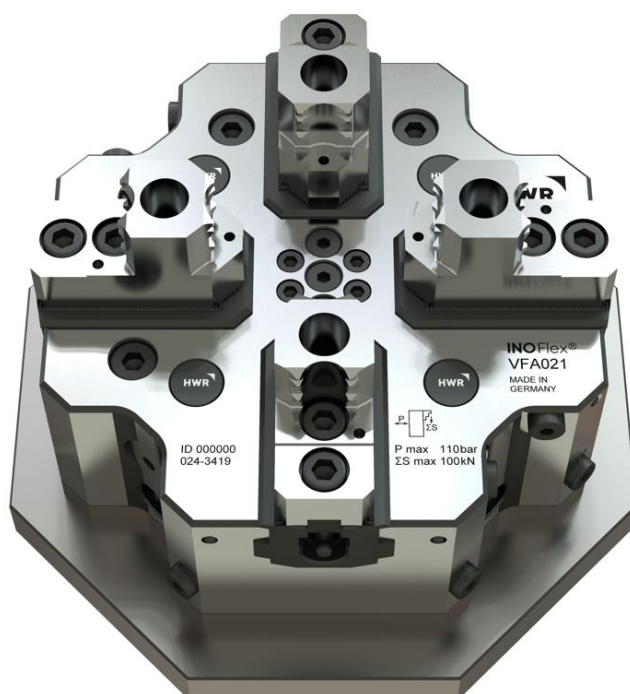


HWR

EN

Operating Manual INOFlex® VF-A 021 - VF-A 070

Hydraulically actuated, compensating 4-jaw centering vise



Original Operating Manual in German!
Keep safe for future reference!

Status: August 21, 2025

Issue: A

EN

Operating Manual INOFlex® VF-A 021 - VF-A 070
Hydraulically actuated, compensating 4-jaw centering vise

IT

Istruzioni per l'uso INOFlex® VF-A 021 - VF-A 070
Morsetto di centraggio a 4 ganasce di compensazione ad azionamento idraulico

FR

Notice d'utilisation INOFlex® VF-A 021 - VF-A 040
Dispositif de serrage auto-centrant à 4 mors à compensation, à commande hydraulique

ES

Manual de instrucciones INOFlex® VF-A 021 - VF-A 040
Tensor de centrado de 4 mordazas compensador y de accionamiento hidráulico

The following illustration shows the centering vise with the embossed data.

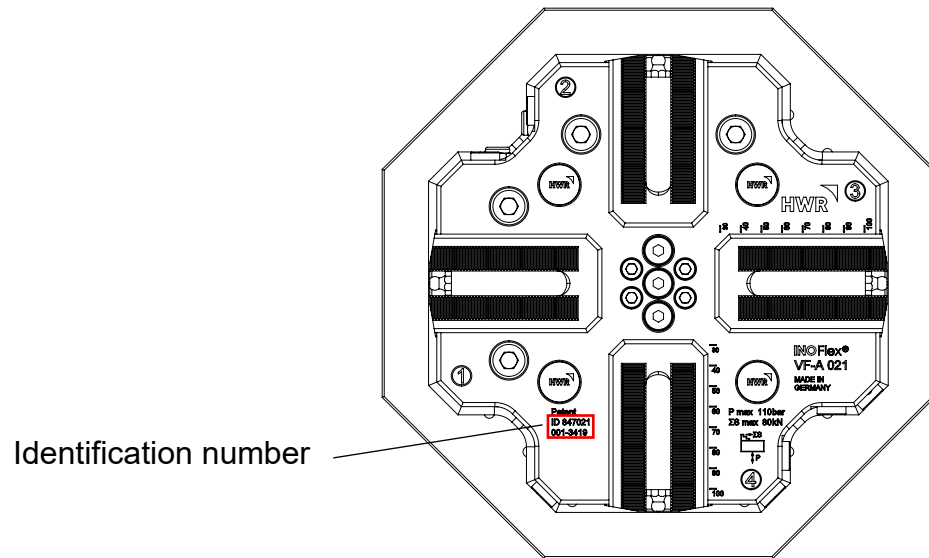


Fig.: Identification number

NOTE

If you have any questions for HWR Spanntechnik GmbH, please have the identification number ready (marked red above).

Errors or mistakes in the documentation excepted. Please inform HWR Spanntechnik GmbH of any mistakes in the documentation.

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The copyright to this documentation shall remain with HWR Spanntechnik GmbH.

This documentation is only intended for the operating company and the corresponding staff. It contains instructions and information that may not be reproduced, distributed or transmitted in any form or by any data technology means or used for competitive purposes without prior authorization.

Violations may constitute an offense resulting in appropriate legal action.

This Operating Manual provides detailed information on the installation, operation and maintenance of the INOFlex® centering vise. It contains safety instructions that ensure safe use of the INOFlex® centering vise. Additional information on the scope of delivery and troubleshooting can be found in this documentation.

This Operating Manual will help you get the most out of your INOFlex® centering vise.

Your INOFlex® centering vise ensures years of reliable and effective performance if always used properly and maintained in good condition. The documentation provided will help you to do just that.

Keep this Operating Manual and the other documentation (e.g., manufacturer's documentation) safe and always within easy reach in the immediate vicinity of the machine on which the centering vise is used. Always observe all the information, notes, instructions and directions contained therein. This helps prevent accidents caused by incorrect operation, retain the full manufacturer's warranty and always have a fully functional centering vise.

The manufacturer is always striving to improve its products. The manufacturer reserves the right to make any changes and improvements it deems necessary. However, please note that there is no obligation to retrofit INOFlex® centering vises that have already been delivered.

DANGER

Prior to commissioning the INOFlex® centering vise, you must have read and understood the Operating Manual and the safety regulations contained therein.

Employees must have received instruction on the features, installation and use of the INOFlex® centering vise in accordance with this Operating Manual.

If you have any questions after initial instructions and reading the Operating

Manual, please contact the manufacturer.

We wish you and your employees lots of enjoyment and success when using the INOFlex® centering vise.

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The logo for HWR Spanntechnik GmbH, featuring the letters 'HWR' in a bold, black, sans-serif font. To the right of the letters is a stylized graphic element consisting of a black square with a white diagonal line running from the top-left corner to the bottom-right corner.

Declaration of incorporation of partly completed machinery

in accordance with Machinery Directive 2006/42/EC; Annex II B

Manufacturer: **HWR Spanntechnik GmbH**

Authorized representative for the technical documentation: **Henrico Viets (Managing Director)**

Designation of the machine: **Compensating 4-jaw centering vise**

Machine number: **VF-A 021 - VF-A 070**

We hereby declare

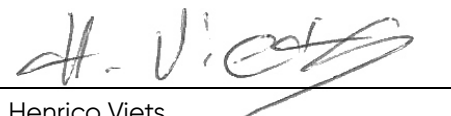
that the aforesaid partly completed machinery is intended for incorporation into another machine. Commissioning is prohibited until the distributor of the completed machine has established that the complete machine complies with the provisions of EC Machinery Directive 2006/42/EC and has issued a Declaration of Conformity in accordance with Annex II, Part A of EC Machinery Directive 2006/42/EC.

that the essential health and safety requirements relating to the design and construction of machinery in accordance with Annex I of EC Machinery Directive 2006/42/EC are complied with in full.

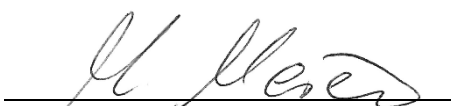
that the "special technical documentation" has been prepared in accordance with Annex VII, Part B.

We undertake to provide national authorities with the special technical documentation for the partly completed machinery in paper form within a reasonable period of time upon justified request.

Oyten, August 22, 2025

A handwritten signature in black ink, appearing to read 'H. Viets', written over a horizontal line.

Henrico Viets
Managing Director

A handwritten signature in black ink, appearing to read 'M. Meier', written over a horizontal line.

Matthias Meier
Managing Director

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1 SAFETY

General information

The Operating Manual for your INOFlex® centering vise contains important information on installation, operation, maintenance and malfunctions. This information helps you to operate your INOFlex® centering vise safely and without risk.

All the safety instructions and liability provisions necessary for handling the INOFlex® centering vise properly are contained in this chapter. Instructions on proper use can also be found here.

▲ CAUTION

It is essential that you read and observe this Operating Manual, and this chapter in particular, prior to using the INOFlex® centering vise.

1.1 SCOPE OF THE DOCUMENTATION

In addition to the safety instructions, the Operating Manual contains:

- a general description of the product
- instructions on installation of the INOFlex® centering vise
- instructions on operation and utilization of the INOFlex® centering vise
- instructions on maintenance and care
- instructions on troubleshooting and fault rectification
- Technical data

The technical documentation also includes the following documents:

- an integrated list of spare parts
- a declaration of incorporation

1.2 NOTES OF THE MANUFACTURER

1.2.1 CUSTOMER SERVICE

The contact details of the manufacturer are given on the back cover. If you have any questions or problems, please contact the manufacturer of the centering vise immediately.

NOTE

Please have the identification number (ID no.) ready if you have any queries for HWR Spanntechnik GmbH.

1.2.2 WARRANTY AND LIABILITY

In principle, our "General Terms and Conditions of Sale and Delivery" apply. They are available to the operating company at the latest when the contract is concluded. Warranty and liability claims for personal injury and property damage are excluded if they are caused by one or more of the following reasons.

- Improper use of the INOFlex® centering vise.
- Improper installation, commissioning, operation and maintenance of the INOFlex® centering vise.
- Operation of the INOFlex® centering vise if the safety devices of the machine are defective or if the safety and protective devices on the machine are not fitted properly or are not in correct working order.
- Failure to observe the instructions in the documentation regarding
 - Storage
 - Installation
 - Operation (e.g. correct clamping of the workpiece, observing the maximum speed)
 - Maintenance and care
 - Troubleshooting at the INOFlex® centering vise
- Unauthorized structural changes to the centering vise or the holder of the machine.
- Inadequate monitoring of parts that are subject to wear.
- Improperly performed repairs.
- Disasters caused by foreign bodies and force majeure.

⚠ DANGER

Do not make any alterations, additions or conversions to the INOFlex® centering vise without the express approval of the manufacturer. All conversions require prior written confirmation from the manufacturer.

⚠ WARNING

Only use original spare and wear parts. In the case of externally sourced parts, there is no guarantee that they have been designed and manufactured to withstand the correct levels of stress and to ensure safety.

NOTE

The manufacturer provides full warranty only and exclusively for spare parts ordered from the manufacturer.

1.2.3 INSTRUCTIONS ON HANDLING THE DOCUMENTATION

Keep this Operating Manual and all other documents relating to the IN-OFlex® centering vise safe and always within easy reach in the immediate vicinity of the machine on which the centering vise is used.

It is essential that you read this Operating Manual prior to using the centering vise for the first time and always observe the safety instructions.

Particularly important passages in this Operating Manual are marked with a symbol.

NOTE

Staff training provided by the manufacturer is regarded merely as the transfer of individual pieces of information. It does not release the operator from their obligation to read this Operating Manual.

1.2.4 EXPLANATION OF PICTOGRAMS

The following symbols are used to designate important passages in this Operating Manual. Observe these instructions carefully and exercise particular caution in these cases.

Marking of safety instructions:

⚠ DANGER

***This note indicates a situation that, if certain rules of conduct are not observed, will result in injury and/or danger of death.
When you see this symbol in the documentation, please take all the necessary safety precautions.***

⚠ WARNING

This note indicates potential material damage, financial losses and legal repercussions (e.g. loss of warranty rights, liability disputes, etc.).

⚠ CAUTION

This note indicates potential material damage to the machine.

NOTE

This note indicates important notes and information on effective, economical and environmentally-friendly handling.

1.3 INTENDED USE

1.3.1 EXCLUSIVE INTENDED USE

The INOFlex® centering vise VF-A 021 – VF-A 070 is intended exclusively for clamping components for mechanical machining in machine tools (see also chapter "7" Technical data [...▶ 40]). Use of the centering vise below speed is not permitted.

Any other use is considered improper. The manufacturer shall not be liable for any resulting damage.

1.3.2 OBSERVING INSTRUCTIONS AND REGULATIONS

Intended use also includes:

- observance of all the instructions in the documentation and in the documentation provided by the manufacturer (if applicable)
- compliance with the maintenance and servicing requirements, as well as the intervals specified by the manufacturer

1.3.3 OBSERVING ACCIDENT PREVENTION REGULATIONS

Comply with the relevant accident prevention regulations and all other generally recognized rules of safety.

1.4 WARNING OF INCORRECT OPERATION AND MISUSE

The efficient working order of your INOFlex® centering vise was factory tested before delivery.

Nevertheless, there are dangers associated with incorrect operation and misuse:

- for the health and safety of operators, third parties and animals in the vicinity of the machine tool on which the centering vise is used,
- for the machine tool, the INOFlex® centering vise and other material assets of the operating company,
- for the efficient operation of the machine tool on which the INOFlex® centering vise is used.

1.5 INSTRUCTIONS ON SAFE OPERATION

⚠ DANGER

Real safety means that you are familiar with all the safety instructions. This concerns the actual type and location of the hazard and, in particular, the relevant safety measures to be taken. Always remain vigilant and be aware of the danger(s).

Malfunctions must be investigated immediately. If necessary, ask the operating staff to call in specialists. Only when the safety of the INOFlex® centering vise and the machine tool is demonstrated beyond any doubt may operation be resumed.

Operation of the INOFlex® centering vise may only be started when the operating staff are satisfied that all maintenance work (as described in this Operating Manual) has been performed.

If it is determined during operation that required maintenance measures have not been performed, operation must be stopped immediately.

When operating the INOFlex® centering vise, observe the permissible room temperatures for machine tool operation (see the operating instructions for the machine tool, if specified).

1.6 OBLIGATIONS

1.6.1 OBLIGATION OF THE OPERATING COMPANY

The operating company shall only allow persons to work with the IN-OFlex® centering vise who

- are familiar with the basic safety and accident prevention regulations and have received instruction on how to operate the INOFlex® centering vise,
- have read and understood this Operating Manual, in particular the chapter on safety, and the warning notes and have confirmed this with their signature.

The operating company is responsible for selecting the operating staff. The operating company must pay particular attention to the suitability of the staff who operate a machine tool with the INOFlex® centering vise.

The operating company must always make all product documentation available to both operating and maintenance staff.

The operating company must routinely check that operating and maintenance staff go about their work in a safety-conscious manner.

The operating company of a machine tool with the INOFlex® centering vise must comply with and observe the following rules and regulations:

- the functional limits and safety regulations specified in the technical instructions.

DANGER

The ultimate responsibility for safety rests with the operating company.

This responsibility cannot be delegated to any other party.

1.6.2 REQUIREMENTS FOR OPERATING / MAINTENANCE STAFF

The operating company shall:

- only allow trained specialists (specializing in metalwork) or CNC lathe operators to work with the INOFlex® centering vise,
- clearly define the responsibilities of staff involved with installation, commissioning, operation, maintenance and repair work,
- ensure that staff undergoing training only work with the INOFlex® centering vise under the supervision of an experienced specialist (specializing in metalwork) or a CNC lathe operator.

Everyone responsible for operating the INOFlex® centering vise shall:

- ensure the safety of third parties, the INOFlex® centering vise and the machine tool at all times,
- read the Operating Manual, in particular the chapter on safety, and the warning notes and confirm this with their signature,
- observe the basic regulations concerning occupational health and safety and accident prevention,
- only use the INOFlex® centering vise when they are familiar with the specific features of the actual centering vise and of the machine tool, including its safety and emergency equipment, and can operate both safely.

Operating staff must devote all their attention to working with the machine tool with the INOFlex® centering vise.



DANGER

It is about your safety and the safety of your colleagues and others in the vicinity of the machine!

1.7 ACCIDENT PREVENTION REGULATIONS

1.7.1 GENERAL

Check the INOFlex® centering vise daily for operational safety prior to each use! In addition to the instructions in the documentation, observe the generally applicable local safety and accident prevention regulations.

Any faults that occur and negatively impact safety must be rectified immediately. Damaged parts must be replaced immediately. The machine must not be operated with the INOFlex® centering vise until the fault has been rectified.

1.7.2 PROTECTIVE MEASURES PROVIDED BY THE OPERATING COMPANY

Workplace ergonomics

The workplaces for operating staff must be designed in accordance with ergonomic guidelines. Clear access (avoidance of tripping hazards), adequate lighting, etc. (accident prevention regulations, safety of the operator at the workplace) must be ensured by the operating company.

Personal protective measures

Personal protective equipment must be worn in accordance with the guidelines and regulations of the employers' liability insurance association and the company (work clothes, non-slip safety shoes, hairnet, etc.).

Access to the machine

Keep unauthorized persons away from the work area. This can be ensured through the use of self-closing doors, which can only be opened with a key, or similar protective measures.

1.7.3 INSTALLATION AND COMMISSIONING

Make sure that the centering vise is properly inserted and secured in the machine tool.

Prior to commissioning the INOFlex® centering vise, commissioning staff must ensure that the INOFlex® centering vise is in efficient working order by carrying out the specified inspections and test runs!

1.7.4 SAFETY WHEN NOT IN USE

Secure the machine tool with the INOFlex® centering vise against unauthorized operation when not in use (e.g. with a padlock at the main switch of the machine tool).

Make sure that children cannot access the INOFlex® centering vise or the machine tool.

1.7.5 **MAINTENANCE AND REPAIR**

Maintenance intervals

Perform all the specified maintenance work on time.

Cleaning agents

Clean all surfaces that come into contact with the product with cleaning agents that comply with the applicable hygiene and health standards.

Tests

Make sure that clamping and rotating parts are in efficient working order prior to each use. Replace defective parts immediately with flawless parts.

After completing maintenance and repair work, make sure that all the components are in efficient working order.

Disposal

Handle and dispose of used substances and materials properly, especially grease and solvents.

2 TECHNICAL DESCRIPTION

2.1 GENERAL

The INOFlex® centering vise VF-A 021 – VF-A 070 is intended exclusively for clamping components for mechanical machining in milling machines (see also chapter "7" Technical data [...▶ 40]).

The centering vise may only be used in compliance with the operating instructions for the machine tool and this Operating Manual.

NOTE

The centering vise is greased at the factory and may need to be re-greased.

2.2 OVERVIEW OF THE INOFLEX®-CENTERING VISE

2.2.1 STRUCTURE

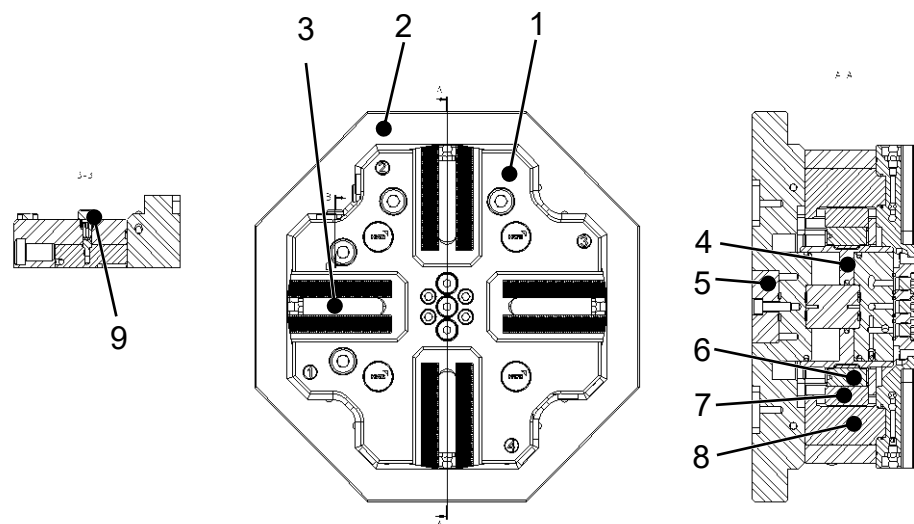


Fig. 2-1: Structure of the INOFlex® centering vise

- | | |
|--------------------------------|---------------------|
| 1 Upper housing | 6 Compensation pin |
| 2 Lower housing | 7 Driver |
| 3 Base jaw | 8 Tangential slider |
| 4 Piston/Compensation ring | 9 Stroke control |
| 5 Hydraulic connection (blank) | |

2.2.2 FUNCTIONAL DESCRIPTION

The concentric and compensating 4-jaw centering vise enables the clamping of round, square and geometrically irregular parts and is also ideal for workpieces that are sensitive to deformation.

The centering vise is actuated hydraulically at the machine. The hydraulic pressure is converted into an axial tensile or compressive force via the piston (1). This force is then transformed into a radial clamping force at the base jaws (6) by means of the compensation ring (2), compensation pin (3), driver (4) and tangential slider (5).

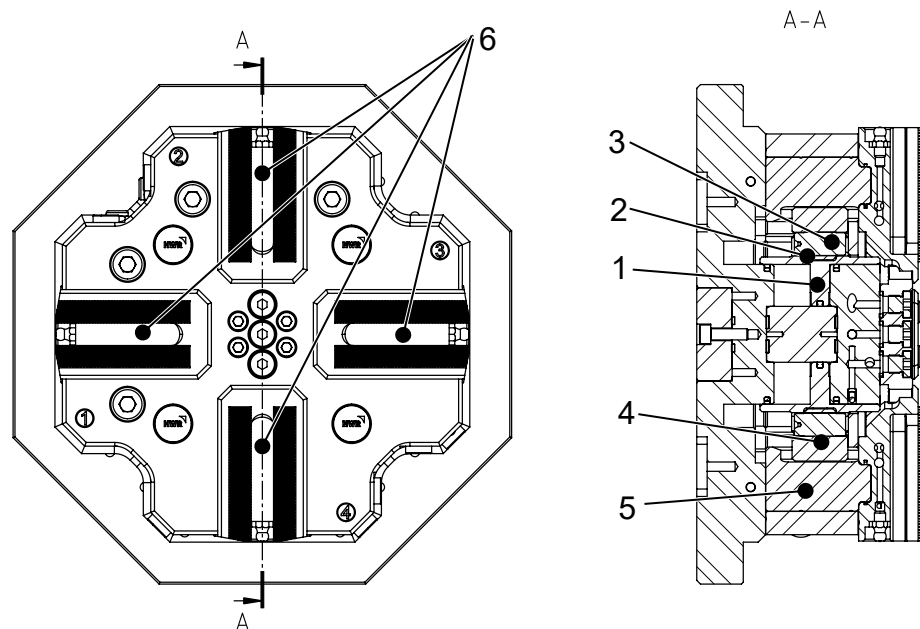


Fig. 2-2: How the INOFlex® centering vise works

3 TRANSPORTATION AND INSTALLATION

3.1 GENERAL

Remain calm and composed during installation work. Avoid stress and stressful situations that could lead to errors or accidents.

Keep all transportation routes and the installation site free of obstructions when performing work.

During installation work also observe the operating instructions for the machine tool on which the centering vise is installed.

WARNING

Observe the regulations and guidelines of the operating company regarding personal protective equipment (PPE).

3.2 TRANSPORTATION

3.2.1 TRANSPORT TOOLS

Upon delivery, the securely packaged INOFlex® centering vise can be transported using the following auxiliary equipment, depending on its weight:

- Crane
- Forklift truck or pallet truck

3.2.2 NOTES ON THE PACKAGING

It is essential that you observe the notes and instructions on the packaging (if available).

3.2.3 PRECAUTIONS FOR TRANSPORTATION

The transportation of heavy INOFlex® centering vises, if necessary with auxiliary equipment, should only be carried out by qualified staff.

DANGER



During transportation, there is a risk of the transported components tipping over, moving or falling down. This may result in damage to the centering vise or life-threatening injuries.

To prevent damage to the centering vise and life-threatening injuries, comply with the following measures:

- The INOFlex® centering vise may only be lifted at the designated suspension point or threaded holes.
- When lifting, moving or transporting the centering vise, always observe its center of gravity and attachment position.
- Load handling devices and lifting accessories must comply with the provisions of the accident prevention regulations.
- When selecting the load handling devices and lifting accessories, always take into account the weight of the INOFlex® centering vise and, if necessary, the length of the lift arm (e.g. crane boom).
- Always cordon off access to transport routes for suspended loads and clearly mark these areas to prevent anyone from entering them.

DANGER



Never walk below or stand underneath suspended loads. Risks of accidents!

3.2.4 CENTERING VISE TRANSPORTATION WITH LIFTING EYE BOLT

The lifting eye bolt (DIN 580) included in the scope of delivery must be used for transportation.

⚠ CAUTION

The lifting eye bolt is marked with the permissible load-carrying capacity.

- Step 1** Screw the lifting eye bolt into the base body of the centering vise prior to transportation (see the following illustration). Attach the hoist.

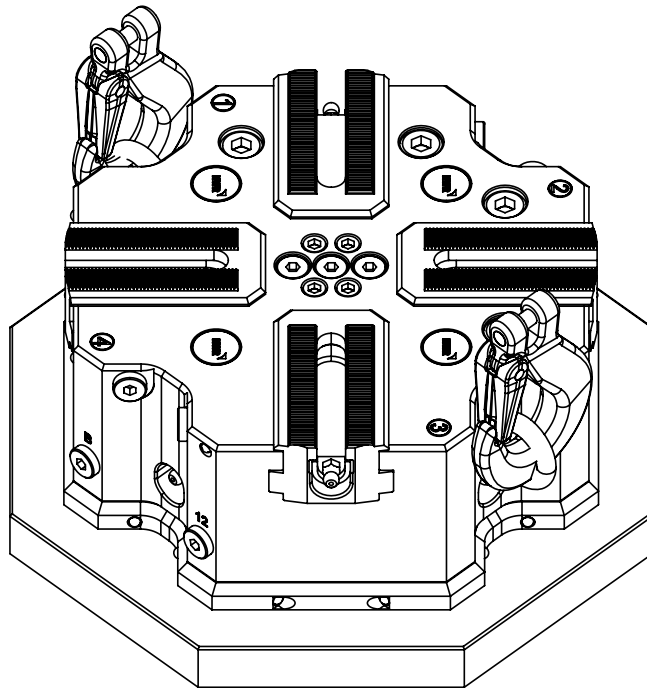


Fig. 3-1: Transportation with lifting eye bolt

- Step 2** During transportation, observe the precautions described in section 3.2.3 [... ▶ 15].

⚠ WARNING

Do not remove the hoist and the lifting eye bolt until the centering vise has been securely installed in the machine tool.

3.2.5 TESTS AFTER TRANSPORTATION / RECEIPT OF THE CENTERING VISE

Check the condition (transport damage) of the INOFlex® centering vise immediately upon receipt.

Notify the carrier and the manufacturer of the centering vise (HWR Spanntechnik GmbH) of any transport damage found. The address and telephone number can be found on the inside of the title page.

⚠ WARNING

Any damage caused during transportation of the centering vise must be repaired properly and fully prior to commissioning.

3.3 INSTALLATION

⚠ WARNING

The INOFlex® centering vise may only be installed by trained and instructed staff who have also received training and instruction to enable them to operate the machine tool.

3.3.1 SPACE REQUIREMENTS

The freedom of movement required for installation of the INOFlex® centering vise corresponds to the space required by the machine tool operator (see the relevant operating instructions for the machine tool).

3.3.2 INSTALLING THE CENTERING VISE

NOTE

The centering vise can be installed in various ways. The exact procedure may vary depending on the actual application. If necessary, please observe the assembly instructions supplied by HWR Spanntechnik GmbH.

- Step 1** Clean the mounting surfaces of the machine table. There must be no dirt or chips on the relevant surfaces.
- Step 2** Use the hoist to carefully and slowly guide the clean centering vise (hanging on the lifting eye bolt) above the machine table.
- Step 3** The centering vise can be installed on the machine table in three different ways:
- 1. Installation with clamping claws:**
Fix the INOFlex® centering vise to the machine table with clamping claws. If necessary, use fitting T-nuts and (from size 042) a centering pin to align the centering vise.
 - 2. Installation with special hole pattern**
Drill the appropriate installation hole pattern into the base plate of the INOFlex® centering vise to allow it to be installed on the machine table, either directly or, if necessary, using T-nuts. If necessary, use fitting T-nuts and (from size VF-A 042) a centering pin to align the centering vise.
 - 3. Installation with SOLIDPoint® / SOLIDBolt**
Insert SOLIDPoint® or SOLIDBolt zero-point studs on the underside of the INOFlex® centering vise, and install the centering vise on the machine table using suitable zero-point plates.
➔ Please note: With the VF-A 021 centering vise, first remove the cover plates (1) to attach the zero-point studs (3) and then replace the connecting bolts (2) with ISO 4762 M10x100 - 12.9 bolts. The bolts are screwed directly along with the zero-point studs.

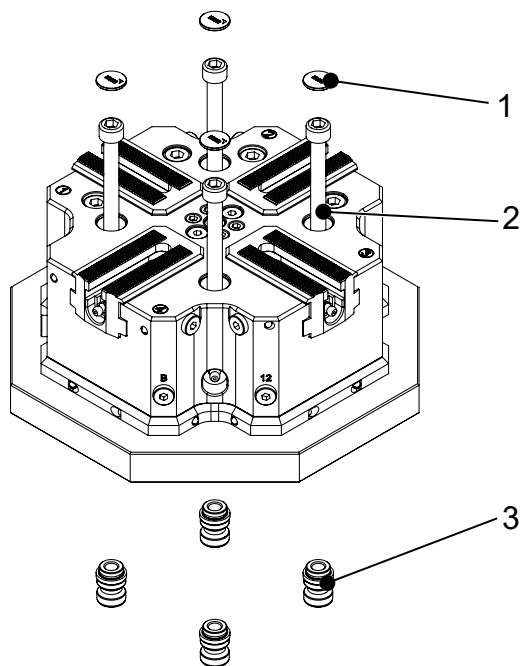


Fig. 3-2: Installing the centering vise

NOTE

Observe the maximum tightening torques for the fixing screws (see Table 7-7 [... 45]).

⚠ WARNING

The chuck body must be free of tension.

3.4 CONNECTING THE CENTERING VISE

3.4.1 CONNECTIONS

The INOFlex® centering vise has three lateral holes (G1/8") for connecting hydraulic and pneumatic lines, which are labeled "A", "B" and "12".

Connection	Function
A	Hydraulics: External clamping
B	Hydraulics: Internal clamping
12	Pneumatics: Final position check / Position check
Table 3-1: Connections	

The INOFlex® centering vise can be connected to the hydraulic / pneumatic system of the machine via these connections.

Alternatively, a feed through the base plate of the INOFlex® centering vise can be used to connect the hydraulics and pneumatics. To do so, first loosen the bolt (3) and remove the adapter piece (2). The adapter piece (2) can then be drilled to fit the required connection before being re-inserted. The parallel pin (1) is used for defined alignment of the adapter piece.

NOTE

Further information on the adapter piece can be obtained from the manufacturer HWR Spanntechnik GmbH.

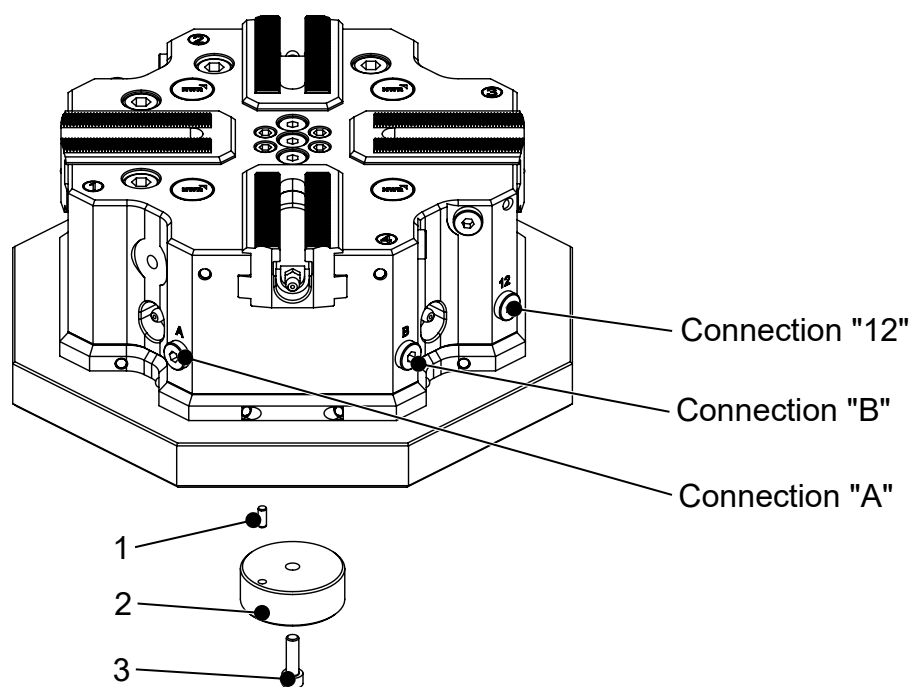


Fig. 3-3: Connections

3.4.2 HYDRAULICS

Please note the following requirements for the hydraulic system used:

	VF-A 021	VF-A 042 - 070
Pressurizing agent	Hydraulic oil according to ISO VG 46, cleanliness class according to ISO 4406:2021-01 [21/18/13]	
Pressurizing agent requirement	Filtered (10 µm), lubricity value of 30 N/mm ² according to DIN 51347-1:2000-01	
Volume flow [l/min.]	Max. 2	Max. 10
Pressure [bar]	Max. 110	Max. 85
Table 3-2: Hydraulic oil		

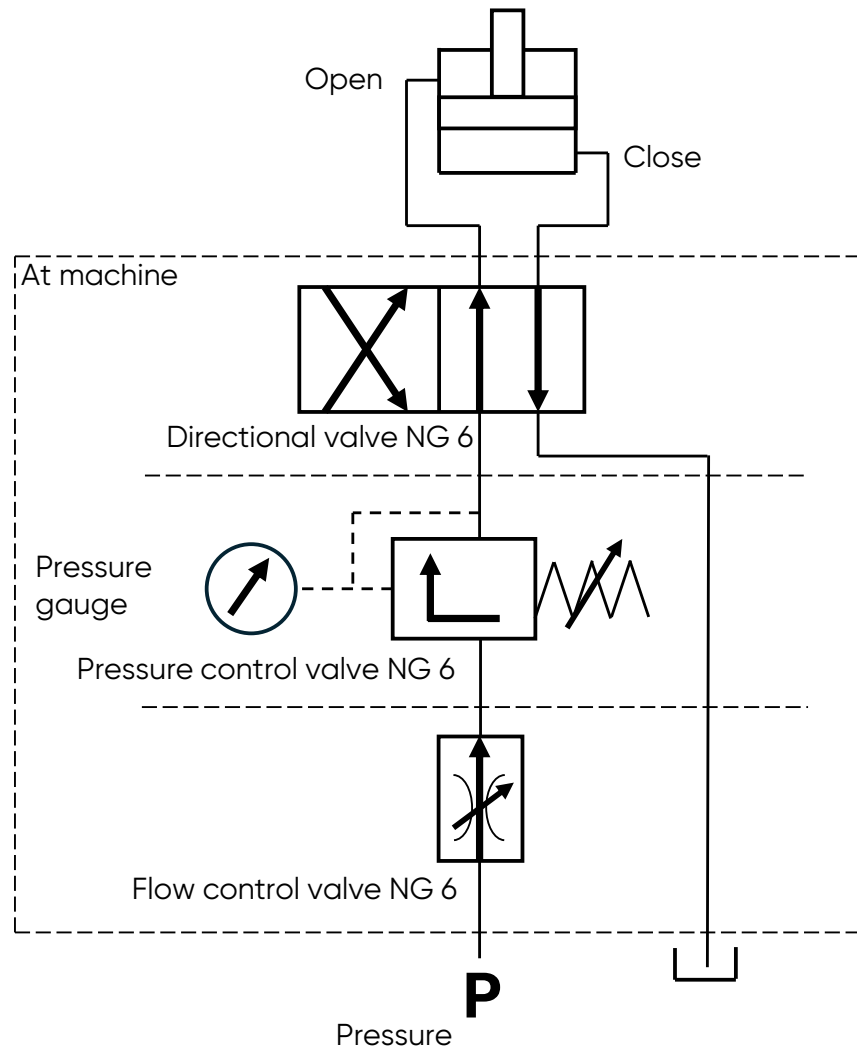


Fig. 3-4: Hydraulic diagram

3.4.3 PNEUMATICS

Please note the following requirements for the pneumatic system used:

	VF-A 021	VF-A 042 - 070
Air quality	According to ISO 8573-1:2010 [7:4:4]	
Pressure [bar]	Max. 10	

Table 3-3: Pneumatics

3.5 VENTING

The centering vise must be vented during initial commissioning and after every oil change.

The venting screws of the centering vise are located in the center of the front face. Vent the channels "A" and "B" for external and internal clamping (see Table 3-1 [...▶19]) separately.

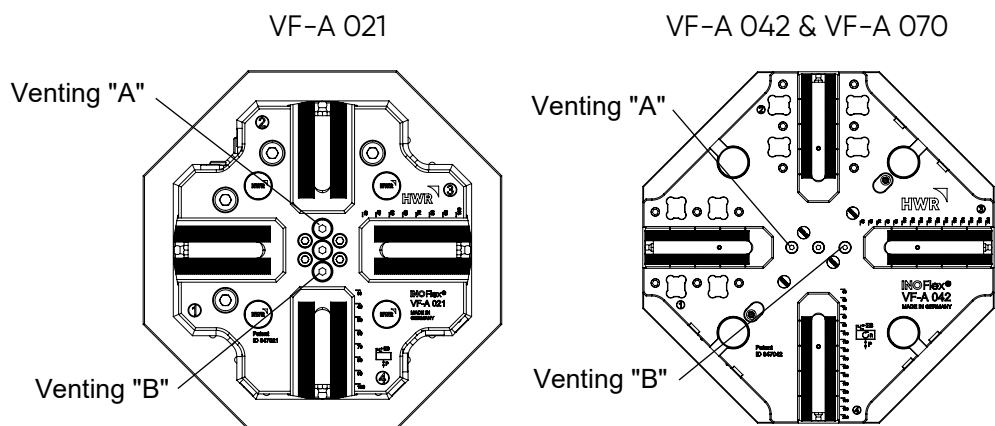


Fig. 3-5: Venting screws

⚠ DANGER

Before opening the venting screws, make sure that the centering vise is de-pressurized.

NOTE

The plug-in connections and plastic hoses supplied with the centering vise can be used to drain any escaping hydraulic oil.

3.6 INSERTING THE CLAMPING JAWS

3.6.1 GENERAL

Depending on the workpiece being machined, soft or hard top jaws can be used.

NOTE

***The manufacturer recommends the use of original clamping jaws from HWR Spanntechnik GmbH.
The manufacturer shall assume no warranty for parts supplied by third parties.***

⚠ WARNING

Should you nevertheless wish to use clamping jaws from other manufacturers, always consult the centering vise manufacturer HWR Spanntechnik GmbH first.

3.6.2 INSTALLING THE TOP JAWS

- Step 1** Insert the T-nut (1) into the centering vise with the beveled end facing the center.
- Step 2** Insert the clamping jaws (2) into the serration and screw in two cylinder bolts (3), each of strength class 12.9.

⚠ WARNING

***Make sure that the serration is clean and that the clamping jaw number matches the base jaw number.
Ensure a sufficient screw-in depth (min. 1.25 x thread diameter).***

- Step 3** Using a torque wrench, first tighten the bolt (3) at the non-beveled end of the T-nut and then the bolt (3) at the beveled end.

NOTE

Observe the maximum tightening torques for the fixing screws (see Table 7-7 [... 45]).

⚠ WARNING

To install the top jaws, at least two fixing screws must be used in each case, which are positioned completely within the groove of the base jaw.

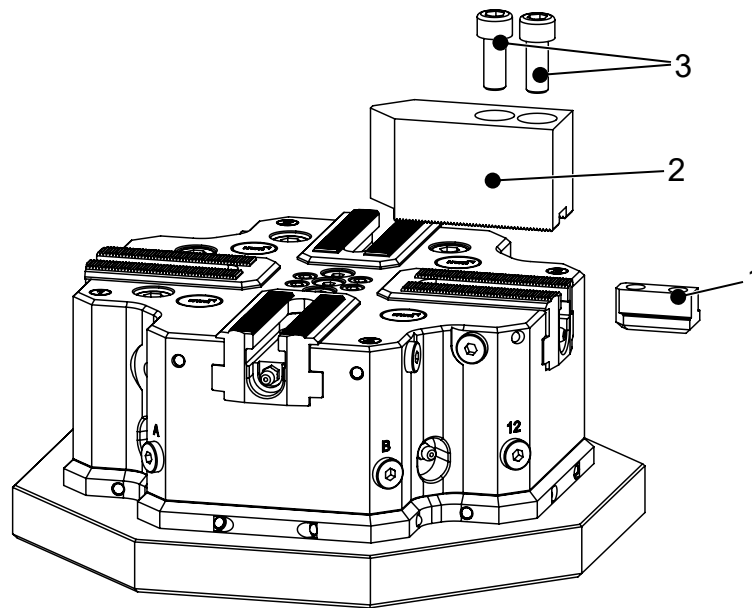


Fig. 3-6: Installing the clamping jaws

3.7 USING STATIONARY JAWS

3.7.1 GENERAL

Depending on the workpiece being machined, one or two stationary jaws can be used.

⚠ WARNING

When using one stationary jaw, divide the maximum permissible actuating pressure of the centering vise by half!!!

⚠ WARNING

An excessive tightening torque can damage the clamping device and consequently lead to insecure clamping!

3.7.2 INSTALLING ONE STATIONARY JAW

Step 1 Remove the caps and bolts or threaded pins from the holes that are to be used for installing the stationary jaw.

Step 2 Insert the stationary jaw (1) into the jaw grooves (2) or holes.

⚠ WARNING

***Make sure that the contact surfaces are clean.
Ensure a sufficient screw-in depth (min. 1.25 x thread diameter).***

Step 3 Install the stationary jaw (1) on the centering vise using the enclosed fixing screws (3). To do so, use a torque wrench.

⚠ WARNING

All the fixing holes in the stationary jaw must always be used for installation.

NOTE

Observe the maximum tightening torques for the fixing screws (see Table 7-7 [... ▶ 45]).

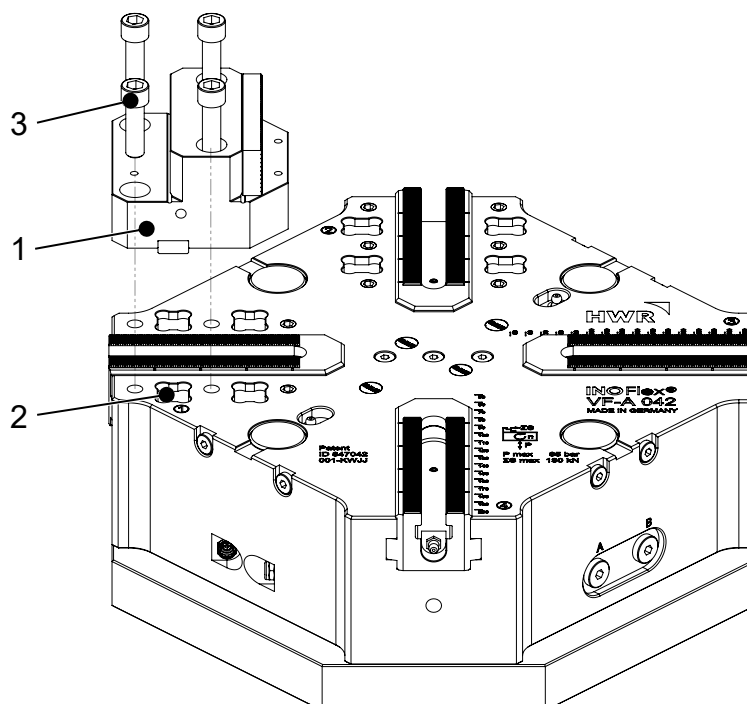


Fig. 3-7: Installing the stationary jaw

3.7.3 MOUNTING OPTIONS FOR STATIONARY JAWS

A One stationary jaw and one movable top jaw

The top jaw (2), which is installed on the base jaw, presses the component against one stationary jaw (1). The other two base jaws remain unused.

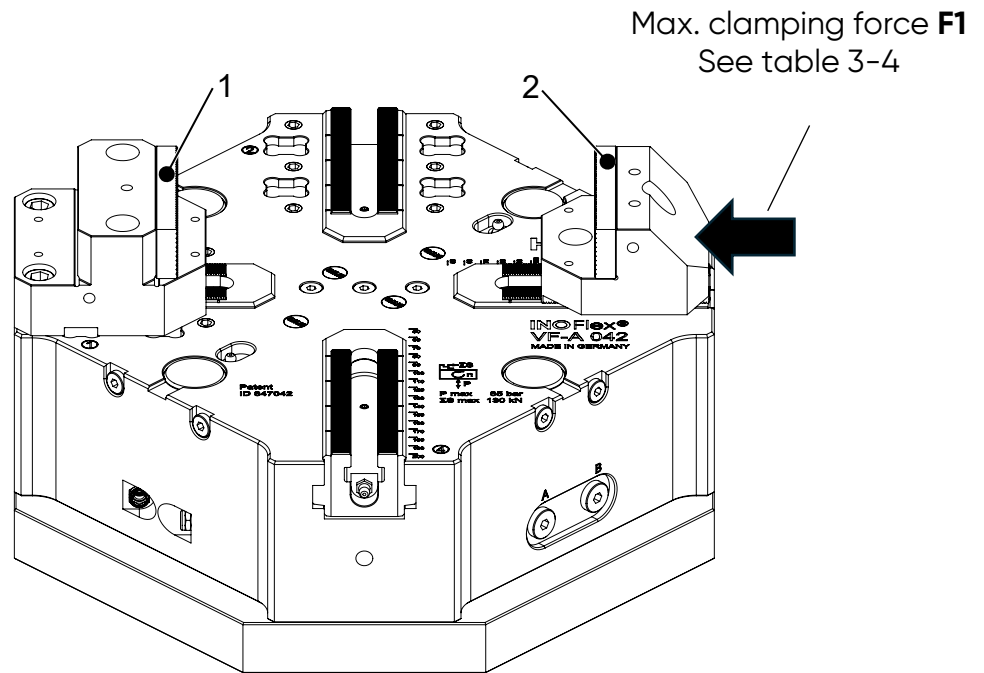


Fig. 3-8: One stationary jaw and one movable top jaw

Chuck size	Max. actuating pressure [bar]	Max. clamping force F1 [kN]
VF-A 021	55	20
VF-A 042	42.5	32.5
VF-A 070	42.5	32.5

Table 3-4: Actuating pressure - clamping force

With the reduced tightening torque, the movable top jaw presses the workpiece with 50% of the possible total clamping force of the centering vise against the stationary jaw.

Example:

Centering vise:	INOFlex® VF-A 042
Max. actuating pressure:	85 bar
Max. total clamping force:	130 kN

- When using the stationary jaw, divide the max. actuating pressure by half to **42.5 bar**.
- Owing to the reduced actuating pressure, the max. total clamping force is also divided by half to **65 kN**.
- As shown, 50% of this force goes into the movable top jaw. Thus, the top jaw presses against the stationary jaw with a force of **32.5 kN**.

B One stationary jaw and three movable top jaws

The top jaw (2), which is installed on the base jaw, presses the component against one stationary jaw (1). Additional movable top jaws (2) are installed on the other two base jaws and press against each other concentrically.

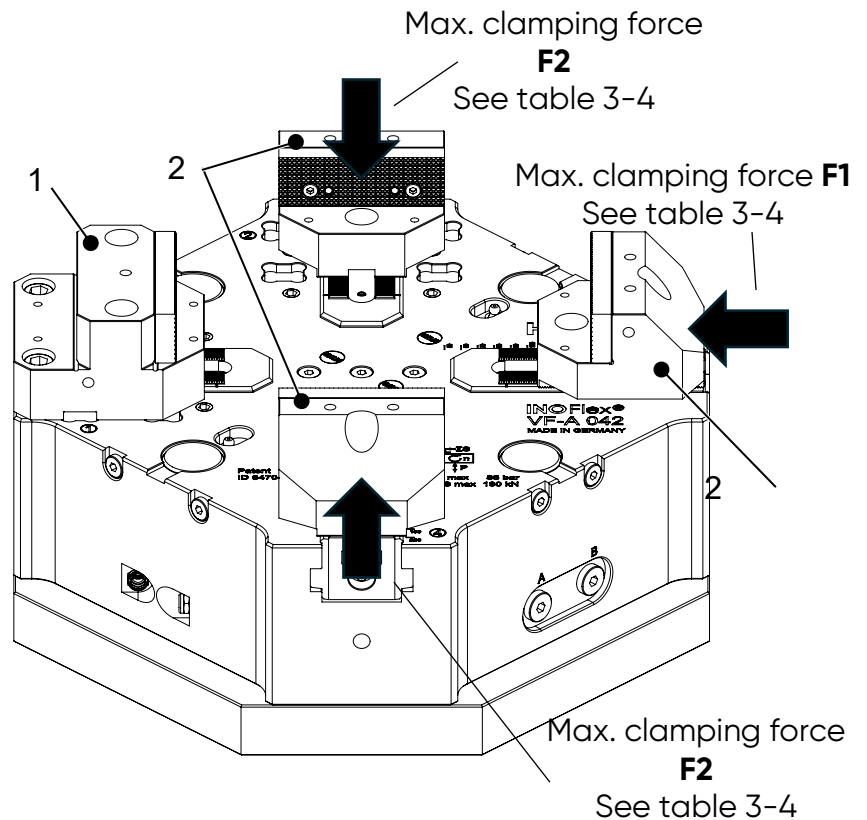


Fig. 3-9: One stationary jaw and three movable top jaws

Chuck size	Max. actuating pressure [bar]	Max. clamping force F1 [kN]	Max. clamping force F2 [kN]
VF-A 021	55	20	10
VF-A 042	42.5	32.5	16.25
VF-A 070	42.5	32.5	16.25

Table 3-5: Actuating pressure - clamping force

With the reduced tightening torque, the movable top jaw presses the workpiece with 50% of the possible total clamping force of the centering vise against the stationary jaw. The other two top jaws press against each other with 25% of the possible total clamping force.

Example:

Centering vise: INOFlex® VF-A 042

Max. actuating pressure: 85 bar

Max. total clamping force: 130 kN

- When using the stationary jaw, divide the max. actuating pressure by half to **42.5 bar**.
- Owing to the reduced actuating pressure, the max. total clamping force is also divided by half to **65 kN**.
- As shown, 50% of this force goes into the movable top jaw. Thus, the top jaw presses against the stationary jaw with a force of **32.5 kN**.
- The other two top jaws press against each other with 25% of the total clamping force, i.e. each with **16.25 kN**.

C Two stationary jaws and two movable top jaws

The two top jaws (2), which are installed on the base jaw, press the component against two stationary jaws (1).

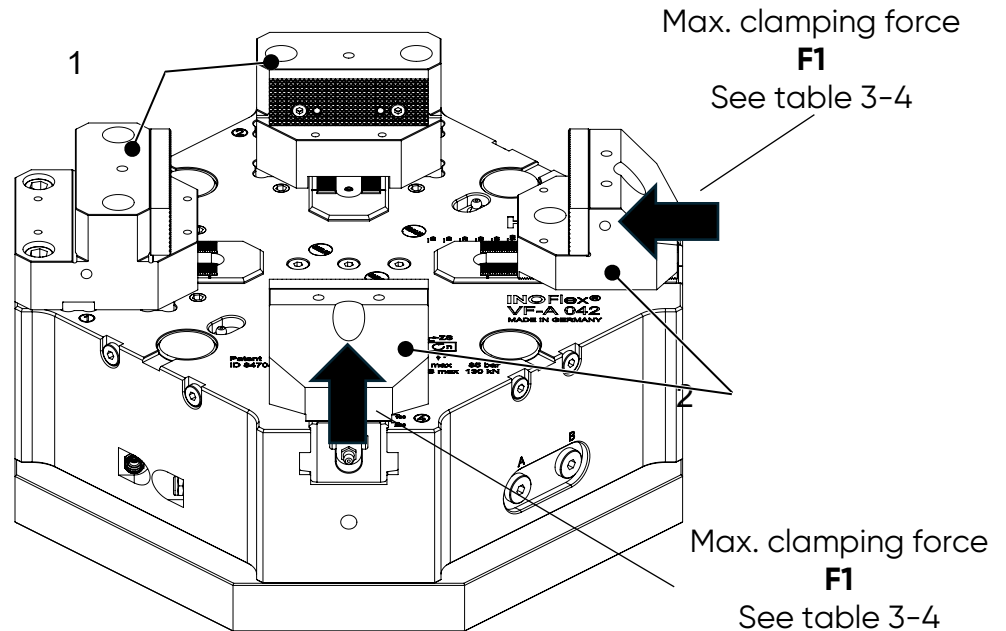


Fig. 3-10: Two stationary jaws and two movable top jaws

Chuck size	Max. actuating pressure [bar]	Max. clamping force F1 [kN]
VF-A 021	55	20
VF-A 042	42.5	32.5
VF-A 070	42.5	32.5

Table 3-6: Actuating pressure - clamping force

With the reduced tightening torque, the movable top jaws press the workpiece with 50%

of the possible total clamping force of the centering vise against the opposite stationary jaw.

With the reduced tightening torque, the movable top jaw presses the workpiece with 50% of the possible total clamping force of the centering vise against the stationary jaw.

Example:

Centering vise:	INOFlex® VF-A 042
Max. actuating pressure:	85 bar
Max. total clamping force:	130 kN

- When using the stationary jaw, divide the max. actuating pressure by half to **42.5 bar**.
- Owing to the reduced actuating pressure, the max. total clamping force is also divided by half to **65 kN**.
- As shown, 50% of this force goes into each movable top jaw. Each top jaw thus presses against the opposite stationary jaw with a force of **32.5 kN**.

3.8 FUNCTIONAL TEST

After installing the centering vise, its efficient working order must be checked prior to commissioning. Particular attention must be paid to the clamping force:

- Correct clamping of the centering vise must be checked by actuating (opening and closing) the centering vise hydraulically (see section 5.2.6 [... ▶ 34]).
- To check the efficient working order, the jaw stroke must be checked (see section 5.2.7 [... ▶ 35]).
- Measure the clamping force with a suitable clamping force gauge using two jaws (1/2 total clamping force) or four jaws.

4 OPERATION

4.1 GENERAL

This chapter provides information on how to operate the INOFlex® centering vise.

WARNING

Observe the regulations and guidelines of the operating company (e.g. regarding personal protective equipment (PPE)).

WARNING

Also observe the operating instructions for the machine tool on which the centering vise is installed.

4.2 PREPARATIONS

! DANGER

Do not operate the centering vise if there are any signs of damage to the pneumatic or hydraulic components. Defective components must be replaced or repaired properly prior to commissioning.

- Step 1** Check that the centering vise has been installed properly on the machine tool.
- Step 2** Make sure that a functional test has been performed (see section 3.6.2 [... ▶ 23]).

4.3 CLAMPING THE WORKPIECE

! WARNING

Prior to turning on the machine and before operating the centering vise, make sure that the machine tool is in efficient working order.

- Step 1** Place the workpiece in the centering vise with both hands and actuate it hydraulically to clamp the workpiece.
- Step 2** Use the pneumatic final position check to make sure that the workpiece has been clamped correctly.

! DANGER

NOBODY other than the trained specialist involved should be present at the machine during the clamping process.

! DANGER

An insecurely clamped workpiece increases the risk of being injured by ejection of the workpiece.

! WARNING



***Risk of becoming trapped
There is a risk of your hands becoming trapped when clamping the workpiece.***

! DANGER

Make sure that both pairs of jaws clamp the component. Never clamp workpieces and proceed to work with only three jaws.

- Step 3** Once the workpiece has been clamped correctly, commence operation of the machine in accordance with the operating instructions for the machine tool.

! DANGER

***Do not clamp workpieces outside the chuck diameter.
(Maximum clamping diameter = chuck diameter)***

4.3.1 FINAL POSITION CHECK

To eliminate the possibility of the base jaw abutting in the centering vise, which ultimately leads to insecure clamping of the workpiece, the centering vise offers a final position check.

The final position check is carried out via a pressure query on the pneumatic supply line "12" (or on the adapter piece for the hydraulic supply line). If all the base jaws are in a secure area for clamping a workpiece, a dynamic pressure can be built up and detected. If the base jaws are close to the end stops, air can escape laterally via silencers (1), thus allowing pressure to build up.

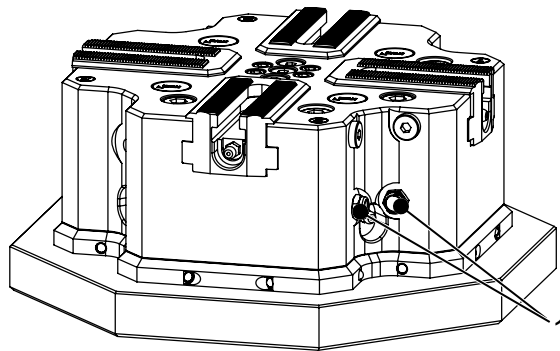


Fig. 4-1: Final position check

4.4 ROUTINE TASKS DURING OPERATION

- Carry out a routine visual inspection for contamination. If necessary, stop operation and clean the centering vise / machine (see chapter "5" Maintenance [...▶ 33]).
- Also observe the operating instructions for the machine tool.

5 MAINTENANCE

5.1 GENERAL

To ensure trouble-free operation, the INOFlex® centering vise and the machine tool require routine maintenance and care. This includes a functional test and a visual inspection for damage and wear.

⚠ WARNING

Also observe the operating instructions for the machine tool on which the centering vise is installed.

Have the materials required for cleaning the centering vise ready.

5.2 MAINTENANCE

5.2.1 MAINTENANCE INTERVALS

Perform all the specified maintenance work on time.

5.2.2 TESTS

The load-bearing and moving parts must be checked to ensure that they are in efficient working order prior to each use. Replace defective parts immediately with flawless parts.

⚠ WARNING

Repair and replacement work on the INOFlex® centering vise may only be performed by trained and instructed staff who have also received training and instruction to enable them to operate the machine tool.

After completing maintenance and repair work, make sure all the safety devices of the machine are in efficient working order. Protective enclosures and protective covers must be installed correctly.

5.2.3 LUBRICANTS

Only use OKS 265 lubricating grease from HWR Spanntechnik GmbH (or other lubricating greases approved by HWR).

⚠ WARNING

In contact with skin, lubricant may cause skin irritation. Always wear suitable protective gloves.

⚠ WARNING

Observe the safety instructions on the grease cartridge and the grease data sheet.

5.2.4 SAFETY INSTRUCTIONS

Prior to starting maintenance and care work, always turn off the machine tool and secure the machine against unintentional reconnection (see the operating instructions for the machine tool).

5.2.5 MAINTENANCE SCHEDULE

Prior to each use of the centering vise		
Visual inspection to ensure optimum condition and efficient working order		
Table 5-1: Maintenance work prior to each use		
During operation		
Routine visual inspection for contamination		
Table 5-2: Maintenance work during operation		
After each use of the machine		
Manual cleaning		
Table 5-3: Maintenance work after each use		
	VF-A 021	VF-A 042 – VF-A 070
Measurement of the clamping force with a suitable clamping force gauge: Measured using two jaws (1/2 total clamping force) or four jaws	All 2000 clamping strokes	All 1000 clamping strokes
Checking the base jaw stroke	All 2000 clamping strokes	All 1000 clamping strokes
Table 5-4: Maintenance work after clamping strokes		

⚠ DANGER

The centering vise must be provided with sufficient lubricating grease. Otherwise, there will be a loss of clamping force. Risks of accidents!

5.2.6 CHECKING THE CLAMPING FORCE

The clamping force of the centering vise must be checked routinely in accordance with the maintenance schedule. Use a suitable gauge to measure the clamping force using two jaws (1/2 total clamping force) or four jaws.

NOTE

The total clamping force results from the sum of the clamping forces of each base jaw.

⚠ WARNING

The clamping force achieved may alter after prolonged operation of the centering vise.

Procedure when the clamping force is exceeded

An increase in the measured clamping force – compared to the value specified in section 7.7 [... 42] does not represent a malfunction of the centering vise. If the clamping force is more than 10% above the value specified in section 7.7 [... 42], the operating company must record and use a new characteristic curve for the ratio between the draw pull and the clamping force (template in section 9.1 [... 51]).

In this case, the maximum draw pull of the centering vise must be reduced to ensure that the maximum clamping force specified in section 7.7 [... ▶ 42] is not exceeded.

Procedure when the clamping force is too low

If the clamping force is more than 15% below the value specified in section 7.7 [... ▶ 42], the centering vise must be re-lubricated (see section 5.3 [... ▶ 36]).

If the desired total clamping force is not achieved even after lubricating all the grease nipples, the centering vise must be sent to the manufacturer (HWR Spanntechnik GmbH) for maintenance.

5.2.7 CHECKING THE BASE JAW STROKE

The stroke of the base jaws must be checked routinely in accordance with the maintenance schedule. The values specified in the technical data (section 7.7 [... ▶ 42]) serve as a reference in this case.

If the measured stroke per base jaw does not match the value specified in the table, the centering vise must be sent to the manufacturer (HWR Spanntechnik GmbH) for maintenance.

5.3 LUBRICATION

⚠ WARNING

*To maintain the required clamping force, the centering vise **MUST** be re-greased at routine intervals (for the maintenance schedule, see Table 5-4 [... ▶ 34]).*

⚠ CAUTION

Only use OKS 265 lubricating grease from HWR Spanntechnik GmbH (or other lubricating greases approved by HWR).

⚠ CAUTION

The base jaws of the centering vise must be fully open during lubrication.

Lubricate all the grease nipples (1) with the grease gun. Roughly five strokes of the grease gun per grease nipple are sufficient.

⚠ WARNING

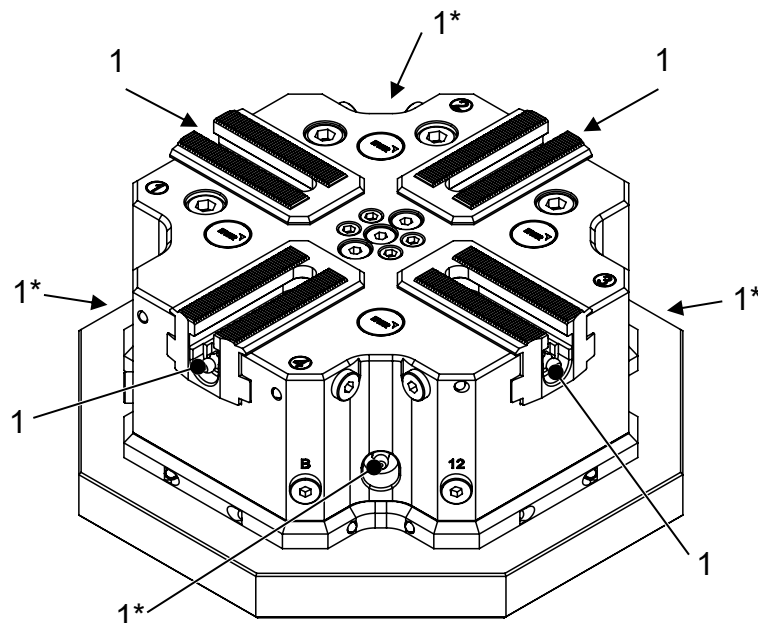
Not enough / Too much grease causes a loss of clamping force and increases the risk of accidents.

⚠ WARNING

In contact with skin, lubricant may cause skin irritation. Always wear suitable protective gloves.

⚠ WARNING

Observe the safety instructions on the grease cartridge and the grease data sheet.



*) from VF-A 042, they can be found on the front face of the centering vise

Fig. 5-1: Grease nipples

5.4 WORKING AFTER A LONGER PERIOD OF INACTIVITY

Technical maintenance staff must carry out the following tasks prior to each use:

after a longer period of inactivity
Visual inspection to ensure optimum condition and efficient working order of the centering vise
Cleaning the centering vise
Table 5-5: After a longer period of inactivity

5.5 DISPOSAL

Have the centering vise removed properly and disassembled into its individual components by a trained specialist.

Handle and dispose of the substances and materials used, in particular grease and solvents, properly and in accordance with national regulations.

6 FAULTS

6.1 GENERAL

This chapter provides information on how to proceed in the event of a fault.

6.2 IN THE EVENT OF A FAULT

Step 1 Prior to starting troubleshooting, always turn off the machine tool and secure the machine against unintentional reconnection (see the operating instructions for the machine tool).

Step 2 Remedy the fault.

WARNING

Repair and replacement work on the INOFlex® centering vise may only be performed by trained and instructed staff who have also received training and instruction to enable them to operate the machine tool. Prior to re-using the centering vise or re-starting the machine, the person responsible for the machine must ensure that

- ***the repair work has been completed fully,***
- ***the centering vise is installed securely in the machine tool,***
- ***the entire machine is in a safe condition.***

With regard to repair work, also observe the safety instructions in chapter "1" Safety [...> 1] of this Operating Manual and also the operating instructions for the machine tool.

Step 3 Restart operation of the machine tool.

WARNING

When re-using the centering vise and the machine, observe chapter "4" Operation [...> 30] of this Operating Manual and also the operating instructions for the machine tool.

6.3 POSSIBLE CAUSES OF ERRORS AND HOW TO REMEDY THEM

Error	Cause	Remedy
Only three jaws are in contact with the component.	The first pair of jaws to engage impedes compensation.	Pay attention to the contour during insertion to avoid tilting the component.
Jaw(s) jammed in the guide rail	Base jaw deformed, contact surface, top jaw not flat, dirty or damaged	Check top jaws, clean them, replace them if necessary.
	Base jaw deformed, tightening torque of fixing screws too high	Observe the specified tightening torque.
	Base jaw deformed	Observe the sequence for fastening T-nuts.
	Non-original jaw(s) used.	Use original jaws.
Centering vise does not move	No hydraulic pressure	Check the hydraulic system.
Loss of clamping force	Short jaw stroke with a large number of identical workpieces Insufficient lubricating film	To build up the lubricating film and to achieve the full clamping force, actuate the centering vise several times at full stroke without a workpiece.
	Insufficient lubricant for lubrication	Lubricate the centering vise. Check the lubricant, change it if necessary.
	Contaminated centering vise	Send the centering vise to the manufacturer for maintenance
	Centering vise not in efficient working order	Send the centering vise to the manufacturer for maintenance
	Hydraulic system not generating any pressure	Repair the hydraulic system.
Table 6-1: Causes of errors and remedies		

7 TECHNICAL DATA

7.1 GENERAL

All the essential technical data for the INOFlex® centering vise can be found in this chapter. The data is organized as tables and structured according to individual sizes.

7.2 GENERAL PRODUCT DATA

Service life	25,000 operating hours
Clampable workpieces	Commercially available steels, cast metals, non-ferrous metals and plastics
Table 7-1: General product data	

7.3 OPERATING RESOURCES

Lubricating grease	OKS 265 (or other lubricating greases approved by HWR)
Table 7-2: Operating resources	

NOTE

OKS 265 lubricating grease (or other lubricating grease approved by HWR) can be obtained from HWR Spanntechnik GmbH.

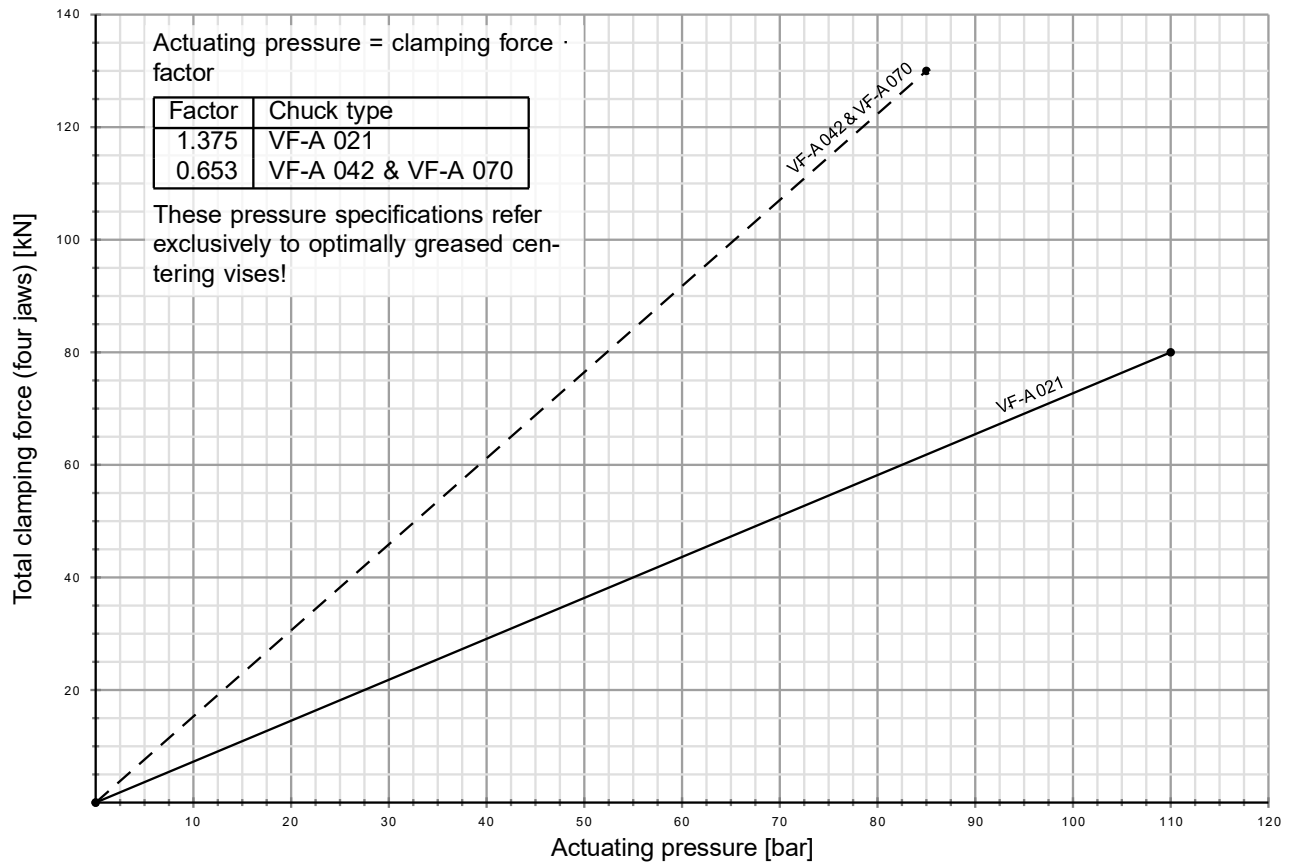
7.4 AMBIENT CONDITIONS

Operation	For temperature range, see the operating instructions for the tools if necessary
Storage	No temperature restrictions
Relative humidity	5-85%
Installation site of the machine tool	Level, firm surface
Table 7-3: Ambient conditions	

7.5 OTHER DOCUMENTS

Spare parts list
Declaration of incorporation
Declaration of knowledge of instructed staff
Table 7-4: Other documents

7.6 CLAMPING FORCE / ACTUATING PRESSURE DIAGRAM



⚠ WARNING

The diagrams apply to centering vises in the as-delivered state. The clamping force curve may have to be re-recorded (see section 5.2.6 [... 34]).

7.7 TECHNICAL DATA

Type ID no.		VF-A 021 847021	VF-A 042 847042	VF-A 070 847070
Chuck size	mm	215	420	700
Stroke per jaw	mm	4.2	11.2	11.2
Compensation per jaw	mm	3.2	10.2	10.2
Max. actuating pressure	bar	110	85	85
Max. clamping force with 4 jaws	kN	80	130	130
Max. clamping force with 2 jaws	kN	40	65	65
Weight (without jaws)	kg	32.4	122.5	215
Standard T-nut	–	GP07	GP11	GP11
Standard soft top jaw	–	VS12	VS16	VP16
Standard hard gripper jaw	–	VG12	VG16	VR16
Table 7-5: Technical data				

NOTE

The specified data on the max. clamping force applies to centering vises in the as-delivered state. The clamping force may alter. Please observe section 5.2.6. [\[...\]](#) [34](#)

DANGER

Do not clamp workpieces outside the chuck diameter.
(Maximum clamping diameter = chuck diameter)

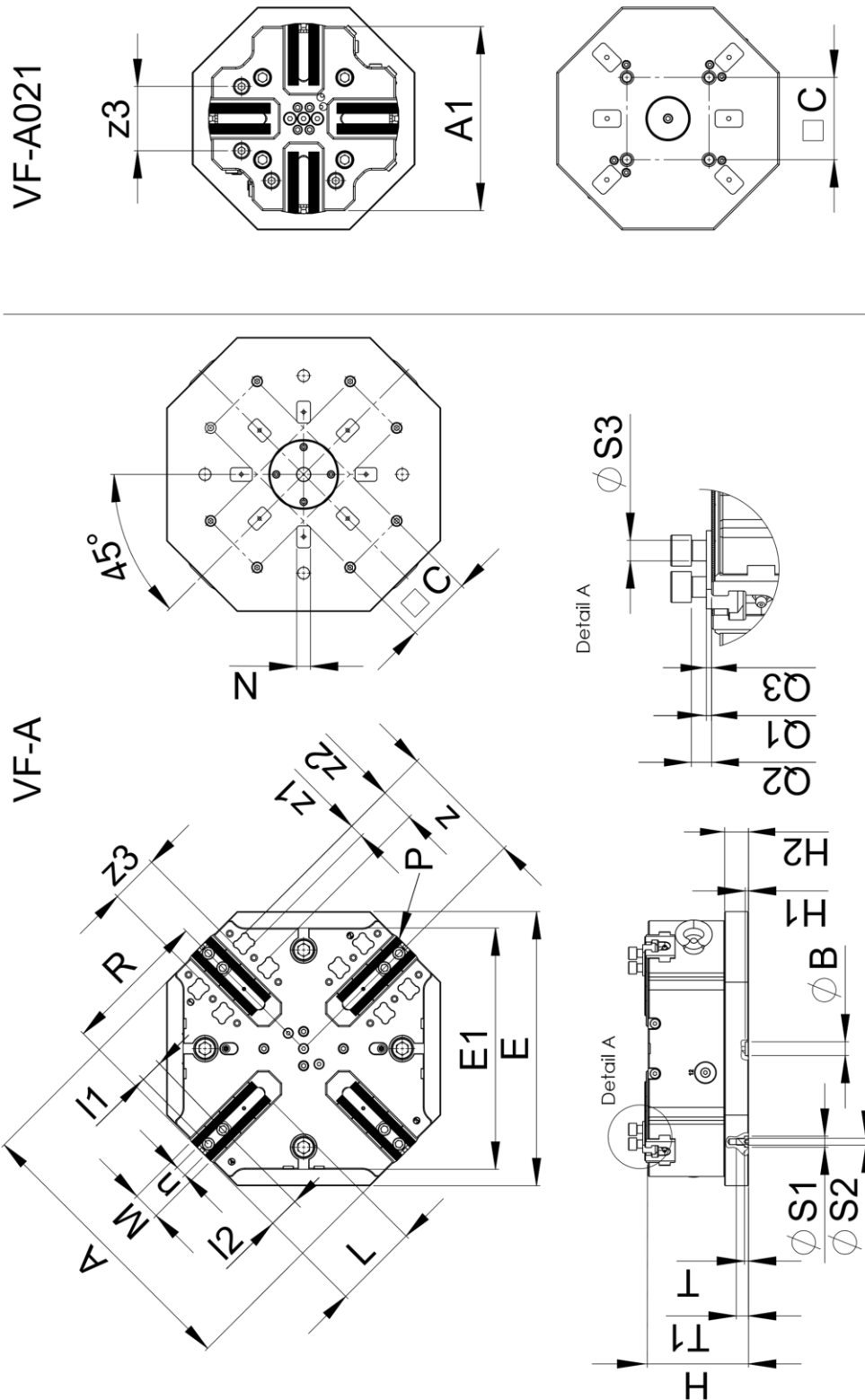


Fig. 7-1: VF-A series [technical details subject to change]

Type VF-A			021	042	070
	A	mm			
	A1	mm	268	420	700
	B H/6	mm	215	420	700
	C	mm	--	20	20
		mm	96	96	96
	E	mm	268	400	610
	E1	mm	220	352	352
	H	mm	116	146.5	146.5
	H1	mm	--	5	5
	H2	mm	25	35	35
	L	mm	72	124.5	264.5
	M	mm	36	40	40
	N G7	mm	20	20	20
Serration	P	mm	1.5 x 60°	1.5 x 60°	Module 2
	Q1	mm	3	3	1.2
	Q2	mm	11.4	11.4	10
	Q3	mm	4.5	5	78
Chuck open	R	mm	110.9	212	352
	S1 H/6	mm	16	16	16
	S2	mm	M12	M10	M10
	S3	mm	M10 x 25	M12 x 30	M12 x 30
	T	mm	6	6	6
	T2	mm	18	22	22
Min. / Max.	I1	mm	20	30	30
	I2	mm	25 / 55	35 / 111	35 / 251
	n	mm	12	16	16
	z	mm	72.5	180	302
	z1	mm	Ø18; 9 deep	20; 6 deep	22; 8 deep
	z2	mm	--	50	70 (2x)
	z3	mm	75	70.5	60.5

Table 7-6: Connection dimensions

m

7.8 MAXIMUM TIGHTENING TORQUES FOR FIXING SCREWS

Strength class	Standard	Thread								
		M5	M6	M8	M10	M12	M14	M16	M20	M24
		Max. tightening torque [Nm]								
12.9	ISO 4762	10	16	30	50	70	105	150	220	450
10.9	ISO 4792	8	12	25	40	58	88	125	180	350

Table 7-7: Maximum tightening torques for fixing screws

8 SPARE PARTS

8.1 GENERAL INFORMATION

Spare parts may be required for the maintenance and repair of the IN-OFlex® centering vise.

This chapter provides information on what you must have ready when ordering spare parts from the centering vise manufacturer HWR Spanntechnik GmbH.

8.2 BASIC INFORMATION ON ORDERING SPARE PARTS

- Size: e.g. INOFlex® VF-A 021
- Identification number (ID no.)
- Designation of the spare part
- Order quantity

8.3 ORDERING SPARE PARTS BY E-MAIL

NOTE

Observe the minimum information (see section 8.2 "Basic information on ordering spare parts").

- Step 1** Look for the required spare part in Fig. 8-1 [... ▶ 47].
- Step 2** Include the minimum order information in the e-mail (see section 8.2 [... ▶ 46]).
- Step 3** Send the order to HWR Spanntechnik GmbH, stating your company address.

NOTE

The e-mail address can be found on the inside of the title page of this Operating Manual. (info@hwr.de)

8.4 SPARE PARTS VF-A 021

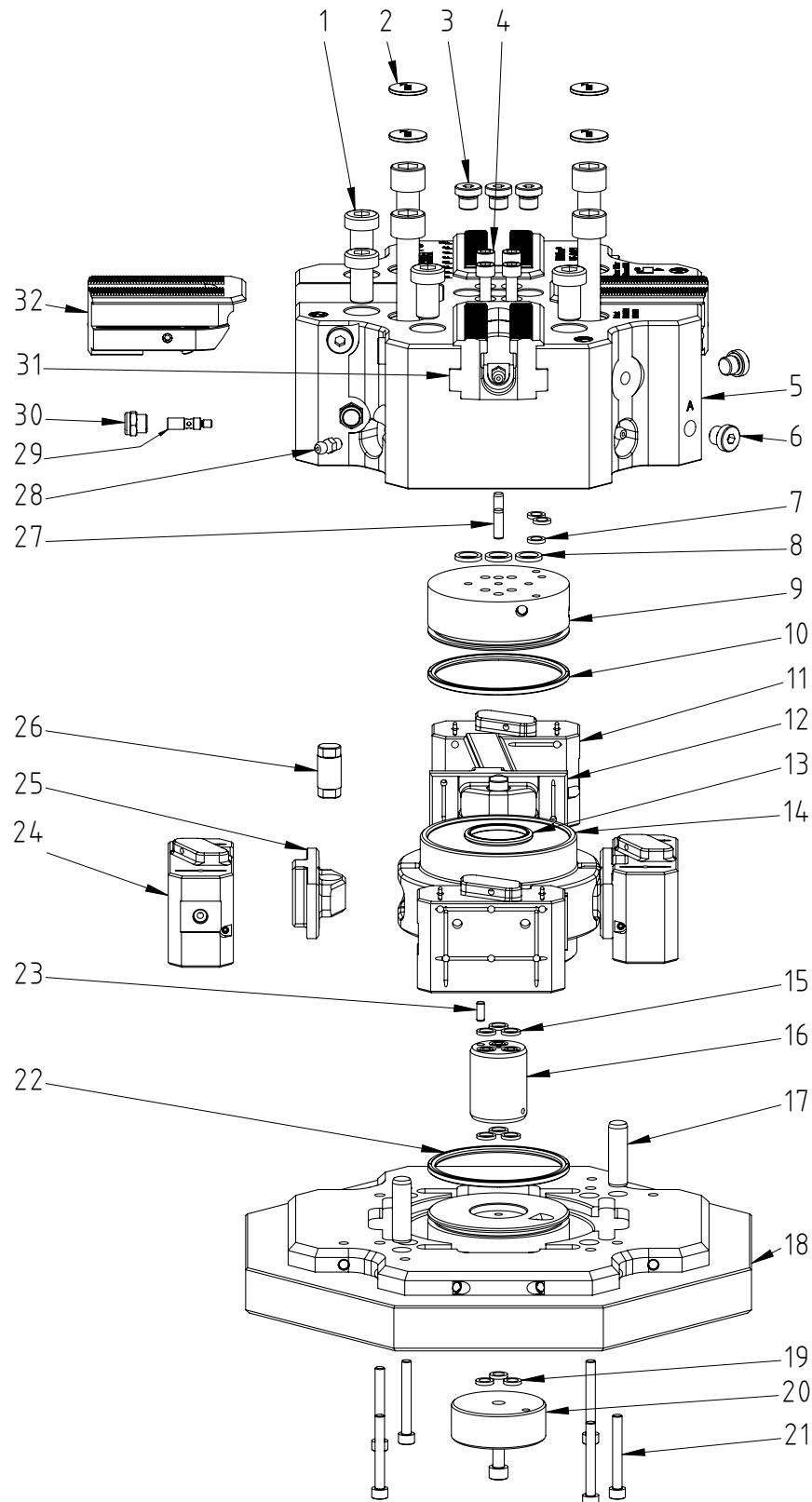


Fig. 8-1: Spare parts VF-A 021

Pos.	Designation	Quantity
1	Cylinder head bolt M12	4
2	Cover plate Ø20	4
3	Screw plug G18"	3
4	Cylinder head bolt M6	4
5	Chuck body	1
6	Screw plug G1/8"	7
7	R-ring Ø6.07	3
8	R-ring Ø10	3
9	Hydraulic distributor	1
10	Hydraulic seal Ø75	1
11	Tangential slider 1	2
12	Driver 1	2
13	Hydraulic seal Ø30	1
14	Piston package	1
15	R-ring Ø7.3	6
16	Hydraulic feed-through	1
17	Parallel pin Ø10	2
18	Lower housing	1
19	R-ring Ø6.07	3
20	Hydraulic distributor, bottom	1
21	Cylinder head bolt M5	6x
22	Hydraulic seal Ø75	1
23	Parallel pin Ø4	1
24	Tangential slider 2	2
25	Driver 2	2
26	Compensation pin	4
27	Parallel pin Ø5	2
28	Grease nipples	4
29	Stroke control pin	2
30	Silencer	2
31	Base jaw 2 / 4	2
32	Base jaw 1 / 3	2

Table 8-1: Spare parts VF-A 021

8.5 SPARE PARTS VF-A 042 & VF-A 070

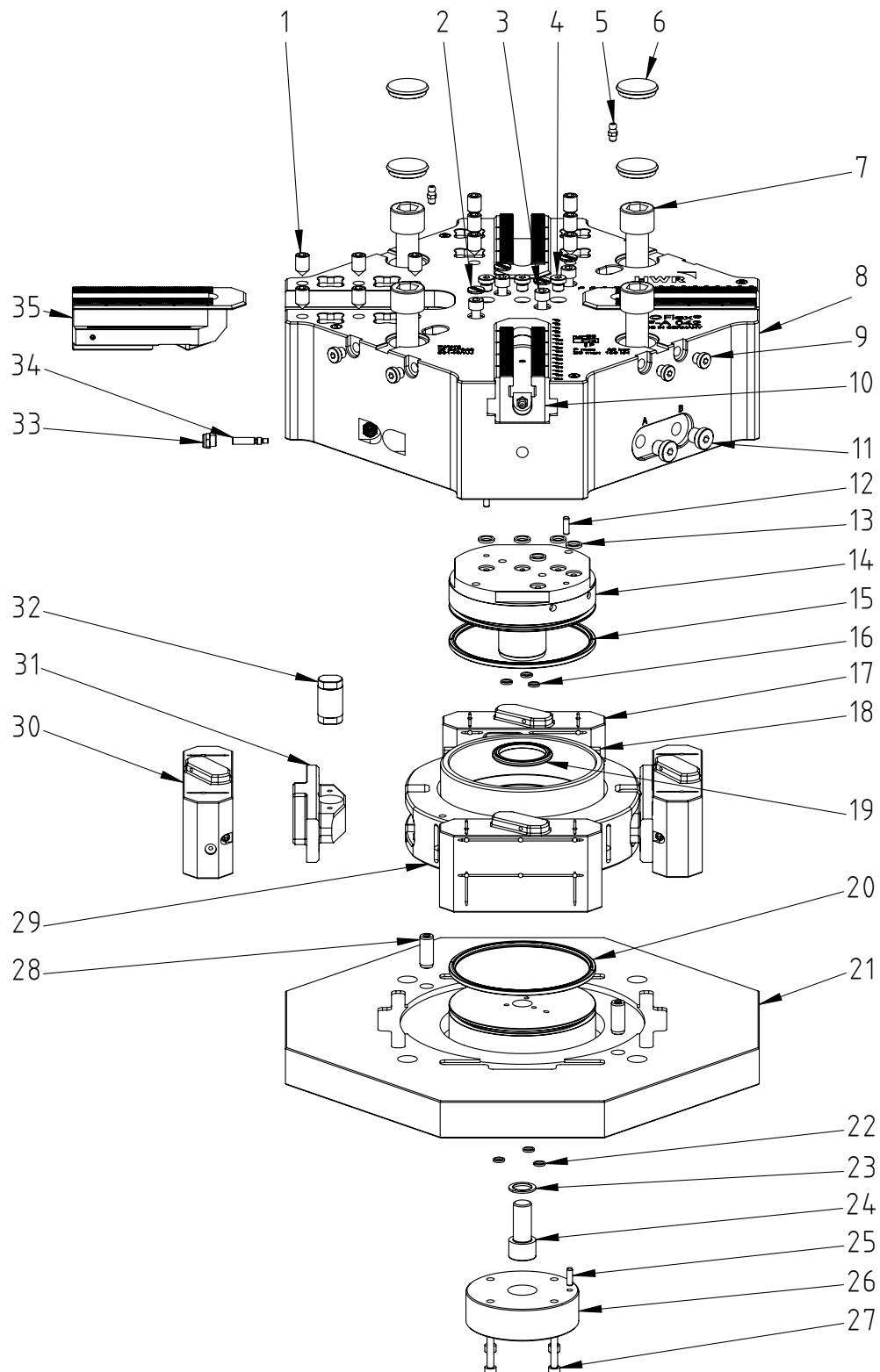


Fig. 8-2: Spare parts VF-A 042 & VF-A 070

Pos.	Designation	Quantity
1	Threaded pin M12	12
2	Cover plate Ø15	4
3	Cylinder head bolt M8	4
4	Screw plug G1/8"	3
5	Tapered grease nipple M6x1	2
6	Countersunk hole cover	4
7	Cylinder head bolt M20	4
8	Chuck body	1
9	Screw plug G1/8"	6
10	Base jaw 2 / 4	2
11	Screw plug G1/4"	2
12	Parallel pin Ø5	1
13	R-ring Ø10	5
14	Hydraulic distributor	1
15	Hydraulic seal Ø130	1
16	R-ring Ø7.3	3
17	Tangential slider 2	2
18	Driver 2	2
19	Hydraulic seal Ø42	1
20	Hydraulic seal Ø130	1
21	Lower housing	1
22	R-ring Ø7.3	3
23	USIT ring	1
24	Cylinder head bolt M16x1.5	1
25	Parallel pin Ø5	1
26	Hydraulic distributor, bottom	1
27	Cylinder head bolt M6	4
28	Parallel pin Ø12	2
29	Piston package	1
30	Tangential slider 1	2
31	Driver 1	2
32	Compensation pin	4
33	Silencer	2
34	Stroke control pin	2
35	Base jaw 1 / 3	2
Table 8-2: Spare parts VF-A 042 & VF-A 070		

9 NOTES

9.1 CLAMPING FORCE / DRAW PULL DIAGRAM (TEMPLATES)

