



Operating Manual

InoFlex® VT016 - VT080

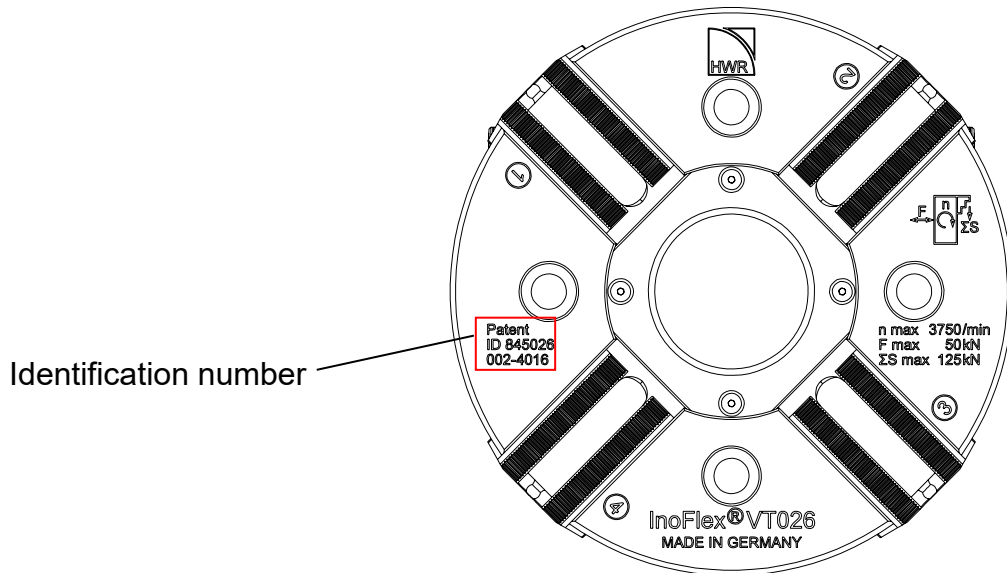
Compensating 4-jaw Through Hole Power Chuck



Translation of the Original Operating Manual (German)!
Keep for future reference!

Version: 11.01.2017
Edition: C

The following figure shows the chuck with the embossed data.



NOTICE

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

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This documentation is designated only for the operating company and its personnel. It contains instructions and information that may not be fully or partially reproduced, distributed nor be transmitted by technical data methods nor be 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® chuck. It includes safety instructions which ensure the safe use of the InoFlex® chuck. 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® chuck.

The InoFlex® chuck will last long and can be used effectively provided that it is used in an appropriate way and serviced well. The documentation received with the chuck will assist you.

Always keep this operating manual and the other documentation (e.g. manufacturer's documentation) handy and in the immediate vicinity of the machine on which the chuck is used. Make sure to always follow all the information, notices 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 chuck.

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

**DANGER**

Before commissioning the InoFlex® chuck 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 success in using the InoFlex® chuck.

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1 SAFETY

General information

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

All of the required safety instructions and provisions on liability for working with the InoFlex® chuck 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® chuck.

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® chuck
- Instructions on the use and operation of the InoFlex® chuck
- Maintenance and service instructions
- Troubleshooting instructions
- Technical data

The technical documentation also includes the following records:

- An integrated spare parts list
- A declaration of incorporation

1.2 MANUFACTURER'S INSTRUCTIONS

1.2.1 CUSTOMER SERVICE

The manufacturer's contact details are printed on the back of the title page. Please contact the chuck manufacturer immediately in case 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 sales terms and delivery conditions« do 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® chuck.
- Improper installation, commissioning, operation and maintenance of the InoFlex® chuck.
- Operating the InoFlex® chuck 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 workpiece, observe the max. speed)
 - maintenance and service
 - troubleshooting of the InoFlex® chuck
- Unauthorized modifications to the chuck or to the machine on which the chuck 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® chuck 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 NOTICE ON THE USE OF DOCUMENTATION

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

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

A symbol is used to mark points in the manual which are particularly important.




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:

| | |
|--|---|
|  DANGER | <i>indicates a hazardous situation which, if not avoided, will result in death or serious injury</i> |
|  WARNING | <i>indicates a hazardous situation which, if not avoided, could result in death or serious injury</i> |
|  CAUTION | <i>indicates a hazardous situation which, if not avoided, will result in minor or moderate injury</i> |
| NOTICE | <i>is used to address practices not related to physical injury</i> |
| SAFETY INSTRUCTIONS | <i>indicate specific safety-related instructions or procedures (title may be altered)</i> |

1.3 INTENDED USE

1.3.1 THE SOLE INTENDED USE

The InoFlex® chuck VT016 - VT080 is solely intended for the clamping of components for mechanical machining in machine tools (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 INSTRUCTIONS AND RULES

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

The functioning of your InoFlex® chuck 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 chuck is used
- Risk to the machine tool, the chuck and other property of the operating company
- Risk of losing efficient operation of the machine tool, in which the chuck 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® chuck and machine tool is absolutely certain.

Operation of the InoFlex® chuck may only be started after the operator has satisfied himself 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.

Make sure to observe the permissible room temperature for operation of the InoFlex® chuck 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® collet chuck, who

- are familiar with the basic regulations on safety and accident prevention and who have been instructed in the operation of the InoFlex® chuck
- 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® chuck.

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® chuck 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 agrees:

- To only allow trained personnel (specialized in metal) and CNC lathe operators to work with the InoFlex® chuck
- 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® chuck under the supervision of an experienced professional (specializing in metal) or a CNC lathe operator.

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

- To always ensure the safety of third parties, the InoFlex® chuck 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® chuck if they are familiar with the function of the chuck 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® chuck.



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® chuck 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® chuck 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 chuck is properly inserted and attached in the machine tool.

Before starting the InoFlex® chuck the commissioning personnel must make sure that the InoFlex® chuck 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® chuck when it is not in use against operation by unauthorized persons (e.g. with a padlock on the main switch of the machine tool).

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

1.7.5 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 and the rotating parts must be inspected before each use to ensure that 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® chuck VT016 - VT080 is intended solely for the clamping of components for mechanical machining in lathes (see also Chapter "7" Technical Data).

The chuck 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 chuck is lubricated at the factory before it is shipped.

2 Technical Description

2.2 OVERVIEW OF THE INOFLEX® CHUCK

2.2.1 SET-UP

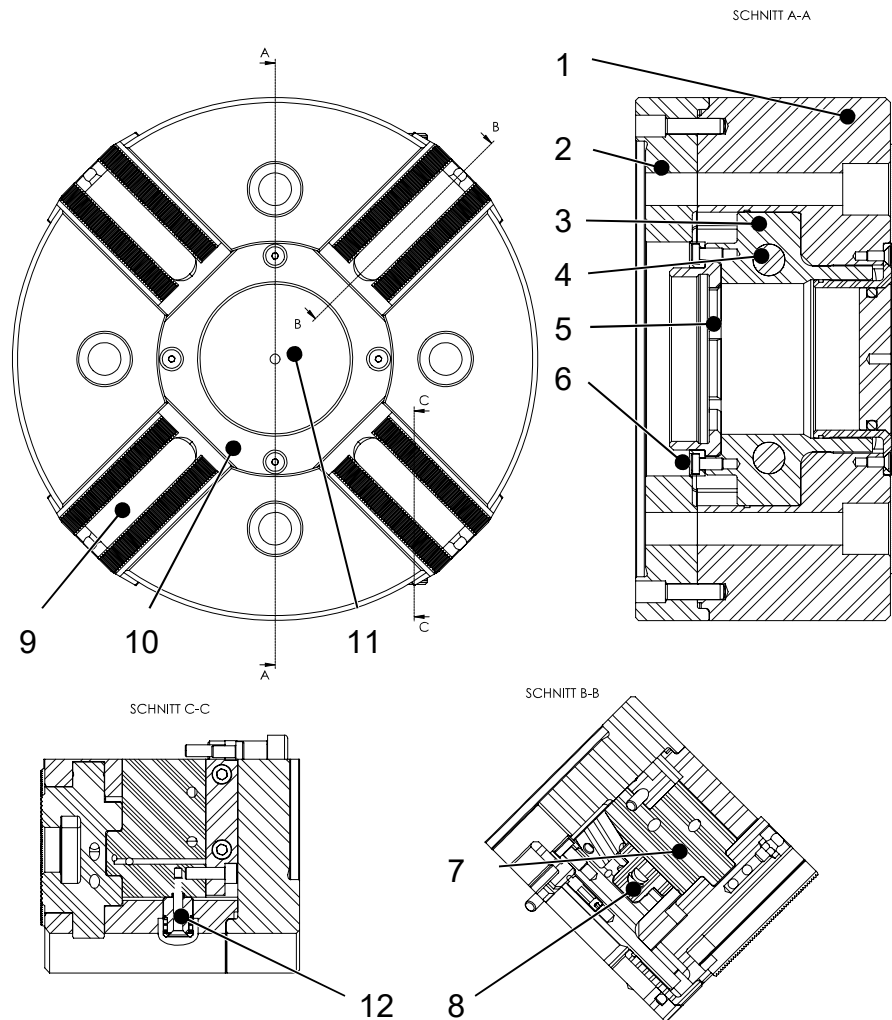


Fig .2-1: Set-up of the InoFlex® power chuck

- | | |
|------------------|------------------------|
| 1. Upper housing | 7. Parallel slider 1/2 |
| 2. Lower housing | 8. Cam |
| 3. Center part | 9. Base jaw |
| 4. Lever | 10. Sealing bush |
| 5. Slotted nut | 11. Cover plate |
| 6. Retainer ring | 12. Stroke control |

2.2.2 DESCRIPTION OF FUNCTIONS

After the power chuck has been installed in the machine tool by a trained specialist (specializing in metal) or CNC lathe operator the same person clamps the workpiece to be machined in the chuck.

The concentric and compensating 4-jaw power chuck allows clamping of round, cubic and geometrically irregular parts and is also suitable for workpieces which are susceptible to deformation.

After installation of the clamping device on the machine spindle (if need be by utilisation of an adapter which is to be installed by the customer) the clamping force of the hydraulic cylinder is transmitted by the slotted nut (3), retainer ring (2) and center part (4) via the lever (5) and cam (6) to the parallel sliders (7) and base jaws (1).

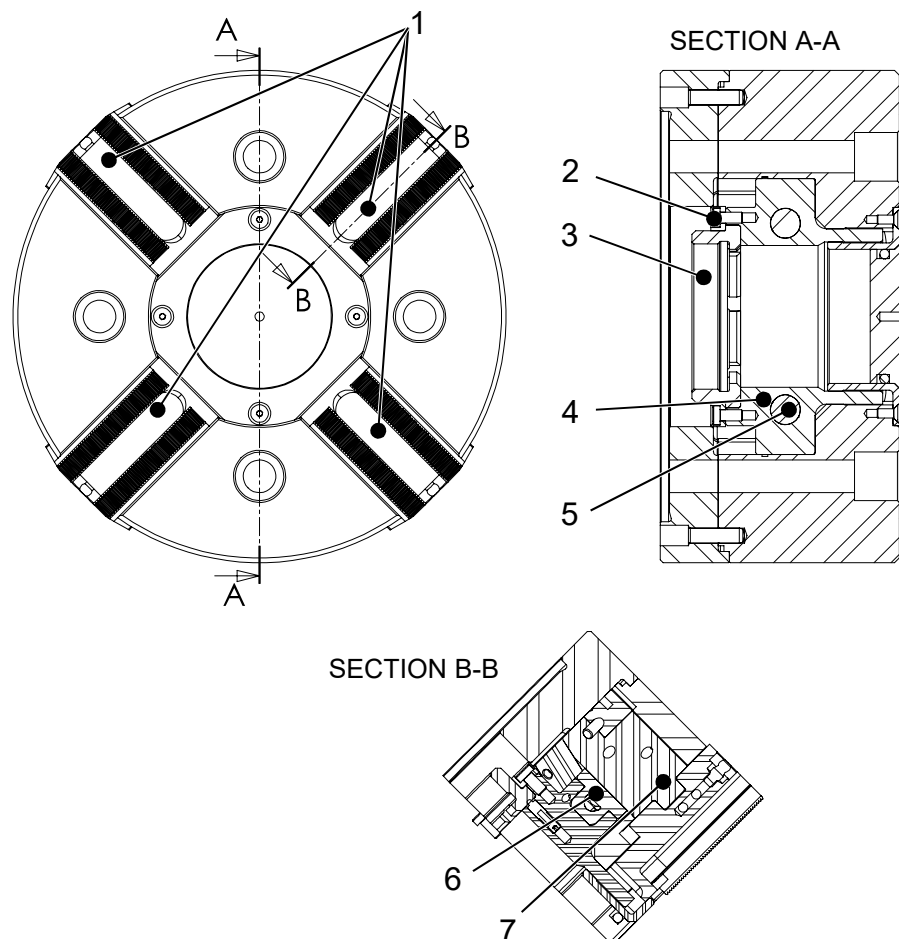


Fig. 2-2: Descriptions of functions of the InoFlex® power chuck

3 TRANSPORT AND INSTALLATION

3.1 GENERAL INFORMATION

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

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

During the installation process observe the operating manual of the machine tool on which the power chuck 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 chuck can be transported with the following tools depending on its weight:

- Crane
- Forklift truck or pallet truck

3.2.2 INSTRUCTIONS ON THE PACKAGING

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

3.2.3 SAFETY PRECAUTIONS FOR TRANSPORT

Transport of heavy chucks may only be conducted by specially qualified personnel, if need be with auxiliary tools.

**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 chuck may only be lifted on the designated attachment point.
- Please observe the center of gravity and the attachment position of the chuck during pick-up, hanging and transport.
- 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 chuck and if necessary the length of the load arm (e.g. crane boom).
- Make sure to cordon off the transport routes used for the transport of floating loads and mark these routes to keep people off.

**DANGER**

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

3.2.4 CHUCK TRANSPORT WITH EYEBOLT

The eyebolt (DIN 580) supplied at delivery must be used for transportation.



CAUTION

The permissible load is marked on the eyebolt.

Step 1

Prior to transport, screw the eyebolt into the main body of the chuck (see the figure below). Attach the hoist.

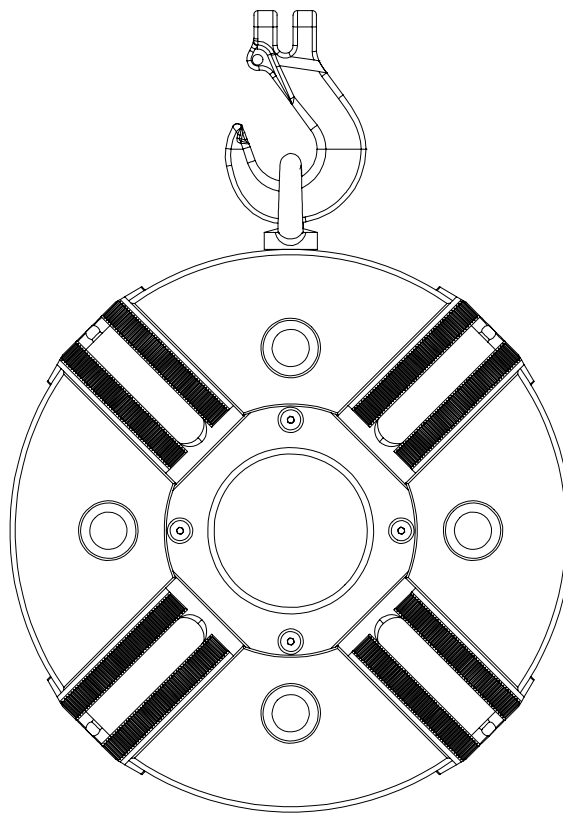


Fig. 3-1: Transport with eyebolt

Step 2

Observe the safety precautions described in section 3.2.3 during transport.



WARNING

Do not remove the hoist and the eyebolt until the chuck is installed properly in the machine tool.

3.2.5 INSPECTIONS AFTER TRANSPORT / RECEIVING THE CHUCK

Check the condition of the InoFlex® chuck immediately after receiving it (transport damage).

Inform the shipping company and the manufacturer of the chuck (HWR Spanntechnik GmbH) if any damage has been found. The address and telephone number you will find on the inside of the front cover.



WARNING

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

3.3 INSTALLATION



CAUTION

Installation of the InoFlex® chuck 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® chuck corresponds with the space requirements of the operator of the machine tool (see corresponding manual of the machine tool).

3.3.2 MEASURES PRIOR TO INSTALLATION

NOTICE

The chuck can be mounted on the machine spindle of the machine tool with an intermediate flange and adequate adaptor.

- Step 1** Clean the mounting surfaces of the machine spindle, and if using an intermediate flange, also clean its center mount and bearing surface. No dirt or chips are allowed on any of these surfaces. If an intermediate flange is used it must rest completely against the machine spindle. Also make sure that all holes are deburred and clean.
- Step 2** Use a dial gauge to check the bearing surfaces (machine spindle and if applicable intermediate flange) of the chuck for true-running.

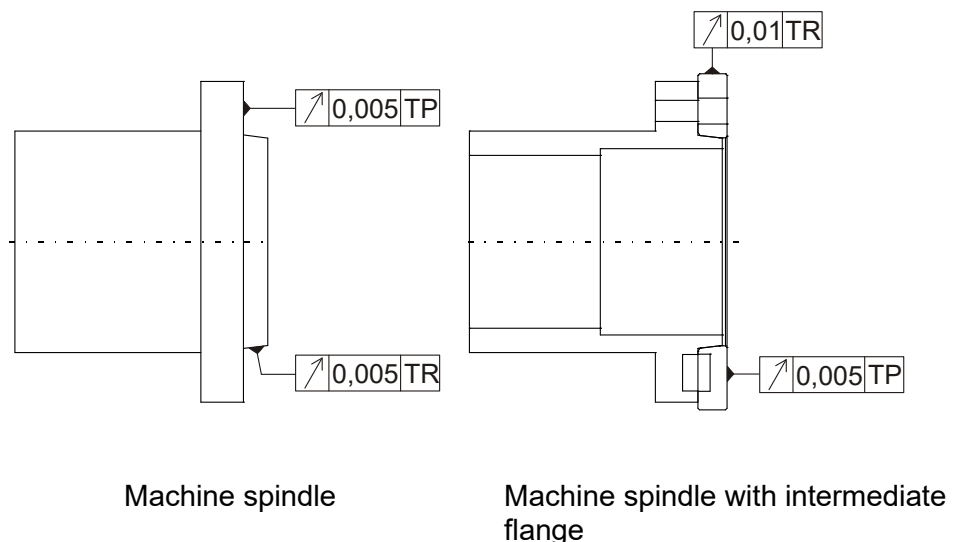


Fig. 3-2: Checking the true-running

- Step 3** Check the max. drag force of the clamping cylinder. It may not exceed the max. actuating force of the chuck. If need be limit the hydraulic pressure of the clamping cylinder!



WARNING

The max. drag force of the clamping cylinder must under no circumstance exceed the actuating force of the chuck. Risk of accident.

Step 4 Check the endurance strength of all self-made joints.

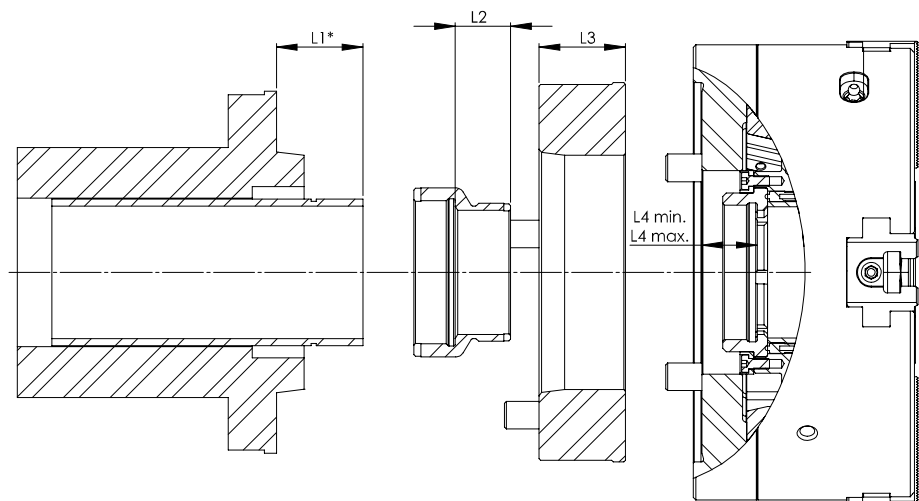
Step 5 Calculations for the adaptor:
 Determine the intermediate size: $L3 + L4 \text{ max.} = X$
 Check the adaptor size: $L1 + L2 = X$

NOTICE

The following figure is an exemplified illustration (here with drawtube outside the spindle and with outside thread).

$L2 = L4 \text{ max.} + L3 - L1$

Please contact the manufacturer for any other constellation



*) Cylinder in front position

Fig. 3-3: Determination of the adaptor length

3.3.3 INSTALLATION OF THE CHUCK

NOTICE

The chuck can be mounted on the machine spindle of the machine tool with an intermediate flange and adequate adaptor.

- Step 1** Check to make sure that measures required prior to installation (see Section 3.3.2) are carried out.
- Step 2** Bring the draw pipe (2) in the most forward position and screw the adaptor (3) onto the draw pipe after the thread has preventively been cleaned with copper paste to avoid rusting or galling
- Step 3** Mount the intermediate flange (4) on the spindle (in case the chuck is not directly screwed onto the spindle) and check the true-running according to Fig. 3-2.
- Step 4** Remove the sealing bush (1) from the chuck so that you can unscrew the slotted nut (5) later on (see step 7).
- Step 5** With the help of the hoist carefully and slowly move the clean chuck in front of the intermediate flange and/or the machine spindle.
- Step 6** Slide the chuck onto the intermediate flange or the machine spindle. Make sure that the through-holes for mounting the chuck are aligned with the threaded holes of the flange and the spindle.

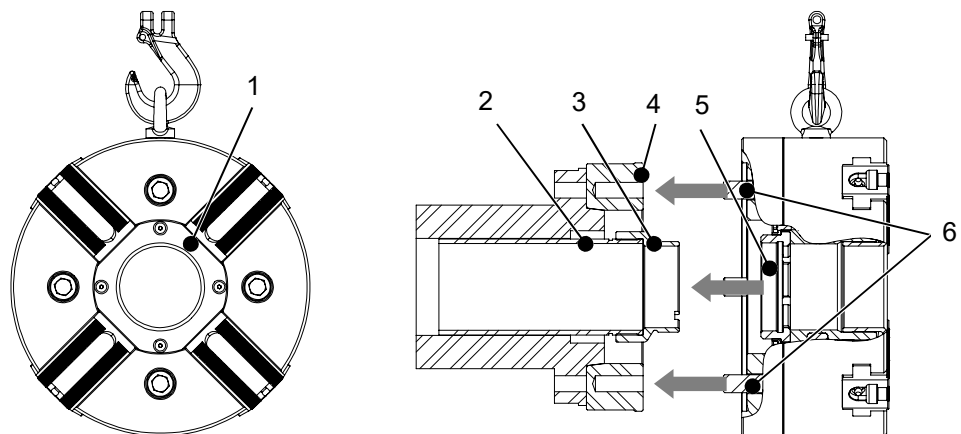


Fig. 3.4: Installation of the chuck

- Step 7** Screw in the mounting screws (6) - preferably strength class 12.9 - and the slotted nut (5) and tighten the screws gently (crosswise).
- Step 8** Remove the hoist and eyebolt.
- Step 9** Reduce the pressure of the clamping cylinder to the lowest possible pressure and actuate the cylinder to "chuck closed".
- Step 10** Check the true-running of the chuck.
Depending on the chuck size the following tolerances have to be observed:

| VT | 016-021 | 026-031 | 040-080 |
|------------------------------|---------|---------|---------|
| Concentricity [mm] | 0,02 | 0,03 | 0,05 |
| Axial run-out tolerance [mm] | 0,02 | 0,03 | 0,05 |

Table 3-1: True-running tolerance

- Step 11** If need be align the chuck with light plastic-hammer strokes on the external diameter.
- Step 12** Tighten the slotted nut (5) using the supplied chuck key (7) with an extension and a ratchet or a cross handle. Afterwards tighten the mounting screws (6) with a torque wrench (crosswise).

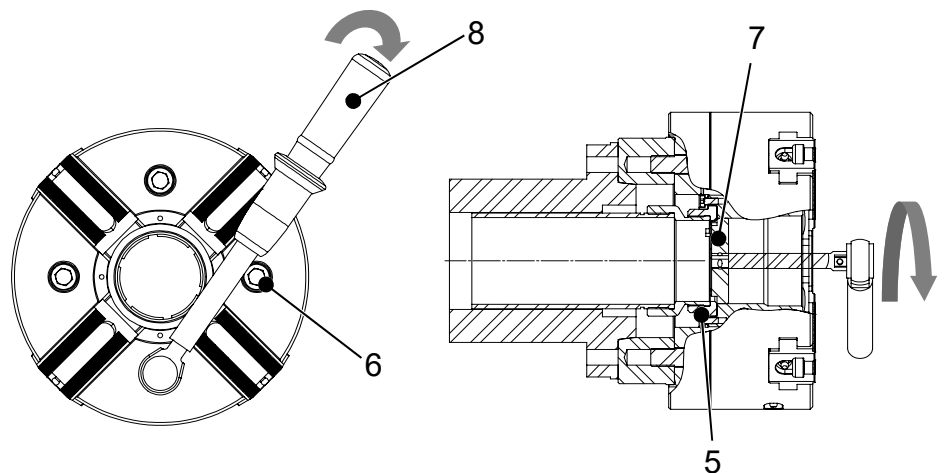


Fig. 3-5: Tightening of the mounting screws with the correct torque

NOTICE

Please observe the maximum tightening torques for mounting screws (see Table 7-7).

⚠ WARNING *The body of the chuck must not be distorted.*

Step 13 Check again the true-running of the chuck according to table 3-1.

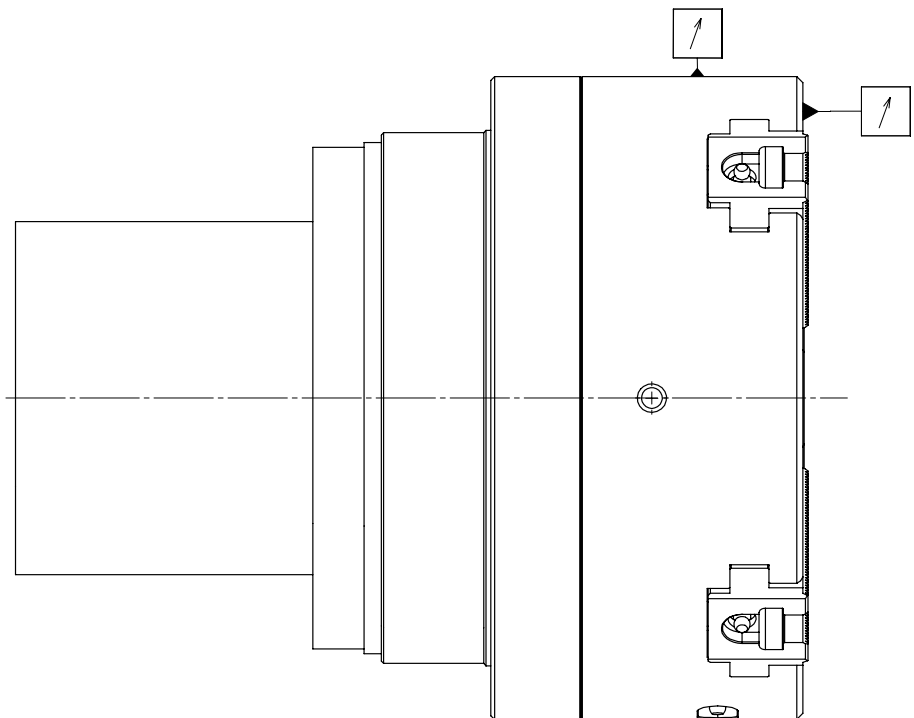


Fig. 3-6: Chuck mounted on intermediate flange

3.4 INSERTION OF THE CLAMPING JAWS

3.4.1 GENERAL INFORMATION

Depending on the workpiece to be processed soft or hard top 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 chuck 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 MOUNTING OF THE TOP JAWS

- Step 1** Insert the T-nut (1) into the chuck with the bevelled end towards the center.
- Step 2** Put the clamping jaws onto the serration (2) and screw-in two cylinder screws each (3) 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 3** First tighten the screw (3) at the non-bevelled end of the T-nut with a torque wrench and afterwards the screw (3) at the bevelled end.

NOTICE

Please observe the maximum tightening torques for mounting screws (see Table 7-7).

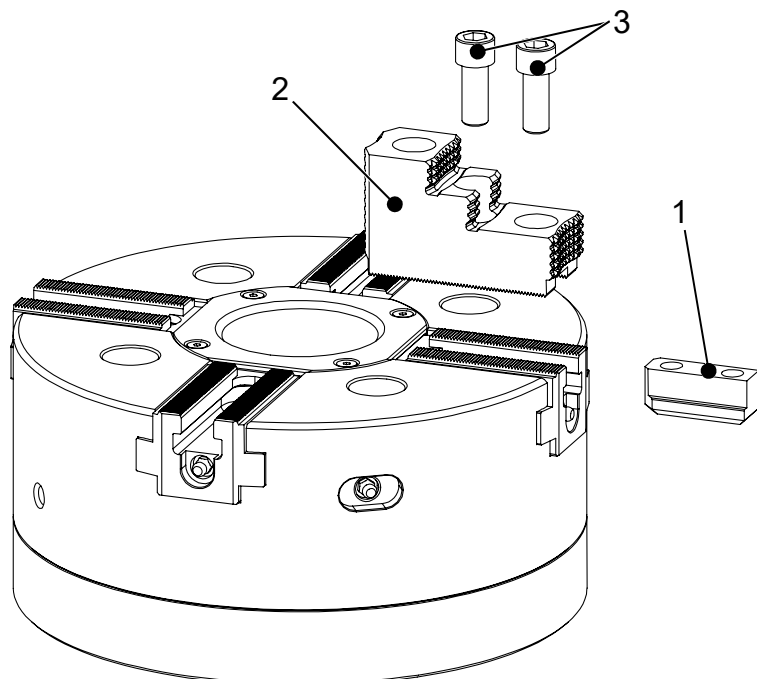


Fig. 3-7: Mounting the top jaws

3.5 FUNCTION CHECK

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

- The clamping function of the chuck is to be checked by actuating the clamping cylinder (opening and closing).
- In order to control the correct mounting to the machine spindle the jaw travel has to be checked.
- If need be 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) or on 4 jaws.

4 OPERATION

4.1 GENERAL INFORMATION

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



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 chuck is installed.

4.2 PREPARATIONS

- Step 1** Check to make sure that the chuck is properly installed on the machine tool.
- Step 2** Make sure that a functional test was carried out (see chapt. 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 chuck.



DANGER

*If the max. speed of the lathe is higher than the max. permissible speed of the chuck then a speed restrictor must be installed in the machine.
Excessive operating speed of the chuck and therefore excessive centrifugal force must never be allowed. Otherwise there is a risk that the workpiece is not clamped sufficiently.*

Step 1 Use both hands when putting the workpiece in the chuck and clamp it by pressing the foot switch.

Step 2 Check the two stroke controls (1) to make sure that the workpiece is clamped safely (see chapter 4.3.1 up to VT063 and 4.3.2 from VT080)



DANGER

*During the clamping process **NOBODY** else apart from the dedicated and trained person for this job is allowed near the machine.*



DANGER

An unsafely clamped workpiece increases the risk of accident by dropping out of the chuck.



WARNING

When clamping the workpiece there is a risk of squeezing your hands.



DANGER

Make sure that the workpiece is clamped by both pairs of jaws. You may never clamp or operate when the piece is clamped by 3 jaws only.

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.

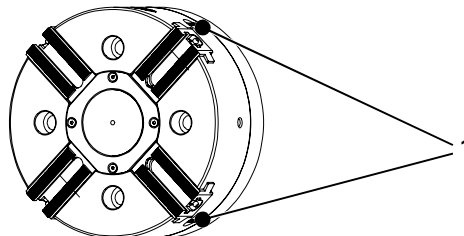


Fig.4-1: Stroke control

4.4 STROKE CONTROL VT016 - VT063

When the workpiece is clamped the stroke control has to be in the green sector as shown in Fig. 4-2.

This eliminates the possibility that base jaw abuts before the workpiece is clamped safely

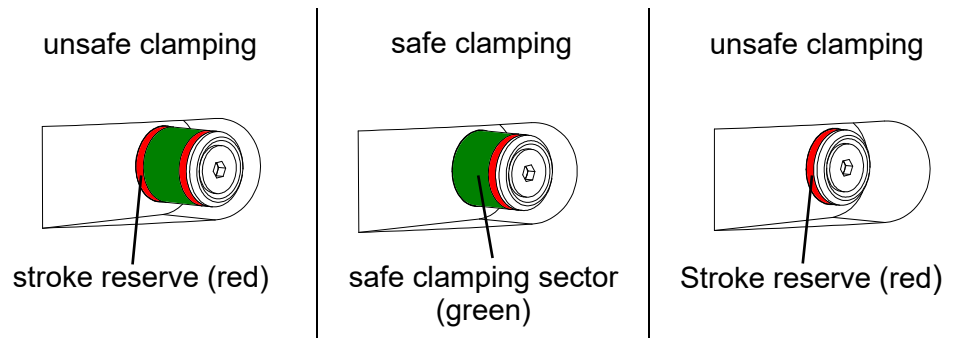


Fig. 4-2: Stroke control VT016 – VT063

4.4.1 STROKE CONTROL VT080

When the workpiece is clamped the rear edge of the base jaw has to be between the inner and outer area as shown in Fig. 4.4 This eliminates the possibility that the base jaw abuts before the workpiece is securely clamped.

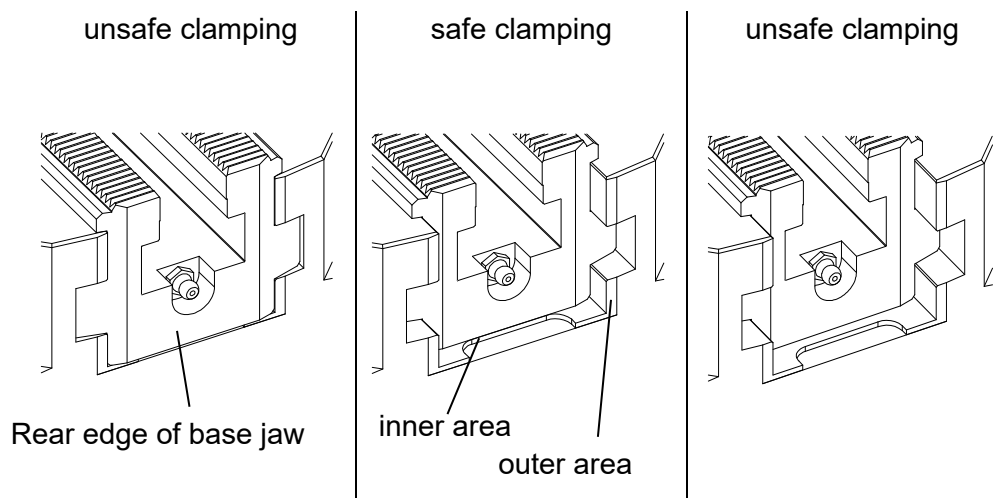


Fig. 4-3: Stroke control VT080

4.5 REGULAR TASKS DURING OPERATION

- Carry out visual inspections for contamination on a regular basis. If necessary stop operation and clean the chuck / 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® chuck 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 chuck is installed.

Keep ready the required materials for cleaning the chuck.

5.2 MAINTENANCE

5.2.1 MAINTENANCE PERIODS

Carry out all required maintenance work in due 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® chuck 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 chuck |
| 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) or on 4 jaws | | X | |
| Disassemble the chuck and clean it (see Chapt. 5.3) | | | X *) for heavy-duty operation |
| Table 5-4: Maintenance work according to operating hours | | | |

 **DANGER** *The chuck must be greased sufficiently. Otherwise clamping force will be lost. Risk of accident!*

5.2.6 LUBRICATION

NOTICE

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

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 chuck lubricate the seven grease nipples (1) with a grease gun.

! WARNING

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

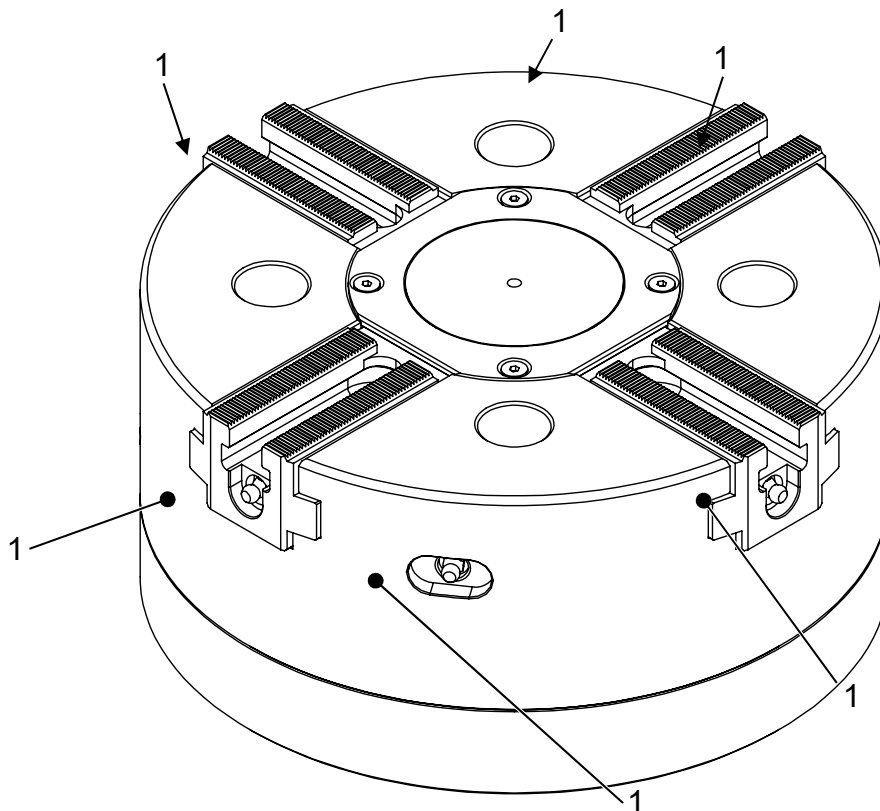


Fig. 5-1: Grease nipples

5.3 DISASSEMBLY / CLEANING / ASSEMBLY OF THE CHUCK

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

NOTICE

Disassembly and cleaning intervals see Table 5-4.

Disassembly and cleaning

- Step 1** Put the chuck with its base jaws closed face down on the work bench.
- Step 2** Remove the mounting bolts (1)
- Step 3** Remove the bottom part of the chuck by screwing two mounting bolts into the threaded holes (2) of the bottom part (3) to eject it.
- Step 4** **(This step does not apply to chucks starting from VT080)**
Remove the stroke control (8) by loosening the respective fastening bolt.
VT016-VT050: The washer, the coloured rings and the carriers are detached from the parallel slider and can be removed.
VT063: Remove the coloured rings (red, green, red) and the disc. Underneath it is a hexagonal bolt for loosening the stroke control pin.
- Step 5** Lift out all inner parts from the chuck body (7) by lifting them with the slotted nut.
- Step 6** Separate all parts from each other and put them aside individually. Also undo the screws which connect the retainer ring (5) with the slotted nut (6).



WARNING

Pay extra attention to the position and mounting orientation of the parts put aside. This will facilitate the assembly later on.

- Step 7** Pull out the base jaws (6) from the chuck body (7).
- Step 8** Clean all parts thoroughly. If need be use some cold cleaner / petroleum.
- Step 9** Check all components. Replace damaged parts prior to recommissioning the chuck.

NOTICE

If you are uncertain or if you have questions please contact the producer HWR Spanntechnik GmbH.

Assembly

- Step 1** Reassemble the chuck in the reverse order of sequence that was followed for disassembly.
On reassembly lubricate all sliding and bearing surfaces with the lubricating grease OKS 265 from HWR Spanntechnik GmbH (or other grease accepted by HWR).
- Step 2** After reassembly lubricate the chuck via the six grease nipples with lubricating grease from HWR Spanntechnik GmbH (see chap. 5.2.6).
- Step 3** Check the clamping force with a suitable clamping force meter : measure on 2 jaws (1/2 total clamping force) or on 4 jaws.



WARNING

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

5.4 TASKS 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 chuck |
| Cleaning of the chuck |
| Table 5-5: After a long period of standstill |

5.5 DISPOSAL

Have a trained expert dismantle and break down the chuck 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 prior to troubleshooting and secure the machine against restarting (see manual of the machine tool).

Step 2 Eliminate the fault.

SAFETY INSTRUCTIONS

Repair and replacement work on the InoFlex® chuck may only be carried out by personnel who are also trained and instructed in the operation of the machine tool. Before restarting the chuck or the machine the person responsible for the machine must ensure that:

- *Repair work is completed*
 - *The chuck 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 chuck and the machine.

6.3 POSSIBLE CAUSES OF ERRORS AND TROUBLESHOOTING

| Error | Cause | Troubleshooting |
|---|--|--|
| Only three jaws abut on the workpiece | First gripping pair of jaws impede the compensation | When inserting the workpiece watch its contour so that it does not cant |
| Jaw (s) is jamming 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 T-nut 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. |
| | Chuck damaged or worn | Send the chuck for inspection to the manufacturer (HWR Spanntechnik GmbH). |
| 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 chuck. |
| | Imbalance on: <ul style="list-style-type: none"> • machine spindle • drive • chuck flange | Check the concentricity of various components in stages. Align, balance or replace components. |
| | Imbalance caused by collision | Send the chuck for inspection and repair to the manufacturer (HWR Spanntechnik GmbH). |

Table 6-1: Possible causes of error and troubleshooting

6.3 POSSIBLE CAUSES OF ERRORS AND TROUBLESHOOTING - CONTINUED

| Error | Cause | Troubleshooting |
|---|---|---|
| Chuck does not close | No hydraulic pressure | Check hydraulic system |
| | Hydraulic cylinder does not close | Check travel control on cylinder |
| Loss of clamping force | Short jaw stroke with large number of identical workpieces Inadequate lubrication film | Actuate the full stroke of the chuck repeatedly without workpiece for buildup of the lubrication film and to reach full clamping force. |
| | Insufficient lubrication Lubricant | Lubricate the chuck. Check lubricant and replace if necessary. |
| | Soiled chuck | Dismantle, clean and lubricate the chuck. |
| | Impaired function of the chuck | Check all components, replace damaged parts by original parts, if need be send the chuck for inspection and repair to the manufacturer (HWR Spanntechnik GmbH). |
| | Clamping cylinder leakage | Overhaul clamping cylinder |
| | Hydraulic system does not generate pressure | Overhaul hydraulic system |
| Table 6-1: Possible causes of error and troubleshooting [continued] | | |

7 TECHNICAL DATA

7.1 GENERAL INFORMATION

All important technical data about the InoFlex® power chuck is contained 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 | 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.

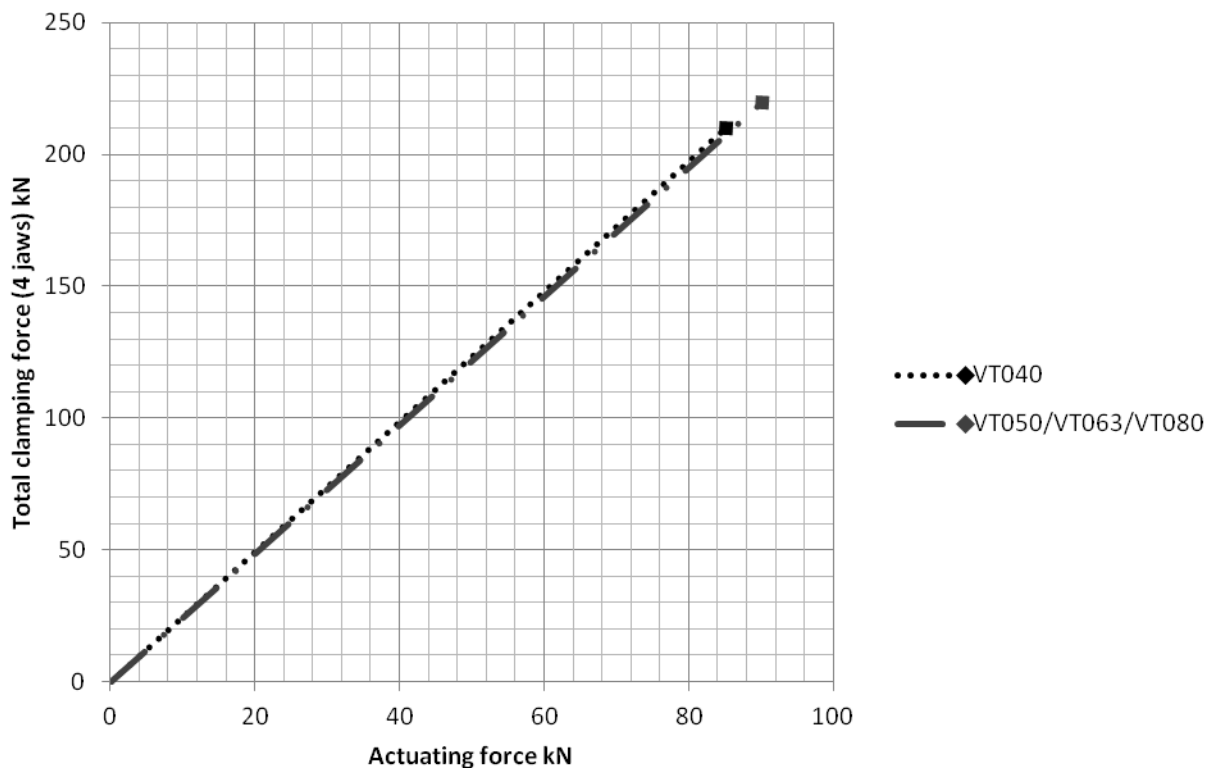
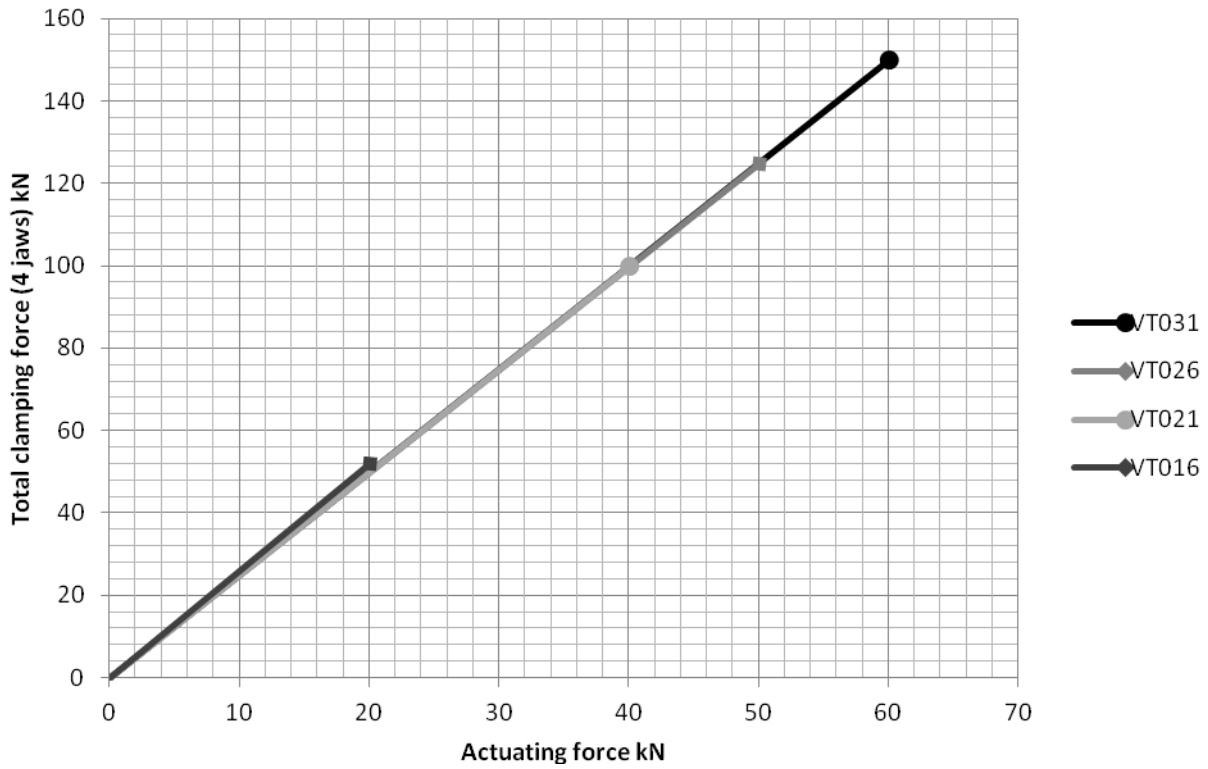
7.4 AMBIENT CONDITIONS

| | |
|---|---|
| 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 | |

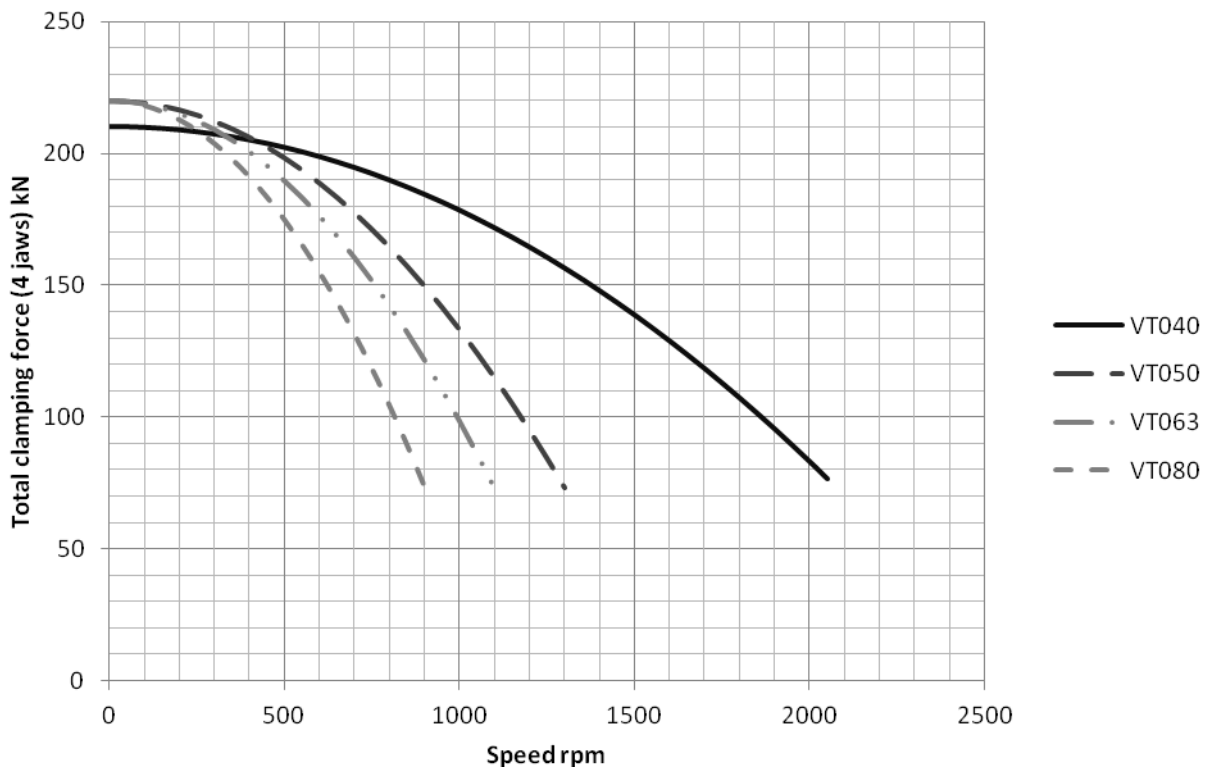
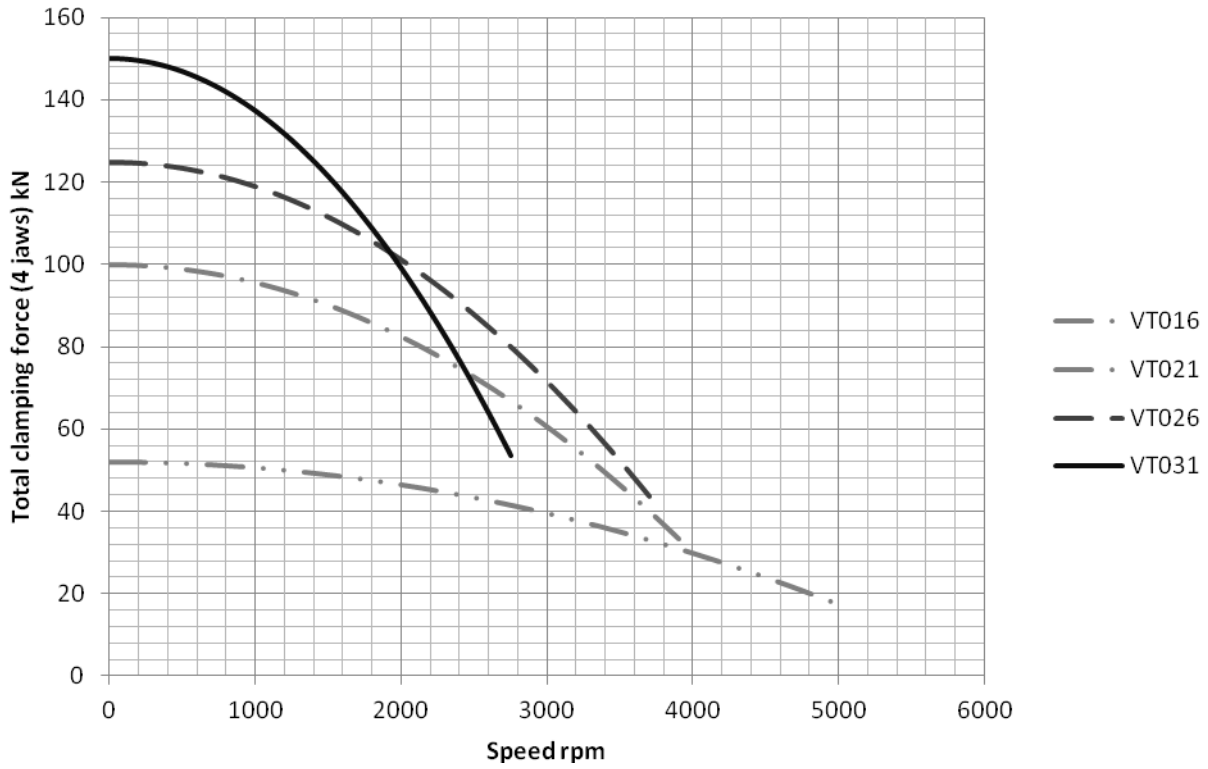
7.5 OTHER DOCUMENTS

| |
|--|
| Spare parts list Declaration of incorporation Assertion of knowledge by the instructed personnel |
| Table 7-4: Other documents |

7.6 CLAMPING FORCE / ACTUATING FORCE DIAGRAM



7.7 CLAMPING FORCE / SPEED DIAGRAM



7.8 TECHNICAL DATA

| Type | | VT016 | VT021 | VT026 | VT031 | VT040 | VT050 | VT063 | VT080 |
|----------------------------------|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Ident-no. | | 845016 | 845021 | 845026 | 845031 | 845040 | 845050 | 845063 | 845080 |
| Diameter | mm | 168 | 212 | 264 | 315 | 400 | 500 | 630 | 800 |
| Through Hole | mm | 46 | 52 | 72 | 91 | 111 | 138 | 165 | 165 |
| Radial jaw stroke per jaw | mm | 3,3 | 4,3 | 5 | 5,5 | 6,2 | 6,2 | 6,2 | 6,2 |
| Compensation per jaw | mm | 2,3 | 3,3 | 4 | 4,5 | 4,5 | 4,5 | 4,5 | 4,5 |
| Axial piston stroke | mm | 15 | 19 | 22 | 24 | 27 | 27 | 27 | 27 |
| max. actuating force | kN | 20 | 40 | 50 | 60 | 85 | 90 | 90 | 90 |
| max. clamping force | kN | 52 | 100 | 125 | 150 | 210 | 222 | 222 | 222 |
| max. speed* | 1/min | 5000 | 3900 | 3750 | 2800 | 2100 | 1300 | 1100 | 900 |
| Weight (without jaws) | kg | 13 | 29,2 | 43 | 69 | 122 | 231 | 325 | 522 |
| Moment of inertia | kg·m ² | 0,05 | 0,18 | 0,42 | 0,93 | 2,66 | 8,2 | 18 | 43,6 |
| T-nut | -- | GP05 | GP07 | GP11 | GP11 | GP13 | GP21 | GP21 | GP21 |
| Standard jaws | Please see our chuck data sheets which you will find in our clamping jaws finder under http://www.hwr.de/en/products/chuck-jaws/#c270 | | | | | | | | |
| Table 7-5: Technical Data | | | | | | | | | |

* Balance quality acc. to DIN ISO 1940-1: G6.3 (ungreased)

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

NOTICE
Max. clamping diameter = chuck diameter

7.9 MOUNTING DIMENSIONS

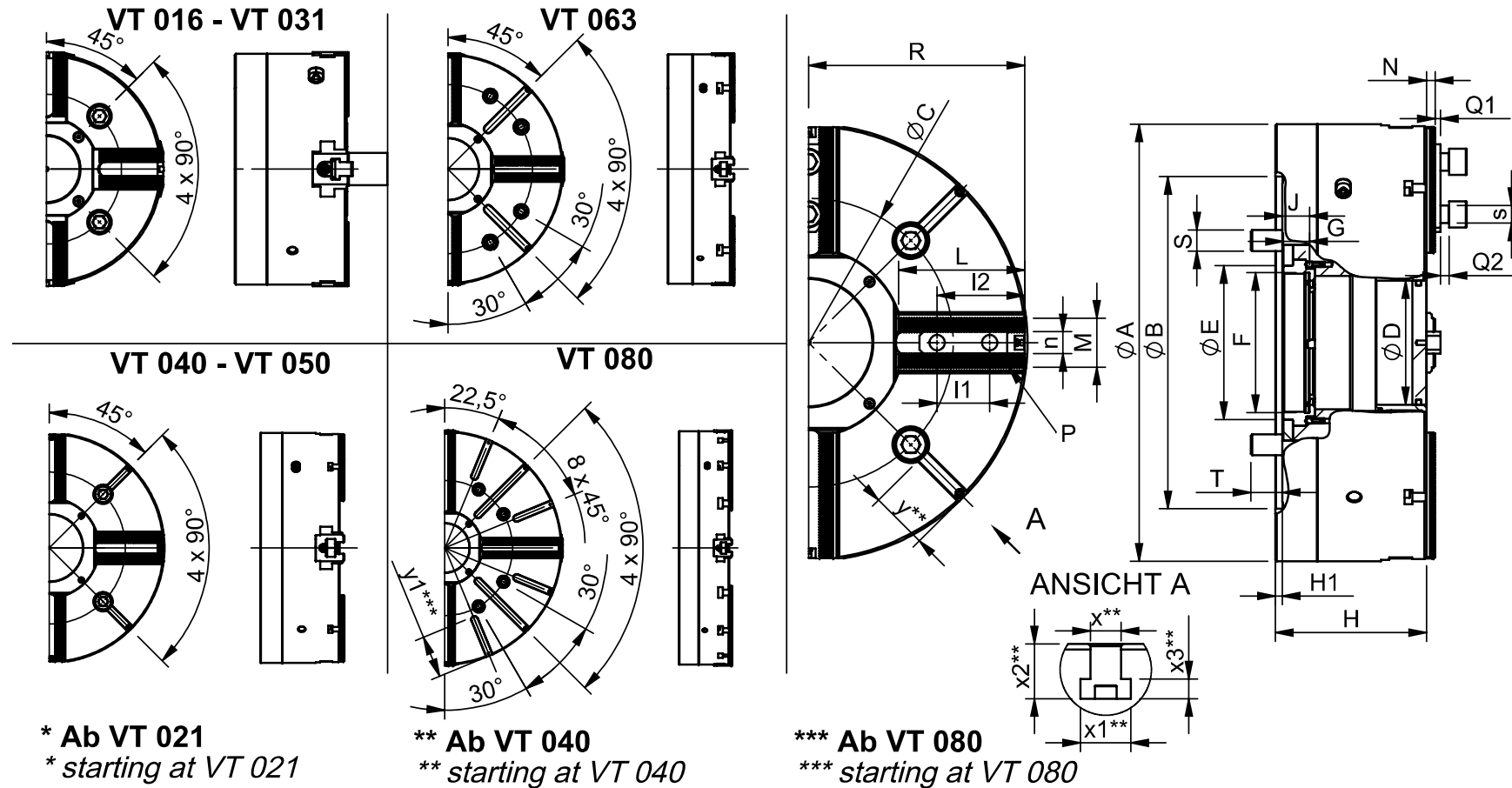


Fig. 7.1: VT-series [subject to technical change]

7.10 MOUNTING DIMENSIONS

| Type | | VT016 | VT021 | VT026 | VT031 | VT040 | VT050 | VT063 | VT080 | |
|--------------------|-----------|---------|-----------|-----------|-----------|-----------|-------------|---------|---------|---------|
| A | mm | 168 | 212 | 264 | 315 | 400 | 500 | 630 | 800 | |
| B H6 | mm | 140 | 170 | 220 | 300 | 380 | 380 | 520 | 520 | |
| C | mm | 104,8 | 133,4 | 171,4 | 235 | 330,2 | 330,2 | 463,6 | 463,6 | |
| D | mm | 46 | 52 | 72 | 91 | 111 | 138 | 165 | 165 | |
| E | mm | -- | 66 | 92 | 112 | 142 | 178 | 196,5 | 202 | |
| F | | M56x1,5 | M60x2 | M85x2 | M100x2 | M125x2 | M160x2 | M180x2 | M180x2 | |
| G | mm | 18 | 20 | 20 | 24 | 30 | 30 | 30 | 30 | |
| H | mm | 84,6 | 109,2 | 123 | 132 | 152 | 164,5 | 164,5 | 164,5 | |
| H1 | mm | 5 | 5 | 5 | 5 | 6 | 8 | 8 | 8 | |
| min. / max. | J | mm | 18 / 33 | 17 / 36 | 10 / 32 | 16 / 40 | 29,6 / 56,6 | 30 / 57 | 30 / 57 | 30 / 57 |
| | L | mm | 45 | 58,5 | 73,5 | 88,5 | 114 | 144 | 189 | 267 |
| | M | mm | 32 | 34 | 40 | 40 | 51,4 | 56 | 56 | 56 |
| | N | mm | 1,5 | 2 | 2 | 2 | 5 | 4,5 | 10 | 10 |
| Serration | P | mm | 1.5 x 60° | 1.5 x 60° | 1.5 x 60° | 1.5 x 60° | 1.5 x 60° | 3 x 60° | 3 x 60° | 3 x 60° |
| | Q1 | mm | 2,5 | 3 | 3 | 3 | 3,5 | 6 | 6 | 6 |
| | Q2 | mm | 10,5 | 11,5 | 11,5 | 11,5 | 11,5 | 17,4 | 17,4 | 17,4 |

Table 7-6: Mounting dimensions

7.10 MOUNTING DIMENSIONS - CONTINUED

| Type | | | VT016 | VT021 | VT026 | VT031 | VT040 | VT050 | VT063 | VT080 |
|-------------|-------|----|-----------|---------|-----------|-----------|----------|------------|----------|----------|
| Chuck open | R | mm | 84,9 | 106,2 | 134,1 | 160 | 202,2 | 253,3 | 318,3 | 398,3 |
| | S | mm | 10,5 | 12,5 | 16,5 | 22 | 26 | 26 | 26 | 26 |
| | T | mm | 10,6 | 17,2 | 24 | 21 | 56 | 50,5 | 50,5 | 50,5 |
| | I1 | mm | 18 | 20 | 30 | 30 | 30 | 60 | 60 | 60 |
| min. / max. | I2 | mm | 22 / 39,5 | 25 / 47 | 35,5 / 58 | 35,5 / 73 | 40 / 100 | 80 / 121,5 | 80 / 169 | 80 / 247 |
| | n H8 | mm | 10 | 12 | 16 | 16 | 21 | 25 | 25 | 25 |
| | s | | M8x22 | M10x25 | M12x30 | M12x30 | M16x35 | M20x55 | M20x55 | M20x55 |
| | x H12 | mm | -- | -- | -- | -- | 14* | 14 | 14 | 14 |
| | x1 | mm | -- | -- | -- | -- | 23 | 23 | 23 | 23 |
| | x2 | mm | -- | -- | -- | -- | 25 | 25 | 25 | 25 |
| | x3 | mm | -- | -- | -- | -- | 9 | 9 | 9 | 9 |
| | y | mm | -- | -- | -- | -- | 93 | 84,9 | 170 | 250 |
| | y1 | mm | -- | -- | -- | -- | -- | -- | -- | 145 |

Table 7-6: Mounting dimensions [continued]

* Note: only use long shaped T-nuts for VT040. Min. length 44 mm!

7.11 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

Spare parts may be required for the maintenance and repair of the InoFlex® chuck.

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

8.2 BASIC INFORMATION REQUIRED FOR ORDERING SPARE PARTS

- Size: e. g. InoFlex® VT026
- 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 spare parts:

- Step 1** Look for the desired part in figure 8-1.
- Step 2** Put down the minimum required order information in your e-mail (see Section 8.2).
- Step 3** Send the order to HWR Spanntechnik GmbH stating 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 spare parts:

Step 1 Look for the desired part in figure 8-1.

Step 2 Copy the figure and if possible the corresponding Table 8-1.

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 spare part (s) in the figure and in the parts list.
Also enter the desired quantity if it should deviate from the quantity 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 SPARE PARTS

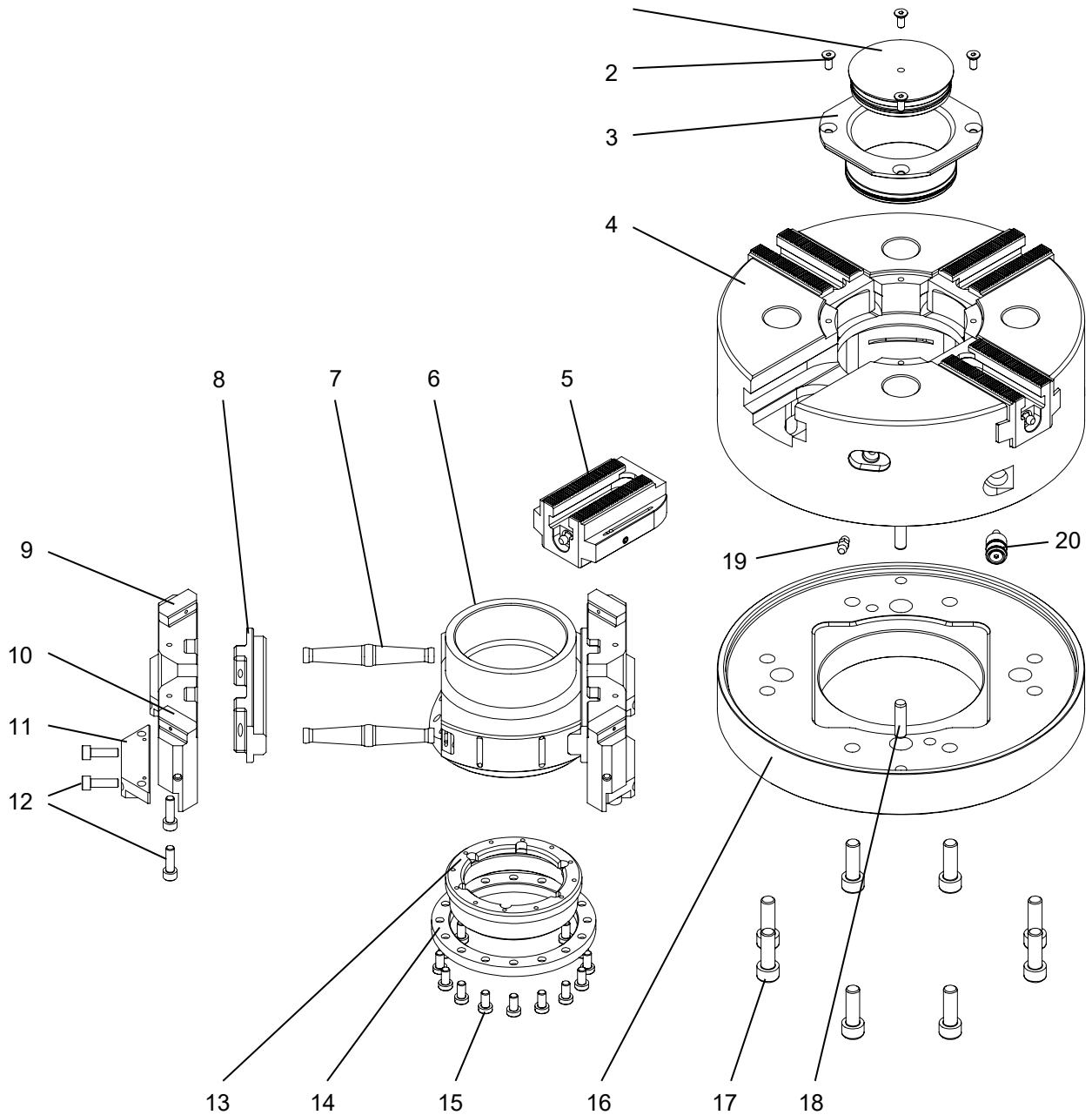


Fig. 8-1: Spare parts

| Pos. | Name | Quantity |
|-----------------------------|--|----------|
| 1 | Cover plate | 1 |
| 2 | Flat headed screw | 4 |
| 3 | Sealing bush | 1 |
| 4 | Upper housing | 1 |
| 5 | Base jaw complete with plugs and grease nipple | 4 |
| 6 | Centre part | 1 |
| 7 | Lever | 2 |
| 8 | Cam | 2 |
| 9 | Parallel slider 1 | 2 |
| 10 | Parallel slider 2 | 2 |
| 11 | Parallel motion | 4 |
| 12 | Cylinder head screw | ** |
| 13 | Slotted nut | 1 |
| 14 | Retainer ring | 1 |
| 15 | Cylinder head screw | ** |
| 16 | Lower housing | 1 |
| 17 | Cylinder head screw | ** |
| 18 | Cylinder pin | 2 |
| 19 | Grease nipple | 2 |
| 20 | Stroke control pin complete | 2 * |
| Table 8-1: Spare parts list | | |

* Does not apply to chucks VT080 and bigger

** Quantity varying depending on chuck size