

Installation manual

EN

Jaw chuck B-Top3

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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

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 Balance quality



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 workpieces.

The clamping of not rotationally symmetrical workpieces 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!

1.5 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!

1.6 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.

1.7 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 Jaw chuck
- 1 Guard bushing
- 1 set Master jaws
- 1 set Test jaws
- 1 Chuck wrench

Optionally the scope of delivery of the clamping device includes:

- Jaws
- Insert bushing
- Eye bolts

1.8 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.

1.9 Warranty terms

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

1.10 Warranty

Length of warranty	24 months
Max. number of clamping cycles	500 000 Cycles

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.



WARNING!

Risk of injury!

An incorrect media supply [hydraulic, pneumatic], e.g. by damaged or missing seals or pipes, can cause serious personal injury.

- Hydraulic and / or pneumatic tubes must be secured by the machine by check valves and a permanent pressure monitoring!

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 / or as an end-stop chuck for chuck work. Furthermore B-Top3 adaptations may be adapted.

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 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 Power Chuck is for example

- If workpieces are not clamped properly
- If safety regulations are disregarded and persons are working at the clamping device 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 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!

Clamping devices with weight more than 15 kg 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.
- 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.

Wrong clamping of the workpiece



WARNING!

Danger of injury due to incorrect clamping of the workpiece!

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

Under dimensioned parts can lead to incorrect clamping!

- Do random checks of the unmachined workpieces on dimensional accuracy.

Too low axial clamping force can lead to the reduction of radial clamping force!

Too high axial clamping force can lead to damage of the components of the clamping device!

- Check and adjust, if necessary, the axial clamping force regularly.

Missing changing parts



WARNING!

Danger of injury due to missing changing parts!

When operating the clamping device without changing parts [guard bushing, workpiece end-stop] 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 guard bushing and/or workpiece end-stop.

Parts with sharp edges



WARNING!

Risk of injury!

When screwing in individual components such as for example workpiece 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/ Personal protective equipment] is required!



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 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 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!

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

	165	215	260	315
Max. Max. actuating force [kN]	30	46	65	90
Max. clamping force [kN]	41	74	115	160
Max. speed [rpm]	6000	5400	4000	3600
Stroke per jaw [mm]	5.9	7.4	8.2	8.6
Piston stroke [mm]	20	25	28	28
Through hole [mm]	43	66	81	104
Weight [kg]	13	24	42	66
Centrifugal torque of the base jaw with fine serration M_{cGB} [kgm]	For the B-Top3 chuck, it is necessary to specifically determine this data.			

The maximum permissible speed for special machining has to be defined by the user on the basis of the required clamping forces. This speed must not exceed the maximum speed of the chuck.

If unhardened top jaws or chuck jaws in a special design are used, ensure that the jaws weigh as little as possible.

For unhardened top jaws or chuck jaws in special design, the permissible RPM according to VDI 3106 must be determined by means of calculation for the respective machining job. In this, however, the recommended maximum speed must not be exceeded. The values calculated must be checked by means of dynamic measurement using a clamping force tester.



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!



NOTE!

Damage of clamping device and/or machine due to throwing out of the clamped work-piece caused by insufficient stroke!

If the actuation stroke of the machine is less than the stroke of the clamping device [piston stroke], there is no complete jaw stroke.

- At quick change of the jaw note the tooth pitch!

3.2 Clamping forces

The diagrams relate to a 3-jaw chuck.

Clamping force/RPM curves have been calculated using hard jaws. In doing so, the maximum actuating force was induced and the jaws set flush with the outer diameter of the chuck.

The chuck is in perfect condition and lubricated with HAINBUCH special grease.

Should one or several of the above mentioned parameters be changed the diagrams are no longer valid.

Chuck set-up for clamping force / speed diagram

$F / 3$	Clamping force per jaw
F_{max}	Actuating force
r_s	Center of gravity radius
S	Center of gravity

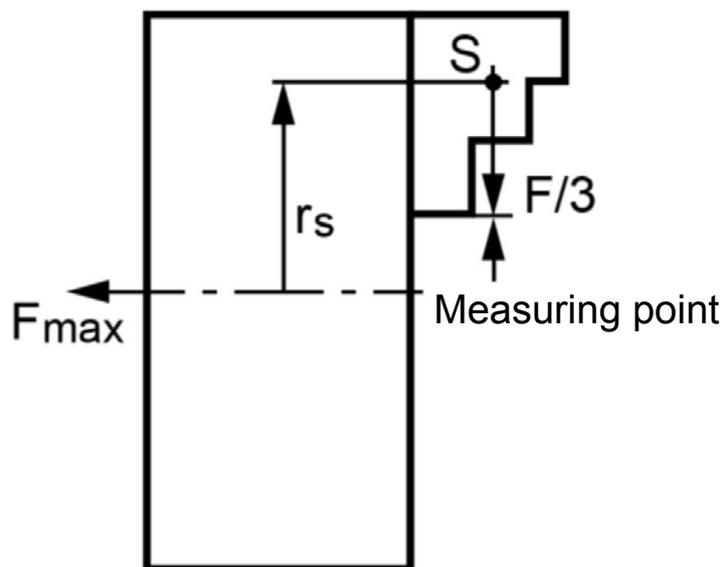


Fig. 1

Clamping force RPM diagram B-Top 165

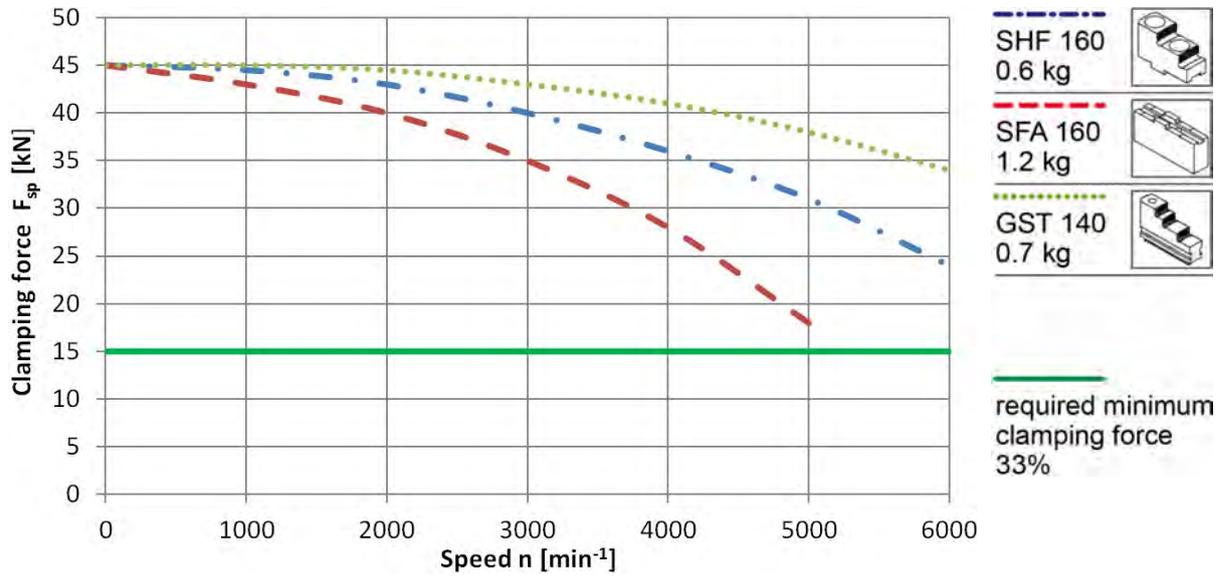


Fig. 2 - Speed n [min⁻¹]

Clamping force RPM diagram B-Top 215

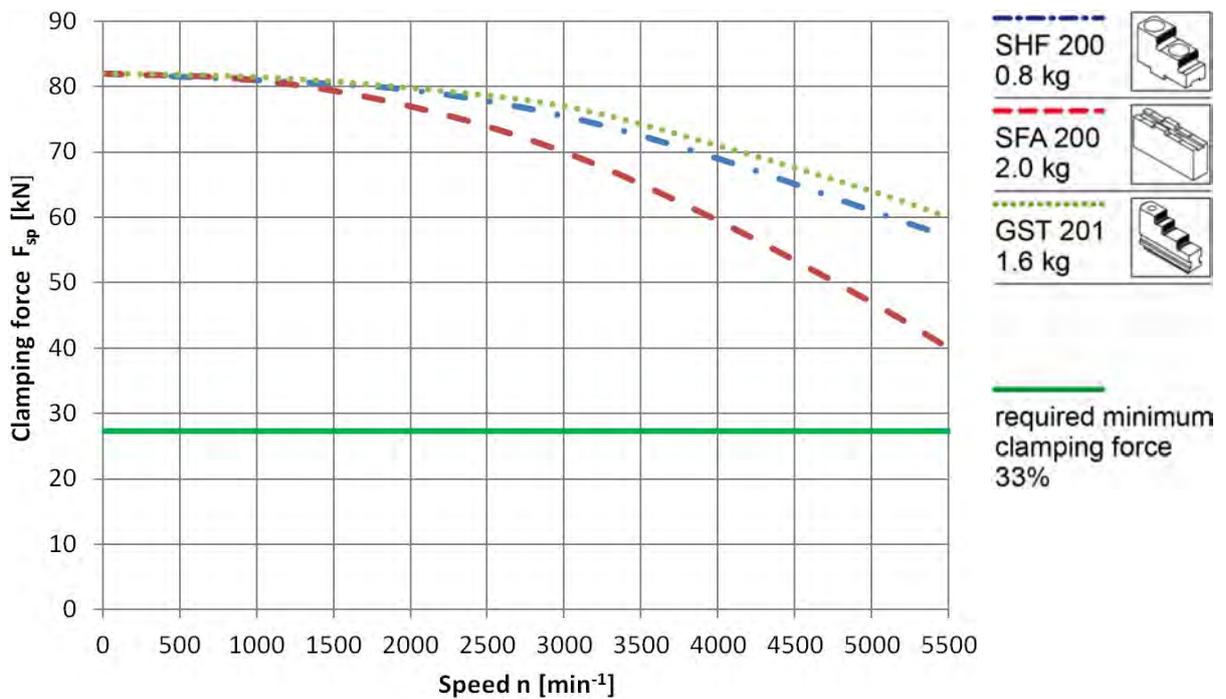


Fig. 3 - Speed n [min⁻¹]

Clamping force RPM diagram B-Top 260

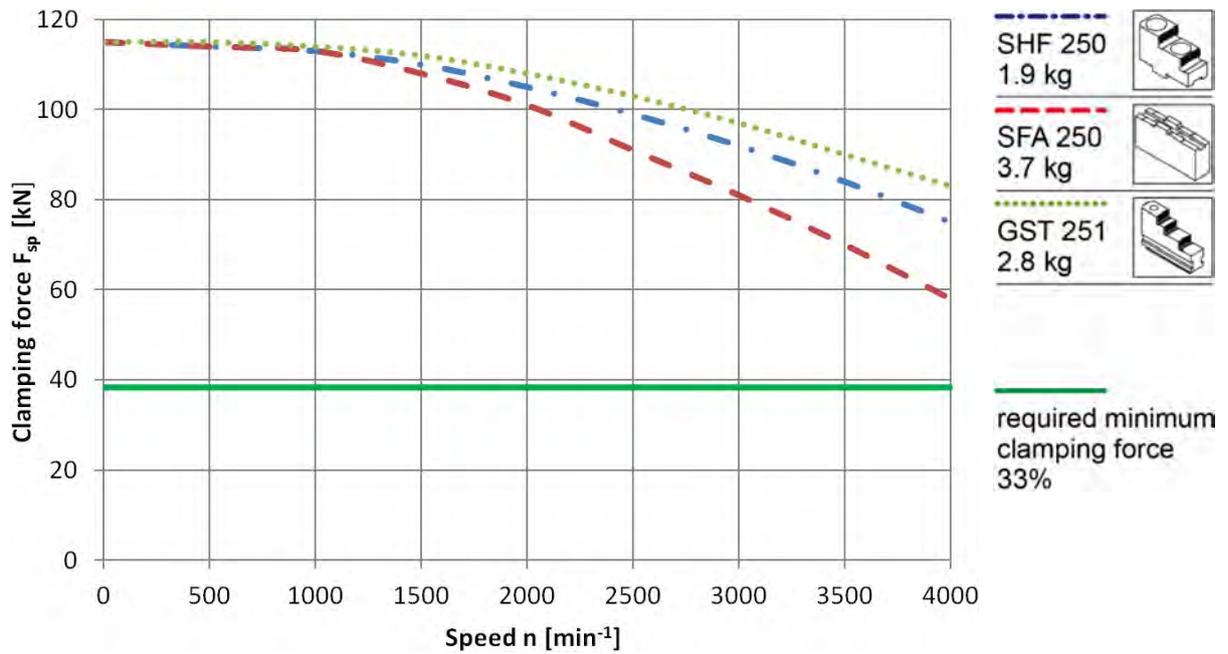


Fig. 4 - Speed n [min⁻¹]

Clamping force RPM diagram B-Top 315

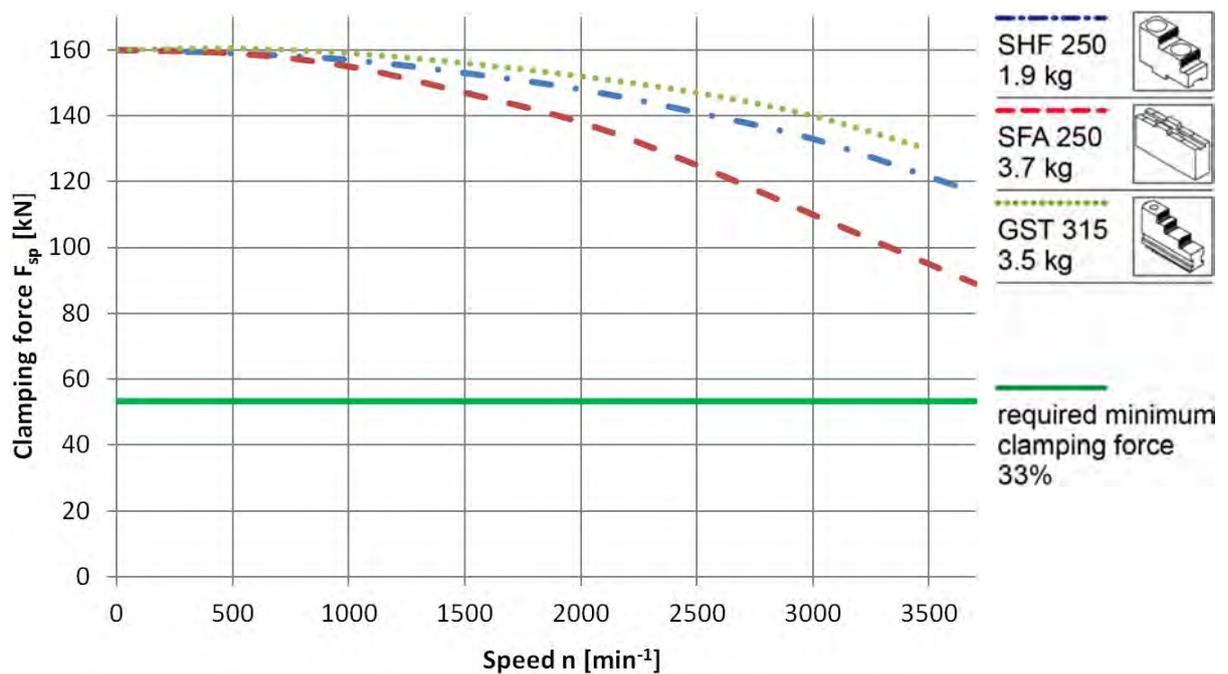


Fig. 5 - Speed n [min⁻¹]

3.3 Calculations for clamping force and speed

Missing information or specifications can be requested from the manufacturer.

3.3.1 Legend

Short description	Unit	Explanation
F_c	[N]	Total centrifugal force
F_{sp}	[N]	Effective clamping force
F_{spmin}	[N]	Min. required clamping force
F_{sp0}	[N]	Initial clamping force
F_{spz}	[N]	Cutting force
m_{AB}	[kg]	Mass of one top jaw
m_B	[kg]	Mass of chuck jaw set
M_c	[Nm]	Centrifugal force torque
M_{cAB}	[Nm]	Centrifugal torque of top jaws
M_{cGB}	[Nm]	Centrifugal torque of base jaws
n	[m-1]	Speed
r_s	[mm]	Center of gravity radius
r_{sAB}	[mm]	Center of gravity radius of top jaw
S_{sp}		Safety factor for clamping force
S_z		Safety factor for cutting
Σ_s	[N]	Max. clamping force of chuck

3.3.2 Calculation of the required clamping force in case of a given rpm

The **initial clamping force** F_{sp0} is the total force impacting radially on the workpiece via the jaws due to actuation of the lathe chuck during shutdown. Under the influence of rpm, the jaw mass generates an additional centrifugal force. The centrifugal force reduces or increases the initial clamping force depending on whether gripping is from the outside inwards or from the inside outwards. The sum of the initial clamping force F_{sp0} and the **total centrifugal force** F_c is the **effective clamping force** F_{sp} .

$$F_{sp} = F_{sp0} \pm F_c [N]$$

(-) for gripping from the outside in

(+) for gripping from the inside out



DANGER!

Risk to life and limb of the operating personnel and significant property damage when the RPM limit (Fig. 6) is exceeded!

With gripping from the outside inwards, and with increasing RPM, the effective clamping force is reduced by the magnitude of the increasing centrifugal force [the forces are opposed]. When the RPM limit is exceeded, the clamping force drops below the minimum clamping force F_{spmin} . Consequently, the workpiece is released in an unchecked manner.

- Do not exceed the calculated RPM.
- Do not fall below the necessary minimum clamping force.

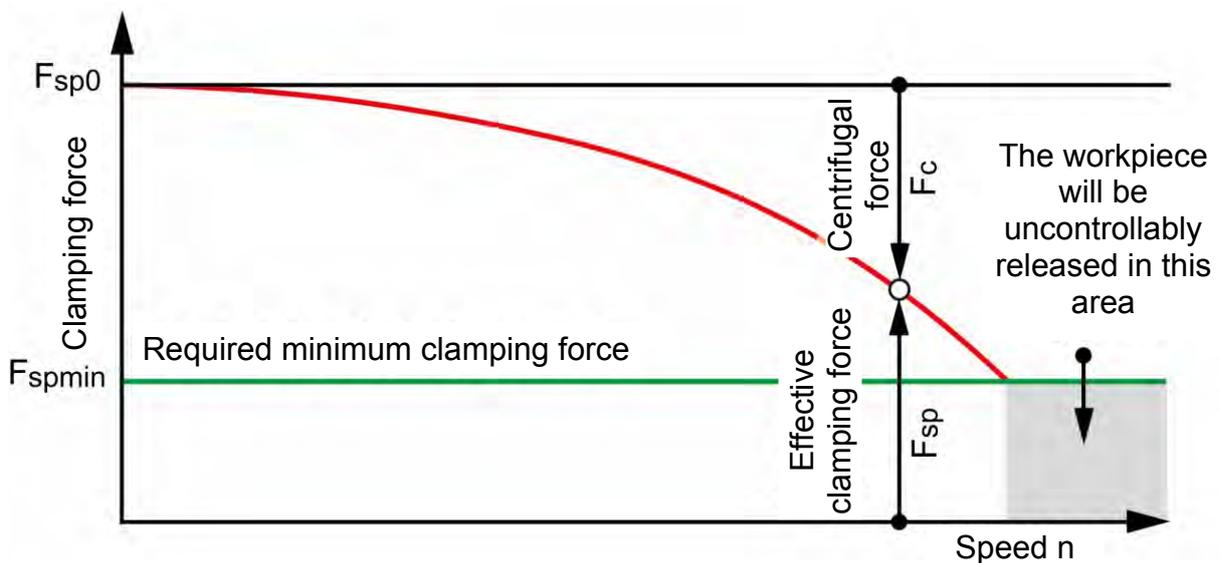


Fig. 6 - Reduction in effective clamping force by the magnitude of the total centrifugal force, for gripping from the outside inwards.

The required effective clamping force for machining F_{sp} is calculated from the product of the machining force F_{spz} with the safety factor S_z . This factor takes into account uncertainties in the calculation of the clamping force. According to VDI 3106, the following is valid: $S_z \geq 1.5$.

$$F_{sp} = F_{spz} * S_z [N]$$

From this we can derive the calculation of the initial clamping force during shutdown:

$$F_{sp0} = S_{sp} * (F_{sp} \pm F_c) [N]$$

(+) for gripping from the outside in
 (–) for gripping from the inside out



NOTE!

This calculated force must not be larger than the maximum clamping force ΣS engraved on the chuck.

- See technical data.

From the above formula it is evident that the sum of the effective clamping force F_{sp} and the total centrifugal force F_c is multiplied by the **safety factor for the clamping force S_{sp}** . According to VDI 3106, the following also applies here: **$S_{sp} \geq 1.5$** .

The **total centrifugal force F_c** is dependent both on the sum of the masses of all jaws and on the center of gravity radius and the RPM.



NOTE!

For safety reasons, in accordance with DIN EN 1550, the centrifugal force may be a maximum of 67 % of the initial clamping force.

The formula for the calculation of the total centrifugal force F_c is:

$$F_c = \sum (m_B * r_s) * \left(\frac{\pi * n}{30}\right)^2 = \sum M_c * \left(\frac{\pi * n}{30}\right)^2 [N]$$

n is the given speed in r.p.m. The product $m_B * r_s$ is described as the **centrifugal force torque M_c** .

$$M_c = m_B * r_s [kgm]$$

In case of chucks with split chuck jaws, i.e. with base jaws and top jaws, for which the base jaws change their radial position only by the stroke amount, the **centrifugal torque of base jaws M_{cGB}** and the **centrifugal torque of top jaws M_{cAB}** need to be added:

$$M_c = M_{cGB} + M_{cAB} [kgm]$$

The centrifugal torque of the base jaws M_{cGB} can be found in the table in »technical data«. The centrifugal torque of the top jaws M_{cAB} is calculated as per:

$$M_{cAB} = m_{AB} * r_{sAB} [kgm]$$

3.3.3 Calculation example

Required initial clamping force F_{sp0} for a given rpm n

The following data is known for the machining job:

- Gripping from the outside in [application-specific]
- Machining force $F_{spz} = 3000 \text{ N}$ [application-specific]
- Max. RPM $n_{max} = 3200 \text{ min}^{-1}$ [Technical data]
- RPM $n = 1200 \text{ min}^{-1}$ [application-specific]
- Mass of one [!] top jaw $m_{AB} = 5.33 \text{ kg}$ [application-specific]
- Center of gravity radius of top jaw $r_{sAB} = 0.107 \text{ m}$ [application-specific]
- Safety factor $S_z = 1.5$ [according to VDI 3106]
- Safety factor $S_{sp} = 1.5$ [according to VDI 3106]



NOTE!

Masses of the jaw mounting screws and T-nuts are not taken into account.

First the required effective clamping force F_{sp} is calculated using the machining force stated:

$$F_{sp} = F_{spz} * S_z = 3000 * 1.5 \rightarrow F_{sp} = 4500 \text{ N}$$

Initial clamping force during shutdown:

$$F_{sp0} = S_{sp} * (F_{sp} + F_c)$$

Calculation of total centrifugal force:

$$F_c = \sum M_c * \left(\frac{\pi * n}{30}\right)^2$$

For two-part chuck jaws, the following applies:

$$M_c = M_{cGB} + M_{cAB}$$

Centrifugal torque of base jaw and top jaw specified in »technical data«:

$$M_{cGB} = 0.319 \text{ kgm}$$

For the centrifugal torque of the top jaw, the following applies:

$$M_{cAB} = m_{AB} * r_{sAB} = 5.33 * 0.107$$

$$M_{cAB} = 0.57 \text{ kgm}$$

Centrifugal torque for one jaw:

$$M_c = 0.319 + 0.571$$

$$M_c = 0.89 \text{ kgm}$$

The chuck has 3 jaws, the total centrifugal torque is:

$$F_c = \sum M_c * \left(\frac{\pi * n}{30}\right)^2 = 2.668 * \left(\frac{\pi * 1200}{30}\right)^2$$

$$F_c = 42131 \text{ N}$$

The total centrifugal force can now be calculated. Initial clamping force during shutdown that was sought:

$$F_{sp0} = S_{sp} * (F_{sp} + F_c) = 1.5 * (4500 + 42131)$$

$$F_{sp0} = 69947 \text{ N}$$

3.3.4 Calculation of the permissible RPM for a given effective clamping force

The following formula can be used to calculate the permissible RPM for a given initial clamping force during shutdown:

$$n_{zul} = \frac{30}{\pi} * \sqrt{\left(\frac{F_{sp0} + (F_{spz} * S_z)}{\sum M_c}\right)}$$



WARNING!

The calculated permissible RPM may not exceed the maximum RPM inscribed on the chuck for safety reasons!

Calculation example

Permissible RPM for a given effective clamping force

The following data is known from previous calculations:

- Initial clamping force during shutdown
 $F_{sp0} = 17723 \text{ N}$
- Machining force for machining job $F_{spz} 3000 \text{ N}$
[application-specific]
- Total centrifugal torque of all jaws $\sum M_c = 2.668 \text{ kgm}$
- Safety factor $S_z = 1.5$ [according to VDI 3106]
- Safety factor $S_{sp} = 1.5$ [according to VDI 3106]



NOTE!

Masses of the jaw mounting screws and T-nuts are not taken into account.

Identifying the permissible RPM:

$$n_{zul} = \frac{30}{\pi} * \sqrt{\left(\frac{F_{sp0} + (F_{spz} * S_z)}{\sum M_c} \right)}$$

$$n_{zul} = \frac{30}{\pi} * \sqrt{\left(\frac{69947 + (3000 * 1.5)}{2.668} \right)}$$

$$n_{zul} = 1495 \text{ min}^{-1}$$

The calculated RPM $n_{zul} = 1495$ rpm is smaller than the maximum permissible RPM of the chuck $n_{max} = 3200$ rpm [see »Technical data«].

This calculated RPM may be used.

3.4 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!

3.5 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 draw-tube 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.

3.6 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. 7

3.7 Grades of Accuracy

Tolerances for run-out accuracy and axial run-out accuracy correspond to the Technical Supply Terms for lathe chucks as per DIN ISO 3089.

3.8 Permissible imbalance

The permissible imbalance for lathe chucks is quality class G 6.3 as per DIN ISO 1940-1.

4 Structure and function

4.1 Overview and brief description

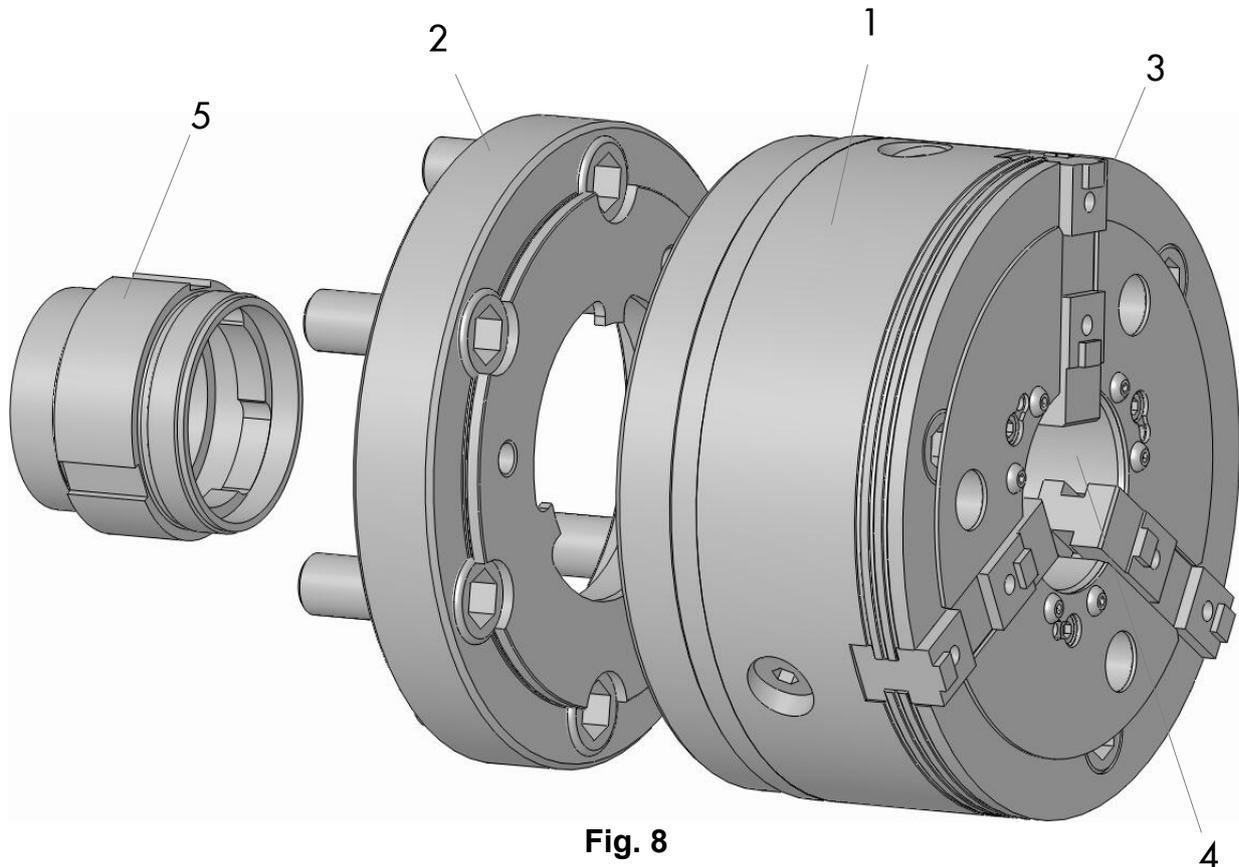


Fig. 8

- 1. Jaw chuck
- 2. Flange
- 3. Master jaws

- 4. Insert bushing
- 5. Bayonet adapter

Brief description

The jaw chuck B-Top3 is designed for maximum flexibility in production. Thus, this chuck is characterized by a quick-change jaw with high repeatability. Through the wedge bar system, a high efficiency, high operating reliability and short setup time is achieved.

In combination with various optional (top) jaws and insert bushings the clamping device can be easily adapted to your requirements.

The jaw chuck B-Top3 can – like a modular system – be easily converted to a full inner clamping [segmented clamping bushing] or a full outer clamping [clamping head] without removing the chuck.

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

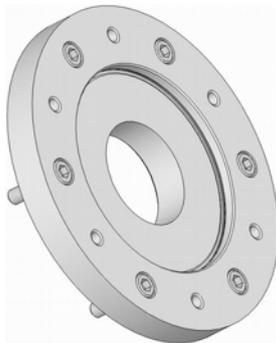


Fig. 9

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 Jaws

For each intended use the clamping device can be adapted with different jaws. You have the choice:

- master jaws
- top jaws
 - hard
 - soft
 - ALU
- claw jaws, hard
- profiled stepped jaws

B-Top3 – Structure and function

4.2.3 Insert bushings



Fig. 10

The exchangeable front insert bushings allow easy adjusting of workpieces - just as you need it:

- closed
- with ejector
- with passage
- with spray nozzle
- with adjustable end-stop

4.2.4 Add on clamping device

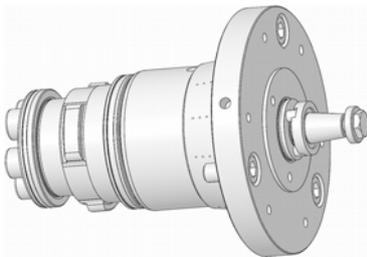


Fig. 11

- Mandrel MANDO Adapt
 - The CENTREX quick change-over interface allows a μ -accurate adaption of the adapt clamping device without adjusting the B-Top3 chuck.
 - Clamping range \varnothing 20 - 80 mm possible by four sizes of mandrel
 - Vibration damping by vulcanized segmented clamping bushings
 - Work piece stabilization by axial traction to the work piece end-stop
 - wide bridging area by vulcanized clamping elements

The MANDO Adapt can be ordered at HAINBUCH.

4.2.5 Grease



Fig. 12

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.

4.2.6 Grease gun



Fig. 13

\varnothing 60 x 360

Supply including flexible hose and nozzle

Order no. 2086/0005

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 transportation



The clamping device is packed vertically and has threaded bores in the end face.

From about weight 15 kg there are also threaded holes in the circumference of the clamping device. Lifting eye bolts can be screwed into these threaded holes.

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

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

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 more than 15 kg
 - Lifting eye bolts
- 1. Screw lifting eye bolt into the thread in the end face of the clamping device.
- 2. Hook the load-handling equipment into the lifting eye bolt.

3. Use a crane to carefully lift the clamping device out of the transport packaging and put it down on a stable, level substrate.

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!

6.1 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 70 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 to 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.

At delivery the clamping device is pre-assembled and can directly be mounted on the machine e.g. on the pre-assembled machine adapter.

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.



CAUTION

Risk of injury!

When operating the clamping device without changing parts [clamping jaws, workpiece end-stop] there is a higher danger of crushing injuries due to the stroke of movable components of the clamping device.

Increased danger by uncontrolled initiation of the clamping process [for example, by incorrect installation of the power supply or faulty programming].



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]!



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.



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 Assemble the drawtube adapter [optional]

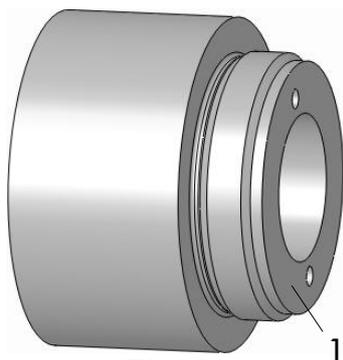


Fig. 14

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 drawtube adapter [1] on the drawtube of the machine by hand or with the aid of a crane. Screw the drawtube adapter [1] on the drawtube and tighten it only finger tight.

6.2.2 Assemble the bayonet adapter [optional]

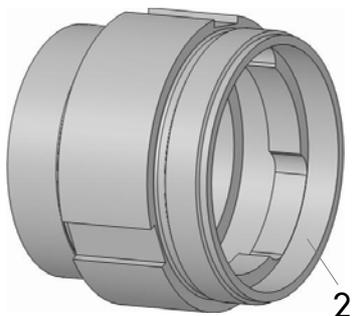


Fig. 15

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 adapter [2] on the draw tube of the machine by hand and tighten it only finger tight.

6.2.3 Assembling the flange [optional]



NOTE!

Material damage due to wrong tightening torque of the cylindrical screws in the spindle flange!

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

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



Fig. 16

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 cylindrical screws into the flange with an allen wrench and hand tighten in a cross pattern.
5. Now adjust the clamping device, see »Adjusting the concentricity of the spindle flange«.



NOTE!

Material damage is possible if the eye bolts are left in the spindle flange!

Eye bolts that are left in the clamping device can significantly damage or even destroy lathe, clamping device and workpiece.

- Always remove eye bolts immediately after mounting the clamping device in the lathe.

6.2.4 Adjusting the concentricity of the spindle flange



NOTE!

Material damage due to insufficient face run and concentricity!

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

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

Auxiliary material required:

- Dial indicator
- Rubber mallet
- Torque wrench

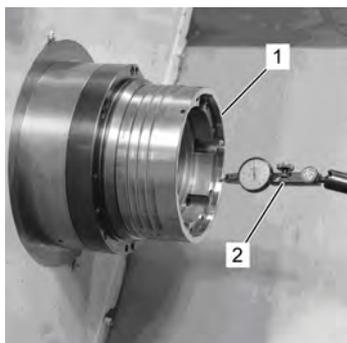


Fig. 17

1. Wipe off the mating surfaces of the spindle flange with a soft, lint-free cloth and remove all oil and grease residues.
2. Place the magnetic base of the dial indicator on the inside of the machine.
3. Place the dial indicator for concentricity on the fit of the spindle flange.

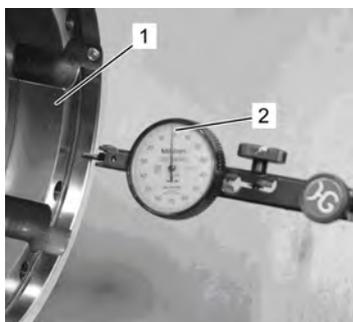


Fig. 18

4. Adjust the spindle flange in such a manner that the dial indicator shows the value »0« [$\leq 0,005$ mm].

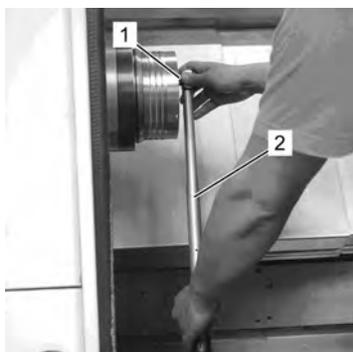


Fig. 19

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



For exact adjustment, if necessary loosen the cylindrical screws a little, repeat the adjusting and retighten the cylindrical screws in a cross pattern.

6.2.5 Checking face run and concentricity

1. Place the magnetic base of the dial indicator on the inside of the machine.
2. Place the dial indicator for concentricity on the inside edge of the spindle flange and check the concentricity [$\leq 0,005$ mm].

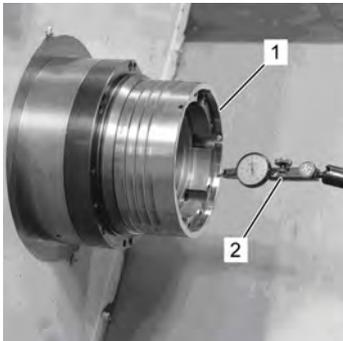


Fig. 20

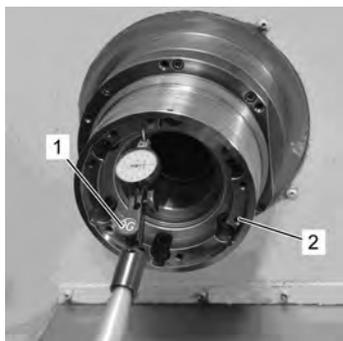


Fig. 21

3. Place the dial indicator for face run on the outer edge of the mating surface, check the face run [$\leq 0,005$ mm].
4. If face run and/or concentricity are larger than the maximum permissible value:
 - Disassemble the flange.
 - Clean all mating surfaces of spindle and spindle flange.
 - Re-assemble the flange.
 - Repeat the adjusting.

6.2.6 Assembly of the clamping device to an interface

The clamping device can be provided with an interface:

1. centroteX / centroteX-V
2. capteX B / capteX D

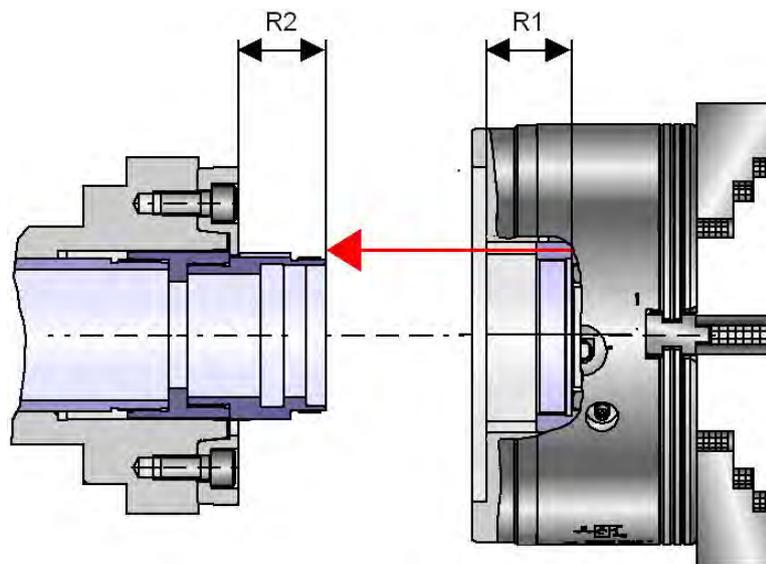
The assembly of the clamping unit to one of the named interfaces is described in the corresponding manual of the interface.

6.2.7 Assembly of the jaw chuck

Two people are required for this task!

Special tools required:

- Allen wrench
 - Crane and eye bolts from weight 15 kg
1. Put the machine in set up mode.
 2. Remove all tools from the interior of the machine.
 3. Set the axial clamping force of the machine tool on the lowest setting.
 4. Move the drawtube of the machine tool into front stop position.



R1 = Chuck piston in front end position
R2 = R1 – 0.3 mm [max. 0.5 mm]



NOTICE!

Material damage due to mounting error!

Make sure that the drawtube can be moved into front end position [release position] with assembled clamping device.

- Keep the dimensions of R1 and R2

5. Screw the clamping device by the piston thread [pos.5] on the clamping draw tube till end.
6. Turn back the clamping device till the passage hole of the chuck body fits to the threaded holes of the spindle flange.
7. Screw in the mounting screws equal and put the base jaw in the clamping device to max. outer position [see chapter »changing the jaws«].



Fig. 22

8. Remove the guard bushing:
Remove the screws [1], screw the into the next threads to push-off the guard bushing.
9. Move back the draw tube till the clamping device fits to the spindle flange [optional] or the machine spindle and tighten the screws again equally.



NOTICE!

Material damage due to eye bolts remaining in the chuck.

By eye bolts remaining in the chuck after assembly the lathe, clamping devices and work piece can be damaged or even destroyed.

- Remove promptly the eye bolts from the chuck after assembly to the machine..

6.2.8 Checking and adjusting the face run and concentricity

Special tools required:

- Dial indicator
- Rubber mallet
- Torque wrench



NOTE!

Material damage due to insufficient face run and concentricity!

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

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

Checking face run

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 front face of the jaw chuck, check the face run [$\leq 0,005$ mm].
3. Adjust the jaw chuck by using a rubber mallet.
4. Tighten the cylindrical screws crosswise with the required tightening torque, see »Maintenance«.



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

- Wipe off the clamping surfaces of the jaw chuck with a soft, lint-free cloth and remove all oil and grease residues.



Fig. 23

Checking concentricity

- Place the magnetic base of the dial indicator on the inside of the machine.
- Place the dial indicator for concentricity on the control edge.
- Adjust the jaw chuck 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.



Fig. 24

- Tighten the mounting screws with the required tightening torque, see »Maintenance«.
- Assemble the guard bushing: Remove the screws from the puss-off threads, screw them into the threads for the guard bushing [1] and tighten them firmly.

6.2.9 Position of the master jaws

Special tools required:

- Chuck wrench

The jaws may only be loosened in release position.

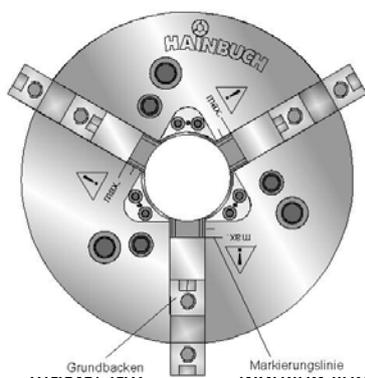


Fig. 25

- On the face side of the clamping device there's a marking line milled in between the jaw guides. These marking line is for positioning of the master and/or block jaw.
- The maximum outer position and/or block jaw position is reached when in the position for changing the jaws [clamping device open] the front side of the master jaw and/or the full block jaw fits to the marking line.

This jaw position has to be strictly adhered to, so that the transfer of the force from the wedge rod to the master / block jaws all sprockets are in contact.

6.2.10 Changing the jaws

Special tools required:

- Chuck wrench

The changing of the jaws only takes place with opened clamping device.

For safety reasons in this position the master jaws are still engaged. Falling out of the jaws is prevented.



Fig. 26

1. Put the chuck wrench into the hexagonal of the respective jaw.

2. Turn the chuck wrench 90° clockwise. Now the respective jaw is released and can be removed.

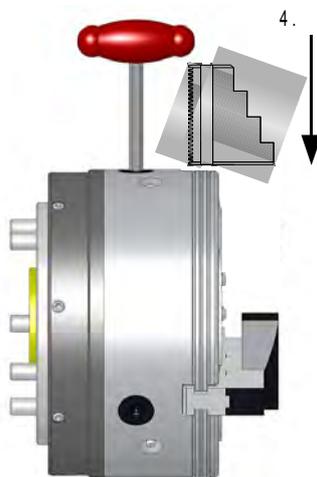


Fig. 27



For safety reasons in this position the wrench may not be removed!

3. Pull the jaw outwardly out of the groove.

4. Put in the desired jaw. Pull the jaw to the desired diameter.

5. Turn the chuck wrench 90° clockwise. The tothing of the jaw chuck must now engage in the tothing of the jaw.

6. Remove the chuck wrench from the clamping device.

6.2.11 Assembly of the top jaws

Special tools required:

- Allen wrench

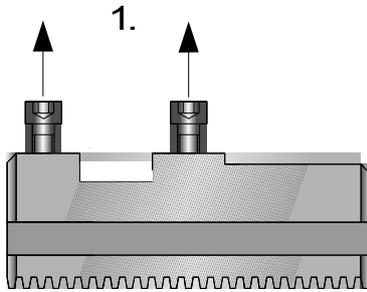


Fig. 28

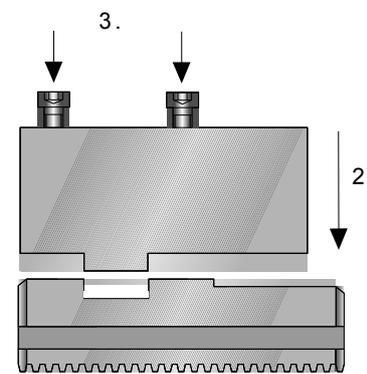


Fig. 29

1. Remove the pre-assembled screws [1] from the master jaws.

2. Clean the location surface of the master and top jaws.

3. Put the top jaws with the cross offset into the groove of the master jaws [2].

4. Put the screws into the mounting holes [3].

5. Tighten the screws according to the following tightening torque table:

Screw size	Torque for screw quality 10.9 [Nm]
M 8	25 Nm
M10	60 Nm
M12	80 Nm
M16	100 Nm
M24	230 Nm



CAUTION!

Material damage by too high tightening torque!

The given tightening torque in the table above may not be exceeded!

- Use only screws DIN 912 of the property class 12.9!

Higher tightening torques will cause deformation of the master jaw – thus the master jaw will stuck in the guides of the clamping device.

6.2.12 Machining the jaws



NOTICE!

Material damage due to lack of accuracy.

Jaws for highest repeatability must be machined and/or grinded in the clamping device under clamping pressure.

When machining or grinding it is important to ensure that the loading ring and loading plugs are clamped by the top jaws, not by the master jaws.

- Keep the master and jaws for recurring work. Tighten the mounting screws for the jaws with a torque wrench.
- In no case tighten the wrench by using a tube extension or a hammer.



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.



CAUTION

Damage of the clamping device!

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

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



WARNING!

Slipping danger due to escaping hydraulic fluid!

Escaping [sprayed out] hydraulic oil from adjacent machine components can cause serious personal 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.

6.2.13 Preparation for adapting a clamping device



Fig. 30

Before assembling the add on clamping elements the jaws must be disassembled.

1. Put the release key into the hexagonal of the respective jaw.
2. Turn the release key 90° anti-clockwise. Now the respective jaw is released and can be removed.
3. Pull the jaw out of the groove.
4. Put in the guarding jaw at the first marking [from the outer dimension].
5. Turn the release key 90° clockwise.
6. Remove the release key from the chuck.

Repeat step 1 to 6 for the other jaws.



CAUTION!

Risk of injury!

For assembly of the SPANNTOP chuck or the MANDO Adapt the machine may not be in clamping position.

- Move the chuck into release position!



Fig. 31

Remove the chip protection:

7. Remove the 3 screws M6 [7] from the chuck.
8. Pull the chip protection out of the front of the chuck [8] – it is easier to move the drawtube carefully into clamping position and then in release position. The chip protection will be ejected from the chuck.



NOTICE!

Dirt, scratches and damage of the bearing surfaces affect the radial and axial running of the clamping device and the machined workpieces.

- Clean all surfaces of the jaw chuck and the add on clamping elements very thoroughly before assembly

9. Move the drawtube into front end position [release position].

The chuck is ready for the assembly of the add on clamping element.

6.2.14 Add on clamping element SPANNTOP



NOTICE!

The clamping head interferes for assembly and disassembly.

- Remove the assembled clamping head.

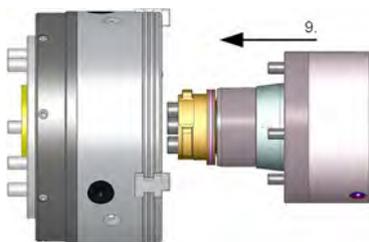


Fig. 32

1. Put the SPANNTOP clamping device into the jaw chuck with the bayonet [9]. The markings at the SPANNTOP clamping device must align to the guarding jaws, the grooves on the back side of the chuck must be between the guarding jaws.



CAUTION!

Crushing danger!

Insertion of the chuck may go a little heavier, as the seals at the adaption have a certain pre-stress.

Crushing danger for the fingers when the frictional force of the seals have been got over.

- Hold the chuck only by the circumference.

2. Put in the chuck till end.

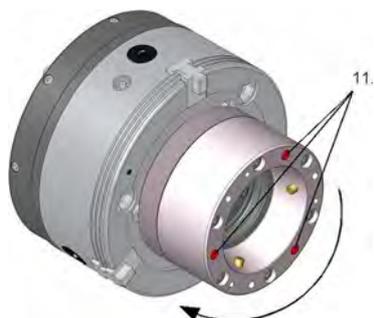


Fig. 33

- When the SPANNTOP clamping device is fitting to the jaw chuck it can be turned 60° [10]. Now the bayonet coupling may grab. If the chuck may not be turned, rap the coupling carefully into the chuck.



NOTICE!

The cutout at the rear side of the SPANNTOP clamping device must align to the guarding jaws in the jaw chuck.

- Assemble the SPANNTOP clamping device by the 3 screws M10 and tighten the screws firmly in a cross pattern. For tightening torque see the following table!



NOTICE!

The screws are installed in the SPANNTOP clamping device!

- Do not distinguish these screws with the screws to assemble the clamping element reception!

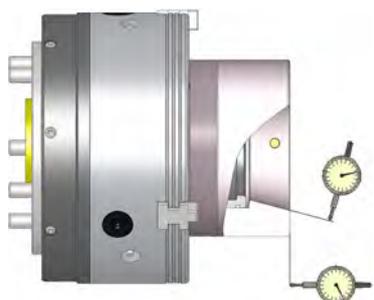


Fig. 34

Maybe the clamping element reception must be adjusted:

- Place the magnetic base of the dial indicator on the inside of the machine.
- Place the dial indicator for concentricity on the clamping taper and rotate the spindle carefully.
- If the value is higher than 0.01 mm the taper may be adjusted. Stop the spindle and loosen the 6 screws M10 on the front side. Adjust the clamping element reception in such a manner that the dial indicator shows the value »0«. Re-tighten the screws M10 firmly in a cross pattern. For tightening torque see the following table.

Diameter	Tightening torque for screws 8.8 [Nm]	Tightening torque for screws 10.9 [Nm]	Tightening torque for screws 12.9 [Nm]
M4	2,5	3,5	4
M5	5	6	8
M6	8	11	13
M8	18	28	32
M10	36	53	62
M12	63	92	108

- For checking the face run place a dial indicator on the surface of the SPANNTOP clamping device and turn the spindle carefully. If the face run is higher than 0.005 mm stop the spindle, disassemble the SPANNTOP clamping device and check the location surfaces for damage or contamination.

6.2.15 Add on clamping element segmented mandrel



NOTICE!

The segmented clamping bushing interferes for assembly and disassembly.

- Remove the assembled segmented clamping bushing.

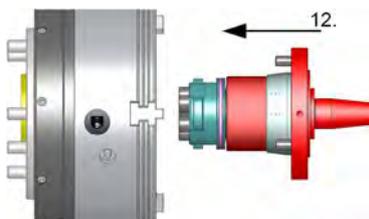


Fig. 35

- Put the segmented mandrel in the jaw chuck. The 3 holes in the circumference must align to the guarding jaws.



CAUTION!

Crushing danger!!

Insertion of the segmented mandrel may go a little heavier, as the seals at the adaption have a certain prestress.

Crushing danger for the fingers when the frictional force of the seals have been got over.

- Hold the segmented mandrel only by the circumference.

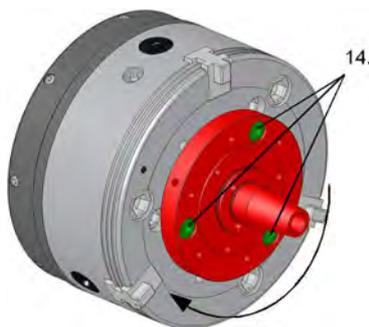


Fig. 36

- Put the segmented mandrel into the chuck till end [12].
- Turn the segmented mandrel by 60° to lock the bayonet [13]
If the segmented mandrel can not be turned, push or even knock lightly the draw bolt into the segmented mandrel.
- Screw the segmented mandrel by the 3 screws M10 at the front [14].

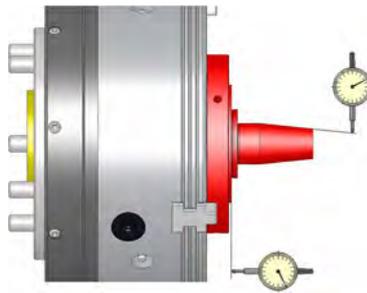


Fig. 37

Maybe the segmented mandrel must be adjusted:

5. Place the magnetic base of the dial indicator on the inside of the machine.
6. Place the dial indicator for concentricity on the clamping taper and rotate the spindle carefully.
7. To check the concentricity place the dial indicator to the taper.
8. To check the face run place the dial indicator at the surface for screwing the workpiece end-stop.
9. If the value too high check the surfaces for damages or contamination.

Diameter	Tightening torque for screws 8.8 [Nm]	Tightening torque for screws 10.9 [Nm]	Tightening torque for screws 12.9 [Nm]
M4	2,5	3,5	4
M5	5	6	8
M6	8	11	13
M8	18	28	32
M10	36	53	62
M12	63	92	108

10. For tightening torque see the table above.

11. Tighten the screws.

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].



NOTE!

Material damage due to inappropriate workpieces!

- Only clamp workpieces that meet the dimensional requirements.
- For the dimensional requirements see chapter 3 »Technical data«.



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 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 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 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/or the assembled add on clamping device 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!

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.



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.



Transport!

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

7.2 Disassembling the clamping device

7.2.1 Disassembling the jaw chuck

Two people are required for this task!

Special tools required:

- Allen wrench
- Crane
- Eye bolts

1. Put the machine tool in set up mode.
2. Remove all tools from the interior of the machine.
3. Set the axial clamping force 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 cylindrical screws.
6. Unscrew the jaw chuck from the flange by using a crane.
7. Remove the jaw chuck out of the machine.

7.2.2 Disassembling the flange

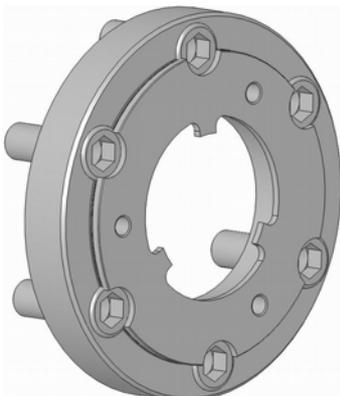


Fig. 38

1. Put the machine tool in set up mode.
2. Loosen, unscrew and remove the cylindrical 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.

7.2.3 Disassemble the bayonet adapter

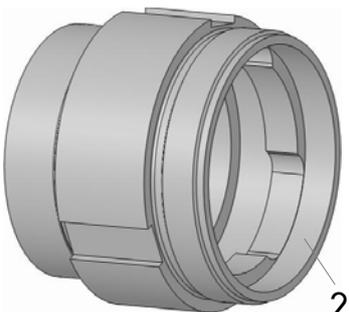


Fig. 39

1. Put the machine in set up mode.
2. Unscrew the bayonet adapter [2] from the drawtube adapter by hand.
3. Wipe off the bayonet adapter with a soft, lint-free cloth and remove all oil and grease residues.

7.2.4 Disassemble the drawtube adapter [optional]

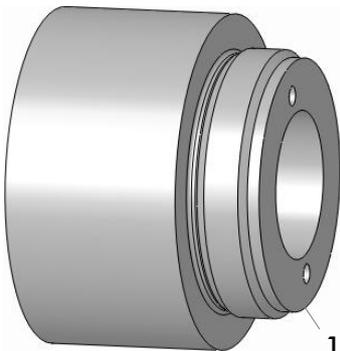


Fig. 40

1. Put the machine in set up mode.
2. Unscrew the drawtube adapter [1] from the drawtube.
3. Wipe off the drawtube adapter with a soft, lint-free cloth and remove all oil and grease residues.

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.



CAUTION!

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.



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.



Risk of injury!

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

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!

- 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
 - Jaw guide
 - Workpiece end-stop [optional]
 - Cylindrical screws

8.3 Preservation

- Special tools required:
 - Universal grease 2085/0003
 - Grease gun
 - Oil stone
 - Soft, lint-free cloth

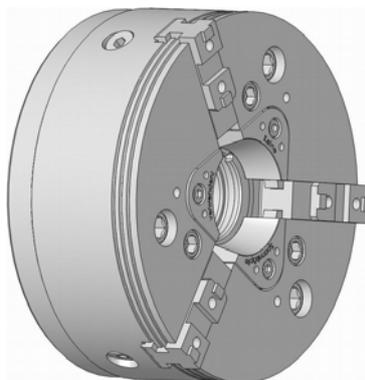


Fig. 41

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 finger-tight.



For subsequent storage tightening the cylindrical screws finger-tight suffices. This facilitates re-commissioning and protect 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	With high load and with use of coolant: <ul style="list-style-type: none"> ■ Grease the clamping device ■ For heavy pollution complete cleaning [see »Cleaning«].
	Check the query of the final position of the machine
	Perform a static clamping force measurement.
After each 20 hours	With normal load and with use of coolant: <ul style="list-style-type: none"> ■ Grease the clamping device ■ For heavy pollution complete cleaning [see »Cleaning«].
After 1000–1500 hours	Completely disassemble and clean the clamping device [see section »Cleaning«].



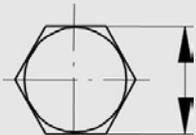
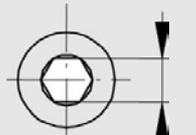
For proper operation of the coolant feed a pre-filtering with duplex filter [mesh size 100 µm, PI 3754] is necessary. The duplex filter is mounted on the coolant cleaning system.

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 force is too low	The chuck was not lubricated properly.	Lubricate the clamping device with HAINBUCH fat according to maintenance schedule.	Specialist

B-Top3 – Trouble shooting

Fault	Possible cause	Fault correction	Corrected by
	Workpiece is under-dimensioned	Move the master jaw by 1 step.	Specialist
Chips penetrate into the chuck.	When lathing with jaws, the guard bushing was not used.	Use the guard bushing	Specialist
Jaws may not be changed.	The clamping device is not in release position.	Move the clamping device into release position.	Specialist
Eccentric dimensional deviation on the workpiece	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 deviation on the workpiece	Contaminated guide	Disassemble the master jaws and clean the guide [see section »Cleaning«].	Specialist
Formal defect on the workpiece	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 workpiece clamping	Bore or grind the jaws.	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 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.

10.2.1 Europe

Austria

HAINBUCH in Austria GmbH
SPANNENDE TECHNIK
Pillweinstr. 16
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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: **B-Top3**

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 /
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