KNECHT

Operating Instructions

HSM 100

Hydromechanical Clamping Nut

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Operating Instructions

HSM 100 Hydromechanical Clamping Nut

Manufacturer

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Documents for machine operator

Operating Instructions

Date of issue of the operating instructions

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Table of Contents

1. Important notes

1.1 Preface to the operating instructions

These operating instructions are intended to make it easy to understand the HSM 100 Hydro-mechanical Clamping Nut and to use it for its intended purpose.

The operating instructions contain important information on how to operate the clamping nut safely, properly and economically. Observance of these instructions helps to avoid hazards, reduce repair costs and downtimes and to increase the reliability and service life of the clamping nut.

The operating instructions must always be available at the place of use of the cutter knife system.

The operating instructions must be read and used by every person who is assigned to work on the clamping nut, e.g.:

- Transport, assembly, commissioning
- Operation, including troubleshooting in the work sequence, as well as
- Maintenance (servicing, repair).

Recognized technical standards for safe and professional work must be observed in addition to these operating instructions and the binding accident prevention regulations applicable in the country of use and at the place of use.

1.2 Warnings and symbols in the operating instructions

The operating instructions use the following symbols/designations that must be followed:

The hazard triangle with the signal word "CAUTION" serves as a work safety notice for all work for which there is a risk of personal injury or death.

In these cases, work should be done with special attention and care.

ACHTUNG

"ATTENTION" is written in places where special attention must be paid to prevent damage or destruction of the clamping nut or its surroundings.

NOTE

"NOTICE" refers to user tips and especially useful informations.

1. Important notes

1.3 Figure and position numbers in the operating instructions

If the text makes a reference to a machine component depicted in a figure, the figure and position number will be given in brackets.

Example: (5-4/1) means picture number 5-4, position 1.

Figure 5-4 *Building up hydraulic pressure*

Use the pump lever (5-4/1) to build up hydraulic pressure of 220 bar.

A limiting valve prevents overpressure.

2. Safety

2.1 Basic safety instructions

2.1.1 Observe notes in the operating instructions

The basic prerequisite for the safe handling and uninterrupted operation of this clamping nut is knowledge of the basic safety instructions and regulations.

- These operating instructions contain important notes on how to operate the clamping nut safely.
- All persons carrying out work on the clamping nut must follow these operating instructions, in particular the safety notices.
- In addition, the rules and regulations regarding accident prevention at the place of use are to be observed.

2.1.2 Obligation on the part of the operator

The operator is obliged to allow only those persons to work with the clamping nut, who

- are familiar with the basic regulations on work safety and accident prevention and have been instructed in the handling of the clamping nut,
- have read and understood the operating instructions, in particular the section entitled "Safety" and the warning notes, and have provided signed confirmation of this.

The safety-awareness of the personnel at work will be monitored at regular intervals.

2.1.3 Obligation on the part of the personnel

All persons assigned to work with the clamping nut are obliged, before starting work, to

- observe the basic regulations on work safety and accident prevention,
- read the operating instructions, particularly the section entitled "Safety" and the warning notes, and provide signed confirmation that they have understood them.

2.1.4 Hazards involved in using the clamping nut

The clamping nut is built to the latest technological standards and the acknowledged rules of technical safety. Nevertheless, its use may result in danger to life and limb of the user or third parties, or damage to the grinding machine or other property.

The clamping nut may be used only:

- for its intended purpose
- in a safe and secure condition.

Malfunctions that may impair safety must be eliminated immediately.

2. Safety

2.1.5 Malfunctions

If safety-relevant malfunctions occur on the clamping nut or if the working behavior indicates such malfunctions, the clamping nut must be stopped immediately until the malfunction has been found and eliminated.

Allow only authorized and qualified personnel to eliminate malfunctions.

2.2 Intended use

The clamping nut is intended exclusively for clamping cutter knife sets in bowl cutters.

Any other use or use beyond this is not considered as intended. KNECHT Maschinenbau GmbH is not liable for any damage resulting from this. The risk is borne solely by the user.

Intended use also includes observing all instructions in the operating manual.

2.3 Warranty and liability

Warranty and liability claims in case of personal injury or property damage are excluded if such damage is attributable to one or more of the following causes:

- improper use of the clamping nut,
- improper transport, commissioning, operation, and maintenance of the clamping nut,
- operating the clamping nut with defective safety devices, or using improperly attached or malfunctioning safety and protective equipment,
- failure to observe the instructions with regard to transportation, commissioning, operation, maintenance and repair of the clamping nut,
- unauthorized structural alterations to the clamping nut,
- failure to monitor parts that are subject to wear and tear, and
- use of unapproved replacement and wear parts.

Use only original replacement and wear parts. If externally purchased parts are used, it is not guaranteed that they have been designed and manufactured to meet the requirements in terms of stress and safety.

2. Safety

2.4 Safety regulations

2.4.1 Organizational measures

Inspect all available safety devices regularly.

Observe prescribed intervals for recurring maintenance work or as specified in the operating instructions!

2.4.2 Protective equipment

Before each start-up of the clamping nut, all protective devices must be properly attached and functional.

Protective equipment may only be removed after the clamping nut has come to a complete stop and has been secured against restarting.

2.4.3 Informal safety measures

The operating instructions must be permanently available at the place of use of the clamping nut. In addition to the operating instructions, the generally applicable as well as locally relevant accident prevention regulations must also be made available and observed.

2.4.4 Selection and qualification of personnel

Only trained and instructed personnel may work with the clamping nut. Observe the legally permitted minimum age!

The responsibilities of the personnel for commissioning, operating, maintaining and repairing must be clearly specified.

Personnel who are in the training, instruction, education or familiarization phase may only work work with the clamping nut under constant supervision of an experienced person!

2.4.5 Safety measures in normal operation

Refrain from any operation that may endanger safety. Only operate the clamping nut when all safety devices are in place and fully functional.

At least once per shift (or per day), check the clamping nut for externally visible damage and proper functioning of the safety devices.

Immediately report any changes present (including those of the operating behavior) to the responsible office or person. If necessary, shut down and secure the clamping nut immediately. In case of malfunctions, shut down the clamping nut immediately and secure it. Have faults rectified immediately.

2.4.6 Maintenance (servicing, repair) and fault rectification

Maintenance work is to be carried out on schedule by qualified personnel. Inform operating personnel before beginning repair work. Designate a supervisor responsible for this.

After completing maintenance work and rectifying any faults, install all safety devices and verify that they are fully functional.

2.4.7 Structural alterations to the clamping nut

Do not make any changes, additions or conversions to the clamping nut without the approval of the manufacturer. This also applies to the installation and setup of safety devices.

Any conversion work requires the written permission from KNECHT Maschinenbau GmbH.

Immediately replace machine parts that are not in perfect condition.

Use only original replacement and wear parts. If externally purchased parts are used, it is not guaranteed that they have been designed and manufactured to meet the requirements in terms of stress and safety.

2.4.8 Cleaning the clamping nut

Properly handle any cleaning agents and materials used and dispose of them in an environmentally-friendly manner.

Dispose of the wear parts and replacement parts in a safe and environmentally friendly manner.

2.4.9 Lubricants / oils and greases

When using oils and greases, follow the safety regulations applicable to the product. Comply with the special regulations for the food areas.

3. Description

3.1 Intended use

The HSM 100 Hydromechanical Clamping Nut clamps cutter knife sets on the knife shaft of a bowl cutter. The clamping nut and knife shaft must have the identical thread.

3.2 Technical specifications

3.2.1 HSM 100 Hydromechanical Clamping Nut

Height	120 mm
Diameter	155 mm
Weight	approx. 7 kg

3.2.2 Hydraulic cart

Height	approx. 970 mm
Width	approx. 700 mm
Depth	approx. 400 mm
Weight (with locking wrench, without clamping nut)	approx. 35 kg
Weight (with locking wrench, with clamping nut)	approx. 42 kg

3.3 Functional description

With the HSM 100 Hydromechanical Clamping Nut, cutter knives are clamped quickly and easily with approx. 90 kN (9 tons).

The special feature: the nut compensates for linear expansion of the clamping system caused by temperature changes, e.g. in cooking cutters. This prevents the clamping elements from bending due to excessive clamping force. As a result, the cutter knives are more resistant to breakage. Regardless of the operating condition, the knives are always tightened with the same force.

3. Description

3.4 Description of assemblies

3.4.1 HSM 100 Hydromechanical Clamping Nut

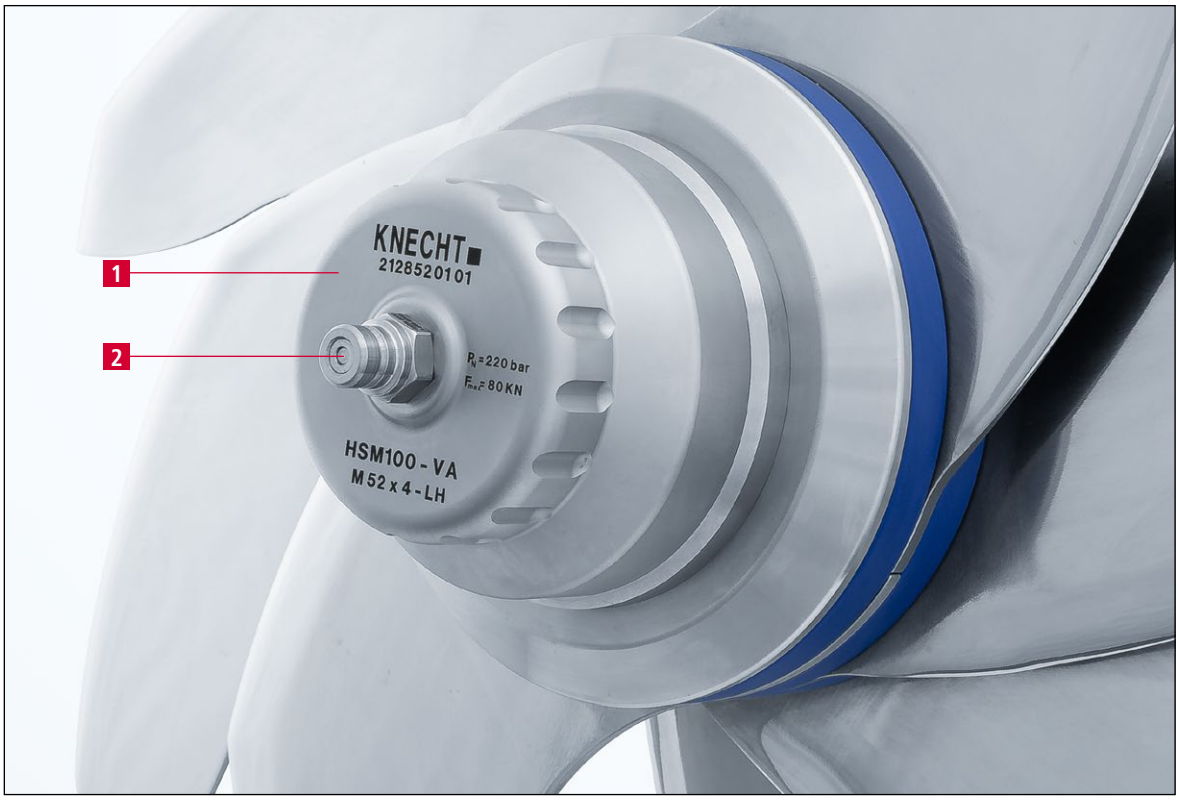


Figure 3-1 General view of the HSM 100 Hydromechanical Clamping Nut

1 HSM 100 Clamping Nut
2 Hydraulic connection (hydraulic nipple)

3. Description

3.4.2 Hydraulic cart

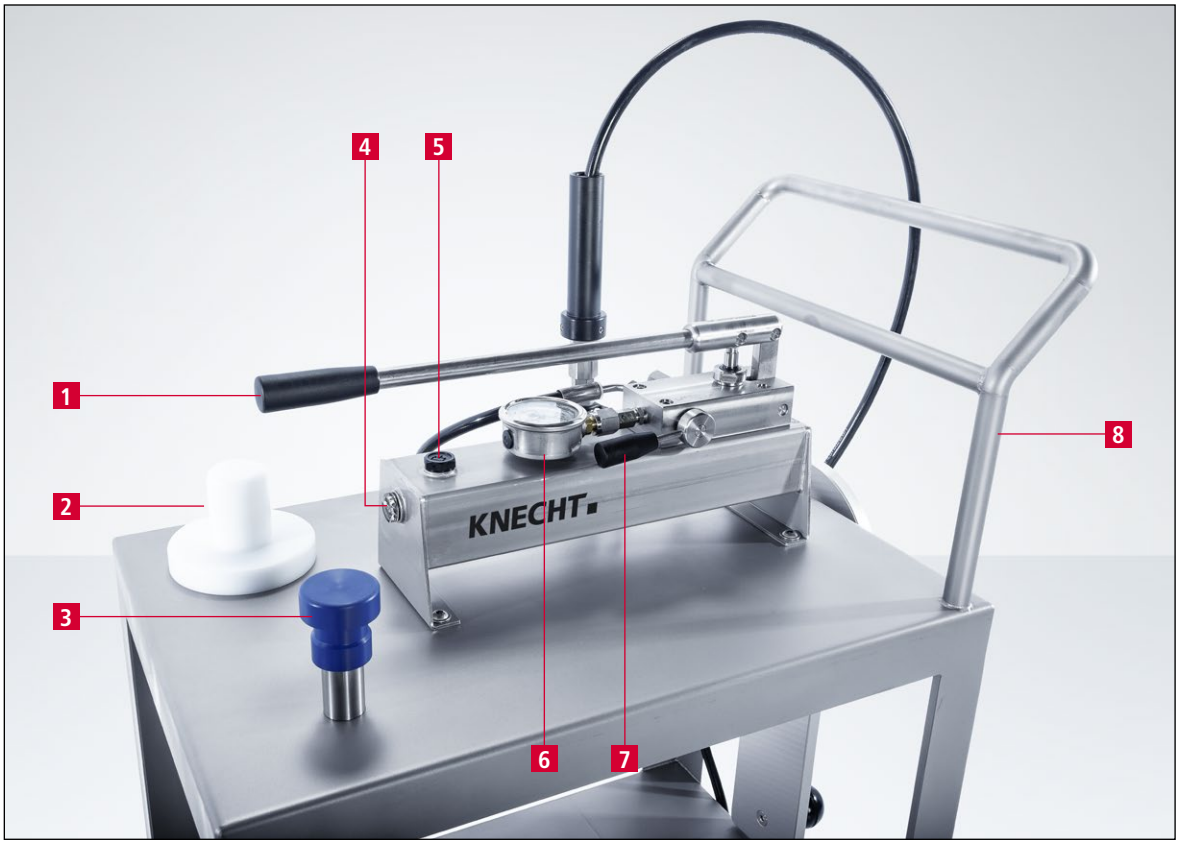


Figure 3-2 Hydraulic cart with hydraulic pump

1 Pump lever
2 Holder for clamping nut
3 Protective cap for hydraulic nipple
4 Oil level inspection glass
5 Oil filler neck
6 Manometer
7 Valve lever
8 Transport cart

4. Transport

When transporting, observe the local applicable safety and accident prevention regulations.

4.1 Transport aids

To transport the HSM 100 Hydromechanical Clamping Nut, only use adequately dimensioned transport aids.

4.2 Transport damage

If damage is detected during acceptance of the delivery, immediately inform KNECHT Maschinenbau GmbH and the forwarding agent. If necessary, an independent expert must be called in immediately.

Remove packaging and fastening straps. Dispose of packaging in an environment-friendly manner.

5. Operation

CAUTION

All work may only be carried out by authorized specialist personnel.

The applicable local safety and accident prevention regulations must be observed.

Serious cutting injuries are possible.

5.1 Tightening the clamping nut

Figure 5-1 Fitting the clamping nut

Turn the clamping nut (5-1/1) counterclockwise by hand onto the knife shaft until it touches the end ring (5-1/2).

Figure 5-2 Removing the protective cap

Remove the protective cap (5-2/1) from the hydraulic nipple and place it on the designated holder (3-2/4) of the Hydraulic cart.

5. Operation

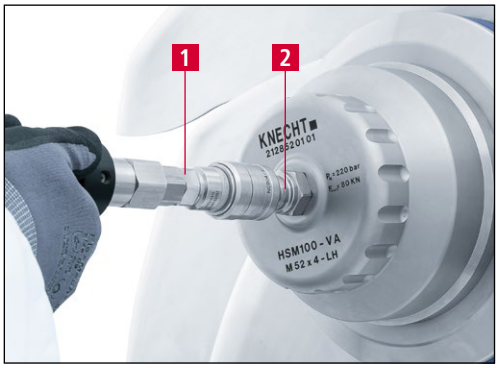


Figure 5-3 Fitting the quick coupling

Place the quick coupling (5-3/1) on the hydraulic nipple (5-3/2) of the nut and engage the coupling under slight pressure.

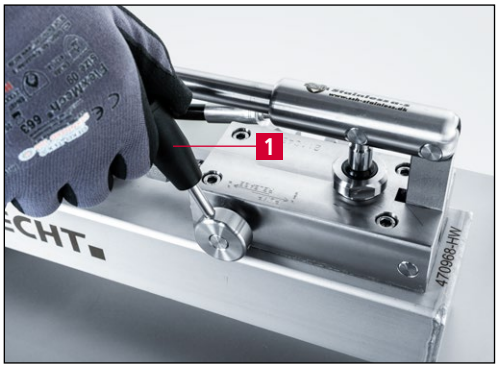


Figure 5-4 Closing the pump valve

Pull the valve lever (5-4/1) on the hydraulic pump upwards, the pump valve closes.

Figure 5-5 Building up hydraulic pressure

Use the pump lever (5-5/1) to build up a hydraulic pressure of 220 bar.

A limiting valve prevents overpressure.

5. Operation

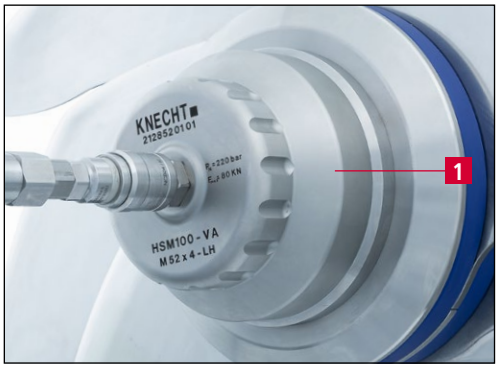


Figure 5-6 Tightening the clamping nut

Slightly tighten the clamping nut (5-6/1) counter-clockwise by hand.

ATTENTION

The clamping nut can only be tightened correctly after the work step described in Figure 5-6.

Figure 5-7 Opening the pump valve

Press the valve lever (5-7/1) down, the pump valve opens. The pressure is released and the clamping nut is tightened.

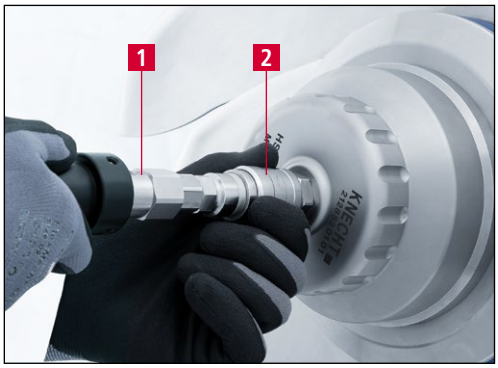


Figure 5-8 Pulling off the quick coupling

Pull the outer casing of the quick coupling (5-8/2) towards the operator and pull the quick coupling (5-8/1) off the clamping nut.

5. Operation

ATTENTION

Under no circumstances may the bowl cutter be operated while the protective cap is fitted on the clamping nut. This can cause serious damage to the clamping nut and machine.

5. Operation

5.2 Loosening the clamping nut

Figure 5-9 Attaching the locking wrench

Place the locking wrench (5-9/1) in the 10 o'clock position onto the clamping nut.

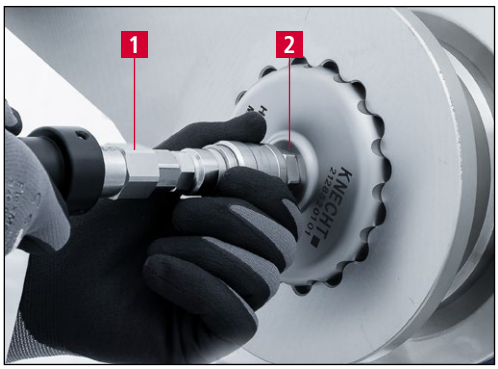


Figure 5-10 Attaching the quick coupling

Place the quick coupling (5-10/1) on the hydraulic nipple (5-10/2) of the nut and engage the coupling while applying slight pressure.

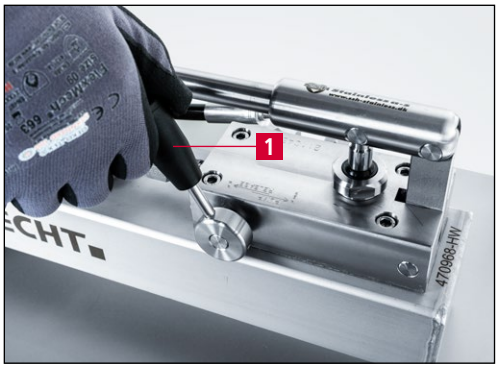


Figure 5-11 Closing the pump valve

Pull the valve lever (5-11/1) upwards, the pump valve closes. The pressure can be built up.

5. Operation

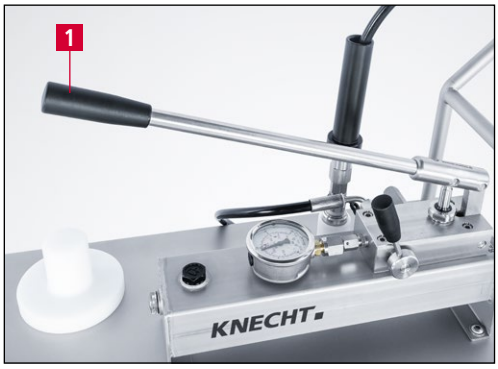


Figure 5-12 Building up hydraulic pressure

Use the pump lever (5-12/1) to build up a hydraulic pressure of 220 bar.

A limiting valve prevents overpressure.

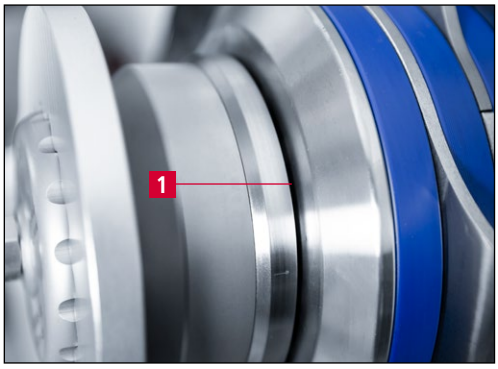


Figure 5-13 Loosening the clamping nut

Turn the clamping nut clockwise approximately one turn using the locking wrench until it protrudes at least 3 mm (5-13/1) from the end ring.

Figure 5-14 Opening the pump valve

Press the valve lever (5-14/1) down, the pump valve opens. The pressure is released.

5. Operation

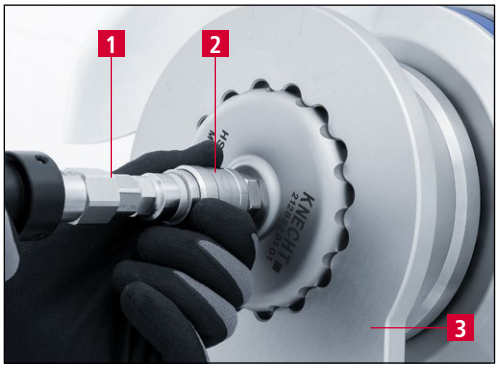


Figure 5-15 Removing the quick coupling and locking wrench

Pull the outer casing (5-15/2) of the quick coupling towards the operator and remove the coupling (5-15/1) from the clamping nut.

Remove the locking wrench (5-15/3) from the clamping nut.

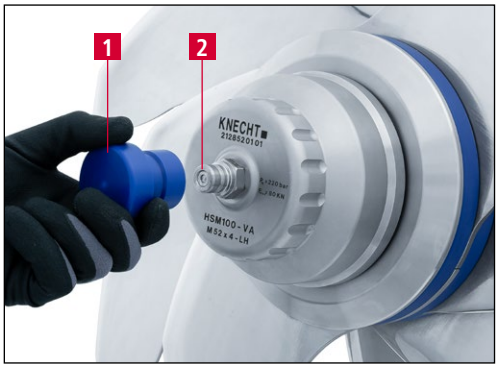


Figure 5-16 Fitting the protective cap

Fit the protective cap (5-16/1) onto the hydraulic nipple (5-16/2).

Figure 5-17 Removing the clamping nut

Turn the clamping nut (5-17/1) clockwise by hand from the knife shaft.

Figure 5-18 Placing the clamping nut down

Place the clamping nut on the designated holder (5-18/1) of the Hydraulic cart.

ATTENTION

Place the clamping nut on the designated holder (5-18/1) on the Hydraulic cart to protect it from damage.

5. Operation

5.3 Refilling the hydraulic pump with oil

Figure 5-19 Unscrew the plug screw

Unscrew the plug screw (5-19/1) on the filler neck of the hydraulic pump counterclockwise using an AF 22 mm open-end wrench.

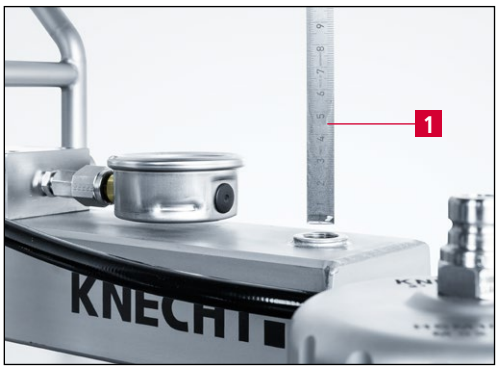


Figure 5-20 Checking the oil level

Use a scale (5-20/1) to check the oil level.

The level should be about 35 mm.

ATTENTION

Only use hydraulic oil permitted for food technology with NSF H1 approval.

We recommend OKS 3775.

Figure 5-21 Oil level correct

On hydraulic pumps with an oil level inspection glass, the oil level must be in the middle of the inspection glass (5-21/1) or slightly above it.

Figure 5-22 Oil level too low

The oil level is too low if it is below the middle of the inspection glass (5-22/1).

5. Operation

5.4 Adjusting the hydraulic pump limiting valve

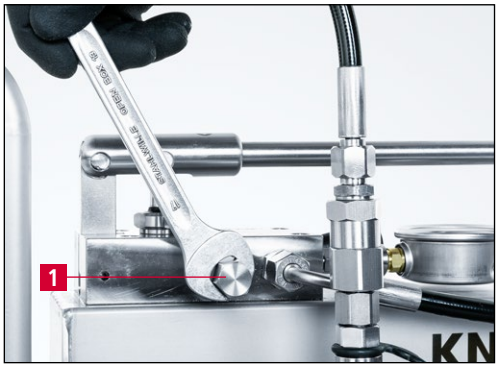


Figure 5-23 Unscrewing the cap nut

Unscrew the cap nut (5-23/1) on the left side of the hydraulic pump counterclockwise using an AF 17 mm open-end wrench.

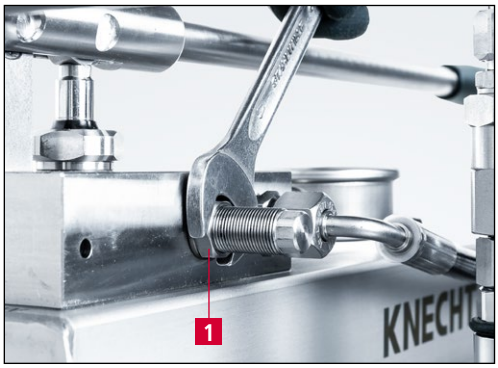


Figure 5-24 Loosening the lock nut

Loosen the lock nut (5-24/1) counterclockwise using an AF 17 mm open-end wrench.

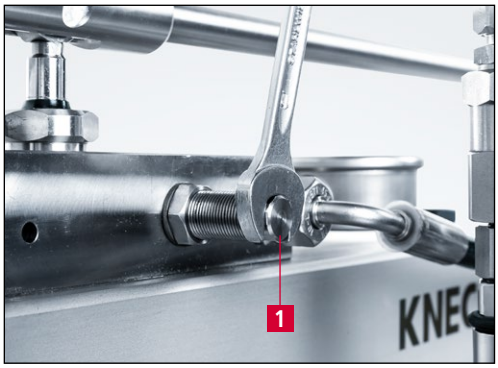


Figure 5-25 Adjusting the regulating screw

Turn the regulating screw (5-25/1) to the left (valve opens at lower pressure) or to the right (valve opens at higher pressure) in 2 mm increments using an AF 12 mm open-end wrench.

5. Operation

Figure 5-26 Closing the pump valve

Check the pressure after each adjustment.

To do this, pull the valve lever (5-26/1) upwards, the pump valve closes.

Figure 5-27 Building up hydraulic pressure

Build up pressure with the pump lever (5-27/1) until the pointer on the manometer stops.

The limiting valve is now open.

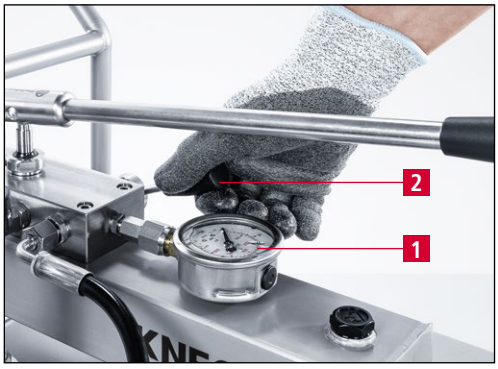


Figure 5-28 Reading the pressure value

Read the pressure value on the manometer (5-28/1) and open the pump valve by pressing the valve lever (5-28/2) downwards.

5. Operation

Figure 5-29 Correct opening value of the limiting valve is 220 bar

Repeat procedures (Fig. 5-25 to Fig. 5-28) until the limiting valve opens at 220 bar.

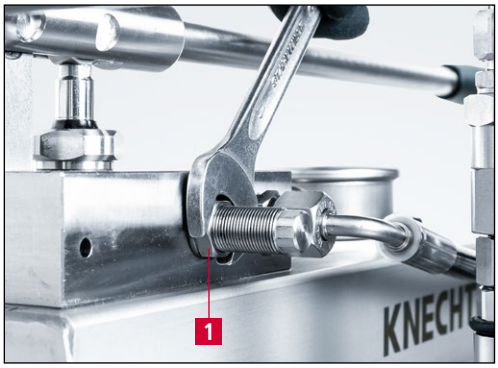


Figure 5-30 Tightening the lock nut

Tighten the lock nut (5-30/1) clockwise using an AF 17 mm open-end wrench.

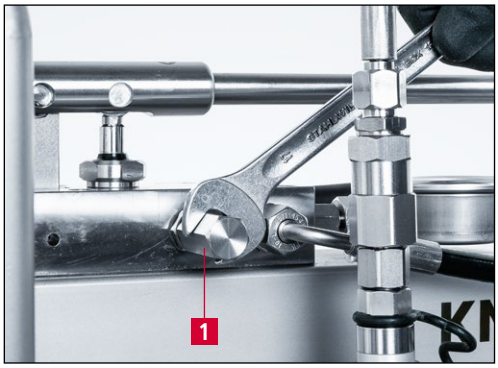


Figure 5-31 Screwing on the cap nut

Fit the cap nut (5-31/1) clockwise using an AF 17 mm open-end wrench and tighten moderately

ATTENTION

At a pressure of 220 bar, the HSM 100 has a clamping force of approx. 90 kN (9 tons).

If the pressure is less than 220 bar, the clamping force is reduced. The cutter knives are no longer tensioned correctly. There is a risk of knife breakage.

5. Operation

ATTENTION

If the pressure is higher than 220 bar, the clamping force increases. The clamping elements can bend. Here too, there is a risk of knife breakage.

6. Care and maintenance

For all work on the clamping nut and the Hydraulic cart, observe the locally applicable safety and accident prevention regulations as well as instructions in the “Safety” and “Important notes” section of the operating instructions.

6.1 Cleaning

The clamping nut, the locking wrench and the hydraulic cart must be cleaned daily.

6.1.1 Cleaning agent and lubricant table

Cleaning / Lubrication work	Interflon	Würth	SHELL	EXXON Mobil	OKS
Cleaning and care of machine parts	Dry Clean Stainless Steel	Stainless Steel Care spray	Risella 917	Marcol 82	
Lubrication of threads and sliding surfaces	Fin Grease	Multi-purpose grease	Gadus S2	Ronex MP	
Hydraulic pump	Hydraulic oil with NSF H1 approval for food technology				Hydraulic oil 3775

6.2 Maintenance plan (one-shift operation)

Interval	Assembly	Maintenance task
Daily	Clamping nut	Clean
	Clamping nut	Check for leaks (visual inspection)
	Hydraulic nipple	Check for damage (visual inspection)
	Locking wrench	Clean
Annually		Send clamping nut to KNECHT Maschinenbau GmbH for annual service.

7. Malfunctions

7.1 Malfunctions

Malfunction	possible cause	Remedy
Maximum pressure is not reached	Oil quantity too low	Top up with oil (see Chapter 5.3). Use OKS 3775 hydraulic oil for food processing technology!
	Limiting valve set incorrectly	Set limiting valve (see Chapter 5.4)

If a malfunction is not included in the malfunction table or if the malfunction is not rectified, please contact our service department (Chapter 9).

ATTENTION

In the event of malfunctions, immediately contact KNECHT Maschinenbau GmbH for further instructions.

Defective clamping nuts may not be put into operation under any circumstances and must be exchanged immediately.

The clamping nut may not be opened or repaired without the permission of KNECHT Maschinenbau GmbH.

8. Disassembly and disposal

8.1 Disassembly

All operating materials must be disposed of properly.

8.2 Disposal

At the end of the service life of the HSM 100 Hydromechanical Clamping Nut, it must be disposed of by a qualified specialist. KNECHT Maschinenbau GmbH will be happy to assist you with disposal. Please contact us.

9. Service

9.1 Postal address

KNECHT Maschinenbau GmbH
Witschwender Straße 26
88368 Bergatreute
Deutschland

Phone +49-7527-928-0
Fax +49-7527-928-32

mail@knecht.eu
www.knecht.eu

9.2 Service

Service line:
For address, see postal address

service@knecht.eu

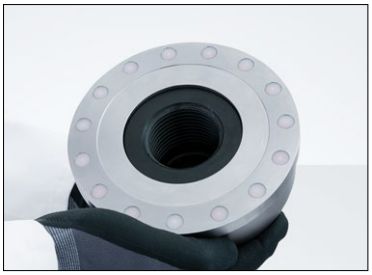
10. Appendix

10.1 Inspection report – HSM 100 Hydromechanical Clamping Nut
Frequency: ideally quarterly (at least every six months)

Inspection directly by KNECHT Maschinenbau GmbH on request.
Write to service@knecht.eu

Department / Customer _____ **Bowl Cutter** _____

Leakage


Clamping surface

Hydraulic nipple and quick coupling

Pos	Inspection	o.k.	Remark
1	General condition		Visual inspection
2	Leakage-free		Visual inspection
3	Cracks on the clamping surface		Visual inspection
4	Are hydraulic nipple and quick coupling easy to connect?		Practical test

Additional information

_____

_____

_____

_____

_____

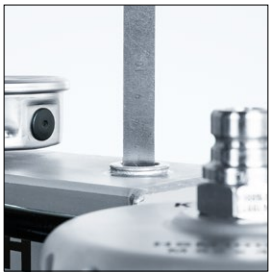
Date _____ Inspector _____ Signature _____

10. Appendix

10.2 Inspection-report – Hydraulic cart
Frequency: ideally quarterly (at least every six months)

Inspection directly by KNECHT Maschinenbau GmbH on request.
Write to service@knecht.eu

Department / Customer _____ **Bowl Cutter** _____



Scale in filler neck: Oil level approx. 35 mm

Inspection glass with correct oil level

Pressure 220 bar

Pressure 220 bar at least 60 seconds

Pos	Inspection	o.k.	Remark
1	General condition		Visual inspection
2	Oil level approx. 35 mm		Scale or inspection glass
3	Pressure with closed pump valve 220 bar (Chapter 5.2)		Manometer display
4	Is the 220 bar pressure being held for approx. 60 s?		Practical test

Additional information

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_____

_____

_____

_____

Date _____ Inspector _____ Signature _____

10. Appendix

10.3 EU Declaration of Conformity

We are manufacturer and distributor of cutting tools and the associated clamping elements. The products are used in machines for food production and come into contact with foods.

We confirm that the products comply with the laws and EU directives listed below:

- Regulation EC No. 10/2011
- Framework Regulation EC Nr. 1935/2004
- Directive 2007/19/EC
- Food and Feed Code LFGB

We confirm that we manufacture the products in accordance with good manufacturing practice (Framework Regulation EC No. 2023/2006) and that they are marketable.

The traceability of the individual components that come into contact with foods, is guaranteed at all stages, (EC No. 1935/2004 Art. 17). No substances are released that negatively affect the foods or endanger health.

Designation of the product:	HSM 100 Hydromechanical Clamping Nut and Hydraulic cart
Machine serial number Hydraulic cart:	from no. 820871HW
Responsible for documentation:	Andreas Doerr (State certified technician) Phone +49-7527-928-81 a.doerr@knecht.eu
Manufacturer:	KNECHT Maschinenbau GmbH Witschwender Straße 26 88368 Bergatreute Germany

The validity of the declaration expires in case of changes in the legal requirements.

Bergatreute, December 6, 2024

KNECHT Maschinenbau GmbH

Markus Knecht
Geschäftsführer

KNECHT Maschinenbau GmbH
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