

**Installation and Operating Instructions for  
Cone Clamping Elements RLK 404 and RLK 404 TC**

**E 03.656e**



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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 by RINGSPANN; 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 RINGSPANN agents.
- If a malfunction is indicated, the product or the machine into which it is installed, should be stopped immediately and either RINGSPANN or an accredited RINGSPANN 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.

**This is a translation of the German original version!**

In case of inconsistencies between the German and English version of this installation and operating instruction, the German version shall prevail.

## 1. General information

### 1.1 Function:

RLK 404 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

These installation and operating instructions are valid for Cone Clamping Elements RLK 404 and RLK 404 TC. The RLK 404 Cone Clamping Element consist of two inner rings 1 + 2 with outside cone and an outer ring 4 with inside cone as well as a number of clamping screws 3.( see Fig. 1). The inner rings are drawn against each other 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 angel 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 rings 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. Cross-sectional drawing and parts list

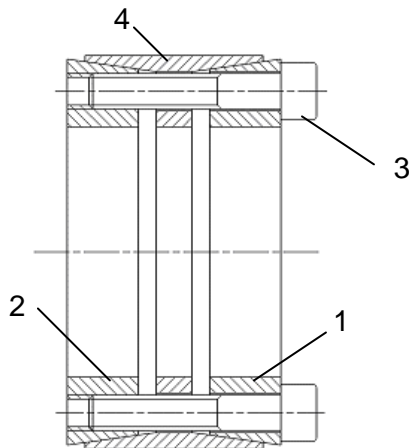


Fig. 1

Pos.	Nomenclature
1	Front Inner ring
2	Rear inner ring
3	Clamping screw
4	Outer ring

## 4. Proper use

The RLK 404 Cone Clamping Elements are designed for installation between the shaft and the hub bore. They are intended solely for the friction-tight mounting of hubs or to shafts in order to transmit torque and/or axial forces. All other uses are prohibited. RINGSPANN shall not be liable for damages caused by improper use. The user bears all resulting risks.

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## 5. Improper use

The RLK 404 Cone Clamping Elements are not suitable for:

- for the direct mounting of hollow shafts to solid shafts or
- as torque-limiting safety devices.

## 6. Condition on delivery

The clamping elements are delivered in tension-free condition. The clamping elements are wrapped in anti-corrosive packing material and are ready to install as delivered.

## 7. Technical requirements for safe, reliable operation

In order to achieve full transmission of torque and/or axial forces, **tolerance** on contact-pressure surfaces

- may not exceed tolerance class h8 for shafts
- or tolerance class H8 for hub bores.

In addition, pressure-contact **surfaces** on shafts and hubs must have a mean peak-to-valley height  $R_a < 3,2 \mu\text{m}$ .

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 Clean the contact surfaces between the shaft and the hub thoroughly.

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



**Do not use oil which contains molybdenum disulphide or high-pressure additives, and do not use grease!**

8.3 Insert the clamping element in the hub of the part to be clamped and push it onto the shaft. Apply pressure only to the clamping screw heads on the front inner ring.



**Note: When used in closed-end bores or on shaft shoulders, an axial play for dismantling the rear inner ring should be kept.**

8.4 Tighten the clamping screws diagonally across by hand while aligning the hub..



**Don't start to tighten the screws located directly to the right and to the left of the slit!**

8.5 With a torque wrench tighten the clamping screws diagonally across with half the tightening torque  $M_s$ . (see section 11). Continue once clockwise with half tightening torque  $M_s$ .

8.6 Tighten the clamping screws one after the other with the full tightening torque  $M_s$ .



**Don't start to tighten the screws located directly to the right and to the left of the slit!**



**The tightening process is only completed when none of the screws can be turned at the full specified torque  $M_s$  any further.**



**Replace missing or damaged clamping screws with identical screws of strength class 12.9 only!**

## 9. Dismantling

9.1 All tightening screws completely unscrew from the cone clamping element.

9.2 Insert as much of the screws in the front inner ring them into the release holes, turning until they abut the flange of ring. (see Fig. 2)

**Note:** To facilitate the installation process, grind and grease the faces of the thread ends of the press-off screws as well as the threads. This reduces friction loss.

9.3 Tighten the screws in the release holes crosswise in multiple steps until the front inner ring is loosened. Remove the ring.

9.4 Insert as much of the screws in the flange of outer ring them into the release holes, turning until they abut with the rear inner ring. (see Fig. 3)

9.5 Tighten the screws in the released holes uniformly in a crosswise sequence in multiple steps until the rear inner ring is loosened.

9.6 Remove the clamping devices together with the machine component from the shaft.

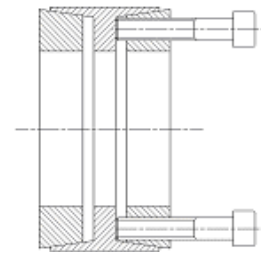


Fig. 2

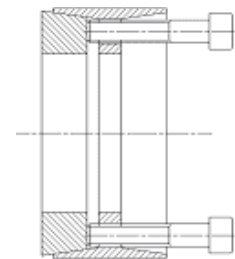


Fig. 3

## 10. Maintenance

The RLK 404 Cone Clamping Elements are maintenance-free. However, signs of loosening may appear in connections during operation. We therefore recommend checking the tightening torques of the clamping screws during each time maintenance is performed on the machine.

## 11. Tightening torque $M_s$

Size d x D [mm]	Clamping screws	Tightening torque $M_s$ [Nm]
70 x 110	M 10	83
75 x 115	M 10	83
80 x 120	M 10	83
85 x 125	M 10	83
90 x 130	M 10	83
95 x 135	M 10	83
100 x 145	M 12	144
110 x 155	M 12	144
120 x 165	M 12	144
130 x 180	M 12	144
140 x 190	M 12	144
150 x 200	M 12	144
160 x 210	M 12	144
170 x 225	M 14	229
180 x 235	M 14	229
190 x 250	M 14	229
200 x 260	M 14	229
220 x 285	M 16	354
240 x 305	M 16	354
260 x 325	M 16	354

Size d x D [mm]	Clamping screws	Tightening torque $M_s$ [Nm]
280 x 355	M 20	692
300 x 375	M 20	692
320 x 405	M 20	692
340 x 425	M 20	692
360 x 455	M 22	945
380 x 475	M 22	945
400 x 495	M 22	945
420 x 515	M 22	945
440 x 535	M 22	945
460 x 555	M 22	945
480 x 575	M 22	945
500 x 595	M 22	945
520 x 615	M 22	945
540 x 635	M 22	945
540 x 635	M 22	945
560 x 655	M 22	945
580 x 675	M 22	945
600 x 695	M 22	945