

**Installation and Operating Instructions for
Bonded Disc Pack Flange Mandrel LBDF**

E 01.805e



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Issue: Date: 21.11.2017	Version : 06	Drawn: SCHC	Checked: SCHV	Pages: 11	Page: 2

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



Warning!

Do not let the fixture rotate without component or inspection ring!

Without clamped component or inspection ring there is a danger for life or physical condition.

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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

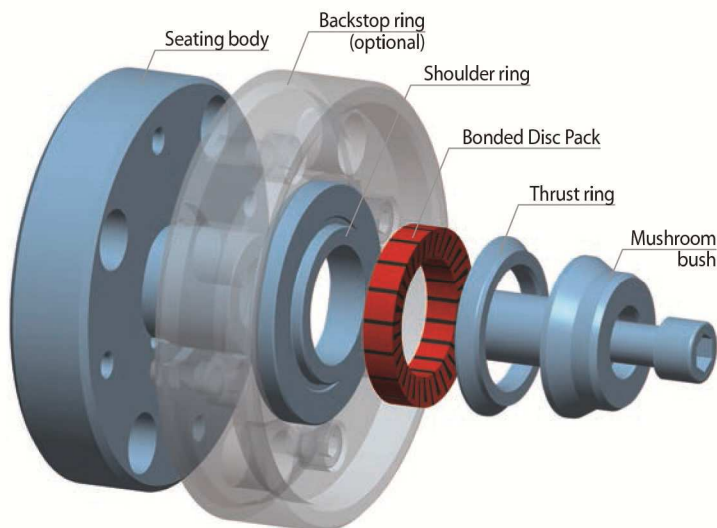


Note:

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

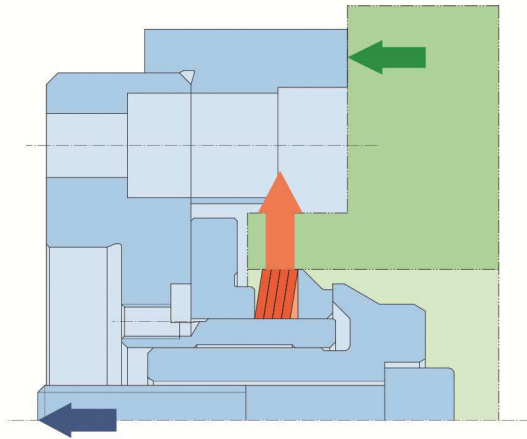
2. Design And Function

2.1 Design



The Bonded Disc Pack Flange Mandrel consists of a seating body, a shoulder ring, a bonded disc pack, a thrust ring and a mushroom bush. A backstop ring and a screw plate are optionally available for handclamping. The Bonded Disc Pack Flange Mandrel is attached to the machine with the seating body. The clamping fixture is actuated by the central bolt of the mushroom bush which is connected to the machine power actuating unit. Depending on the required transmitted torque, bonded disc packs of different widths may be installed. The required installation situations for the shoulder ring are shown in chapter 8.2 - Exchanging The Clamping Element / Cleaning of The Fixture

2.2 Clamping Principle



Key:

 Axial actuating force
  Radial clamping force
  Axial pull-back force

The bonded disc pack sits pre-loaded on the seating diameter of the seating body. When axial actuating force is applied the bonded disc pack is raised to an upright position. The component is centred, pressed against the shoulder ring or the backstop and aligned flush. The tipping movement of the bonded disc pack converts the axial actuating force into a radial clamping force that is up to 10 times higher.

3. Intended Use

The Bonded Disc Pack Flange Mandrel is designed for the mechanical processing or inspection of workpieces. Clamping takes place in a pre-processed cylindrical bore hole which is machined together with a location face in the same set-up.

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 hole. The bore diameter must be within an IT7 tolerance over its entire length.

Caution!

Clamping in bore holes with a cylindricity outside an IT7 tolerance is not permissible.



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

Caution!

Clamping may only take place in bore holes 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 fixture, it must be ensured that, during workpiece processing, there is always the necessary actuating pressure for the processing forces/processing moments.



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 Bonded Disc Pack Flange Mandrel is delivered fully assembled and in accordance with the ordered size, the specified bore diameter at the workpiece and the chosen bonded disc pack width. The clamping diameter of the disc pack used is produced with the tolerance e6.

If an "Assembly Group For Hand Clamping" or further items are ordered, they will be delivered as separate order items.

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

- Remove the central actuating screw
- Remove the mushroom bush
- Remove the thrust ring
- Insert the screw plate on the rear side of the seating body and fix it with the enclosed screws
- Assemble the thrust ring
- Assemble the mushroom bush
- Insert the central screw and screw it in



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.

7.2 Mounting of Backstop Ring

The backstop ring is centred either by the outer diameter of the flange or by the seating diameter of the disc pack. In this case the backstop ring replaces the shoulder ring.

- Before assembly ensure that in transition from the seating diameter to the surface for the disc pack must have a sharp edge.
- Clean interfaces at the seating body and the backstop ring thoroughly. All centring diameters and all surfaces that are in contact with one another must be free of adhesions and be even.
- Oil lightly all components before assembly
- Insert the backstop ring and and fix it with screws.



Caution!

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



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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7.3 Installation In The Machine / Pallet etc.

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.

Set the axial position of the power clamping device in such a way that the disc pack can be relaxed completely. A gap of 0.5mm max. is permissible between the thrust ring and disc pack. An adapter is usually required between the power clamping device and clamping fixture. The adapter and the mushroom bush must be firmly connected with each other on their front side.

7.4 Commissioning

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

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. 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.

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8.2 Exchanging The Clamping Element / Cleaning of The Fixture



Caution!

Put the power clamping device in the machine spindle into relaxed position. Ensure that the power clamping fixture cannot be moved during the disassembly/assembly of the clamping fixture.

Switch off machine tool.

- Loosen and remove the central screw
- Remove the mushroom bush
- Remove the thrust ring
- Remove the disc pack. The bonded disc pack sits pre-loaded on the seating diameter of the seating body.
- Remove the shoulder ring and / or the backstop ring

Check all components for damage and wear. Exchange defective components. Assembly is carried out in reverse order. Screw tightening torque in accordance with VDI2230.



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.



Caution!

Using a bonded disc pack with a different clamping diameter requires an exchange thrust ring.

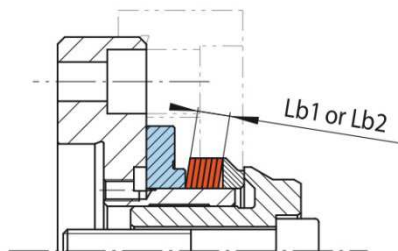
Bonded disc pack and the thrust ring have the same clamping diameter within an e6 Tolerance.



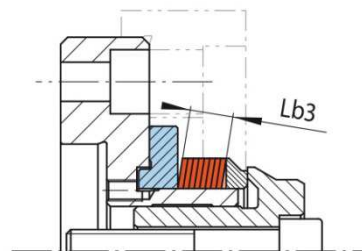
Caution!

When you exchange the bonded disc pack take care to the orientation of the thrust ring. The orientation is depending on the width L_b of the bonded disc pack.

Width	Bonded Disc Pack LBD			Bonded Disc Pack LGD	
	Lb1	Lb2	Lb3	Lb1	Lb3
Size	mm	mm	mm	mm	mm
LBDF 11	4	6	8	---	---
LBDF 15	4	6	8	5,4	10,8
	6	9	12	5,4	10,8
LBDF 20	6	9	12	5,4	10,8
LBDF 25	6	9	12	5,4	10,8
LBDF 30	6	9	12	5,4	10,8
LBDF 35	6	9	12	5,4	10,8
LBDF 40	6	9	12	5,4	10,8
LBDF 45	6	9	12	5,4	10,8
LBDF 50	6	9	12	5,4	10,8
	6	10	16	6,9	13,8
LBDF 60	6	10	16	6,9	13,8
LBDF 70	6	10	16	6,9	13,8
LBDF 80	6	10	16	6,9	13,8
LBDF 90	6	10	16	6,9	13,8
LBDF 100	6,3	10	16	6,9	13,8
				9	18



Scheibenblockbreite Lb1 und Lb2:
Bonded Disc Pack touches the stepped shoulder



Scheibenblockbreite Lb3:
Stepped shoulder reaches in the seating body

9. Storage

If the clamping fixture is to remain on the machine tool, 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 is dependent on the size. See the data sheet in catalogue 10. Or you will find the up to date version of the data sheet in the download section.



Note:

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