RINGSPANN®
Power Transmission

Installation and operation instructions for RIMOSTAT® friction torque limiters RSHD with one-sided friction linings

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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 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.

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.

Contents

1. General notes

1.1 General safety instructions

Read these installation/operating instructions carefully before putting the friction torque limiter into operation. Consider these instructions as well as the drawings in the individual paragraphs.

All work with and on the friction torque limiter is to be carried out taking into account that **"safety is top priority"**.

Switch the drive unit off before carrying out work on the friction torque limiter.

Rotating parts (e.g. V-belt pulley) must be secured by the operator against unintentional touching.

1.2 Special safety instructions

Life-threatening danger!

When assembling, operating and maintaining the friction torque limiter, it is to be ensured that the entire drive train is secured against being switched on unintentionally. Moving parts can cause severe injury. Rotating parts (e.g. V-belt pulley) must be secured against by the operator unintentional touching.

2. Design and function / parts list

2.1 Function

RINGSPANN friction torque limiters are safety couplings and are deployed wherever machines and drive units need to be protected against overloading.

In the event of an overload, i.e. when the load torque exceeds the set limit torque, the built-in component, for example a V-belt pulley, slips, the limit torque however continues to be transferred. A relative movement results between the built-in component part and the hub.

If the load torque falls below the set limit torque, the built-in component and the hub once again rotate at the same speed.

The limit torque is determined by the number of the compression springs in operation, see the chapter on start-up.

2.2 Identification

These operating instructions apply for:

- the execution RIMOSTAT friction torque limiter with one-sided friction linings according to the catalogue
  - the execution with a special hub
  - the execution with the built-in component (e.g. V-belt pulley, chain wheel, drive plate etc.)

There is a type plate on the friction torque limiter with a 16-digit material number. The exact design of the friction torque limiter is defined by this material number only.

As well as these instructions, please also consider the catalogue data for the friction torque limiter at www.ringspann.de and the drawings in the individual sections.

2.3 Drawing and parts list

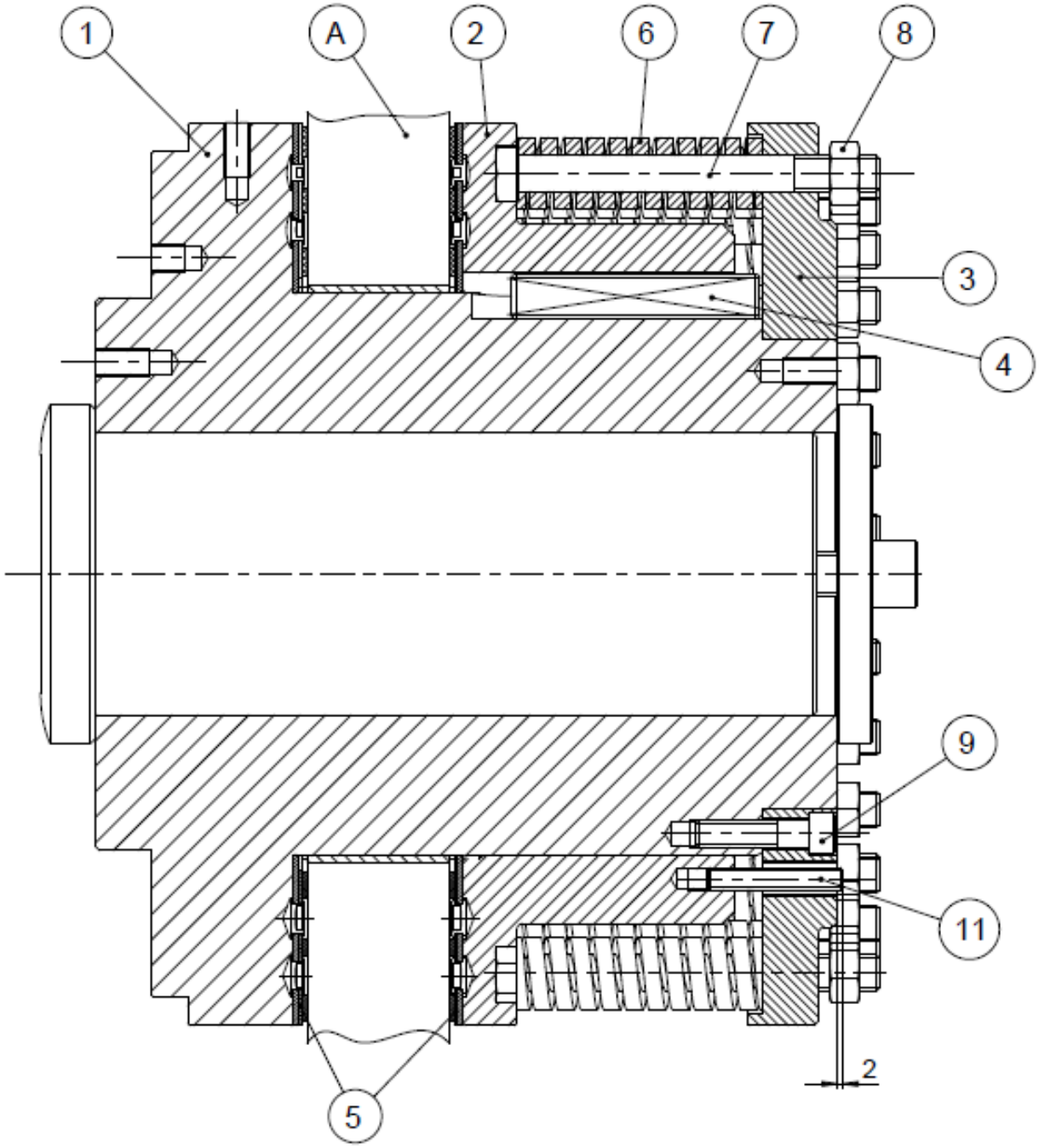

Figure 2.1 Illustration of friction torque limiter RSHD 310 – 600 Version E

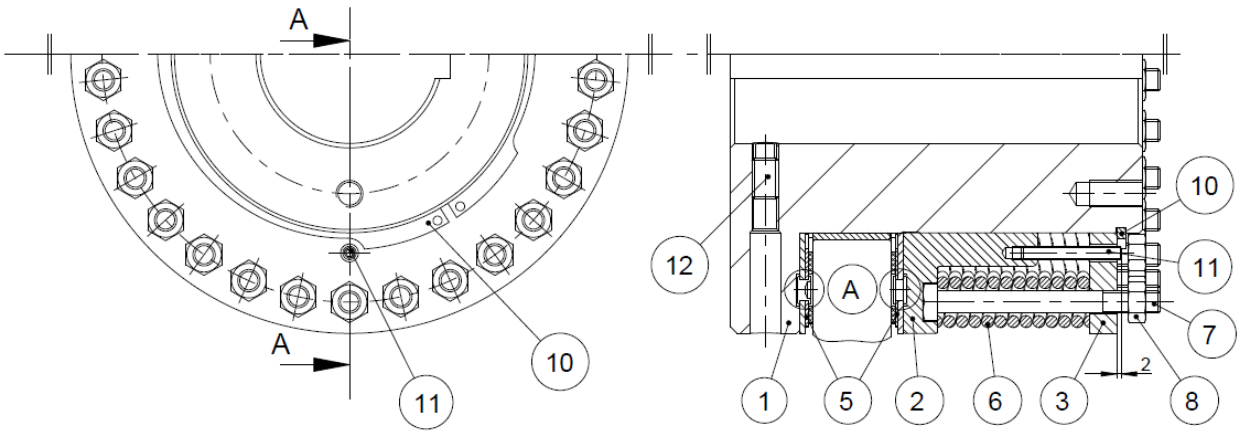

Figure 2.2 Illustration of friction torque limiter RSHD 205 – 250 Version E

Part	Designation
A	Customer connected part / built-in component
1	Hub
2	Pressure ring
3	Spring carrier
4	Parallel key
5	Friction lining to version E
6	System spring
7	Hexagon screw
8	Hexagon nut
9	Cylinder screw
10	Circlip
11	Set screw (wear indicator)
12	Set screw (clamp screw)

3. Intended use

The friction torque limiter has been designed for use as an overload protection device.
Use for any other purpose will be deemed improper.

4. Impermissible use

It not permissible to operate the friction torque limiter as a clutch coupling. Unauthorised constructional changes to the friction torque limiter are also not allowed.

5. Condition as delivered

The friction torque limiter is delivered pre-assembled or with the built-in component both with and without torque adjustment.
The friction torque limiters are pre-drilled or are fully drilled in accordance with the order and supplied with internal gear teeth.

6. Handling and storage

The technical data of the friction torque limiter such as max. / min. torque and weight are shown on the catalogue pages for the friction torque limiter. The current data can also be found on the RINGSPANN website www.ringspann.de. The friction torque limiter is delivered in preserved condition and can be stored for 12 months in an enclosed and dry place.

The friction torque limiter may not under any circumstances be treated with preservative oil for the storage. Any preservatives will make the friction linings unusable, which will mean that a safe and precise torque adjustment cannot be guaranteed.

It is to be made sure that no condensation develops. Damp storage rooms are not suitable. Prior to installation it must be ensured that the friction torque limiter does not exhibit any damages.

7. Technical prerequisite for reliable operation

Fastening the product to stable and low-vibration machine parts will ensure quiet operation, as well as an optimum service life.

In the event of slipping, the facility is to be shut down within 0.5 seconds to minimise the friction lining wear and prevent a thermal overloading of the friction torque limiter. Different switch-off times are possible after in consultation with RINGSPANN. The adherence to the switch-off times is to be ensured by the customer through suitable measures. The sensors required for this task and the speed monitor can optionally be supplied.

8. Installing the friction torque limiter

8.1 General instructions regarding assembly and installation

Before installing the friction torque limiter, the customer connected part must be cleaned with alcohol – e.g. spirit (ethanol) or isopropyl alcohol – or with water-based tenside solutions (soapy water or the like).

If cleaning the customer connected part with a diluent, acetone or brake cleaning agent, it must be ensured that these agents, as well as any residues from these agents, do not come into direct contact with the friction linings.

Important!

Residues from oil and anti-rust agents considerably reduce the coefficient of friction and thus also the slipping and holding torque!

Important!

Risk of damage: The friction torque limiter may not be fitted with hammer blows!

Important!

All screws are to be tightened using the tightening torque in accordance with VDI 2230 Sheet 1 μ=0.12 and secured with a screw lock (e.g. Loctite 243).

8.2 Assembly of the complete friction torque limiter

The complete friction torque limiter is pushed up onto the shaft. After this the friction torque limiter must be secured axially with an end plate, which is held by screw(s). Optionally it can be secured with a threaded pin, radially clamping (12). Both options are shown in Figures 2.1 and 2.2 in Chapter 2.3.

Requirements of the customer built-in component
RINGSPANN recommends manufacturing the customer built-in component (A) from casting, since this material represents an optimal friction pairing in conjunction with the friction linings.

The friction torque limiter can be equipped with special friction linings for customer built-in components made from steel. RINGSPANN must in such a case be informed of this in queries or orders.

Before assembly, check whether the customer built-in component is even in the area of the friction linings and the overall axial run-out for drilling is within the tolerance of 0.1 mm. The surface quality in this area should exhibit a surface roughness of less than / equal to Rz10.

The connection dimensions of the friction torque limiter and the customer built-in component must be checked for dimensional accuracy. For this, the connection dimensions must be checked in accordance with the catalogue data sheet or the installation drawing.

8.4 Assembly of the customer built-in component

Firstly, it must be examined whether all compression springs (6) are flushly tightened!
If supplied in another manner, all compression springs (6) must be tightened flush with the help of the hexagon nuts (8). The nuts are subsequently to be turned back 360°.

- Place the hub (1) vertically onto the firm and stable surface
- Remove the screws (9) and the circlip (10) and remove the spring carrier assembly group (3) from the hub (1)
- Remove the pressure ring (2), parallel key (4) and friction linings (5) from the hub (1)

- Prepare the built-in component with the plain bearing bush (A) in accordance with the general instructions in Chapter 8.1. The plain bearing bush must be suitable for a pure dry operation. The clearance fit may under no circumstances come into contact with the grease/oil. For the requirements of the bore hole of the mounting part and the assembly instructions, please refer to the specifications of the plain bearing bushes manufacturer.

Important!

Check whether the connected part on the hub can be freely rotated.

- Insert the friction lining (5), the built-in component with the mounted plain bearing bush (A) and then the second friction lining (5) onto the hub. It must be ensured that the rivet heads of the friction linings are sunken into the respective provided counterbores of the hub (1) and of the pressure ring (2).
- Insert the parallel key (4) and slide the pressure ring (2) on
- Slide the assembly group spring carrier (3) with flushly tightened pre-loaded compression springs (6) onto the hub (1). It should hereby be ensured that all screw heads of the screws (7) are sunken into the pressure ring (2) groove (rotation lock) and the set screw (11) can be screwed into the borehole of the spring carrier (3).
- Depending on the design, tighten the cylinder screws (9) and mount the circlip (10). During the assembly of the circlip, ensure that the set screw (11) is not hidden. By turning the nuts (8) back against the on-site mounted upsetting at the screw end, the compression springs are put into operation.

9. Start-up

The friction torque limiter needs to run in before torque adjustment. The run-in procedure serves to increase the percentage contact area of the friction surfaces of the friction linings and to increase the friction value in the friction pairings. The running-in process should be performed in two steps with respectively 30 and 60 % of the active springs required for the desired slipping torque. It is possible to determine how many springs will approximately be required using formula 9.1. The friction surfaces should heat up locally to 160 ... 200°C.

The running-in process is not necessary if RINGSPANN supplies the friction torque limiter with the built-in component (A) and a finished bore, as well as a set torque.

After running in, the friction torque limiter must cool down to ambient temperature.

No parts need to be disassembled for torque adjustment. The torque is determined by the number of the compression springs in operation. If the friction torque limiter was installed with the built-in component without torque adjustment, all compression springs are in operation, i.e. the nuts are turned back against the screw end. Compression springs are taken out of operation by tightening the nut that sits at the end of the screw by turning it to the right, until the compression spring is tightened flush. The head of the hexagon screw may hereby however not slip out of the groove of the pressure ring.

Afterwards, the nut must be turned back again by 45° - 60°.

Important!

Under all circumstances ensure that a rotationally symmetrical distribution of the compression springs in operation is carried out!

Using the formula below it is possible to determine which torque will approximately be reached depending on the number of compression springs. The number of springs may vary in practice as a result of friction coefficient changes, material selection, spring force and component tolerances.

After the running-in process, the set screw (11) must be adjusted in such a manner that it protrudes out of the spring carrier by the wear measurement of 2 mm of the friction linings. The pin should hereby be secured with Loctite 243.

$$A = \frac{M}{F}$$

A = Approx. number of compression springs in operation
$A_{max.}$ = maximum number of compression springs according to size
M = Slip or limit torque in Nm
F = Calculated factor Nm (for each compression spring)

Formula 9.1

The calculated maximum torque is $M_{max.} = A_{max.} * F$

RSHD 205 Version E: $A_{max.} = 30$; F = 100 Nm; $M_{max.} = 3000$ Nm
RSHD 250 Version E: $A_{max.} = 30$; F = 200 Nm; $M_{max.} = 6000$ Nm
RSHD 310 Version E: $A_{max.} = 20$; F = 530 Nm; $M_{max.} = 10595$ Nm
RSHD 400 Version E: $A_{max.} = 30$; F = 750 Nm; $M_{max.} = 22500$ Nm
RSHD 600 Version E: $A_{max.} = 50$; F = 1200 Nm; $M_{max.} = 60000$ Nm

Important!

A torque measurement is essential for determining the exact setting of the torque.

10. Disassembling the friction torque limiter

Life-threatening danger!

When disassembling the friction torque limiter, it is to be ensured that the entire drive train is secured against being switched on unintentionally. Moving parts can cause severe injury. Rotating parts (e.g. V-belt pulley) must be secured against by the operator unintentional touching.

The friction torque limiter can be removed from the shaft after the axial fastening is removed.

11. Maintenance

11.1 General maintenance

Depending on how much the friction torque limiter is used in operation, maintenance is to be carried out on it at intervals of 4 to 12 weeks.

The following is to be carried out when performing maintenance:

- Check the friction linings for wear. This is carried out by measuring the thickness of the friction lining or via the set screw (11), provided the adjustment was carried out correctly. The friction linings need to be replaced when the set screw does not protrude over the spring carrier.
- Check the screw connections.
- Check the axial fastening of the friction torque limiter.

11.2 Permissible friction lining wear and exchanging of the friction linings

Important!

Friction linings may only be changed when the system or the working machine is stationary!

The one-sided riveted standard friction lining has a thickness of 6.3 mm when new. When a residual lining thickness of 5.3 mm is reached, the friction linings must always be replaced in pairs, i.e. on both sides.

Important!

Only original RINGSPANN friction linings may be used.

Before replacing the friction linings, ensure that the mass held by the friction torque limiter is secured against moving, since parts of the friction torque limiter need to be loosened for this purpose.

Life-threatening danger!

The compression springs are live! It is essential that you adhere to the following steps when removing the friction torque limiter.

- Check that a hexagon nut is located on all hexagon screws on the screw ends.
- Put the compression springs out of operation by tightening the nuts by turning them to the right until the compression springs are tightened flush. Then turn the nuts back again 45°- 60°.
- Remove the cylinder screws (9) or the circlip (10).
- Disassemble assembly group spring carrier from the hub (1).

- Remove the pressure ring (2) and remove the parallel key (4).
- First remove the friction lining and then the customer connected part (e.g. V-belt pulley or drive plate) with the sliding bush, and then the second friction lining from the hub.

The assembly is carried out in the reverse order.

Important!

With the friction lining, the friction layer must show in the direction of the customer built-in component (A) and the rivet heads of the friction linings must be sunk in the provided counterbores of the hub (1) and of the pressure ring (2). After changing friction linings, a running-in process should be performed in order to reach the maximum slipping torque and the set screw (11) must be re-adjusted, see chapter 9.