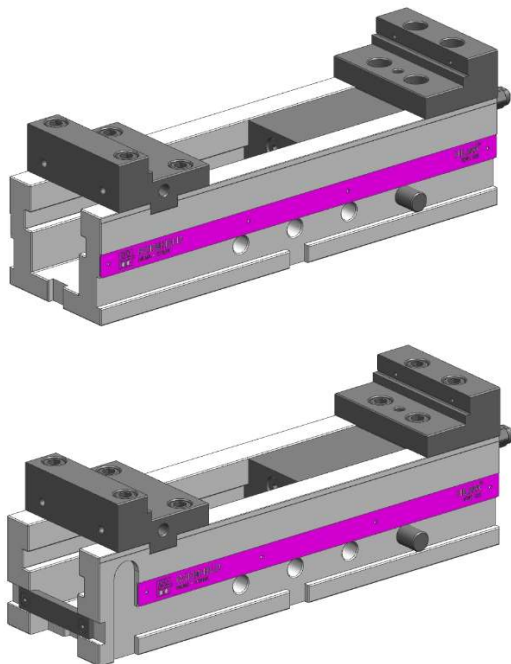


Machine Vice KNC

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



1 Product description

Description

The products are designed for universal workpiece clamping on machine tools. They are equipped with fully encapsulated mechanical-hydraulic clamping slides with hydraulic power amplifiers. The internal design is the same for all variants.

When building up the clamping force, the primary piston is pressed into the oil chamber by means of the inner pressure spindle. A high hydraulic pressure and consequently a high clamping force is built up.

When the socket pin has been pulled out, the clamping slide can be moved into another clamping range or it can be fully removed (see page 5).

Application

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

The products are suitable both for series production and individual production on 3-axis equipment.

2 Validity of documentation

This documentation is valid for the following products:

Products of catalogue sheet WS 13150. The following types or part numbers are concerned:

- 3150

3 Target group

Specialists, fitters and set-up men of machines and installations with hydro-mechanical expert knowledge.

Qualification of the personnel

Expert knowledge means that the personnel must

- be in the position to read and completely understand technical specifications such as circuit diagrams and product-specific drawing documents,
- have expert knowledge of function and design of the corresponding components.

A **specialist** is somebody who has due to its professional education and experiences sufficient knowledge and is familiar with the relevant regulations so that he

- can judge the entrusted works,
- can recognize the possible dangers,
- can take the required measures to eliminate dangers,
- knows the acknowledged standards, rules and guidelines of the technology.
- has the required knowledge for repair and mounting.

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4 Symbols and signal words

WARNING

Personal damage

Stands for a possibly dangerous situation.

If it is not avoided, death or very severe injuries can be the consequences.

CAUTION

Light injuries / property damage

Stands for a possibly dangerous situation.

If it is not avoided, minor injuries or property damages can be the consequences.

Hazardous to the environment



The symbol stands for important information for the proper handling with materials that are hazardous to the environment.

Ignoring these notes can lead to heavy damages to the environment.



Mandatory sign!

The symbol stands for important information, necessary protection equipment, etc.

NOTE

- This symbol stands for tips for users or especially useful information. This is no signal word for a dangerous or harmful situation.

5 For your safety

5.1 Basic information

The operating manual serves for information and avoidance of dangers when installing the products into the machine as well as information and references for transport, storage and maintenance.

Only in strict compliance with this operating manual, accidents and property damages can be avoided as well as trouble-free operation of the products can be guaranteed.

Furthermore, the consideration of the operating instructions will:

- avoid injuries
- reduce down times and repair costs,
- increase the service life of the products.

5.2 Safety instructions

The product was manufactured in accordance with the generally accepted rules of the technology.

Observe the safety instructions and the operating instructions given in this manual to avoid personal or material damage.

- Read this operating manual thoroughly and completely, before you work with the product.
- Keep this operating manual so that it is accessible to all users at any time.
- Pay attention to the current safety regulations, regulations for accident prevention and environmental protection of the country in which the product will be used.
- Use the ROEMHELD product only in perfect technical condition.
- Observe all notes on the product.

- Use only accessories and spare parts approved by the manufacturer to exclude danger to persons because of not suited spare parts.
- Respect the intended use.
- You only may start up the product, when it has been found that the incomplete machine or machine, in which the product shall be mounted, corresponds to the country-specific provisions, safety regulations and standards.
- Perform a risk analysis for the incomplete machine, or the machine.
Interactions between the product and the machine/fixture or 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 control,
 - etc.
- Use of personal protective equipment is to be considered for all work steps.

6 Use

6.1 Intended use

The products are exclusively designed for clamping workpieces in industrial applications. They must 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 data sheet).
- Use as described in this operating manual.
- Compliance with maintenance intervals.
- Qualified and trained personnel for the corresponding activities.
- Mounting of spare parts only with the same specifications as the original part.
- Only HLP hydraulic oils may be used.
- Only clamping jaws may be moved.

6.2 Inappropriate use

WARNING

Injuries, material damages or malfunctions!

- Do not modify the product!

The use of these products is not admitted:

- For domestic use.
- On pallets or machine tool tables in primary shaping and metal forming machine tools.
- If due to physical/chemical effects (vibrations, welding currents or others), damages of the products or seals can be caused.
- In machines, on pallets or machine tool tables that are used to change the characteristics of the material (magnetise, radiation, photochemical procedures, etc.).
- In areas for which special guidelines apply, especially installations and machines:
 - For the use on fun fairs and in amusement parks.
 - In food processing or in areas with special hygiene regulations.
 - For military purposes.
 - In mines.
 - In explosive and aggressive environments (e.g. ATEX).
 - In medical engineering.
 - In the aerospace industry.
 - For passenger transport.
- For other operating and environmental conditions e.g.:

- Higher operating pressures than indicated on the data sheet or installation drawing.
- With hydraulic fluids that do not correspond to the specifications.
- Higher flow rates than indicated on the data sheet or installation drawing.

Special solutions are available on request!

7 Installation

WARNING

Injury by high-pressure injection (squirting out of hydraulic oil under high pressure)!

- Improper connection can lead to escapes of oil under high pressure at the connections.
- Mounting or dismounting of the element must only be made in depressurised mode of the hydraulic system.
- Connection of the hydraulic line as per DIN 3852/ISO 1179.
- Unused connections have to be locked professionally.
- Use all mounting holes.

Injury by high-pressure injection (squirting out of hydraulic oil under high pressure)!

Wear, damage of the seals, ageing and incorrect mounting of the seal kit by the operator can lead to escapes of oil under high pressure.

- Before using them make a visual control.

Injury by dropping parts!

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

Poisoning due to contact with hydraulic oil.

Wear, damage of the seals, aging and incorrect mounting of the seal kit by the operator can lead to escapes of oil.

Incorrect connection can lead to escapes of oil at the ports.

- For handling with hydraulic oil consider the material safety data sheet.
- Wear protection equipment.

CAUTION

Heavy weight may drop

- Some product types have a considerable weight. These have to be secured against dropping during transport.
- Weight specifications see chapter "Technical data".

NOTE

Aggressive media

If there is a possibility that aggressive cutting and cooling liquids including swarf 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 will be transmitted by the slide onto the clamping jaw.

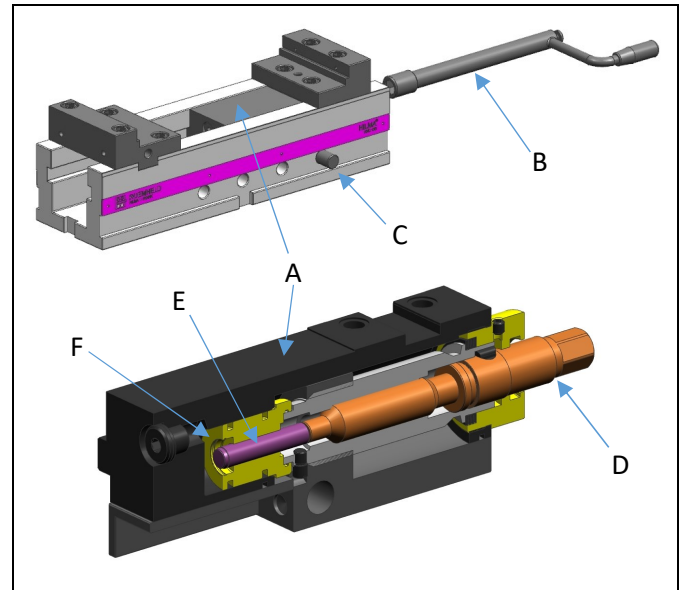


Figure 1: Components

A	Clamping slide	D	Pressure spindle
B	Crank handle	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 operating manual.
- Ensure that the installation surface of the product base and the machine table are clean before installation.
- The installation surface of the product base must be even and have a minimum overlap of 75 % on the machine table.
- Install the product in accordance with the torque specified in the operating manual.
- Fix the product so that it may not be displaced by the machining 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.

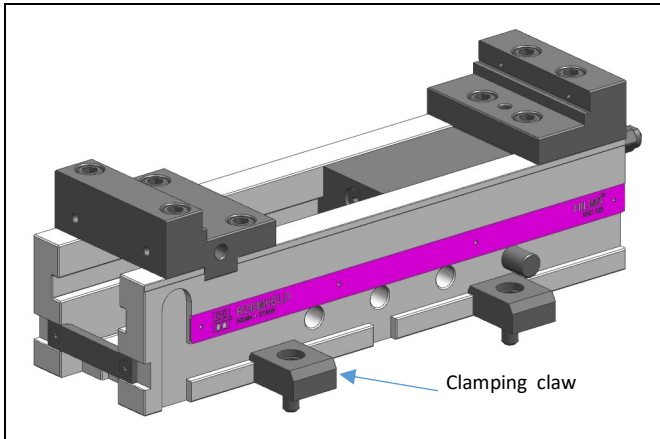


Figure 2: Presentation with clamping claws

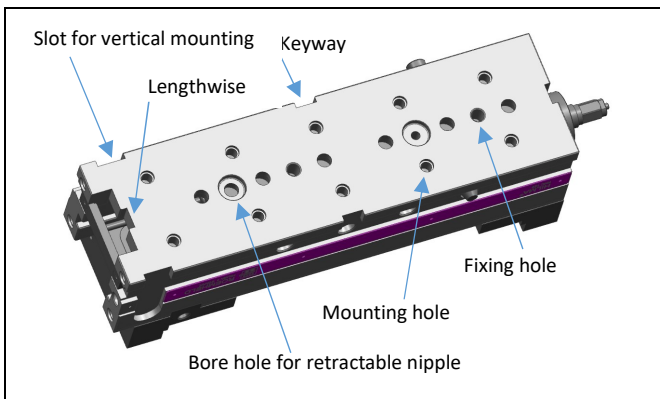


Figure 3: View from below

Fixing on the machine table:

1. Unevenness and swarf between the contact surface and the base surface shall be removed.
2. Alignment
 - with a load cell,
 - with keyblocks,
 - with positioning pins,
 - with retractable nipple.
3. Fixing
 - with screws,
 - with clamping claws,
 - with retractable nipple.

Special fixing kits may be ordered for each series.

8 Start-up

⚠ WARNING

Poisoning due to contact with hydraulic oil!

Wear, damage of the seals, aging and incorrect mounting of the seal kit by the operator can lead to escapes of oil.

Incorrect connection can lead to escapes of oil at the ports.

- For handling with hydraulic oil consider the material safety data sheet.
- Wear protection equipment.

Danger of injury due to high-pressure injection in case of improper handling!

In case of improper handling of the hydraulic system, fluids can splash out under high pressure and injure people.

- Work on hydraulic equipment should only be carried out by qualified personnel with the relevant knowledge in this area.

NOTE

Lubrication before start-up

The elements are delivered with minimal lubrication.

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

- Check tight seat (check tightening torque of the 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 is to be used in such a way that the temperatures occurring as intended do not lead to inadmissible clamping forces. In particular, the following points must be observed:

- Durability of seals
- Expansion of media.
- Admissible temperature difference of the product in clamped condition is max. +/- 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 machining and result in personal injuries or damage to property.

- Exclude vibration on the product if possible.

Risks 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 injury due to improperly secured socket pins!

If the socket pin is not properly secured, the socket pin may slip out of the securing. The clamping slide can slip from the base and cause injuries due to a socket pin not secured in the product.

- Check that the 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

Machining with mounted crank handle and/or torque wrench is not permitted

Machining with mounted crank handle and/or torque wrench on the product is not permitted.

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

9.1 Setting the clamping range

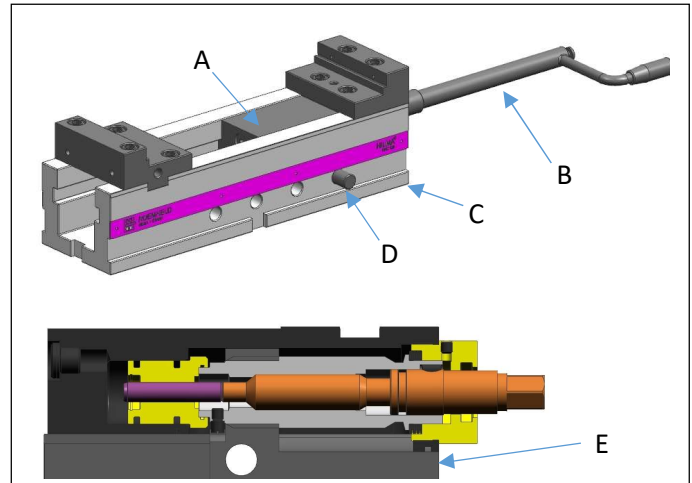


Figure 4: Setting the clamping range

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

- Pull the socket pin and move the clamping slide until the workpiece can be inserted.
- Push the clamping slide against the workpiece.
- Turn the crank handle until the angle nut in the base adjusts so that the socket pin can be inserted through the base and angle nut up to the stop.
- Insert the socket pin.
- Check clamping range overlap (min. 2 mm).

9.2 Clamping and unclamping

⚠ 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 machining.

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

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 machining.

- 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.

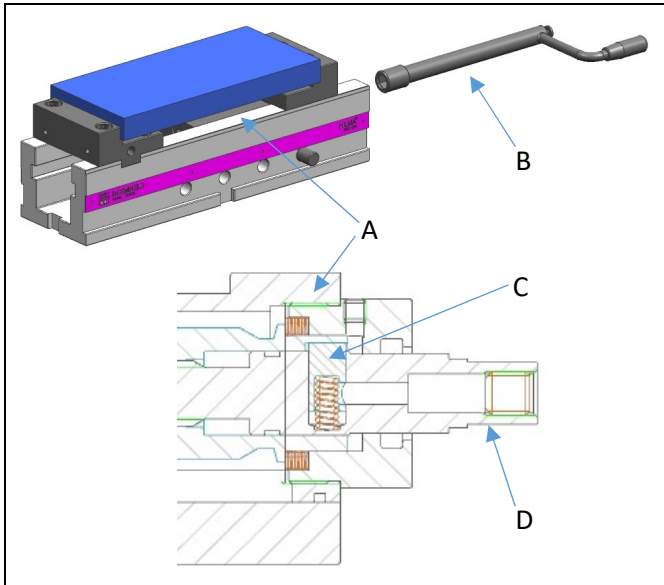


Figure 5: Clamping and unclamping

A Clamping slide	C Catch
B Crank handle	D Pressure spindle

- By turning the crank handle clockwise, the clamping slide is moved to the workpiece until a noticeable resistance is created. By means of the catch, the changeover to the mechanical-hydraulic power transmission takes place with increased force on the crank handle. When the inner pressure spindle is turned further, the clamping force is built up continuously up to the stop.
- The clamping force adjustment to sensitive workpieces is continuously adjustable by reducing the crank rotation (see technical data). A clamping force preselection is available as an accessory.
- The clamping force is continuously reduced by turning the crank handle counterclockwise until the catch engages noticeably. The vice is opened when the crank handle is turned further.
- The catch must engage, otherwise only a reduced clamping force will be achieved when reclamping.

9.3 Clamping and unclamping with gripper

To compensate for the plastic deformation of the workpiece when clamping with the gripper, two clamping operations are required, as described in chapter Clamping and unclamping.

NOTE

Loss of clamping force in the gripper area

The first time the workpiece is clamped with the gripper, deformation occurs in the area of the gripper. Due to the deformation, the workpiece is no longer sufficiently clamped and must be reclamped in a second clamping operation.

- After the first clamping, do not move the workpiece and clamp it a second time.

9.3.1 Load relief for the clamping slide

CAUTION

Danger of crushing due to dropping clamping slide without gas pressure spring

- When the product is used vertically with the socket pin pulled, the clamping slide is not held in position without the gas pressure spring fitted. Without the gas pressure spring fitted, the slide drops down along the base and can crush limbs.
- Install the gas pressure spring before using the product vertically.

WARNING

Risk of injury due to damage to the gas pressure spring!

The gas pressure spring is under high pressure. When attempting to open or overheat the gas pressure spring, the pressure escapes from the gas pressure spring and may injure persons.

- Do not open gas pressure spring.
- Do not heat the gas pressure spring above 80 °C.
- After prolonged storage, check gas pressure spring for proper function.

Danger of crushing due to automatic pushing back of the clamping slide!

When the product is used horizontally and with the socket pin pulled, the gas pressure spring pushes the clamping slide to the rear and can crush limbs in the process.

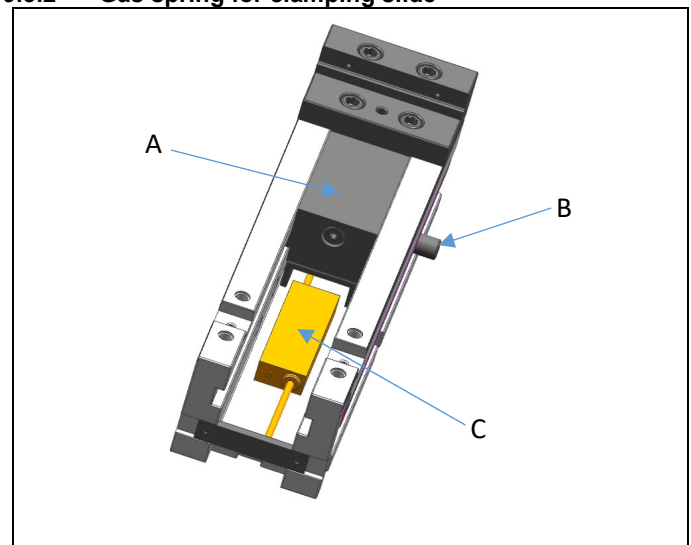
- Keep the movement area of the clamping slide free of body parts and objects before pulling the socket pin.

NOTE

Vertical mounting with gas spring

Only the types -0141 and -7101 are suitable for vertical mounting. They are equipped with a gas pressure spring that prevents the clamping slide from falling down.

9.3.2 Gas spring for clamping slide



A Clamping slide	C Gas spring
B Socket pin	

- To prevent the clamping slide from falling down when pulling the socket pin, the types -0141 and -7101 are equipped with a gas pressure spring. This allows easy

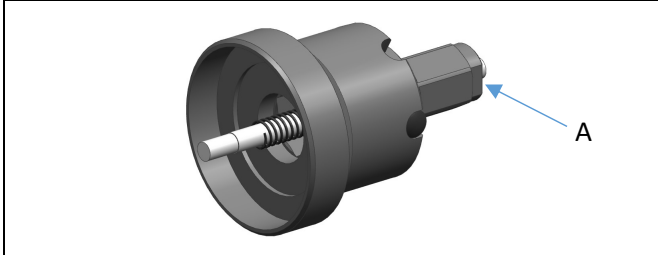
adjustment of the clamping range by relieving the load of the clamping slide.

- The gas pressure spring is active when delivered and must be removed for horizontal use. This is only possible when the socket pin is pulled.

⚠ CAUTION

- In horizontal mounting, the gas pressure spring pushes the clamping slide backwards when the socket pin is pulled.

9.4 Clamping force pre-adjustment with lock (optional)



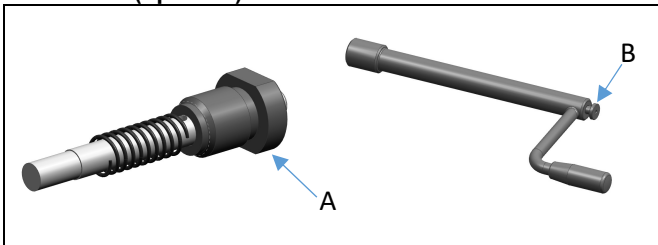
Clamping force preselection

The clamping force preselection limits the stroke of the pressure spindle and allows thereby a gradual adjustment of the clamping force. The max. clamping force is obtained in step six.

Mounting the clamping force preselection:

- Remove the set screw from the pressure spindle.
- Put the clamping force preselection on the pressure spindle.
- Tighten sleeve (A).

9.5 Lock (optional)



Lock:

The lock blocks the indexing bolt in the hollow spindle and enables a purely mechanical clamping.

Mounting the lock:

- Remove the set screw from the pressure spindle.
- Push the lock into the pressure spindle.
- Screw in sleeve (A) and tighten firmly.

Lock the catch:

- Pressing in the locking bolt (B) with the knob on the crank handle locks the index mechanism.

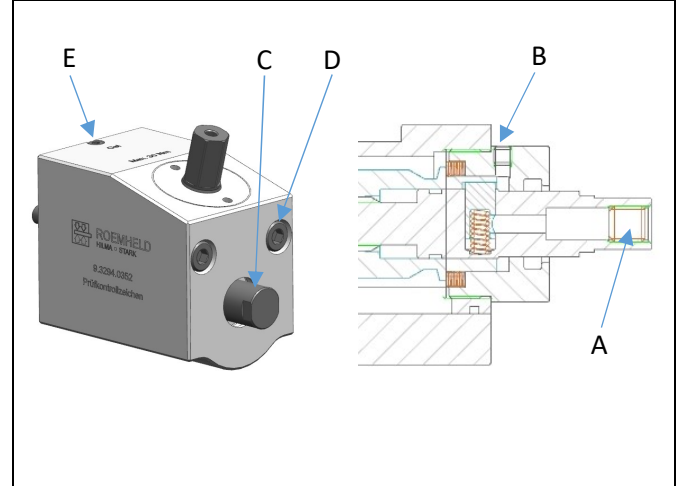
Attention:

- Because of the locking device, there is no more switching to the hydraulic force transmission. The max. admissible torque on the crank handle is then 20 Nm. Violent rotating will damage the system.

Release the lock:

- Turning to the left releases the system and the spring-loaded knob (B) on the crank handle pops out. When turning further, the clamping force is continuously reduced and the vice is opened.

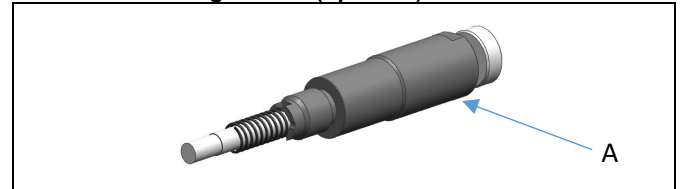
9.6 Angle drive (optional)



Mounting the angle drive:

- Remove the set screw (A) from the pressure spindle.
- Unscrew the set screw (B).
- Push the angle drive onto the centring collar of the bearing cover.
- Screw the bolt (C) into the pressure spindle and tighten it.
- Also tighten screws (D).
- Loosen screw (E) and fill in approx. 0.5 cm³ of Vactra 2 hydraulic oil.
- Screw in screw (E) again.

9.7 Lock for angle drive (optional)



Mounting the lock:

- Unscrew bolt (C).
- Push in the lock.
- Screw in sleeve (A) and tighten firmly.

10 Maintenance

⚠ WARNING

Burning due to hot surface!

- 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!

Due to overload or faulty operation during operation, product parts may break, and this may cause personal injuries.

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

Danger of injury due to high-pressure injection in case of improper handling!

In case of improper handling of the hydraulic system, fluids can splash out under high pressure and injure people.

- Work on hydraulic equipment should only be carried out by qualified personnel with the relevant knowledge in this area.

10.1 Maintenance plan

Maintenance works	Interval	Realisation
Cleaning	As required	Operator
Regular checks	daily	Operator
Regular lubrication	At the latest after 500 clamping cycles!	⚠ Caution! If this lubrication will not be made, this can lead to a failure of the fixture clamp!
Repair		Qualified personnel

10.2 Cleaning

⚠ CAUTION

Damage to moving components!

Avoid damage to moving components (rods, plungers, bolts, etc.) as well as wipers and seals.

Aggressive cleaning agents

The product must not be cleaned with:

- corrosive or caustic substances or
- organic solvents as halogenated or aromatic hydrocarbons and ketones (cellulose thinner, acetone, etc.), since this can damage the seals.

The element must be cleaned at regular intervals. Especially the clamping slide and the base have to be cleaned of swarf and other liquids.

In the case of heavy contamination, cleaning must be made at shorter intervals.

10.3 Regular checks

- Check tightness of hydraulic connections (visual control).
- Leakage check on the clamping slide.
- Clamping force control by pressure control.
- Check the observance of the maintenance intervals.

10.4 Exchange piston system incl. seals

The piston system has to be exchanged in case of external leakages. For high availability, we recommend to change the seals at the latest after 1,000,000 cycles or 2 years.

The piston system incl. seals is available as a spare part.

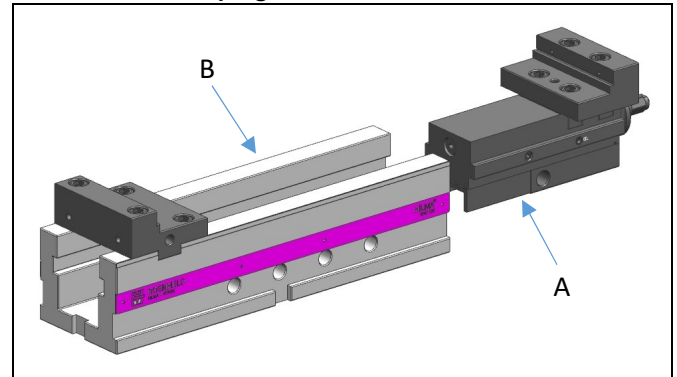
NOTE

Seal kits

- Do not install seal kits which were exposed to light for a longer time.
- Observe storage conditions (see chapter "Technical data").
- Only use original seals.

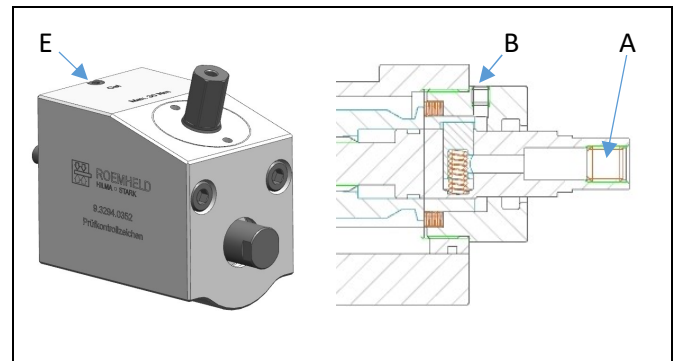
10.5 Maintenance and care

Dismount the clamping slide



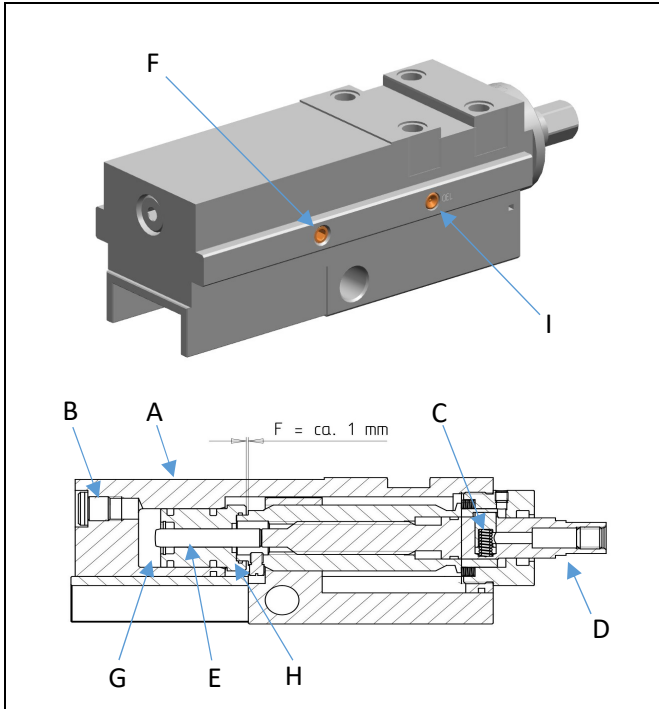
Regularly remove the clamping slide (A) from the base (B), clean and, if necessary, remove the sliding surfaces and oil them with slide way oil.

Lubrication of the catch



- Loosen the set screw (A+B+C).
- Add approx 0.5 cm³ of Vactra 2 hydraulic oil.
- Screw in the set screw (A+B+C) again.
- Relubrication as required, but at least once a month.

Refilling hydraulic oil / lubricating the spindle



For KNC 125 + 160:

- Turn back the pressure spindle (D) until the indexing bolt (C) engages.
- Remove the clamping slide (A) from the base.
- Unscrew the screw plug (B).
- Move the primary piston (E) to off-position. To do this, use a filling nipple and an oil gun or pressurise the oil chamber (G) with compressed air.
- Fill hydraulic oil HLP 68 to the brim without bubbles.
- Screw in and tighten screw plug (B).
Observe the tightening torque.
30 Nm for size 125
50 Nm for size 160
- Unscrew set screw (F) and check dimension "F", approx. 1mm. (Range 0.8 - 1.2 mm)
- Screw in set screw (F) and tighten.

For KNC 100:

- Turn back the pressure spindle (D) until the indexing bolt (C) engages.
- Remove the clamping slide (A) from the base.
- Unscrew screw plug (B) and set screw (F).
- Move the primary piston (E) to off-position. To do this, use a filling nipple and an oil gun or pressurise with compressed air.
- Insert sensor tape (0.7 thick) between slide housing (A) and piston (H). (Dimension "F")
- Fill hydraulic oil HLP 68 to the brim without bubbles.
- Screw in and tighten screw plug (B).
Observe the tightening torque 15 Nm.
- Remove sensor tape and check dimension "F", approx. 1mm.
(Range 0.8 - 1.2 mm)
- Screw in set screw (F) and tighten.

Lubricating the spindle:

- Move the slide back to the stop by turning the crank handle to the left. (max. jaw opening)
- Pull the socket pin and remove it from the base.

- Now place the slide on the lateral support surface.
- Then lubricate the spindle in the slide with Vactra 2 hydraulic oil on the lubricating nipple (I) using an oil gun. (1 x per month 2 puffs)

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 Trouble shooting

Trouble	Cause	Remedy
Clamping slide has too much play	Guide worn out	Exchange vice, exchange component, if required.
Clamping pressure reduces due to leakages at the vice	Wear at the seals	Exchange seals
No clamping pressure build-up	Pressure spindle not in off-position.	Turn pressure spindle back, until the indexing bolt engages (see chapter "Clamping and unclamping").
	Clamping range set incorrectly.	See chapter "Setting the clamping range".
	Premature change over to hydraulic power transmission due to blocked slide guide.	After pulling the socket pin, remove the clamping slide from the base, clean and oil all sliding surfaces.
	High pressure path consumed by protruding burr or yielding workpiece.	Clamp only burr-free workpieces. Support yielding workpieces or clamp with formed jaws.
	Oil reserve exhausted.	Refill oil (see chapter "Refilling of hydraulic oil").
Socket pin sluggish	Dirt between base and angle nut	Remove the clamping slide and clean the guide.

12 Technical data

Characteristics

Type 3150			
Jaw width [mm]	100	125	160
Max. clamping force [kN]	25	40	50
Base length [mm]	300	440	540
Weight [kg]	17	39.5	72

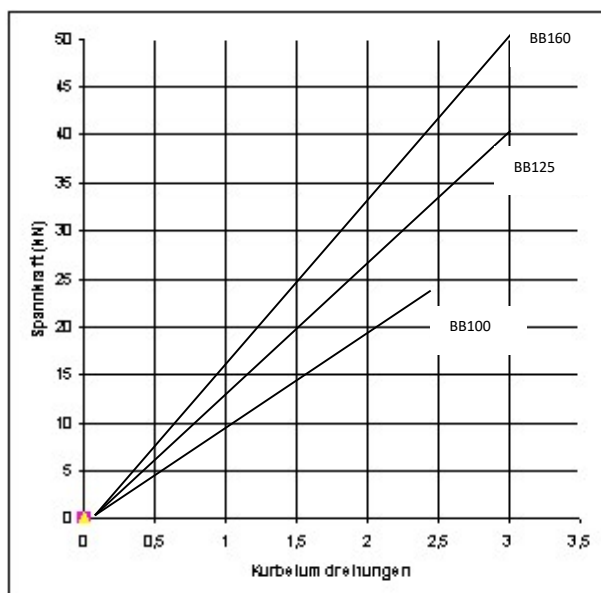


Figure 6: Relation of clamping forces

NOTE

Further details

- For further technical data see ROEMHELD data sheet.

Proposal, tightening torques for screws of tensile strength 8.8, 10.9, 12.9

NOTE

- The indicated values are approximate values and have to be interpreted according to the user's application!
See note!

Thread	Tightening torque (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 set screws made of steel with metric thread and connecting surface dimensions as per 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 $\mu_{ges} = 0.14$ - not lubricated, utilisation of minimum yield point = 90%.

12.1 Storage

CAUTION

Storage of components!

- The product must not be exposed to direct sunlight, since UV light may cause serious damage to the seals.
- Storage not in compliance with the storage conditions is inadmissible.
- In case of improper storage, the seals can embrittle and resinification of the anti-corrosive oil or corrosion at the element can occur.

ROEMHELD products are tested with mineral oil by default. The exterior of the products is protected against corrosion. 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.

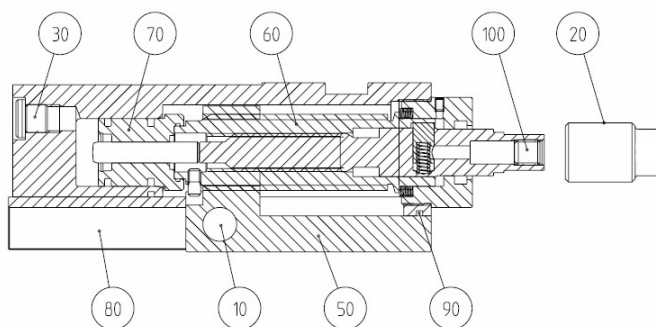
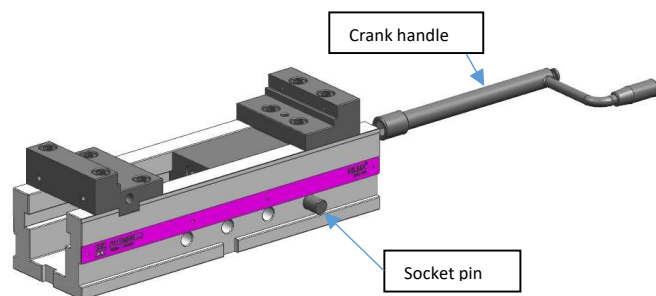
12.2 Accessories

NOTE

Accessories

- see data sheet

12.3 Spare parts



Pos	Denomination	Qua	Spare part no.		
			BB 100	BB 125	BB160
10	Socket pin	1	7.3152.0006	7.3153.0006	7.3154.0006
20	Crank handle	1	4.2056.0043	4.2056.0040	4.2056.0042
30	Screw plug	1	1.0908.1008	1.0908.1009	1.0908.1010
40					
50	Angle nut	1	5.2053.0062	5.2053.0060	5.2053.0061
60	Spindle complete	1	9.3152.0524	9.3153.0524	9.3154.0524
70	Piston system	1	9.3073.0522	9.3073.0522	9.3074.0522
80	Gas pressure	2	2.6011.0018	2.6011.0015	2.6011.0017
90	Seal	1	1.9516.0005	1.9516.0005	1.9516.0005
100	Set screw	1	1.0913.0097	1.0913.0113	1.0913.0113

13 Disposal



Hazardous to the environment

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. stroke measuring systems, proximity switches, etc.) the country-specific statutory requirements and regulations have to be complied with.

14 Declaration of incorporation

Manufacturer

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Products of catalogue sheet WS 13150. The following types or part numbers are concerned:

- 3150

They are designed and manufactured in line with the relevant versions of the directives **2006/42/EC** (EC MSRL) and in compliance with the valid technical rules and standards. In accordance with EC-MSRL, these products are components that are not yet ready for use and are exclusively designed for the installation in a machine, a fixture or a plant.

According to the pressure equipment directives the products are not to be classified as pressure reservoirs but as hydraulic placing devices, since pressure is not the essential factor for the design, but the strength, the inherent stability and solidity with regard to static or dynamic operating stress.

The products may only be put into operation after it was assessed that the incomplete machine / machine, in which the product shall be installed, corresponds to the machinery directives (2006/42/EC).

The manufacturer commits to transmit the special documents of the products to state authorities on request. The technical documentation as per appendix VII part B was prepared for the products.

15 List of the used standards

Product Safety Act - ProdSG; November 2011

DIN EN ISO 12100, 2011-03, Safety of machinery; Basic concepts, General principles for design (replacement for part 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. (replaces: DIN EN 294)

DIN EN 349, 2008-09, Safety of machinery - Minimum gaps to avoid crushing of parts of the human body

DIN EN 81714-2, 2007-08, Design of graphical symbols for use in the technical documentation of products

DIN EN ISO 4413, 2011-04, Fluid technology - General rules and safety requirements for hydraulic systems and their components

DIN EN 82079; **2010-10**, Preparation of instructions, structuring, content and presentation - Part 1

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Wilnsdorf-Wilden, October 10, 2022