Operating manual

INOFlex® VT-S 013 – VT-S 080

Compensating 4-jaw through-hole power chuck

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

Last revised: 25/04/2025
Edition: F

https://www.hwr.de/betriebsanleitungen/

https://www.hwr.de/en/manuals/

DE Betriebsanleitung InoFlex® VT-S 016 – VT-S 080 – Ausgleichendes 4-Backen-Kraftspannfutter mit Durchgang

FR Notice d'utilisation INOFlex® VT-S 013 – VT-S 080 - Mandrin de serrage automatique à 4 mors à compensation avec passage

IT Istruzioni per l'uso INOFlex® VT-S 013 – VT-S 080 - Mandrino a forte serraggio a 4 ganasce di compensazione con foro passante

ES Manual de instrucciones INOFlex® VT-S 013 – VT-S 080 - Mandril de sujeción compensador de gran apriete de 4 mordazas, con orificio pasante

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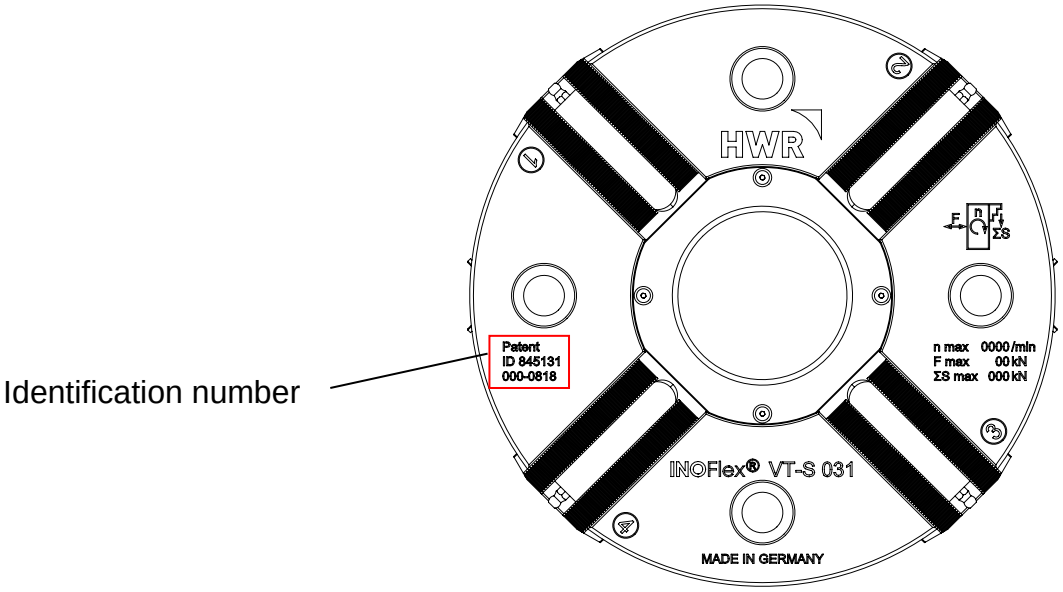
The following picture shows the chuck with the embossed specifications.



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.

This operating manual provides detailed information about the installation, operation and maintenance of the INOFlex® chuck. It contains safety instructions that ensure safe use of the INOFlex® chuck. In addition, you will find information on the scope of delivery and troubleshooting in this documentation.

The purpose of this operating manual is to help you get the most out of your INOFlex® chuck.

As long as you use the INOFlex® chuck properly and maintain it carefully, you can work with it long and effectively. This documentation will help you with it.

Keep this operating manual as well as additional documentation (e.g. . manufacturer documents) always close at hand in the immediate vicinity of the machine where the chuck is used. Always observe all information, tips, instructions and directions contained therein. This helps avoid accidents caused by incorrect operation, guarantees full manufacturer warranty and continued functionality of the chuck.

The manufacturer always strives to improve its products. It reserves the right to make any changes and improvements it deems necessary. However, this does not imply any obligation to retrofit already delivered INOFlex® chucks.

⚠ DANGER ***Before commissioning the INOFlex® chuck you must have read and understood the operating instructions and safety rules contained therein.***

Employees must be instructed in the operation, installation and use of the INOFlex® chuck in accordance with this operating manual.

If any questions remain after reading the operating manual, please contact the manufacturer.

We hope that you and your employees enjoy using the INOFlex® chuck and wish you a lot of success.

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Declaration of incorporation for the installation of an incomplete machine

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

Manufacturer:	**HWR Spanntechnik GmbH**
Authorized representative for technical documentation:	**Henrico Viets (Managing Director)**
Name of the machine:	**Compensating 4-jaw through-hole power chuck**
Machine number:	**INOFlex® VT-S 013 – VT-S 080**

We hereby declare

that the above referenced incomplete machine is intended for installation in another machine. Commissioning is prohibited until the owner of the completed machine has determined that the complete machine complies with the provisions of EU Machinery Directive 2006/42/EC and has issued a declaration of conformity in accordance with Annex II, Part A of EC Machinery Directive 2006/42/EC.

that the basic safety and health requirements for the design and construction of machinery in accordance with Annex I of the EU Machinery Directive 2006/42/EC are met.

that the ‘specifial technical documentation’ has been prepared in accordance with Annex VII, Part B.

We undertake to provide national authorities, upon reasonable request, with the special technical documentation for the incomplete machine in paper format within a reasonable period of time.

Oyten, 25. April 2025

Henrico Viets
Geschäftsführer

Matthias Meier
Geschäftsführer

Table of Contents

1 SAFETY

General information

The operating manual for your INOFlex® chuck contains important information on installation, operation and maintenance as well as troubleshooting in case of malfunction. This information will help you operate your INOFlex® chuck safely and securely.

All safety instructions and liability provisions necessary for handling the INOFlex® chuck are included in this chapter. You will also find instructions for intended use here.

⚠ 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
- notes on installing the INOFlex® chuck
- the instructions for handling and operation of the INOFlex® chuck
- maintenance and care instructions
- a troubleshooting guide
- Technical specifications

The technical documentation also includes the following documents:

- an integrated spare parts list
- a declaration of incorporation

1.2 INFORMATION FROM THE MANUFACTURER

1.2.1 CUSTOMER SERVICE

On the back of the front page are the contact details of the manufacturer. If you have any questions or problems, please contact the manufacturer of the chuck immediately.

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

1.2.2 WARRANTY AND LIABILITY

Generally, our 'General Conditions of Sale and Delivery' apply. They are available to the operator upon conclusion of the contract at the latest. Warranty and liability claims for personal injury and property damage are excluded if they are due to one or more of the following causes.

- Improper 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 improperly installed or non-functioning safety and protective devices on the machine.
- Failure to follow the instructions in the documentation regarding
  - Storage
  - installation
  - operation (e.g. correct clamping of the workpiece, observing maximum speed)
  - Maintenance and Care
  - Troubleshooting the INOFlex® chuck
- Unauthorized structural changes to the chuck or the chuck holder within the machine.
- Insufficient monitoring of parts that are subject to wear.
- Improperly performed repair.
- Disasters caused by foreign objects and 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 INSTRUCTIONS FOR HANDLING THE DOCUMENTATION

Always have this operating manual and other INOFlex® chuck documentation readily available in the immediate vicinity of the operating unit of the machine into which the chuck is inserted.

Please read this operating manual before first use and be sure to observe the safety instructions.

Particularly important points in the operating manual are marked with an icon.

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 can be found at all important points in this operating manual. Pay close attention to these instructions and take special care when you see them.

Identification of the safety instructions:

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

1.3 INTENDED USE

1.3.1 EXCLUSIVE USE

The INOFlex® power chuck VT-S 013 – VT-S 080 is designed exclusively for clamping of components for mechanical machining in machine tools (see also chapter '7 – Technical specifications').

Any use other than the intended use is considered to be improper. The manufacturer is not liable for resulting damages.

1.3.2 OBSERVE INSTRUCTIONS AND REGULATIONS

Intended use also includes:

- observance of all instructions from the documentation as well as the supplied manufacturer documentation (if applicable) and
- compliance with the maintenance and service conditions and intervals prescribed by the manufacturer.

1.3.3 OBSERVE ACCIDENT PREVENTION REGULATIONS

Observe the relevant accident prevention regulations as well as the other, generally recognized safety rules.

1.4 WARNING AGAINST MISUSE AND ABUSE

Proper functioning of your INOFlex® chuck has been tested at the factory. Nevertheless, misuse or abuse may lead to hazards:

- to the life and limb of operators, third parties and animals in the vicinity of the machine tool in which the chuck is inserted,
- to the machine tool, the chuck and other property of the operator,
- to the 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 hazard and, in particular, to the safeguards to be taken. Stay alert and be aware of the hazard(s).

Malfunctions must be investigated immediately. If necessary, experts must be requested by the operating personnel. The operation may only be resumed if the safety of the INOFlex® chuck and the machine tool is ensured beyond any doubt.

Operation of the INOFlex® chuck may only be started when the operator is convinced that all maintenance has been performed (as described in this operating manual).

If it is determined during operation that pending maintenance measures have not been carried out, the operation must be stopped immediately.

During operation of the INOFlex® chuck, observe the room temperatures permitted for operating the machine tool (see operating instructions of the machine tool, if specified).

1.6 OBLIGATIONS

1.6.1 OBLIGATION OF THE OPERATOR

The operator undertakes to only let persons operate the INOFlex® chuck who

- are familiar with the basic safety and accident prevention provisions and are trained in the operation of the INOFlex® chuck,
- have read and understood the operating manual, the safety chapter and the warnings and confirmed this with their signatures.

The operator is responsible for the selection of the operating personnel. He must pay particular attention to the suitability of the operator for operating a machine tool with the INOFlex® chuck.

The operator must always provide the operating and maintenance personnel with the entire product documentation.

The operator must check the safety-conscious handling of the operating and maintenance personnel at regular intervals.

The operator of a machine tool with the INOFlex® chuck must comply with the following rules and regulations:

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

⚠ DANGER ***The operator bears the ultimate responsibility for safety. This responsibility cannot be delegated.***

1.6.2 REQUIREMENTS FOR OPERATING AND REPAIR PERSONNEL

The operator undertakes to

- only allow trained specialists (specializing in metal) or CNC turners work with the INOFlex® chuck,
- clearly define the responsibilities of the personnel for installation, commissioning, operation, maintenance and repair,
- only allow untrained personnel work with the INOFlex® chuck under the supervision of an experienced specialist (specializing in metal) or a CNC turner.

All persons who are commissioned to operate the INOFlex® chuck undertake to:

- always ensure the safety of third parties, the INOFlex® chuck and the machine tool
- read the operating instructions, the safety chapter and the warnings and confirm by signing that they have understood them,
- observe the basic regulations concerning safety at work and accident prevention,
- only use the INOFlex® chuck if they are familiar with the function of the chuck itself and the function of the machine tool as well as its safety and emergency features and know how to handle them safely.

The operating personnel must be completely focused on operating the machine tool with the INOFlex® chuck.

⚠ 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

Check the INOFlex® chuck daily for operational safety before each use! In addition to the instructions in the documentation, you must also observe the generally applicable local safety and accident prevention regulations.

Malfunctions that impact safety must be remedied immediately. Defective parts must be replaced immediately. Until the malfunction has been eliminated, the machine with the INOFlex® chuck must not be operated.

1.7.2 PROTECTIVE MEASURES BY THE OPERATOR

Workplace ergonomics

The workstations for the operator must be designed according to ergonomic guidelines. Free access (avoidance of tripping hazards), adequate lighting, etc. (accident prevention regulations, safety of the operator at the workplace) must be ensured by the operator.

Personal protective measures

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

Access to the machine

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

1.7.3 INSTALLATION AND COMMISSIONING

Check that the chuck is properly inserted and secured inside the machine tool.

Before using the INOFlex® chuck for the first time, the commissioning staff must make sure that the INOFlex® chuck is in perfect condition by administering the stipulated tests and trial operation!

1.7.4 SAFETY WHILE NOT IN USE

Secure the machine tool with the INOFlex® chuck during periods of non-use against use by unauthorized persons (e.g. by securing the main switch of the machine tool with a padlock).

Make sure that children do not gain access to the INOFlex® chuck or machine tool.

1.7.5 MAINTENANCE AND REPAIR

Maintenance deadlines

Perform all stipulated maintenance work on time.

Cleaning agents

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

Inspection work

The tensioned and rotating parts must be checked for flawless condition before each use. Defective parts must be replaced immediately with flawless parts.

After completion of the maintenance and repair work, check all components for their functionality.

Disposal

Handle and dispose used substances and materials properly, especially greases and solvents.

2 TECHNICAL DESCRIPTION

2.1 GENERAL

The INOFlex® power chuck VT-S 013 – VT-S 080 is designed exclusively for clamping of components for mechanical machining in lathes (see also chapter ‘7 – Technical specifications’).

The chuck must be used exclusively in accordance with VDI 3106 and the operating manual of the machine tool as well as this operating manual.

NOTICE ***The chuck is delivered pre-greased from the factory and must be regreased if necassary.***

2.2 OVERVIEW OF THE INOFLEX® CHUCK

2.2.1 DESIGN CONFIGURATION

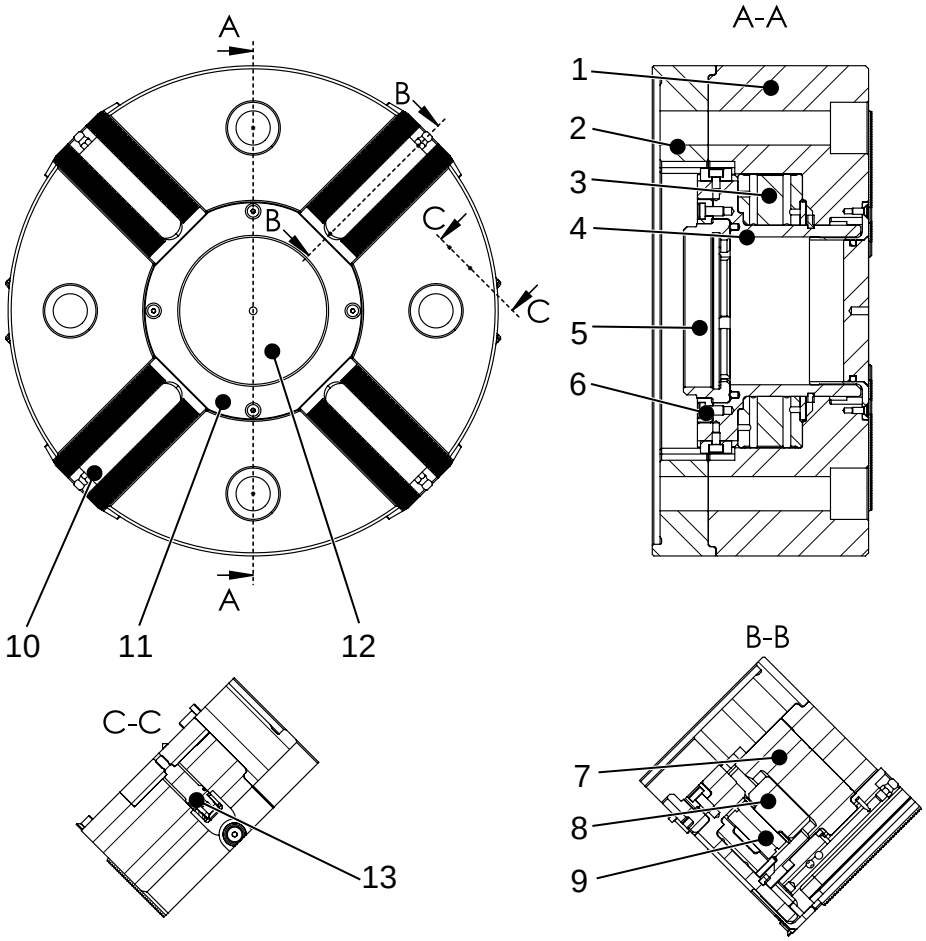


Fig. 2-1: Design configuration of the INOFlex® power chuck

1. Upper housing
2. Lower housing
3. Tension ring
4. Cable guiding
5. Groove nut
6. Retaining ring
7. Tangential slider 1/2
8. Drive
9. Compensation pin
10. Base jaw
11. Sealing bush
12. Cover
13. Stroke monitoring **

** omitted from VT-S 050 and up

2.2.2 FUNCTION DESCRIPTION

After the power chuck has been mounted in the machine tool by a trained and instructed specialist (specializing in metal) or a CNC turner, the same person tensions the workpiece to be machined in the chuck.

The concentric and compensating, tensioning 4-jaw power chuck enables clamping of round, cubic and geometrically irregular parts and is equally suitable for workpieces that are sensitive to deformation.

After installation of the clamping device into the machine spindle (possibly to be installed with the aid of an adapter for the customer) the clamping force of a hydraulic clamping cylinder is transmitted from the groove nut (3), retaining ring (2) and cable guide (4) via the pull ring (5), compensation pin (6) and drive (7) to the tangential slider (8) and base jaws (1).

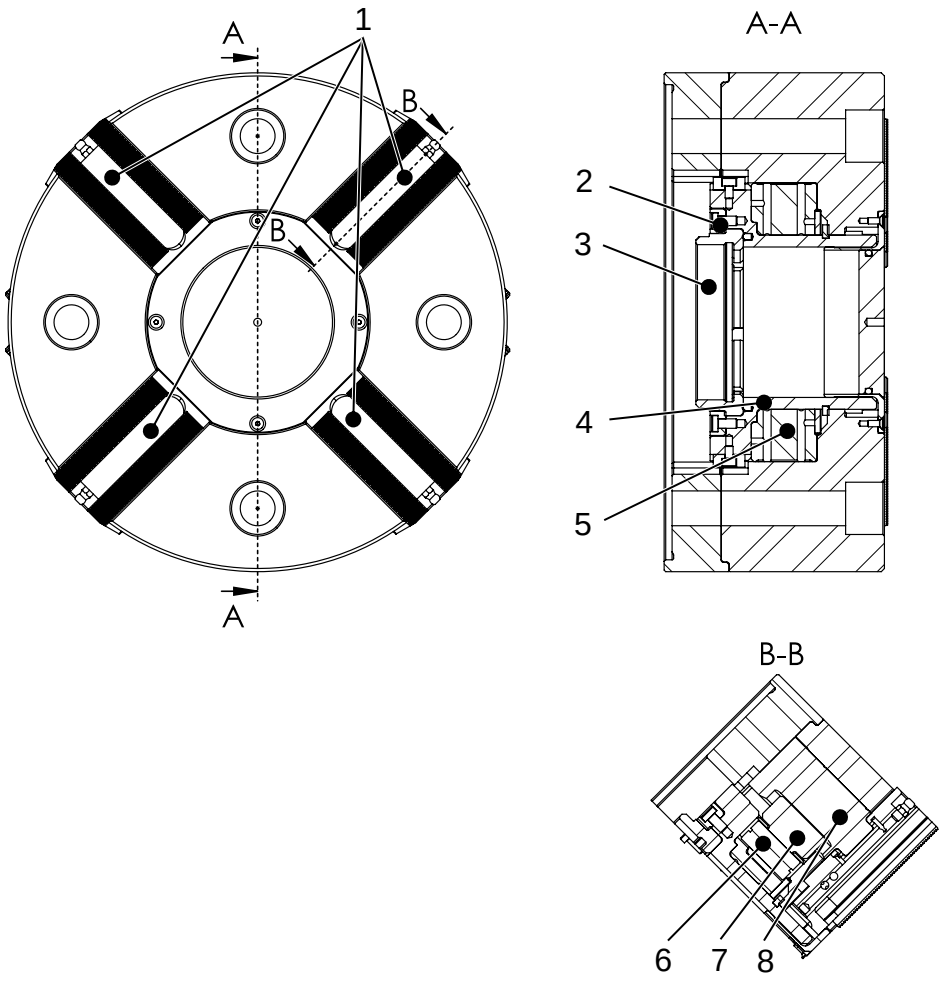


Fig. 2-2: Operating principle of the INOFlex® power chuck

3 TRANSPORT AND INSTALLATION

3.1 GENERAL

Proceed calmly and prudently during the installation work. Avoid stress and rushing, because this can lead to work mistakes or even accidents.

Keep all transport routes and the installation area free of obstructions during the entire work.

During installation work, also observe the operating instructions of the machine tool on which the power chuck is 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

Upon delivery, the safely packed chuck can be transported with the following tools, depending on weight:

- Crane
- Forklift or pallet truck

3.2.2 NOTES ON THE PACKAGING

Always follow the instructions and directions on the packaging (if available).

3.2.3 PRECAUTIONS FOR TRANSPORT

Transport of heavy chucks, if necessary with tools, may only be carried out by 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.***

To prevent equipment damage and life-threatening injuries, you must comply with the following measures:

- The chuck may only be lifted at the intended attachment point.
- Always pay attention to the centre of gravity and the stop position when picking up or suspending the chuck and while transporting the chuck.
- Lifting equipment and slings must comply with the provisions of the accident prevention regulations.
- For the selection of the lifting equipment and slings, it is important to take into account the weight of the chuck and, if necessary, the length of the load arm (e.g. crane boom).
- Be sure to block the transport path of suspended loads and label these paths so that no one can be in that area.

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

3.2.4 CHUCK TRANSPORT WITH EYE BOLT

The eye bolt (DIN 580) included in the delivery must be used for transport.

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

Step 1 Screw the eye bolt into the base of the chuck before transport (see the following figure). Hook the hoist.

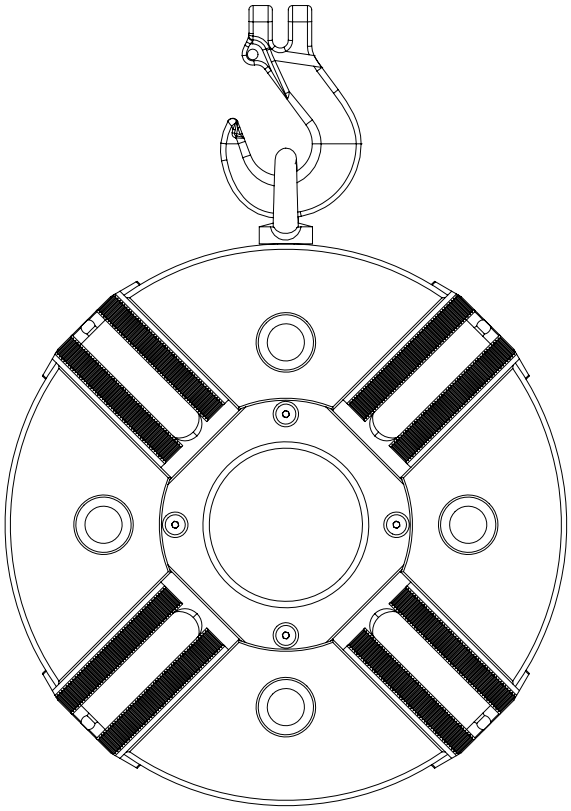


Fig. 3-1: Transport with eye bolt

Step 2 Observe the precautionary measures described in chapter 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 CHECKS AFTER TRANSPORT/RECEIPT OF THE CHUCK

Immediately after receiving the INOFlex® chuck, check its condition (transport damage).

If you discover any damage, report it to the transporter and the manufacturer of the chuck (HWR Spanntechnik GmbH). The address and phone number can be found on the inside of the title page.

⚠ 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 REQUIREMENTS

The freedom of movement requirement for installing the INOFlex® chuck corresponds to the space requirement of the operator of the machine tool (see corresponding operating instructions of the machine tool).

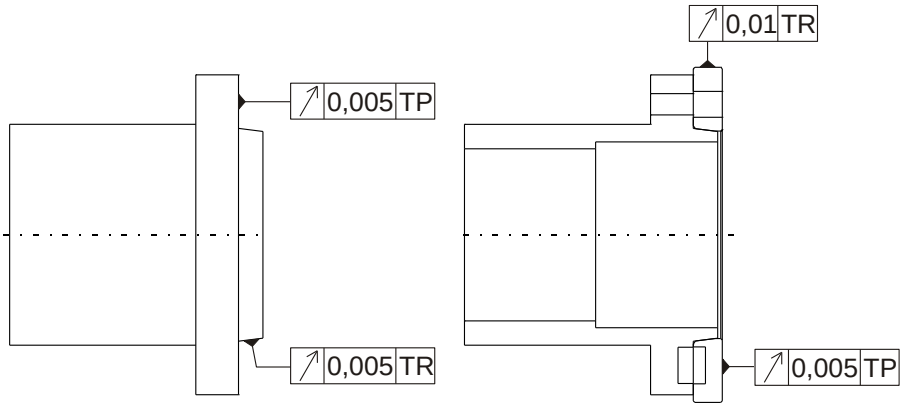
3.3.2 MEASURES BEFORE INSTALLATION

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 an intermediate flange is used, also clean its centring fixture and contact surfaces. There must be no dirt or shavings on the corresponding surfaces. The potentially existing intermediate flange must rest completely against the machine spindle. Also make sure that all holes are deburred and clean.

Step 2 Check the mounting surfaces (machine spindle and, if applicable, the intermediate flange) for the chuck with a dial gauge for radial and axial runout.



Machine spindle

Machine spindle with intermediate flange

Fig. 3-2: Testing of radial and axial runout

Step 3 Check the maximum tensile force of the clamping cylinder. It must not exceed the maximum operating force of the chuck. If necessary, limit the hydraulic pressure of the clamping cylinder!

⚠ WARNING

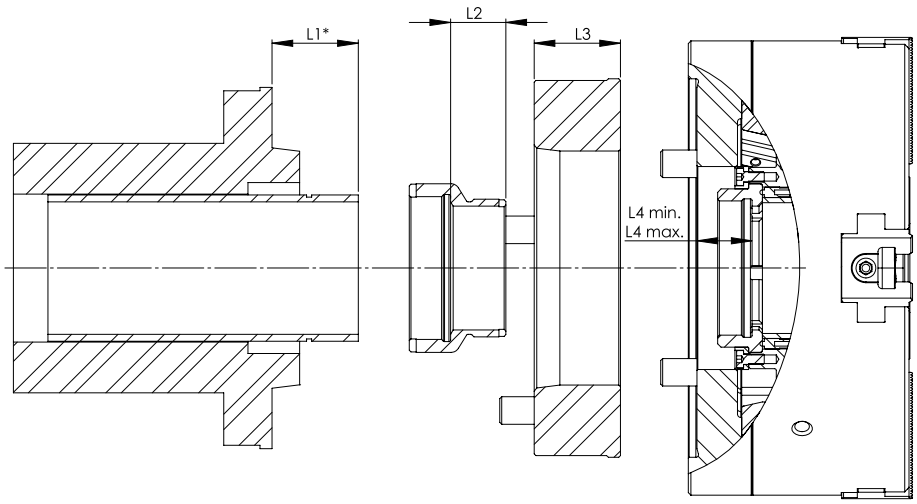
The max. drag force of the clamping cylinder must under no circumstance exceed the actuating force of the chuck. Risk of accident.

Step 4 Check the fatigue strength of self-made connection parts.

Step 5 Calculations for the adapter:
Determine the intermediate dimension: L3 + L4 max = X
Check the adapter dimension: L1 + L2 = X

NOTICE

The following figure is an exemplified illustration (here with drawtube outside the spindle and with external thread).
L2 = L4 max + L3 – L1
Please contact the manufacturer for any other constellation



*) Cylinder in the front position

Fig. 3-3: Determining the adapter length

3.3.3 ASSEMBLY 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 that all necessary measures were carried out before starting the installation (see chapter 3.3.2).

Step 2 Place the draw tube (2) in the front position and screw the adapter (3) onto the draw tube, after you have coated the thread with copper paste to prevent corrosion/seizure.

Step 3 Attach the intermediate flange (4) to the spindle (if the chuck is not screwed directly to the spindle) and check the radial and axial runout as shown in Fig. 3-2.

Step 4 Remove the sealing bush (1) from the chuck so that you can later (see step 7) unscrew the groove nut (5).

Step 5 Carefully and slowly guide the clean chuck (hanging from the eye bolt) to the front of the intermediate flange or the machine spindle with the aid of the hoist.

Step 6 Slide the chuck onto the intermediate flange or the machine spindle. Make sure that the through-holes for fastening the chuck are aligned with the threaded holes of the flange or spindle.

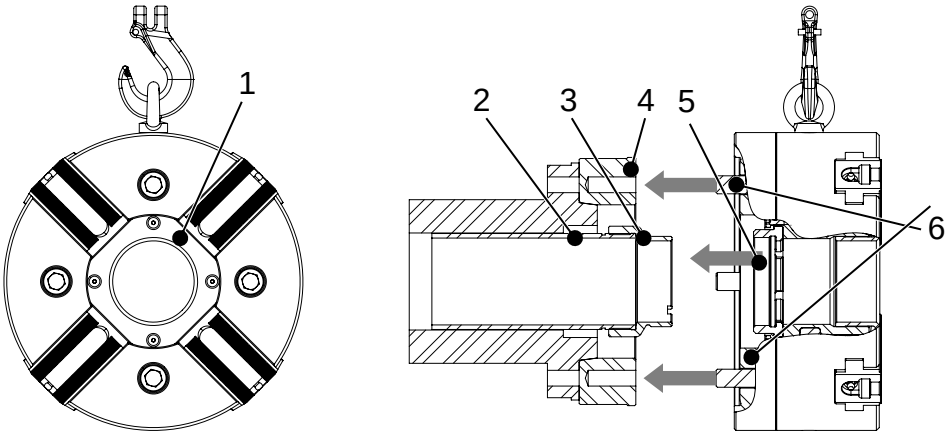


Fig. 3-4: Assembly of the chuck

Step 7 Screw in the fixing screws (6) included in the delivery (preferably strength class 12.9) and the groove nut (5) and tighten everything slightly (alternating pattern).

Step 8 Remove the hoist and eye bolt.

Step 9 Set the clamp cylinder to the lowest pressure and set the cylinder to 'chuck closed'.

Step 10 Check the axial and radial runout of the chuck
Depending on the size of the chuck, the following tolerances must be observed:

VT-S	013-021	026-031	040-080
Concentricity tolerance [mm]	0.02	0.03	0.05
Axial runout tolerance [mm]	0.02	0.03	0.05

Table 3-1: Concentricity/axial runout tolerance

Step 11 If necessary, align the chuck with light strokes using a plastic hammer on the outside diameter.

Step 12 Tighten the groove nut (5) with the supplied chuck key (7) and an extension and a ratchet or a cross handle. Then tighten the fixing screws (6) using a torque wrench (8) (alternating pattern).

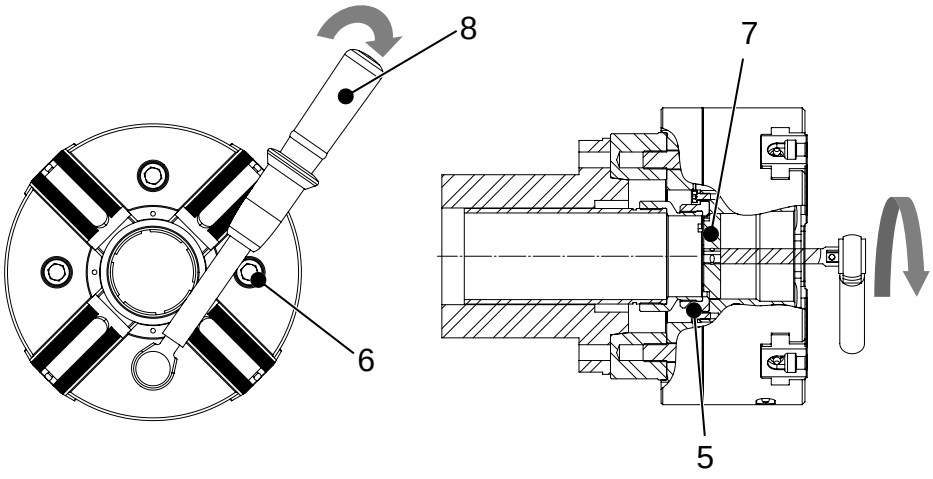


Fig. 3-5: Tighten the screws with correct torque

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 axial and radial runout of the chuck again as outlined in table 3-1.

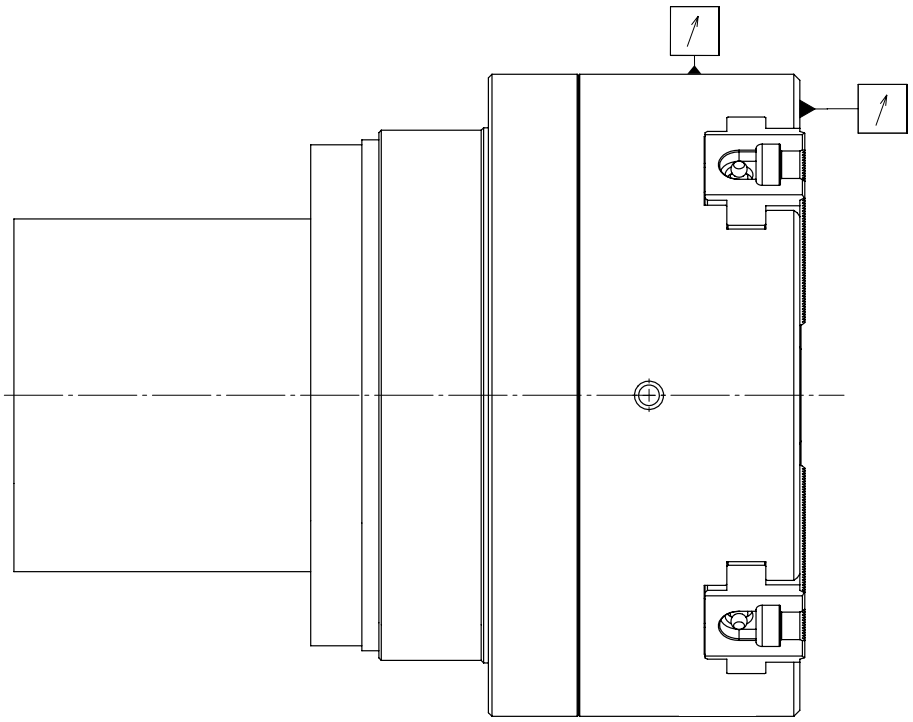


Fig. 3-6: Chuck mounted on intermediate flange

3.4 INSERTING THE JAWS

3.4.1 GENERAL

Depending on the workpiece to be machined, soft or hard jaws can be attached.

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 ASSEMBLY OF THE JAWS

Step 1 Insert the slot nut (1) into the chuck with the chamfer facing the centre.

Step 2 Insert the clamping jaws (2) into the interlocking mechanism and screw in two cheese-head screws (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) on the non-chamfered end of the slot nut with a torque wrench and then tighten the screw (3) on the chamfered end.

NOTICE

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

⚠ WARNING

Mounting the jaws requires at least two fixing screws, which are completely positioned inside the groove of the base jaw.

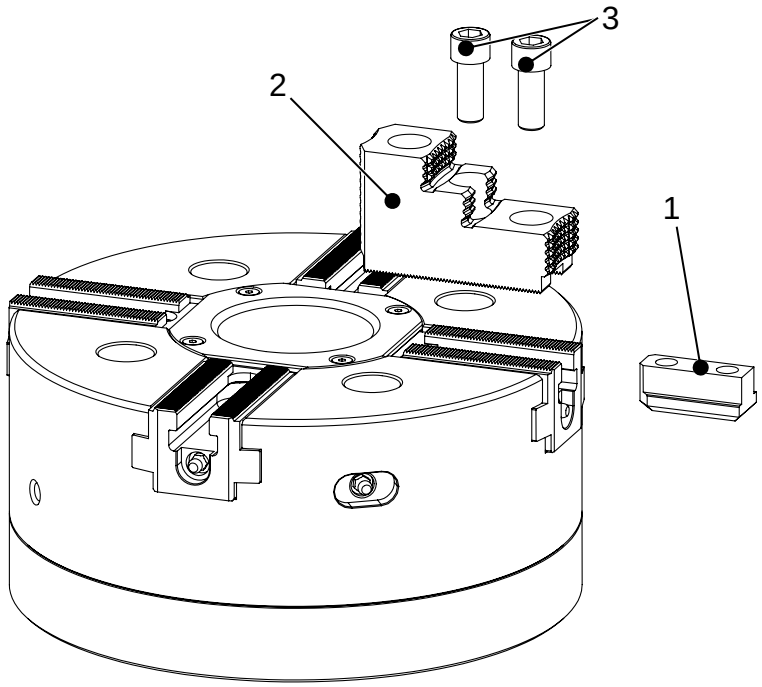


Fig. 3-7: Mount clamping jaws

3.4.3 ASSEMBLY OF THE JAWS (SLOT AND TENON)

Step 1 Insert the clamping jaws (1) into the Slot and screw in two cheese-head screws (2) 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 Tighten the screws (2) with a torque wrench and then tighten the screw (3) on the chamfered end.

NOTICE

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

⚠ WARNING

Mounting the jaws requires at least two fixing screws.

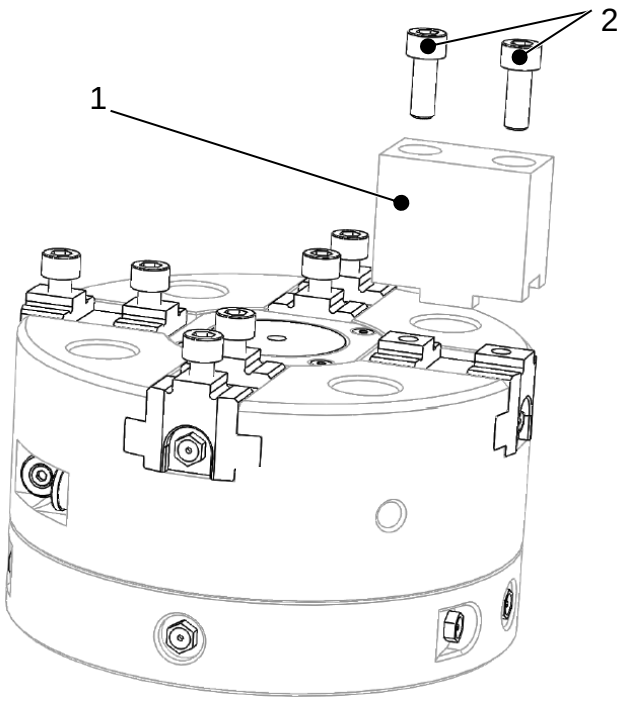


Fig. 3-8: Mount clamping jaws (Slot and Tenon)

3.5 FUNCTIONAL TEST

After installing the chuck, its function must be tested before first use. Especially the clamping force has to be considered:

- The clamping function of the chuck must be tested by operating the clamping cylinder (opening and closing) (see chapter 5.2.6).
- To check proper mounting on the machine spindle, check the jaw stroke (see chapter 5.2.7).
- If necessary, carry out a calculation of the permissible rotational speed in accordance with the VDI 3106 guideline.
- Measure the clamping force with a suitable clamping force gauge using 2 jaws (1/2 total clamping force) or 4 jaws.

4 OPERATION

4.1 GENERAL

This chapter provides 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 that the chuck is properly installed on the machine tool.

Step 2 Make sure that a functional test has been 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 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 Insert the workpiece into the chuck with both hands and clamp it by pressing the foot switch.

Step 2 Check the two stroke controls (1) to ensure that the workpiece is securely clamped (see chapter 4.3.1 to VT-S 040 and 4.3.2 from VT-S 050)

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

DANGER ***An unsafely clamped workpiece increses 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 the operation of the machine as outlined in the instruction manual of the machine tool. Do not exceed the permissible rotational speed.

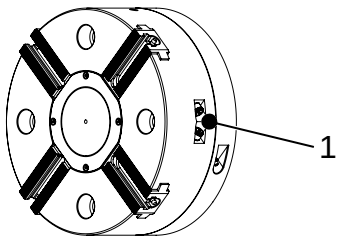


Fig. 4-1: Stroke monitoring

DANGER ***maximum clamping diameter = chuck diameter***

4.3.1 STROKE CONTROL VT-S 013 – VT-S 040

In the clamped condition of the workpiece, the reference surface, as shown in Fig. 4-2, must be in the range of the offset (green) diameter. This rules out that the base jaw in the chuck moves towards the block and the workpiece is not clamped securely.

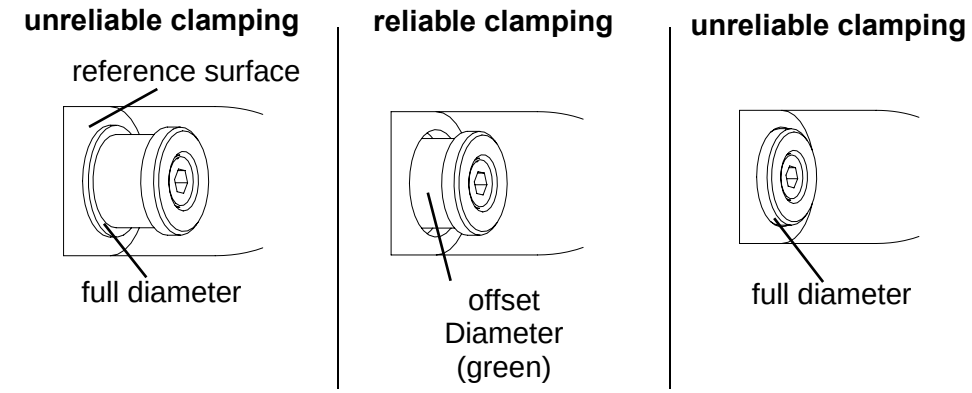


Fig. 4-2: Stroke control V-tach VT-S 013 – VT-S 040

4.3.2 STROKE CONTROL VT-S 050 – VT-S 080

In the clamped state of the workpiece, the trailing edge of the base jaw must be between the outer and inner surfaces shown in Figure 4-3. This rules out that the base jaw in the chuck moves towards the block and the workpiece is not clamped securely.

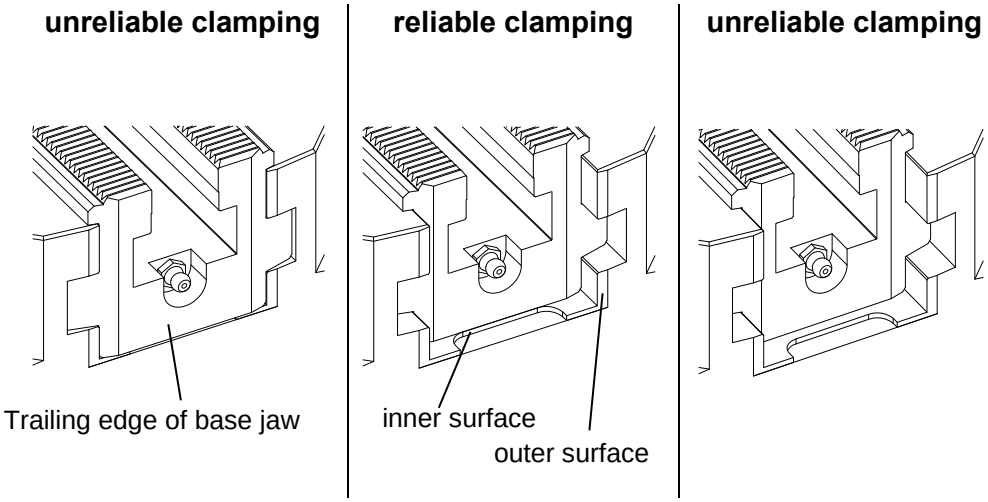


Fig. 4-3: Stroke control VT-S 050 – VT-S 080

4.4 REGULAR WORK DURING OPERATION

- Perform periodic visual inspection for contamination. If necessary, stop the operation and clean the chuck/machine (see chapter ‘5 - Maintenance’).
- Also observe the operating instructions of the machine tool.

5 SERVICE AND MAINTENANCE

5.1 GENERAL

To ensure trouble-free operation, the INOFlex® chuck and machine tool must be subjected to regular maintenance. This includes a functional test and visual inspection for damage and wear.

⚠ WARNING ***In addition, observe the operating instructions of the machine tool in which the chuck is installed.***

Keep the necessary materials handy to clean the chuck.

5.2 MAINTENANCE

5.2.1 MAINTENANCE DEADLINES

Perform all stipulated maintenance work on time.

5.2.2 INSPECTION WORK

The carrying and moving parts must be checked for flawless condition before each use. Defective parts must be replaced immediately with flawless 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.***

After completion of the maintenance and repair work, check all safety devices of the machine for proper function. Protective cladding and protective covers must be installed correctly.

5.2.3 LUBRICANT

Use only lubricant OKS 265 from HWR Spanntechnik GmbH (or other greases approved by HWR).

5.2.4 SAFETY INSTRUCTIONS

Before starting maintenance and service work, turn off the machine tool and secure the machine against being turned on again (see operating instructions of the machine tool).

5.2.5 MAINTENANCE SCHEDULE

before each use of the chuck
Visual inspection for condition and function
Table 5-1: Maintenance work before each use

during operation
frequent visual inspection for contamination
Table 5-2: Maintenance work during operation

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

	VT-S 013 – VT-S 021	VT-S 026 – VT-S 040	VT-S 050 – VT-S 080
Clamping force monitoring with suitable clamping force measuring device: measured over 2 jaws (1/2 total clamping force) or over 4 jaws	after 2000 clamping strokes	after 1000 clamping strokes	after 500 clamping strokes
Monitoring of the base jaw stroke	after 2000 clamping strokes	after 1000 clamping strokes	after 500 clamping strokes
Table 5-4: Maintenance work after clamping strokes			

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

5.2.6 MONITORING OF THE CLAMPING FORCE

According to the maintenance schedule, the clamping force of the chuck must be checked regularly. Use a suitable measuring device with to measure the clamping force using 2 jaws (1/2 total clamping force) or 4 jaws.

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

⚠ WARNING ***The achieved clamping force can change after prolonged operation of the chuck.***

Procedure for excessive clamping force

Increasing the measured clamping force, in comparison to the value specified in chapter 7.8, does not constitute a malfunction of the chuck. If the clamping force is more than 10% above the value specified in chapter 7.8, the operator must record and use a new characteristic curve for the relationship between actuating force and clamping force (template in chapter 9.1).
The maximum actuating force of the chuck must be reduced in this case so that the maximum clamping force specified in chapter 7.8 is not exceeded.

Procedure for insufficient clamping force

If the clamping force is more than 15% below the value specified in chapter 7.8, the chuck must be re-lubricated (see chapter 5.3).
If the desired total clamping force is not achieved even after lubricating all grease nipples, then the chuck must be disassembled and completely cleaned (see chapter 5.4).
If the total clamping force cannot be achieved even after complete cleaning, including relubrication of the chuck, the chuck must be sent to the manufacturer for inspection.

5.2.7 MONITORING OF THE BASE JAW STROKE

According to the maintenance plan, the stroke of the base jaws must be checked regularly. The values from the technical specifications (chapter 7.8) serve as a reference.
If the measured stroke per base jaw does not align with the table value, the chuck must be disassembled and completely cleaned (see chapter 5.4).
If the required stroke per base jaw cannot be achieved even after complete cleaning, the chuck must be sent to the manufacturer for inspection.

5.3 LUBRICATING

NOTICE

To maintain the required clamping force, the chuck MUST be relubricated at regular intervals (maintenance schedule, see Table 5-4).

NOTICE

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

Lubricate all grease nipples (1) with the grease gun. About 5 strokes with the grease gun per grease nipple are sufficient.

⚠ WARNING

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

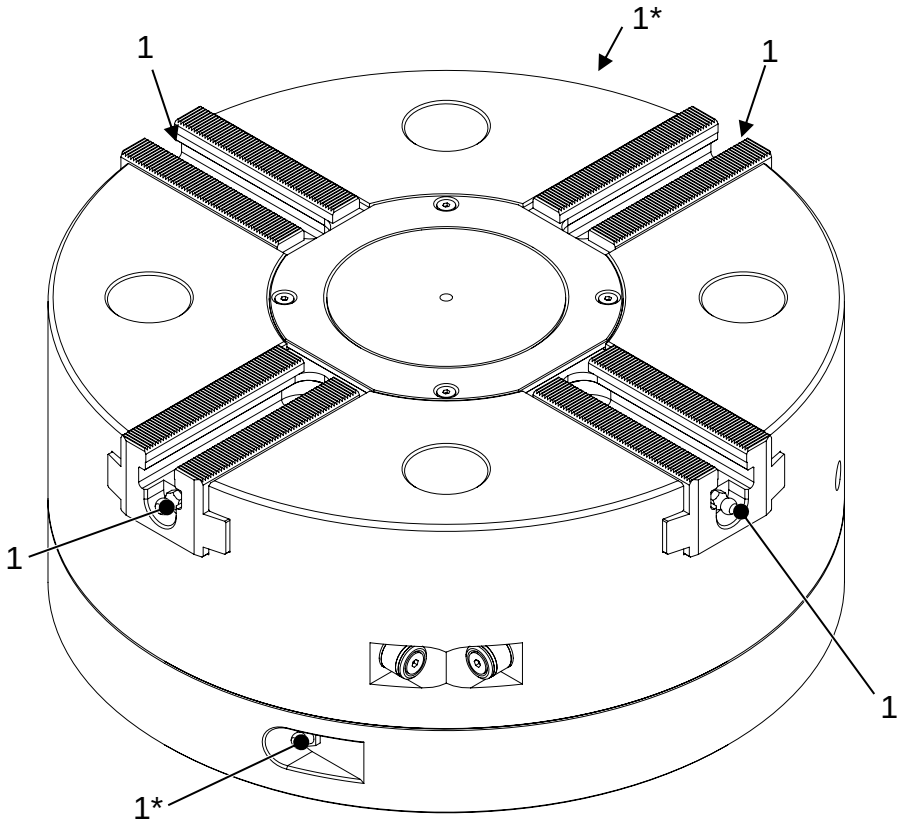


Fig. 5-1: Grease nipple

*) are in the front surface of the chuck from VT-S 050

5.4 DISMANTLING / CLEANING / MOUNTING THE CHUCK

To ensure proper clamping force, the chuck must be removed at regular intervals, cleaned and then lubricated again.

NOTICE **Maintenance schedule, see table 5-4.**

Dismantling and cleaning

Step 1 Lay the chuck on the workbench with the jaw side down.

Step 2 Remove the fixing screws (1).

Step 3 Remove the lower part (3) by pressing it down with the fixing screws (1) in the threaded holes (2).

Step 4 **(This step is omitted from VT-S 050 and up)**
Remove the stroke control (9) by loosening the respective tube mounting screw. The pins are released from the parallel slider and can be removed.

Step 5 Lift the inner parts out of the chuck (7) by lifting them over the groove nut (4).

Step 6 Now separate all parts from each other and lay them down one by one. To do this, loosen the screws that connect the retaining ring (5) with the groove nut (4) and remove the circlip (6).

⚠ WARNING ***The circlip (6) must be replaced by a new one after each removal.***

⚠ 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 the base jaws (8) out of the chuck body (7).

Step 8 Clean all parts thoroughly. If necessary, use cold cleaner/petroleum.

Step 9 Check all components. Replace defective parts before recommissioning the chuck.

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

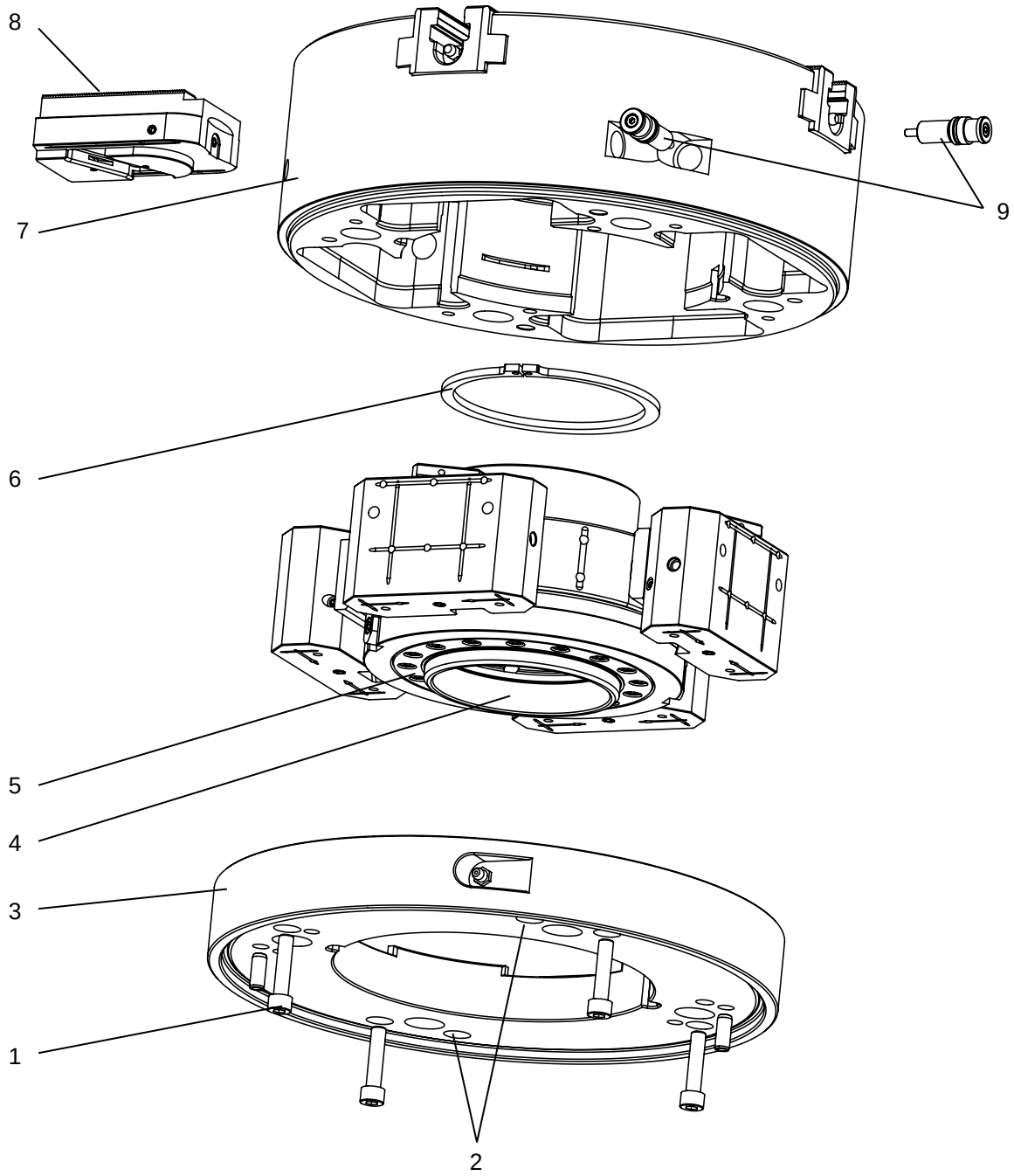


Fig. 5-2: Disassemble/assemble chuck (VT-S 013 – VT-S 080)

5.5 ASSEMBLY

NOTICE ***The internal components of the chuck can be inserted using an auxiliary tool. Please contact the manufacturer HWR Spanntechnik GmbH.***

⚠ WARNING **There are marking points on the base jaws, the tangential sliders and the upper part of the housing for the arrangement of the components in the chuck.**

Step 1 Mount the chuck in reverse order of the disassembly steps. During assembly, lubricate all sliding and guide surfaces with lubricant OKS 265 from HWR Spanntechnik GmbH (or other greases approved by HWR).

Step 2 After assembly, lubricate the chuck with the lubricant by HWR Spanntechnik GmbH via the six grease nipples (s. chapter5.3).

Step 3 Check the clamping force with a suitable clamping force measuring device:
measured over 2 jaws (1/2 total clamping force) or over 4 jaws

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

5.6 WORKING AFTER A LONGER DOWNTIME

The technical maintenance personnel must carry out the following tasks before each start-up after a long standstill phase:

after a long downtime
Visual inspection for condition and function of the chuck
Clean chuck

Table 5-5: after a long period of inactivity

5.7 DISPOSAL

Have the chuck properly removed by a trained specialist and disassembled into its components.

Handle and dispose of used substances and materials, in particular greases and solvents, properly and in accordance with state regulations.

6 MALFUNCTIONS

6.1 GENERAL

This chapter provides information about the course of action in the event of a malfunction.

6.2 IN THE EVENT OF A MALFUNCTION

Step 1 Before troubleshooting, turn off the machine tool and secure the machine against being turned on again (see operating instructions of the machine tool).

Step 2 Correct the error.

SAFETYINSTRUCTIONS

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 MALFUNCTIONS AND THEIR REPAIR

Error	Cause	Repair
Only three jaws are attached to the component.	First gripping pair of jaws hinders the balance.	During installation, pay attention to the contour so that the component does not tilt.
Jaw(s) stuck in guide rail	Base jaw deformed, contact surface, jaw uneven, dirty or damaged	Check jaws, clean, and replace if necessary.
	Base jaw deformed, tightening torque of fixing screws too high	Observe the specified tightening torque.
	Base jaw deformed	Pay attention to the sequence of the slot nut attachment (see 3.4.2)
	no original jaw(s) used	Use original jaws.
Runout error	Jaws are not correctly turned out or milled	Turn the jaws out again or mill them.
	Jaw inserted into wrong guide rail	Insert jaw in guide rail with matching marking.
	Base jaws dirty or damaged	Clean or replace base jaws.
	Fixing screws of the top jaws too short or too long or overstretched	Check screw depth, replace screws, observe tightening torque.
	Swing of the jaws too large	Change jaws or clamping method.
	Chuck damaged or worn	Send the chuck to the manufacturer (HWR Spanntechnik GmbH) for testing.
strong vibration of the machine spindle	Imbalance caused by workpiece or jaws	Altering/reworking jaws or adding weight on the chuck body.
	Imbalance on: • Machine spindle • Driver • Chuck flange	Check concentricity step by step on various components. Align, balance or replace components.
	Imbalance due to collision	Send the chuck to the manufacturer (HWR Spanntechnik GmbH) for testing and repair.

Table 6-1: Possible causes of malfunctions and their repair

6.3 POSSIBLE CAUSES OF MALFUNCTIONS AND THEIR RECTIFICATION - CONTINUED

Error	Cause	Repair
Chuck does not close	no hydraulic pressure	Check hydraulic system.
	Clamping cylinder does not move	Check path control on the cylinder.
Clamping force decrease	short jaw stroke for large number of identical workpieces deficient lubricating film	To build up the lubricating film and to achieve full clamping force, actuate the chuck without workpiece several times with full stroke.
	Insufficient lubrication Lubricant	Lubricate chuck. Check lubricant, change if necessary.
	dirty chuck	Disassemble, clean and lubricate the chuck.
	Chuck function error	Check all components, replace damaged components with original components, if necessary send chuck to manufacturer (HWR Spanntechnik GmbH) for inspection and repair.
	Clamping cylinder leaking	Repair the clamping cylinder.
	Hydraulic system does not generate pressure	Repair the hydraulic system.

Table 6-1: Possible causes of malfunctions and their rectification

7 TECHNICAL SPECIFICATIONS

7.1 GENERAL

All essential technical specifications for the INOFlex® power chuck are contained in this chapter. The data is listed as tables and structured based on individual sizes.

7.2 GENERAL PRODUCT INFORMATION

Lifespan	25,000 operating hours
tensionable workpieces	Commercially available steels, cast metals, non-ferrous metals and plastics
Table 7-1: General product information	

7.3 EQUIPMENT

Lubricant	OKS 265 (or other grease approved by HWR)
Table 7-2: Equipment	

NOTICE

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

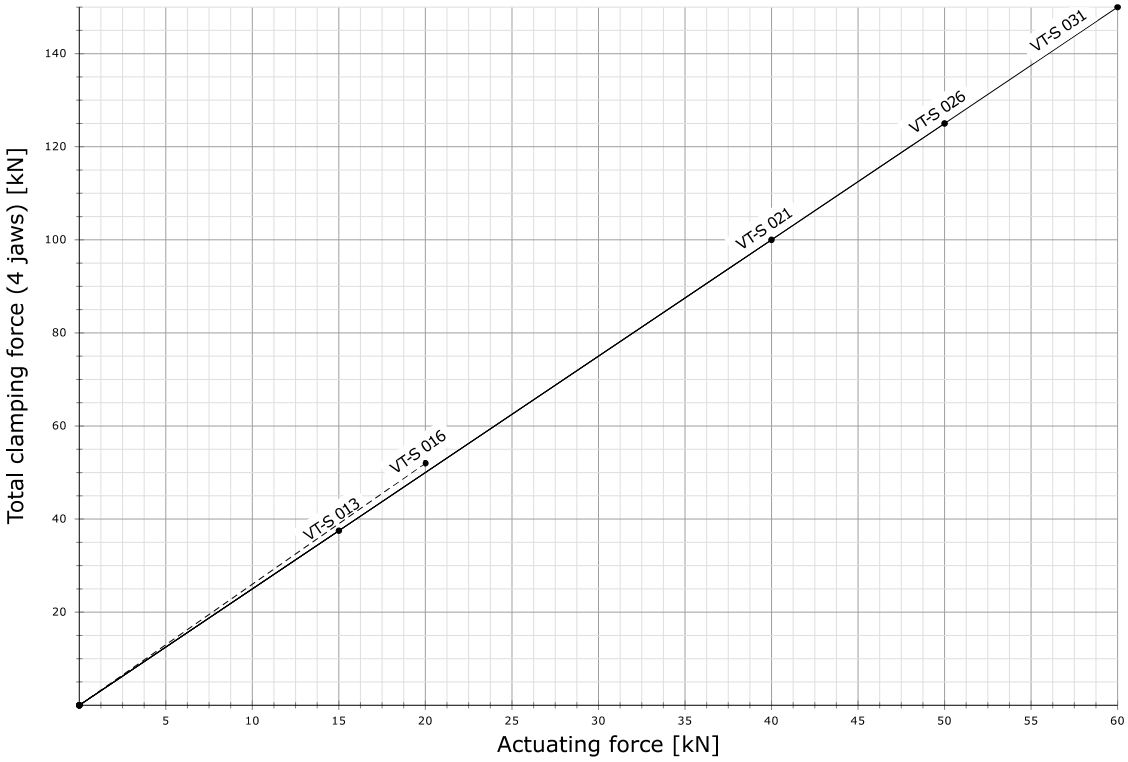
7.4 ENVIRONMENTAL CONDITIONS

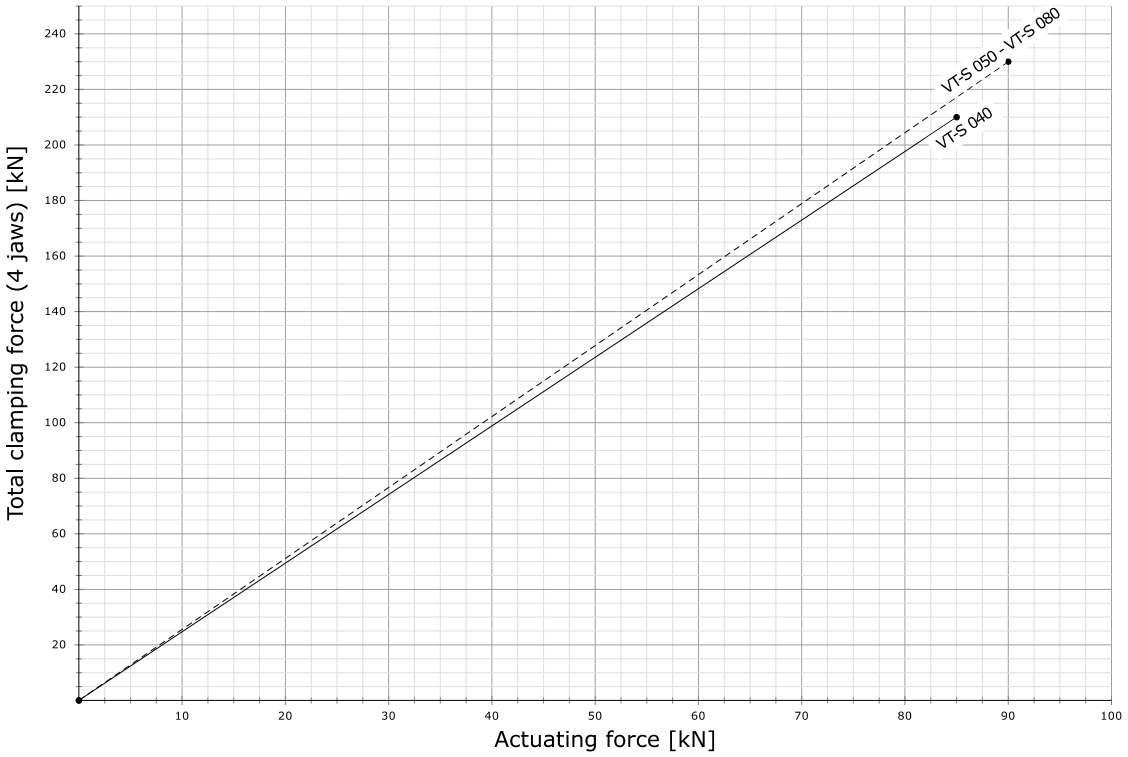
Operation	For temperature range, refer to the instruction manual of the tools
Storage	no temperature restriction
relative humidity	5-85%
Location of the machine tool	level, firm surface sufficiently ventilated
Table 7-3: Environmental conditions	

7.5 OTHER DOCUMENTS

Spare parts list
declaration of incorporation
declaration of knowledge of the instructed personnel
Table 7-4: Other documents

7.6 CLAMPING FORCE / ACTUATING FORCE DIAGRAM

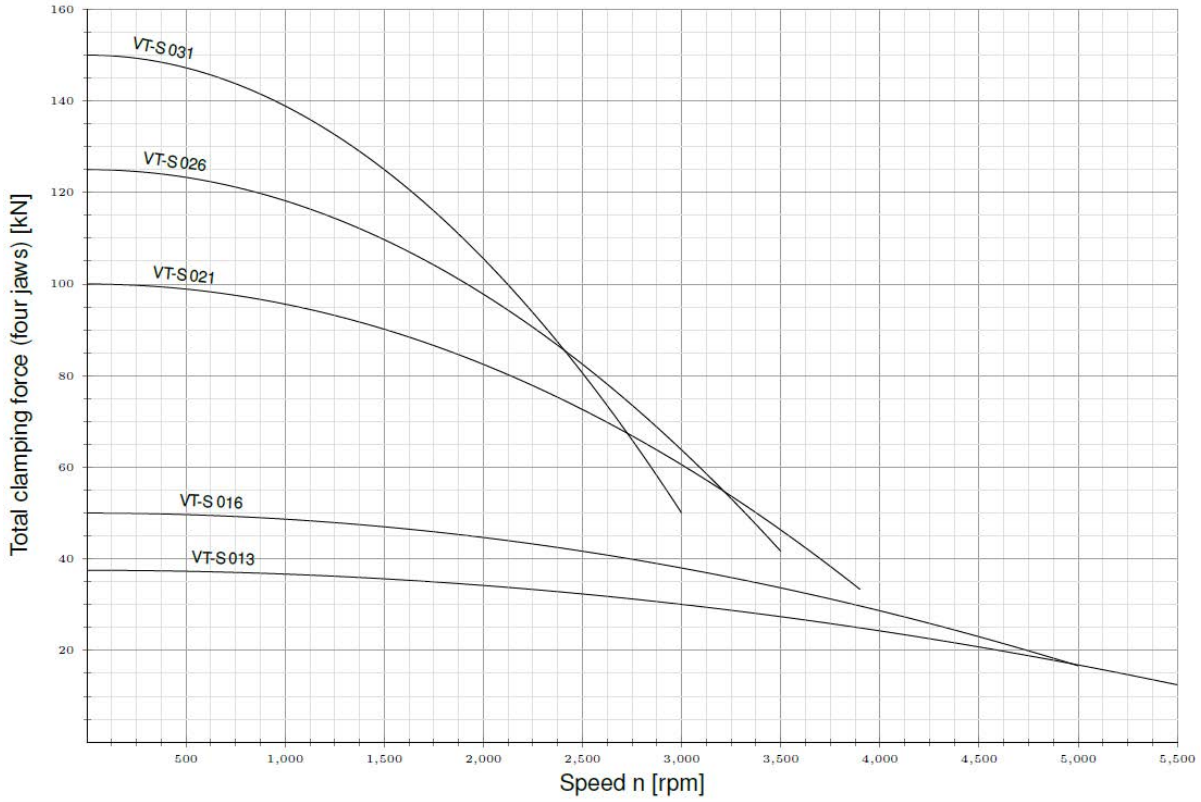


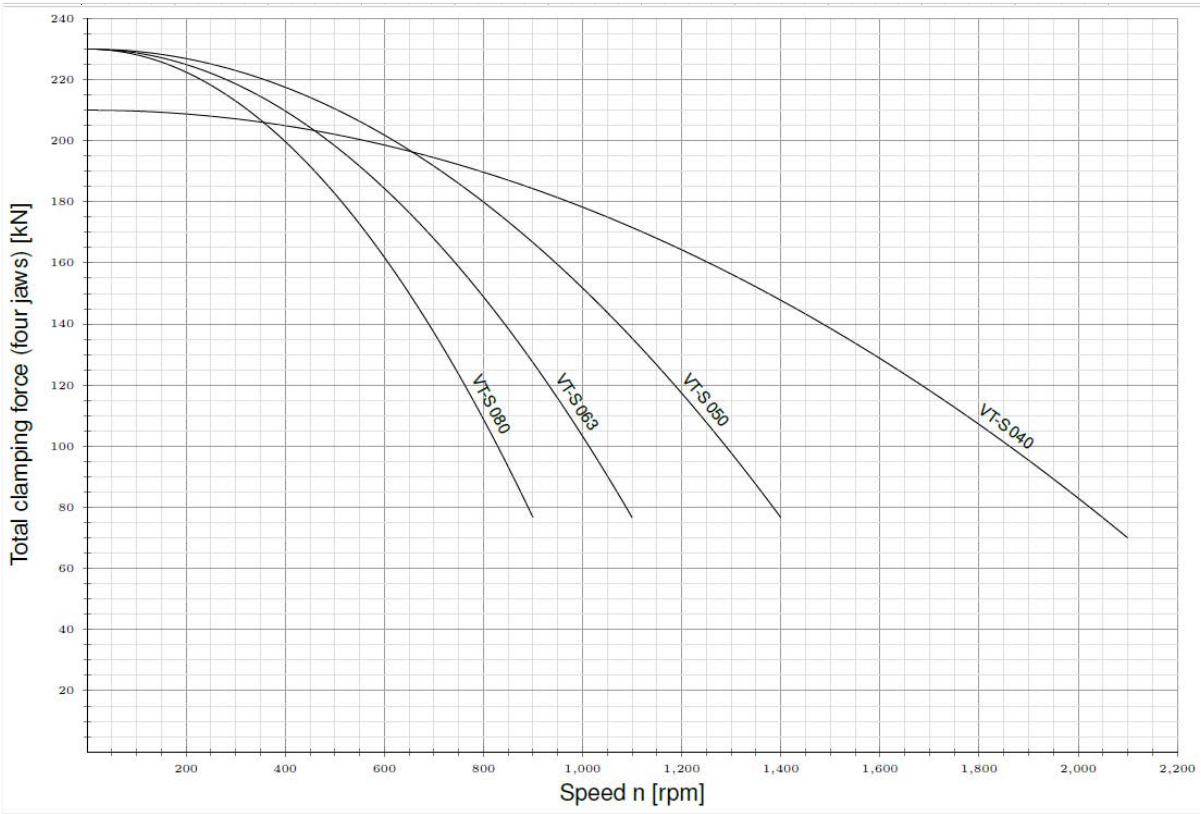


⚠ WARNING

The diagrams apply to chucks in the delivery state. The clamping force curve must be resumed if necessary (see chapter 5.2.6).

7.7 CLAMPING FORCE / ROTATIONAL SPEED DIAGRAM





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7.8 TECHNICAL SPECIFICATIONS

Type		VT-S 013	VT-S 016	VT-S 021	VT-S 026	VT-S 031	VT-S 040	VT-S 050	VT-S 063	VT-S 080
ID No.		845113	845116	845121	845126	845131	845140	845150	845163	845180
Diameter	mm	135	168	218	264	315	400	500	630	800
Through-hole	mm	32	46	52	72	91	111	142	165	165
Stroke per jaw	mm	2.7	3.4	4.3	5	5.5	6.2	6.2	6.2	6.2
Compensating stroke per jaw	mm	1-8	2.3	3.3	4	4.4	5	4.5	4.5	4.5
Piston stroke	mm	12	15	19	22	24	27	27	27	27
maximum operating force	kN	15	20	40	55	60	85	90	90	90
maximum clamping force	kN	37.5	50	100	125	150	210	230	230	230
maximum rotational speed *	1/min	5500	5000	3900	3500	3000	2100	1400	1100	900
Mass (without jaws)	kg	6.5	12	26	42	64	119	207	315	498
Moment of inertia	kg·m²	0.05	0.05	0.19	0.42	0.89	2.69	7.4	17.2	41.0
Slot nut	--	--	GP05	GP07	GP11	GP11	GP13	GP21	GP21	GP21
Standard jaws	According to chuck data sheet - available in our jaw finder under https://hwr-usa.com/produkte/unijaws-en/									

Table 7-5: Technical specifications

* Balancing quality according to DIN ISO 1940-1: G 6.3 (ungreased)

NOTICE

The specified data for the maximum camping force apply to the chuck in delivery state. The clamping force may potentially change. Please refer to chapter 5.2.6.

⚠ DANGER

maximum clamping diameter = chuck diameter

7.9 CONNECTING DIMENSIONS

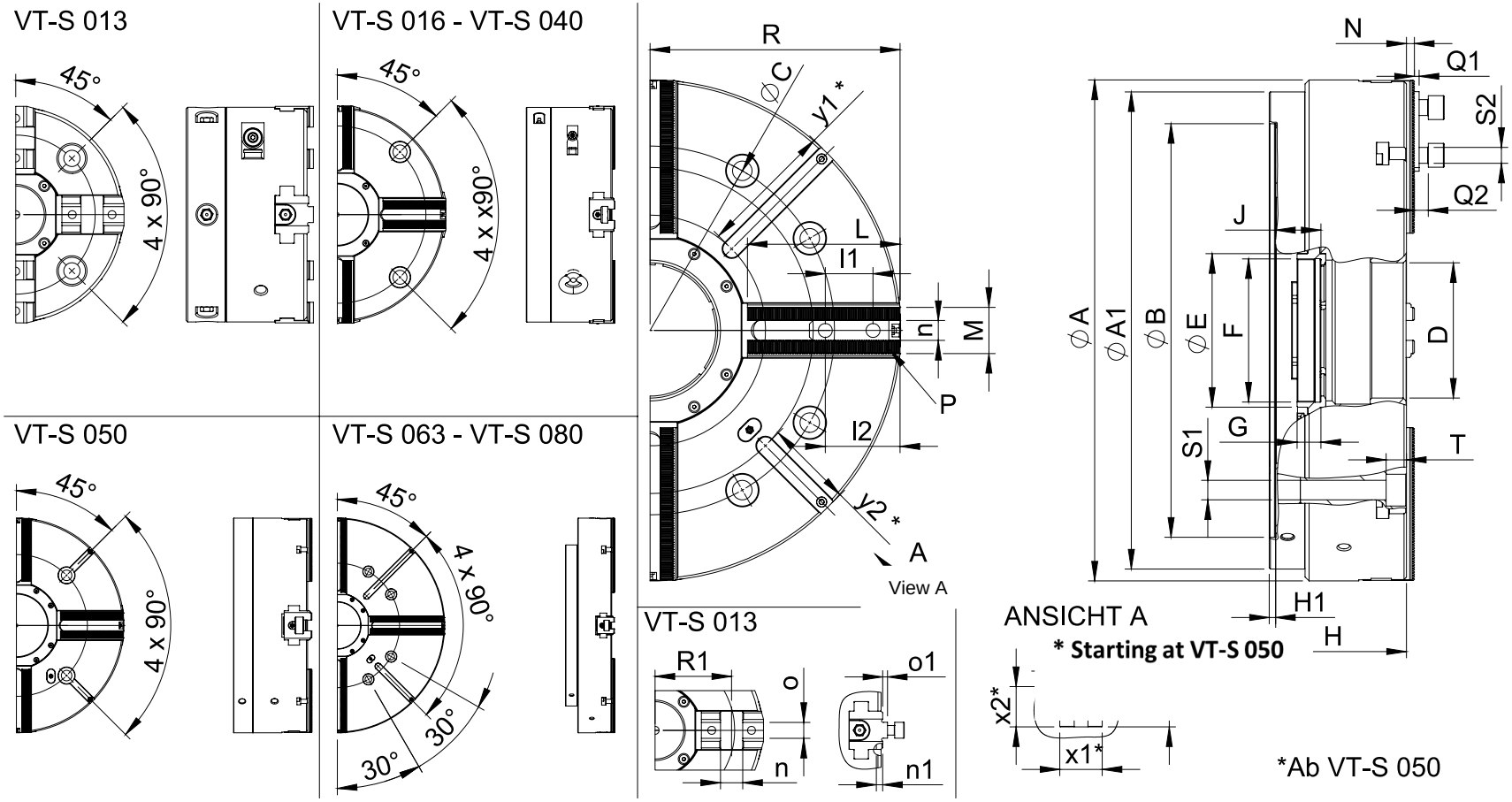

Fig. 7-1: VT-S series \ [technical changes reserved]

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7.10 CONNECTING DIMENSIONS

Type			VT-S 013	VT-S 016	VT-S 021	VT-S 026	VT-S 031	VT-S 040	VT-S 050	VT-S 063	VT-S 080
	A	mm	135	168	218	264	315	400	500	630	800
	A1	mm	135	168	218	264	315	400	500	600	600
	B *H6*	mm	125	140	170	220	300	380	380	520	520
	C	mm	100	104.8	133.4	171.4	235	330.2	330.2	463.6	463.6
	D	mm	32	46	52	72	91	111	142	165	165
	E	mm	48	--	67	92	112	142	167	193	193
	F	mm	M40x1.5*	M56x1.5	M60x2	M85x2	M100x2	M125x2	M155x2	M180x2	M180x2
	G	mm	18	18	20	20	24	30	30	30	30
	H	mm	72	88	109.2	125	134	154	164.5	164.5	164.5
	H1	mm	4	5	5	5	5	6	8	8	8
min. / max.	**J**	mm	12 / 24	18 / 33	17 / 36	10 / 32	16 / 40	29.6 / 56.6	30 / 57	30 / 57	30 / 57
	L	mm	--	46.5	61.5	78	88.5	117	147	192	276
	M	mm	24	32	34	42	46	52	58	58	58
	N	mm	4	1.5	2	2	2	5	10	10	10
Interlocking	**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	3	2.5	3	3	3	3.5	6	6	6
	Q2	mm	7.5	10.5	11.5	11.5	11.5	11.5	16.5	16.5	16.5
Chuck opened	**R**	mm	68	84.9	108.9	134.1	160	202.2	249.3	314.3	399.3
Chuck opened	**R1**	mm	48	--	--	--	--	--	--	--	--

Table 7-6: Connecting dimensions

*Static locknut

Type			VT-S 013	VT-S 016	VT-S 021	VT-S 026	VT-S 031	VT-S 040	VT-S 050	VT-S 063	VT-S 080
	S1	mm	10.5	10.5	12.5	16.5	22	26	24.5	24.5	24.5
	S2	mm	M6 x 16	M8 x 22	M10 x 25	M12 x 30	M12 x 30	M16 x 35	M20 x 55	M20 x 55	M20 x 55
	T	mm	12	12	17.2	26	22	26	30	25.5	25.5
	l1	mm	25	18	20	30	30	30	60	60	60
min. / max.	**l2**	mm	26.9 / 29.6	22 / 39.5	25 / 52	35 / 62	35 / 73	40 / 103	70 / 121	70 / 158	70 / 242
	n *H8*	mm	14	10	12	16	16	21	25	25	25
	n1	mm	4	--	--	--	--	--	--	--	--
	o *f7*		10	--	--	--	--	--	--	--	--
	o1	mm	3	--	--	--	--	--	--	--	--
	x *H12*	mm	--	--	--	--	--	--	14	22	22
	x1	mm	--	--	--	--	--	--	23	40	40
	x2	mm	--	--	--	--	--	--	25	38	38
	x3	mm	--	--	--	--	--	--	9	16	16
	y1	mm	--	--	--	--	--	--	66	170	245
	y2	mm	--	--	--	--	--	--	66	110	185

Table 7-6: Connecting dimensions [continued]

7.11 MAXIMUM TIGHTENING TORQUES FOR FIXING SCREWS

Strength class	Standard	Thread								
		M5	**M6**	**M8**	**M10**	**M12**	**M14**	**M16**	**M20**	**M24**
		maximum 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 torques for fixing screws

8 SPARE PARTS

8.1 GENERAL INFORMATION

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

In this chapter you will find instructions about which information you will need for ordering spare parts from the manufacturer HWR Spanntechnik GmbH.

8.2 BASIC INFORMATION ON ORDERING SPARE PARTS

- Size: e.g. INOFlex® VT-S 026
- Identification number (ID no.)
- Name of the spare part
- Quantity

8.3 ORDERING SPARE PARTS BY EMAIL

NOTICE

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

To order a replacement part we recommend the following procedure:

Step 1 Find the desired spare part in Figure 8-1.

Step 2 Enter the minimum order details in the email (see Section 8.2).

Step 3 Send the order to HWR Spanntechnik GmbH with your company address.

NOTICE

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

8.4 ORDERING SPARE PARTS 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.

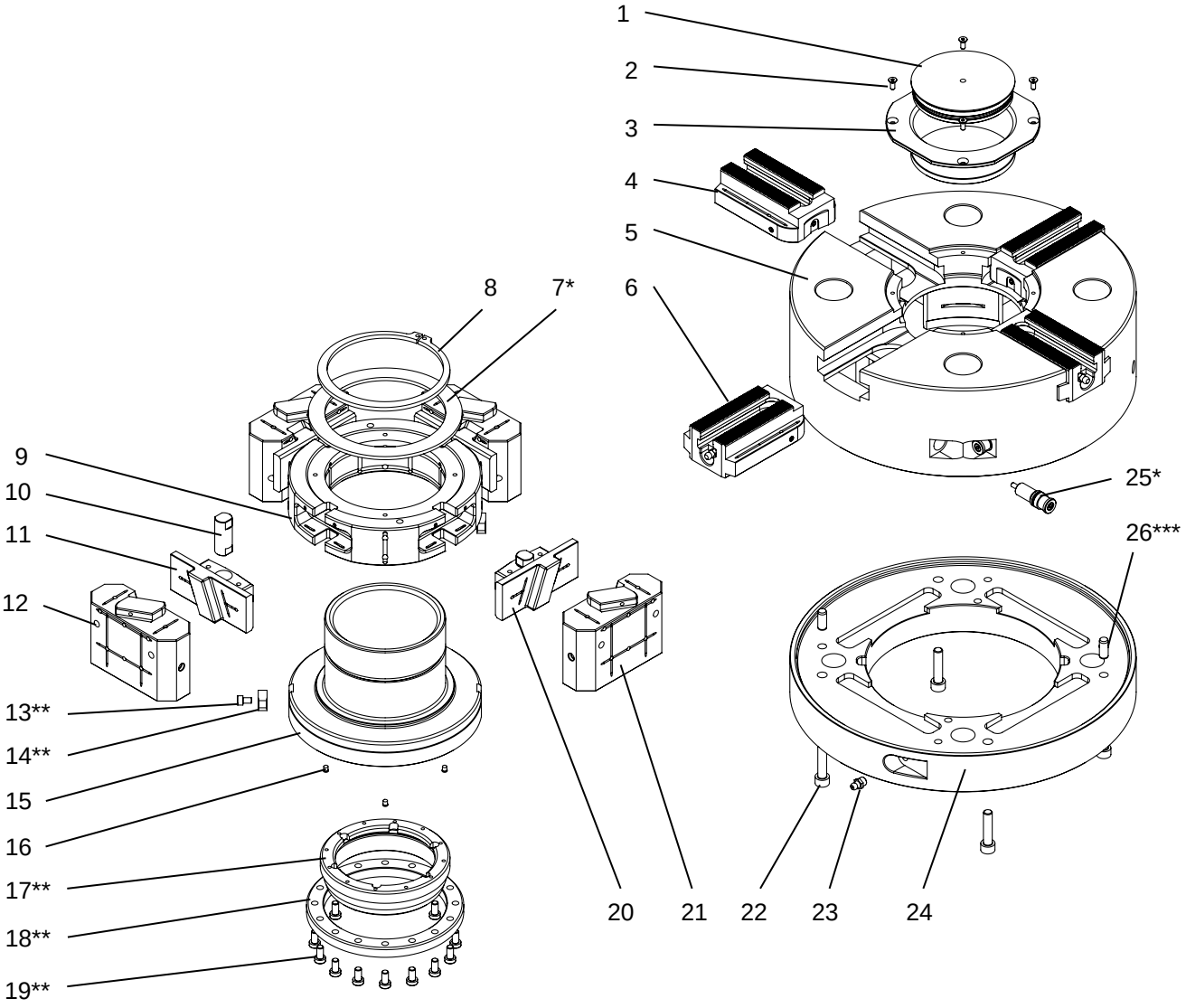
Step 3 Clearly indicate the desired spare part (s) in the figure and in the parts list.
Also enter the desired quantity if it should deviate from the quantity already indicated.

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



8-1: Spare parts

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Pos.	Designation
1	Cover
2	Countersunk screw
3	Sealing bush
4	Base jaw 1/3
5	Upper part of the housing
6	Base jaw 2/4
7 *	Support disc *
8	Circlip
9	Tension ring
10	Compensation pin
11	Driver 1
12	Tangential slider 1
13 **	Cylinder-head bolt (for parallel key) **
14 **	Parallel key **
15	Cable guiding
16	Spring-loaded pressure piece
17 **	Grooved nut **
18 **	Retaining ring **
19 **	Cylinder head bolt (for retaining ring) **
20	Driver 2
21	Tangential slider 2
22	Cylinder head screw (for lower housing part)
23	Grease nipple
24	Lower part of the housing
25 *	Stroke control pen *
26 ***	Cylindrical pin ***

Table 8-1: Spare parts list

* not applicable du to type and version

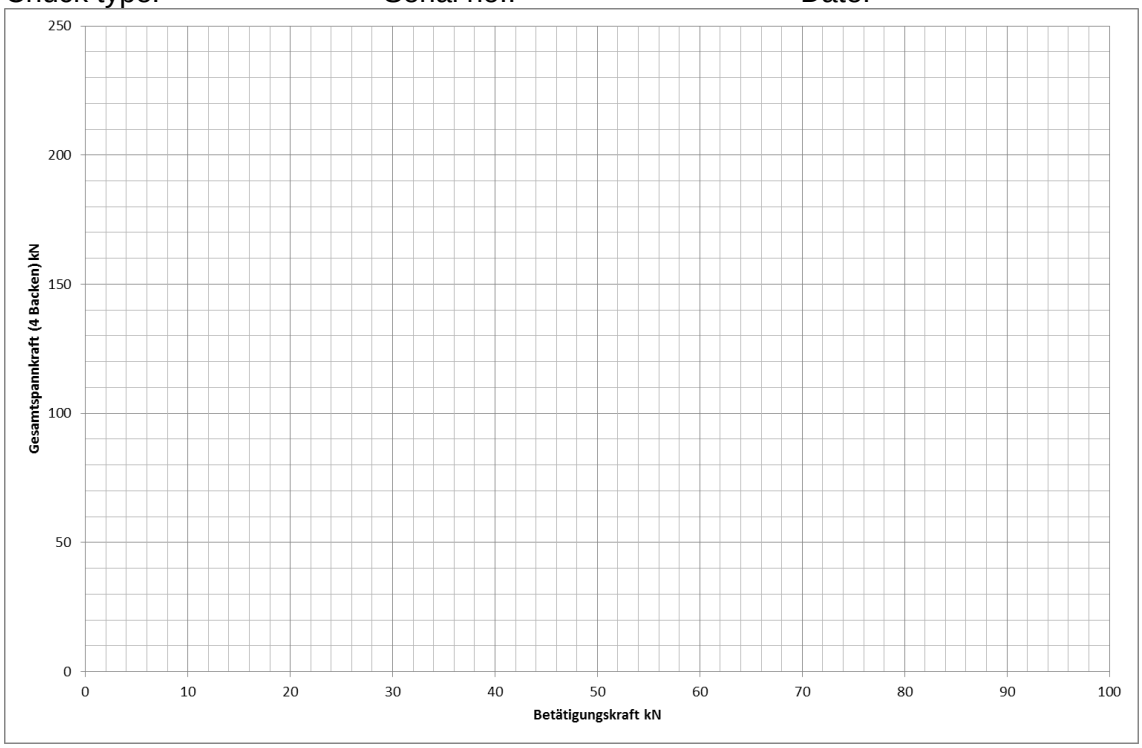
** omitted from VT-S 013 – VT-S 016

*** From VT-S 050 replaced by fitting groove slot nut incl. cylinder-head bolt

9 NOTES

9.1 CLAMPING/ACTUATING FORCE DIAGRAM (TEMPLATES)

Chuck type: Serial no.: Date:



Chuck type: Serial no.: Date: