

**Installation and Operating Instructions for
Flat Element Flange Mandrel KFDF**

E 01.842e



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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.

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1. General

1.1 General Safety Notices

The following hazard notices and warnings are used in these installation and operating instructions:



Warning!

This symbol indicates a situation where there is a risk of injury or danger for life or physical condition.



Caution!

This symbol indicates risks for the RINGSPANN product described and thus for equipment and machinery.



Note:

This symbol indicates notices, user tips and useful information.

- Only use RINGSPANN products in a technically impeccable condition.
- Consider all notices written on the product.
- Comply with the intended use.
- Before commissioning, ascertain and document that the machine the RINGSPANN product is to be built into is compliant with the country-specific regulations, rules of safety and standards.
- Perform a risk analysis for all parts and equipment of the machine with which safe operation of the RINGSPANN products is associated.

1.2 Product-related Safety Notices



Warning!

In the case of design modifications to the workpiece in the area of the clamping point, the clamping fixture must be checked to ensure it is suitable.

Such changes include:

- Changes to the workpiece diameter at the clamping point
- Changes to the workpiece tolerances at the clamping diameter
- Changes to the clamping length at the workpiece

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1.3 Further Applicable Documents

Catalogue 10 with further technical notices in the appendix

VDI 2230 Systematic calculation of highly stressed screw connections

Cylindrical screw connections

You can also find an excerpt of VDI 2230 in the appendix of catalogue 10

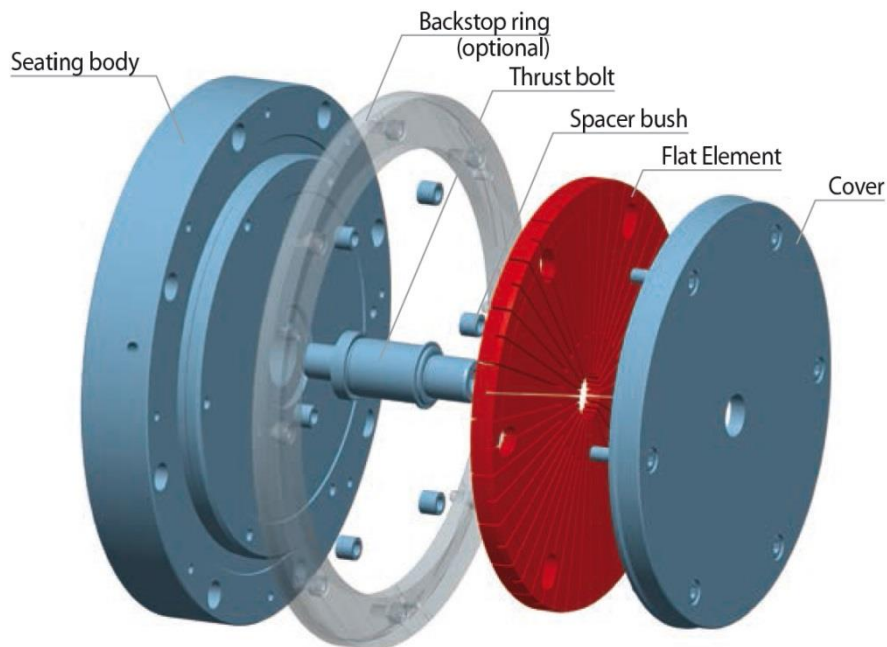


Note:

You will find the current versions of RINGSPANN data sheets and RINGSPANN catalogues at www.ringspann.com

2. Design And Function

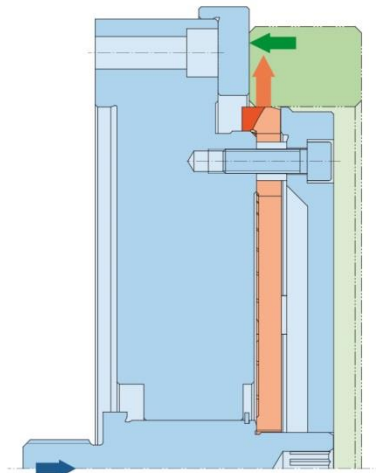
2.1 Design



The Flat Element Flange Mandrel consists of a seating body, a thrust bolt, a set of spacer bushes, a flat element and a cover. A backstop ring and an sub assembly for hand clamping are optionally available. The Flat Element Flange Mandrel is attached to the machine with the seating body. The clamping fixture is actuated by the thrust bolt which is connected to the machine power actuating unit.

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2.2 Clamping Principle



Key:

- ➡ Axial actuating force
↑ Radial clamping force
← Axial pull-back force

The flat element sits pre-loaded on the seating body. For clamping the flat element is elastically deformed by the axial actuation force. The component is centred, pressed against the backstop and aligned flush.

3. Intended Use

The Flat Element Flange Mandrel KFDF is designed for the mechanical processing or inspection of workpieces. Clamping takes place on a pre-processed diameter which is machined in the same set-up with the backstop face.

4. Improper Use / Warnings



Warning!

Applications that deviate from those given in Chapter 3. **Intended use**, are not permissible.



Warning!

In the case of design modifications to the workpiece in the area of the clamping point, the clamping fixture must be checked to ensure it is suitable.

Such changes include:

- Changes to the workpiece diameter at the clamping point
- Changes to the workpiece tolerances at the clamping diameter
- Changes to the clamping length at the workpiece

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5. Technical Prerequisites For Safe Operation



Clamping takes place in a pre-processed cylindrical bore. The face of the workpiece is ideally processed with the same set-up as the clamping diameter.

Caution!

Clamping may only take place on diameters with an actual dimension that is within the maximum permissible diameter change ΔD ".

If the diameter change is greater than ΔD , it may be that the workpiece is not clamped and/or the necessary transmissible torque is not reached.



Caution!

When using a pneumatic or hydraulic power clamping unit, it must be ensured that, during workpiece processing, there is always the necessary actuating pressure for the processing forces/processing torques.



Caution!

During clamping / declamping it must be ensured by practical technical methods that peak forces do not exceed the maximum actuating force.

The maximum actuating force depends on the size of the fixture. You will see the maximum actuating force in the currently valid datasheet which can be found under

www.ringspann.com

6. Condition As Delivered

The Flat Element Flange Mandrel KFDF is delivered fully assembled and in accordance with the ordered size, the specified clamping diameter at the workpiece and the specified backstop level / insertion depth of the component. The clamping diameter of the flat element is produced with the tolerance e6.

If an "Assembly Group For Hand Clamping" and / or a backstop ring or additional items are ordered, they will be delivered as a separate order item.

A backstop ring and its fastening screws as well as an adapter for the power clamping device are usually provided by the customer.

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7. Installation And Commissioning

7.1 Mounting of the Assembly Group For Hand Clamping

Disassembly of the thrust bolt for power clamping. Access from the rear side of the clamping fixture is required.

- Untighten the screws of the cover from the front side and remove them.
- Remove the cover. Be careful with the loose spacer bushes.
- Remove the spacer bushes
- Take off the flat element. It sits with pre-tension on the seating body
- Remove the circlip from the thrust bolt.
- Withdraw the thrust bolt from the rear side.

Assembly of the sub assembly for hand clamping:

- Push the new thrust bolt with circlip and key from the front side into the centre bore of the seating body.
- Assemble the flat element. The flat element sits with pre-tension on the seating body. Grip the flat element, bend the centre part by your thumbs, place it on the seating body and push it down.
- Put back the spacer bushes.
- Assemble the cover. The cover is centred via the thrust bolt.
- Insert the screws and tighten them with a pre-set torque wrench across
- Assemble the ring and the central actuation screw from the front side.



Note:

Select screw torques according to VDI 2230 for minimum screw quality 8.8. An excerpt from VDI 2230 can be found in the appendix of catalogue 10.

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7.2 Installation In The Machine With Power Actuation



Caution!

The actuating force of the power actuating unit must be set before the clamping actuation with or without component. The actuating force must not exceed the maximum actuating force related to the size of the Flat Element Flange Mandrel KFDF.

The way of installation of the clamping fixture is to be chosen according to the machine. There might be more than one option. Below you will find described one option.

Clean interfaces at machine spindle or adapter flange and the clamping fixture thoroughly. All centring diameters and all surfaces that are in contact with one another must be free of adhesions and be even.

- Assemble all relevant adaptors on the power actuation unit and on the machine spindle
- Place the seating body on the machine spindle / spindle adaptor.
- Bolt the flange of the clamping fixture down to the machine spindle / adaptor.
- Move the power actuation unit carefully towards the front of the machine spindle.
- Screw the thrust bolt in. This might be done in three or four steps until the thrust bolt is screwed in fully. Tighten the screw bolt
- Pull the power actuation in until the stop (inside the clamping fixture). The flat element must release fully.



Note:

Select screw torques according to VDI 2230 for minimum screw quality 8.8. An excerpt from VDI 2230 can be found in the appendix of catalogue 10.

7.3 Installation In The Machine With Hand Actuation

Clean interfaces at machine spindle or adapter flange and the clamping fixture thoroughly. All centring diameters and all surfaces that are in contact with one another must be free of adhesions and be even.

- Place the seating body on the machine spindle / spindle adaptor.
- Bolt the flange of the clamping fixture down to the machine spindle / adaptor.



Note:

Select screw torques according to VDI 2230 for minimum screw quality 8.8. An excerpt from VDI 2230 can be found in the appendix of catalogue 10.

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7.4 Mounting of Backstop Ring

Put on the backstop ring (usually provided by the customer) and fasten it with screws (not included in delivery).



Note:

Select screw torques according to VDI 2230 for minimum screw quality 8.8. An excerpt from VDI 2230 can be found in the appendix of catalogue 10.

7.5 Commissioning



Caution!

The actuating force of the power actuating unit must be set before the clamping actuation with or without component. The actuating force must not exceed the maximum actuating force related to the size of the Flat Element Flange Mandrel KFDF..

The same is valid for hand clamping. The torque wrench must be setted before the first actuation takes place.

The maximum permissible tightening torque of the central actuating screw is defined by its thread size and the maximum actuation force (see datasheet in catalogue 10). Via the tightening torques and the assy pretensioning forces depending on screws size and quality of the central screw the max. tightening torque can be calculated. This will take place by a linear conversion as follows:

$$\frac{\text{assy pretensioning force}}{\text{tightening torque}} \times \text{max. actuating force} = \text{max. tightening torque}$$



Note:

Select tightening torques and the assy pretensioning forces depending on screws size and quality according to VDI 2230. An excerpt from VDI 2230 can be found in the appendix of catalogue 10.

It might be necessary to actuate the central screw with lower tightening torques due to thinwalled components. Please check. It might be necessary to find out the right tightening torque by tests. When a power unit is used the thrust force needs to be found out by tests.

Maximum true running accuracy is reached by clamping the clamping fixture after assembly once without a workpiece and then three times with a workpiece before being relaxed again. Processing of the workpieces and/or checking can then be commenced.

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8 Maintenance And Repair

8.1 General Notices

The operating and ambient conditions for RINGSPANN clamping fixtures and clamping elements are different for each application. With its geometry, hardness, surface quality and kind of feed, the workpiece itself exerts influences on the clamping fixture. RINGSPANN can therefore not make any indications as to the wear properties of the clamping fixture and can only give general notices on maintenance.

The maintenance and cleaning of the clamping fixture should be carried out when the machine is maintained at the latest. More frequent maintenance intervals may be necessary depending on what is observed during operation and upon regular visual inspection (at the start of a shift for example).

The clamping element is rubberized. Not rubberized are all throughholes for the back stop pins. The rubber is elastic but takes the new shape with the duration of the deflection (stressrelaxation). This might lead into a non full movement back to the original shape. The guide in clearance will be reduced and the removal or the load in of the component might be hindered.

8.2 Exchanging of The Clamping Element

The flat element will be changed from the front side. There is no need to take the clamping fixture off the machine spindle.



Caution!

Put the power clamping device in relaxed position.

Ensure that the power clamping fixture cannot be moved during the disassembly / assembly of the clamping fixture.

Switch off the machine.

For power actuation:

- Untighten the screws of the cover from the front side and remove them.
- Remove the cover. Be carefull with the loose spacer bushes.
- Remove the spacer bushes
- Take off the flat element. It sits with pre-tension on the seating body

For hand actuation:

- Remove the central actuation screw and the ring from the front side.
- Untighten the screws of the cover from the front side and remove them.
- Remove the cover. Be carefull with the loose spacer bushes.
- Remove the spacer bushes.
- Take off the flat element. It sits with pre-tension on the seating body

Check all components for damage and wear. Exchange defective components.



Thoroughly clean and lightly oil all components before assembly.

Caution!

No lubricants with friction-reducing additives may be used on the clamping elements and the components in contact with these.

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The assembly takes place in reverse order.

- Assemble the flat element. The flat element sits with pre-tension on the seating body. Grip the flat element, bend the centre part by your thumbs, place it on the seating body and push it down.
- Put back the spacer bushes.
- Assemble the cover. The cover is centred via the thrust bolt.
- Insert the screws and tighten them with a pre-set torque wrench across
- For hand actuation: Assemble the ring and the central actuation screw from the front side.

8.3 List of Wearing Parts And Spare Parts

The flat element is a wearing part.

The operating and ambient conditions for RINGSPANN clamping fixtures and clamping elements are different for each application. With its geometry, hardness, surface quality and kind of feed, the work-piece itself exerts influences on the clamping fixture or clamping element. RINGSPANN can therefore not make any indications as to the wear properties of the clamping fixture or clamping element and can only give general notices on maintenance. This means that no recommendation can be made as to the number of clamping cycles after which the flat element needs exchanging.

All spare parts (components) are specified in the catalogue 10. They are available individually or as part of a sub assembly.

9. Storage

If the clamping fixture is to remain on the machine tool and also before storage, it is to be put into relaxed position.

If put into storage, the clamping fixture is to be lightly oiled with an anti-corrosive oil (not wax) wrapped in anti-corrosive paper and kept in a sturdy box.

The corrosion protection is to be renewed every 6 months.

10. Technical Data

The technical data are dependent on the size. See the data sheet in catalogue 10



Note:

You will find the current versions of RINGSPANN data sheets and RINGSPANN catalogues at www.ringspann.com