

## **Installation manual**

Segmented mandrel T812

EN

## Table of contents

1 General.....	5
1.1 Information about this manual.....	5
1.2 Explanation of symbols.....	5
1.3 Limitations of liability.....	6
1.4 Max. RPM.....	7
1.5 Copyright.....	7
1.6 Scope of delivery.....	8
1.7 Spare parts.....	8
1.8 Warranty terms.....	8
2 Safety.....	9
2.1 Responsibility of the customer.....	9
2.2 Personnel requirements.....	9
2.3 Intended use.....	10
2.4 Personal protective equipment.....	11
2.5 Special dangers.....	13
2.6 Further warnings.....	15
2.7 Screws.....	17
2.8 Clamping force.....	17
2.9 Functionality.....	18
2.10 Environmental protection.....	19
3 Technical data.....	20
3.1 General information.....	20
3.2 Operating conditions.....	20
3.3 Power specifications.....	20
3.4 Dimensional sheet.....	21
3.5 Type designation.....	21
4 Structure and function.....	22
4.1 Overview and brief description.....	22
4.2 Optional Accessories.....	23
4.2.1 Spindle flange.....	23
4.2.2 Segmented clamping bushing.....	23
4.2.3 Work piece end-stop.....	24
4.2.4 Grease.....	24
4.2.5 Grease gun.....	24
5 Transporting, packaging, storing.....	25
5.1 Safety instructions for transporting.....	25
5.2 Symbols on the packaging.....	25
5.3 Transport inspection.....	26

5.4 Unpacking and inner-company transport.....	26
5.5 Packaging.....	27
5.6 Storing.....	28
6 Assembly.....	29
6.1 Pre-consideration.....	30
6.2 Preparations.....	30
6.3 Assembling of the clamping device.....	32
6.3.1 Assembling the draw tube adapter.....	34
6.3.2 Assembling the flange.....	34
6.3.3 Assembling the quick-change machine adapter.....	37
6.3.4 Assembly of the segmented mandrel.....	37
6.3.5 Assembly of the segmented mandrel [bayonet].....	38
6.3.6 Assembly of the segmented mandrel [quick change-over interface].....	39
6.3.7 Checking and adjusting the face run and the concentricity.....	39
6.3.8 Assembly of the segmented clamping bushing RD.....	41
6.3.9 Assembling of the work piece end-stop.....	42
6.4 Work piece.....	43
6.5 Inspections.....	44
6.6 Control of the stroke position.....	45
6.7 Activities after production is concluded.....	45
7 Disassembly, subsequent storage, disposal.....	46
7.1 Safety.....	46
7.2 Disassembling the clamping device.....	48
7.2.1 Disassembling the work piece end-stop.....	48
7.2.2 Disassembling the segmented clamping bushing [RD/SE].....	48
7.2.3 Disassembling the segmented mandrel [machine spindle].....	49
7.2.4 Disassembly of the segmented mandrel [bayonet].....	49
7.2.5 Disassembly of the segmented mandrel [quick-change interface].....	50
7.2.6 Disassembling the flange.....	50
7.2.7 Disassembly of the quick-change machine adapter [optional].....	51
7.2.8 Disassembling the draw tube adapter.....	51
7.3 Subsequent storage of the clamping device.....	51
7.4 Disposal.....	52
8 Maintenance.....	53
8.1 General.....	53
8.2 Cleaning.....	55
8.3 Preservation.....	56
8.4 Use of lubricant.....	56
8.5 Maintenance schedule.....	57
8.6 Bolt torque.....	59

9 Trouble shooting.....	60
9.1 Safety.....	60
9.2 Trouble shooting table.....	61
9.3 Start-up after corrected fault.....	62
10 Appendix.....	63
10.1 Service Hotline.....	63
10.2 Representatives.....	63
10.2.1 Germany.....	64
10.2.2 Europe.....	65
10.2.3 America.....	68
10.2.4 Asia.....	68
10.2.5 Australia.....	69
10.2.6 Africa.....	70
11 Index.....	70

---

**»Translation of original installation manual«**

# 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 than 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

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.

**CAUTION!**

Our clamping devices are balanced with balance quality  $G = 4$ , in one level  $n = 1$ .

The data on the rotation balance refers to rotationally symmetrical work pieces.

The clamping of not rotationally symmetrical work pieces may not be clamped and/or only be clamped after consultation with the manufacturer.

Balancing bolts and balancing weights at the clamping devices may not be removed / disassembled!

## 1.4 Max. RPM

**CAUTION!**

The maximum permissible RPM of the clamping device must be redetermined in every application case, on the basis of the clamping forces required for machining.

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

## 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.

In scope of delivery of the clamping device:

- 1 segmented mandrel
- 1 coupling

Optionally the scope of delivery of the clamping device includes:

- Spindle flange
- Trimming sleeve for SAD segmented clamping bushing
- Segmented clamping bushing
- Work piece end-stop
- Eye bolts

## 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 device is used in industrial applications. Consequently the owner of the device 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 must be adhered to and complied with for the area of implementation of the device.

### 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 clamping device is designed for installation in a machine tool according to CE compliant. Within the machine tool the clamping device is designed exclusively as a through-bore chuck for bar work and as an end-stop chuck for chuck work.

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.

## **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 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.

### Horizontal / lying parts



#### **WARNING!**

#### **Danger of injury due to horizontal parts!**

Before transporting the clamping device in horizontal condition:

- Put the clamping device on a non-slip pad
- Screw in the eye bolts

### Suspended loads



#### **WARNING!**

#### **Life-threatening danger due to suspended loads!**

Some clamping devices must be lifted with a crane. When lifting the clamping device there is a life-threatening hazard due to falling parts or parts swinging out of control.

- Never step under suspended loads.
- Comply with the instructions concerning the intended attachment points. Ensure that the sling gear is securely seated!
- Do not attach lifting gear in projecting components.
- Only use approved hoists and sling gear with sufficient bearing capacity.
- Do not use rope and belts that are torn or frayed.

**Moving parts****WARNING!****Danger of injury due to moving parts!**

Rotating parts of the clamping device can cause serious injuries.

- Do not reach into moving parts or handle moving parts during operation.
- Note the gap dimensions 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.

**Wrong clamping of the work piece****WARNING!****Danger of injury due to incorrect clamping of the work piece!**

Incorrect work piece clamping may lead to the ejection of the work piece and result in serious injuries.

Under dimensioned (tolerance) parts can lead to incorrect clamping!

- Check the unmachined work pieces at random on dimensional accuracy.

Too low supply pressure can lead to the reduction of clamping force!

Too high supply pressure can lead to damage of the components of the clamping device!

- Check and adjust, if necessary, the supply pressure regularly.
- Do random checks of the unmachined work pieces on dimensional accuracy.

**Missing changing parts****WARNING!****Danger of injury due to missing changing parts!**

When operating the clamping device without changing parts [segmented clamping bushing, clamping heads, work piece end-stops] there is a higher danger of crushing injuries due to the stroke of movable components of the clamping device.

- The clamping process may not be initiated without assembled segmented clamping bushing and/or work piece end-stop.

**Parts with sharp edges****WARNING!****Risk of injury!**

When screwing in individual components such as for example work piece end-stops, threaded adapters and similar devices that are equipped with an external thread or wear caused by burrs, there is risk of cutting.

- The operation must be done only by qualified personnel.
- Wearing of gloves / [PSA] is required!

**2.6 Further warnings****WARNING!****Risk of injury!**

Never start rotating the clamping device without a clamped work piece.

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

**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!**

Falling down of the clamping device or its parts can cause severe bruises and fractures.

The dead weight of the clamping device or its parts can lead to high physical stress.



**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!**

**Risk of injury!**

**Missing o-rings or seals may cause severe injuries!**

Due to missing / fallen out O-rings and seals compressed air or hydraulic fluids which are under high pressure may expel!

- Make sure that all O-rings / seals for the hydraulic / pneumatic connections are available and undamaged!
- If necessary lubricate them before assembly and/or during service.



**WARNING!**

**Damage of clamping device!**

The clamping device may be released exclusively in the standing condition!



**Risk of injury!**

Leaking [sprayed out] hydraulic oil can cause serious injury.

- Make sure that all O-rings / seals for the hydraulic and/or pneumatic connections are available and undamaged



**WARNING!****Risk of injury!**

The operating screw may be turned out and/or thrown off!

- Never put the machine adapter into rotation if the operating system is not tightened with the given tightening torque!

## 2.7 Screws

### Moving parts

**WARNING!****Danger of injury due to screws and stud screws being accelerated out of the device!!**

Screws and stud screws radially attached to the product can be accelerated out of the device and cause severe injuries.

- At the product radially mounted screws and stud screws which were loosened for assembly and maintenance must be re-tightened with the correct tightening torque!
- The tightening torque is shown in the assembly drawing of the product or it is engraved on the device itself in the direct vicinity of the screw or stud screw.
- All screws or stud screws that are not marked with a tightening torque specification are tightened with the prescribed tightening torque and locked [medium-strength bonding] in the factory and should only be unscrewed after consultation with the manufacturer. If in doubt you must contact the manufacturer immediately do determine the subsequent procedure.

## 2.8 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.

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

## 2.9 Functionality



**NOTICE!**

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

- The cleaning and maintenance intervals must be observed.

## 2.10 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 clamping device is available in different sizes and variants.

Information about e.g.

- dimensions
- weight

you will find on the corresponding drawing that you can order at HAINBUCH.

### 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.

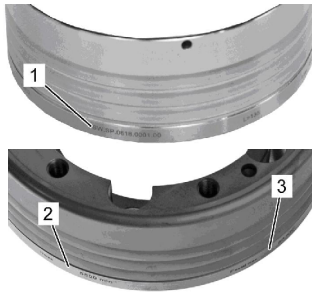
- Only operate clamping devices and adapters in machines with the same power specifications.

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

### 3.4 Dimensional sheet

Dimension sheets for the respective product can be requested from HAINBUCH.

### 3.5 Type designation



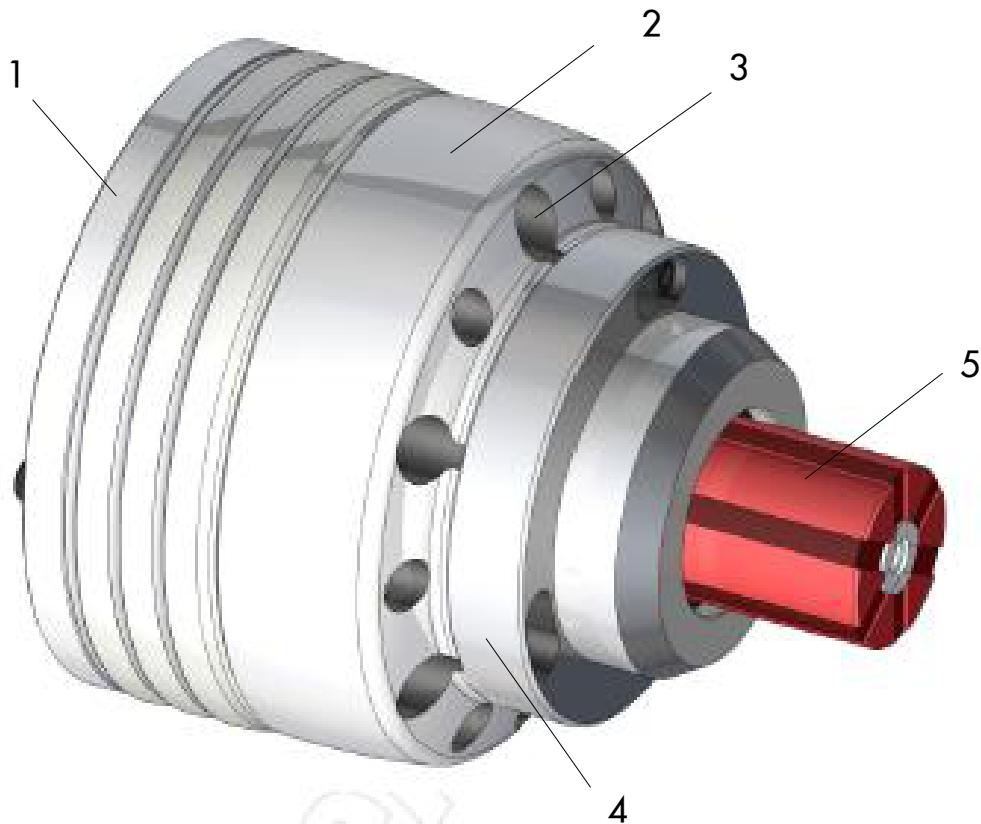
The type designation is on the product and includes the following information:

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

Fig. 1

## 4 Structure and function

### 4.1 Overview and brief description



**Fig. 2**

- 1. Flange
- 2. Mandrel body
- 3. Allen screws
- 4. Work piece end-stop [optional]
- 5. Segmented clamping bushing [optional]

#### **Brief description**

The MANDO T812 functions according to the deadlength principle.

By vulcanized segmented clamping bushing made of hardened steel and the deadlength principle at the work piece end-stop, there's no pulling effect to the sub spindle.

## 4.2 Optional Accessories

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

Specially developed segmented clamping bushings match to the respective maximum RPM are available for each clamping device. Trouble-free and precise function of HAINBUCH clamping devices is only ensured when using original HAINBUCH segmented clamping bushings.

Lubricating grease and grease gun are required for cleaning and preservation of the clamping device. The lubricating grease is also specially matched for protection of the vulcanized segments of the segmented clamping bushings and increase their service life and elasticity by a significant factor.

### 4.2.1 Spindle flange

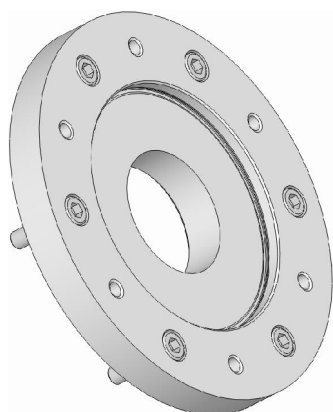


Fig. 3

The spindle flange serves for adaption of the segmented mandrel to the machine.

Depending on the order the spindle flange can be included in the delivery or provided by the customer.

### 4.2.2 Segmented clamping bushing

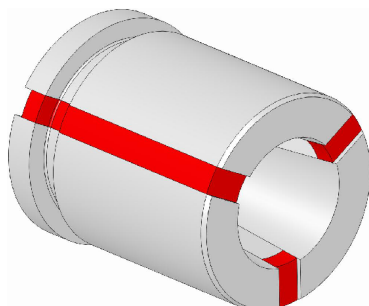


Fig. 4

The segmented clamping bushing is offered with a clamping diameter manufactured according to the customers needs.

### 4.2.3 Work piece end-stop

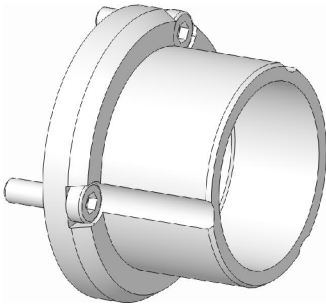


Fig. 5

The work piece 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.

### 4.2.4 Grease



Fig. 6

The universal grease for chuck and mandrel lubrication is supplied in a 1000g can. The order number for the universal grease is 2085/0003; it can be ordered from HAINBUCH.

### 4.2.5 Grease gun



Fig. 7

The grease gun is filled with universal grease, which is pressed into the clamping device. The grease gun has a pointed mouthpiece. The order number for the grease gun is 2086/0004; it can be ordered from HAINBUCH.



## 5 Transporting, packaging, 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



Usually the clamping device is packed vertically. Depending on the size it has threaded bores in the circumference of the clamping device for assembling the eye bolts.

In these threaded bores lifting eye bolts can be screwed in.

To safely lift the clamping device out of the package it must be hooked into a crane depending on the weight.

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.

- Two people are required for this task.
- Special tools required:
  - Crane from weight 15 kg
  - Lifting eye bolts

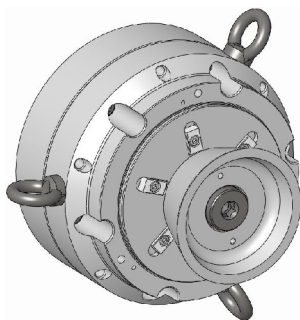


Fig. 8

1. Screw lifting eye bolts into the thread in the circumference of the clamping device.
2. Hook the load-handling equipment into the lifting eye bolts.
3. Use a crane to carefully lift the clamping device out of the transport packaging and put it down on a stable, level substrate.
4. 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.



### **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 Pre-consideration

- Screws are tightened according to the size of the screw and the general torque.  
To avoid axis-parallel warpage under load and to get stiffness turn in the screws evenly.
- To avoid precision error clean the screw joint surfaces and also the mating surfaces (see service instructions).  
The ex works wetting of the plate surfaces and the clamping element is only corrosion protection. It's not functionally lubricated.
- The insertion of lubricant is provided only on the mechanical surfaces. Pay attention to the instructions for lubricants in the chapter »Maintenance«.
- Avoid too much lubricant on the bearing surface, as this can cause face runout.
- Seal rings (e.g. o-ring, quad-ring seal) and sealing surfaces must be lubricated.  
Note the information in the chapter »Maintenance«.
- Note that the function surfaces (plate surface, mating surface, cone surface and seal surface) may not be damaged.



### **CAUTION!**

Wear safety shoes during the assembly and maintenance work.

Make sure that the starting of the spindle is impossible.

## 6.2 Preparations

The total weight of the clamping device, consisting of spindle flange and clamping unit, depends on the size and can be as much as 50 kg.

Depending on the weight, to safely lift the clamping device out of the package and position it in the machine it must be hooked into a crane.

**WARNING!****Danger of injury due to falling components!**

When mounting components can fall and cause severe injury and material damage.

- Two people are always required for this task.
- Use a crane.
- For mounting on a vertically hanging spindle, a suitable mounting aide is necessary.

If the clamping device is delivered in combination with a flange, the flange must be assembled before the clamping device!

Special tools required:

- Allen wrench
- Oil stone
- Crane
- Ring nuts

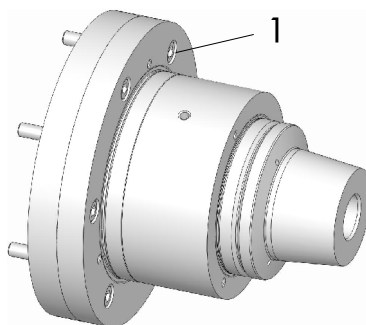


Fig. 9

1. Loosen, unscrew and remove the allen screws [1] in the clamping device; use an allen wrench.

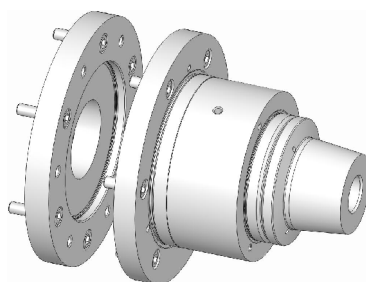


Fig. 10

2. Remove the flange from the clamping device.
3. Clean the mating surfaces at flange and clamping device with a soft, lint-free cloth and remove all oil and grease residues.
- 4.hone the mating surfaces on the spindle flange with an oil stone.

## 6.3 Assembling of the clamping device



### **WARNING!**

#### **Danger of injury due to unintentional startup of the tool spindle!**

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

- Prior to switching on automatic mode close all protective doors or hoods that are present on the machine tool.
- Unscrew all eye bolts from the clamping device and remove them from the interior of the machine.
- Only run the machine in set-up mode or jog mode.



### **WARNING!**

#### **Risk of injury!**

By operating the clamping device without changing parts [clamping head, segmented clamping bushing, work piece end-stops ...] there is an increased risk of crushing injuries by the stroke of the moving components of the clamping device.

By uncontrolled discharge of the clamping process [e.g. by incorrect installation of the energy supply or faulty programming] there is an increased danger.



### **WARNING!**

#### **Risk of injury!**

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



**Risk of injury!****Material damage due to unintentional start-up of the tool spindle!**

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 work piece is not properly tightened and can be thrown out.

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

**Risk of injury!**

If the clamping pressure is too low clamped work piece may be thrown out.

If the clamping pressure is too high severe damages of the components of the clamping device may occur the throwing out of the work piece.

- Before operation set the operation pressure back to operation level.
- The operating pressure should be checked and adjusted regularly!
- The dimension of the work pieces 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.

**WARNING!****Danger of injury due to vertical suspended spindle!**

Bending into the machine work area when assembling overhead can cause severe head injuries.

- Secure components prior to overhead assembly.
- For assembly on a vertically suspended spindle always use a suitable mounting aid.

### 6.3.1 Assembling the draw tube adapter

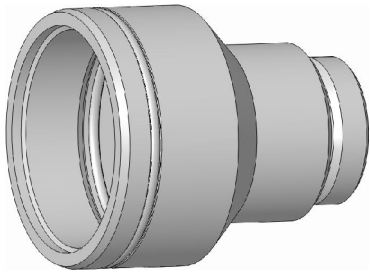


Fig. 11

1. Put the machine in set up mode.
2. Wipe off the mating surfaces of the machine spindle with a soft, lint-free cloth and remove all oil and grease residues.
3. Screw the draw tube adapter on the draw tube of the machine till end stop.

### 6.3.2 Assembling the flange

**NOTE!****Material damage due to wrong tightening torque of the allen screws in the spindle flange!**

The tightening torque of the allen screws is prescribed by the spindle or machine manufacturer. Incorrect tightening torque of the allen screws in the flange can cause significant material damage on the clamping device and on the machine.

- Only tighten the allen screws of the spindle with the torque prescribed by the spindle or machine manufacturer.

**Fig. 12**

1. Put the machine in set up mode.
2. Wipe off the mating surfaces of the machine spindle with a soft, lint-free cloth and remove all oil and grease residues.
3. Lift the flange into the machine by hand or with the aid of a crane and place it on the machine spindle. Position the flange on the machine spindle with the aid of the bores.
4. Screw all allen screws into the flange with an allen wrench and hand tighten in a cross pattern.

**NOTE!****Material damage is possible if the ring nuts are left in the spindle flange!**

Ring nuts that are left in the clamping device can significantly damage or even destroy lathe, clamping device and work piece.

- Always remove ring nuts immediately after mounting the clamping device in the lathe.

**NOTE!****Material damage due to insufficient face run and concentricity!**

Due to insufficient face run and concentricity work pieces can be damaged during processing.

- After each mounting check, and if necessary re-adjust, the face run and concentricity of the clamping device.

**Checking face run**

Special tools required:

- Dial indicator
- Plastic tip hammer



Fig. 13



1. Place the magnetic base of the dial indicator on the inside of the machine.
2. Place the dial indicator for face run on the face of the clamping unit.
3. Use a plastic tip hammer to carefully knock the clamping unit into position.
4. Tighten the allen screws finger-tight.



For exact adjustment, if necessary loosen the allen screws several turns and re-tighten in a cross pattern.

5. Wipe off the taper of the the segmented mandrel with a soft, lint-free cloth and remove all oil and grease residues.

### Checking concentricity

Special tools required:

- Dial indicator
- Plastic tip hammer
- Torque wrench

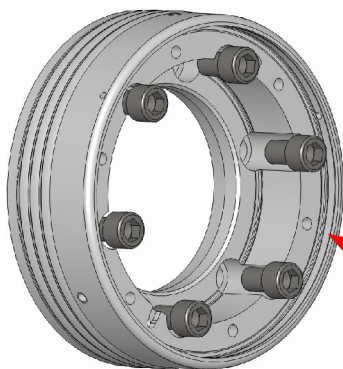


Fig. 14

1. Place the magnetic base of the dial indicator on the inside of the machine.
2. Place the dial indicator [2] for concentricity on the clamping taper [1].
3. Adjust the segmented mandrel in such a manner that the dial indicator shows the value »0«.



For exact adjustment, if necessary loosen the allen screws several turns and re-tighten in a cross pattern.

4. Tighten the allen screws in a cross pattern with the correct tightening torque [see »bolt torque«].
5. Remove all tools from the machine.

### 6.3.3 Assembling the quick-change machine adapter

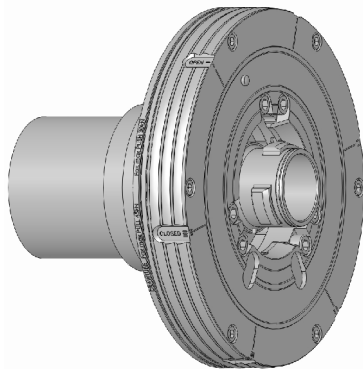


Fig. 15

The assembly of the quick-change machine adapter to the machine is described in the manual of the machine adapter.

### 6.3.4 Assembly of the segmented mandrel

Two people are required for this task!

Special tools required:

- Allen wrench
- Crane
- Eye bolts

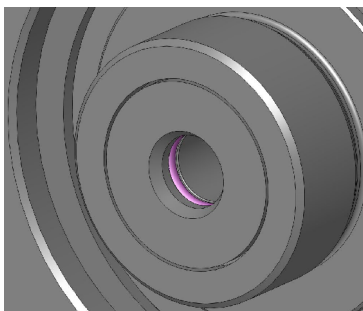


Fig. 16

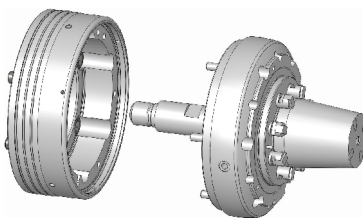


Fig. 17

1. Put the machine 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 draw tube of the machine tool into front stop position.
5. If an LAK-adapter is available make sure that the O-ring [see figure] is present and greased.
6. Put the segmented mandrel on the pre-assembled flange on the machine spindle by using a crane.
7. Screw the segmented mandrel by its threaded adapter on the draw tub of the machine or on the draw tube adapter till end.
8. Turn back the segmented mandrel until the bolt hole circles fit.
9. Screw in all allen screws into the segmented mandrel with an allen wrench and tighten them only finger-tight in a cross pattern.

**NOTE!**

Before operating the segmented mandrel must be adjusted, see chapter »Checking and adjusting the face run and the concentricity«.

### 6.3.5 Assembly of the segmented mandrel [bayonet]

Two people are required for this task!

Special tools required:

- Allen wrench
- Crane
- Eye bolts

1. Put the machine 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 draw tube of the machine tool into front stop position.
5. Put the segmented mandrel on the pre-assembled flange on the machine spindle by using a crane.
6. Secure the clamping device by turning it in the bayonet.
7. Screw in all allen screws into the segmented mandrel with an allen wrench and tighten them only finger-tight in a cross pattern.

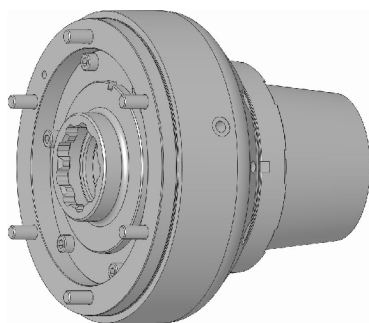


Fig. 18

**NOTE!**

Before operating the segmented mandrel must be adjusted, see chapter »Checking and adjusting the face run and the concentricity«.

### 6.3.6 Assembly of the segmented mandrel [quick change-over interface]

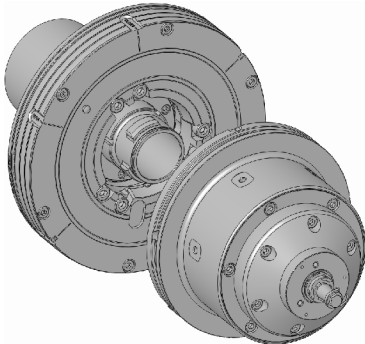


Fig. 19

The assembly of the segmented mandrel from the quick change machine adapter is described in the manual of the machine adapter.

### 6.3.7 Checking and adjusting the face run and the concentricity



#### **NOTE!**

#### **Material damage due to insufficient face run and concentricity!**

Due to insufficient face run and concentricity work pieces can be damaged during processing.

- After each mounting check, and if necessary re-adjust, the face run and concentricity of the clamping device.

#### **Checking face run**

Special tools required:

- Dial indicator
- Plastic tip hammer

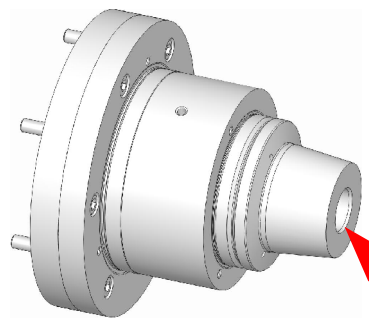


Fig. 20

1. Place the magnetic base of the dial indicator on the inside of the machine.
2. Place the dial indicator for face run on the face of the clamping unit.
3. Use a plastic tip hammer to carefully knock the clamping unit into position.



4. Tighten the cylindrical screws with a torque wrench in a cross pattern [see section »Screw tightening torque«].



For exact adjustment, if necessary loosen the cylindrical screws several turns and retighten in a cross pattern.

5. Wipe off the taper of the the segmented mandrel with a soft, lint-free cloth and remove all oil and grease residues.

### Checking concentricity

Special tools required:

- Dial indicator
- Plastic tip hammer
- Torque wrench

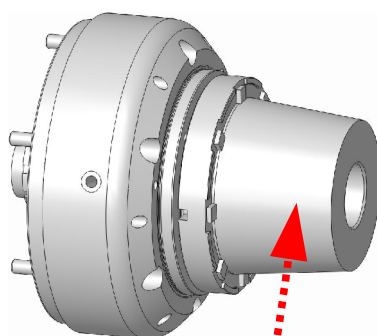


Fig. 21

1. Place the magnetic base of the dial indicator on the inside of the machine.
2. Place the dial indicator [2] for concentricity on the clamping taper [1].
3. Adjust the segmented mandrel in such a manner that the dial indicator shows the value »0«.



For exact adjustment, if necessary loosen the cylindrical screws several turns and retighten in a cross pattern.

4. Tighten the cylindrical screws in a cross pattern with the correct tightening torque [see chapter »Bolt torque«].



### 6.3.8 Assembly of the segmented clamping bushing RD

Special tools required:

- Allen wrench

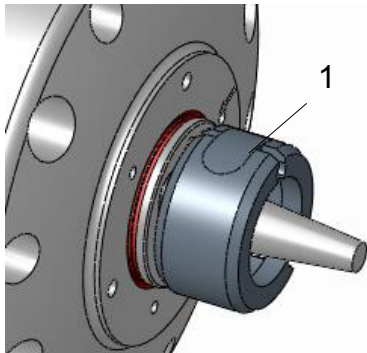


Fig. 22

1. Put the machine in set up mode.
2. Remove all tools from the interior of the machine.
3. Set the clamping pressure of the machine on the lowest setting.
4. Move the drawtube of the machine tool into the front stop position.
5. Open the coupling rings [1] and remove the coupling.

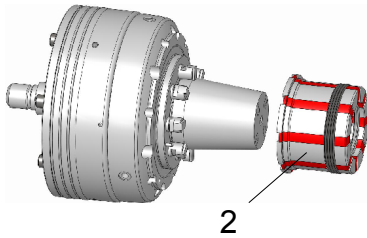


Fig. 23

6. Put the segmented clamping bushing [2] on the segmented mandrel.
7. Put the coupling rings over the segmented clamping bushing [2] and close the coupling.



#### **WARNING!**

#### **Risk of injury due to ejected parts!**

When operating the clamping device without changing parts [segmented clamping bushing, work piece end-stop] the coupling rings can be ejected.

- Operate the clamping device always with assembled changing parts.

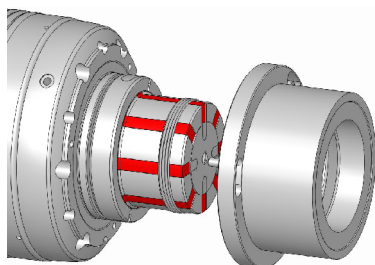
**6.3.9 Assembling of the work piece end-stop**

Fig. 24

Special tools required:

- Torque 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.
5. Put the work piece end-stop on the segmented mandrel.
6. Screw in all allen screws into the work piece end-stop with an allen wrench and tighten them clockwise with an allen wrench [see section »Screw tightening torque«].

**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.

**Risk of injury!**

If the clamping pressure is too low clamped work piece may be thrown out.

If the clamping pressure is too high severe damages of the components of the clamping device may occur the throwing out of the work piece.

- Before operation set the operation pressure back to operation level.
- The operating pressure should be checked and adjusted regularly!

**WARNING!****Slipping danger due to escaping hydraulic fluid!**

Escaping (sprayed out) hydraulic oil can cause serious injuries.

- Make sure that all o-rings/seals for the hydraulic / pneumatic interfaces are available and in undamaged condition.
- Make sure that the clamping device is empty and leakage of hydraulic fluid is avoided.

## 6.4 Work piece

**WARNING!****Risk of injury due to thrown out parts!**

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

- Check the clamping diameter of the work piece.
- Tighten only work pieces that meet the dimensional requirements.
- For clamping very long work pieces use in addition a tailstock / a steady rest for support.
- Do not exceed the maximum clamping pressure.
- Make sure that the correct supply pressure [neither too high nor too low] is set.

**CAUTION****Risk of injury!**

When placing the work piece:

- Make sure that the hands / fingers may not be clamped between the flange and the work piece!

## 6.5 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 work piece.

- 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 allen screws of the clamping device must be present and tightened with the proper tightening torque.
- The balance screws of the clamping device must all be present and undamaged.
- All rubber segments must be intact; this means that they are neither torn, nor are they porous at any point.
- 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 draw tube force specified on the perimeter of the clamping device must not be exceeded.
- The clamping pressure of the machine must be sufficiently high.
- All mounting tools must be removed from the interior of the machine.
- Clamping device and work piece must be compatible – check the clamping diameter regularly.
- The work piece must be clamped into the clamping device with sufficient work piece tension.
- Do a pressure loss test and a measurement of clamping force.

## 6.6 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.

## 6.7 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 of chips and production residues with a soft, lint-free cloth.
5. Close the protective door or hood.

## 7 Disassembly, subsequent storage, disposal

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!**

#### **Danger of injury due to falling components!**

When mounting components can fall and cause severe injury and material damage.

- Two people are always required for this task.
- Use a crane.
- For assembly on a vertically suspended spindle always use a suitable mounting aid.

**DANGER!****Risk of injury by released energy!**

Risk of injury during the disassembling of the balance weight due to released energy.

- Pay attention to the safety instruction during the disassembly of the stroke limit screw.

**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!

**WARNING!****Danger of injury due to vertical suspended spindle!**

Bending into the machine work area when assembling overhead can cause severe head injuries.

- Secure components prior to overhead assembly.
- For assembly on a vertically suspended spindle always use a suitable mounting aid.

## 7.2 Disassembling the clamping device

### 7.2.1 Disassembling the work piece end-stop

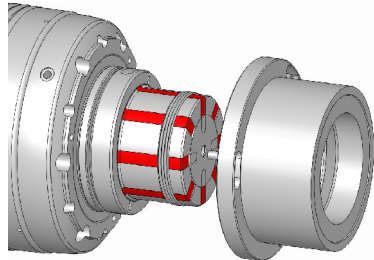


Fig. 25

Special tools required:

- Allen wrench

1. Put the machine tool in set up mode.
2. Remove all tool 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.
5. Loosen, unscrew and remove the allen screws.
6. Remove the work piece end-stop from the segmented mandrel.

### 7.2.2 Disassembling the segmented clamping bushing [RD/SE]

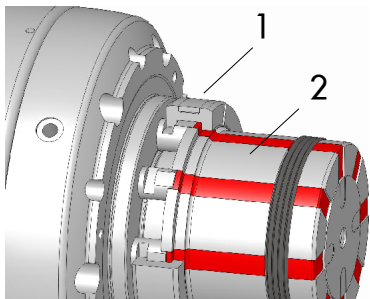


Fig. 26

Special tools required:

- Wrench

1. Put the machine tool in set up mode.
2. Remove all tool 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.
5. Open the coupling rings [1] and remove the coupling.
6. Remove the segmented clamping bushing [2] from the segmented mandrel.



### 7.2.3 Disassembling the segmented mandrel [machine spindle]

Two people are required for this task!

Special tools required:

- Allen wrench
- Crane
- Ring nuts

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.
5. Loosen, unscrew and remove the allen screws.
6. Remove the segmented mandrel from the flange by using a crane.

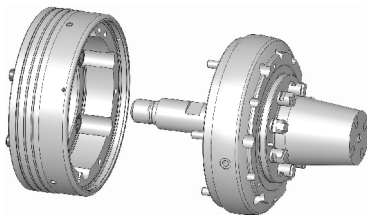


Fig. 27

### 7.2.4 Disassembly of the segmented mandrel [bayonet]

Two people are required for this task!

Special tools required:

- Allen wrench
- Crane
- Eye bolts

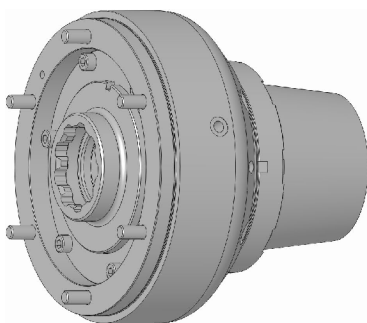


Fig. 28

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 draw tube of the m
5. Loosen, unscrew and remove the allen screws.
6. Screw in the eye bolts and secure the clamping device with a crane.

7. Unlock the clamping device by turning it in the bayonet.
8. Remove the segmented mandrel from the flange by using a crane.

### **7.2.5 Disassembly of the segmented mandrel [quick-change interface]**

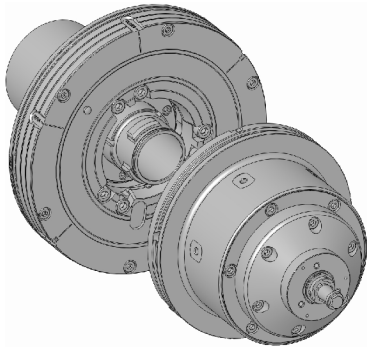


Fig. 29

The disassembly of the segmented mandrel from the quick-change machine adapter is described in the manual of the machine adapter.

### **7.2.6 Disassembling the flange**



Fig. 30

1. Put the machine tool in set up mode.
2. Loosen, unscrew and remove the allen screws.
3. Remove the flange by hand from the machine spindle.
4. Wipe off the mating surfaces at the machine spindle with a soft, lint-free cloth and remove all oil and grease residues.

### 7.2.7 Disassembly of the quick-change machine adapter [optional]

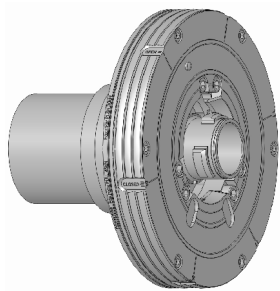


Fig. 31

The disassembly of the quick change machine adapter is described in the manual of the machine adapter.

### 7.2.8 Disassembling the draw tube adapter

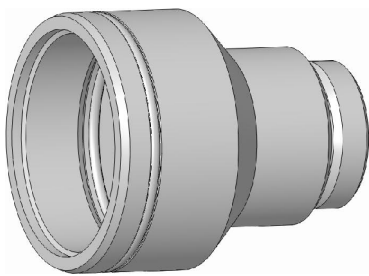


Fig. 32

1. Put the machine in set up mode.
2. Wipe off the mating surfaces of the machine spindle with a soft, lint-free cloth and remove all oil and grease residues.
3. Unscrew the draw tube adapter from the draw tube of the machine.

## 7.3 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«.

## 7.4 Disposal

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



### **NOTE!**

#### **Composite materials!**

For disposal clamping devices which include composite materials [mineral cast, CFK] must be returned at HAINBUCH!



#### **Risk of injury due to leaking fluids!**

Hydraulically or pneumatically operated clamping devices may contain residues of liquids. Uncontrolled leakage of fluids can lead to severe injuries.

- Open the pressure relief screw and drain remaining liquid.
- Discard the liquid.



### **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.



#### CAUTION

#### **Danger of injury due to improper handling of cleaners!**

Improper handling of cleaners can cause health impairments.

- Always comply with the safety data sheets and guidelines provided by the manufacturer of the cleaning agent for handling/using the cleaners.



#### 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.



### **NOTE!**

#### **Material damage due to use of the wrong cleaning agent/cleaner!**

Seals and clamping elements can be damaged due to use of the wrong seals and clamping elements.

- Do not use any solvents that contain ester or polar solvents for cleaning purposes.



### **Risk of injury!**

Slipping while the lubricating with a grease gun can lead to severe cuts!



### **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!



### **NOTE!**

#### **Damage of seal rings and segmented clamping bushing!**

Do not use ester-containing solvents or polar solvents for cleaning the clamping device. Seals and clamping elements could be damaged.

## 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!

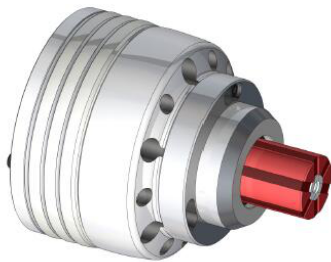


Fig. 33

- Auxiliary material required:
  - Ester-free, non-polar cleaning agent
  - Soft, lint-free cloth
- 1. Disassemble the clamping device [see section »Disassembling the clamping device«].
- 2. Clean all components listed below with cleaning agent and a cloth; remove all oil and grease residues:
  - Flange
  - Taper, reception and inner thread of the segmented mandrel
- Segmented clamping bushing
  - Coupling rings
  - Work piece end-stop
  - Allen screws

### 8.3 Preservation

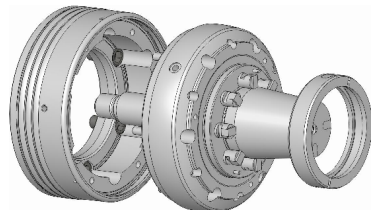


Fig. 34

- Special tools required:
    - Universal grease 2085/0003
    - Grease gun
    - Oil stone
    - Soft, lint-free cloth
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 allen screws. Remove excess grease with a cloth.
  4. Remount the clamping device.
  5. Screw all allen screws into the clamping device again and tighten them finger-tight.
 

**!** For subsequent storage tightening the allen screws finger-tight suffices. This facilitates re-commissioning and protect the allen screws.
  6. Use the lubricating nipple to grease the mandrel body of the segmented mandrel type 812 SE with a grease gun and universal grease.
  7. Lightly grease all interior and outer surfaces of the clamping device. Remove excess grease with a cloth.
  8. 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 product information

### Alternatives:

Lubricant	Manufacturer	Product
Universal grease	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 and complete cleaning in case of heavy contamination [see section »Cleaning«], especially at the clamping and end-stop face to avoid damages at the clamping device and the clamping elements early.
Each 36 operating hour	Clean the clamping device and the clamping unit [see section »Cleaning«].
	Clean the clamping taper [see section »Cleaning«].
	Grease the clamping device [see section »Preservation«].
Every 6 months	Completely disassemble and clean the clamping unit [see section »Cleaning«].



For proper operation of the coolant feed a prefiltering with duplex filter (mesh size 100 µm, PI 3754) is necessary. The duplex filter is mounted on the coolant cleaning system.

By using the clamping device in the 3-shift operating it should be maintained as follows:

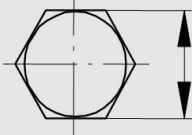
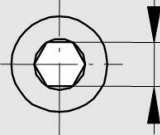
- After **22 operation hours each**, the clamping element is to be taken from the clamping device and cone, coupling and clamping element (clamping element, segmented clamping bushing) are to be cleaned. **Special attention applies for the coupling area.**
- A general **visual inspection**, particularly at the clamping area and the end-stop face, is to be done to ascertain early damages at the clamping device and at the rubber of the clamping element.
- During maintenance also the seals of the segmented clamping bushing must be checked for any damage, if necessary they must be replaced.
- Depending on contamination a complete cleaning of all mobile parts should be accomplished.
- Approx. **2 times annually** the clamping device is must be divided and cleaned completely.
- With storage the clamping device must be cleaned in principle by lubricating coolant and be protected from rust with preservative at the surface.
- **Daily and additional when needed** the coupling area must be cleaned.

## 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  $\mu_{\text{tot}} = 0,12$
- 90% utilization of the apparent limit of elasticity

Diameter	 [mm]	 [mm]	Torque for screw quality <b>10.9</b> [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 maximum permissible values and does not include any other safety factors. 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.
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 device does not open or release stroke is insufficient	Fouling between the draw mechanism and the clamping unit	Remove the clamping unite, move the drawtube back and clean the coupling area [see section »Disassembling the clamping unit«].	Specialist
	Dimensional deviation of the draw tube adapter	Check the dimensions of the draw tube adapter and correct them if necessary.	Specialist
Clamping force is too low	Work piece is over-dimensioned	Replace with a suitable clamping unit	Specialist
	Insufficient hydraulic pressure on the clamping cylinder	Check the machine side hydraulic aggregate	Hydraulic specialist
	Defective clamping cylinder or blocked draw tube	Contact the machine manufacturer	Machine manufacturer
Eccentric dimensional deviation on the work piece	Concentricity error of the segmented mandrel	Check the concentricity at the taper of the segmented mandrel, correct if necessary [see section »Checking and adjusting the face run and the concentricity«].	Specialist
Dimensional	Contaminated coupling area	Clean the coupling area of the clamping device [see section »Cleaning«].	Specialist

Fault	Possible cause	Fault correction	Corrected by
deviation on the work piece	Contaminated clamping taper	Disassemble the clamping unit and clean the clamping taper [see section »Cleaning«].	Specialist
Formal defect on the work piece	Elastic deformation of feedstock that is subject to formal defects. After machining the workpiece returns to its original form.	Use feedstock with fewer formal defects. If technically justifiably reduce the clamping pressure.	Specialist
Marks on the clamping surface	Point or linear work piece clamping	Replace with a clamping unit that has a smoother clamping surface	Specialist
	Excessive dimensional difference between the work piece diameter and the clamping bore	Replace with a clamping unit that has a suitable clamping bore	Specialist

### 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 [0]7144. 907-333

### Schedule Hotline

Current status of your order? Just call:  
+49 [0]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 [0]7144. 907-444

## 10.2 Representatives

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

Overview of German postal codes:

<b>Mi</b>	010 – 049	<b>Si</b>	350 – 369	<b>Hen</b>	560 – 569	<b>Rt</b>	730 – 739	<b>Fs</b>	880 – 899
<b>Sl</b>	060 – 089	<b>Bs</b>	370 – 399	<b>Re</b>	570 – 599	<b>Ti</b>	740 – 749	<b>Sb</b>	900 – 919
<b>Mi</b>	090 – 189	<b>Ft</b>	400 – 479	<b>Si</b>	600 – 659	<b>He</b>	750 – 799	<b>Hs</b>	920 – 949
<b>Wt</b>	190 – 289	<b>Bo</b>	480 – 499	<b>Ti</b>	660 – 699	<b>Hs</b>	800 – 819	<b>Sb</b>	950 – 969
<b>Bs</b>	290 – 319	<b>Ft</b>	500 – 549	<b>Rt</b>	700 – 709	<b>Gg</b>	820 – 829	<b>Si</b>	970 – 978
<b>Bo</b>	320 – 339	<b>Hen</b>	550 – 559	<b>Rt</b>	710 – 719	<b>Hs</b>	830 – 859	<b>Ti</b>	979
<b>Bs</b>	340 – 349	<b>Si</b>	400 – 479	<b>Fs</b>	720 – 729	<b>Gg</b>	860 – 879	<b>Sl</b>	980 – 999

**10.2.1 Germany**

- Bo** Werner Bock KG  
Commercial Agency  
Neue Reihe 2  
DE-33699 Bielefeld  
Phone +49 [0]521. 92458-0  
Fax +49 [0]521. 92458-99  
E-Mail: bockkg@gmx.de  
Internet: www.werner-bock-kg.de
- Bs** Bock & Strothmann GmbH  
Commercial Agency  
Berliner Allee 49  
DE-30855 Langenhagen-Godshorn  
Phone +49 [0]511. 781068  
Fax +49 [0]511. 782960  
E-Mail: vertrieb@bockundstrothmann.de  
Internet: www.bockundstrothmann.de
- Fs** Uwe Fischer  
Sales Representative  
HAINBUCH GMBH  
Im Apfentäle 25  
DE-72525 Münsingen-Auingen  
Phone +49 [0]7144. 907-662  
Fax +49 [0]7381. 183783  
E-Mail: uwe.fischer@hainbuch.de
- Ft** Jörg Fedtke  
Sales Representative  
HAINBUCH GMBH  
Kunkelsberg 2  
DE-45239 Essen  
Phone +49 [0]7144. 907-661  
Fax +49 [0]201. 2463-839  
E-Mail: joerg.fedtke@hainbuch.de
- Gg** Winfried Gogg  
Sales Representative  
HAINBUCH GMBH  
Kantstr. 16  
DE-88471 Laupheim  
Phone +49 [0]7144. 907-673  
Fax +49 [0]7144. 907-872  
E-Mail: winfried.gogg@hainbuch.de
- Hb** HAINBUCH GmbH  
Spannende Technik  
Erdmannhäuser Straße 57  
DE-71672 Marbach  
Phone +49 [0]7144. 907-333  
Fax +49 [0]7144. 18826  
E-Mail: verkauf@hainbuch.de
- He** Thomas Helfer Industrievertretung  
Commercial Agency  
Gerwigstraße 4  
DE-76437 Rastatt  
Phone +49 [0]7222. 916231  
Fax +49 [0]7222. 916240  
Mobil +49 [0]171. 2032559  
E-Mail: helfer.industrievertretung@t-online.de
- Hen** Anika Hensen  
Sales Representative  
HAINBUCH GmbH  
Mühlenberg 15  
DE-53902 Münstereifel  
Phone +49 [0]7144. 907-6750  
Fax +49 [0]7144. 18826  
E-Mail: anika.hensen@hainbuch.de
- Hs** Thomas Hummel  
Sales Representative  
HAINBUCH GMBH  
Pfarrer-Hopp-Straße 1  
DE-93142 Pirkensee  
Phone +49 [0]7144. 907-674  
Fax +49 [0]7144. 907-874  
E-Mail: thomas.hummel@hainbuch.de
- Mi** Henry Miersch  
Sales Representative  
HAINBUCH GMBH  
Feldstraße 51  
DE-06917 Jessen  
Phone +49 [0]7144. 907-664  
Fax +49 [0]3537. 200455  
E-Mail: henry.miersch@hainbuch.de
- Re** Ulrich Remmel  
Commercial Agency  
Gildestraße 18  
DE-58791 Werdohl  
Phone +49 [0]2392. 9383-0  
Fax +49 [0]2392. 9383-17  
E-Mail: info@remmel.de  
Internet: www.remmel.de
- Rt** Renee Reuter  
Sales Representative  
HAINBUCH GMBH  
Brühlstraße 7  
DE-73252 Lenningen  
Phone +49 [0]7144. 907-670  
Fax +49 [0]7026. 371871  
E-Mail: renee.reuter@hainbuch.de



**Sb** Benjamin Schuh  
Sales Representative  
HAINBUCH GMBH  
Am Erlengraben 39  
DE-91459 Markt Erlbach  
Phone +49 [0]7144. 907-672  
Fax +49 [0]7144. 907-872  
E-Mail: benjamin.schuh@hainbuch.de

**Si** Michael Simon  
Sales Representative  
HAINBUCH GMBH  
Am Tannenberg 8  
DE-63776 Mömbris  
Phone +49 [0]7144. 907-667  
Fax +49 [0]6029. 994932  
E-Mail: michael.simon@hainbuch.de

**Sl** Jörg Schlag  
Sales Representative  
HAINBUCH GMBH  
Martin-Drucker-Straße 21  
DE-04157 Leipzig  
Phone +49 [0]7144. 907-665  
Fax +49 [0]341. 24689012  
E-Mail: joerg.schlag@hainbuch.de

**Kp** Thomas Klumpp  
Technical Consultant  
HAINBUCH GMBH  
Hahnbergweg 15  
DE-72270 Baiersbronn  
Phone +49 [0]7144. 907-663  
Fax +49 [0]7144. 291131  
E-Mail: thomas.klumpp@hainbuch.de

**Ti** Jörg Tittel  
Technical Consultant  
HAINBUCH GMBH  
Wunnensteinstraße 10  
DE-71711 Steinheim/Murr  
Phone +49 [0]7144. 907-668  
Fax +49 [0]7144. 819864  
E-Mail: joerg.tittel@hainbuch.de

**Wt** Werkzeug-Technik-Nord  
Commercial Agency  
Emmy-Noether-Str. 1  
DE-24558 Henstedt-Ulzburg  
Phone +49 [0]4193. 8891780  
Fax +49 [0]4193. 88917888  
E-Mail: wtn@wtn-gmbh.de

**Za** Carsten Zander  
Technical Consultant  
HAINBUCH GMBH  
Friedrich-Ebert-Straße 9  
DE-31848 Bad Münder  
Phone +49 [0]7144. 907-669  
Fax +49 [0]5042. 506751  
E-Mail: carsten.zander@hainbuch.de

## 10.2.2 Europe

### Austria

GGW Gruber & Co. GmbH  
Kolingasse 6  
1090 Vienna  
Phone +43 [0]1. 3107596-0  
Fax +43 [0]1. 3107596-31  
E-mail: ggw@gruber-ing.at  
Internet: www.gruber-ing.at

### Belgium

BIS Technics bvba/sprl  
Zevenputtenstraat 20  
3690 Zutendaal  
Phone +32 89518890  
Fax +32 89518899  
E-mail: info@bistechnics.com  
Internet: www.bistechnics.com

### **Czech Republic, Slovakia**

TMC CR s.r.o.  
Masná 27/9  
60200 Brno  
Phone +420 548214572  
Fax +420 548217219  
E-mail: info@tmccr.cz  
Internet: www.tmccr.cz

### **Estonia, Latvia, Lithuania**

DV-Tools OÜ  
Peterburi tee 34/4  
11415 Tallinn  
Phone +372 6030508  
Fax +372 6030508  
E-mail: info@dv-tools.ee

### **France**

**HAINBUCH France SNC**  
Equipements de machines-outils  
ZI Lons-Perrigny  
1600, Route de la Lième  
39570 Lons-le-Saunier  
Phone +33 384876666  
Fax +33 384876677  
E-mail: info@hainbuch.fr  
Internet: www.hainbuch.com

### **Great Britain**

**HAINBUCH UK Ltd.**  
Newberry  
Keys Business Village, Keys Park Road  
Hednesford, Staffordshire  
WS12 2HA  
Phone +44 1543 478710  
Fax +44 1543 478711  
Mobile +44 7980212784  
E-mail: nick.peter@hainbuch.co.uk  
Internet: www.hainbuch.com

### **Hungary**

GGW Gruber & Co. GmbH  
Kolingasse 6  
1090 Vienna  
Phone +43 [0]1. 3107596-0  
Fax +43 [0]1. 3107596-31  
E-mail: ggw@gruber-ing.at  
Internet: www.gruber-ing.at

### **Denmark**

Jørn B. Herringe A/S  
Ramsømagle  
Syvvejen 31  
4621 Gadstrup  
Phone +45 46170000  
Fax +45 46170001  
E-mail: sales@jhb-tools.dk  
Internet: www.jhb-tools.dk

### **Finland**

Oy Maantera Ab  
PL 70 Keinumäenkuja 2  
01510 Vantaa  
Phone +358 29006130  
Fax +358 290061130  
E-mail: maantera@maantera.fi  
Internet: www.maantera.fi

### **France**

#### **Representative for: Haute Savoie**

Utilis France Sarl  
597, Avenue du Mont Blanc  
74460 Marnaz  
Phone +33 450963630  
Fax +33 450963793  
E-mail: contact@utilis.com  
Internet: www.utilis.com

### **Greece**

PAPET Papadopoulos GbR  
Hauptstraße 75  
DE-73061 Ebersbach/Fils  
Phone +49 71635858/530668  
Fax +49 716352265  
E-mail: paris@papet-technologies.de

### **Ireland**

Machine Shop & Engineering Supplies Ltd.  
11 Vale View Lawn - The Park  
Cabinteely, Dublin 18  
Phone +353 12847003  
Fax +353 12857955  
E-mail: machshop@indigo.ie

**Italy****HAINBUCH Italia srl**

Via Caduti di Nassiriya 5  
22036 Cantu [Co]  
Phone +39 0313355351  
Fax +39 031611570  
E-mail: info@hainbuchitalia.it  
Internet: www.hainbuchitalia.it

**Norway**

Onstad Maskin A/S  
Chr. H. Blomsgt. 13  
3717 Skien  
Phone +47 35532373/74  
Fax +47 35532375  
E-mail: postmaster@onstadmaskin.no  
Internet: www.onstadmaskin.no

**Romania**

Banatech srl  
Carasului Str. 26  
325400 Caransebes  
Phone +40 255517175  
Fax +40 355814125  
Mobile +40 749220553  
E-mail: office@banatech.ro  
Internet: www.banatech.ro

**Slovakia**

NS s.r.o.  
Vácka ulica 4109/10  
01841 Dubnica N/V  
Phone +421 424450873  
Fax +421 424440406  
E-mail: tns@tnssro.sk  
Internet: www.tnssro.eu

**Spain, Portugal**

ATM Asistentes Tecnológicos del  
Mecanizado, S. L.  
Isaac Albeniz, 29  
08402 Granollers [Barcelona]  
Phone +34 938606572  
Fax +34 938791689  
E-mail: atm.sl@atmbarcelona.com

**Switzerland**

Utilis Müllheim AG  
Präzisionswerkzeuge  
Kreuzlinger Strasse 22  
CH-8555 Müllheim  
Phone +41 [0]52. 7626262  
Fax +41 [0]52. 7626200  
E-mail: info@utilis.com  
Internet: www.utilis.com

**Netherlands**

BIS Specials  
[Brandenburg Industry Service Dongen BV]  
Dreef 7  
6996 BA Drempt  
Phone +31 313482566  
Fax +31 313482569  
E-mail: info@bisspecials.com  
Internet: www.bisspecials.com

**Poland**

BIM Sp.z.o.o.  
ul. Wysogotowska 9  
62081 Przemierowo  
Phone +48 616232041  
Fax +48 616232040  
E-mail: bim@bazafirm.pl

**Russia**

LLC Rosna Engineering  
Melnichnaya 4  
192019 St. Petersburg  
Phone +812 4129213  
Fax +812 4125586  
E-mail: rosna@rosna.spb.ru  
Internet: www.rosna.spb.ru

**Slovenia**

Elmetool d.o.o.  
Prvomajska ulica 62  
5000 Nova Gorica  
Phone +386 53303300  
Fax +386 53303304  
E-mail: info@elmetool.si

**Sweden****HAINBUCH Svenska AB**

Kemistvägen 17  
18379 Täby  
Phone +46 87327550  
Fax +46 87327650  
E-mail: hainbuch@hainbuch.se  
Internet: www.hainbuch.com

**Turkey**

Hidkom  
Organize Sanayi Bölgesi  
75. Yil CD. Demirciler Sit. B Blok No.2  
16159 Nilüfer / Bursa  
Phone +90 2242438292  
Fax +90 2242436365  
E-mail: hidkom@tr.net  
Internet: www.hidkom.com

### 10.2.3 America

#### Brasil

Sanposs Tecnologia, Suprimentos e  
Consultoria Internacional Ltda.  
Rua Cândia nº 65 - Jardim do Mar  
CEP: 09726-220  
São Bernardo do Campo - São Paulo  
Phone +55 11 41266711  
Fax +55 11 41266710  
Correo electrónico: tsci@sanposs.com.br  
Internet: www.sanposs.com.br

#### Canada

**HAINBUCH America Corp.**  
Workholding Technology  
W129 N10980 Washington Dr.  
Germantown, WI 53022  
Phone +1 4143589550  
Fax +1 4143589560  
Correo electrónico:  
sales@hainbuchamerica.com  
Internet: www.hainbuch.com

#### Mexico

**HAINBUCH America Corp.**  
Workholding Technology  
W129 N10980 Washington Dr.  
Germantown, WI 53022  
Phone +1 4143589550  
Fax +1 4143589560  
Correo electrónico:  
sales@hainbuchamerica.com  
Internet: www.hainbuch.com

#### Canada

**Representative for: Ontario, Québec**  
J.Winkel & Associates Inc.  
6516 Warbler Lane  
L5N 6E1 Mississauga, Ontario  
Phone +1 4143589550  
Fax + 1 4143589560  
Correo electrónico:  
sales@hainbuchamerica.com  
Internet: www.hainbuch.com

#### USA

**HAINBUCH America Corp.**  
Workholding Technology  
W129 N10980 Washington Dr.  
Germantown, WI 53022  
Phone +1 4143589550  
Fax +1 4143589560  
**Se habla español:**  
Tel +1 2143268081  
Correo electrónico:  
sales@hainbuchamerica.com  
Internet: www.hainbuch.com

### 10.2.4 Asia

#### China

**HAINBUCH Shanghai Co. Ltd.**  
Workholding Technology  
1/F, West building  
No. 388 East Kangqiao Rd.  
Pudong, Shanghai 201319  
Phone +86 2120916384  
Fax +86 2120916383  
E-mail: sales@hainbuch.cn  
Internet: www.hainbuch.cn

#### India

M'la Sales Corporation  
5, Yeshwantnagar  
Telco-Century Enka Road  
411018 Pune  
Phone +91 20 27477405  
Fax +91 20 27464249  
E-mail: info@m-la-sales.com  
Internet: www.m-la-sales.com

**India**

A.H. Rao  
Management & Technology Consultant  
Gr.Fl. HNO 4157, 14th Main  
HAL 2nd Stage Indiranagar  
Bangalore 560 008  
Phone +91 25279551  
Fax +91 9986997959  
E-Mail: ahr.rao@gmail.com

**Israel**

M.T.M. Machine Tools Marketing Ltd.  
31, Harbazel  
69710 Tel Aviv  
Phone +972 36479560  
Fax +972 36479578  
E-mail: sales@mtm.co.il  
Internet: www.mtm.co.il

**Korea**

HIOIL E&T Co. Ltd.  
160-5, Seokchon-dong, Songpa-gu  
Seoul, 138-844  
Phone +82 24137911  
Fax +82 24137910  
E-Mail: inform@hioilent.com  
Internet: www.hainbuch.co.kr

**Taiwan**

GSTC Technology Co., Ltd.  
No. 418, Youn-Chun East 1st Rd  
Taichung City 40877, Taiwan'  
Phone +88 6423805678  
Fax +88 6423805511  
E-mail: gstc@seed.net.tw  
Internet: www.gstctech.com.tw

**Indonesia**

PT. STAHL ARBEIT  
WTC Mangga Dua 2nd Floor A-6  
JL. Mangga Dua Raya No. 8  
Jakarta 14430  
Phone +62 21 3777 6622  
Fax. +62 21 3001 8070  
E-mail: info@stahl-arbeit.com  
Internet: www.stahl-arbeit.com

**Japan**

NK Works Co LTD  
2-17-17 Iwamoto-cho, Chiyoda-ku  
Tokyo, 101-0032  
Phone +81 338645411  
Fax +81 338646752  
E-mail: info@nk-works.co.jp  
Internet: www.nk-works.co.jp

**Malaysia, Singapore & Vietnam**

Jebesen & Jessen Technology [S] Pte Ltd.  
Process Engineering Division  
18 Enterprise Road  
Singapur 629824  
Phone +65 63053692  
Fax +65 63053699  
E-mail: phillip\_lee@jjsea.com  
Internet: www.jjsea.com

**Thailand**

PTT Precision Tools Co Ltd  
HAINBUCH Workholding Solutions  
Eastern Seaboard Ind. Est. Micro Fty.  
Ph 2 ESIE-Rd 14,  
64/93, Moo 4, Tambon Pluak Daeng,  
Amphur Pluak Daeng  
Rayong 21140  
Phone +66 2362 8656  
Mobile +66 818384 924  
Fax +66 2362 8656  
E-mail: anuwat@hb-ptt.com  
Internet: www.hainbuch.com

**10.2.5 Australia****Australia**

Romheld Automation Pty Ltd  
Unit 30 115 Woodpark Road  
Smithfield . NSW. 2164  
Phone +61 297211799  
Fax +61 297211766  
E-mail: sales@romheld.com.au  
Internet: www.romheld.com.au

**10.2.6 Africa****South Africa**

Retecon [PTY] Ltd.  
P.O. Box 1472  
1620 Kempton Park  
Phone +27 119768600  
Fax +27 113942471  
E-mail: tools@retecon.co.za  
Internet: www.retecon.co.za

**11 Index**

<b>A</b>	
Accessories.....	
optional.....	23
Assembly.....	
Concentricity and face run.....	39
Draw tube adapter.....	34, 51
Flange.....	34
Preparations.....	30
Segmented clamping bushing RD.....	41
Segmented mandrel.....	37
Segmented mandrel [bayonet].....	38
Segmented mandrel [capteX].....	39
Work piece.....	43
Work piece end-stop.....	42
<b>B</b>	
Bolt torque.....	59
Brief description.....	22
<b>C</b>	
Cleaning.....	55
Control of the stroke position.....	45
<b>D</b>	
Dimensional sheet.....	21
Disassembly.....	
Flange.....	50
Segmented clamping bushing.....	48
Segmented mandrel [bayonet].....	49
Segmented mandrel [capteX].....	50
Segmented mandrel [machine spindle]	
.....	49
Work piece end-stop.....	48
Disposal.....	52
<b>E</b>	
Environmental protection.....	19
<b>G</b>	
Grease.....	24
Grease gun.....	24
<b>I</b>	
Intended use.....	10
<b>M</b>	
Maintenance schedule.....	57
<b>O</b>	
Operating conditions.....	20
Overview.....	22

<b>P</b>		Segmented clamping bushing.....	23
Packaging.....	27	Spare parts.....	8
Personal protective equipment.....		Special dangers.....	13
Hard hat.....	12	Storing.....	28
Protective gloves.....	12	Structure.....	22
Protective goggles.....	12	Subsequent storage.....	46
Protective work clothing.....	12	Symbols on the packaging.....	25
Safety footwear.....	12	<b>T</b>	
Personnel requirements.....	9	Transport inspection.....	26
Power specifications.....	20	Transport, inner-company.....	26
Preservation.....	56	Trouble shooting.....	60
<b>R</b>		Trouble shooting table.....	61
Representatives.....		Type designation.....	21
Africa.....	70	<b>U</b>	
America.....	68	Unpacking.....	26
Asia.....	68	<b>W</b>	
Australia.....	69	Work piece end-stop.....	24
Europe.....	65		
Germany.....	64		
<b>S</b>			
Scope of delivery.....	8		



SPANNENDE TECHNIK

HAINBUCH GMBH  
SPANNENDE TECHNIK  
PO Box 1262 · DE-71667 Marbach  
Erdmannhäuser Straße 57 · DE-71672 Marbach  
Phone +49 [0]7144. 907-0  
Fax +49 [0]7144. 18826  
verkauf@hainbuch.de  
www.hainbuch.com  
**24h-Emergency call** +49 [0]7144. 907-444