

# Installation and Operating Instructions for RLK 300 Cone Clamping Elements

E 03.607e



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## IMPORTANT

Please read these instructions carefully before installing and operating the product. Your particular attention is drawn to the notes on safety.

These installation and operating instructions are valid on condition that the product meets the selection criteria for its proper use. Selection and design of the product is not the subject of these installation and operating instructions.

Disregarding or misinterpreting these installation and operating instructions invalidates any product liability or warranty; the same applies if the product is taken apart or changed.

These installation and operating instructions should be kept in a safe place and should accompany the product if it is passed on to others -either on its own or as part of a machine- to make it accessible to the user.

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## SAFETY NOTICE

- Installation and operation of this product should only be carried out by skilled personnel.
- Repairs may only be carried out by the manufacturer or accredited agents.
- If a malfunction is indicated, the product or the machine into which it is installed, should be stopped immediately and either we or an accredited agent should be informed.
- Switch off the power supply before commencing work on electrical components.
- Rotating machine elements must be protected by the purchaser to prevent accidental contact.
- Supplies abroad are subject to the safety laws prevailing in those countries.

## 1. General information

### 1.1 Function:

RLK 300 Cone Clamping Elements are internal clamping connections for backlash free fastening of hubs on shafts. By tightening clamping screws surfaces are pulled together generating radial forces; these forces create a frictional connection between the Cone Clamping Element and the shaft as well as the hub. Torques or axial forces can be transmitted from the shaft via the Cone Clamping Element to the hub.

### 1.2 General safety instructions:



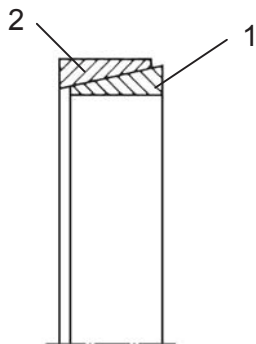
**Caution! Danger of injury!**

**The immediate vicinity of the rotating shrink disc must be kept clear of body parts, hair, clothing and other objects at all times.**

## 2. Configuration and function

The RLK 300 Cone Clamping Elements consists of an inner ring 1 with outside cone and an outer cone ring 2 with inside cone. The pressure flanges or thrust rings needed for manufacturing the clamping connection and the clamping screws are to be provided by the user. The conical rings are clamped axially by tightening the clamping screws. Radial clamping forces are generated by the conical surfaces which are dependent on the torques of the clamping screws, the cone angle and the friction coefficients at the screws and conical surface. The radial clamping forces press the outer ring into the hub bore and the inner ring onto the shaft and create a friction connection at the respective contact surfaces. In this way, torque and/or axial force can be transmitted between the shaft and the hub.

## 3. Diagram (cross-section) and parts list



Pos.	Nomenclature
1	Inner ring
2	Outer ring

## 4. Proper use

The RLK 300 Cone Clamping Elements are designed for installation between a shaft and a hub bore. They are intended solely for the friction-tight connection of hubs and shafts for the purpose of transmitting torque and/or axial forces. Use for any other purpose is regarded as improper use. We accept no liability for damages resulting from improper use and associated risks shall be borne by the user.

## 5. Improper use

RLK 300 Cone Clamping Elements are not suitable for:

- the direct attachment of hollow shafts to solid or hollow shafts or
- use as torque-limiting safety devices

## 6. Condition on delivery

The cone clamping elements are delivered packed in special paper to protect against corrosion.

## 7. Technical requirements for safe and effective operation

The transmissible torques and/or axial forces are subject to the following **tolerances**:

Shaft diameter d [mm]		Hub bore	shaft
>	<	ISO	ISO
10	40	H7	H6
40	96	H8	H8

In addition, pressure-contact **surfaces** on shafts and hubs must have a mean peak-to-valley height  $R_a \leq 1 \mu\text{m}$ .

Shaft and hub must be manufactured from **materials** with the following mechanical properties:

- E-module about  $170 \text{ kN/mm}^2$

## 8. Mounting

8.1 Apply a light coat of oil to the clamping element.



**Do not use oil containing molybdenum sulphide or high-pressure additives or grease of any kind!**

8.2 Push the hub onto the shaft; insert inner and other cone ring and, if necessary, distance rings according to the assembly design.

8.3 Attach the pressure flange or the thrust ring, lightly tighten the clamping screws and align the hub.

8.4 Tighten diagonally opposite screws in several stages with a torque wrench to tightening torque  $M_s$ . If possible, this procedure should be repeated after the first application of stress to the clamping element



**The tightening procedure is complete when no screw turns at the full torque of  $M_s$ .**



**Missing or damaged clamping screws must be replaced with identical screws with used quality grade!**

## 9. Dismantling

9.1 Release clamping screws diagonally opposite in such a way that the thrust ring or the pressure flange does not tilt

9.2 Release the hub radially by lightly tapping with a rubber hammer evenly over the circumference

9.3 With applications without shaft shoulders, draw off parts in both directions.

9.4 Inspect the cone clamping element for damage.



**Only undamaged cone clamping elements may be reused!**

9.5 When working with reusable cone clamping elements, lubricate all contact surfaces, the threads on the clamping screws and the contact surfaces of the screw head with a light coat of oil.



**Do not use oil containing molybdenum sulphide or high-pressure additives or grease of any kind.**

## 10. Maintenance

RLK 300 Cone Clamping Elements are maintenance-free. However, signs of settling may appear in connections during operation. We therefore recommend checking the tightness of the clamping screws each time maintenance is performed on the machine.

## 11. Preload forces $E_s$ and Tightening torques $M_s$

Metric Screws

The preload forces indicated in the table are corrected for friction deviations.

Thread	Preload force $E_s$ [kN] for quality grade			Tightening torque for $\mu_K = 0,1$ $M_s$ [Nm] for quality grade		
	8.8	10.9	12.9	8.8	10.9	12.9
M 4	3,8	5,5	6,7	2,6	3,9	4,5
M 5	6,3	9,4	11,0	5,2	7,6	8,9
M 6	9,1	13,2	15,5	9,0	13,2	15,4
M 8	16,3	24,0	28,2	21,6	31,8	37,2
M 10	26,5	38,5	44,7	43	63	73
M 12	37,4	55,5	64,8	73	108	126
M 14	52,0	76,5	89,1	117	172	201
M 16	70,7	103,9	121,3	180	264	309
M 18	89,6	127,1	149,3	259	369	432
M 20	113,7	162,4	189,7	363	517	605
M 22	141,4	201,5	236,3	495	704	824
M 24	164,6	233,7	273,8	625	890	1041