LIGHTWEIGHT AND COMPACT

single-position
multi-position
full disengagement

TORQLIGHT®
SAFETY COUPLINGS

SERIES SL | 10 – 700 Nm

R+W®
COUPLING TECHNOLOGY

THE ULTIMATE COUPLING FROM 10 – 700 Nm

www.rwcouplings.com

optional stainless steel

SERIES **SL**

DESIGN / FEATURES

Extremely lightweight construction

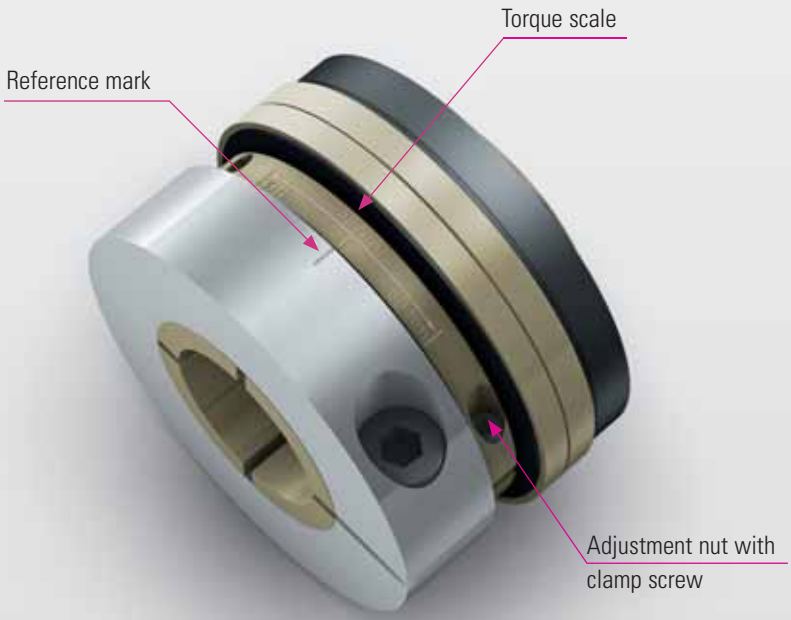
- Up to 60 % weight reduction in comparison to the standard series
- Torque rating increased by 50 %
- Good dynamic characteristics
- Spring tensioned ball-detent principle with absolutely zero backlash
- Corrosion resistant
- Very simple torque setting

TORQUE SETTING

These safety couplings are preset by R+W to the customer's specified values.

Changes to the preset value are very simple to make:

- Loosen the adjustment nut's clamp screw.
- Turn the adjustment nut until the reference mark indicates the desired value. (see Torque scale)
- Tighten down the adjustment nut's clamp screw.



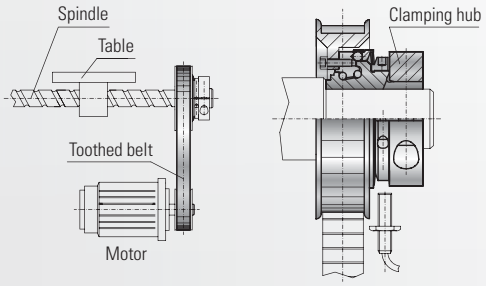
single-position
multi-position
full disengagement

MODELS	FEATURES	POSSIBLE APPLICATIONS

SLN

With clamping hub for indirect drives

- Integral bearing for timing belt pulley or sprocket
- Compact, simple construction
- Torque setting is continuously variable
- Frictional clamp connection
- Simple to install

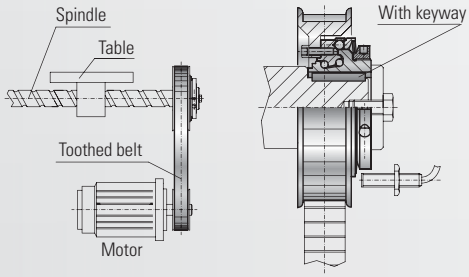


see page 4

SLP

With keyway connection for indirect drives

- Integral bearing for timing belt pulley or sprocket
- Compact, simple construction
- Torque setting is continuously variable
- Simple keyed connection

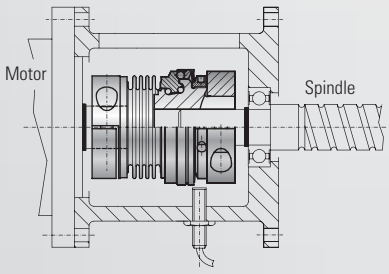


see page 5

SL 2

With clamping hub for direct drives

- Easy to install
- Low moment of inertia
- Small space requirement
- Misalignment compensation
- Torque setting is continuously variable

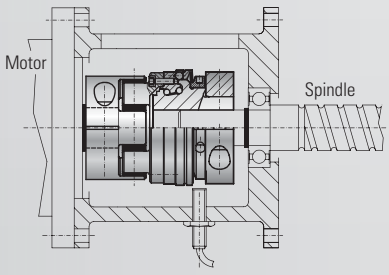


see page 6

SLE

With clamping hub for direct drives

- Easy to install
- Vibration damping
- Misalignment compensation
- Torque setting is continuously variable



see page 7

optional stainless steel

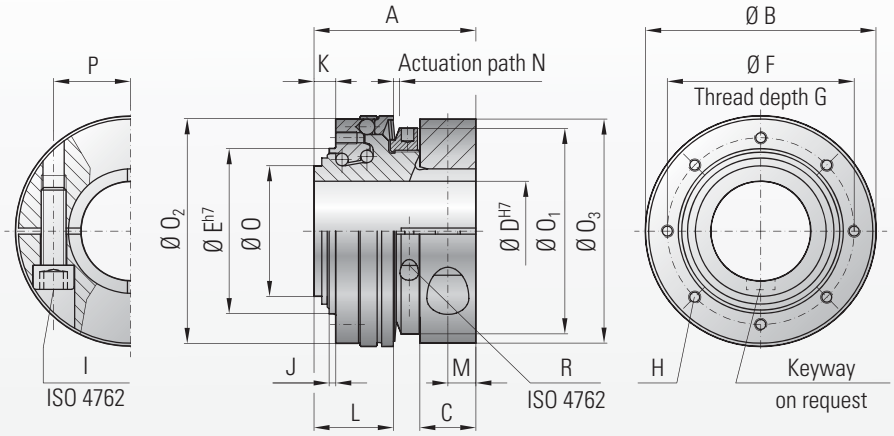
single-position
multi-position
full disengagement

MODEL **SLN**

Production monitored
Type tested

BACKLASH FREE TORQUE LIMITER

with clamping hub



Design:
With clamp collar and screw per ISO 4762
Components of compact and rigid design with backlash free interface

Temperature range: -30 to +120°C

Service life:
These couplings are maintenance free and stable over their entire service life if technical limits are not exceeded

Fit tolerance:
Overall clearance between shaft and hub
0.01-0.05 mm

Function system:
W = single position engagement (standard)
D = multi position engagement every 60°
(30, 45, 90° optional)
F = full disengagemnt on request

Model SLN			Series											
			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			19-48			22-60			
Bore diameter with keyway DIN 6885 from Ø to Ø H7		D	12-25.4			16-32			19-44			22-54			
Centering 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			
ISO 4762 screw		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 path	(mm)	N	1.3			1.5			1.8			2			
Base element Ø	(mm)	O	35			42			54			70			
Adjustment nut Ø	(mm)	O_1	55			66			82			100			
Flange Ø -0.2	(mm)	O_2	58			72			87			110			
Clamping hub Ø	(mm)	O_3	59			72			90			112			
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} Kgm^2)	J_{ges}	0.15			0.3			1			3			

(1Nm = 8.85 in lbs)

* max. transmittable torque depends on the bore diameter; see table below:

Maximum transmittable torque in relation to bore diameter

Series	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 ratings possible with key / keyway

optional stainless steel

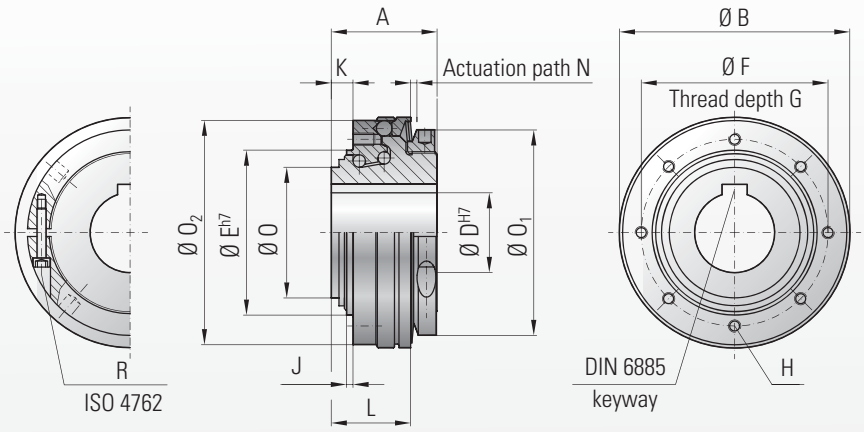
single-position
multi-position
full disengagement

MODEL **SLP**

Production monitored
Type tested

BACKLASH FREE TORQUE LIMITER

with pure keyway connection



Design:
Keyway per DIN 6885 or ANSI standard dimensions
Components of compact and rigid design with backlash free interface

Temperature range: -30 to +120°C

Service life:
These couplings are maintenance free and stable over their entire service life if technical limits are not exceeded

Fit tolerance:
Overall clearance between shaft and hub
0.01-0.05 mm

Function system:
W = single position engagement (standard)
D = multi position engagement every 60°
(30, 45, 90° optional)
F = full disengagemnt on request

Model SLP			Series											
			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	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)*			
Centering 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 path	(mm)	N	1.3			1.5			1.8			2			
Base element Ø	(mm)	O	35			42			54			70			
Adjustment nut Ø	(mm)	O_1	55			66			82			100			
Flange Ø -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			

* max. possible bore diameter if (shallow) keyway per DIN 6883/3 is used (1Nm = 8.85 in lbs)

Ordering specifications

SLN / 060 / W / 30 / 80 / 60-120 / XX

- Model
- Series
- Function system
- Bore Ø D H7
- Disengagement torque (Nm)
- Adjustment range (Nm)
- Special feature, e.g. stainless steel

SLP / 060 / W / 30 / 80 / 60-120 / XX

- Model
- Series
- Function system
- Bore Ø D H7 with DIN 6885 keyway
- Disengagement torque (Nm)
- Adjustment range (Nm)
- Special feature, e.g. stainless steel

All data is subject to change without notice.

optional stainless steel

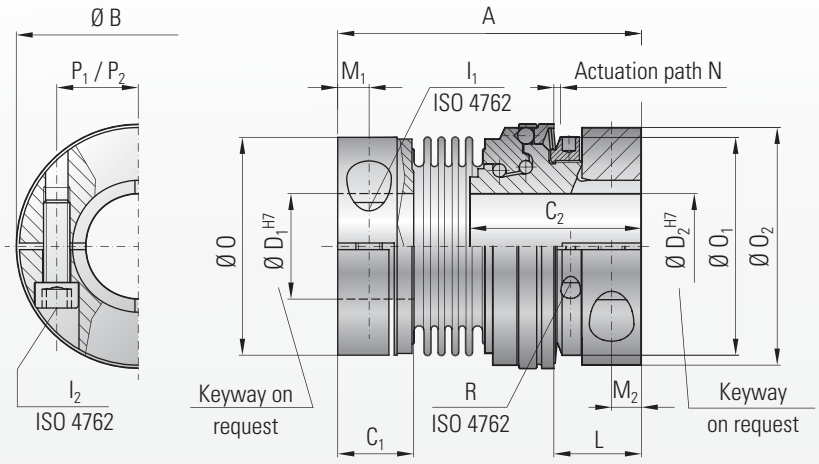
single-position
multi-position
full disengagement

MODEL **SL2**

Production monitored
Type tested

BACKLASH FREE TORQUE LIMITER

with clamping hubs and metal bellows



Design:
Clamping hub with one ISO 4762 screw per hub. Components of compact and rigid design with backlash free interface. Misalignment compensation via torsionally rigid bellows

Temperature range: -30 to +100°C

Service life: These couplings are maintenance free and stable over their entire service life if technical limits are not exceeded

Fit tolerance: Overall clearance between shaft and hub 0.01-0.05 mm

Function system:
W = single position engagement (standard)
D = multi position engagement every 60° (30, 45, 90° optional)
F = full disengagemnt on request

Model SL2			Series								
			30		60		150		300		
Adjustment range* from - to	(Nm)	T_{KN}	10-35	30-80	20-50	40-100	40-100	100-200	100-250	200-350	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 / 19-48		22-60 / 22-60		
ISO 4762 screw	(mm)	I_1/I_2	M6		M8		M10		M12		
Tightening torque	(Nm)		15		40		75		130		
Distance to actuation ring edge	(mm)	L	22		27		32		35		
Distance	(mm)	M_1/M_2	7.5/7.5		9.5/9		11/11		13/12		
Actuation path	(mm)	N	1.3		1.5		1.8		2		
Clamping hub Ø, (coupling end)	(mm)	O	55.5		66		82		110		
Adjustment nut Ø	(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		2.5		
Approx. moment of inertia at D max.	(10^{-3} Kgm^2)	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		

* max. transmittable torque depends on the bore diameter; see table on page 4. (1Nm = 8.85 in lbs)

max. misalignment for bellows

Angular misalignment
± 1°

Axial misalignment
± 2 mm

Lateral misalignment
see table above

Ordering specifications

SL2 / 060 / W / 30 / 20 / 80 / 40-100 / XX

- Model
- Series
- Function system
- Bore Ø D1H7
- Bore Ø D2H7
- Disengagement torque (Nm)
- Adjustment range (Nm)
- Special feature, e.g. stainless steel

optional stainless steel

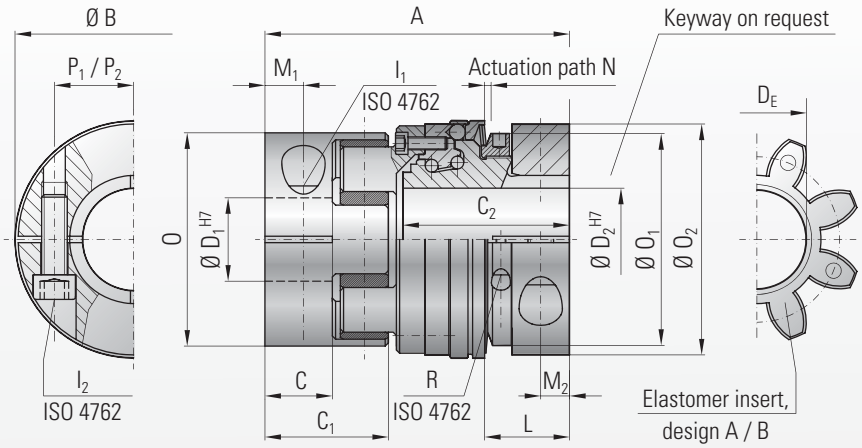
single-position
multi-position
full disengagement

MODEL **SLE**

Production monitored
Type tested

BACKLASH FREE TORQUE LIMITER

with clamping hubs and elastomer insert



Design:
Clamping hub with one ISO 4762 screw per hub. Components of compact and rigid design with backlash free interface. Misalignment compensation via elastomer insert

Temperature range: -30 to +100°C

Service life: These couplings are maintenance free and stable over their entire service life if technical limits are not exceeded

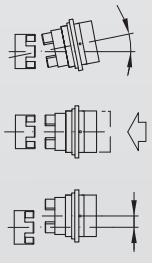
Fit tolerance: Overall clearance between shaft and hub 0.01-0.05 mm

Function system:
W = single position engagement (standard)
D = multi position engagement every 60°
(30, 45, 90° optional)
F = full disengagemnt on request

Model SLE			Series									
			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* 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 (pure coupling end)	(mm)	C/C_1	20 / 36		21 / 39		31 / 52		34 / 57			
Hub length (torque limiter end)		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 / 19-48		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 path	(mm)	N	1,3		1,5		1,8		2			
Clamping hub Ø, elastomer coupling		O	56		66,5		82		102			
Adjustment nut Ø		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	(mm)	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 ±	max. (mm)		0,12	0,1	0,15	0,12	0,18	0,14	0,2	0,18		

Static torsional rigidity at 50% T_{KN} Dynamic torsional rigidity at T_{KN} * max. transmittable torque depends on the bore diameter; see table on page 4. (1Nm = 8.85 in lbs)

max. offsets for elastomer insert



Angular misalignment
± 1°

Axial misalignment
± 2 mm

Lateral misalignment
see table above

Ordering specifications

SLE / 060 / A / W / 30 / 20 / 80 / 60-120/XX

- Model
- Series
- Elastomer insert design
- Function system
- Bore Ø D1H7
- Bore Ø D2H7
- Disengagement torque (Nm)
- Adjustment range (Nm)
- Special feature, e.g. stainless steel

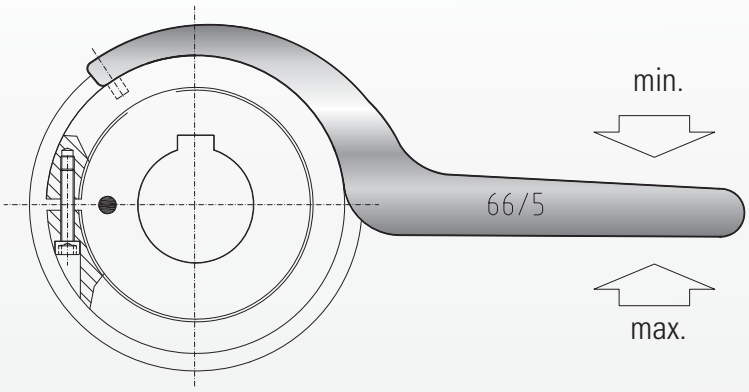
optional stainless steel

ACCESSORIES

BACKLASH FREE TORQUE LIMITER

Spanner wrench for torque adjustment

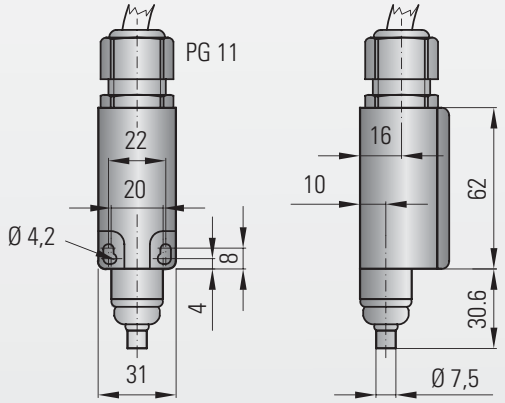
Order no.: see table

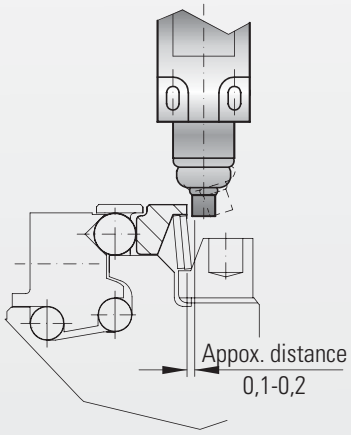


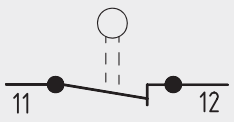
Series	30	60	150	300
Order no.:	55/4	66/5	82/5	100/6

Mechanical limit switch (emergency OFF function)

Order no.: 618.6740.644





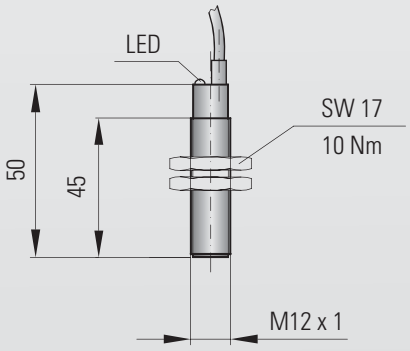
Technical data	
Max. voltage:	500 V AC
Max. constant current:	10 A
Protective system:	IP 65
Contact system:	Opener (forced seperating)
Temperature range:	- 30 - +80 °C
Actuation:	Plunger (metal)
Swith diagram:	

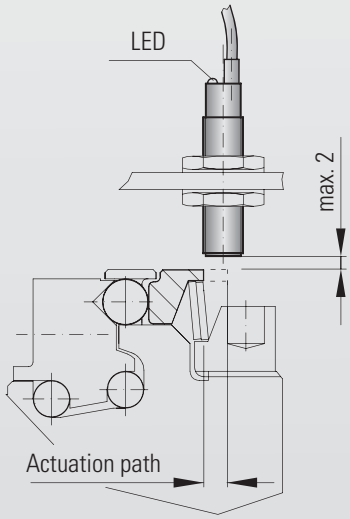
Attention:
A 100 % test of the switch's functionality after it is installed is imperative.

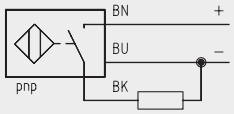
The switch's plunger should be positioned as close to the safety couplings' actuation ring as possible (approx. 0.1-0.2mm)

Proximity sensor (emergency OFF function)

Order no.: 619.4711.650





Technical data	
Voltage:	10 to 30 V DC
Max. output current:	200 mA
Max. switch frequency:	≤ 3 KHz
Temperature range:	-25°C to +70°C
Protective system:	IP 67
Switch type:	PNP, NO
Max. detection gap:	2 mm
Switch diagram:	

Attention:
A 100 % test of the switch's functionality after it is installed is imperative.

optional stainless steel

GENERAL FUNCTION

BACKLASH FREE TORQUE LIMITER

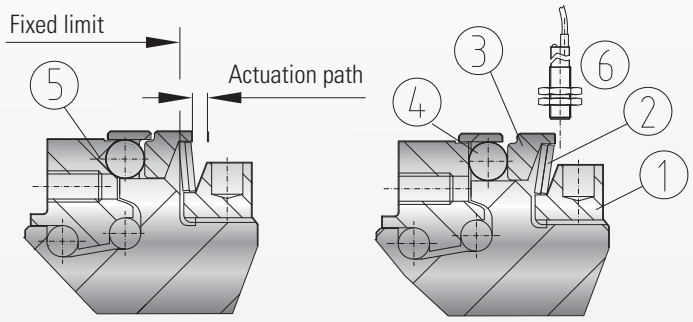
Safety element functionality

- Torque is transmitted through hardened ball bearings (4) arranged around the coupling's circumference and loaded into conical detents (5)
- The ball bearings are loaded into the detents by an actuation ring (3) which, in turn, is held in place by disc springs (2)
- Disengagement torque is continuously adjustable through rotation of the adjustment nut (1)
- In the event of overload the actuation ring (3) moves toward the disc springs (2) which are pushed over center by the force from the balls exiting their detents. This completely disconnects the driving and driven sides of the coupling.
- As a consequence of the actuation ring's (3) axial movement, the mechanical limit switch or proximity sensor (6) is activated, signaling the drive to be shut down.

In its disengaged state this design forces the disc springs into a shape where the residual force drops off to a very small value. The residual force of the springs is insufficient to re-engage the coupling.

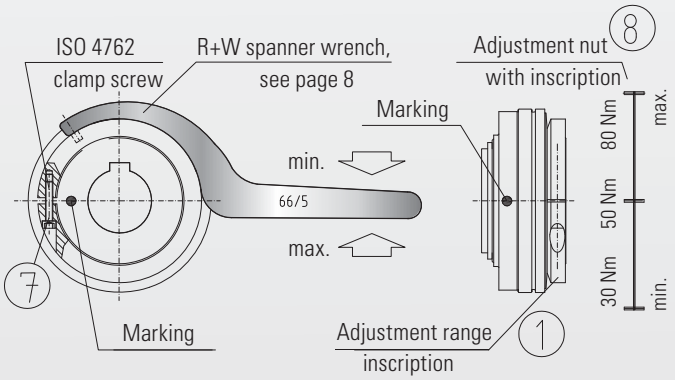
Coupling re-engagement will only take place at very slow rotational speed.

Single-position / multi-position

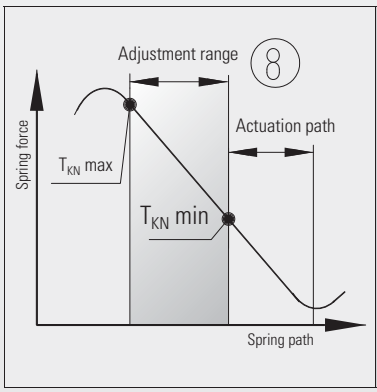


① Adjustment nut ③ Conical detents ⑤ Conical depressions
② Springs ④ Detent balls ⑥ Limit switch

Disengagement torque setting



R+W safety couplings are preset and marked with the desired disengagement torque setting at the factory. The min. and max. of the torque adjustment range are then also marked on the adjustment nut (1). Disengagement torque is continuously adjustable within the range (8) though adjustment of the tension on the disc springs.



Attention! R+W safety couplings have disc springs with a special characteristic. The torque adjustment range lies within a specific range of positions for the disc spring, outside of which the torque limiter can not function. It is important to always stay within the min. – max. of the specified torque adjustment range.

The adjustment range should not be exited during torque adjustment. After loosening the clamp screw (7), the adjustment nut is rotated with an appropriate tool (e.g. R+W spanner wrench). To verify torque adjustment range, see tables on pages 4-7. Afterward the clamp screw is tightened down. The safety coupling is again operational.

Additional information

Wear:
No wear takes place while the coupling is engaged. In the event of disengagement, the drive must be shut down immediately through the use of a mechanical limit switch or proximity sensor.

Rotational speed
The safety coupling's service life is essentially determined by the rotational speed, and the frequency and duration of disengagement events.

Maintenance:
Since these safety couplings are not subject to wear while they are engaged, there is not maintenance necessary. The positive connections are free of backlash and have lifetime lubrication.

Selection:
Safety couplings are generally selected by the desired disengagement torque value. This value must be greater than the torque required for normal acceleration and deceleration of the equipment. The safety coupling's disengagement torque is typically determined by the data from the drive, motor, and / or gearbox.

optional stainless steel

MOUNTING INSTRUCTIONS

MOUNTING AND DISMOUNTING OF TORQUE LIMITERS

Installation preparation

The shafts and hub bores to be connected must be free of contaminants and burrs. Check shaft dimensions and tolerances (including key width and height dimensions). The bores of the R+W safety couplings are machined to an ISO H7 fit. For a clamp connection the overall clearance between shaft and hub must be between 0.01-0.05 mm. This fit clearance, along with oiling of shaft journals assists in installation and removal without reducing clamping force. Fretting corrosion is thus avoided.

Attention!
Oils and greases containing molybdenum disulphide or other high-pressure additives as well as anti-seize pastes must not be used.

Installation instructions, SLN / SLP

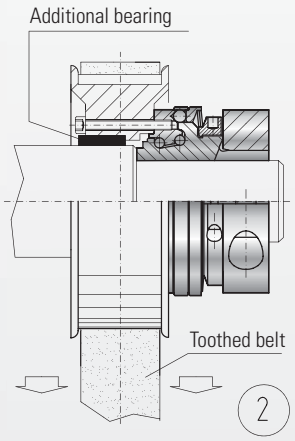
Model SLN / SLP have an integral bearing (1) for support of the attached component (e.g. timing belt pulley, sprocket, etc). The max. radial force (2) must not be exceeded. See table.

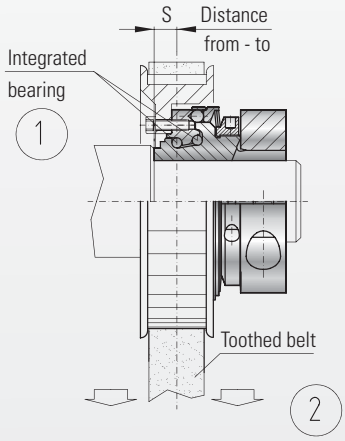
When dimension (S) is maintained, the load is placed between the two bearing races. In this case, a separate bearing is not necessary. An offset attachment requires an additional bearing. This is recommended especially when the diameter is small or the attachment is very wide.

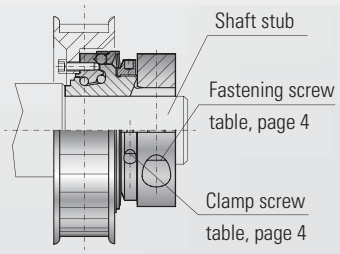
Depending on the situation, ball bearings, needle bearings or plain bearings are suitable.

Series		30	60	150	300
Belt tension, max.	**(N)**	1800	2300	3000	4500
Distance (S) from - to	**(mm)**	4-14	5-18	6-20	6-23

(1N = 0.2248 lbs.)

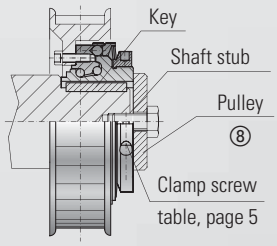






Mounting:
Slide the complete coupling onto the shaft and place it in the correct axial position. Tighten down the fastening screw to its specified torque according to the table (page 4).

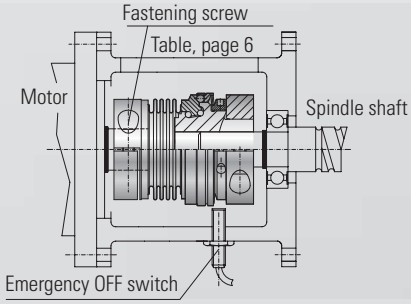
Dismounting:
To remove the R+W safety coupling, it is only necessary to loosen the fastening screw.



Mounting:
Use an appropriate aid to pull the complete coupling onto the shaft journal. The final position must be secured axially, e.g. with a washer (8).

Dismounting:
Remove the coupling's axial fixation and pull the complete coupling off the shaft with an appropriate aid.

SL2 installation instructions



Mounting:
Slide the safety coupling onto the spindle shaft. When the correct axial position has been reached, tighten down the fastening screw with a torque wrench to the torque specified in the table (page 6). Insert the motor shaft, and at the correct axial position, with no axial force on the metal bellows, tighten the clamping hub's fastening screw as described above.

Dismounting:
To remove the R+W safety coupling, it is only necessary to loosen the fastening screw.

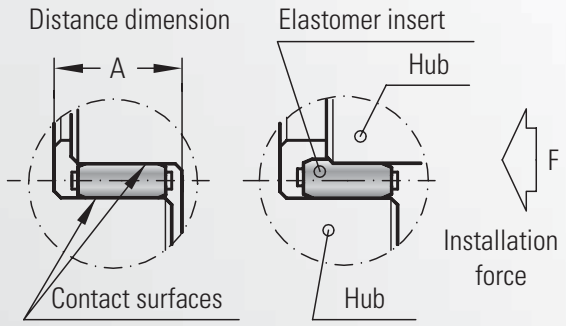
MOUNTING AND DISMOUNTING OF TORQUE LIMITERS

SLE elastomer insert

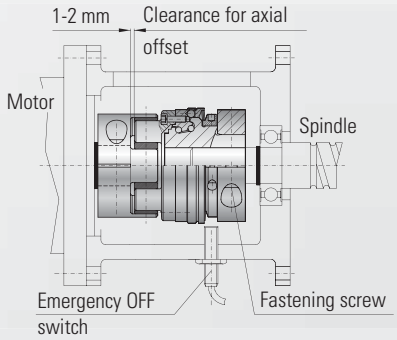
The elastomer insert is the compensating element in an SLE coupling. It transmits torque without backlash and damps shock and vibration. The SLE couplings elastomer insert determines the hysteresis characteristics of the entire rotational axis, and is available in two different designs.

When the coupling hubs are pushed together during installation, axial force is needed to overcome the elastomer insert's preload tension. The amount of force required can be reduced by cleaning the elastomer insert then applying a coat of light oil to its contact surfaces.

Design	Color	Material	Temperature range	Characteristics
A / 98 Sh A	red	TPU	-30°C - +100°C	good damping
B / 64 Sh D	green	TPU	-30°C - +120°C	high torsional rigidity



SLE installation instructions

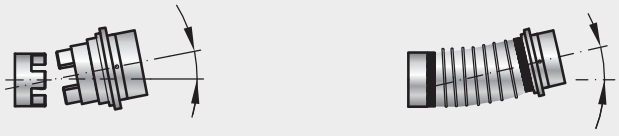


Mounting:
Slide the safety coupling onto the spindle shaft. When the correct axial position has been reached, tighten down the fastening screw, with a torque wrench, to the torque specified in the table (page 7). Insert the motor shaft, and at the correct axial position, tighten the fastening screw as described above.

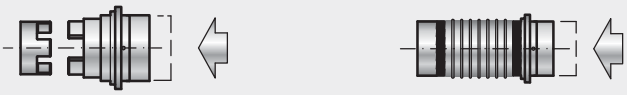
Dismounting:
To remove the R+W safety coupling, it is only necessary to loosen the fastening screw.

Coupling max. misalignment compensation

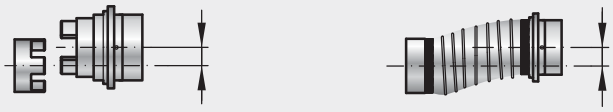
Angular misalignment Δ Kw



Axial misalignment Δ Ka



Lateral misalignment Δ Kr



Attention!

Exact alignment of R+W safety couplings increases their service life.

The stress on adjacent bearings becomes negligible and the entire drive train runs more smoothly.

For very high speed drive systems alignment with a dial indicator is recommended.

Maximum misalignment values can be found in the tables of the individual models.

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From 0.1 – 160,000 Nm, Bore diameters 3 – 290 mm
Available as a single position, multi-position,
load holding, or full disengagement version
Single piece or press-fit design

BELLOWS COUPLINGS
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Bore diameters 3 – 280 mm
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Bore diameters 5 – 140 mm
Available up to 6 mtr. length

MINIATURE BELLOWS COUPLINGS
Series MK

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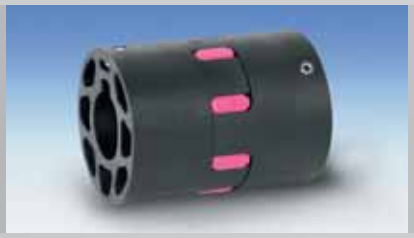
Bore diameters 1 – 28 mm
Single piece or press-fit design

SERVOMAX®
ELASTOMER COUPLINGS
Series EK

From 2 – 25,000 Nm, Shaft diameters 3 – 170 mm
backlash-free, press-fit design



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ELASTOMER COUPLINGS
Series TX 1

From 2 – 810 Nm
Shaft diameters 3 – 45 mm

LINEAR COUPLINGS
Series LK

From 70 – 2,000 N
Thread M5 – M16

POLYAMID COUPLINGS
MICROFLEX
Series FK 1

Rated torque 1 Ncm
Bore diameters 1.5 – 2 mm

603/02/12/1500