

## Installation and Operating Instructions for Shrink Discs RLK 603

E 03.619e



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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 603 shrink discs are used to effect friction-tight, no-play connections between hollow shafts and shaft ends for the purpose of transmitting torque, shear and axial forces.

### 1.2 General safety instructions:



#### **Caution! Danger of injury!**

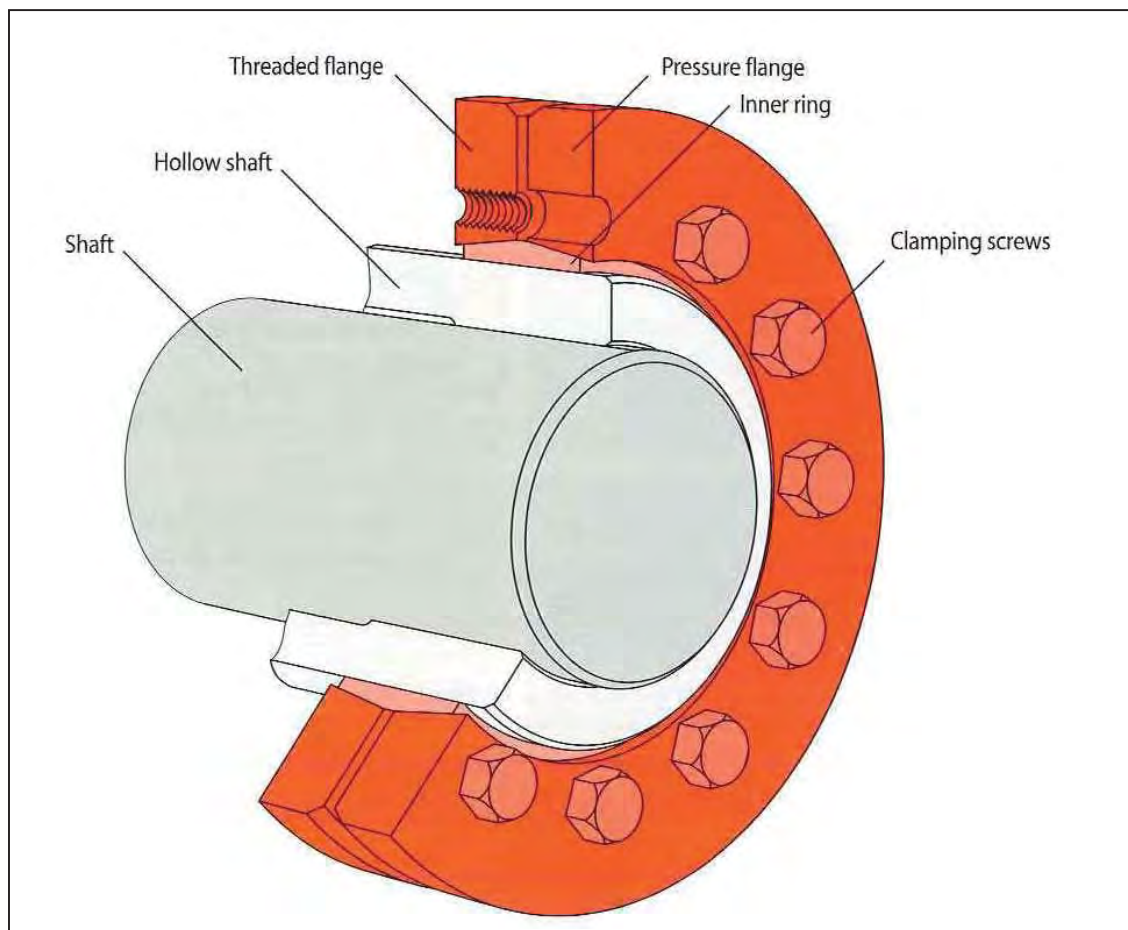
**The immediate vicinity of the rotating shrink disc must be kept clear of body parts, hair, clothing and other objects at all times.**

## 2. Configuration and function

The RLK 603 shrink disc consists of a slotted inner ring, a pressure flange, a threaded flange and a number of clamping screws. The threaded flange and the pressure flange are pulled together over the inner ring by tightening the clamping screws. A radial clamping force is generated by the conical surfaces which is dependent on the friction coefficients at the screws and the conical surfaces. The radial clamping force presses the hollow shaft onto the shaft and creates a frictional connection at the contact surfaces between the shaft and the hollow shaft. Thereby, torque and/or axial force can be transmitted between the shaft and the hollow shaft.

During the clamping process, the position of the inner ring relative to the hollow shaft remains unchanged. The connection is released simply by loosening the clamping screws, as the cone angles are self-releasing.

## 3. Cross-sectional diagram and parts list



#### 4. Purpose and proper use

RLK 603 shrink discs are external clamping elements. They are designed exclusively for rigid hollow-to-solid shaft connections for the purpose of transmitting torque and axial forces through friction-tight connection. Use for any other purpose is regarded as improper use. We shall not be liable for damages resulting from improper use. All resulting risks shall be borne by the user.

#### 5. Improper use

RLK 603 shrink discs are not suitable for use:

- as torque-limiting safety devices.

#### 6. Condition on delivery

The shrink discs are delivered ready for installation. They have been sprayed with rust-proofing oil and are wrapped in anti-corrosion paper.

#### 7. Technical requirements for safe operation

To ensure full transmission of torque and axial forces, the fitting **tolerance** for the outside diameter of the hollow shaft must not exceed tolerance class f7. It is also important to ensure compliance with the following clearance combinations between the hollow shaft bore and the outside diameter of the shaft:

Other diameter of solid shaft $d_W$		Hollow shaft bore ISO	Solid shaft diameter ISO	Joint clearance	
> mm	≤ mm			min. mm	max. mm
10	18	H6	j6	0	0,014
18	30			0	0,017
30	50	H6	h6	0	0,032
50	80	H6	g6	0,029	0,048
80	120	H7	g6	0,012	0,069
120	180			0,014	0,079
180	250			0,015	0,090
250	315			0,017	0,101
315	360			0,018	0,111

Failure to adhere to these fitting **tolerances** may

- cause changes in transmissible torques and/or axial forces and
- render proper installation impossible.

In addition, the contact **surfaces** of the shaft ends and hollow shaft must have a mean roughness depth of  $R_a \leq 3,2 \mu\text{m}$ .

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

- Yield strength  $R_e \geq 340 \text{ N/mm}^2$
- E-module about  $206 \text{ kN/mm}^2$

The **MoS<sub>2</sub> paste** between the tapered surfaces of the inner segment and outer segment, on the threads and under the head of the screws must not be removed. Proper installation is not possible without this MoS<sub>2</sub> paste.

## 8. Installation

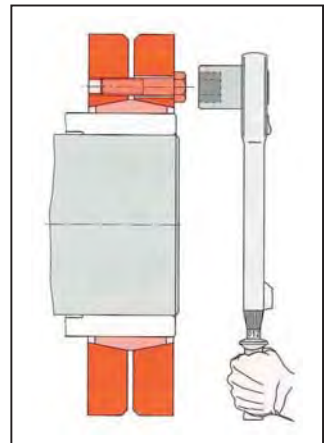
- 8.1 Clean the hollow shaft bore and the shaft thoroughly to remove all dirt, oil and grease and ensure a friction coefficient of  $\mu \geq 0,15$  on all contact surfaces.
- 8.2 Apply a light coat of oil to the hollow shaft at the point at which the shrink disc is positioned (diameter d).
- 8.3 Push the shrink disc onto the hollow shaft
- 8.4 Insert the shaft into the hollow shaft.
- 8.5 Tighten diametrically opposed clamping screws by hand whilst aligning the shaft coupling so that the clamping flanges lie parallel to each other.
- 8.6 Tighten the clamping screws clockwise with full tightening torque  $M_s$  with a torque wrench (see Section 12).



**Tighten the clamping screws uniformly  $\frac{1}{4}$  revolution at a time. Repeat the process until no screw turns at the full tightening torque of  $M_s$ .**



**Replace missing or damaged clamping screws with equivalent screws of quality grade 10.9 only, grease new screws like described under 10.2!**



## 9. Disassembly

- 9.1 Part-release the clamping screws evenly in stages in order to avoid any tilting of the clamping flanges



**Do not remove clamping screws completely from threaded bores under any circumstances, as this poses the risk of injury.**

- 9.2 Remove the shrink disc from the hollow shaft

## 10. Remounting removed shrink discs

Please observe the following instructions when reusing previously removed shrink discs:

- 10.1 Completely dismantle the shrink disc and clean thoroughly to remove residues of lubricants applied to the tapered surfaces by the manufacture prior to delivery.



**Shrink discs with damaged tapered surfaces may not be reused and must be replaced with fully functional elements.**



**It is essential to ensure that the original pairing of pressure flange, threaded flange and inner ring remains intact following cleaning and lubrication.**

10.2 Lubricate the threads of the clamping screws and head contact surfaces thoroughly with MoS<sub>2</sub> paste "gleitmo 100" from FUCHS LUBRITEC ([www.fuchs-lubritec.de](http://www.fuchs-lubritec.de)) or a molybdenum-sulphide lubricant of equivalent quality.

## 11. Maintenance

RLK 603 shrink discs 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.

## 12. Tightening Torque M<sub>s</sub>

Size d [mm]	Clamping screws	Tightening Torque M <sub>s</sub> [Nm]
14	M 5	4
16	M 5	4
20	M 5	4
24	M 5	4
30	M 5	6
36	M 6	12
44	M 6	12
50	M 6	12
55	M 6	12
62	M 6	12
68	M 6	12
75	M 8	30
80	M 8	30
90	M 8	30
100	M 8	30
110	M 10	59
115	M 10	59
120	M 10	59
125	M 10	59
130	M 10	59

Size d [mm]	Clamping screws	Tightening Torque M <sub>s</sub> [Nm]
140	M 12	100
155	M 12	100
160	M 12	100
165	M 16	250
170	M 16	250
175	M 16	250
180	M 16	250
185	M 16	250
190	M 16	250
195	M 16	250
200	M 16	250
220	M 16	250
240	M 20	490
260	M 20	490
280	M 20	490
300	M 20	490
320	M 20	490
340	M 20	490
360	M 20	490