

<b>EDMAYR</b> ANTRIEBSTECHNIK	<b>Installation and Operating Instructions for Cone Clamping Elements RLK 400 and RLK 401</b>	<b>E 3.601e</b>			
Date: 20.08.2012	Version : 04	Signed: Su	Reviewed: Su	Pages 6	Page: 1

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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 guarantee; 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.

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**EDMAYR**  
ANTRIEBSTECHNIK

## 1. General information

### 1.1 Function:

The RLK 400 cone clamping elements are used to connect machine components fastening without play to shafts for the transmission of torques, axial forces and longitudinal forces.

The RLK 401 clamping device is designed specifically for use under conditions which prevail during the installation of conveyor drums.

### 1.2 General safety instructions:



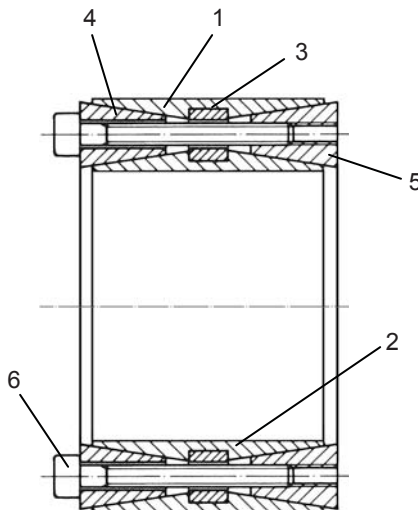
**Caution! Danger of injury!**

**Body parts, hair, items of clothing and objects of other kinds are kept well away from the rotating screw heads while the clamp connection is turning.**

## 2. Configuration and function

The RLK 400 and RLK 401 cone clamping devices consist of two double-tapered clamping rings 4 + 5, each with a slotted inner and outer conical sleeve 1 + 2 and a corresponding number of clamping screws 6. The conical sleeves are aligned with a centring ring 3 in fixed axial position. When the clamping screws 6 are tightened, the clamping rings exert clamping tension. Once fitting play is overcome, this connection exerts strong radial pressing force between the clamping device and the hub or the clamping device and the shaft, effecting the friction-tight connection between the shaft and the hub.

## 3. Cross-sectional drawing and parts list



Pos.	Nomenclature
1	Outer conical sleeve
2	Inner conical sleeve
3	Centering ring
4	Front clamping ring
5	Rear clamping ring
6	Clamping screw

## 4. Proper use

The RLK 400 and RLK 401 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 conveyor belt drums to shafts in order to transmit torque and axial forces. All other uses are prohibited. We 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 400 and RLK 401 cone clamping elements are not suitable for:

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

## 6. Condition on delivery

The clamping elements are delivered in tension-free condition, i.e. the front clamping ring 4 is released by the two clamping screws 6 in the threaded press-off bores.

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

## 7. Technical requirements for safe, reliable operation

In order to ensure full transmission of torque and axial forces, fitting tolerances on the contact surfaces may not exceed

- tolerance class h8 for shafts
- and tolerance class H8 for hub bores.

In addition, the contact surfaces between the shaft and the hub must have a mean peak-to-valley height of  $R_z \leq 16 \mu\text{m}$ .

## 8. Installation

8.1 Loosen all clamping screws – except for the two screws in the threaded press-off bores – for a couple of turns.

8.2 Press the heads of the clamping screws against the front clamping ring 4 by exerting pressure on the screw heads. This loosens the rear clamping ring 5.

8.3 Lightly oil the clamping element



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

8.4 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 clamping ring.

8.5 Turn the two screws out from the release threads and screw back into the adjacent clamping holes.

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



**Note: During installation, the shaft and the hub are sufficiently centred for most applications, provided the shaft and/or hub has free axial mobility. Special procedures are required for applications in which better centring is required. See Section 9.**

8.7 With a torque wrench tighten the clamping screws diagonally across with half the tightening torque  $M_s$ . Continue diagonally across with full tightening torque  $M_s$ .

8.8 Tighten the clamping screws one after the other one in a clockwise to the full tightening torque.



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. Installation with improved centring

- 9.1 Install the clamping element as described in Section 8 up to No. 8.6.
- 9.2 Align the front clamping ring 4 and – if visible – the rear clamping ring 5 parallel to the faces of the inner and outer rings, until the two conical rings are installed parallel and without wobble. To check the gap between the shaft and the hub, check for equal circumference at several different points.



**Note:** If eccentricity is detected, tighten the screw nearest to the smallest gap until the gap is equal over the entire circumference. It may be necessary to loosen the screws nearest the largest gap slightly.

- 9.3 Tighten each of the clamping screws with a torque wrench to the specified torque  $M_s$  uniformly by  $\frac{1}{4}$  turns in several successive steps in order to achieve parallel alignment of the conical rings. Check for equal gap between the hub and the shaft along the circumference continually while tightening and adjust as needed in accordance with the instructions above.
- 9.4 The tightening process is only completed when none of the screws can be turned at the full specified torque  $M_s$  any further.

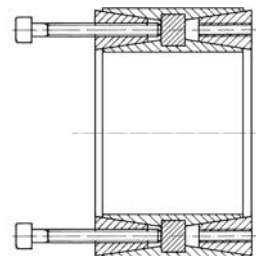


### Caution:

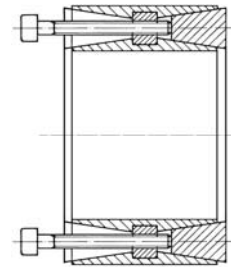
If the shaft and/or hub do not have free radial mobility, severe tensions build up, as the clamping element effects centring against outside resistance. Damage to the shaft, hub and clamping device may result.

## 10. Deinstallation

- 10.1 Loosen the clamping screws diagonally across for a couple of turns.
- 10.2 Remove all of the screws in the front clamping ring 4 and insert them into the release holes, turning until they abut with centring ring 3.  
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.
- 10.3 Tighten the screws in the release holes crosswise in multiple steps until the front clamping ring 4 is loosened. Remove the ring.



- 10.4 Remove the clamping screws from the front clamping ring 4 and turn them by hand into the threaded bores of centring ring 3 until they abut with the rear clamping ring 5.
- 10.5 Tighten the screws in the released holes of centring ring 3 uniformly in a crosswise sequence in multiple steps until the rear clamping ring 5 is loosened. Remove the clamping devices together with the machine component from the shaft.



**Note:** When used in closed-end bores or on shaft shoulders, it is necessary to ensure that at least 7 mm of axial play is present for shafts with diameters of up to 100 mm and at least 15 mm of axial play is present for shafts with diameters of 155 mm and above for deinstallation of the rear clamping ring 5.

## 11. Maintenance

The RLK 400 and RLK 401 clamping elements are maintenance-free. However, signs of loosening may appear in connections during operation. We therefore recommend checking the tightness of the clamping screws during each time maintenance is performed on the machine.

**12. Tightening torque  $M_s$** **Series RLK 400**

d x D [mm]	Clamping screws	Tightening torque $M_s$ [Nm]
45 x 75	M 8	35
48 x 80	M 8	35
50 x 80	M 8	35
55 x 85	M 8	35
60 x 90	M 8	35
65 x 95	M 8	35
70 x 110	M 10	71
75 x 115	M 10	71
80 x 120	M 10	71
85 x 125	M 10	71
90 x 130	M 10	71
95 x 135	M 10	71
100 x 145	M 12	121
110 x 155	M 12	121
120 x 165	M 12	121
130 x 180	M 14	195
140 x 190	M 14	195
150 x 200	M 14	195
160 x 210	M 14	195
170 x 225	M 16	300
180 x 235	M 16	300
190 x 250	M 16	300
200 x 260	M 16	300
220 x 285	M 16	300
240 x 305	M 16	300
260 x 325	M 16	300
280 x 355	M 20	580
300 x 375	M 20	580
320 x 405	M 20	580
340 x 425	M 20	580
360 x 455	M 22	780
380 x 475	M 22	780
400 x 495	M 22	780

**Series RLK 401**

d x D [mm]	Clamping screws	Tightening torque $M_s$ [Nm]
70 x 110	M 10	45
75 x 115	M 10	45
80 x 120	M 10	45
85 x 125	M 10	45
90 x 130	M 10	45
95 x 135	M 10	45
100 x 145	M 10	45
110 x 155	M 10	45
120 x 165	M 10	45
130 x 180	M 12	87
140 x 190	M 12	87
150 x 200	M 12	87
160 x 210	M 12	87
170 x 225	M 12	87
180 x 235	M 12	87
190 x 250	M 12	87
200 x 260	M 12	87
220 x 285	M 14	158
240 x 305	M 14	158
260 x 325	M 14	158
280 x 355	M 16	207
300 x 375	M 16	207
320 x 405	M 16	207
340 x 425	M 16	207