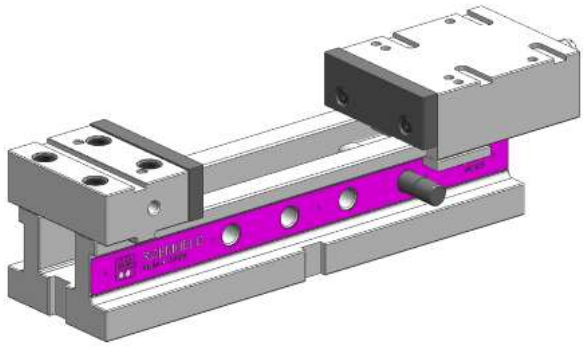
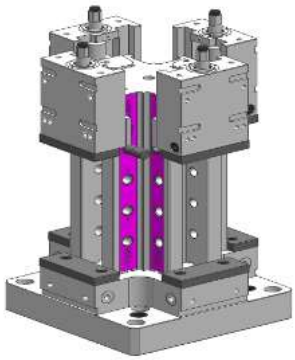
Machine vices, T-Tower

Jaw widths 100 mm, 125 mm, 160 mm, mechanical-hydraulic





Contents

1 Product description

Description

The products are designed for multi-purpose workpiece clamping on machine tools. They are fitted with mechanical-hydraulic clamping slides with hydraulic load amplifiers whose internal construction is the same for all variants.

For clamping force build-up, the primary piston is extended into the oil chamber by the inside pressure spindle. This results in a high hydraulic pressure, which generates the clamping force.

After pulling the socket pin, the clamping slide may be shifted to another clamping range or removed fully (see page 4).

Application

The products are used for processing dimensionally stable workpieces in single or multiple clamping systems.

The products are suitable both for series production and individual production on 3-axle systems.

2 Documentation applicability

This documentation is applicable to the following products:

Products of catalogue sheet WS 13020. These cover the types and/or order numbers:

- 3020,
- 3070,
- 3320,

3 Target group

Specialist staff, fitters and set-up staff of machines and systems with expert knowledge of hydro-mechanical equipment.

Staff qualification

Expert knowledge means, that staff must:

- be capable to read and completely understand technical specifications such as circuit diagrams and product-specific drawings;
- have expert knowledge of the function and construction of the relevant components.

An **expert** is a person who has sufficient knowledge based on professional training and experience and who is familiar with the relevant standards and regulations, so that he/she:

- may assess the work assigned to him/her;
- is able to identify potential risks;
- is able to take appropriate measures to eliminate risks;
- is aware of the approved technical standards, codes and regulations;
- has the required knowledge for repair and installation.

4 Symbols and signal words

⚠ WARNING

Personal injury

Identifies a potentially hazardous situation.

If not avoided, death or serious injuries may be the consequence.

⚠ CAUTION

Light injuries / damage to property

Identifies a potentially hazardous situation.

If not avoided, light injuries or damage to property may be the consequence.

Hazardous to the environment

This symbol identifies important information for the proper handling of substances which are hazardous to the environment.
Non-compliance with the related instructions may result in serious environmental damage.

Mandatory action symbol!

This symbol identifies important information of required protection equipment, etc.

NOTE

- This symbol identifies tips for application or particularly useful information. It is not a signal work for dangerous or hazardous situations.

5 For your safety

5.1 General information

This Operation Manual is intended to provide information on and avoidance of risks related to the installation of the products into the machine, as well as information and notes on transport, storage and maintenance.
Accidents and damage to property can only be avoided and the trouble-free operation of the products can only be guaranteed if this Operation Manual is strictly observed.
In addition, compliance with this Operation Manual will help to:

- avoid injuries;
- reduce downtimes and repair cost;
- increase the products' lifetime.

5.2 Safety instructions

The product was manufactured in accordance with the generally recognized codes of practice.
Please observe the safety instructions and procedural descriptions in this Operation Manual in order to avoid personal injuries or damage to property.

- Please read this Operation Manual carefully and completely before working with the product.
- Please keep this Operation Manual where it is accessible to all product users at any time.
- Please observe the applicable safety instructions as well as instructions for the prevention of accidents and for environmental protection in the country where the product is used.
- Please only use this Roemheld product in a technically safe and perfect condition.
- Please observe all instructions on the product.
- Please only use accessories and spare parts approved by the manufacturer in order to exclude personal risks due to unsuitable spare parts.
- Please only use the product in accordance with its intended purpose.
- You may only start operation with the product if it has been determined that the incomplete machine and/or the machine in which the product is to be installed complies with the country-specific regulations, safety instructions and standards.
- Please perform a risk analysis for the incomplete machine and/or machine.
  Interactions between the product and the machine/system and its environment may result in risks, which may only be identified and minimized by the user, e.g.:
  - forces generated;
  - movements initiated;
  - influence of hydraulic and electrical controls;
  - etc.
- Use of personal protection equipment is to be considered for all work steps.

6 Use

6.1 Use in compliance with intended purpose

The products are exclusively designed for clamping workpieces in industrial applications. They may only be operated with hydraulic oil.
In addition, use in compliance with the intended purpose includes:

- Use within the capacity limits specified in the technical data (see catalogue sheet).
- Use as described in this Operation Manual.
- Compliance with maintenance intervals.
- Assignment of staff qualified or trained in the relevant activities.
- Installation of spare parts with the same specifications as the original parts only.
- Only HLP hydraulic oils may be used.
- Only clamping jaws may be moved.

6.2 Improper use

⚠ WARNING

Injuries, damage to property or malfunction!

- Do not modify the product!

Use of products is impermissible:

- for domestic applications.
- on pallets or tool tables in prototype or forming machines.
- if the products or gaskets might be damaged by physical/chemical effects (vibrations, welding currents or others).
- in machines, pallets or tool tables used for modifying the material properties (magnetizing, radiation, photochemical processes, etc.).
- in areas subject to special regulations, in particular as regards systems and machines:
  - for use on funfairs and in amusement parks.
  - for use in food processing or in areas subject special hygienic regulations.
  - for military purposes.
  - in mines.
  - in explosive and aggressive environments (e.g. ATEX).
  - in medical engineering.
  - in aerospace engineering.

- for passenger transportation.

• if deviating operating and environmental conditions apply, e.g.:
  - if operating pressures exceed those indicated in the catalogue sheet and/or the installation drawing.
  - if pressure liquids not complying with the specified ones are used.
  - if volume flows exceed those indicated in the catalogue sheet and/or the installation drawing.

Special solution models are available upon request!

7 Assembly

⚠ WARNING

Injuries due to high pressure injection (ejection of hydraulic oil under high pressure)!

- Improper connection may result in the ejection of oil under high pressure at the connections.
- The element may only be installed and/or dismantled in the unpressurized condition of the hydraulic system.
- Connection to hydraulic pipe pursuant to DIN 3852/ISO 1179.
- Properly close connections not in use.
- Use all fastening holes.

Injuries due to high pressure injection (ejection of hydraulic oil under high pressure)!

Wear, damage to gaskets, ageing and the incorrect installation of the gasket kit by the user may result in the ejection of oil under high pressure.

- Perform a visual check before use.

Injuries by parts falling off!

- Keep hands and other parts of the body remote of the working area.
- Wear personal protection equipment!

Intoxication by contact with hydraulic oil!

Wear, damage to gaskets, ageing and the incorrect installation of the gasket kit by the user may result in oil leakage.

Improper connection may result in oil leakage at the connections.

- Observe the safety data sheet when handling hydraulic oil.
- Wear personal protection equipment.

⚠ CAUTION

Heavy weigh may drop

- Some product types have a significant weight. These products have to be secured against dropping during transport.
- Weight data are included in the "Technical data" section.

NOTE

Aggressive media

If there is a possibility that aggressive cutting and cooling liquids including chippings may ingress the inside of the clamping slide, the clamping slide inside must be cleaned by the customer.

Ease of movement

Please make sure that the product moves easily upon installation!

7.1 Design

The hydraulic force of an internal piston is transferred to the jaw via the slide.

EL, NC and T-Tower series

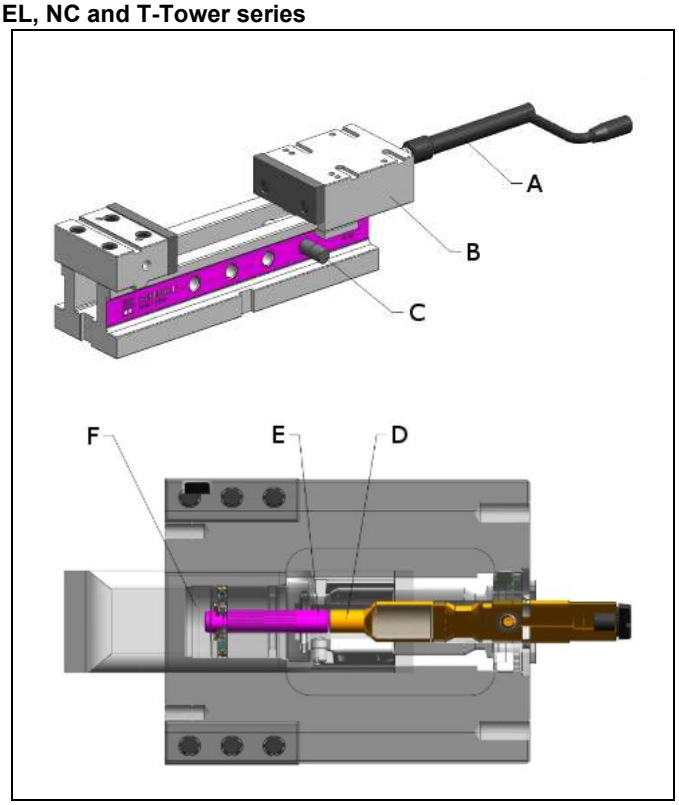


Fig. 1: Components for EL, NC and T-Tower series

A	Crank handle	D	Pressure spindle
B	Clamping slide	E	Primary piston
C	Socket pin	F	Oil chamber

7.2 Types of installation

⚠ WARNING

Risk of injuries due to improper product fixing!

If the product is fixed improperly, it may loosen from the machine bench or be damaged during clamping or processing.

- Install the product as instructed in the present Operation Manual.
- Ensure that the installation surface of the product base and the machine bench are clean before installation.
- The installation surface of the product base must be even and have a minimum overlap of 75 % on the machine bench.
- Install the product in accordance with the torque specified in the Operation Manual.
- Fix the product so that it may not be displaced by the processing forces.

Bruises, burns and bone fractures caused by dropping workpieces!

Workpieces may cause injuries when dropping.

- Wear safety shoes with safety level 1 (S1) as a minimum requirement.

Risk of injuries by improperly mounted crank handle and/or torque wrench!

An improperly mounted crank handle or torque wrench may slip off during operation and cause injuries to the operator.

- Check crank handle and/or torque wrench for proper seat.

Risk of injuries due to limited range of motion of the crank handle and/or the torque wrench!

When using the crank handle or the torque wrench, extremities may be squeezed between the crank handle and/or the torque wrench and objects in the range of motion.

- The range of the crank handle's and/or torque wrench's motion must be freely accessible.

EL, NC series

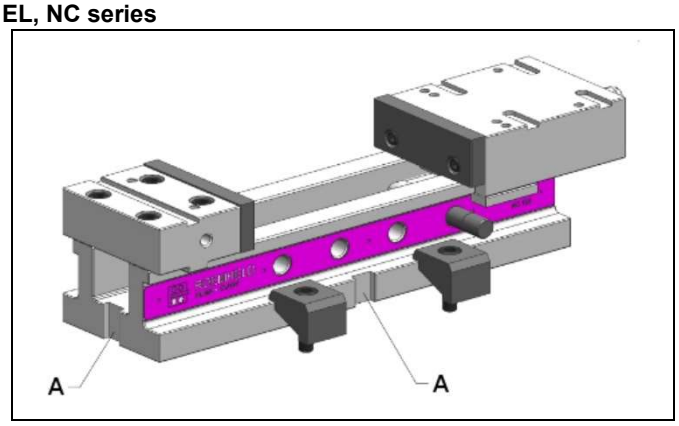


Fig. 2: Installation types for EL, NC series with adjusting slot (A)

Fastening on the machine table:

1. Unevenness and chips between the contact surface and the base surface shall be removed.
2. Alignment
   - with a load cell,
   - with key blocks.
3. Fixing
   - with bolts,
   - with clamping claws.

Special fixing kits may be ordered for each series.

T-Tower series

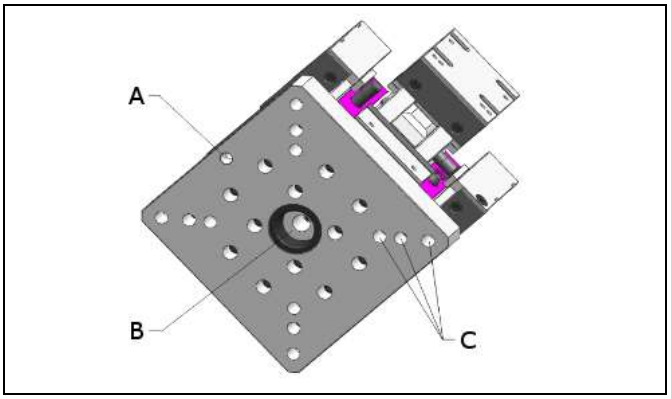


Fig. 3: Installation types for T-Tower series

A Alignment hole B Centring hole	C Fixing hole

Fastening on the machine table:

1. Unevenness and chips between the contact surface and the base surface shall be removed.
2. Alignment
   - with centring bolt
   - with positioning pins
   - with load cell
3. Fixing
   - with bolts

Special fixing kits may be ordered for each series.

8 Start-up

⚠ WARNING

Intoxication by contact with hydraulic oil!

Wear, damage to gaskets, ageing and the incorrect installation of the gasket kit by the user may result in oil leakage.

Improper connection may result in oil leakage at the connections.

- Observe the safety data sheet when handling hydraulic oil.
- Wear personal protection equipment.

Risk of injuries by high-pressure injection in case of improper handling!

Improper handling of the hydraulic system may result in the ejection of liquids under high pressure from the hydraulic system and cause injuries to persons.

- Work on hydraulic systems may only be performed by qualified staff with special knowledge in the field.

NOTE

Lubrication before start-up

The elements are delivered with a minimum lubrication.

The sliding surfaces have to be lubricated lightly with track oil, ISO VG 220, before start-up!

- Check tight seat (check tightening torques of fixing screws).

NOTE

Product operation on grinding machines

When the product is used on grinding machines, the product will be more heavily contaminated.

- Clean product from contamination regularly.

Observe clamping force and temperature difference

The product shall be used so that temperatures developing as intended will not result in impermissible clamping forces. In particular, the following aspects must be observed:

- Gasket durability
- Media expansion
- Permissible maximum temperature difference of the product in the clamped condition is +/- 10 °C.

⚠ WARNING

Risk of injuries or damage to property by collision with system components!

In the range of motion of the system components, persons may be injured by collision with system components, or damage to property may be caused by collision with other system components.

- Check the range of motion of the system components before start-up.

9 Operation

⚠ WARNING

Vibration will loosen the product fixture!

Vibration affects the workpiece fixture and results in an improperly fixed workpiece. An improperly fixed workpiece may be catapulted off the product during processing and result in personal injuries or damage to property.

- Exclude vibration on the product if possible.

Risk of burns caused by hot workpieces!

Hot workpieces may cause burns on parts of the body.

- Wear heat-resistant protective clothing.

Risk of injuries during workpiece clamping!

The workpiece properties may induce personal injuries during clamping if the workpiece is not clamped properly.

- Remove contamination on the clamping surfaces before clamping.
- Observe material properties of the workpiece during clamping.
- Observe workpiece shape during clamping.
- Observe workpiece clamping surface during clamping.
- Observe workpiece inertia during clamping.

Risk of injuries due to improperly secured socket pin!

If the socket pin is secured improperly, it may slip off. The clamping slide may slip off and cause injuries if the socket pin is not secured in the product.

- Check if socket pin is properly secured before clamping.

⚠ CAUTION

Risk of injuries by crushing of extremities during clamping

The product is to be used in a manner so that the operator's own or other persons' extremities may not be squeezed during clamping.

- Keep your own or other persons' extremities off the clamping area during clamping.

Risk of injuries due to exertion during clamping and unclamping of the product

When unclamping the product, high forces have to be overcome initially. Persons may slip off the product during unclamping and be injured.

- Be careful and proceed slowly when unclamping the product.

NOTE

Processing with mounted crank handle and/or torque wrench is impermissible

Processing with mounted crank handle and/or torque wrench on the product is not permissible.

- Remove the crank handle and/or torque wrench from the product before processing a workpiece..

9.1 Setting the clamping range

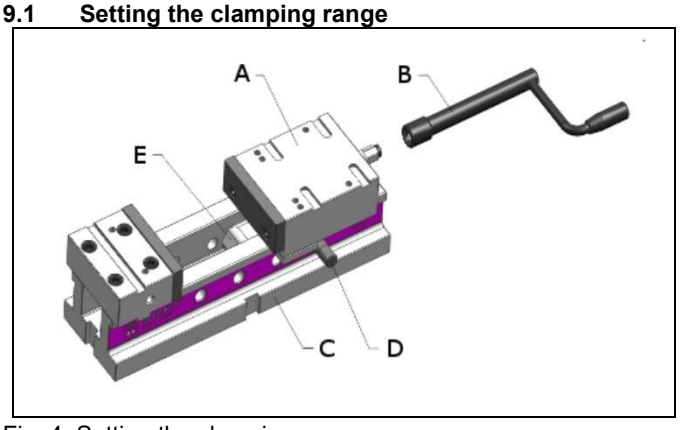


Fig. 4: Setting the clamping range

A Clamping slide	D Socket pin
B Crank handle	E Angle nut
C Bottom	

- Pull the socket pin and shift the slide so that the workpiece may be inserted.
- Push the slide against the workpiece.
- Turn the crank handle until the angle nut in the bottom shifts so that the socket pin may be inserted through the bottom and angle nut and to the stop.
- Insert the socket pin.
- Check clamping range overlap (min. 2 mm).

9.2 Clamping and releasing

⚠ WARNING

Risk of injuries due to flexible or insufficiently clamped workpieces!

Flexible or insufficiently clamped workpieces may be catapulted off the machine or drop and cause personal injuries during processing.

- Only use the product for clamping rigid workpieces.
- Sufficiently clamp the workpiece before processing.

Risk of injuries due to insufficient clamping force or insufficient workpiece clamping!

Insufficient clamping force or insufficiently clamped workpieces may be catapulted off the machine or drop and cause personal injuries during processing.

- Have the product checked for its operational reliability by a qualified expert after extended downtimes, repair work, and at regular intervals.
- Have the product checked for its defined clamping force by a qualified expert.
- Have the product checked for visual damage or wear by a qualified expert.
- Check whether the product is fixed properly before product start-up.
- Check whether the workpiece is clamped properly before product start-up.

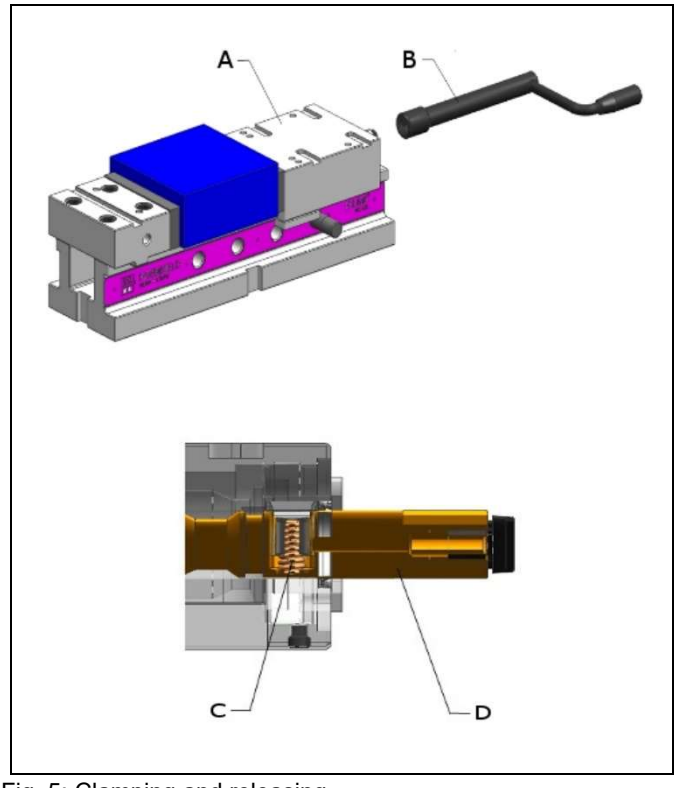


Fig. 5: Clamping and releasing

A Clamping slide	C Catch
B Crank handle	D Pressure spindle

- By turning the crank handle clockwise, the slide is approached to the workpiece until a noticeable resistance occurs. In combination with increased force on the crank handle, the catch will cause a changeover to mechanical-hydraulic power transmission. When the inside pressure spindle is turned further, the clamping force is continuously built up until the stop is reached.
- The clamping force is gradually adjusted to sensitive workpieces by a reduction of the crank handle revolutions (see Technical data). Clamping force preselection is optionally available.
- Turning the crank handle counter-clockwise until the catch engages will continuously reduce the clamping force. If turned further, the vice is opened.
- The catch must engage, since otherwise only a reduced clamping force is reached when clamping is repeated.

9.3 Clamping and unclamping with gripper

In order to compensate for plastic workpiece deformation during clamping with a gripper, clamping has to be performed twice as described in the Clamping and unclamping section.

ⓘ NOTE

Loss of clamping force in the gripper area

In the first clamping cycle with gripper, workpiece deformation will occur in the gripper area. Due to the deformation, the workpiece is no longer clamped sufficiently and must be re-clamped in a second clamping cycle.

- Do not shift the workpiece after the first clamping cycle and perform a second clamping cycle.

9.3.1 Brake for clamping slide (accessory for EL and NC series)

⚠ CAUTION

Risk of crushing by dropping slide without brake

If the product is used vertically with removed socket pin, the slide is not held in its position without a mounted brake. Without a mounted brake, the slide will drop along the bottom, and extremities may be squeezed.

- Mount the brake before using the product vertically.

Risk of crushing by dropping slide without gas spring

If the product is used vertically with removed socket pin, the slide is not held in its position without a mounted gas spring. Without a mounted gas spring, the slide will drop along the bottom, and extremities may be squeezed.

- Mount the gas spring before using the product vertically.

⚠ WARNING

Risk of injuries by damaged gas spring!

The gas spring is highly pressurized. When attempting to open or overheat the gas spring, pressure will be released from the spring and persons may be injured.

- Do not open the gas spring.
- Do not heat the gas spring to over 80 °C.
- Check the gas spring for proper function after extended storage.

Risk of crushing by automatic retraction of the slide!

In a horizontal installation and with removed socket pin, the gas spring will push the slide backwards and may cause crushing of extremities.

- Keep the slide's range of motion clear of extremities and objects before removing the socket pin.

NOTE

Vertical installation with brake

Only products BB 100 and BB 125 are suitable for vertical installation. Vertical installation requires a brake upgrade.

9.3.2 Brake for clamping slides BB 100 and BB 125

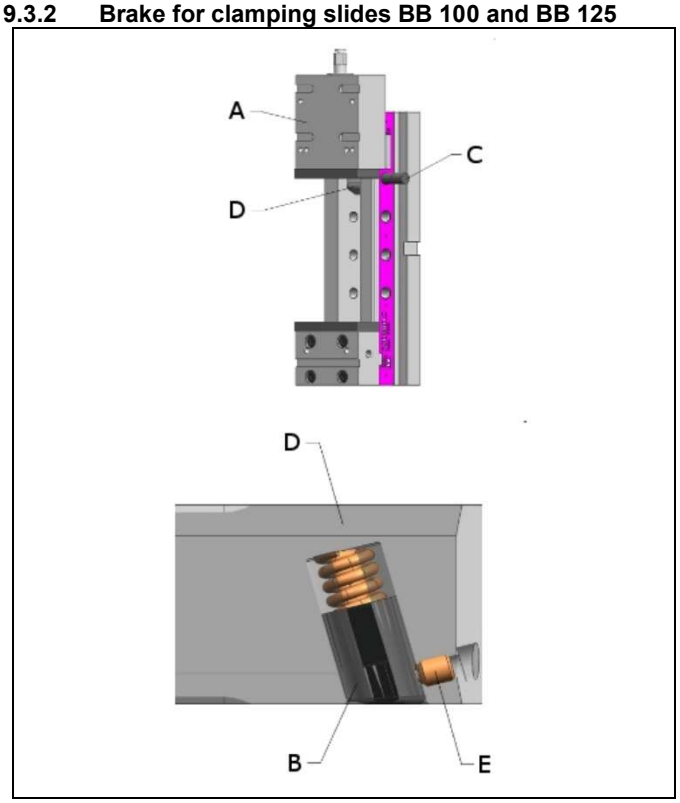


Fig. 6: Brake for clamping slides BB 100 and BB 125

A Clamping slide	D Angle nut
B Brake	E Lock screw
C Socket pin	

The brake is not mounted when the product is delivered. This allows for facilitated clamping range adjustment for horizontal use.

Brake installation

- Remove the socket pin.
- Pull the slide back to the guide rail end.
- Mount the pressure piece, gas spring and lock screw in the angle nut.

Release brake

- Press the brake into the angle nut.
- Tighten the lock screw.

9.4 Angle drive

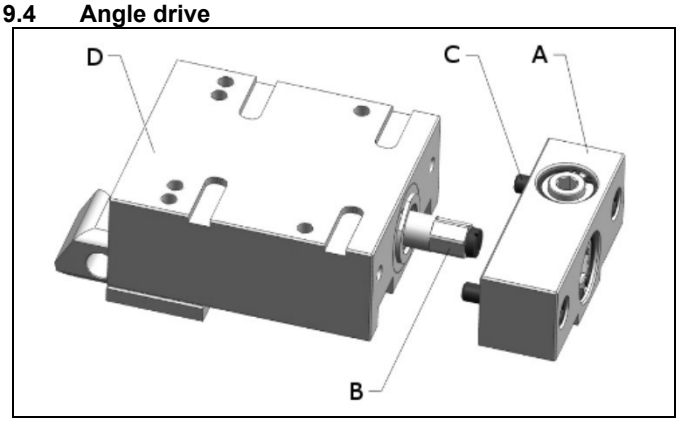


Fig. 7: Angle drive

A Angle drive	C Bolts
B Pressure spindle	D Slide surface

Angle drive installation

- Push the angle drive onto the pressure spindle.
- Slightly tighten the screws.
- Align the angle drive in parallel to the slide surface.
- Tighten the screws.
- Check ease of movement.

Angle drive dismantling

- Loosen screws.
- Pull angle drive off the pressure spindle.

10 Maintenance

⚠ WARNING

Burns on hot surfaces!

- In operation, surface temperatures of over 70°C may develop on the product.
- Maintenance and repair work should only be performed in a cooled down condition and/or with protective gloves.

Risk of injuries by breaking product parts!

During operation, product parts may break, and this may cause personal injuries.

- Observe maintenance intervals for all parts pursuant to this Operation Manual.

Risk of injuries by high-pressure injection in case of improper handling!

Improper handling of the hydraulic system may result in the ejection of liquids under high pressure from the hydraulic system and cause injuries to persons.

- Work on hydraulic systems may only be performed by qualified staff with special knowledge in the field.

10.1 Maintenance schedule

Maintenance work	Interval	Performance
Cleaning	As required	Operator
Regular checks	Daily	Operator
Regular lubrication	After 500 clamping cycles at the latest!	⚠ **Caution!** If this lubrication is omitted, the tensioner may fail!
Repair		Expert staff

10.2 Cleaning

⚠ CAUTION

Damage to moving components!

Avoid damage to moving components (rods, plunger, pins, etc.) as well as wiper and gasket.

Aggressive cleaning agents

The product must not be cleaned:

- with corrosive or caustic substances or
- organic solvents such as halogenated or aromatic hydrocarbons and ketones (cellulose thinner, acetone, etc.), since these may destroy the gaskets.

The element has to be cleaned at regular intervals. In this regard, the slide and housing area has to be cleaned from chippings and liquids in particular.

In case of heavy contamination, cleaning intervals have to be shortened.

10.3 Regular checks

1. Check hydraulic connections for leaks (visual check).
2. Leakage check on housing and slide.
3. Clamping force check by pressure test.
4. Check compliance with maintenance intervals.

10.4 Gasket set replacement

The gasket set has to be replaced if outside leakage occurs. At a high level of availability, the gaskets should be replaced after 1,000,000 cycles or 2 years at the latest.
The gasket set is available as spare parts kit.

NOTE

Gasket sets

- Do not install gaskets, which have been exposed to light for an extended period.
- Observe storage conditions for gaskets (see "Technical data" Section).
- Only use original gaskets.

10.5 Maintenance and care

Slide dismantling

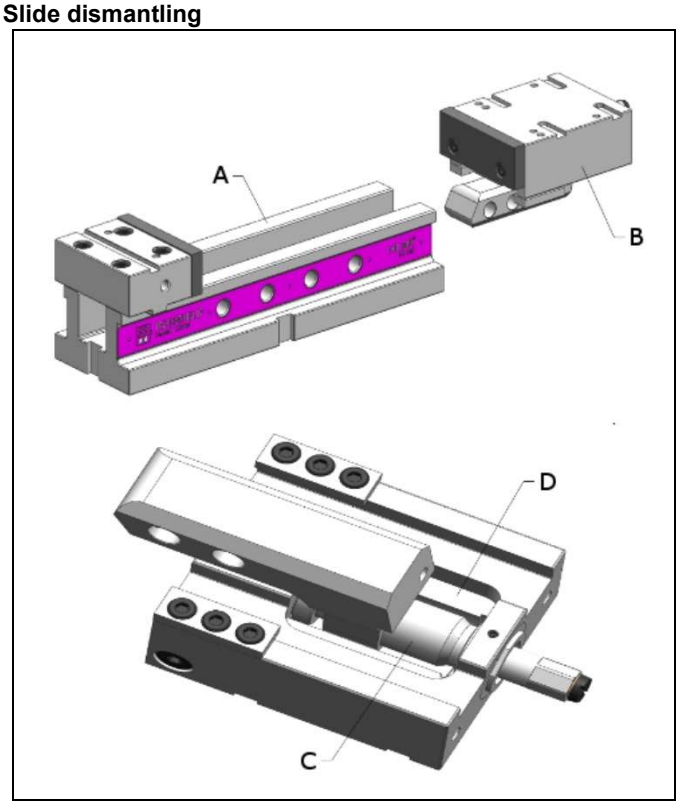


Fig. 8: Slide dismantling

A Bottom	C Spindle thread
B Clamping slide	D Spindle chamber

The following maintenance and care work is to be performed as required, however once a month, each:

1. Remove slide from bottom, clean it, wipe off the sliding surfaces, if required, and lubricate with track oil.
2. Lubricate spindle thread with track oil.
3. Lubricate spindle chamber with track oil.

On this occasion, check the oil reserve at distance "F" between the secondary piston and the slide body, distance "F" = approx. 1 mm.

Hydraulic oil refilling

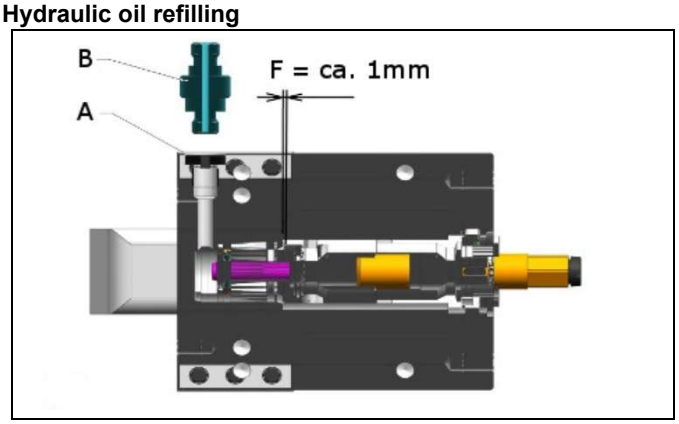


Fig. 9: Hydraulic oil refilling

A Screw plug	B Filling nozzle

4. Turn back pressure spindle until the catch bolt engages.
5. Remove slide from bottom, clean it, wipe off the sliding surfaces, if required, and lubricate with track oil.
6. Unscrew screw plug.
7. Move primary piston to normal position.
8. Use filling nozzle and push-type oil gun, or pressurize oil chamber.
9. Fill in hydraulic oil HLP 68 bubble-free to capacity.
10. Fix screw plug.
    Observe the tightening torque:
    30 Nm for size 100+125
    50 Nm for size 160
11. Lubricate spindle thread with track oil.
12. Lubricate spindle chamber with track oil.

On this occasion, check the oil reserve at distance "F" between the secondary piston and the slide body, distance "F" = approx. 1 mm.

Catch lubrication

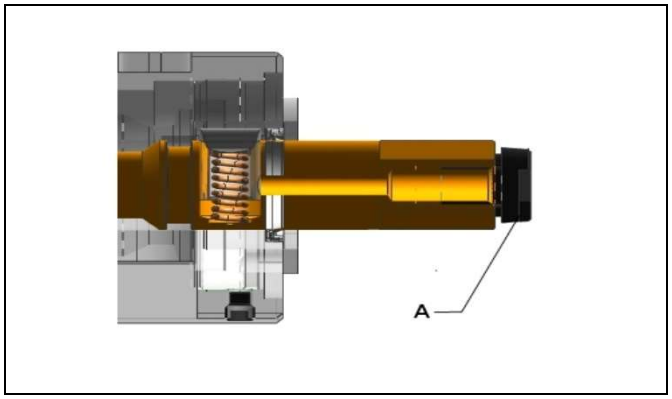


Fig. 10: Catch lubrication

A Screw plug	

13. Loosen screw plug
14. Fill approx. 0.5 ccm of hydraulic oil type Vactra 2.
15. Fix screw plug.
16. Relubrication as required, however once a month as a minimum requirement.

10.6 Service / maintenance service

1. In Germany
   Maintenance by manufacturer
   Please send the clamping system free of transportation charges.

   Stark Spannsysteme GmbH
   Römergrund 14
   6830 Rankweil, Austria
   Service-Telefon: +43 5522 / 37400-0
   E-Mail: service@stark-inc.com

   Maintenance at customer workshop:
   Please call maintenance service

   Service-Telefon: +49 6405 / 89-400
   E-Mail: service@roemheld.de

2. Internationally
   Please contact the HILMA-RÖMHELD general importer or your local dealer.

11 Troubleshooting

Error	Cause	Remedy
Slide has backlash	Guide rail is worn	Replace vice and/or replace component
Clamping pressure reduces via vice	Wear on gaskets	Replace gaskets
No clamping pressure build-up	Pressure spindle not in normal position	Turn pressure spindle backwards until catch bolt engages (see "Clamping and unclamping" Section).
	Clamping range set incorrectly.	See "Setting the clamping range" Section.
	Early switching to hydraulic power transmission by blocked slide guide.	Remove slide from bottom after removing socket pin, clean slide and lubricate all sliding surfaces.
	High-pressure travel distance used up by projecting burr or yielding workpiece.	Only clamp deburred workpieces. Support yielding workpieces or clamp with form jaws.
	Oil reserve used up.	Refill hydraulic oil (see "Hydraulic oil refilling" Section).
Socket pin sluggish	Contamination between bottom and angle nut.	Remove slide and clean guide rail.
Sluggish clamping range adjustment	Brake effective.	See "Brake for clamping slides BB 100 and BB 125" Section.

12 Technical data

Parameters

Types 3020, 3070, 3320			
Jaw width [mm]	100	125	160
Max. clamping force [kN]	25	40	50
Crank force [N]	50	75	95
Crank radius [mm]	80	100	125

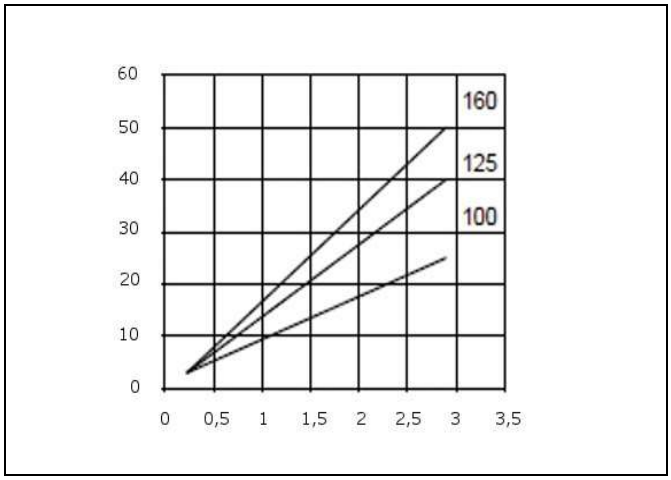


Fig. 11: Clamping force ratios

X-axis: Crank revolutions	Y-axis: Clamping force (kN)

NOTE

Other data

- For more technical data, please refer to the catalogue sheet.

Proposal, tightening torques for screws of strength classes 8.8; 10.9; 12.9

NOTE

- The values indicated are to be considered as approximate values and to be interpreted by the user in each individual case!
  See note!

Threads	Tightening torques (MA) [Nm]		
	8.8	**10.9**	**12.9**
M6	10	15	18
M8	25	36	45
M10	49	72	84
M12	85	125	145
M14	135	200	235
M16	210	310	365
M20	425	610	710

Note: Applicable to workpieces and shaft screws of steel with metric threads and head bearing dimensions as DIN 912, 931, 933, 934 / ISO 4762, 4014, 4017, 4032
The tightening torque (MA) values in the table take account of: Steel/steel design, friction value μges = 0.14 - not lubricated; utilization of minimum yield strength = 90%

12.1 Storage

⚠ CAUTION

Component storage!

- The product must not be exposed to direct sunlight, since UV light may cause serious damage to the gaskets.
- Storage not in compliance with the specified storage conditions is impermissible.
- Improper storage may result in the embrittlement of gaskets and in the resinification of the corrosion protection oil and/or in corrosion on the element.

ROEMHELD products are tested with mineral oil by default. Products are treated with corrosion inhibitor on the outside. The oil film remaining after the test ensures inside corrosion protection for six month if the product is stored in dry and evenly tempered rooms.
For extended storage periods, the product must be filled with a non-resinating corrosion inhibitor, and the outside surfaces have to be treated.

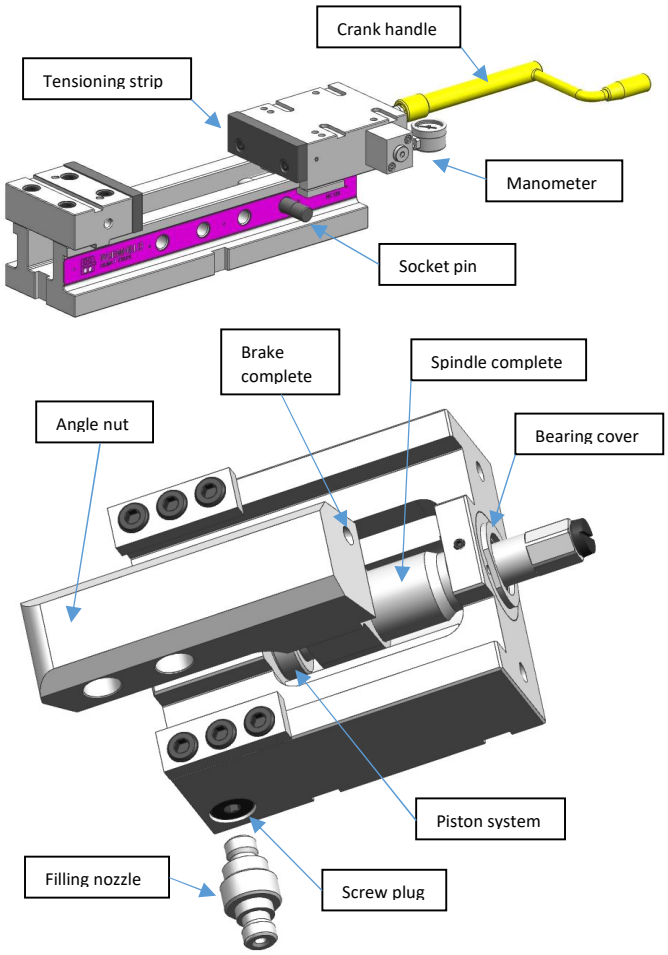
12.2 Accessories

NOTE

Accessories

- See catalogue sheet.

12.3 Spare parts



Designation	Pc.	Spare part no.		
		BB 100	BB 125	BB 160
Socket pin	1	7.3072.0006	7.3073.0006	7.3074.0006
Crank handle	1	4.2056.0020	4.2056.0019	4.2056.0021
Screw plug	1	1.0908.1009	1.0908.1009	1.0908.1010
Filling nozzle	1	5.3090.0006	5.3090.0006	5.3090.0007
Angle nut	1	5.2053.0075	5.2053.0073	5.2053.0074
Spindle, complete	1	9.3072.0523	9.3073.0523	9.3074.0523
Bearing cover	1	5.2031.0038	5.2031.0039	5.2031.0040
Tensioning strip	2	9.3022.0512	9.3023.0512	9.3024.0512
Piston system	1	9.3072.0522	9.3073.0522	9.3074.0522
Manometer, left	1	93122.0552	9.3122.0552	9.3122.0552
Manometer, right	1	9.3122.0554	9.3122.0554	9.3122.0554
Brake, complete (accessory)	1	9.3122.0551 in angle nut	9.3123.0551 in angle nut	9.3769.0401 Gas spring

Subject to change without prior notice

13 Disposal

Hazardous to the environment
In order to avoid potential environmental damage, the individual components have to be disposed of by approved expert companies.

All materials have to be disposed of in compliance with the applicable codes and regulations as well as environment protection regulations.
Particular importance is to be attached to the disposal of components containing residues of pressure liquids. The notes regarding disposal in the safety data sheet have to be observed.
As regards the disposal of electrical and electronic components (e.g. position sensors, proximity switches, etc.), the country-specific statutory requirements and regulations have to be complied with.

14 Installation statement

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www.roemheld.de

Products of catalogue sheet WS 13020. These cover the types and/or order numbers:

- 3020,
- 3070,
- 3320,

They have been designed and manufactured pursuant to directive **2006/42/EG** (EG-MSRL) as revised as well as the applicable technical codes.
Pursuant to EG-MSRL and EN 4412, these products are components not ready for use and exclusively intended for installation into a machine, device or system.

Pursuant to the pressure equipment directive, the products are not classified as pressure vessels, but as hydraulic adjustment device, since the pressure is not the essential factor for the design, but strength, inherent stability and stability against static and dynamic operation loads.

The products may not be operated until it has been determined that the incomplete machine and/or the machine in which the product is to be installed complies with the machinery directive (2006/42/EG).

The manufacturer agrees to submit the product-specific documents to government agencies upon request.
The technical documentation for the products pursuant to Annex VII Part B has been prepared.

15 List of applicable standards

Product Safety Act [ProdSG]; November 2011

DIN EN ISO 12100, 2011-03, Safety of machinery; Basic terminology, general principles for design (supersedes Parts 1 and 2)

DIN EN ISO 13857; 2008-06, Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs. (supersedes: DIN EN 294)

DIN EN 349, 2008-09, Safety of machinery; minimum distances to avoid crushing of parts of the human body

DIN EN 81714-2, 2007-08, Design of graphic symbols for use in technical product documentation

DIN EN ISO 4413, 2011-04, Pneumatic fluid power - General rules and safety requirements for hydraulic systems and their components

DIN EN 82079; 2010-10, Preparation of Instructions for Use - Structuring, Content and Presentation – Part 1

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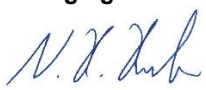

Wilnsdorf-Wilden, October 7, 2022