

Installation manual

EN

Micro mandrel

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1 General

1.1 Information about this manual

This manual enables safe and efficient handling of the clamping device.

The manual is a component of the clamping device and must be kept in the immediate vicinity of the clamping device where it is accessible for personnel at all times. Personnel must have carefully read and understood this manual prior to starting all tasks. The basic prerequisite for safe work is compliance with all the safety instructions and handling instructions in this manual.

Illustrations in this manual are provided for a basic understanding and may deviate from the actual model of the clamping device.

It is assumed that the reader is familiar with standard procedures, such as cleaning the mounting surfaces.

1.2 Explanation of symbols

Safety instructions

Safety instructions are indicated by symbols in this operating manual. The safety instructions are introduced by signal words that express the scope of the hazard.

The safety instructions must be strictly adhered to. You must act prudently to prevent accidents, personal injury, and material damage.



DANGER

... indicates an imminent dangerous situation that can result in death or serious injury if it is not avoided.



WARNING

... indicates a possible dangerous situation that can result in death or serious injury if it is not avoided.



CAUTION

... indicates a possible dangerous situation that can result in minor or light injury if it is not avoided.



NOTE

... indicates a possible dangerous situation that can result in material damage if it is not avoided.

Tips and recommendations



... indicates useful tips and recommendations, as well as information for efficient and trouble-free operation.

1.3 Limitations of liability

All information and instructions in this operating manual have been provided under due consideration of applicable standards and regulations, the current state of technology, as well as our many years of experience.

The manufacturer assumes no liability for damage due to:

- Failure to follow the instructions in the manual
- Non-intended use
- Deployment of untrained personnel
- Unauthorized conversions
- Technical changes
- Use of non-approved spare parts
- Use of non-approved accessories

The actual scope of delivery can vary from the explanations and graphic representations provided in this manual in the case of special versions, if supplemental order options are desired, or on the basis of the latest technical changes.

The agreed obligations in the delivery contract, the general terms and conditions, as well as delivery conditions of the manufacturer, and the statutory regulations valid at the time the contract was concluded, apply.

1.4 Max. RPM



CAUTION!

The maximum permissible speed is marked on the product.

By the combination of a clamping device and an add on clamping device a reduction of the maximum permissible speed may be necessary.

- Of all RPMs of the groups specified, the **lowest given RPM** must always be used.

Note that the clamping force is influenced by the centrifugal force of the clamping elements.

- If necessary, adjust the machining force!

1.5 Copyright

This manual is protected by copyright and is provided exclusively for internal purposes.

Delivery of the operating manual to third parties, duplication in any form – including excerpts – as well as exploitation and/or communication of the content, are not permitted [except for internal use] without written approval from the manufacturer.

Actions to the contrary make damage compensation mandatory. We reserve the right to enforce additional claims.

1.6 Scope of delivery



All tools and accessories that are not included in the scope of delivery are marked as optional.

The scope of delivery of the clamping device includes:

- 1 micro mandrel

Optionally the scope of delivery of the clamping device includes:

- Workpiece end-stop

1.7 Spare parts



WARNING!

Safety risk if the wrong spare parts are used!

Incorrect or defective spare parts can cause damage, malfunction, or total failure; they can also impair safety.

- Only use manufacturer's original spare parts.

Only purchase spare parts from authorized dealers or direct from the manufacturer. Addresses are in the appendix.

1.8 Warranty terms

The warranty terms are included in the manufacturer's terms and conditions.

2 Safety

This section provides an overview of all the important safety aspects for optimal protection of personnel, as well as for safe and trouble-free operation.

2.1 Responsibility of the customer

The product is used in industrial applications. Consequently the owner of the product is subject to legal industrial safety obligations.

In addition to the safety instruction in this manual, generally valid safety and accident protection guidelines, and environmental protection guidelines as well as the machines' manual must be adhered to and complied with for the area of implementation of the device.

Note in particular that the status scans of the machine must be adjusted to the respective product.



DANGER!

Risk of injury due to thrown out parts!

Incorrect machine settings may lead to the throwing out of parts.

- The status scans the machine must be set to the respective clamping device.
- Regularly check the status scans of the machine, see chapter »Maintenance Schedule«. If the end position can not be reached the product may no longer be used.
- Observe the operating instructions of the machine.



WARNING!

Risk of injury!

Declining operating force, for example by declining energy supply, may cause serious personal injury.

- The product may be used only on machines where it is ensured, that during use, the operating force does not drop.

2.2 Personnel requirements



WARNING!

Danger of injury due to insufficient qualification!

Improper handling of the clamping device can cause serious injury or material damage.

- Only have activities performed by personnel who are qualified to perform these activities.

The following qualifications are cited in the operating manual for the various activity areas.

■ **Specialized personnel**

are personnel who due to their specialized training, skills, and experience, as well as knowledge of the applicable regulations, are capable of executing the tasks assigned to them and of recognizing and avoiding possible hazards on their own.

■ **Hydraulic specialist**

The hydraulic specialist has been trained for the particular task area in which he is active and is familiar with the relevant standards and regulations. Due to his specialized training and experience the hydraulic specialist can perform tasks on hydraulic equipment and recognize and avoid possible dangers on his own.

■ **Electric specialist**

The electric specialist has been trained for the particular task area in which he is active and is familiar with the relevant standards and regulations. Due to his specialized training and experience the electric specialist can perform tasks on electric equipment and recognize and avoid possible dangers on his own.

Only persons from whom it can be expected that they reliably execute their work are considered as personnel. Persons whose capability to react is impaired, for instance through drugs, alcohol, or medication, are not approved.

- Comply with age-specific and job-specific regulations that are applicable at the installation site when selecting personnel.

2.3 Intended use

The micro mandrel is designed for installation in a machine tool according to CE compliant.

The clamping device should only be mounted, operated, maintained, and cleaned by instructed, specialized personnel.

Intended use also includes compliance with all the instructions in this manual.

The clamping device is to be used for the case of application contractually agreed between the producer/deliverer and the user, as well as such cases of application described in the product description which are also in accordance with the technical values.

The safe function of the clamping device is, as far as it can be foreseen, guaranteed when it is used for the intended purpose in accordance with the appropriate safety regulations.

Any use that extends beyond the intended use, or any other use of the clamping device is considered to be misuse and can cause dangerous situations.



WARNING!

Danger due to misuse!

Misuse of the clamping device can cause dangerous situations.

Particularly refrain from the following uses of the clamping device:

- Use in machines other than machine tools.
- Use in machine tools with technical data other than that specified on the clamping device.

Claims of any type due to damage arising from non-intended use are excluded.

Unintended and improper use of the clamping device is for example

- If workpieces are not clamped properly
- If safety regulations are disregarded and persons are working at the power chuck without additional protective devices e.g. for machining.
- If the clamping device is used for machines or tools for which it is not intended.

2.4 Personal protective equipment

Wearing of personal protective equipment is required to minimize health hazards when working with the device.

- Always wear the protective equipment necessary for the respective task when working with the device.
- Follow the instructions that have been posted in the work area.

Always wear



For all tasks always wear:

Protective work clothing

is tight-fitting work clothing with low resistance to tearing, with tight sleeves, and without projecting parts. It is primarily used to protect against entanglement by moving machine parts.

Do not wear rings, chains, or other jewelry.



Safety footwear

for protection against heavy falling parts and slipping on slippery substrates.

For special tasks wear



Special protective equipment is required when executing special tasks. Separate reference is made to this equipment in the specific sections of this manual. This special protective equipment is explained below:

Hard hat

to protect against falling and flying parts and materials.



Protective goggles

to protect eyes from flying parts and liquid splashes.



Protective gloves

to protect hands from friction, abrasion, puncture wounds, or deeper injuries, as well as from contact with hot surfaces.

2.5 Special dangers

In the following section residual risks are cited that occur due to installation of the add on clamping device in a machine tool. In each case the residual risks that have been determined based on a risk analysis of the machine must be specified by the customer.

- Follow the safety instructions listed here and the warnings in the other sections of this manual to reduce health hazards and to avoid dangerous situations.

Moving parts



WARNING!

Danger of injury due to moving parts!

Rotating parts of the add on clamping device can cause serious injuries.

- Do not reach into moving parts or handle moving parts during operation.
- Pay attention to the clearance of moving parts.
- Do not open covers when the device is in operation.
- Be aware of afterrun time:
Prior to opening the covers ensure that all parts have come to a standstill.
- Wear tight-fitting protective work clothing in the danger zone.



CAUTION!

Risk of injury!

A special use-dependent or job-based design can result in variations in the clamping strokes and thus the clamping force.

- The notes on the associated clamping situations or product drawing must always be observed

2.6 Further warnings



WARNING!

Risk of injury!

Never start rotating the clamping device without a clamped workpiece.

- For operation any available clamping position must be clamped with a suitable workpiece.



WARNING!

Risk of injury!

Never reach for the clamping device while the spindle is rotating. Before starting to work on the mandrel, make sure the machine spindle cannot be put in motion.



WARNING!

Risk of injury!

By repeated reworking or wear and tear of the clamping surfaces sharp edges and burrs may appear and lead to severe cutting damages.



WARNING!

Damage of clamping device!

The clamping device may be released exclusively in the non-rotating condition!



CAUTION!

Risk of injury!

Bending into the machine work area can cause severe head injuries. Unexpected start up of the tool spindle can cause severe injury.

- Make sure that the system is pressure-free and that a restart of the machine can be excluded!



WARNING!

Risk of injury due to uncontrolled machine movement!

With manual loading of the clamping device with a workpiece uncontrolled machine movement can cause serious injury.

- The manual loading must be done in the jog mode!



NOTE!

Malfunction of the safety device by incorrect machine setting!

By a missing or incorrect setting of the machine-side limit switch the clamping control can become invalid.

- In interfaces where no constructive idle stroke is taken into consideration, it must be ensured that the machine-side limit switch control is adjusted to the stroke of the clamping device.



NOTE!

In the product screws can be installed which are secured with sealing wax.

- The screws secured with sealing wax must not be opened.

2.7 Clamping force

The achieved clamping force can vary due to the maintenance condition of the clamping device [state of lubrication and degree of contamination] [see chapter »Maintenance«].

The clamping force must be checked at regular intervals. This requires the use of static clamping force measuring devices.



CAUTION!

Damages due to excessive draw and compressive force!

An excessive draw force and/or compressive force may damage the clamping device and/or the drawtube adapter.

- The max. draw force and compressive force may not be exceeded.

2.8 Functionality



NOTICE!

With high contamination of the clamping device the functionality is no longer guaranteed.

- The cleaning and maintenance intervals must be observed.

2.9 Environmental protection



NOTE!

Environmental hazard due to incorrect handling!

Incorrect handling of environmentally hazardous substances, particularly improper disposal, can cause significant environmental damage.

- Always comply with the instructions cited below
- If environmentally harmful substances should inadvertently get into the environment, initiate suitable measures immediately. If in doubt notify the responsible municipal authority about the damage.

The following environmentally harmful substances are used:

Lubricants

Lubricants like greases and oils can contain toxic substances. Ensure that they do not get into the environment.

The device must be disposed of by a specialized disposal company.

To achieve trouble-free operational performance of the clamping device only use HAINBUCH lubricants. See the appendix for reference addresses.

3 Technical data

3.1 General information

The micro mandrel is available in different sizes and variants.

Information about e.g.B.

- dimension
- weight

you will find in the following table and/or on the corresponding drawing that you can order at HAINBUCH.

Some examples for technical data are provided below:

Clamping device	Dimension [Ø x length in mm]	max. RPM [RPM]	Clamping force F_{rad} max. [kN]	Clamping force F_{ax} max. [kN]	Weight [kg]
A084727.0005C	Ø75 x 124	600	4,4	14	1,3
A085081.0002C	Ø75 x 124	600	4,4	14	1,3
A085092.0009C	Ø75 x 124	600	4,4	14	1,3
A085103.0006C	Ø75 x 124	600	4,4	14	1,3
A085475.0006C	Ø75 x 127	600	4,4	14	1,1
A085668.0003C	Ø75 x 66	10000	4	20	0,6



WARNING!

Risk of injury!

Using false technical data can lead to serious personal injury and property damage.

- The technical data [label on the product, assembly drawing] must be observed and may not be modified by the operator!

3.2 Operating conditions

Environment	Specification	Value	Unit
	Temperature range	15 - 65	°C

Mechanical actuating In each possible operating condition the maximum draw force and compressive force may not be exceeded!

3.3 Power specifications



NOTE!

Material damage if the power specifications do not agree!

If the power specifications of clamping device, machine adapter and machine do not agree, severe damage extending to total damage can occur.

- Only assemble clamping devices and adapters in machines with the same power specifications.

Information on maximum clamping force and drawtube force is provided on the clamping device and the adapter.

- If the power values become unreadable through the abrasive effect, please refer from the manual and/or get in contact to the manufacturer.

3.4 Type designation



Fig. 1

The type designation is on the product and includes the following information:

- 1 ID no. [marked with the # symbol]
- 2 Maximum speed [rpm]
- 3 Maximum clamping force [kN]

4 Structure and function

4.1 Overview and brief description

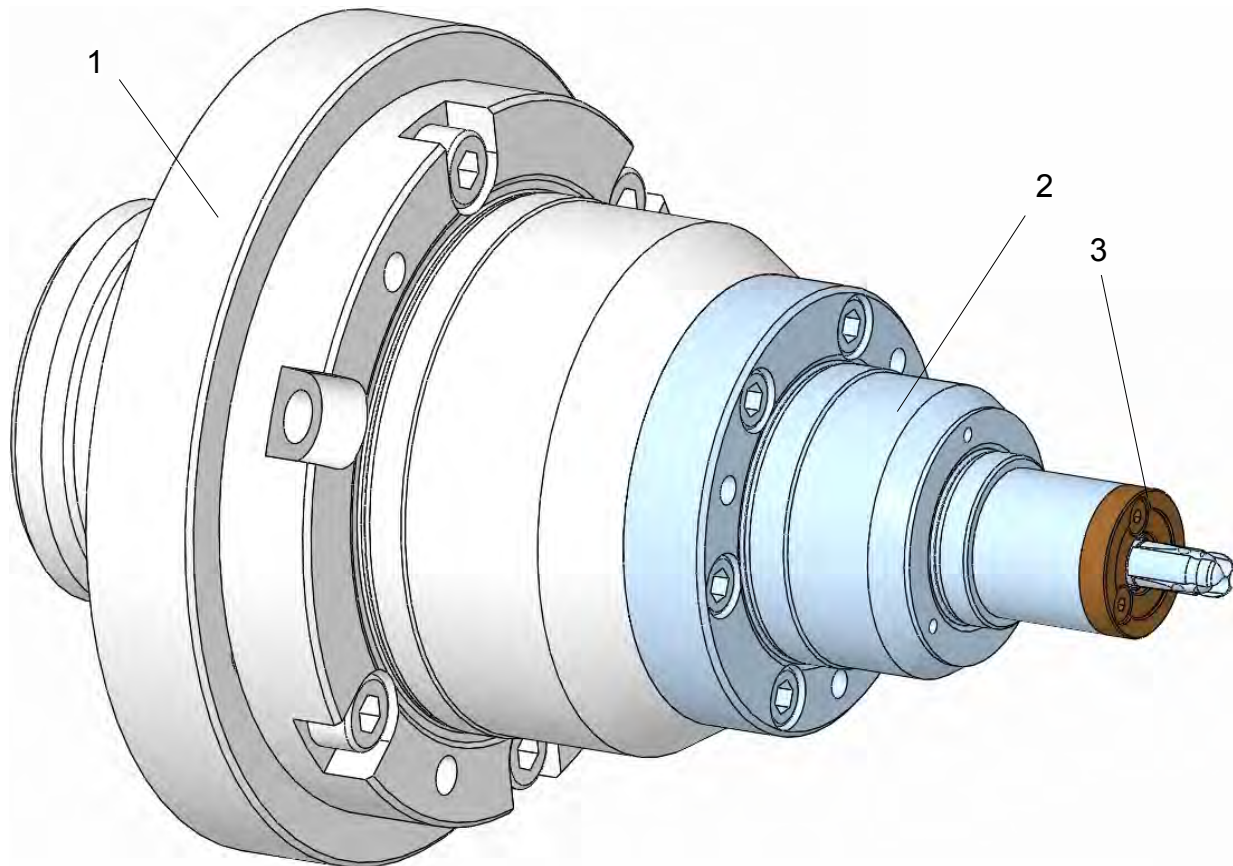


Fig. 2

- 1. Machine adapter
- 2. Micro mandrel

- 3. Workpiece end-stop

Brief description

The micro mandrel is designed especially for clamping very small diameters which can't be clamped with a usual segmented mandrel.

4.2 Optionales Zubehör

The accessories described here are not included in the scope of delivery.

For each clamping device, specially designed clamping elements, which are tuned to the maximum speed, are available. The perfect and precise function of HAINBUCH clamping devices is only guaranteed when using original HAINBUCH clamping elements.

4.2.1 Workpiece end-stop

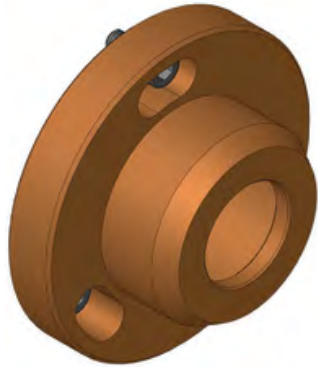


Fig. 3

The workpiece end-stop is manufactured with a end-stop dimension according to the customers request. In combination with the segmented clamping bushing and the segmented mandrel it provides a functional unit.

5 Transporting, packaging and storing

5.1 Safety instructions for transporting

Unbalanced package



WARNING!

Danger of falling due to an unbalanced package

Packed goods can have an unbalanced package. If attached incorrectly the package can tip and cause life-threatening injuries.

- Note the markings on the packages.
- Attach the crane hook in such a manner that it is located above the center of gravity.
- Carefully lift and see if the load tilts. If necessary change the attachment.



Transport!

- For transport always use a suitable clamping means / crane.
- Make sure that a rolling / falling of the clamping device is not possible.

5.2 Symbols on the packaging



Fragile

Identifies packages with fragile or sensitive contents. Handle the packed goods with care; do not allow them to fall, and do not subject them to impact.



Protect from moisture

Keep packed goods dry and protected against moisture.

5.3 Transport inspection

Check delivery immediately upon receipt to ensure that delivery is complete and to identify any transport damage.

Proceed as follows if there is apparent external damage:

- Do not accept the delivery, or only accept it with reservation.
- Note the extent of transport damage on the transport documents or on the transport company's delivery ticket.
- Submit a complaint.



Report any defect as soon as it is detected. Claims for damage compensation can only be enforced during the applicable periods for giving notice of lack of conformity.

5.4 Unpacking and inner-company transport



For transporting with transport trolley the clamping device must be positioned in standing condition. Make sure that a non-slip pad has been laid.

All tools and accessories which are not in scope of delivery are marked as optional in the operating instructions.

1. Carefully lift the clamping device out of the transport packaging and put it down on a stable, level substrate.
2. Prevent the clamping device against rolling away.

5.5 Packaging

About the packaging

Individual packages are packed according to the expected transport conditions. Environmentally-friendly materials have been used exclusively for the packaging.

Packaging should protect the specific components from transport damage, corrosion, and other damage until installation. Therefore do not destroy the packaging, remove it just before installation.



The packed goods are sealed in foil airtight and packed in cartons. See the »Technical Data« section for the specific weight of the respective sizes.

Handling packaging materials

Dispose of packaging materials in accordance with the respectively valid statutory regulations and local guidelines.



NOTE!

Improper disposal causes environmental damage!

Packaging materials are valuable raw materials and in many cases they can be reused, or they can be effectively treated and recycled.

- Dispose of packaging materials in an environmentally responsible manner.
- Comply with locally applicable disposal guidelines. If necessary commission a specialized company to dispose of packaging.

5.6 Storing



Under certain circumstances instructions for storage and subsequent storage are affixed to the packages that extend beyond the requirements cited here.

Comply with these instructions accordingly.

Storage of packages Only store packages under the following conditions:

- Do not store outdoors.
- Store in a dry and dust-free location
- Do not expose to aggressive media
- Protect from direct sunlight
- Avoid mechanical vibration
- Storage temperature: 15 bis 35 °C
- Relative humidity: max. 60 %
- For storage periods longer than 3 months:
 - Check the general condition of all parts and the packaging at regular intervals.
 - Touch up or re-apply anti-corrosion agents as needed

Subsequent storage of the clamping device

Only re-store the clamping device under the following conditions:

- Thoroughly clean the clamping device prior to subsequent storage [see section »Cleaning«]
- Thoroughly oil and grease the clamping device. [see section »Cleaning«]
- Store the clamping device in airtight foil
- The clamping device must be stored securely in position. If this is not guaranteed, use a suitable container for the clamping device or equip the shelf with a circumferential securing edge.

6 Assembly



WARNING!

During the initial installation of the clamping device severe injuries may occur.

- The initial installation must be done only by qualified personnel.
- All screws remaining in the clamping must be tightened firmly.
- All tools and keys must be removed after installation.
- Always wear personal protective equipment!



WARNING

Risk of injury due to stored energy!

The clamping device can be designed with disc springs. These disc springs are under permanent tension! The release of the stored energy can cause injuries!

- By loosening the corresponding screws they have to be operated continuously alternately to reduce the clamping pressure to a minimum!
- Particularly cautious approach is required!
- For cleaning and maintenance disassemble the clamping device from the machine!
- Always wear personal protective equipment!

6.1 Preparation

6.1.1 Assembly of machine adapter / flange



Before assembling the micro mandrel, a suitable machine adapter and/or flange has to be assembled.

Special tools required:

- Allen wrench

Assembly of the machine adapter - variant 1

For the assembly of the machine adapter [variant 1] to the machine the following steps are to be done:

- Move the drawtube into front end position and reduce the clamping pressure to minimum.

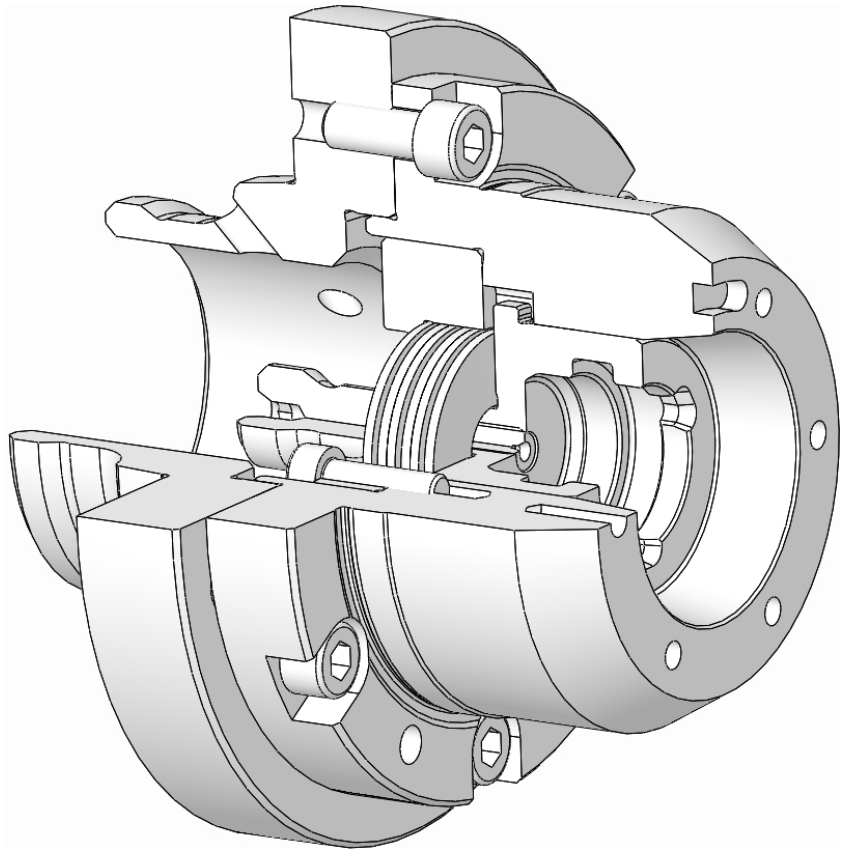


Fig. 4

1. Put the machine adapter onto the machine spindle.
2. Clamp the machine adapter by the clamping system of the machine.

The machine adapter is assembled.

Assembly of the machine adapter / flange - variant 2

For the assembly of the machine adapter [variant 2] to the machine the following steps are to be done:

- Move the drawtube into front end position and reduce the clamping pressure to minimum.

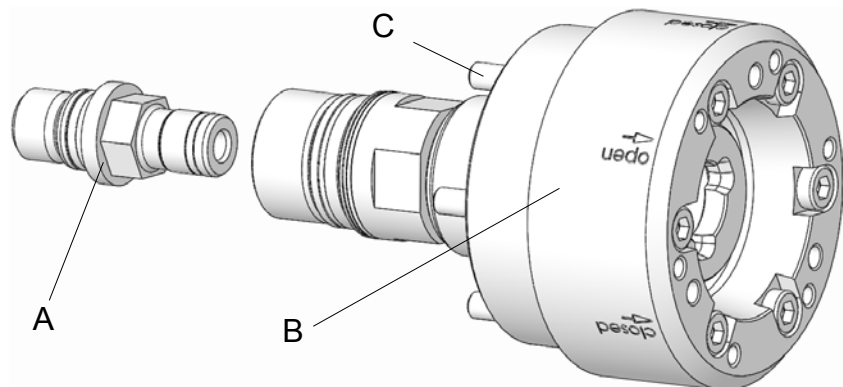


Fig. 5

1. Screw the tube [A] into the machine spindle until the edge and tighten it firmly.
2. Screw the complete flange [B] into the machine spindle until the edge.
3. Turn back the flange [B] until the bolt hole circles for the mounting screws [C] at flange and machine spindle flush.
4. Screw in the mounting screws [C] and tighten them firmly with the required tightening torque, see »Maintenance«.

The flange is assembled.

6.1.2 Preparation of the micro mandrel

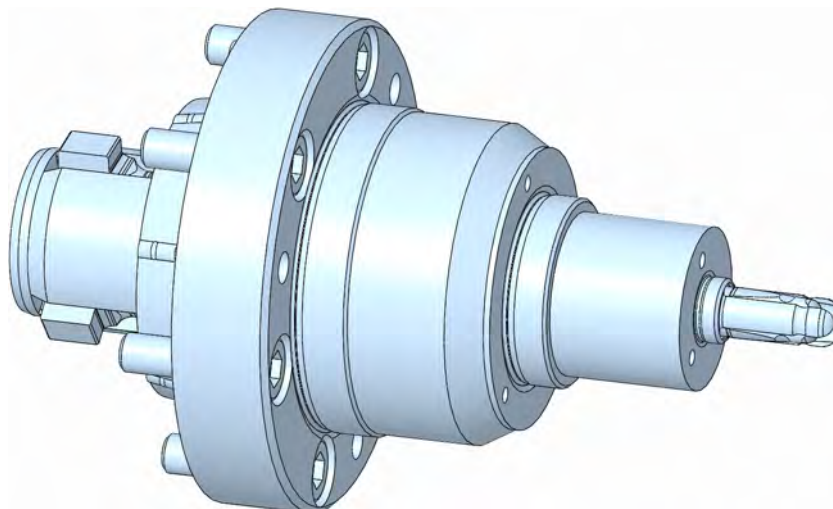


Fig. 6

The micro mandrel is delivered in assembled condition.

- Clean the micro mandrel of fouling with a soft, lint-free cloth.

6.2 Installation



WARNING!

Danger of injury due to unintentional start-up of a machine spindle!

Unexpected start up of a machine spindle can cause severe injury.

- Only run the machine in set-up mode or jog mode.
- Set the axial clamping force of the machine tool on the lowest setting.
- Always remove immediately all the tools and wrenches from the clamping device after use.
- Unscrew all eye bolts from the clamping device and remove them from the interior of the machine.
- Prior to switching on automatic mode close all protective doors or hoods that are present on the machine tool.



WARNING!

Risk of injury!

Bending in the working area of the machine can cause severe head injuries!



CAUTION!

Risk of injury!

Unexpected start up of the tool spindle can cause severe injury.

- Make sure that the system is pressure-free and that a restart of the machine can be excluded!



Risk of injury!

Contamination of the mechanism can influence/reduce the stroke, thus the clamping force is reduced and thus, the workpiece is not properly tightened and can be thrown out.

- Clean the product regularly [see chapter »Maintenance and service«].



Risk of injury!

If the axial clamping force is too low clamped workpiece may be thrown out.

If the axial clamping force is too high severe damages of the components of the clamping device may occur the throwing out of the workpiece.

- Before operation set the operation pressure back to operation level.
- The axial clamping force should be checked and adjusted regularly!
- The dimension of the workpieces should be checked regularly [clamping- \emptyset]!



Transport!

- For transport always use a suitable clamping means / crane.
- Make sure that a rolling / falling of the clamping device is not possible.

6.2.1 Assembly of the micro mandrel

Special tools required:

- Allen wrench
- Put the machine tool in set up mode.
- Remove all tools from the interior of the machine.
- Set the clamping pressure of the machine tool on the lowest setting.
- Move the drawtube of the machine tool into the front stop position.

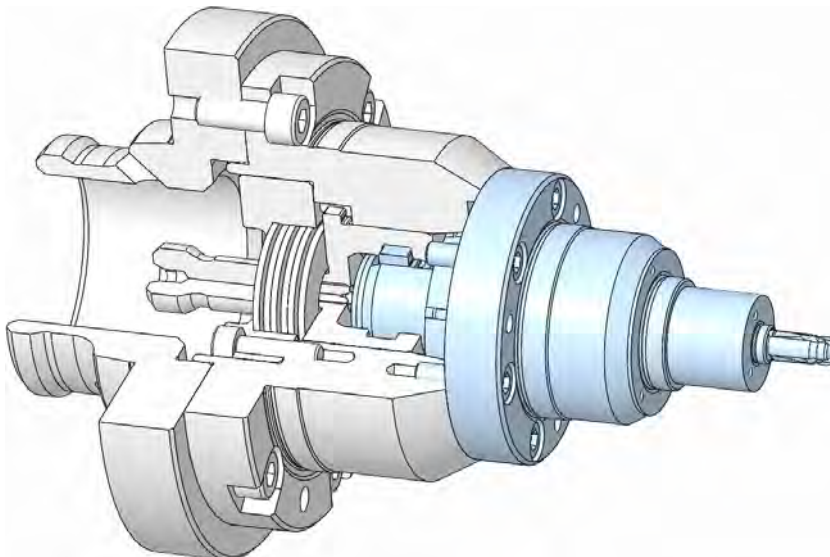


Fig. 7

- Put the micro mandrel into the pre-assembled machine adapter. Make sure that the noses at the micro mandrel flush to the grooves in the machine adapter.
- Carefully press with the hand on the center to move in the pins completely.



Possibly, the machine adapter is marked with »OPEN« and »CLOSED« and the microdrive mandrel is marked with an arrow.

- During assembly, make sure that the arrow at the micro mandrel flushes to the marking »OPEN« at the machine adapter.
 - After locking the array at the micro mandrel flushes to »CLOSED« at the machine adapter.
- Rotate the micro mandrel in the machine adapter by approximately 60 ° to lock it in the bayonet.

- Screw in the mounting screws [1] and tighten them firmly with the required tightening torque, see »Maintenance«.

6.2.2 Assembly of the workpiece end-stop

Special tools required:

- Allen wrench

There are different types of assembly:

1. Assembly via mounting screws
2. Assembly via threads

1. Assembly via mounting screws

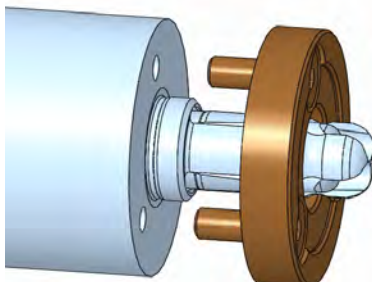


Fig. 8

- Put the workpiece end-stop onto the assembled clamping device.



NOTE!

Material damage due to too heavy tightening of the mounting screws!

By too heavy tightening of the mounting screws they can be damaged or even destroyed.

- Tighten the mounting screws only by hand.
- Do not screw beyond the resistance.

- Screw in the mounting screws and tighten them firmly.

2. Assembly via threads

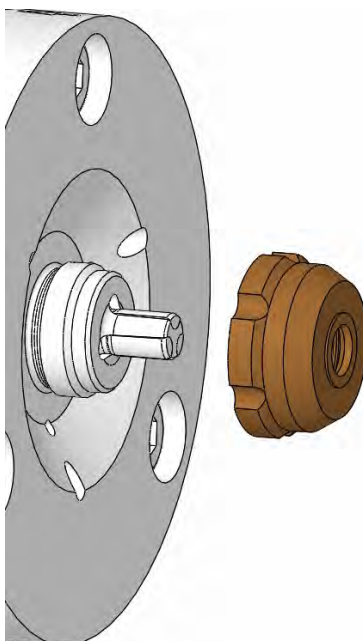


Fig. 9

- Screw the workpiece end-stop by its thread onto the micro mandrel until the edge and tighten it firmly.



WARNING!

Risk of injury!

Tools and gages that are thrown out of the machine can cause injury.

- Remove all tools and gages from the working area of the machine before the machine is started up.

6.3 Workpiece



WARNING!

Risk of injury due to thrown out parts!

During clamping of the workpiece and the processing parts can be thrown and cause severe injuries and property damage.

- Check the clamping diameter of the workpiece.
- Only clamp workpieces that meet the dimensional requirements.
- For clamping very long workpieces use in addition a tailstock / a steady rest for support.
- Do not exceed the maximum permissible axial clamping force.
- Make sure that the applied axial clamping force is set correctly [neither too high nor too low].



CAUTION

Risk of injury!

When placing the workpiece:

- Make sure that the hands / fingers may not be clamped when inserting the workpiece!

6.4 Inspections



NOTE!

Material damage due to damaged clamping devices!

A damaged, incomplete, or unbalanced clamping device can significantly damage or even destroy the machine tool and the workpiece.

- Only install undamaged, complete, and precisely balanced clamping devices.
- If in doubt contact the manufacturer.

Ensure the following points prior to each installation and start-up of the clamping device:

- All cylindrical screws of the clamping device must be present and tightened with the proper tightening torque.
- The balance screws [if provided] of the clamping device must all be present and undamaged.
- All edges and bearing surfaces are intact; this means that they are neither broken nor do they show any signs of wear.
- The set speed of the machine tool should not exceed the maximum permissible speed of the clamping device.
- The maximum drawtube force specified on the perimeter of the clamping device must not be exceeded.
- The axial clamping force of the machine must be sufficiently high.
- All mounting tools must be removed from the interior of the machine.
- Clamping device and workpiece must be compatible – check the clamping diameter regularly.
- The workpiece must be clamped into the clamping device with sufficient workpiece tension.
- Do a a measurement of clamping force.

6.5 Control of the stroke position



WARNING!

Crushing danger from moving parts!

Crushing danger from moving parts during controlling the stroke position!

Gaps, caused while controlling the stroke position, can cause severe injury.

- Only do the controlling of the stroke position with assembled changing parts.
- Only run the machine in set-up mode or jog mode.
- Do not reach into moving parts or handle moving parts during operation.
- Note the gap dimensions of moving parts.
- Wearing of gloves / [PSA] is required!

6.6 Activities after production is concluded

1. Move the clamping device into unclamped position.
2. Switch off the machine tool and safeguard it from being switched on again.
3. Open the protective door or hood.
4. Clean the clamping device and a possibly mounted add on clamping device and adapter of chips and production residues using a soft, lint-free cloth and oil them lightly.
5. Close the protective door or hood.

7 Disassembly

If there is break in production that lasts longer than 3 days, the clamping device must be disassembled and properly stored in accordance with the manufacturer's specifications [see section »Transport, packaging, storage«].

Prior to disassembling:

- Put the machine in set up mode.
- Remove fuels and auxiliary materials, as well as residual processing materials and dispose of these items in an environmentally-responsible manner.

7.1 Safety

Safeguarding against restart



DANGER!

Life-threatening danger if restarted without authorization!

When disassembling there is danger of the energy supply being switched on inadvertently. This poses a life-threatening hazard for persons in the danger zone.

- Prior to starting the tasks switch off all energy supplies and safeguard them from being switched on again.



WARNING

Risk of injury due to stored energy!

The clamping device can be designed with disc springs. These disc springs are under permanent tension! The release of the stored energy can cause injuries!

- By loosening the corresponding screws they have to be operated continuously alternately to reduce the clamping pressure to a minimum!
- Particularly cautious approach is required!
- For cleaning and maintenance disassemble the clamping device from the machine!
- Always wear personal protective equipment!



Transport!

- For transport always use a suitable clamping means / crane.
- Make sure that a rolling / falling of the clamping device is not possible.

7.1.1 Disassembly of the workpiece end-stop

Special tools required:

- Allen wrench

There are differently mounted workpiece end-stops:

1. via mounting screws
2. via thread

1. Disassembly via mounting screws

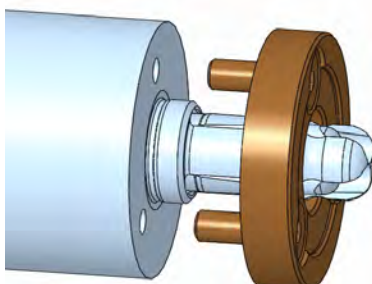


Fig. 10

- Loosen and remove the mounting screws.
- Remove the workpiece end-stop from the assembled clamping device.

2. Disassembly via thread

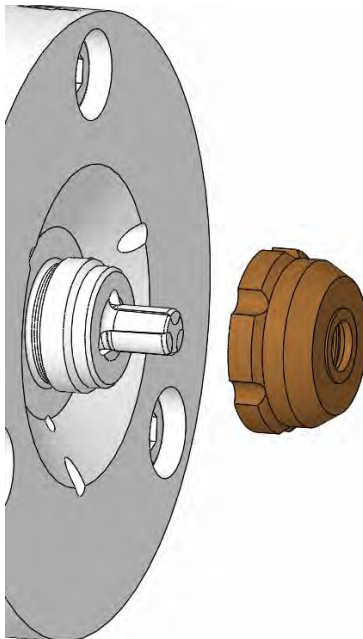


Fig. 11

- Unscrew the workpiece end-stop via the thread from the micro mandrel.

7.1.2 Disassembly of the micro mandrel

Special tools required:

- Allen wrench

1. Put the machine tool in set up mode.
2. Remove all tools from the interior of the machine.
3. Set the clamping pressure of the machine tool on the lowest setting.
4. Move the drawtube of the machine tool into the front stop position.

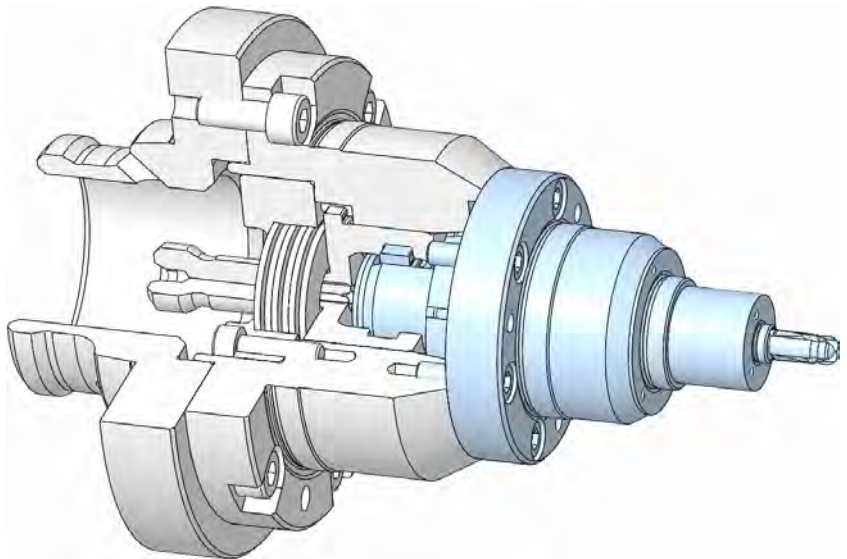


Abb. 12



Possibly, the machine adapter is marked with »OPEN« and »CLOSED« and the microdrive mandrel is marked with an arrow.

- For the disassembly of the micro mandrel, make sure that the arrow at the micro mandrel points to »OPEN« at the machine adapter .
 - Before unlocking, the arrow of the micro mandrel points to »CLOSED« at the machine adapter, after unlocking it points to »OPEN«.
- Loosen and remove the mounting screws [1].
 - Rotate the micro mandrel in the machine adapter by approximately 60 ° to unlock it in the bayonet.
 - Carefully remove the micro mandrel from the machine adapter.

7.1.3 Disassembly of machine adapter / flange

Special tools required:

- Allen wrench

Disassembly of the machine adapter - variant 1

For the disassembly of the machine adapter [variant 1] from the machine the following steps are to be done:

- Move the drawtube into front end position and reduce the clamping pressure to minimum.

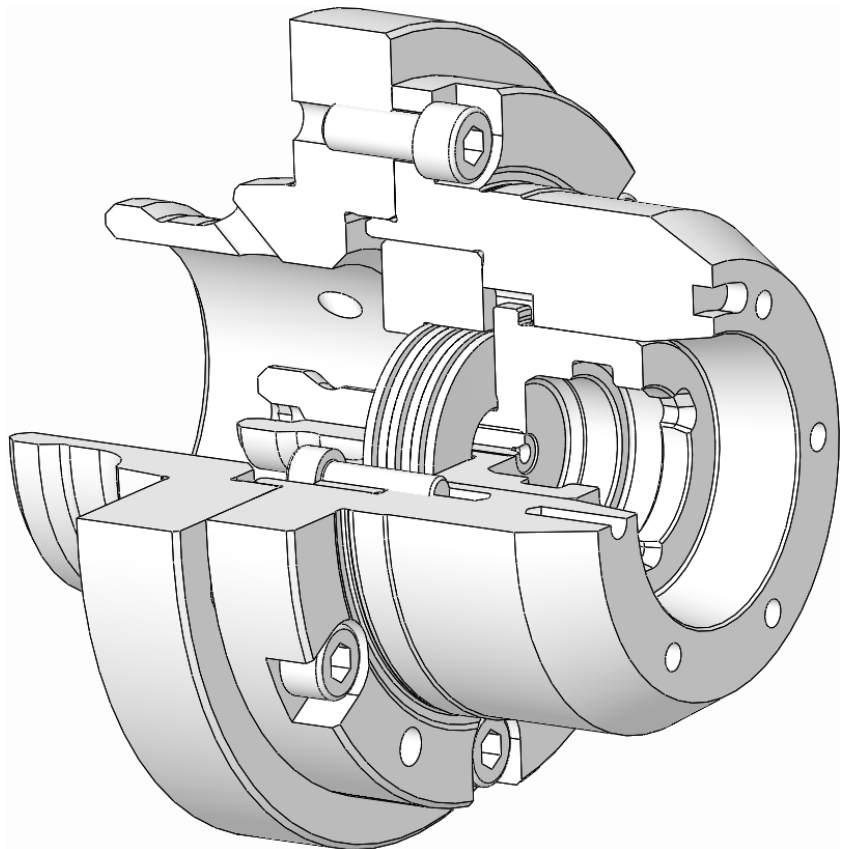


Fig. 13

1. Loosen the machine adapter by the clamping system of the machine.
2. Remove the machine adapter from the machine spindle.

The machine adapter is disassembled.

Disassembly of machine adapter / flange - variant 2

For the disassembly of the machine adapter [variant 2] from the machine the following steps are to be done:

- Move the drawtube into front end position and reduce the clamping pressure to minimum.

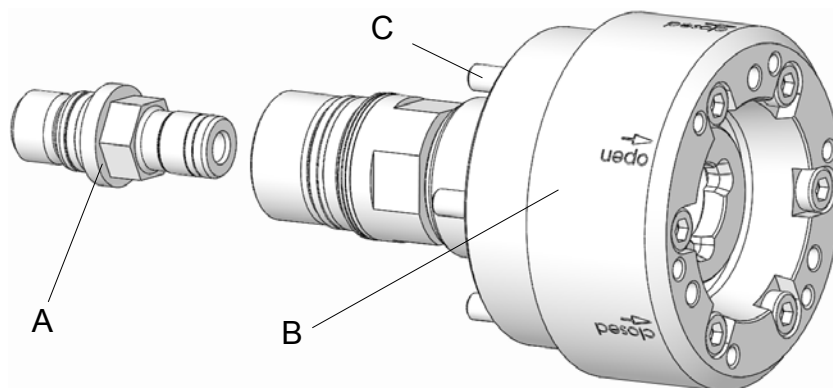


Fig. 14

1. Loosen and remove the mounting screws [C].
2. Unscrew the complete flange [B] out of the machine spindle.
3. Loosen and remove the tube [A] out of the machine spindle.

The machine adapter / flange is disassembled.

7.2 Subsequent storage of the clamping device

The clamping device must be cleaned and treated with corrosion protection for subsequent storage [see section »Cleaning«].



NOTE!

The storage conditions are specified in the section »Transport, packaging and storage«.

7.3 Disposal

If a return or disposal agreement has not been concluded, then recycle disassembled components.



NOTE!

Improper disposal causes environmental damage!

Lubricants and other auxiliary materials are subject to treatment as special waste, and should only be disposed of by approved specialist companies!

Local municipal authorities or specialized disposal companies provide information on environmentally-responsible disposal.

8 Maintenance

Environmental protection

Comply with the following instructions for environmental protection when performing maintenance work:

- At all lubricating points where lubricant is applied by hand, remove escaping, used, or excess grease, and dispose of it in accordance with applicable local regulations.
- Collect used oil in suitable containers and dispose of it in accordance with applicable local regulations.

8.1 General

Cleanliness of the appropriate end-stop as well as the guidance diameters are conditions for reaching the concentricity and perpendicularity tolerances. Clean these surfaces with an appropriate cleaner.



WARNING!

Risk of injury!

Always comply with the safety data sheets and guidelines provided by the manufacturer.



CAUTION

Danger of injury due to loss of clamping force!

Fouling of the clamping device can cause the clamping device to lose considerable clamping force.

- Always comply with the maintenance and cleaning intervals specified in this manual.
- In conjunction with the maintenance intervals, regularly check the maintenance status of the clamping device through clamping force measurements.

8.2 Cleaning



NOTE!

Material damage if cleaned with compressed air!

Cleaning the clamping device with compressed air can force metal chips into thread and grooves. This can damage or even destroy the clamping device.

- Never clean the clamping device with compressed air!

Special tools required:

- Ester-free, non-polar cleaning agent
- Soft, lint-free cloth

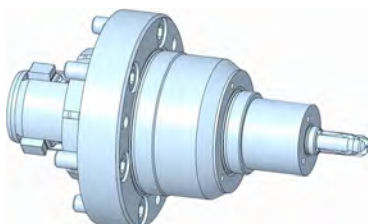


Fig. 15

1. Disassemble the clamping device [see section »Disassembling the clamping device«].
2. Clean all the components listed below with cleaning agent and a cloth; remove all oil and grease residues:

- Bayonet adapter
- Machine adapter
- clamping unit
- clamping bolt
- Cylindrical screws

8.3 Preservation

Special tools required:

- Universal grease 2085/0003
- Oil stone
- Soft, lint-free cloth

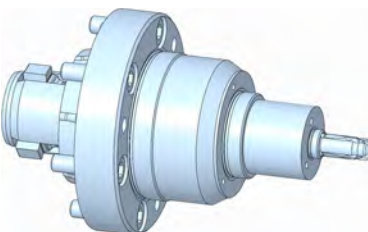


Fig. 16

1. Disassemble the clamping device [see section »Disassembling the clamping device«].
2. Hone all the bearing surfaces of the clamping device with an oil stone.
3. Lightly grease all cylindrical screws. Remove excess grease with a cloth.
4. Remount the clamping device.
5. Screw all cylindrical screws into the clamping device again and tighten them hand tight.



For subsequent storage tightening the cylindrical screws hand tight suffices. This facilitates re-commissioning and protects the cylindrical screws.

6. Lightly grease all interior and outer surfaces of the clamping device. Remove excess grease with a cloth.
7. Pack the clamping device airtight in foil. Place it on a level, impact-free storage location and safeguard it from falling.

8.4 Use of lubricant

With the usage of lubricant you may only use grease that corresponds to the requirements concerning bond, pressure-stability and solubility in lubricating coolant. In addition no dirt particles may be in the grease; they cause run errors if they come in in-between two mating surfaces.

We recommend for this the following lubricant:

HAINBUCH grease

See optional Accessories

Alternatives:

Lubricant	Manufacturer	Product
Universal grease	OKS	OKS 265
	MicroGleit	GP 355
	Klüber	QNB 50
	Zeller & Gmelin	DIVINOL SD24440
	Bremer & Leguill	RIVOLTA W.A.P.
Special grease	Klüber	MICROLUBE GL 261

8.5 Maintenance schedule

Maintenance tasks are described in the sections above that are required for optimal and trouble-free operation. If increased wear is detected during regular inspections, then reduce the required maintenance intervals according to the actual indications of wear. Contact the manufacturer, [see the service address on the back] if you have questions concerning maintenance tasks and intervals.

Interval	Maintenance task
Daily	Visual inspection, particularly at the clamping area and end-stop face, in case of heavy contamination, to ascertain early damages at clamping device and clamping pins. If heavily soiled, complete cleaning [see section »Cleaning«].
After 36 operation hours each	Clean the clamping device and the changing parts [see section »Cleaning«]
	Clean the clamping cone [see section »Cleaning«]
	Lubricate the clamping device [see section »Preservation«].
Every six months	Clean the clamping device [see section »Cleaning«]



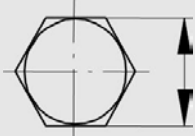
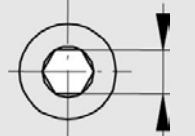
For proper operation of the coolant feed a pre-filtering with duplex filter [mesh size 100 µm, PI 3754] is necessary. The duplex filter is mounted on the coolant cleaning system.

8.6 Bolt torque

Metric ISO thread

The guide values for bolt tightening torque for achieving the highest permissible pre-tension for metric ISO thread are specified in Nm in the table.

- Total friction coefficient $\mu_{\text{tot}} = 0,12$

Diameter	 [mm]	 [mm]	Torque for screw quality 10.9 [Nm]
M 4	7	3	4
M 5	8	4	7
M 6	10	5	12
M 8	13	6	25
M 10	17	8	50
M 12	19	10	100
M 16	24	14	220
M 20	30	17	400
M 24	36	19	600

The table shows the prescribed values.

Knowledge of the applicable guidelines and configuration criteria are the prerequisites.

9 Trouble shooting

Possible fault causes and the tasks to correct these faults are described in the following section.

If faults occur more frequently, the maintenance intervals must be shortened to correspond to the actual system load.

Contact the manufacturer if there are faults that cannot be corrected by following the instructions below; see the service address on the back of this operating instruction.

9.1 Safety

Trouble shooting

The following always applies:

1. For faults that pose a direct danger for personnel and or property immediately execute the emergency-stop function of the machine.
2. Determine the cause of the fault.
3. If correction of the fault requires work in the danger zone, put the machine in set-up mode.
4. Immediately inform the responsible parties at the installation site of the fault.
5. Depending on the type of fault, either have authorized specialized personnel correct the fault, or correct it yourself.



The trouble shooting table provided below lists personnel who are authorized to correct the fault.

6. If there is a fault that was not caused by the clamping device the cause of the fault may be in the machine area. See the operating manual for the machine in this regard.

9.2 Trouble shooting table

Fault	Possible cause	Fault correction	Corrected by
Clamping bolts tear	The clamping force was too high	Clamping bolts must be replaced	HAINBUCH
Tensioning bolts are deposited	Soiling in the draw mechanics	Clamping bolts must be replaced	HAINBUCH

9.3 Start-up after corrected fault

After correcting the fault execute the following steps to start up again:

1. Reset the emergency-stop device
2. Acknowledge the fault on the machine tool controller
3. Ensure that no one is in the danger zone
4. Start the machine tool

10 Appendix

10.1 Service Hotline

Order Hotline

Quickly ordered and delivered. A call is all it takes:
+49 7144. 907-333

Schedule Hotline

Current status of your order? Just call:
+49 7144. 907-222

24h emergency call

Has there been a crash or other technical emergency?

Our experts are at your service around the clock:
+49 7144. 907-444

10.2 Representatives

The sales partners and service employees listed below are available for further consultation or support.

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EC Declaration of conformity

EG-Konformitätserklärung im Sinne der EG-Richtlinie 2006/42/EG über Maschinen [Anhang II A] /

EC Declaration of conformity according to EC directive 2006/42/EC on machinery [Annex II A]

Original-Konformitätserklärung / Translation of original declaration of conformity

Hersteller / manufacturer: HAINBUCH GmbH Spannende Technik
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Diese Erklärung bezieht sich nur auf die Maschine in dem Zustand, in dem sie in Verkehr gebracht wurde; vom Endnutzer nachträglich angebrachte Teile und/oder nachträglich vorgenommene Eingriffe bleiben unberücksichtigt. Die Erklärung verliert ihre Gültigkeit, wenn das Produkt ohne Zustimmung umgebaut oder verändert wird.

This declaration relates exclusively to the machinery in the state in which it was placed on the market, and excludes components which are added and/or operations carried out subsequently by the final user. The declaration is no more valid, if the product is modified without agreement.

Hiermit erklären wir, dass die nachstehend beschriebene Maschine
Herewith we declare, that the machinery described below

Produktbezeichnung / product denomination: **Micro mandrel**

allen einschlägigen Bestimmungen der Maschinenrichtlinie 2006/42/EG entspricht.
is complying with all essential requirements of the Machinery Directive 2006/42/EC.

Angewandte harmonisierte Normen / Harmonised Standards used:

- EN ISO 12100:2011-03 Sicherheit von Maschinen – Allgemeine Gestaltungsgrundsätze
Safety of Machinery – Basic concepts
- DIN EN 1550:1997 Sicherheitsanforderungen für die Gestaltung und Konstruktion von Spannfuttern für die Werkstückaufnahme /
Safety requirements for the design and construction of work holding chucks

Bevollmächtigter für die Zusammenstellung der technischen Unterlagen /
The person authorized to compile the relevant technical documentation:
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