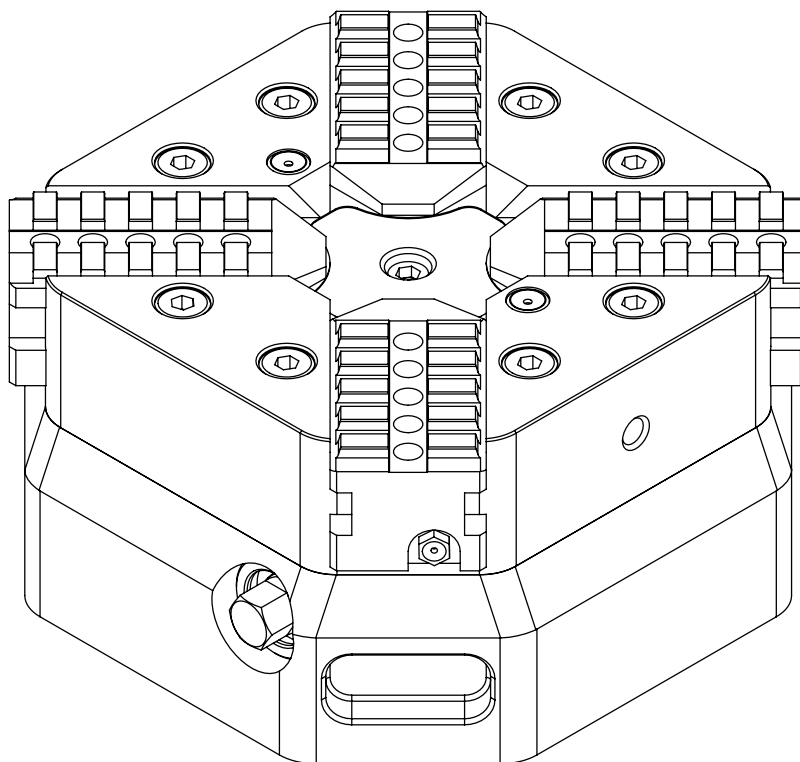




Operating Manual

InoFlex® VF016 - VF026

Compensating 4-jaw centering vice

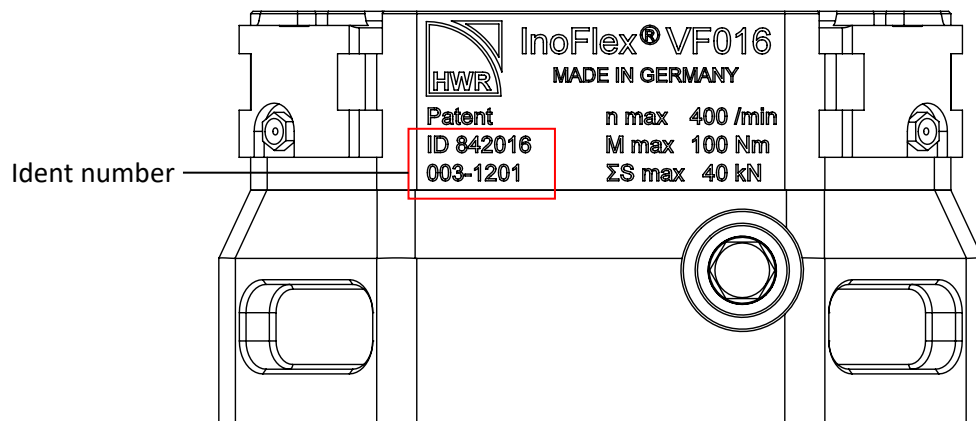


Translation of the original Operating Manual!
Keep for future reference!

Version: Januar
2024 Edition: C

HWR

The following figure shows the centering vice with the embossed data.



NOTICE

Please have ready the identification number if you have any questions for the HWR Spanntechnik GmbH. Errors and omissions in the documentation are excepted. Please inform the HWR Spanntechnik GmbH of any errors in the documentation.

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This documentation is designated only for the use of the operating company and its personnel. It contains instructions and information that may not be fully or partially reproduced, distributed or transmitted using technical data methods or utilized for the purpose of unauthorized competition.

Copyright violations are subject to prosecution under the law.

This operating manual gives you detailed information about the installation, operation and maintenance of the InoFlex® centering vice. It includes safety instructions which ensure the safe use of InoFlex® centering vice. You will also find information in this documentation about the scope of delivery and troubleshooting.

With this manual we want to help you get the maximum benefit from your InoFlex® centering vice.

You can work long and effectively with the InoFlex® centering vice if you take care of it and use it properly. The documentation you receive from us will assist you.

Keep this operating manual and the other documentation (e.g. manufacturer's documentation) always handy and in the immediate vicinity of the machine on which the centering vice is used. Make sure to always follow all the information, notes and instructions contained therein. This will prevent accidents caused by incorrect operation, preserve the manufacturer's warranty and always provide you with a fully functioning centering vice.

The manufacturer continuously strives to improve his products. He also reserves the right to make changes and improvements he considers to be necessary. However, this does not include any obligation for retrofitting InoFlex® centering vice previously delivered.



DANGER

Before commissioning the InoFlex® centering vice you must have read and understood the operating instructions and safety rules contained therein.

Staff has to be instructed according to this operating manual. Please contact the manufacturer if you still have questions after the briefing and reading the operating manual.

We wish you and your colleagues much joy and success in using the InoFlex® centering vice.

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1 SAFETY

GENERAL INFORMATION

The operating manual for your InoFlex® centering vice contains important instructions for installation, operation, maintenance and troubleshooting. This information will help to ensure the safe operation of your InoFlex® centering vice.

All of the required safety instructions and provisions on liability for working with the InoFlex® centering vice are included in this chapter. In addition, you will also find instructions here on the intended use of the tool.



WARNING

Read this operating manual carefully and pay particular attention to this chapter before working with the InoFlex® centering vice.

1.1 SCOPE OF THE DOCUMENTATION

In addition to the safety instructions the operating manual includes:

- A general product description
- Information on installing the InoFlex® centering vice
- The instructions on use and operation of the InoFlex® centering vice
- Maintenance and service instructions
- Troubleshooting instructions
- Technical data

The technical documentation also includes the following records:

- An integrated spare parts list
- A declaration of installation

1.2 MANUFACTURER'S INSTRUCTIONS

1.2.1 SERVICING

The manufacturer's contact details are provided on the back of the title page. Please contact the manufacturer of the centering vice immediately if any questions or problems arise.

NOTICE

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

1.2.2 WARRANTY AND LIABILITY

As a basic principle, our »general rules for sales and delivery« apply. These are made available to the operating company no later than at conclusion of the contract. Warranty and liability claims for personal injury and property damage are excluded if they can be attributed to one or more of the following causes.

- Inappropriate use of the InoFlex® centering vice.
- Improper installation, commissioning, operation and maintenance of the InoFlex® centering vice.
- Operating the InoFlex® centering vice with defective machine safety devices or safety and protective devices that are incorrectly attached or not functioning properly.
- Failure to observe the instructions in the documentation regarding
 - storage
 - installation
 - operation (e.g. correct clamping of the work piece, observation of the max. speed)
 - maintenance and service
 - troubleshooting of the InoFlex® centering vice
- Unauthorized modifications to the centering vice or to the machine on which the centering vice is mounted
- Inadequate monitoring of parts subject to wear
- Improper repairs
- Catastrophes caused by external influence or force majeure.

DANGER

No modifications, additions, or conversions to the InoFlex® centering vice are allowed without permission of the manufacturer. All conversion measures require a written confirmation from the manufacturer.

WARNING

Use only original spare and expendable parts. It cannot be guaranteed that externally procured parts are constructed to meet the required tolerance and safety standards.

NOTICE

The manufacturer only provides a full guarantee for the spare parts ordered from him.

1.2.3 NOTES ON DOCUMENTATION HANDLING

Always keep this operating manual and other documents for the InoFlex® centering vice in the immediate vicinity of the control unit of the machine in which the centering vice is used.

Read this operating manual and make sure to follow the safety instructions before initial use of the tool.

Points of particular importance are marked with a symbol.

NOTICE

The training of personnel by the manufacturer is only considered to be a provision of limited information. It does not exempt the user from reading the manual.

1.2.4 EXPLANATION OF THE PICTOGRAMS

The following symbols are used at all key points in this operating manual. Follow these instructions carefully and proceed with caution in these situations.

Identification of the safety instructions (according to ANSI Z535.6):



indicates a hazardous situation which, if not avoided, will result in death or serious injury



indicates a hazardous situation which, if not avoided, could result in death or serious injury



indicates a hazardous situation which, if not avoided, will result in minor or moderate injury



is used to address practices not related to physical injury



indicate specific safety-related instructions or procedures (title may be altered)

1.3 INTENDED USE

1.3.1 THE SOLE INTENDED USE

The InoFlex® centering vice VF016 - VF026 is intended solely for the clamping of components for mechanical machining in milling machines (see also Chapter "7" Technical Data).

Any other use is considered improper. The manufacturer is not liable for damages resulting from improper use.

1.3.2 OBSERVE THE NOTES AND INSTRUCTIONS

Intended use also includes:

- Following all the instructions in the documentation as well as the manufacturer-supplied documentation (if applicable)
- Compliance with the manufacturer's prescribed service and maintenance conditions and intervals

1.3.3 OBSERVE THE ACCIDENT PREVENTION REGULATIONS

Observe the applicable accident prevention regulations and other generally recognized regulations related to safety.

1.4 WARNING ABOUT FAULTY OPERATION AND MISUSE

Your InoFlex® centering vice has been tested at the factory. However, there are risks associated with faulty operation or misuse, e.g.:

- Risk to life and health of operators, third persons and animals in the vicinity of the machine tool in which the centering vice is used
- Risk to the machine tool, the centering vice and other property of the operating company
- Risk of losing efficient operation of the machine tool, in which the centering vice is installed.

1.5 INSTRUCTIONS FOR SAFE OPERATION

DANGER

Real safety means that you are familiar with all safety instructions. This applies to the type and location of the risk and in particular the protective measures that must be taken. Always remain vigilant and aware of the risk (s) involved.

Malfunctions must be investigated immediately. The operating personnel should consult experts if necessary. Operation may only be resumed if the safety of the InoFlex® centering vice and the machine tool is absolutely certain.

Operation of the InoFlex® centering vice may only be started after the operator is satisfied that all maintenance has been performed (as described in this manual).

Should it be determined during operation that pending maintenance was not performed then use must be stopped immediately.

When using the InoFlex® centering vice make sure to observe the permissible room temperature for operation of machine tool (if specified, see manual of the machine tool).

1.6 OBLIGATIONS

1.6.1 OBLIGATION OF THE OPERATING COMPANY

The operator agrees to only allow those persons to work with the InoFlex® centering vice who

- are familiar with the basic regulations on safety and accident prevention and who have been instructed in the operation of the InoFlex® centering vice
- have read and understood the operating manual, the chapter on safety and the warning instructions and who have confirmed this with their signature

The operator is responsible for the selection of the operating personnel. He must pay particular attention to the suitability of the personnel selected for operating a machine tool with the InoFlex® centering vice.

The operator always supplies his operating and maintenance personnel with the entire product documentation.

The operator periodically checks the operating and maintenance personnel with respect to safety conscientious work behavior.

The operating company of a machine tool with the InoFlex® centering vice must abide by and observe the following rules and regulations:

- The functional limits and safety regulations listed in the technical operating manuals.



DANGER

The operating company is ultimately responsible for safety. This responsibility cannot be delegated.

1.6.2 REQUIREMENTS FOR OPERATING / MAINTENANCE PERSONNEL

The operator commits himself:

- To only allow trained personnel (specialised in metal) and CNC milling operators to work with the InoFlex® centering vice
- To clearly define the responsibilities of personnel charged with installation, commissioning, operation, maintenance and repair
- To only allow personnel being trained to work with the InoFlex® centering vice under the supervision of an experienced professional (specialised in metal) or a CNC milling operator.

All persons who are assigned to operate the InoFlex® centering vice agree:

- To always ensure the safety of third parties, the InoFlex® centering vice and the machine tool
- To read the operating manual, the chapter on safety and the warning instructions and to confirm with their signature that they have understood them
- To observe the basic regulations concerning work safety and accident prevention
- To only use the InoFlex® centering vice if they are familiar with the function of the centering vice itself and the function of the machine tool and have full control over the corresponding safety and emergency equipment

The operating personnel must be completely focused when working with the machine tool and the InoFlex® centering vice.

 **DANGER**

These are matters which concern your own safety and the safety of colleagues and bystanders in the vicinity of the machine!

1.7 ACCIDENT PREVENTION REGULATIONS

1.7.1 GENERAL INFORMATION

Check the operational safety of the InoFlex® centering vice each day prior to startup! In addition to the instructions in the documentation, please observe the general, local safety and accident prevention regulations as well.

Faults which occur and impair safety must be eliminated immediately. Damaged parts must be replaced immediately. The machine with the InoFlex® centering vice may not be operated until the fault is eliminated.

1.7.2 PROTECTION MEASURES TAKEN BY THE OPERATING COMPANY

Workplace ergonomics

The workstations for the operating personnel must be designed according to ergonomic guidelines. Clear access (prevention of tripping hazards), adequate lighting, etc. (accident prevention regulations, operator workstation safety) must be ensured by the operating company.

Personal protective measures

Personal protective equipment must be worn according to company guidelines and regulations of the employers' liability insurance association (work clothes, anti-slip safety shoes, hair net, etc.).

Machine access

Make sure that unauthorized persons cannot access the work area. This can be accomplished with automatic closing doors which can only be opened with a key or other similar safeguards.

1.7.3 INSTALLATION AND COMMISSIONING

Check to make sure that the centering vice is properly inserted and attached in the machine tool.

Before starting the InoFlex® centering vice the commissioning personnel must make sure that the InoFlex® centering vice is in perfect working condition by conduction mandatory inspections and a trial run!

1.7.4 SAFETY WHEN NOT IN USE

Secure the machine tool with the InoFlex® centering vice against operation by unauthorized persons when it is not in use (e.g. with a padlock on the main switch of the machine tool).

Make sure that children are unable to access the InoFlex® centering vice and the machine tool.

1.8 MAINTENANCE AND REPAIR

Maintenance periods

Perform all required maintenance on time.

Cleaning agents

All surfaces that come into contact with the product must be cleaned with cleaning agents that comply with applicable hygienic or sanitary standards.

Inspection work

The clamping parts must be inspected before each use to ensure they are in perfect working condition. Damaged parts must be replaced immediately with fault-free parts.

Examine the function of all components after completion of maintenance and repair work.

Disposal

Make sure to properly handle and dispose of substances and materials that are used, especially greases and solvents.

2 TECHNICAL DESCRIPTION

2.1 GENERAL INFORMATION

The InoFlex® centering vice VF016 - VF026 is intended solely for the clamping of components for mechanical machining in milling machines (see also Chapter "7" Technical Data).

The centering vice is to be used solely in accordance with VDI [Association of German Engineers] 3106, the user manual of the machine tool and this manual.

NOTICE

The centering vice is lubricated at the factory before it is shipped.

2.2 OVERVIEW OF THE INOFLEX® CENTERING VICE

2.2.1 ASSEMBLY

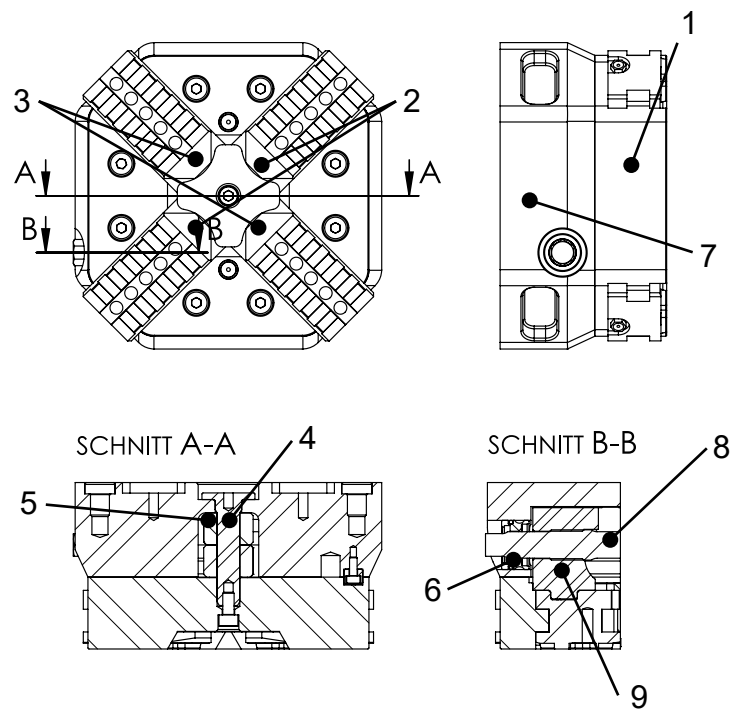


Abb. 2-1: Aufbau des InoFlex® Zentrierspanners

- | | |
|------------------|----------------------|
| 1. Upper housing | 6. Seal assembly |
| 2. Base jaw 1/3 | 7. Lower housing |
| 3. Base jaw 2/4 | 8. Spindle |
| 4. Pivot bolt | 9. Parallel slider 2 |
| 5. Clamping bone | |

2.2.2 DESCRIPTION OF FUNCTIONS

After installation of the centering vice in the machine tool by a trained specialist (specialised in metal) or CNC milling machine operator, the same person also clamps the work piece to be machined in the centering vice.

The concentric and compensating clamping 4-jaw manual centering vice allows clamping of round, cubic and geometric irregular parts and is also suitable for deformation sensitive work pieces.

The drive of the compensating clamping 4-jaw centering vice moves the base jaws (1/3) and (2/4) on two parallel axes / paths toward and away from each other. Compensation is made possible by connecting the diametrically arranged slides with levers or via a sliding gate-type gear.

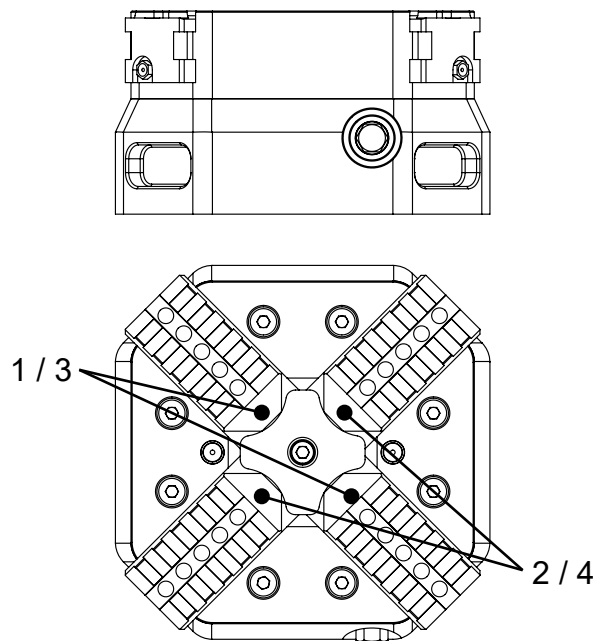


Fig. 2-2: 2-2: Mode of operation of the InoFlex® centering vice

3 TRANSPORT UND INSTALLATION

3.1 GENERAL INFORMATION

Work in a relaxed and careful manner when installing the centering vice. Avoid stress and hectic, as this may lead to work mistakes or even accidents.

Keep all transport routes and the installation area free of interfering objects during the entire work period.

During the installation process also read the operating manual of the machine tool on which the manual centering vice is being mounted.



WARNING

Also make sure to comply with the regulations and policies of the operating company regarding personal protective equipment (PPE).

3.2 TRANSPORT

3.2.1 TRANSPORT TOOLS

After delivery, the safely packaged centering vice can be transported with the following tools depending on its weight:

- Crane
- Forklift truck or jack lift

3.2.2 NOTES ON PACKAGING

Please observe the notes and instructions (if any) affixed to the packaging.

3.2.3 SAFETY PRECAUTIONS FOR TRANSPORT

Heavy centering vices may only be transported (with additional tools if necessary) by specially qualified personnel.

 **DANGER**

During transport, there is a risk that the component may tilt, swing or fall. This can result in equipment damage or serious bodily injury.

The following measures must be taken to prevent equipment damage and life-threatening injuries:

- The centering vice may only be lifted on the designated attachment point.
- When lifting or hanging the centering vice and also during transport please consider the center of gravity and the position of the attachment point.
- Load-carrying and lifting equipment must comply with the accident prevention regulations.
- When selecting the load-carrying and lifting equipment make sure to consider the weight of the centering vice and if necessary the length of the load arm (e.g. crane boom).
- Make sure to cordon off the transport routes used to transport floating loads and mark these routes to prevent people from walking below the loads.

 **DANGER**

At no time are people allowed to stay under a floating load. Risk of accident!

3.2.4 TRANSPORT OF CENTERING VICE WITH EYEBOLT

The eyebolt (DIN 580) supplied with the shipment must be used for transportation starting from size VF 025.

CAUTION *The permissible load is marked on the eyebolt.*

Step 1 Prior to transport, screw the eyebolt into the main body of the centering vice (see the figure below). Attach the hoist.

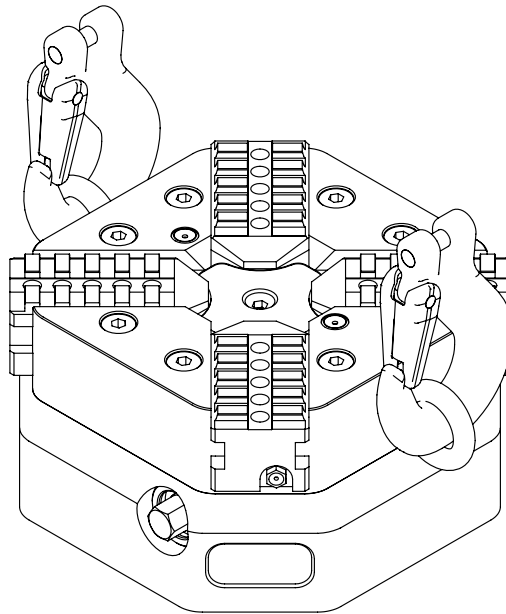


Fig. 3-1: Transport with eyebolt

Step 2 During transport please consider the safety precautions described in section 3.2.3.

WARNING *Do not remove the hoist and the eyebolt until the centering vice is installed properly in the machine tool.*

3.2.5 INSPECTIONS AFTER TRANSPORT / RECEIVING THE CENTERING VICE

Check the condition of the InoFlex® centering vice immediately after receipt (transport damage).

Inform the shipping company and the manufacturer of the centering vice (HWR Spanntechnik GmbH) in case of noticing any damage. The address and telephone number you will find on the inside of the front cover.



WARNING

Damage caused during transportation of the centering vice must be repaired completely and properly before commissioning.

3.3 INSTALLATION



CAUTION

Installation of the InoFlex® centering vice may only be carried out by personnel who are trained and instructed in the operation of the machine tool.

3.3.1 SPACE REQUIREMENT

The free space required to install the InoFlex® centering vice corresponds with the space requirements of the operator of the machine tool (see corresponding manual of the machine tool).

3.3.2 INSTALLATION OF THE InoFLEX® CENTERING VICE (EXAMPLARY)

NOTICE

This is an exemplary installation. The exact procedure can vary in the individual case. If need be please see the installation instructions provided by HWR Spanntechnik.

NOTICE

The InoFlex® centering vice can be installed on the machine table of the machine tool directly.

- Step 1** Clean the surface of the machine table or the QuickPoint plates and of the bottom surface of the centering vice. There must not be any debris or swarf on any of the surfaces.
- Step 2** With the help of the hoist carefully and slowly guide the clean centering vice (1) to the machine table (7) of the milling machine.
- Step 3** Put a centering bolt (5) into the lower housing of the InoFlex® centering vice (1) and bolt together the centering bolt with the corresponding fastening bolt (6).
- Step 4** Place a locating sliding block (3) into the corresponding slot of the lower housing of the InoFlex® centering vice (1) and bolt together the sliding block with the corresponding fastening bolt (4).
- Step 5** Lower the InoFlex® centering vice (1) on the machine table (7). The centering vice (1) is being aligned via the centering bolt (5) and the locating sliding block (3).
- Step 6** Fasten the InoFlex® centering vice (1) on the machine table (7) with clamping claws (2).

NOTICE

Observe the maximum tightening torque for clamping claws.

- Step 7** Remove the hoist and the eyebolt from the InoFlex® centering vice (1).



WARNING

The InoFlex® centering vice must not be distorted.

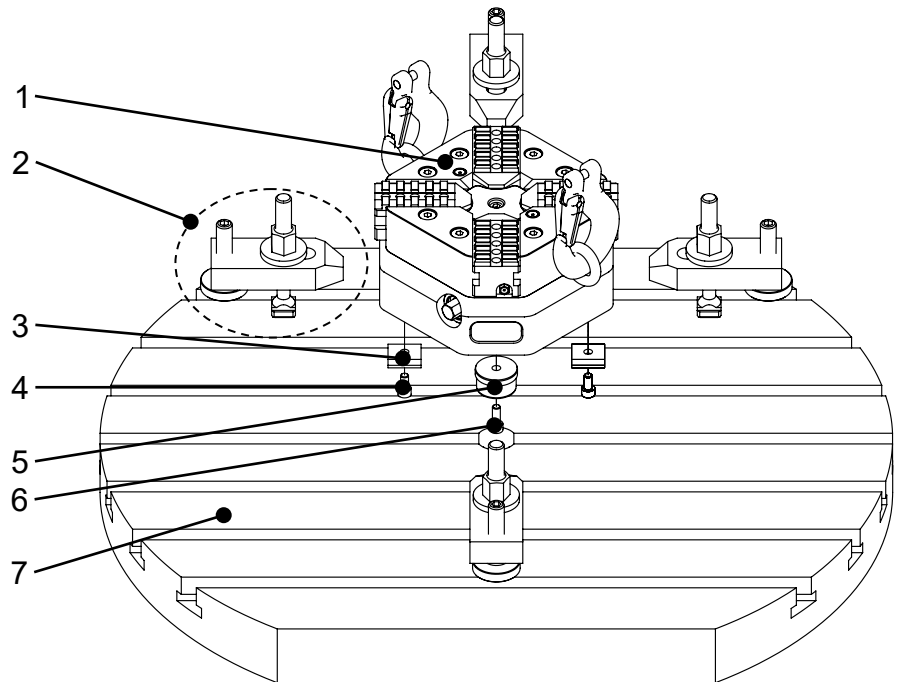


Fig. 3-2: Installation of the InoFlex® centering vice

3.4 INSERTION OF TOP JAWS

3.4.1 GENERAL INFORMATION

Dependent on the workpiece top jaws or gripper jaws can be used.

NOTICE

The manufacturer recommends the use of original clamping jaws from HWR Spanntechnik GmbH. The manufacturer does not guarantee performance of externally procured parts.

WARNING

Consult with the centering vice manufacturer HWR Spanntechnik GmbH before you use clamping jaws from a different manufacturer. You also need to carry out a calculation in accordance with VDI 3106 to determine the maximum permissible speed and required clamping force.

3.4.2 INSTALLATION OF TOP JAWS / GRIPPER JAWS

- Step 1** Put the clamping jaws (2) on the serration of the base jaw (1) and fasten them with two tightening bolts (3) each of strength class 12.9.

! WARNING

Make sure the serration is free from any dirt. Allocate the clamping jaw-number to the corresponding base jaw number.

Ensure sufficient screw-in depth (min. 1.25 x thread diameter)

- Step 2** First tighten the screws (3) with a torque wrench.

NOTICE

Please observe the maximum tightening torques for mounting screws (see Table 7-7 on page 7-39 Fehler! Textmarke nicht definiert.).

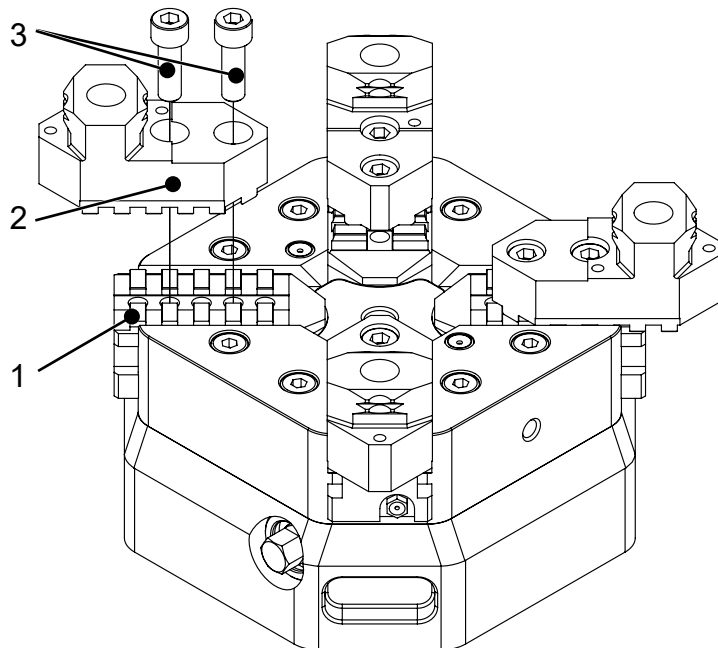


Fig. 3-3: Installation of top jaws

3.5 FUNCTION CHECK

The function of the centering vice must be checked after installation and before commissioning. Pay particular attention to the clamping force at this time:

- Carry out a calculation of the permissible speed according to the VDI 3106 guideline.
- Measure the clamping force with a suitable clamping force meter on 2 jaws (1/2 total clamping force).

4 OPERATION

4.1 GENERAL INFORMATION

In this chapter you will find information on how to operate the InoFlex® centering vice.



WARNING

Also make sure to comply with the regulations and policies of the operating company regarding personal protective equipment (PPE).



WARNING

In addition, observe the operating instructions of the machine tool in which the centering vice is installed.

4.2 PREPARATIONS

Step 1 Check to make sure that the centering vice is properly installed on the machine tool.

Step 2 Make sure that a functional test was carried out (see chapter 3.5).

4.3 CLAMPING THE WORKPIECE



WARNING

Make sure the machine tool is in proper working condition before turning on the machine and before operation of the centering vice.



DANGER

If the max. speed of the milling-turning center is higher than the max. permissible speed of the centering vice then a speed restrictor must be installed in the machine. Excessive operating speed of the centering vice and therefore excessive centrifugal force must never be allowed. Otherwise there is a risk that the workpiece is not clamped properly.

Step 1 Clamp the workpiece with a torque wrench and by turning the spindle (1).

NOTICE

Pay attention to the maximum tightening torque of the spindle (1) (see marking on the upper housing and table 7-5 on page 7-36).



DANGER

An unsafely clamped workpiece increases the risk of accidents by falling off.

Step 2 Pull off the wrench after clamping the workpiece.

! DANGER

According to EN 1550 the spindle of the machine tool may not start until the torque wrench is removed from the centering vice.

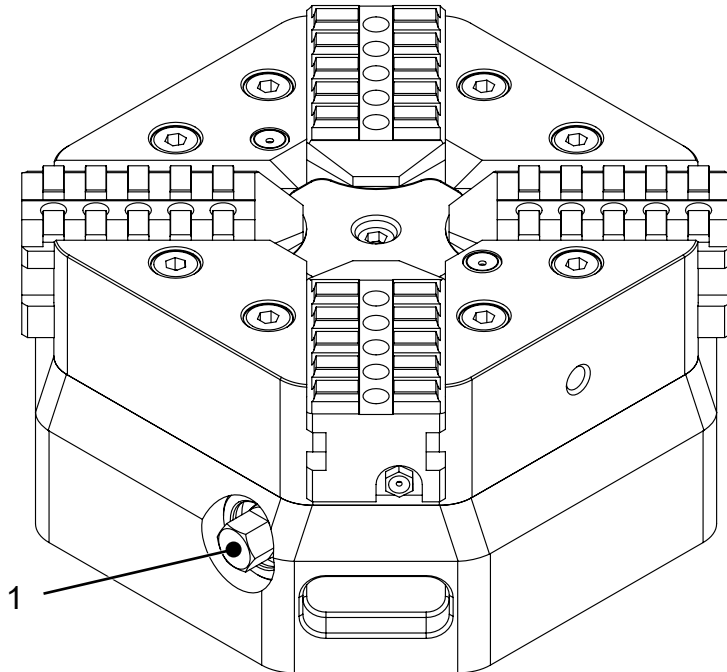


Fig. 4-1: Clamping the workpiece

Step 3 After correct clamping of the workpiece start operating the machine according to the operating manual of the machine tool. Do not exceed the permissible speed.

4.4 REGULAR TASKS DURING OPERATION

- Carry out visual inspections for contamination on a regular basis. If necessary stop operation and clean the centering vice / machine (see Chapter 5 "Maintenance").
- In addition, observe the operating manual of the machine tool.

5 MAINTENANCE

5.1 GENERAL INFORMATION

Regular maintenance and service intervals must be maintained in order to ensure trouble-free operation of the InoFlex® centering vice and the machine tool. This includes a test of functions and a visual inspection for damage and wear.



WARNING

In addition, observe the operating instructions of the machine tool in which the centering vice is installed.

Keep ready the required materials for cleaning the centering vice.

5.2 MAINTENANCE

5.2.1 MAINTENANCE PERIODS

Perform all required maintenance on time.

5.2.2 INSPECTION WORK

The load bearing and the moving parts must be checked before each use to ensure they are in perfect working condition. Damaged parts must be replaced immediately by fault-free parts.



WARNING

Repair and replacement work on the InoFlex® centering vice may only be carried out by personnel who are trained and instructed in the operation of the machine tool.

Examine the function of all safety devices on the machine after completion of maintenance and repair work. Protective cladding and protective covers must be installed correctly.

5.2.3 LUBRICANT

Use only the special lubricating grease OKS 265 from HWR Spanntechnik GmbH (or other grease accepted by HWR).

5.2.4 SAFETY INSTRUCTIONS

Switch-off the machine tool and secure the machine against restarting (see operating manual of the machine tool) prior to conducting maintenance and service work.

5.2.5 MAINTENANCE SCHEDULE

Prior to each use of the centering vice
Visual inspection of condition and function
Table 5-1: Maintenance work prior to each use

During ongoing operation
Regular visual inspection for contamination
Table 5-2: Maintenance work during ongoing operation

After each use of the machine
Manual cleaning
Table 5-3: Maintenance work after each use

	every 8 operating hrs	every 40 operating hrs	every 1200 / 800* operating hrs
Lubricate each grease nipple (s. Chapt. 5.2.6)	for normal operation		
Check the clamping force with a suitable clamping force meter: measure on 2 jaws (1/2 total clamping force)		X	
Remove the centering vice and clean it (s. Chapt. 5.3)			X *) for heavy-duty operation
Table 5-4: Maintenance work according to operating hours			



The centering vice must be provided with sufficient grease. Otherwise clamping force will be lost. Risk of accident!

5.2.6 LUBRICATION

NOTICE

*The centering vice is lubricated at the factory before it is shipped. To maintain the required clamping force the centering vice **MUST** be re-greased with a metered amount of grease. For lubrication intervals see Table 5-4 on page 5-26.*

NOTICE

Use only the special lubricating grease OKS 265 from HWR Spanntechnik GmbH (or other grease accepted by HWR).

Depending on the operating hours of the centering vice lubricate the six grease nipples (1) with the grease.



WARNING

Too little/too much grease causes a loss of clamping force and increases the risk of accidents.

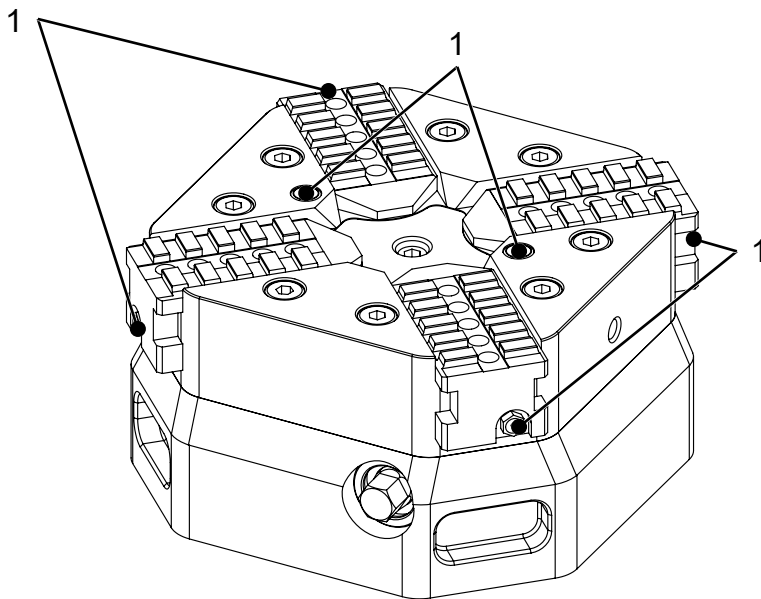


Fig. 5-1: Grease nipples

5.3 DISASSEMBLY / CLEANING / RE-ASSEMBLY OF THE CENTERING VICE

To ensure proper clamping force, the centering vice must be disassembled at regular intervals, cleaned and greased again.

NOTICE

Disassembly and cleaning intervals see Table 5-4 on page 5-26.

Disassembly and cleaning

- Step 1** Place the centering vice on a suitable underlay so that the screws (2) are accessible. (If need be use eyebolts and hoist)
- Step 2** Loosen and remove the screws (2).
- Step 3** Place the centering vice on a suitable underlay so that the screws (12) are accessible. (If need be use eyebolts and hoist)
- Step 4** Loosen and remove the screw (12).
- Step 5** Lift off the upper housing (9) of the InoFlex® centering vice from the lower housing (7).
- Step 6** Loosen and remove the cylinder pins (6).
- Step 7** Remove the seal kit (4), shaft seal (5) and O-Ring (3) as one unit. Check the condition and function of the shaft seal (5). (If necessary, replace the shaft seal before reinstalling the InoFlex® centering vice.)
- Step 8** Pull out the pivot bolt (1).
- Step 9** Lift out the entire parallel slide unit (8) by gently lifting and tilting it.
- Step 10** Remove the base jaws (10 u. 11).
- Step 11** Clean all the centering vice's components. Use a cold cleaner if necessary.
- Step 12** Check all the components. Damaged parts must be replaced. Contact the manufacturer if you have any questions.

Re-assembly

- Step 1** Re-assemble the centering vice in the reverse order to the procedure that was used for disassembly.
- Step 2** Lubricate the centering vice on the six grease nipples (see chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**).
- Step 3** Check the clamping force with a suitable clamping force meter: measure on 2 jaws (1/2 total clamping force)



WARNING

The initial clamping force measured after greasing may lie below the specified values.

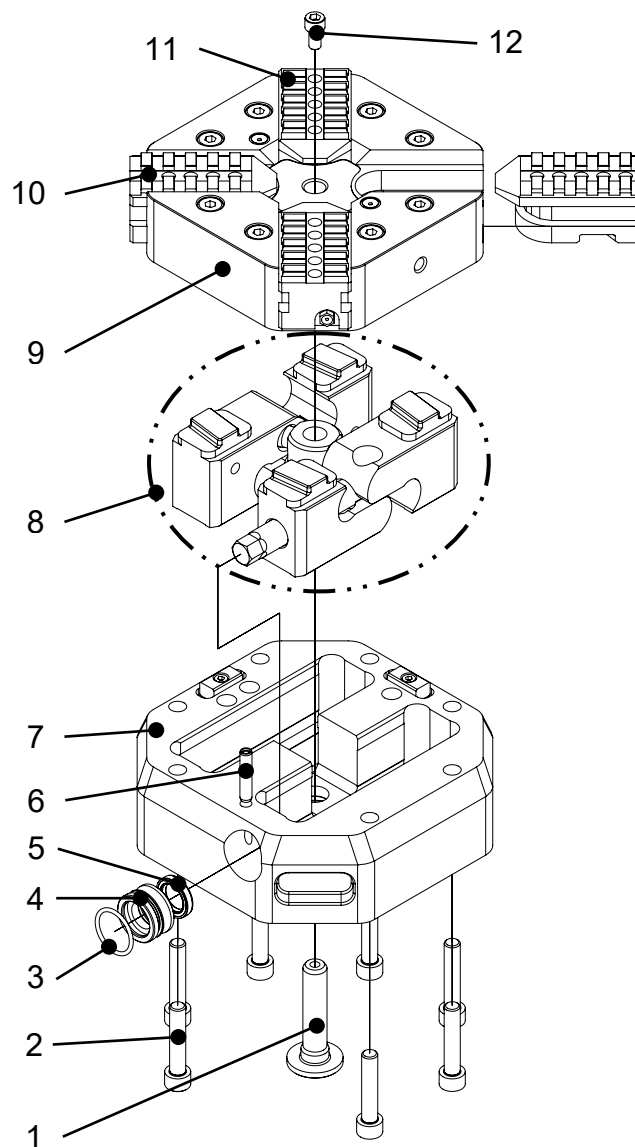


Fig. 5-2: Disassembly / assembly of the InoFlex® centering vice

5.4 WORK AFTER PROLONGED STANDSTILL

The technical maintenance personnel must carry out the following jobs prior to each start after an extended period of standstill:

After a long period of standstill
Visual inspection of the condition and function of the centering vice
Cleaning of the centering vice
Table 5-5: After a long period of standstill

5.5 DISPOSAL

Have a trained expert dismantle and break down the centering vice into its individual components.

Properly handle and dispose of substances and materials used in accordance with the national laws, especially greases and solvents.

6 FAULTS

6.1 GENERAL INFORMATION

This chapter describes the course of action in the event of a fault.

6.2 IF FAULTS OCCUR

Step 1 Switch-off the machine tool and secure the machine against re-starting (see manual of the machine tool) prior to troubleshooting.

Step 2 Eliminate the fault.

SAFETY INSTRUCTIONS

Repair and replacement work on the InoFlex® centering vice may only be carried out by personnel who are also trained and instructed in the operation of the machine tool.

Before restarting the centering vice or the machine the person responsible for the machine must ensure that:

- ***Repair work is completed***
- ***The centering vice is securely installed in the machine tool***
- ***The overall machine is in safe working condition***

Also observe the safety instructions in Chapter 1 of this manual and the manual of the machine tool regarding repairs.

Step 3 Resume operation of the machine tool.

WARNING

Please observe Chapter 4 of this manual and also the manual of the machine tool when restarting the centering vice and the machine.

6.3 POSSIBLE CAUSES OF ERRORS AND TROUBLESHOOTING

Error	Cause	Troubleshooting
Jaw (s) is (are) stuck in the guide track	Base jaw deformed, contact surfaces and top jaw not plane soiled or damaged	Check top jaw, clean and replace if necessary.
	Base jaw deformed, tightening torque of the mounting screws too high	Comply with the prescribed tightening torque.
	Base jaw deformed	Follow the sequence of tightening sliding block screws (s. 3.4.2)
	Original jaw (s) not used	Use original jaws.
Concentricity error	Jaws not properly turned or milled	Turn or mill top jaws again.
	Jaw inserted in the wrong guide track	Insert the jaw into the guide track with the appropriate identification.
	Base jaws soiled or damaged	Clean or replace the base jaws.
	Mounting screws for the top jaws are too short, too long or overstretched	Check screw depth, replace screws, and observe torque.
	Projection of the top jaws too large	Change the top jaws or clamping method.
	Centering vice damaged or worn	Send the centering vice for inspection to the manufacturer (HWR Spanntechnik GmbH).
Loss of clamping force	Short jaw stroke with large number of identical workpieces Inadequate lubrication film	Actuate the full stroke of the centering vice repeatedly without workpiece for buildup of the lubrication film and to reach full clamping force.
	Insufficient lubrication Lubricant	Lubricate the centering vice. Check lubricant and replace if necessary.
	Soiled centering vice	Dismantle, clean and lubricate the centering vice.
	Impaired function of the centering vice	Check all components, replace damaged parts with original parts, send centering vice to the manufacturer (HWR clamping GmbH) for inspection and repair.

Table 6-1: Causes of error and troubleshooting

6.3 POSSIBLE CAUSES OF ERRORS AND TROUBLESHOOTING - CONTINUED

Error	Cause	Troubleshooting
Strong vibration of the machine spindle	Imbalance from the workpiece or top jaws	Change / rework top jaws or add weight to the body of the centering vice.
	Imbalance on: <ul style="list-style-type: none"> • machine spindle • drive • centering vice flange 	Check the concentricity of various components in stages. Align, balance or replace components.
	Imbalance caused by collision	Send the centering vice for inspection and repair to the manufacturer (HWR Spanntechnik GmbH).
Table 6-1: Causes of error and troubleshooting [continued]		

7 TECHNICAL DATA

7.1 GENERAL INFORMATION

All important technical data for the InoFlex® manual centering vice is included in this chapter. The data is listed in tables and structured according to individual sizes.

7.2 GENERAL PRODUCT DATA

Operating period	12 hrs/day
Service life	25,000 operating hrs
Clampable workpieces	Commercial steels, cast metals and non-ferrous metals
Table 7-1: General product data	

7.3 OPERATING MATERIALS

Lubricating grease	HWR Special lubricating grease OKS 265 (or other grease accepted by HWR)
Table 7-2: Operating materials	

NOTICE *The special lubricating grease OKS 265 (or other grease accepted by HWR) is to be obtained from HWR Spanntechnik GmbH.*

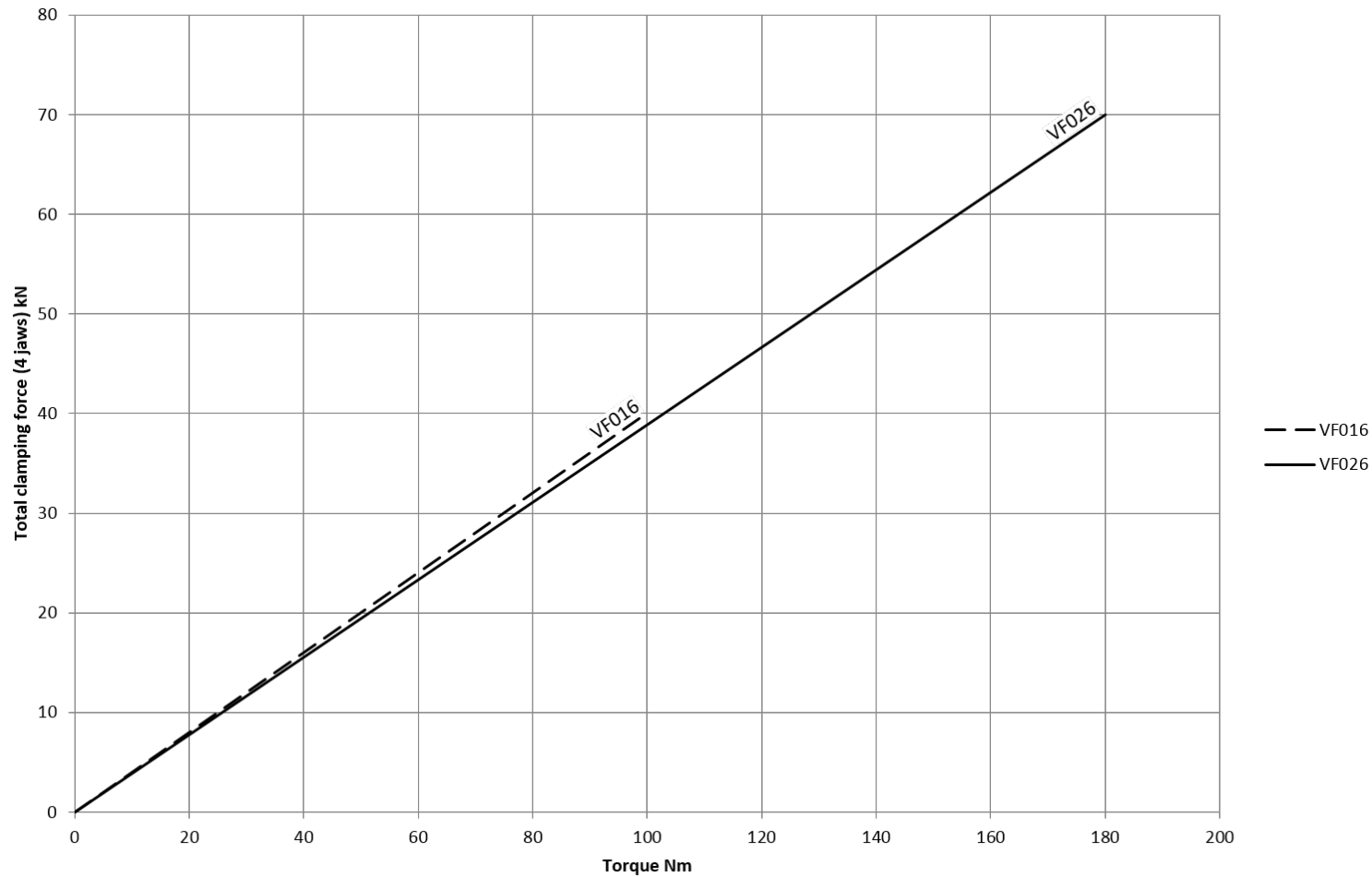
7.4 AMBIENT CONDITIONS

Factory	For temperature range see the operating manual of the tools
Storage	No temperature restrictions
Relative humidity	5-85 %
Installation location of the machine tool	Level, firm ground adequately ventilated
Table 7-3: Ambient conditions	

7.5 OTHER DOCUMENTS

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

7.6 CLAMPING FORCE-/ TORQUE DIAGRAM



7.7 TECHNICAL DATA

Type		VF016	VF026
Ident-no.		842016	842026
Diameter	mm	162	235
Radial jaw stroke per jaw	mm	12,6	14
Compensation per jaw	mm	11,6	13
max. tightening torque	Nm	100	180
max. clamping force	kN	40	70
max. speed	1/min	400	400
Weight (without jaws)	kg	13	44,5
Moment of inertia	kg·m ²	0,05	0,38
Standard jaws	--	Please see our centering vice data sheets which you will find in our clamping jaws finder under http://www.hwr.de/en/products/centering vice-jaws/	
Table 7-5: Technical Data			

* Balance quality acc. to DIN ISO 1940-1: G 6,3 (ungreased)

** for exceeding workpiece weights a support on the centering vicebody has to be utilised

7.8 MOUNTING DIMENSIONS

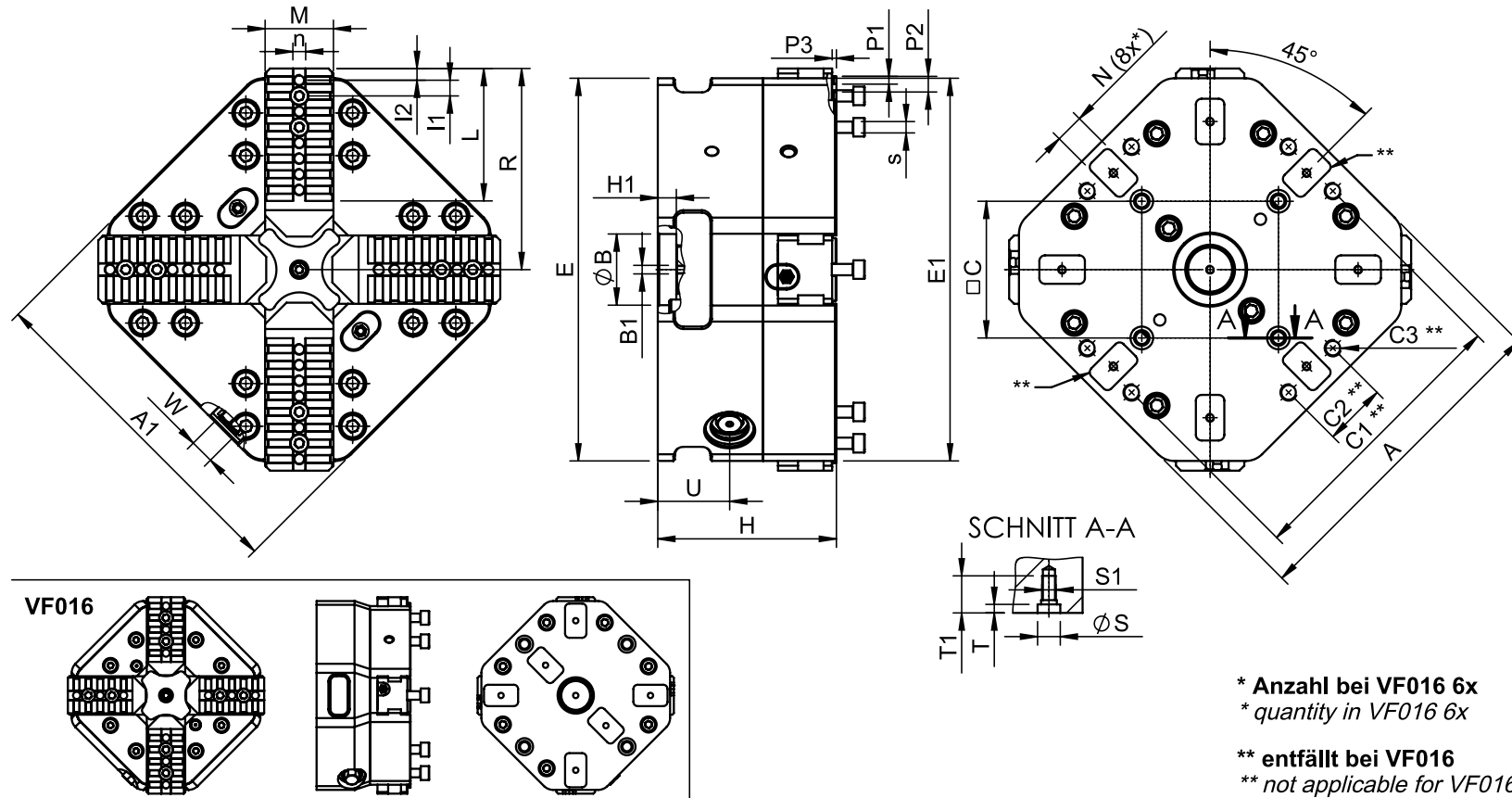


Fig. 7-1: Mounting dimensions
(Subject to technical change)

7.8 MOUNTING DIMENSIONS

Typ		VF016	VF026	Typ		VF016	VF026	
A	mm	162	235	P1	mm	5,5	5,5	
A1	mm	148,5	235	P2	mm	11	11	
B <i>H7</i>	mm	32	50	P3	mm	3	3	
B1	mm	M6; 5 tief	M6; 5 tief	Futter geöffnet	R	mm	92	141,3
C $\pm 0,01$	mm	96	96	S <i>H6</i>	mm	16	16	
C1	mm	--	200	S1	mm	M10	M10	
C2	mm	--	44	T	mm	6	6	
C3	mm	--	M12; 22 tief	T1	mm	20	26	
E	mm	176,8	268,7	U	mm	33	50,5	
E1	mm	167,3	268,7	Schlüsselweite	W	SW	12	17
H	mm	88	125,5	I1	mm	11, 4x	11, 7x	
H1	mm	5,5	13	I2	mm	8,25	8,25	
L	mm	60,5	93	n	mm	9	9	
M	mm	36	48	s	mm	M8 x 25	M8 x 30	
N <i>G7</i>	mm	20	20	Anbindung	QuickPoint für 96mm Bolzenabstand / Spannpratzen / Adapterplatte			

Tabelle 7-6: Anschlussmaße

7.9 MAXIMUM TIGHTENING TORQUE FOR MOUNTING SCREWS

Strength class	Standard	Thread								
		M5	M6	M8	M10	M12	M14	M16	M20	M24
		max. tightening torque [Nm]								
12.9	ISO 4762 (DIN 912)	10	16	30	50	70	105	150	220	450
10.9	ISO 4762 (DIN 912)	8	12	25	42	58	88	125	180	350

Table 7-7: Maximum tightening torque for mounting screws

8 SPARE PARTS

8.1 GENERAL INFORMATION

Replacement parts may be required for the maintenance and repair of the InoFlex® centering vice.

This chapter informs you about what information you should have available when ordering replacement parts from the manufacturer HWR Spanntechnik GmbH.

8.2 BASIC INFORMATION REQUIRED FOR ORDERING SPARE PARTS

- Size: e. g. InoFlex® VF016
- Identification number (ID No.)
- Name of the spare part
- Order quantity

8.3 SPARE PARTS ORDER VIA E-MAIL

NOTICE

Please observe the minimum information requirements (see section 8.2 "Basic information about ordering spare parts").

We recommend the following procedure when ordering a replacement part:

- Step 1** Look for the desired part in figure 8-1
- Step 2** Enter the minimum required order information in the e-mail (see Section 8.2).
- Step 3** Send the order to HWR Spanntechnik GmbH using your company address.

NOTICE

The e-mail address can be found on the inside of the front cover of this operating manual.

8.4 SPARE PARTS ORDER BY FAX

NOTICE

Please observe the minimum information requirements (see section 8.2 "Basic information about ordering spare parts").

We recommend the following procedure when ordering a replacement part:

- Step 1** Look for the desired part in figure 8-1.
- Step 2** Copy the figure and if possible the corresponding Table.

NOTICE

Make sure to place the original sheet back into the documentation to ensure the integrity of your data.

- Step 3** Clearly indicate the desired replacement part (s) in the figure and in the parts list.
Also enter the desired quantity if it should deviate from number already indicated.
- Step 4** Fax this page (s) to HWR Spanntechnik GmbH stating your company address.

NOTICE

The fax number can be found on the inside of the front cover of this operating manual.

8.5 SPAREPARTS LIST INOFLEX® VF016 – VF026

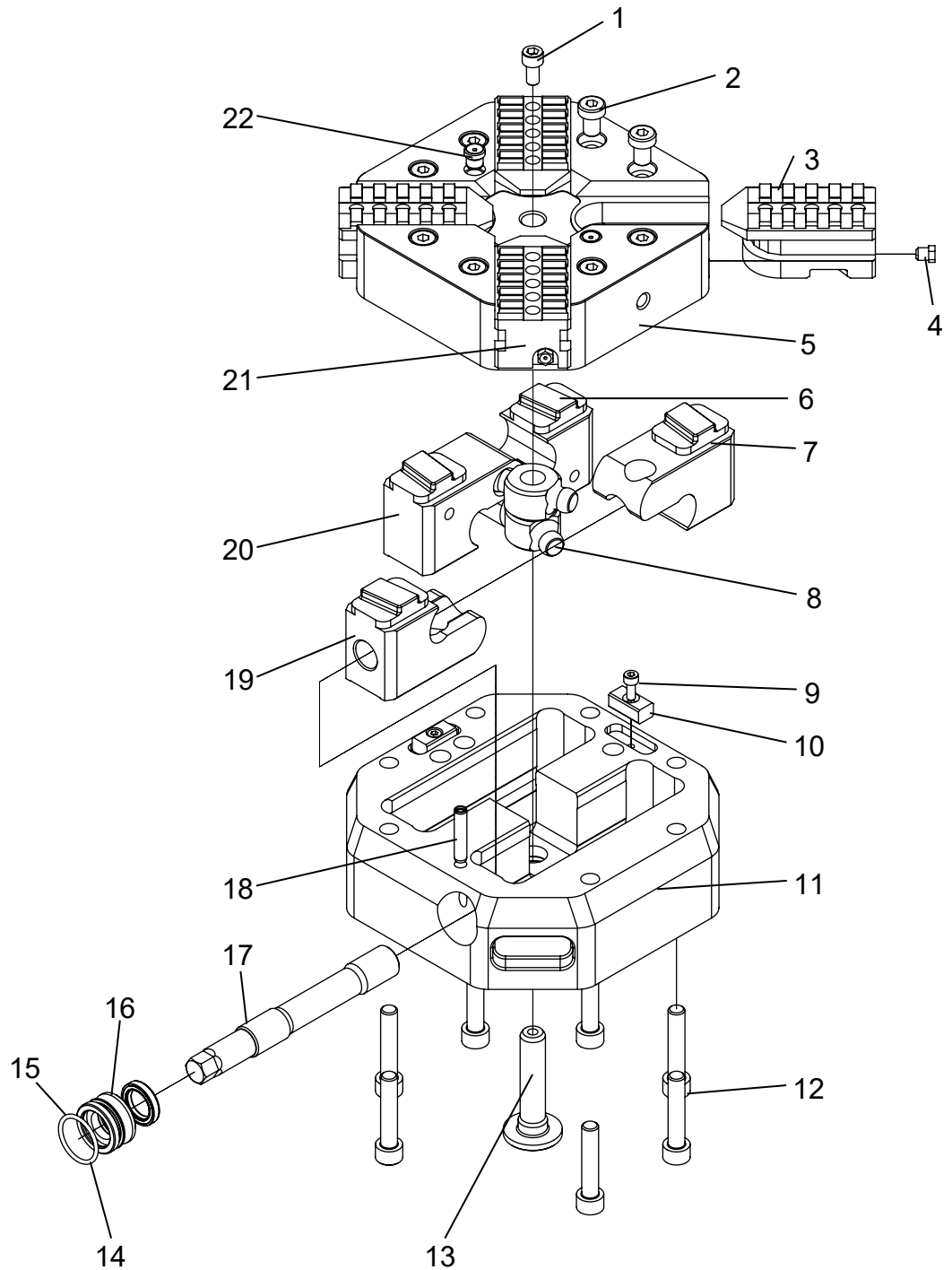


Fig. 8-1: Spare parts list InoFlex® VF016 – VF026

Pos.	Name	Quantity
1	Screw	1
2	Flat head screw	8*
3	Base jaw 2/4	2
4	Grease nipple	4
5	Upper housing	1
6	Parallel slider 4	1
7	Parallel slider 3	1
8	Clamping bone	2
9	Screw	2
10	Sliding block	2
11	Lower housing	1
12	Screw	7**
13	Pivot bolt	1
14	O-Ring	1
15	Seal kit	1
16	Shaft seal	1
17	Spindle	1
18	Zylinder pin	1***
19	Parallel slider 2	1
20	Parallel slider 1	1
21	Base jaw 1/3	2
22	Grease nipple	2
Table 8-1: Spare parts list InoFlex® VF016 – VF026		

* Quantity for VF026: 16

** Quantity for VF026: 9

*** Quantity for VF026: 2