



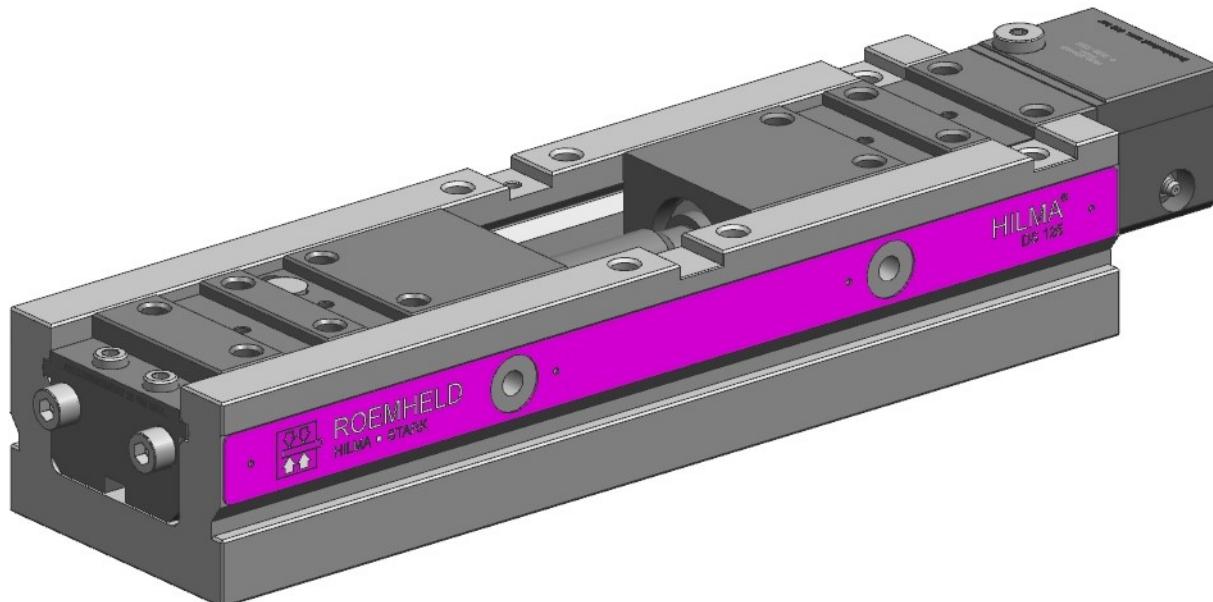
ROEMHELD
HILMA ■ STARK

Operating Manual

incl. declaration of incorporation and installation instructions
for incomplete machines as per machinery directives 2006/42/EC

Double Workholding System DS 100 hydraulic
Double Workholding System DS 125 hydraulic

Type 9.3685.xxxx
Type 9.3686.xxxx

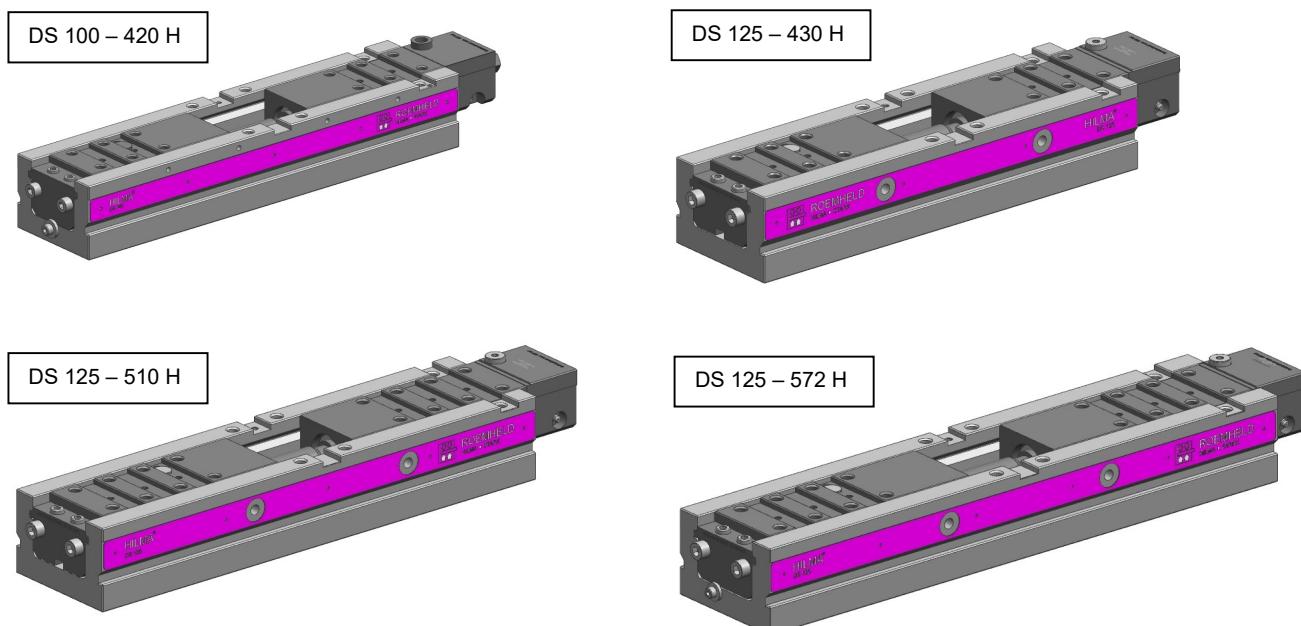


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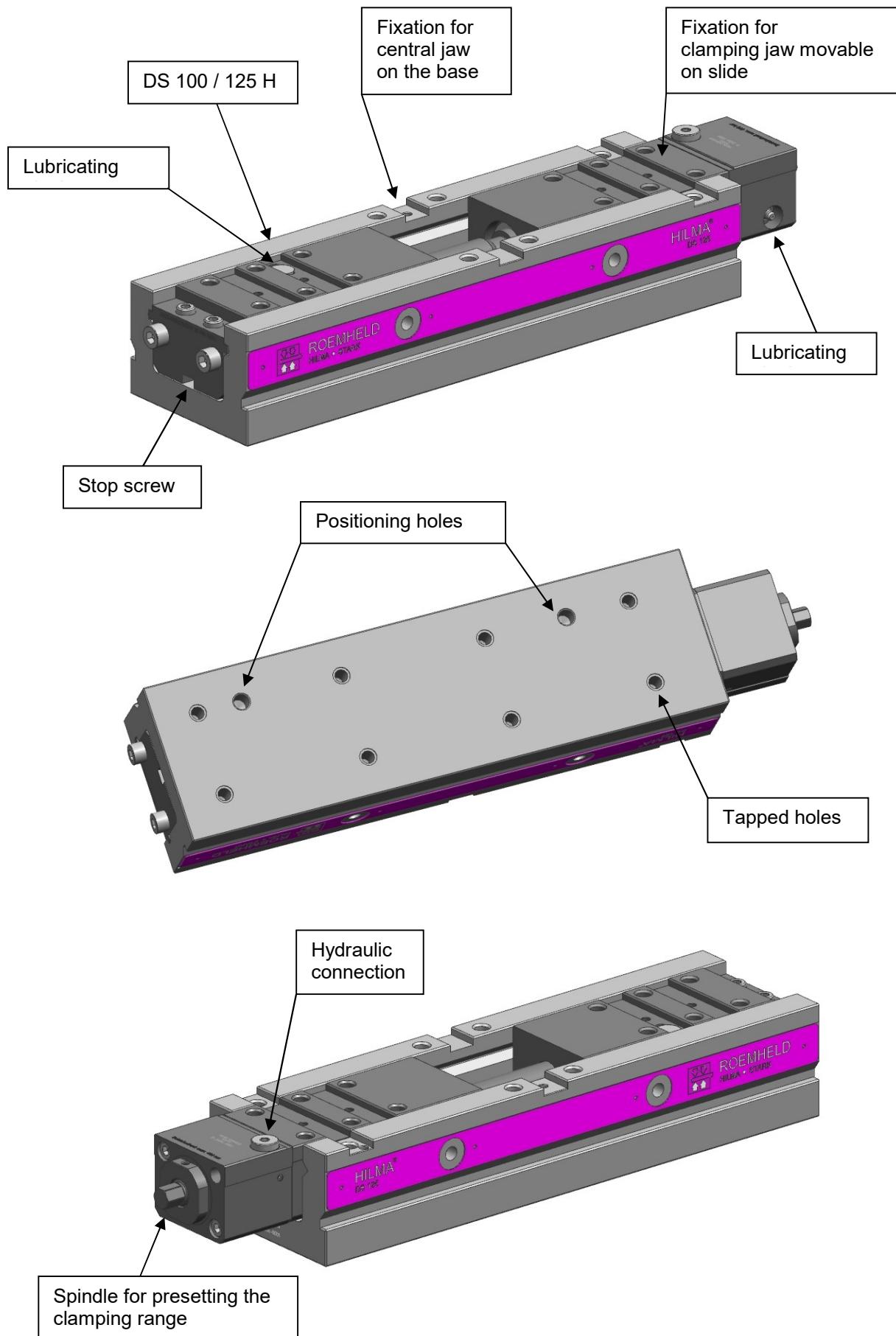
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To ensure safe and functional operation, it is imperative to read the operating manual before installation and start up!

1.1 Series

1.2 Structure of the workholding system





1.3 Description of the workholding system

The product is designed for universal workpiece clamping on machine tools and for simultaneous clamping of one to four workpieces. The clamping points can be loaded with differently-sized workpieces. The clamping range setting allows both clamping slides to be opened evenly and thus allows an undisturbed workpiece change.

When the clamping jaws are mounted, the slides are guided without play.

The hydraulic power stroke is generated by an external pressure transducer (e.g. ROEMHELD modular power unit). The return spring ensures fast opening of the clamping slides.

Construction easy to maintain. After disassembly of the clamping jaws and a stop screw, the slide unit can be removed from the base.

1.4 For your safety

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.
- Before start up, carry out a collision check taking into account the working space of the machine.
- Screw the workholding system immovably onto the machine table.
- The workpiece clamping forces must be high so that the machining forces cannot move the workpiece.
- During start up and in continuous operation, suitable measures must be taken to prevent any danger of crushing due to the slide stroke.
- For safe clamping, only part of the hydraulic power stroke may be used as the insertion clearance.
- Check clamping force regularly using a force measuring gauge.
- Install protective guards or provide two-hand control to prevent hazards (crushing).

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/fixtures 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.

Use

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.

Inappropriate use



WARNING

Injuries, material damages or malfunctions!

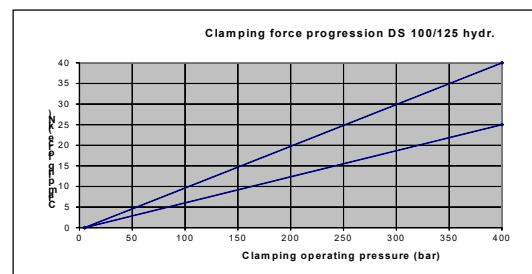
- Do not modify the product!

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.

1.5 Technical data

Jaw width mm	Length mm	Clamping force kN	Operating pressure bar	Clamping stroke per slide	Power stroke mm	Weight kg
100	420	25	400	44	10	20.7
125	430	40	400	44	10	31.5
125	510	40	400	44	10	37.5
125	572	40	400	48	10	41.2



1.6 Delivery

The workholding system is supplied in assembled condition including operating manual.



2.1 Pressure transducer, e.g. hydraulic power unit

- The pressure transducer should work in intermittent operation and be equipped with pressure monitoring and machine safety system. The pressure monitoring switches on the pump after a pressure drop of 10%. In the case of a pressure drop of 15%, the machine is stopped by the machine safety system.

2.2 Pressure port and bleeding

- Connect the double workholding system to the hydraulic power unit via a high-pressure hose. If the pressure adjustment of the power unit is low (20 bar), bleed the system free of bubbles at the connection of the double workholding system. Oil recommendation: HLP32 or HLP46 as per DIN 51524

2.3 Fixing on the machine table

The workholding systems must be fixed in such a way that they cannot be displaced by machining forces.

- Unevenness and swarf between the contact surface and the base surface shall be removed.
- Before start up, carry out a collision check taking into account the working space of the machine.
- Alignment
 - with the dial gauge
 - with positioning pins.
- Fixing
 - with screws

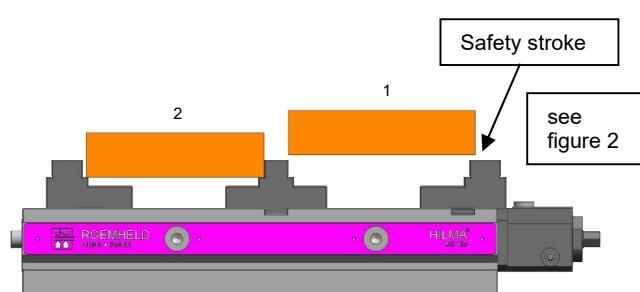
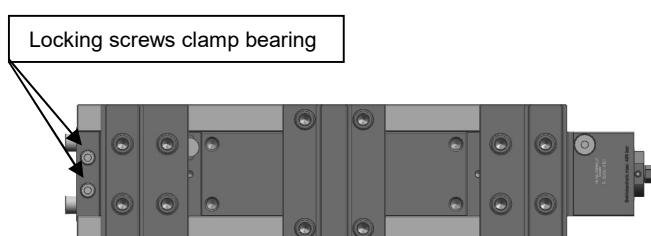
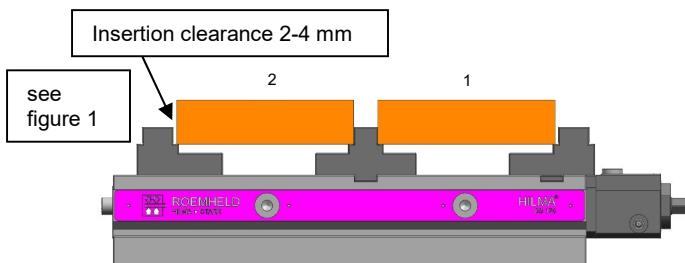


Fig.1 Insertion clearance



Fig.2 Safety stroke



2.4 Setting the clamping range

- By rotating the spindles counter clockwise, open the double workholding system until the stop.
- Select and fix the appropriate set of jaws for the workpieces. Pay attention to the cleanliness between the jaws and the guide.
- Tighten the locking screws of the clamp bearing.
- Insert workpiece 1 and place it against the fixed jaw using the spindle.
- Loosen the locking screws of the clamp bearing.
- Set the insertion clearance 2-4 mm for workpiece 2 and tighten the locking screws of the clamp bearing.
- By rotating the spindles counter clockwise, set the insertion clearance 2-4 mm for workpiece 1.
- Check safety stroke (min. 2 mm). To do this, remove workpiece 1 (workpiece 2 remains clamped) and continue turning the spindle clockwise.
- Attention: Do not use the entire power stroke as insertion clearance, otherwise the clamping slides will move during clamping against the internal stop and as a result the workpieces will not be clamped. In the case of yielding parts, the clamping slides may have to be closed with the crank handle before clamping.
- When adjusting the setting, the workpieces are **not** clamped (secure the workpieces against falling out when vertically mounted).



2.5 Clamping and unclamping

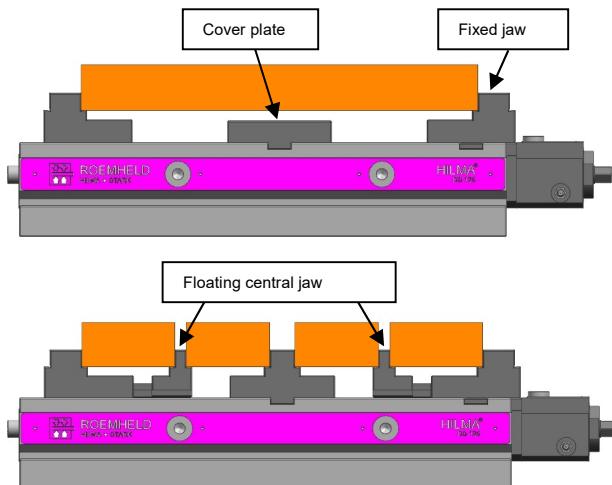
- By switching on the hydraulic power unit, the workpieces are clamped proportionally to the set pressure. (Observe maximum values, see technical data 1.5). To unclamp, a directional control valve is actuated so that the integrated springs return the clamping slides to their off-position.

⚠ CAUTION

Do not use the entire power stroke as insertion clearance, otherwise the clamping slides will move during clamping against the internal stop and as a result the workpiece will not be clamped.

⚠ CAUTION

The clamping pressure may have dropped after long periods of standstill (e.g. weekends). Please check the pressure before machining, if necessary reclamp. After pressing the emergency switch, the workpieces must be reclamped, as the hydraulics are also switched off in the event of an emergency stop.



2.5.1 Individual clamping

- To do this, mount a fixed jaw that holds the left slide in place and a cover plate.

2.5.2 Quadruple clamping

- Select the guide plated of the floating central jaws suitable for the workpiece size and screw them onto the slide. Clamping and unclamping analogue 2.5

2.6 Workpiece support

- The workpieces are always placed on the clamping jaws or on the workpiece supports.
- The guideway of the base is not permitted as workpiece support.

2.7 Error messages

Fault	Cause	Remedy
Max. jaw opening is not reached	Locking screw of the clamp bearing tightened	Loosen locking screws of the clamp bearing
Inaccurate angular position of the movable jaw	Due to unclean assembly swarf between jaws and guide	Disassemble jaws, clean, remove if necessary, lubricate and assemble
Workpieces are not clamped sufficiently.	Slides move against internal stop	See 2.4 Setting the clamping range
	Yielding workpieces	Support workpieces or minimize insertion clearance to increase the clamping stroke
	Operating pressure too low	Set higher operating pressure at pressure transducer
Clamping slides do not return or return only slowly when pressure is relieved	Too high resistance in the return line Directional control valves dirty or defective	Increase cable cross-section or reduce cable length. Clean or replace directional control valves.
	Hydraulic oil viscous	Use hydraulic oil HLP 32 or HLP 46 as per DIN 51524
	The clamping slides jam due to heavy contamination or damage.	Dismount clamping slide, clean guides, remove if necessary and lubricate
Spindle stiff	Grease lubrication washed out by emulsion	Lubricate spindle and bearing via lubricating nipple



2.8 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.

⚠️ 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.

2.9. 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.

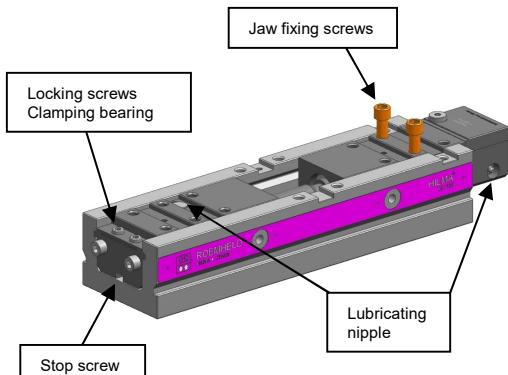
- Observe maintenance intervals for all parts pursuant to this Operating Manual.

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.

2.9.1 Maintenance and care



- In addition to normal cleaning of the spindle and bearings, lubricate with grease at regular intervals via the grease nipples (e.g.: BP Energearse LS-EP 2).
- For basic cleaning, unscrew the jaws, after removing the stop screw, remove the slide system from the base using two jaw fixing screws. Then clean and lubricate



2.10 Maintenance plan

Maintenance works	Interval	Realisation
Cleaning	As required	Operator
Regular checks	daily	Operator
Regular lubrication (with bed way oil, e.g. Vactra 2)	At the latest after 5,000 clamping cycles Alternatively 1 per week	 Caution! If this lubrication will not be made, this can lead to a failure of the fixture clamp!
Repair		Qualified personnel

2.11 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 housing have to be cleaned of swarf and other liquids.

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

Regular checks

1. Check tightness of hydraulic connections (visual control).
2. Leakage control at the housing and the clamping slide.
3. Clamping force control by pressure control.
4. Check the observance of the maintenance intervals.

2.12 Service / maintenance service

1. In Germany

Maintenance by manufacturer

Please send the workholding system carriage paid.

Maintenance at customer workshop:

Please call maintenance service - information 12.3011.

Service phone: 02733 – 281 150

2. Internationally

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

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!

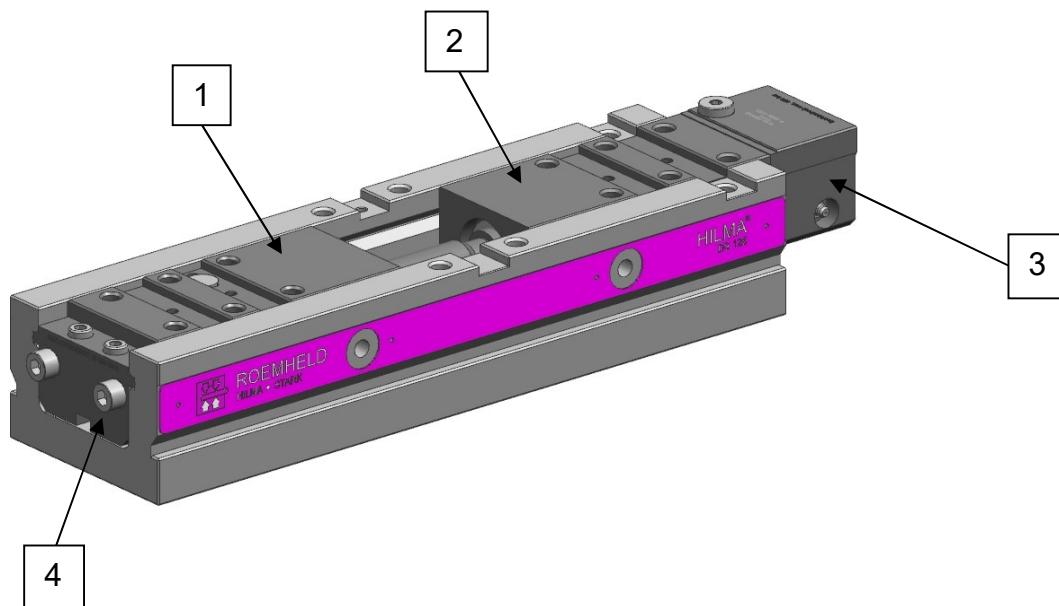
Thread	Tightening torque (MA) [Nm]		
	8.8	10.9	12.9
M6	10	15	18
M8	25	36	45
M10	49	72	84
M12	85	125	145
M14	135	200	235
M16	210	310	365
M20	425	610	710

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%.

2.11 Spare parts



Clamping system	Slide unit left Pos. 1	Slide unit right Pos. 2	Power block Pos. 3	Block third-hand Pos. 4
DS 100 H – 420 long	7.3685.0001	7.3685.0002	7.3685.0003	7.3685.0004
DS 125 H – 430 long	7.3686.0001	7.3686.0002	7.3686.0003	7.3686.0011
DS 125 H – 510 long	7.3686.0005	7.3686.0006	7.3686.0003	7.3686.0011
DS 125 H – 572 long	7.3686.0008	7.3686.0009	7.3686.0003	7.3686.0012



3.1. 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.

3.2 Declaration of incorporation

Manufacturer

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The products are designed and manufactured in line with the relevant versions of the directives **2006/42/CE** (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.

3.3 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 + 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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Hilchenbach, June 26, 2020