) (Nm) | $T_{KN}$ | 0.1-0.6<br>0.4-1<br>0.8-1.5 | 0.2-1.5<br>or<br>0.5-2 | 1-3<br>or<br>3-6 | 2-6<br>or<br>4-12 | 5-10<br>or<br>8-20 | 10-25<br>or<br>20-40 | 10-30<br>or<br>25-80 | 20-70<br>or<br>30-90 | 20-70<br>45-150<br>80-180 | 30-90<br>60-160<br>120-240 | 100-200<br>150-240<br>200-320 | 80-200<br>200-350<br>300-500 | 400-650<br>500-800<br>650-850 | 650-800<br>700-1200<br>1000-1800 |
| Adjustment range available from - to (approx. values) ("F" Version) (Nm) | $T_{KN}$ | 0.3-0.8<br>or<br>0.6-1.3 | 0.2-1.5 | 2.5-4.5 | 2-5<br>or<br>5-10 | 7-15 | 8-20<br>or<br>16-30 | 20-40<br>or<br>30-60 | 20-60<br>or<br>40-80 | 20-60<br>40-80<br>80-150 | 80-140<br>or<br>130-200 | 120-180<br>or<br>160-300 | 60-150<br>100-300<br>250-500 | 200-400<br>or<br>450-800 | 1000-1250<br>or<br>1250-1500 |
| Overall length (mm) | A | 42 | 46 51 | 57 65 | 65 74 | 75 82 | 87 95 | 102 112 | 115 127 | 116 128 | 128 140 | 139 153 | 163 177 | 190 | 223 |
| Overall length, ("F" Version) (mm) | $A^F$ | 42 | 46 51 | 57 65 | 65 74 | 75 82 | 87 95 | 102 112 | 117 129 | 118 130 | 131 143 | 142 156 | 167 181 | 201 | 232 |
| Actuation ring Ø (mm) | B | 23 | 29 | 35 | 45 | 55 | 65 | 73 | 92 | 92 | 99 | 120 | 135 | 152 | 174 |
| Actuation ring Ø, ("F" Version) (mm) | $B^F$ | 24 | 32 | 42 | 51.5 | 62 | 70 | 83 | 98 | 98 | 117 | 132 | 155 | 177 | 187 |
| Clamping fit length (mm) | C | 11 | 13 | 16 | 16 | 22 | 27 | 31 | 35 | 35 | 40 | 42 | 51 | 48 | 67 |
| Inside diameter from Ø to Ø H7 (mm) | $D_1/D_2$ | 3-9 | 4-12 | 5-14 | 6-20 | 10-26 | 12-30 | 15-32 | 19-42 | 19-42 | 24-45 | 30-60 | 35-60 | 40-75 | 50-80 |
| Diameter (mm) | $D_3$ | 9.1 | 12.1 | 14.1 | 20.1 | 21.1 | 24.1 | 32.1 | 36.1 | 36.1 | 42.1 | 58.1 | 60.1 | 60.1 | 68.1 |
| Outside diameter of coupling (mm) | E | 19 | 25 | 32 | 40 | 49 | 55 | 66 | 81 | 81 | 90 | 110 | 123 | 134 | 157 |
| Distance (mm) | F | 12 | 13 | 15 | 17 | 19 | 24 | 28 | 31 | 31 | 35 | 35 | 45 | 50 | 63 |
| Distance, ("F" Version) (mm) | $F^F$ | 11.5 | 12 | 14 | 16 | 19 | 22 | 29 | 31 | 30 | 33 | 35 | 43 | 54 | 61 |
| Distance (mm) | G | 3.5 | 4 | 5 | 5 | 6.5 | 7.5 | 9.5 | 11 | 11 | 12.5 | 13 | 17 | 18 | 22.5 |
| Distance between centers (mm) | H | 6 | 8 | 10 | 15 | 17 | 19 | 23 | 27 | 27 | 31 | 39 | 41 | 2x48 | 2x55 |
| Screw ISO 4762 | I | M2.5 | M3 | M4 | M4 | M5 | M6 | M8 | M10 | M10 | M12 | M12 | M16 | 2xM16 | 2xM20 |
| Tightening torque (Nm) | | 1 | 2 | 4 | 4.5 | 8 | 15 | 40 | 50 | 70 | 120 | 130 | 200 | 250 | 470 |
| Approx. weight (kg) | | 0.035 | 0.07 | 0.2 | 0.3 | 0.4 | 0.6 | 1.0 | 2.0 | 2.4 | 4.0 | 5.9 | 9.6 | 14 | 21 |
| Moment of inertia ($10^{-3}$ kgm²) | $J_{ges}$ | 0.01 | 0.01 0.01 | 0.02 0.02 | 0.06 0.07 | 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 | 42.0 | 83.0 |
| Torsional stiffness ($10^3$ Nm/rad) | $C_T$ | 0.7 | 1.2 1.3 | 7 5 | 9 8 | 20 15 | 39 28 | 76 55 | 129 85 | 175 110 | 191 140 | 420 350 | 510 500 | 780 | 1304 |
| Lateral ± (mm) | max. values | 0.15 | 0.15 0.20 | 0.20 0.25 | 0.20 0.30 | 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 | 0.35 | 0.35 |
| Angular ± (Degree) | | 1 | 1 1.5 | 1.5 2 | 1.5 2 | 1 1.5 | 1 1.5 | 1 1.5 | 1 1.5 | 1 1.5 | 1.5 2 | 1.5 2 | 2 2.5 | 2.5 | 2.5 |
| Lateral spring stiffness (N/mm) | | 70 | 40 30 | 290 45 | 280 145 | 475 137 | 900 270 | 1200 420 | 920 255 | 1550 435 | 2040 610 | 3750 1050 | 2500 840 | 2000 | 3600 |
| Actuation distance (mm) | | 0.7 | 0.8 | 0.8 | 1.2 | 1.5 | 1.5 | 1.7 | 1.9 | 1.9 | 2.2 | 2.2 | 2.2 | 2.2 | 3 |

**$A^F$, $B^F$, $L^F$ = Full disengagement / manual re-engegement version (F)** Larger versions available upon request.

# SL2

# WITH CLAMPING HUBS

10 - 400 Nm

LEICHTBAUWEISE

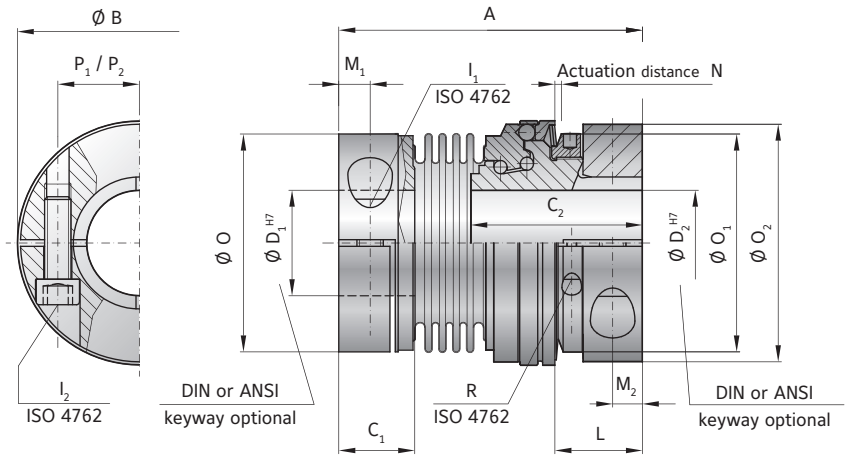
## ABOUT

### DESIGN

Clamping collar / clamping hub with one clamping screw each. Clutch system: spring loaded ball-detent principle. Special compact, high stiffness version. Operable temperature range from -30 to +100° C.

### AVAILABLE FUNCTION SYSTEMS

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




## MODEL SL2

| SIZE | | | 30 | 60 | 150 | 300 |
|---|---|---|---|---|---|---|
| Adjustment range* from - to | (Nm) | $T_{KN}$ | 10-35<br>30-80 | 20-50<br>40-100 | 40-100<br>100-200 | 100-250<br>200-350<br>300-400 |
| Overall length | (mm) | A | 80 | 93 | 112 | 126 |
| Actuation ring diameter | (mm) | B | 63 | 74 | 92 | 118 |
| Hub length | (mm) | $C_1/C_2$ | 21/45 | 23/53 | 28 / 63 | 34/72 |
| Bore diameter from Ø to Ø H7 | (mm) | $D_1/D_2$ | 12-32/12-30 | 16-35 / 16-35 | 19-42 / 19-42 | 22-60 / 22-60 |
| Screw ISO 4762 | (mm) | $I_1/I_2$ | M6 | M8 | M10 | M12 |
| Tightening torque | (Nm) | | 15 | 40 | 75 | 130 |
| Distance to actuation ring edge | (mm) | L | 22 | 26 | 32 | 35 |
| Distance | (mm) | $M_1/M_2$ | 7.5/7.5 | 9.5/9 | 11/11 | 13/12 |
| Actuation distance | (mm) | N | 1.3 | 1.5 | 1.8 | 2 |
| Ø Clamping hub Ø, (coupling end) | (mm) | O | 55.5 | 66 | 82 | 110 |
| Ø Adjustment nut | (mm) | $O_1$ | 55 | 66 | 82 | 100 |
| Clamping ring Ø, (torque limiter end) | (mm) | $O_2$ | 59 | 72 | 90 | 112 |
| Distance between centers, bellows side/safety element | (mm) | $P_1/P_2$ | 20/21.5 | 23 / 25 | 27/33 | 39/41 |
| 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 | 0.7 | 1.2 | 2.8 |
| Approx. moment of inertia at D max.($10^{-3}$ Kgm²) | | $J_{ges}$ | 0.2 | 0.8 | 1.4 | 6.2 |
| Torsional stiffness | ($10^3$ Nm/rad) | | 31 | 72 | 141 | 157 |
| Lateral ± | max. (mm) | | 0.2 | 0.2 | 0.2 | 0.25 |

*Maximum transmittable torque of the clamping hub depends on the bore diameter / see table on page 96

| ORDERING EXAMPLE | SL2 \| SK2 | 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. SL2 / 60 / W / 30 / 20 / 80 / 40-100; XX=special dual keyway)

# SK3

# WITH CONICAL CLAMPING BUSHING

5 – 2,800 Nm

## ABOUT

### MATERIAL

- **Bellows:** high grade stainless steel
- **Clutch system:** hardened steel
- **Clamping hubs / bushings:** steel

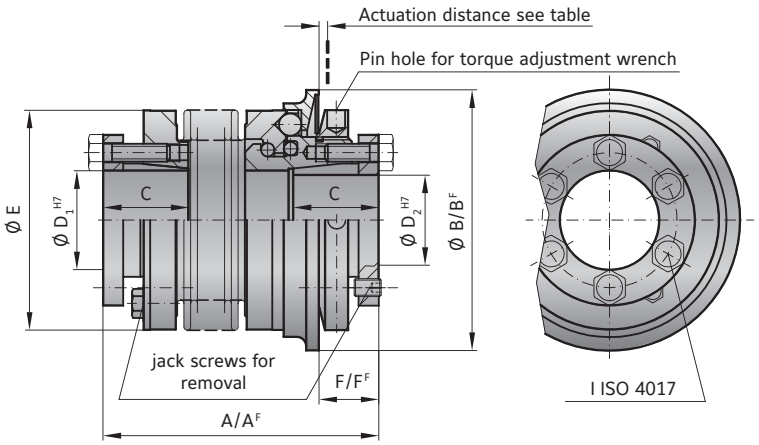
### DESIGN

Two conical clamping assemblies with six tightening screws each, plus jack screws for removal. Clutch system: spring loaded ball-detent principle.

Operable temperature range from -30 to +100° 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




## MODEL SK3

| SIZE | | | 15 | | 30 | | 60 | | 150 | | 200 | | 300 | | 500 | | 800 | 1500 | 2500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjustment range available from (approx. values) | (Nm) | $T_{KN}$ | 5-10 or 8-20 | | 10-25 or 20-40 | | 10-30 or 25-80 | | 20-70 45-150 80-200 | | 30-90 60-160 140-280 | | 100-200 150-240 220-400 | | 80-200 200-350 300-500 | | 400-650 500-800 600-900 | 650-850 700-1200 1000-1800 | 1500-2000 2000-2500 2300-2800 |
| Adjustment range available from (approx. values) ("F" Version) | (Nm) | $T_{KN}$ | 7-15 | | 8-20 or 16-30 | | 20-40 or 30-60 | | 20-60 40-80 80-150 | | 80-140 or 130-200 | | 120-180 or 160-300 | | 60-150 100-300 250-500 | | 200-400 or 450-800 | 1000-1250 or 1250-1500 | 1400-2200 or 1800-2700 |
| Overall length ±2 | (mm) | A | 62 | 69 | 72 | 80 | 84 | 94 | 93 | 105 | 99 | 111 | 114 | 128 | 123 | 136 | 151 | 175 | 246 |
| Overall length. ("F" Version) ±2 | (mm) | $A^F$ | 62 | 69 | 72 | 80 | 84 | 94 | 93 | 105 | 102 | 114 | 117 | 131 | 127 | 140 | 151 | 184 | 252 |
| Actuation ring Ø | (mm) | B | 55 | | 65 | | 73 | | 92 | | 99 | | 120 | | 135 | | 152 | 174 | 243 |
| Actuation ring Ø. ("F" Version) | (mm) | $B^F$ | 62 | | 70 | | 83 | | 98 | | 117 | | 132 | | 155 | | 177 | 187 | 258 |
| Clamping fit length (mm) | | C | 19 | | 22 | | 27 | | 32 | | 32 | | 41 | | 41 | | 49 | 61 | 80 |
| Inside diameter from Ø to Ø H7 | (mm) | $D_1/D_2$ | 10-22 | | 12-23 | | 12-29 | | 15-37 | | 20-44 | | 25-56 | | 25-60 | | 30-60 | 35-70 | 50-100 |
| Outside diameter of coupling | (mm) | E | 49 | | 55 | | 66 | | 81 | | 90 | | 110 | | 123 | | 133 | 157 | 200 |
| Distance | (mm) | F | 13 | | 16 | | 18 | | 19 | | 19 | | 23 | | 25 | | 31 | 30 | 34 |
| Distance. ("F" Version) | (mm) | $F^F$ | 13 | | 14 | | 17 | | 18 | | 17 | | 20 | | 22 | | 20 | 26 | 31 |
| 6x Screw ISO 4017 | | I | M4 | | M5 | | M5 | | M6 | | M6 | | M8 | | M8 | | M10 | M12 | M16 |
| Tightening torque | (Nm) | | 4 | | 6 | | 8 | | 12 | | 14 | | 18 | | 25 | | 40 | 70 | 120 |
| Approx. weight | (kg) | | 0.3 | | 0.4 | | 1.2 | | 2.3 | | 3.0 | | 5.0 | | 6.5 | | 9.0 | 16.3 | 35 |
| Moment of inertia | ($10^{-3}$ kgm²) | $J_{ges}$ | 0.10 | 0.15 | 0.28 | 0.30 | 0.75 | 0.80 | 1.90 | 2.00 | 2.80 | 3.00 | 5.50 | 6.00 | 11.0 | 12.8 | 20 | 42 | 257 |
| Torsional stiffness | ($10^3$ Nm/rad) | $C_T$ | 20 | 15 | 39 | 28 | 76 | 55 | 175 | 110 | 191 | 140 | 420 | 350 | 510 | 500 | 780 | 1304 | 3400 |
| Lateral | | max. values | 0.15 | 0.20 | 0.20 | 0.25 | 0.20 | 0.25 | 0.20 | 0.25 | 0.25 | 0.30 | 0.25 | 0.30 | 0.30 | 0.35 | 0.35 | 0.35 | 0.35 |
| Angular | | | 1 | 1.5 | 1 | 1.5 | 1 | 1.5 | 1 | 1.5 | 1.5 | 2 | 1.5 | 2 | 2 | 2.5 | 2.5 | 2.5 | 2.5 |
| Lateral spring stiffness | | | 475 | 137 | 900 | 270 | 1200 | 380 | 1550 | 435 | 2040 | 610 | 3750 | 1050 | 2500 | 840 | 2000 | 3600 | 6070 |
| Actuation distance | | | 1.5 | | 1.5 | | 1.7 | | 1.9 | | 2.2 | | 2.2 | | 2.2 | | 2.2 | 3 | 3 |

**$A^F$. $B^F$. $L^F$ = Full disengagement / manual re-engegement version (F)** Larger versions available upon request.

| ORDERING EXAMPLE | SK3 \| SK5 | 60 | 84 | D | 16 | 19.05 | 25 | 10-30 | XX |
|---|---|---|---|---|---|---|---|---|---|
| Model | ● | | | | | | | | Special designation only (e.g. special bore / keyway dimensions). |
| Size | | ● | | | | | | | |
| Overall length mm | | | ● | | | | | | |
| 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. SK3 / 60 / 84 / D / 16 / 19.05 / 25 / 10-30 / XX; XX=special 30 deg re-engagement angle)**

# SK5

# BLIND MATE WITH CLAMPING HUBS

0.1 – 850 Nm

## ABOUT

### MATERIAL

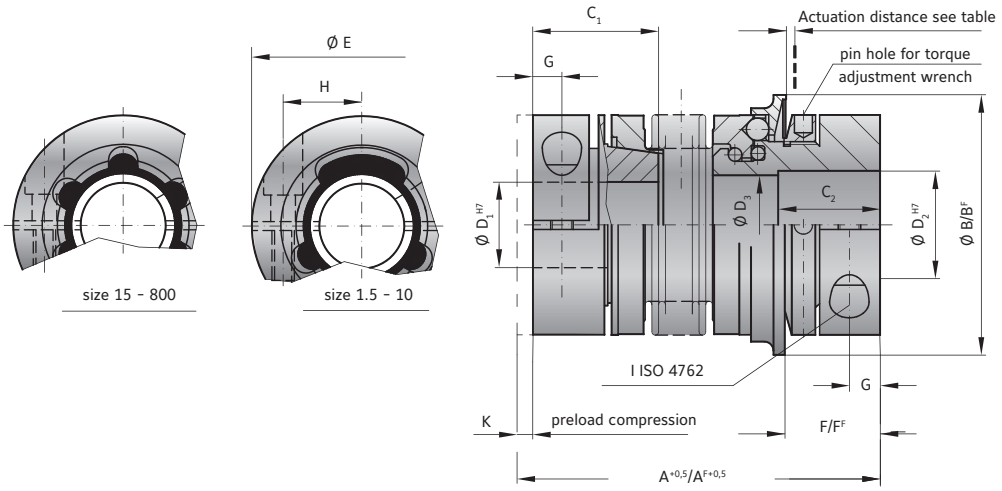
- **Bellows:** high grade stainless steel
- **Clutch system:** hardened steel
- **Clamping hubs:** up to size 80 aluminum, size 150 and up steel
- **Tapered male segment:** high strength plastic

### DESIGN

Two clamping hubs with one clamping screw each, and one of the clamping hubs with tapered male segment for plug-in installation. Clutch system: spring loaded ball-detent principle. Operable temperature range from -30 to +100° 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




## MODEL SK5

| Size | | 1.5 | 2 | 4.5 | 10 | 15 | 30 | 60 | 80 | 150 | 300 | 500 | 800 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adjustment range available from - to (approx. values) (Nm) | $T_{KN}$ | 0.1-0.6<br>0.4-1<br>0.8-1.5 | 0.2-1.5<br>or<br>0.5-2 | 1-3<br>or<br>3-6 | 2-6<br>or<br>4-12 | 5-10<br>or<br>8-20 | 10-25<br>or<br>20-40 | 10-30<br>or<br>25-80 | 20-70<br>or<br>30-90 | 20-70<br>or<br>45-150 | 100-200<br>150-240<br>200-320 | 80-200<br>200-350<br>300-500 | 400-650<br>500-800<br>650-850 |
| Adjustment range available from - to (approx. values) ("F" Version) (Nm) | $T_{KN}$ | 0.3-0.8<br>or<br>0.6-1.3 | 0.5-2 | 2.5-4.5 | 2-5<br>or<br>5-10 | 7-15 | 8-20<br>or<br>16-30 | 20-40<br>or<br>30-60 | 20-60<br>or<br>40-80 | 80-150 | 120-200<br>or<br>160-300 | 60-150<br>100-300<br>250-500 | 200-400<br>or<br>450-800 |
| Overall length +0.5 (mm) | A | 44 | 48 54 | 60 68 | 70 79 | 76 83 | 89 97 | 105 115 | 115 127 | 116 128 | 143 157 | 166 180 | 196 |
| Overall length +0.5 ("F" Version) (mm) | $A^F$ | 44 | 48 54 | 60 68 | 70 79 | 76 83 | 89 97 | 105 115 | 117 129 | 118 130 | 146 160 | 170 184 | 207 |
| Actuation ring Ø (mm) | B | 23 | 29 | 35 | 45 | 55 | 65 | 73 | 92 | 92 | 120 | 135 | 152 |
| Actuation ring Ø ("F" Version) (mm) | $B^F$ | 24 | 32 | 42 | 51.5 | 62 | 70 | 83 | 98 | 98 | 132 | 155 | 177 |
| Clamping fit length $C_1/C_2$ (mm) | $C_1/C_2$ | 14 11 | 16 13 | 19 16 | 21 16 | 28 22 | 33 27 | 39 31 | 43 35 | 43 35 | 52 42 | 61 52 | 74 48 |
| Bore Diameter from Ø to Ø H7 (mm) | $D_1$ | 3-8 | 4-12 | 5-16 | 5-20 | 8-22 | 10-25 | 12-32 | 14-38 | 14-38 | 30-56 | 35-60 | 40-62 |
| Bore Diameter from Ø to Ø H7 (mm) | $D_2$ | 3-8 | 4-12 | 5-14 | 5-20 | 8-26 | 10-30 | 12-32 | 14-42 | 14-42 | 30-60 | 35-60 | 40-75 |
| Diameter (mm) | $D_3$ | 9.1 | 12.1 | 14.1 | 20.1 | 21.1 | 24.1 | 32.1 | 36.1 | 36.1 | 58.1 | 60.1 | 60.1 |
| Outside diameter (mm) | E | 19 | 25 | 32 | 40 | 49 | 55 | 66 | 81 | 81 | 110 | 123 | 134 |
| Distance (mm) | F | 12 | 13 | 15 | 17 | 19 | 24 | 28 | 31 | 31 | 35 | 45 | 50 |
| Distance ("F" Version) (mm) | $F^F$ | 11.5 | 12 | 14 | 16 | 19 | 22 | 29 | 31 | 30 | 36 | 43 | 54 |
| Distance (mm) | G | 3.5 | 4 | 5 | 5 | 6.5 | 7.5 | 9.5 | 11 | 11 | 13 | 17 | 18 |
| Distance between centers (mm) | H | 6 | 8 | 10 | 15 | 17 | 19 | 23 | 27 | 27 | 39 | 41 | 2x48 |
| Screw ISO 4762 | I | M2.5 | M3 | M4 | M4 | M5 | M6 | M8 | M10 | M10 | M12 | M16 | 2xM16 |
| Tightening torque (Nm) | I | 1 | 2 | 4 | 4.5 | 8 | 15 | 40 | 50 | 70 | 130 | 200 | 250 |
| Pretensioning, approx (mm) | K | 0.1 - 0.5 | 0.2 - 0.7 | 0.2 - 0.7 | 0.2 - 1.0 | 0.2 - 1.0 | 0.3 - 1.5 | 0.5 - 1.5 | 0.5 - 1.0 | 0.5 - 1.0 | 0.5 - 1.5 | 0.5 - 2.0 | 0.8 - 2.0 |
| Axial recovery of coupling max. (N) | | 4 | 8 5 | 15 10 | 25 30 | 20 12 | 50 30 | 70 45 | 48 32 | 82 52 | 157 106 | 140 96 | 200 |
| Approx. weight (kg) | | 0.038 | 0.07 | 0.2 | 0.3 | 0.4 | 0.6 | 1.4 | 2 | 2.4 | 5.9 | 9.6 | 15 |
| Moment of inertia ($10^{-3}$ kgm²) | $J_{ges}$ | 0.01 | 0.01 0.01 | 0.02 0.02 | 0.06 0.07 | 0.10 0.15 | 0.27 0.32 | 0.75 0.80 | 1.80 1.90 | 2.50 2.80 | 6.50 7.00 | 13.0 17.0 | 50 |
| Torsional stiffness ($10^3$ Nm/rad) | $C_T$ | 0.7 | 1.2 1.3 | 7 5 | 8 7 | 12 10 | 18 16 | 40 31 | 68 45 | 90 60 | 220 190 | 260 250 | 390 |
| Lateral ± (mm) | max. values | 0.15 | 0.15 0.20 | 0.20 0.25 | 0.20 0.30 | 0.15 0.20 | 0.20 0.25 | 0.20 0.25 | 0.20 0.25 | 0.20 0.25 | 0.25 0.30 | 0.30 0.35 | 0.35 |
| Angular ± (Degree) | | 1 | 1 1.5 | 1.5 2 | 1.5 2 | 1 1.5 | 1 1.5 | 1 1.5 | 1 1.5 | 1 1.5 | 1.5 2 | 2 2.5 | 2.5 |
| Lateral spring stiffness (N/mm) | | 70 | 40 30 | 290 45 | 280 145 | 475 137 | 900 270 | 1200 420 | 920 290 | 1550 435 | 3750 1050 | 2500 840 | 2000 |
| Actuation distance (mm) | | 0.7 | 0.8 | 0.8 | 1.2 | 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)**

# ES2

# PRESS FIT ELASTOMER WITH CLAMPING HUB

1 - 1,800 Nm

## ABOUT

### MATERIAL

- **Clutch system:** hardened steel
- **Hub D1:** up to size 450 high strength aluminum, size 800 and up steel
- **Hub D2:** up to size 60 high strength aluminum, size 150 and up steel
- **Elastomer insert:** wear resistant thermally stable TPU

### ORDERING EXAMPLE

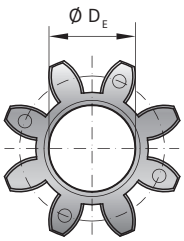
see page 105

### DESIGN

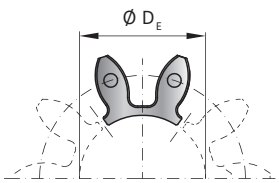
Two clamping hubs with one clamping screw in each and concave driving jaws. Backlash free, vibration damping, electrically isolating elastomer insert press fit into the jaw sets. Clutch system: spring loaded ball-detent principle.

### AVAILABLE FUNCTION SYSTEMS

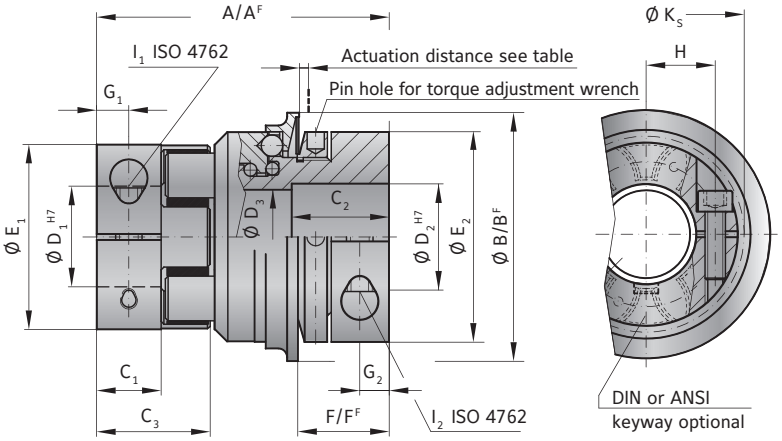
- W = Single postion / automatic re-engagement (standard)
- D = Multi-position / automatic re-engagement
- G = Load holding / load blocking
- F = Full disengagement / manual re-engagement




**Size 5-800**
elastomer insert
type A / B




**Size 1500**
includes 5x elastomer segments type A / B




## MODEL ES2

| Size | | | 5 | | 10 | | 20 | | 60 | | 150 | | 300 | | 450 | | 800 | | 1500 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type (Elastomer insert) | | | A | B | A | B | 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 | 950 | 1100 | 1950 | 2450 |
| Max. torque* | (Nm) | $T_{Kmax}$ | 18 | 24 | 25 | 32 | 34 | 42 | 120 | 150 | 320 | 400 | 650 | 810 | 1060 | 1350 | 1900 | 2150 | 3900 | 4900 |
| 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 | | 400 - 650 500 - 800 600 - 900 | | 600 - 850 700 - 1200 1000 - 1800 | |
| 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 | | 200 - 400 or 450 - 800 | | 1000 - 1250 or 1250 - 1500 | |
| Overall length | (mm) | A | 50 | | 60 | | 86 | | 96 | | 106 | | 140 | | 164 | | 179 | | 245 | |
| Overall length ("F" Version) | (mm) | $A_F$ | 50 | | 60 | | 86 | | 96 | | 108 | | 143 | | 168 | | 190 | | 257 | |
| Actuation ring Ø | (mm) | B | 35 | | 45 | | 65 | | 73 | | 92 | | 120 | | 135 | | 152 | | 174 | |
| Outside diameter of actuation ring ("F" Version) | (mm) | $B_F$ | 42 | | 51.5 | | 70 | | 83 | | 98 | | 132 | | 155 | | 177 | | 187 | |
| Clamping fit length | (mm) | $C_1$ | 8 | | 10.3 | | 17 | | 20 | | 21 | | 31 | | 34 | | 46 | | 88 | |
| Fit length | (mm) | $C_2$ | 14 | | 16 | | 27 | | 31 | | 35 | | 42 | | 51 | | 45 | | 67 | |
| Length of hub | (mm) | $C_3$ | 16.7 | | 20.7 | | 31 | | 36 | | 39 | | 52 | | 57 | | 74 | | 120 | |
| 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 | | 35 - 80 | | 35 - 90 | |
| Inside diameter from Ø to Ø H7 | (mm) | $D_2$ | 6 - 14 | | 6 - 20 | | 12 - 30 | | 15 - 32 | | 19 - 42 | | 30 - 60 | | 35 - 60 | | 40 - 75 | | 50 - 80 | |
| Diameter Ø | (mm) | $D_3$ | 14.1 | | 20.1 | | 24.1 | | 32.1 | | 36.1 | | 58.1 | | 60.1 | | 60.1 | | 68.1 | |
| Inside diameter (Elastomer insert) | (mm) | $D_E$ | 10.2 | | 14.2 | | 19.2 | | 26.2 | | 29.2 | | 36.2 | | 46.2 | | 60.5 | | 79 | |
| Diameter of the hub | (mm) | $E_1$ | 25 | | 32 | | 42 | | 56 | | 66.5 | | 82 | | 102 | | 136.5 | | 160 | |
| Diameter of the hub | (mm) | $E_2$ | 19 | | 40 | | 55 | | 66 | | 81 | | 110 | | 123 | | 132 | | 157 | |
| Distance | (mm) | F | 15 | | 17 | | 24 | | 28 | | 31 | | 35 | | 45 | | 50 | | 63 | |
| Distance ("F" Version) | (mm) | $F_F$ | 14 | | 16 | | 22 | | 29 | | 30 | | 35 | | 43 | | 54 | | 61 | |
| Distance | (mm) | $G_1$ | 4 | | 5 | | 8.5 | | 10 | | 11 | | 15 | | 17.5 | | 23 | | 36 | |
| Distance | (mm) | $G_2$ | 5 | | 5 | | 7.5 | | 9.5 | | 11 | | 13 | | 17 | | 18 | | 22.5 | |
| Distance between centers | (mm) | $H_1$ | 8 | | 10.5 | | 15 | | 21 | | 24 | | 29 | | 38 | | 50.5 | | 2x 57 | |
| Screws (ISO 4762) | | $I_1$ | M3 | | M4 | | M5 | | M6 | | M8 | | M10 | | M12 | | M16 | | 2x M16 | |
| Tightening torque | (Nm) | | 2 | | 4.5 | | 8 | | 15 | | 35 | | 70 | | 120 | | 290 | | 300 | |
| Distance between centers D2 side | (mm) | $H_2$ | 10 | | 15 | | 19 | | 23 | | 27 | | 39 | | 41 | | 48 | | 2x 55 | |
| Screws (ISO 4762) | | $I_2$ | M4 | | M4 | | M6 | | M8 | | M10 | | M12 | | M16 | | 2x M16 | | 2x M20 | |
| Tightening torque | (Nm) | | 4 | | 4.5 | | 15 | | 40 | | 70 | | 130 | | 200 | | 250 | | 470 | |
| Diameter with screwhead | (mm) | $K_S$ | 25 | | 32 | | 44.5 | | 57 | | 68 | | 85 | | 105 | | 139 | | 155 | |
| Approx. weight | (kg) | | 0.2 | | 0.3 | | 0.6 | | 1.0 | | 2.4 | | 5.8 | | 9.3 | | 14.3 | | 26 | |
| Moment of inertia | ($10^{-3}$ kgm$^2$) | $J_{ges}$ | 0.02 | | 0.06 | | 0.25 | | 0.7 | | 2.3 | | 11 | | 22 | | 33.5 | | 185 | |
| Actuation distance | (mm) | | 0.8 | | 1.2 | | 1.5 | | 1.7 | | 1.9 | | 2.2 | | 2.2 | | 2.2 | | 3.0 | |

**For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts see page 105. $A^F$, $B^F$, $L^F$ = Full disengagement / manual re-engegement version (F)**
* Maximum transmittable torque of the clamping hub depends on the bore diameter see table on page 105.

# SLE

# PRESS FIT ELASTOMER WITH CLAMPING HUB

10 - 700 Nm

**ULTRALIGHT DESIGN**

## ABOUT

### DESIGN

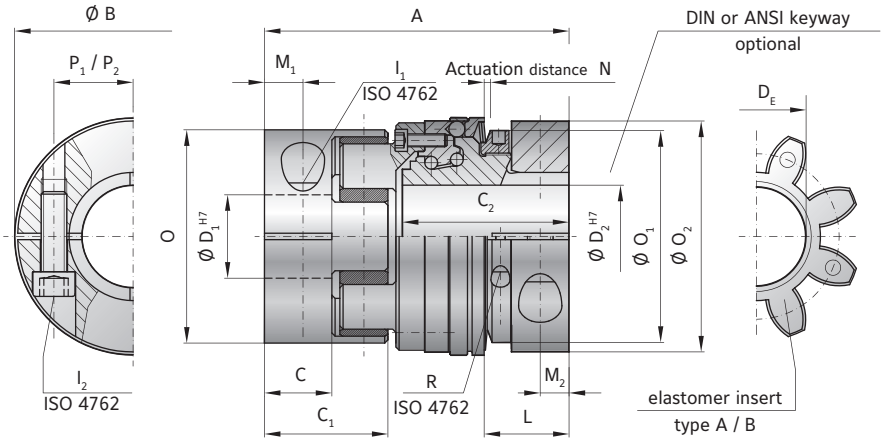
Clamping collar with clamping screw. Clamping hub with concave driving jaws and clamping screw. Backlash free, vibration damping, electrically isolating elastomer insert press fit into the jaw sets. Clutch system: spring loaded ball-detent principle, in a special compact, low inertia design.

### AVAILABLE FUNCTION SYSTEMS

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

### ORDERING EXAMPLE

see page 105




## MODEL SLE

| 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<br>30-80<br>40-135 | | 30-80<br>60-120<br>100-200 | | 40-100<br>100-200<br>150-300 | | 200-350<br>300-450<br>400-550<br>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 |

# ESL

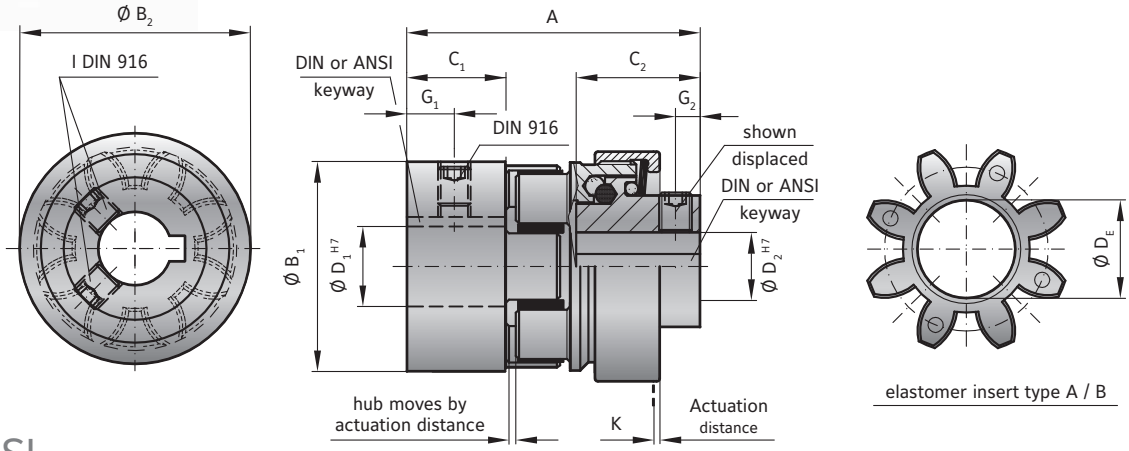
# WITH KEYWAY MOUNTING
1 - 150 Nm

## ABOUT

### MATERIAL
- **Clutch system:** high strength steel, drive balls made from hardened steel
- **Hubs:** high strength aluminum
- **Elastomer insert:** wear resistant, thermally stable TPU

### DESIGN
Two hubs, each with keyway, set screw, and concave driving jaws. Backlash free, vibration damping, electrically isolating elastomer insert press fit into the jaw sets. The clutch system is integrated into one of the hubs. All couplings have a multi-position function system due to the spring loaded, interlocking ball system.

### DISENGAGEMENT SPEED
Negligible wear at up to 200 rpm. Contact R+W for higher speed applications.




## MODEL ESL

| Size | | | 5 | | 10 | | 20 | | 60 | | 150 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type (Elastomer insert) | | | 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 |
| Torque setting possible* from - to | (Nm) | $T_{Kn}$ | 1-6 | | 1-12 | | 3-19 | | 5-60 | | 20-150 | |
| Overall length | (mm) | A | 34 | | 45 | | 64 | | 80 | | 90 | |
| Diameter of the hub | (mm) | $B_1$ | 25 | | 32 | | 42 | | 56 | | 66.5 | |
| Diameter of the hub | (mm) | $B_2$ | 29 | | 32 | | 46 | | 59 | | 75 | |
| Clamping fit length | (mm) | $C_1$ | 12.5 | | 12 | | 25 | | 30 | | 35 | |
| Clamping fit length | (mm) | $C_2$ | 11.5 | | 20 | | 22 | | 31 | | 35 | |
| Inside diameter from Ø to Ø H7 | (mm) | $D_1$ | 6-15 | | 6-18 | | 8-25 | | 12-32 | | 19-38 | |
| Inside diameter from Ø to Ø H7 | (mm) | $D_2$ | 6-10 | | 6-12 | | 8-19 | | 12-24 | | 19-32 | |
| Inside diameter max. (elastomer) | (mm) | $D_E$ | 10.5 | | 14.2 | | 19.2 | | 26.2 | | 29.2 | |
| Distance | (mm) | $G_1$ | 5 | | 6 | | 9 | | 11 | | 12 | |
| Distance | (mm) | $G_2$ | 2.5 | | 3.5 | | 4 | | 4 | | 4 | |
| Screws DIN 916** | | I | depending on bore diameter see below table | | | | | | | | | |
| Approx. weight | (kg) | | 0.05 | | 0.15 | | 0.2 | | 0.5 | | 1 | |
| Moment of inertia | ($10^{-3}$ kgm²) | $J_1/J_2$ | 0.01 | | 0.02 | | 0.08 | | 0.15 | | 0.5 | |
| Actuation distance | (mm) | K | 0.6 | | 0.6 | | 0.7 | | 1.1 | | 1.4 | |

* Disengagement torque is permanently set at the factory. For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts see page 105.

| ORDERING EXAMPLE | ESL | 10 | A | 14 | 12 | 10 | XX |
|---|---|---|---|---|---|---|---|
| Model | ● | | | | | | Special designation only (e.g. special bore tolerance). |
| Size | | ● | | | | | |
| Elastomer insert type | | | ● | | | | |
| Bore D1 H7 includes standard keyway | | | | ● | | | |
| Bore D2 H7 includes standard keyway | | | | | ● | | |
| Disengagement torque Nm (not adjustable) | | | | | | ● | |

For custom features place an XX at the end of the part number and describe the special requirements (e.g. ESL / 10 / A / 14 / 12 / 10 / XX; XX=stainless steel)

## FIXED DISENGAGEMENT TORQUE

The ESL coupling is unlike other R+W safety couplings in that the disengagement torque is permanently set and tamper proof.

| ** SET SCREWS | | | | | |
|---|---|---|---|---|---|
| D1/D2 | - Ø 10 | Ø 11-12 | Ø 13-30 | Ø 31-58 | Ø 59-80 |
| I | M3 | M4 | M5 | M8 | M10 |

Bores <6mm made without keyway.

## DESCRIPTION OF THE ELASTOMER TYPES

| Design | Shore hardness | Color | Material | Relative damping (μ) | Temperature range | Features |
|---|---|---|---|---|---|---|
| **A** | 98 Sh A | red | 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 |
| **D** | 65 Sh D | black | TPU | 0.3 - 0.45 | -10°C to + 70°C | electrically conductive |

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

## ES2 | ESL

| SIZE | | | 5 | | 10 | | 20 | | 60 | | 150 | | 300 | | 450 | | 800 | | 1500 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elastomer type | | | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| Static torsional stiffness | (Nm/rad) | $C_T$ | 150 | 350 | 260 | 600 | 1140 | 2500 | 3290 | 9750 | 4970 | 10600 | 12400 | 18000 | 15100 | 27000 | 41300 | 66080 | 87600 | 109000 |
| Dynamic torsional stiffness | (Nm/rad) | $C_{Tdyn}$ | 300 | 700 | 541 | 1650 | 2540 | 4440 | 7940 | 11900 | 13400 | 29300 | 23700 | 40400 | 55400 | 81200 | 82600 | 180150 | 17500 | 216000 |
| Lateral | ± (mm) | Max. values | 0.08 | 0.06 | 0.1 | 0.08 | 0.1 | 0.08 | 0.12 | 0.1 | 0.15 | 0.12 | 0.18 | 0.14 | 0.2 | 0.18 | 0.25 | 0.2 | 0.5 | 0.3 |
| Angular | ± (Degree) | | 1 | 0.8 | 1 | 0.8 | 1 | 0.8 | 1 | 0.8 | 1 | 0.8 | 1 | 0.8 | 1 | 0.8 | 1 | 0.8 | 1.5 | 1 |
| Axial | ± (mm) | | ± 1 | | ± 1 | | ± 2 | | ± 2 | | ± 2 | | ± 2 | | ± 2 | | ± 2 | | ± 3 | |

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

## SLE

| SIZE | | | 30 | | 60 | | 150 | | 300 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Elastomer type | | | A | B | A | B | A | B | A | B |
| Static torsional stiffness | (Nm/rad) | $C_T$ | 3290 | 9750 | 4970 | 10600 | 12400 | 18000 | 15100 | 27000 |
| Dynamic torsional stiffness | (Nm/rad) | $C_{Tdyn}$ | 7940 | 11900 | 13400 | 29300 | 23700 | 40400 | 55400 | 81200 |
| Lateral | ± (mm) | Max. values | 0.12 | 0.1 | 0.15 | 0.12 | 0.18 | 0.14 | 0.2 | 0.18 |
| Angular | ± (Degree) | | 1 | 0.8 | 1 | 0.8 | 1 | 0.8 | 1 | 0.8 |
| Axial | ± (mm) | | ± 2 | | ± 2 | | ± 2 | | ± 2 | |

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

## ES2 | MAXIMUM TRANSMITTABLE TORQUE (Nm) OF THE CLAMPING HUB DEPENDS ON THE BORE DIAMETER (mm)

| Size | 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 | Ø 65 | Ø 70 | Ø 75 | Ø 80 | Ø 85 | Ø 90 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | | | | | | |
| 800 | | | | | | | | | 700 | 750 | 800 | 835 | 865 | 900 | 925 | 950 | 1,000 | | |
| 1500 | | | | | | | | | 1,900 | 2,600 | 2,900 | 3,200 | 35,00 | 3,800 | 4,000 | 4,300 | 4,600 | 4,900 | 5,200 |

Higher torque possible with keyways

## SLE | MAXIMUM TRANSMITTABLE TORQUE (Nm) OF THE CLAMPING HUB DEPENDS ON THE BORE DIAMETER (mm)

| 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 |

| ORDERING EXAMPLE | SLE \| ES2 | 60 | A | W | 30 | 19.05 | 80 | 40-100 | XX |
|---|---|---|---|---|---|---|---|---|---|
| Model | ● | | | | | | | | Special designation only (e.g. special bore tolerance). |
| Size | | ● | | | | | | | |
| Elastomer insert type | | | ● | | | | | | |
| 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. SLE / 60 / A / W / 30 / 19.05 / 80 / 40-100 / XX; XX=anodized aluminum)**


STOP·STOP·STOP

# SAFETY COUPLING ACCESSORIES

# ACCESSORIES FOR SK / ES2 / SL SAFETY COUPLINGS

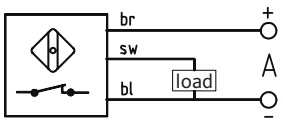
**It is important that switches be 100% tested for proper functioning after mounting with safety coupling.**

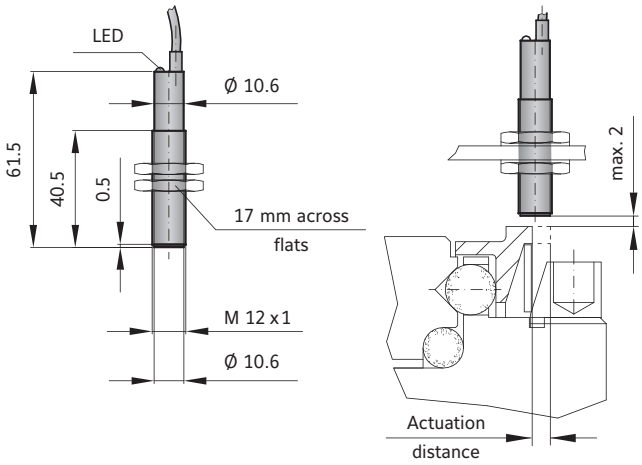
## PROXIMITY SWITCH (E-STOP FUNCTION)

**SK** **ES2**

### ORDER NUMBER 650.2703.001

| TECHNICAL DATA | SK, ES2 |
|---|---|
| Voltage | 10 to 30 V DC |
| Max. output current | 200 mA |
| Max. switch frequency | 800 Hz |
| Temperature range | -25° to +70° C |
| Protective system | IP 67 |
| Switch type | normally open |
| Max. detection gap | max. 2 mm |
| **SWITCH DIAGRAM SK, ES2** | |

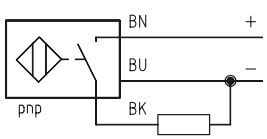


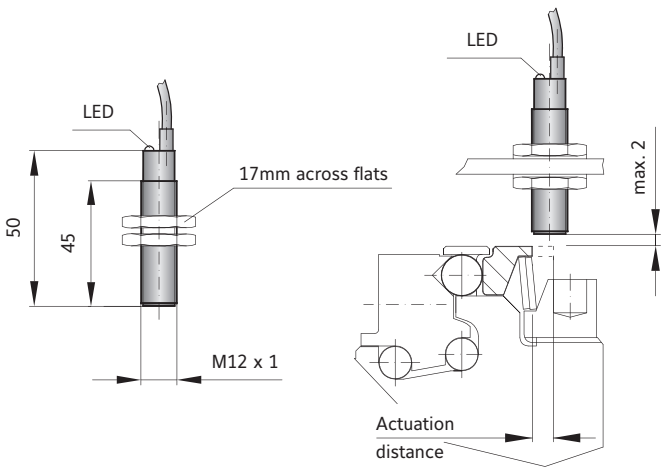




**SL**

### ORDER NUMBER 619.4711.650

| TECHNICAL DATA | SL |
|---|---|
| Voltage | 10 to 30 V DC |
| Max. output current | 200 mA |
| Max. switch frequency | ≤ 3 Khz |
| Temperature range | -25° to +70° C |
| Protective system | IP 67 |
| Switch type | PNP, NO |
| Max. detection gap | max. 2 mm |
| **SWITCH DIAGRAM SL** | |



**It is important that switches be 100% tested for proper functioning after mounting with safety coupling.**

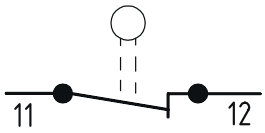
## MECHANICAL LIMIT SWITCH (E-STOP FUNCTION)

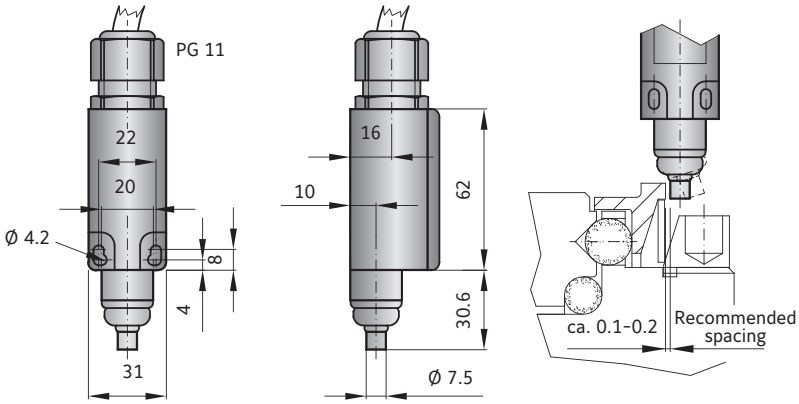
**SK** **ES** **SL**

## ORDER NUMBER 618.6740.644

| TECHNICAL DATA | SK, ES2, SL |
|---|---|
| Max. voltage | 250 V AC |
| MAX. CONSTANT CURRENT: | 2.5h A |
| Protective system | IP 65 |
| Contact system | Opener (forced seperating) |
| Temperature range | -30° to +80° C |
| Actuation | Plunger (metal) |

**SWITCH DIAGRAM SK, ES2, SL**




The mechanical limit switch is suitable for size 30 and up. For smaller safety couplings the proximity sensor is recommended.

The switch plunger (pictured above and right) should be located as close to the actuation ring / limit switch plate as possible (approximately 0.1-0.2mm).

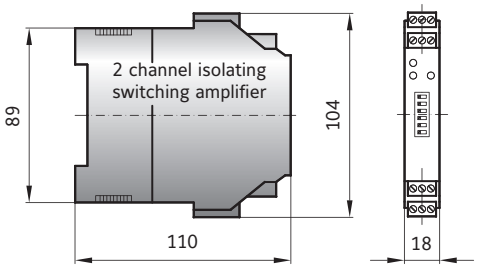
# ACCESSORIES FOR ATEX
# SAFETY COUPLINGS

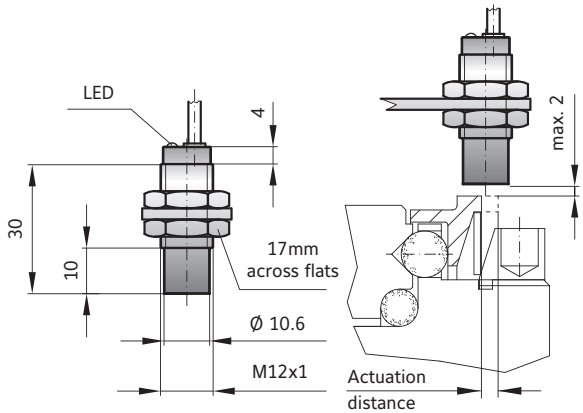
**It is important that switches be 100% tested for proper functioning after mounting with safety coupling.**

## ATEX PROXIMITY SWITCH (E-STOP FUNCTION)

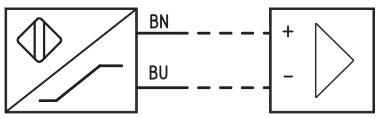
**SK** **ES 2**

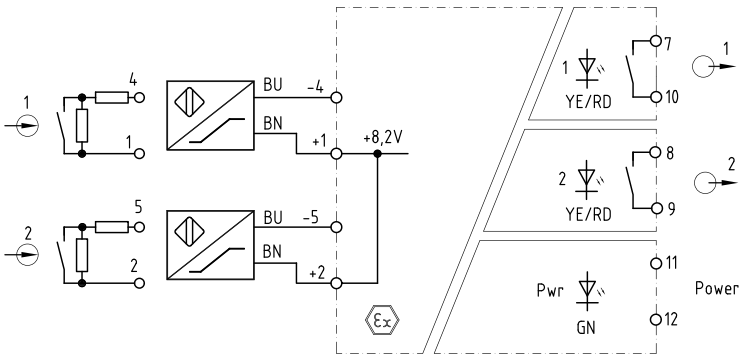
ORDER NUMBER EEX. 1624.004




### SWITCH DIAGRAM



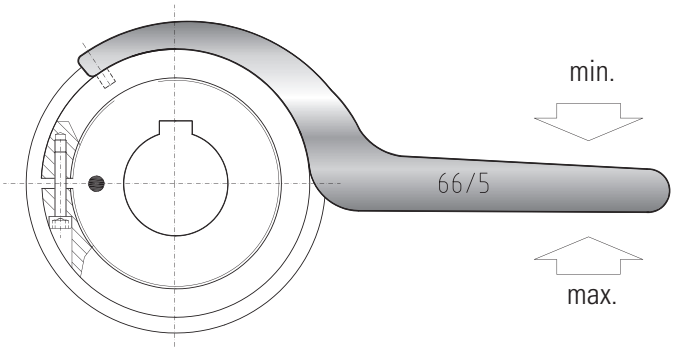



# ACCESSORIES FOR SK / ES2 / SL
# SAFETY COUPLINGS

## R+W SPANNER WRENCH FOR TORQUE ADJUSTMENT

**SK** **ES 2** **SL**

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 | SK Single postion Multi-position Load holding | SK Full disengagement | ES2 Single postion Multi-position Load holding | ES2 Full disengagement | SL 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 | – | – | – |
| 800 | 134/8 | 144/8 | 134/8 | 144/8 | – |
| 1500 | 163/8 | 163/8 | 163/8 | 163/8 | – |
| 2500 | 210/10 | 226/10 | – | – | – |

ATEX

# FOR USE IN HAZARDOUS AREAS

# FOR USE IN HAZARDOUS AREAS
## PRECISION COUPLINGS

## MARKING EXAMPLE

Based on the ATEX markings the product can be certified for suitability under certain conditions.

| | | | | | |
|---|---|---|---|---|---|
|  | II | 2G | c | IIA T6 | X |
| | II | 2D | c | 85°C | X |
| | Equipment group | Category | Protection type | Explosion group / temperature class / maximum surface temperature | Additional features |

| Equipment group | Approval type |
|---|---|
| I | approved for underground operation |
| II | approved for all other applications |

| Category | Approved for zone | Zone description |
|---|---|---|
| 1G | 0 | Area in which an explosive atmosphere consisting of a mixture of air and flammable gases, vapors, or mists, is present continuously, frequently, or for long periods of time. |
| 2G | 1 | Area in which the potential exists for an explosive mixture of air and flammable gases, vapors, or mists to occur. |
| 3G | 2 | Area in which the potential for an explosive mixture of air and flammable gases, vapors, or mists to occur is unlikely and only for a brief duration. |
| 1D | 20 | Area with the same conditions as zone 0, with powder or dust. |
| 2D | 21 | Area with the same conditions as zone 1, with powder or dust. |
| 3D | 22 | Area with the same conditions as zone 2, with powder or dust. |

| Protection type | Definition |
|---|---|
| c | Design safety level: ignition hazard is avoided by the product design. |

**Example classification by occurring gases, mists and vapors according to temperature class and explosion group**

| Explosion group / temperature class / maximum surface temperature | IIA | IIB (includes IIA) | IIC (includes IIA + IIB) |
|---|---|---|---|
| T1 / 450°C | acetone, ammonia, methane... | natural gas | hydrogen |
| T2 / 300°C | ethyl alcohol, butane, cyclohexane... | ethylene, ethylene oxide | ethyne (acetylene) |
| T3 / 200°C | gasoline, diesel fuel, fuel oil... | ethylene glycol, hydrogen sulfide | |
| T4 / 135°C | acetaldehyde | ethyl ether | |
| T5 / 100°C | | | |
| T6 / 85°C | | | carbon disulphide |

| Additional labeling | Definition |
|---|---|
| X | Special operating conditions |
| U | Product is only a component in a machine. Conformity therefore shall only be declared after installation. |

# ATEX BELLOWS COUPLINGS

### CONSTRUCTION

Dimensions and materials of the standard models remain largely intact.

### PERFORMANCE RATINGS

All permitted misalignment, speed, and torque ratings of the standard models must be reduced by 30%.

### OPERATION

ATEX metal bellows couplings must only be operated inside a sealed housing. Both the input and output shafts must be monitored to guarantee shut down in the case of coupling failure.

With blind mate style bellows couplings it is also necessary to guarantee electrical continuity between both shafts. This is necessary due to the electrically isolating properties of the coupling, and the need to prevent sparking from any electrostatic charges.

### SAMPLE IDENTIFICATION

Type: BK2/60/EEx - 2013
II 2G c T4
II 2D c 135˚C
Ser.No.: 123456.7
Tech.Ref.No.:2003/003RW

Type: BK5/60/EEx - 2013
II 2G c T4
II 2D c 135˚C
Ser.No.: 123456.7
Tech.Ref.No.:2003/006RW

# ATEX ELASTOMER COUPLINGS

### CONSTRUCTION

Dimensions and materials of the standard models remain largely intact.

For ATEX elastomer couplings the inserts come in version "D" (Sh65D) which is electrically conductive to provide continuity for any potential electrostatic charges.

### PERFORMANCE RATINGS

All permitted misalignment, speed, and torque ratings of the standard models must be reduced by 30%.

### OPERATION

In the case of model TX thermoplastic hub elastomer couplings it is also necessary to guarantee electrical continuity between both shafts. This is necessary due to the electrically isolating properties of the coupling, and the need to prevent sparking from any electrostatic charges.

### SAMPLE IDENTIFICATION

Type: EK2/60/EEx - 2013
II 2G c T4
II 2D c 135˚C
Ser.No.: 123456.7
Tech.Ref.No.:2003/001RW

Type: TX1/60/EEx - 2013
II 2G c IIA T6
II 2D c 85˚C
Ser.No.: 123456.7
Tech.Ref.No.:2003/001RW

ATEX

# FOR USE IN HAZARDOUS AREAS
PRECISION COUPLINGS

## ATEX SAFETY COUPLINGS

### CONSTRUCTION

Dimensions and materials of the standard models remain largely intact.

Generally full disengagement style safety couplings are used in ATEX environments in order to avoid high temperatures from excess friction after disengagement.

For ES2 safety couplings the inserts come in version "D" (Sh65D) which is electrically conductive to provide continuity for any potential electrostatic charges.

### PERFORMANCE RATINGS

All permitted misalignment and speed ratings of the standard models must be reduced by 30%.

### OPERATION

ATEX safety couplings must be used with an ATEX proximity switch. The emergency stop function in conjunction with activation of the switch must be fully tested for proper function prior to commissioning of the machine.

When bellows couplings are incorporated they must only be operated inside a sealed housing. Both the input and output shafts must be monitored to guarantee shut down in the case of bellows failure.

With blind mate style bellows couplings it is also necessary to guarantee electrical continuity between both shafts. This is necessary due to the electrically isolating properties of the coupling, and the need to prevent sparking from any electrostatic charges.

### SAMPLE IDENTIFICATION

Type: SK2/60/EEx - 2013
II 2G c T3
II 2D c 200°C
Ser.No.: 123456.7
Tech.Ref.No.:2003/004RW

Type: ES2/60/(F)EEx - 2013
II 2G c T3
II 2D c 200°C
Ser.No.: 123456.7
Tech.Ref.No.:2003/002RW

## ATEX LINE SHAFTS

### CONSTRUCTION

Dimensions and materials of the standard models remain largely intact.

For EZ type line shafts the inserts come in version "D" (Sh65D) which is electrically conductive to provide continuity for any potential electrostatic charges.

### PERFORMANCE RATINGS

All permitted misalignment, speed, and torque ratings of the standard models must be reduced by 30%.

The allowable operating speed depends on the overall length of the line shaft and is available upon request.

### OPERATION

When bellows couplings are incorporated they must only be operated inside a sealed housing. Both the input and output shafts must be monitored to guarantee shut down in the case of bellows failure.

### SAMPLE IDENTIFICATION

Type: EZ2/60/D/EEx - 2013
II 2G c T4
II 2D c 135°C
Ser.No.: 123456.7
Tech.Ref.No.:2003/005RW

Type: ZA/10/EEx - 2013
II 2G c T4
II 2D c 135°C
Ser.No.: 123456.7
Tech.Ref.No.:2005/007RW

# ATEX DISC PACK COUPLINGS

### CONSTRUCTION

Dimensions and materials of the standard models remain largely intact.

### PERFORMANCE RATINGS

All permitted misalignment, speed, and torque ratings of the standard models must be reduced by 30%.

### OPERATION

Both the input and output shafts must be monitored to guarantee shut down in the case of disc pack failure.

### SAMPLE IDENTIFICATION

Type: LP2/300/EEx - 2013
II 2G c T4
II 2D c 135°C
Ser.No.: 123456.7
Tech.Ref.No.:2003/011RW

**Prior to deviating from any of the previous safety instructions please contact R+W.**

The use of devices and components in explosive areas is governed by the European directives 94/9/EC (for manufacturers) and 1992/92/EC (for operators). The presented products are non-electrical equipment of category 2. All necessary documents and certifications are stored in a known location. The conformity of these products with these guidelines is established and may be declared by the manufacturer.

According to Directive 94/9/EC, delivery of an ATEX coupling requires the inclusion of special installation and operating instructions along with the EC declaration of conformity issued by the manufacturer. All necessary values for installation, operation and removal are included.

All statements made about ATEX conforming products are based on our present knowledge and experience. R+W reserves the right to change technical specifications.

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