

ENGINEERING
TOMORROW

Danfoss

Operator's Manual

ET4100 Portable Crimping Machine



Imprint

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This Operating Manual of the machine is a translation; the original is in German.

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EC Declaration of Conformity

In accordance with EC Machinery Directive 2006/42/EC.

The following machine

ET4100

was developed, designed and manufactured in compliance with EC Directive 2006/42/EC, in the sole responsibility of

UNIFLEX-Hydraulik GmbH
Robert-Bosch-Strasse 50 - 52
D-61184 Karben

The following standards, codes and specifications have been applied:

- EC Directive 2006/42/EC
- EN ISO 12100: 2010

This declaration are invalid when the machine is modified or if unauthorized and unapproved third-party components are used without our prior approval.

Entity authorised for documentation: Uniflex-Hydraulik GmbH, Technical Documentation Dept.

Karben, 02.11.2021



Managing Director Harald von Waitz

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1 About this document

1.1 Target groups

1 About this document

In this Operation Manual, the “forming machine ET4100” is consistently referred to as machine.

This Operation Manual includes important notes on how you operate your machine/unit safely, properly and economically.

Use not in compliance with the intended purpose may result in hazard to the operator's health and life and/or in the risk of damage to/the machine/unit. Consequently, please only use the machine/unit

- in good order and condition,
- in accordance with its intended purpose,
- in a safety-conscious manner, with awareness of risks and hazards,
- in compliance with all notes included in this Operation Manual.

The machine/unit may only be operated by staff who

- has read the Operation Manual,
- has understood it,
- has been instructed in the operation of the machine/unit, and
- has signed in the Annex.



Figures may include accessories/options. Customer-specific equipment may vary.

The product images shown are for reference only and may differ from the product delivered.

1.1 Target groups

The target groups of this Operation Manual are:

Owner

An owner is a natural person or entity using the device himself/herself/itself, or on whose behalf the device is used. An owner may appoint a representative to exercise the owner's rights and obligations.

The owner has to make sure that

1 About this document

1.1 Target groups

- national provisions, occupational safety regulations and applicable environmental protection regulations are fully complied with;
- persons working on the machine/unit are adequately qualified;
- persons working on the machine/unit are suitable for operating the machine/unit;
- the Operation Manual has been read and understood. One hardcopy of the Operation Manual must always be kept at a designated place where the machine/unit is used.
- persons working on the machine/unit are aware of potential risks;
- the operating staff is familiar with the location as well as with operating the fire alarm and fighting means. Free access to this equipment must be ensured.
- personal protection equipment is worn (safety footwear, protection gloves and safety glasses).

Machine/unit fitters

Machine/unit fitters must be at least 18 years old and have completed training for the task, i.e. they must have attended a specialist vocational training.

A fitter

- must observe the instructions in the Operation Manual;
- must inform the owner on failures and damage.

Operator

An operator is a person charged with and instructed in the proper operation of the machine/unit by the owner or the otherwise contractually obliged person.

The operator

- must observe the instructions in the Operation Manual;
- must inform the owner on failures and damage.
- must not perform and maintenance or repair work on the machine/unit.

1 About this document

1.2 Storage

1.2 Storage

The Operation Manual is part of the machine/unit and must be kept near the machine/unit at all times. Upon disposal of the machine/unit, the Operation Manual must also be handed over.

1.3 Name plate

The name plate is fixed on the machine back.

1.4 Abbreviations

CFM	Crimp Force Monitoring
FD	Manual Flow Divider
PB	Crimping dies
PBK	Calibration crimping dies
PFC	Pressure Force Control
PFM	Pressure Force Monitoring
QDC	Quick crimping die change system
ZWB	Intermediate dies

2 Safety instructions

2.1 Presentation of warnings

2 Safety instructions

2.1 Presentation of warnings

Warning notes in the Operation Manual warn against risks involved with the handling of the machine/unit. Risk levels are identified as follows:

**HAZARD!**

The signal word HAZARD identifies an imminent hazard resulting in serious injuries or death. This warning is supplemented by a triangular hazard symbol.

**WARNING!**

The signal word WARNING identifies a potentially hazardous situation, which might result in serious injuries or death. This warning is supplemented by a triangular hazard symbol.

**CAUTION!**

The signal word CAUTION identifies a potentially hazardous situation, which might result in light injuries. This warning is supplemented by a triangular hazard symbol.

**ATTENTION!**

The signal word ATTENTION identifies a potentially hazardous situation, in which the product or property in the environment may be damaged. This warning is supplemented by a hazard symbol or an exclamation mark.

2.2 Intended use

This machine is a forming machine for industrial use, only suitable for the manufacture of hose connections with a permissible diameter depending on the fitting and the hose thickness, see “Technical Data” in Section 3.

Intended purposes include:

- single workplace for one person only,
- single stroke with manual feed and withdrawal,
- for maximum hydraulic operating pressure, see “Technical Data” in Section 3.
- operating temperature between 10 °C and 35 °C,
- operation in a closed room,
- use of eight identical original UNIFLEX dies with the same label or seven dies and one associated marking crimping die.

2 Safety instructions

2.3 Product-specific risks

- The machine must not be operated by persons not capable of operating the machine without any risk. These may include:
 - persons with physical or mental disabilities;
 - children and persons under age;
 - persons with a restricted capability for the operation of machines (e.g. under the influence of drugs, alcohol or narcotics)


Use of the control in compliance with the intended purpose also includes compliance with the instructions in this Operation Manual.

Use for other than the intended purpose

Any other use is considered as being not in compliance with the intended purpose, in particular:

- design modification of the machine;
- use in explosive environments;
- forming of non-metal workpieces without specific safeguards approved by UNIFLEX;
- misuse of consumables and waste materials.

In particular non-metal workpieces may be overstressed by the forming process so that this may result in a sudden failure. Chips or seriously accelerated workpiece parts impose a high risk potential for operators, individuals and objects, even outside the working area.

WARNING!	
	<p>Risk for life and health!</p> <p>Use not in compliance with the intended purpose imposes risks for life and health. Consequences resulting from use for other than the intended purpose shall be under the sole responsibility of the owner.</p> <ul style="list-style-type: none">• Always use the machine in compliance with its intended purpose.

2.3 Product-specific risks

The machine/unit is designed in accordance with the latest state of technology. Nevertheless, the machine/unit may impose risks:

2 Safety instructions

2.3 Product-specific risks

2.3.1 Risks imposed by mechanical equipment

Risk of squeezing

When the die system closes, there is a risk of getting squeezed between the die and the workpiece.

- Keep the feed opening for the workpiece as small as possible.
- Keep sufficient distance to the die system.

Tilting hazard

The risk of tilting mainly exists while the machine is being transported.

- Observe the machine's centre of gravity during transport.

2.3.2 Risks imposed by hydraulic equipment

Risks are imposed by all hydraulic lines and connections. Hydraulic systems are subject to special safety provisions. Work on hydraulic equipment may only be performed by persons with expert knowledge of and experience with hydraulic equipment.

- After the machine is deactivated, the given and potentially hazardous residual energy has to be considered.
- Relieve the residual pressure in the system before performing repair or maintenance work on hydraulic systems.
- Regularly check lines and bolted connections for leaks and visible damage. Immediately remedy any damage detected.

Repair work on the hydraulic system of the machine or on its components may only be performed by the manufacturer's specialist staff.

2.3.3 Risks imposed by substances

Oils, greases and emulsions may penetrate the skin. When handling hazardous substances, oils and greases, the manufacturers' safety instructions have to be observed. Apply skin protection appropriate for the hazardous substances used.

2 Safety instructions

2.3 Product-specific risks

2.3.4 Risks imposed by noise

The noise level meter acc. to IEC 804, Class 2, was calibrated before measuring.

The operation of the machine/unit causes noise emissions of < 70 dB(A) at the workplace. Noise protection is not required.

Higher noise emissions may occur when other machine/unitry is simultaneously used at the workplace. The machine/unit owner must provide for appropriate protection, e.g.

- instruct staff to wear ear protection,
- provide information/instructions on risks,
- identify hazardous areas,
- provide health monitoring.

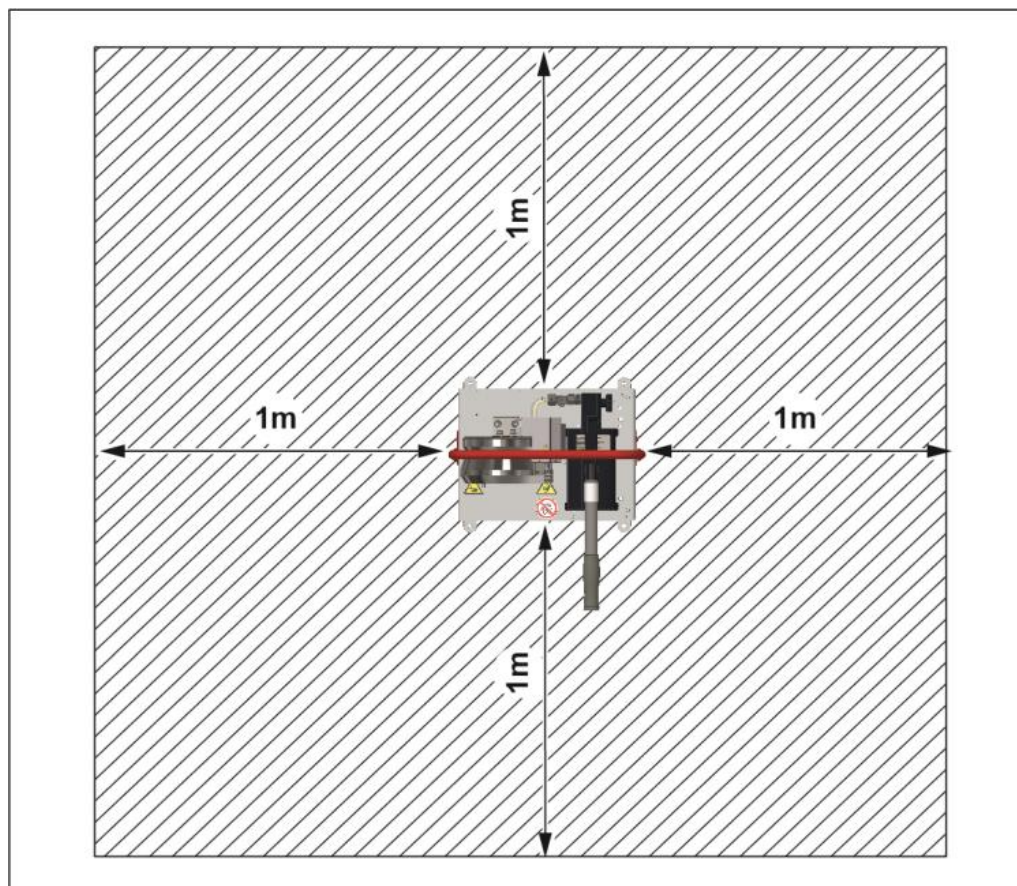
2.3.5 Risks in case of fire

The operating staff has to be familiar with the location as well as with operating the fire alarm and fighting means. Free access to this equipment must be ensured.

Never use water to extinguish a fire. For appropriate fire extinguishing action, please read the safety data sheet of the hydraulic oil supplier.

2.4 Safety

2.4.1 Working area



The working area is defined as the area 1 metre all around the machine (shaded).

- Keep the working area free from trip hazards
- Use ducts for lines and cables
- Provide good illumination

2.4.2 Protection equipment

Due to the variety of customer-specific workpieces, no additional standard protection equipment can be supplied with the machine that can prevent potential residual risks imposed by the machine.

The necessity of additional, workpiece-specific protection equipment may for instance arise for angled workpiece geometries needing a large opening for being inserted into the forming machine.

2 Safety instructions

2.4 Safety

The pressure joining of insulators, structural steel and steel ropes, too, may require special safeguards.

The owner has to consider the need for adapted protection equipment before commissioning. If such need exists, the relevant protection equipment has to be mounted before commissioning of the machine.

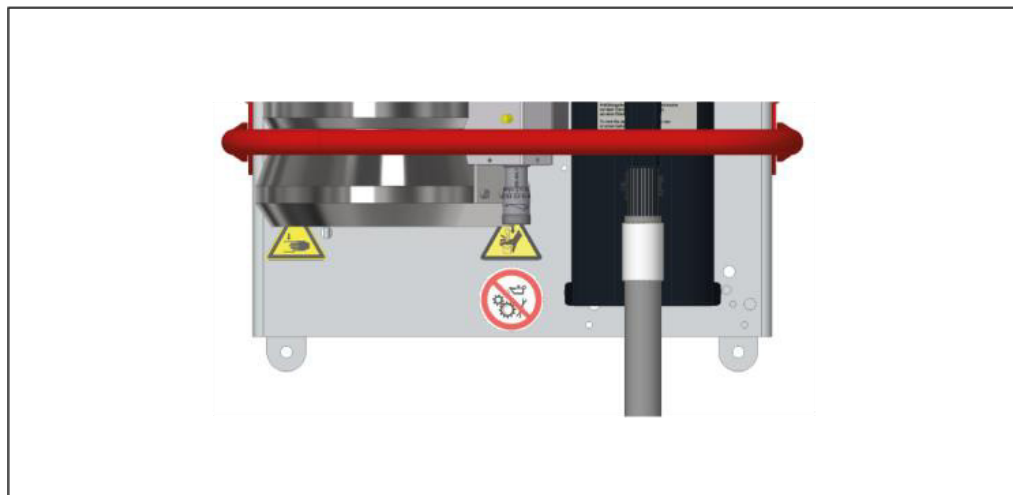
Customized solutions for protection equipment can be delivered upon request. Please do not hesitate to address your personal contact for consultation.




Mounted safety equipment must not be removed, bypassed or avoided.

2 Safety instructions

2.4 Safety

2.4.3 Warning signs on the machine



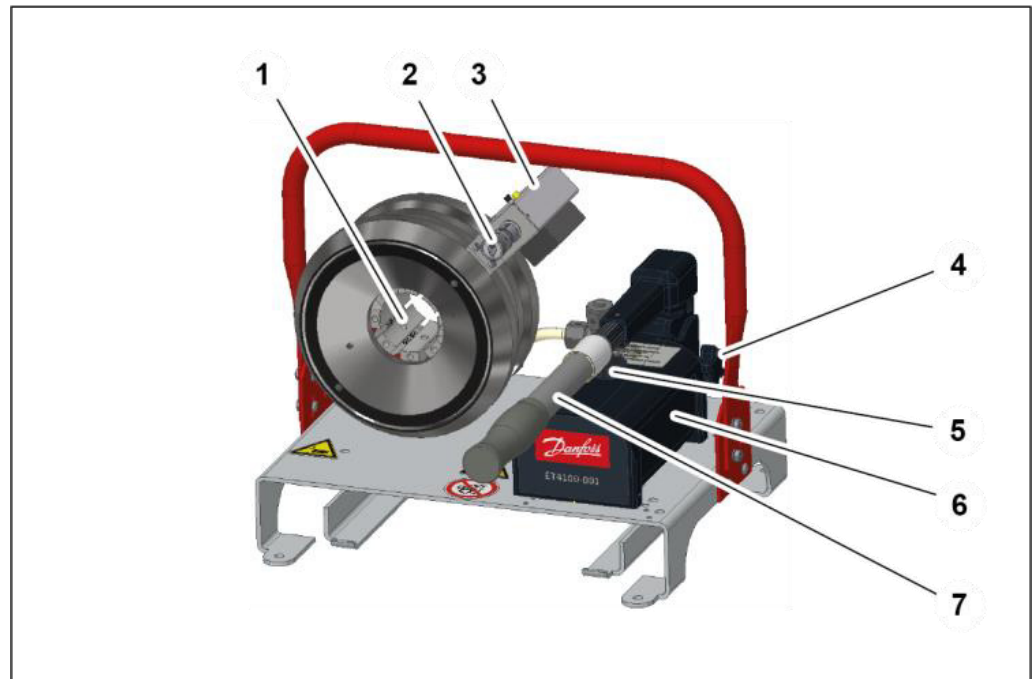
	Risk of crushing on the die system
	Risk of shearing on the die system
	Oiling / greasing prohibited on the die system

Illegible or missing warning signs must immediately be replaced by the operator.

3 Machine description

3.1 Design and function

Base machine



- (1) Crimping tool
- (2) Micrometer
- (3) Signal lamp
- (4) Drainage valve hand wheel
- (5) Oil filling and drainage screw
- (6) Hydraulic hand pump
- (7) Pump handle

The crimping tool (1) is closed hydraulically, whereby the work piece is formed. The pressure needed for this purpose is generated by the hydraulic hand pump (6) and transferred to the hollow piston. The signal lamp (3) lights up when the crimping diameter is reached. The crimping tool (1) is opened by slowly opening the drainage valve hand wheel (4).

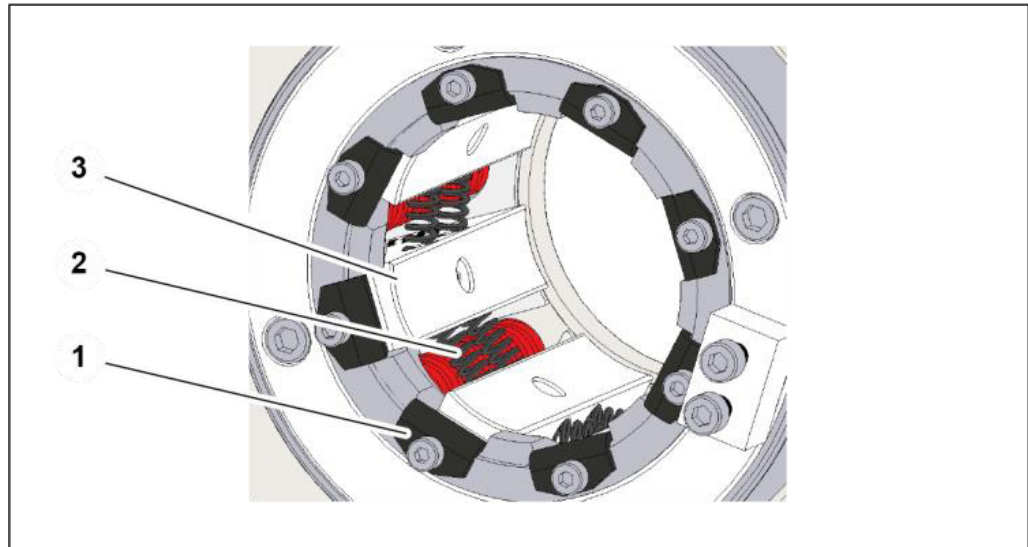
The actual forming process is controlled via the pump handle.

The micrometer (2) is used to change the final diameter of the die system.

3 Machine description

3.2 Forming process

Crimping tool



The die system comprises base dies and crimping dies.

All base dies are mounted on sliding plates (1). The crimping dies are plugged onto the base dies (3).

After the forming process, the base dies are pressed apart by the pressure springs (2) when the tool opens. The bearing segments on the front guide the base dies axially in the tool.

Accessories

The machine can be fitted with accessories. A list of the available accessories is included in the Annex, Section "Accessories".

3.2 Forming process

There is one type of forming:

- Forming to a defined diameter

Forming to a defined diameter

This is the standard process for forming to produce hydraulic hoses. The crimping tool closes until it reaches a pre-set diameter, regardless of the required forming force. The required forming force may be up to the machine's maximum capacity.

3 Machine description

3.2 Forming process

WARNING!



Risk of injuries!

In particular non-metal workpieces may be overstressed by the forming process so that this may result in a sudden failure. Chips or seriously accelerated workpiece parts impose a high risk potential for operators, individuals and objects, even outside the working area!

- Relevant workpieces should only be formed using specific safeguards.

ATTENTION!



Risk of damage to machinery!

The machine lifetime is reduced with a high permanent load, while wear increases disproportionately. Forming machines for servicing are not intended for permanent operation and are not suitable for series production.

- Do not perform more than 200 **crimping actions** per day.

3 Machine description

3.3 Technical data

3.3 Technical data

Machine

Dimensions L x W x H 500 x 420 x 440 mm

Machine weight approx. 30 kg

Operation mode Short-time duty S2

Function

Forming force 900 kN / 90 t

Max. forming range Ø crimping dies + 8 mm
(max. outside diameter of the fittings before the forming process)

Maximum Ø crimping dies 47 mm

Opening size without dies 77 mm

Opening distance +22 mm

3 Machine description

3.3 Technical data

Work piece capacity

SAE R12 / 4SP 1 Part fittings	1 ¼ ", depending on the fitting
SAE R15 / 4SH 2 part fittings	1", depending on the fitting
Industry	1 ¼ "
90° bend	1", depending on the fitting
Die type	263

Hydraulic system

Oil volume	approx. 0.65 l
Oil type	HLP 22, DIN 51524, 10 μ filtered
System pressure	max. 700 bar

Workbench

Stable, level workbench with a carrying capacity of	approx. 500 kg
---	----------------

We recommend industrial flooring which meets the following structural requirements

Permanent floor loading	Approx. 0.07 kg/mm ²
Floor carrying capacity	Min. 2500 kg/m ²
Floor quality	B25
Evenness	Max. unevenness 5 mm/m
Inclination	max. 5 mm/m

3 Machine description

3.3 Technical data

Ambient conditions

Ambient temperature 10 °C – 35 °C

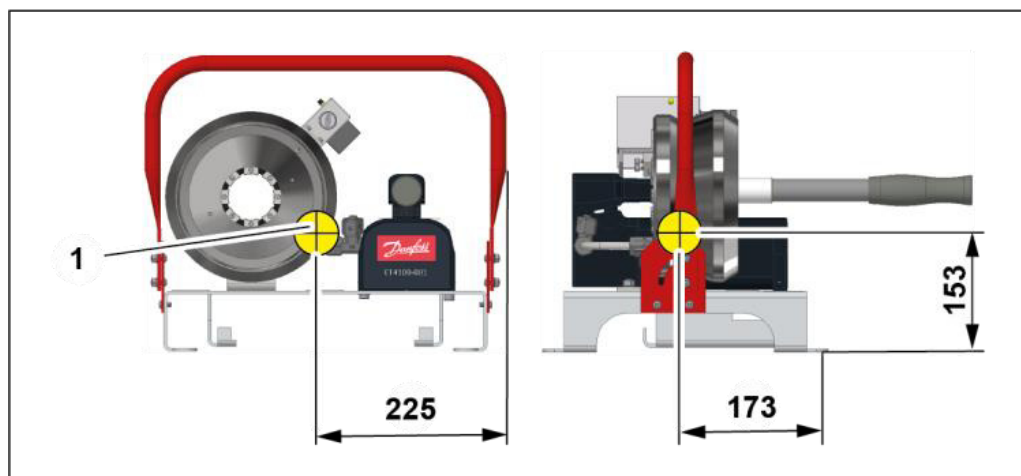
Air humidity 45 % – 65 %

The * data are theoretical/computed values, or values measured on a prototype. Actual values may vary slightly, depending on the machine.

4 Transport and commissioning

4.1 Transport

The goods should be transported in the original packaging. During transport, the goods must be secured safely within the packaging. All applicable laws and regulations relating to securing loads shall be observed during transport.



The machine can only be transported manually. For machine weight, please refer to "Technical data" in Section 3.

WARNING!



Danger from falling loads!

Risk of injury from falling loads.

- Do not stand under suspended loads.

WARNING!



Danger from increased load weights!

The machine has a weight of over 25 kg.

- Transport the machine with two persons.
- Use transport aids.

4 Transport and commissioning

4.2 Intermediate storage of machine/unit

1. Lift the machine manually and transfer it to the installation site.

4.2 Intermediate storage of machine/unit

If the machine/unit cannot be mounted immediately upon delivery, it must be protected against:

- Contamination,
- Weather influences,
- Mechanical damage.

The machine/unit components may only be stored in closed rooms and under the following conditions:

- temperature between 10°C and 35°C,
- maximum air humidity 80% (non-condensating).

4.3 Commissioning

The machine is commissioned by the customer's fitter.

1. Place the machine on a stable and level workbench.
2. Bolt the machine legs onto the workbench.



The workbench must be sufficiently solid and stable.



Place the machine in a way so that it is easily accessible for maintenance work from all sides.

3. Check the machine for damage.
4. Check the hydraulic piping for damage.
5. Train the operating staff and record training sessions in “Declaration of trained staff”, Section 9.

4 Transport and commissioning

4.4 Mounting the telescopic handle

WARNING!

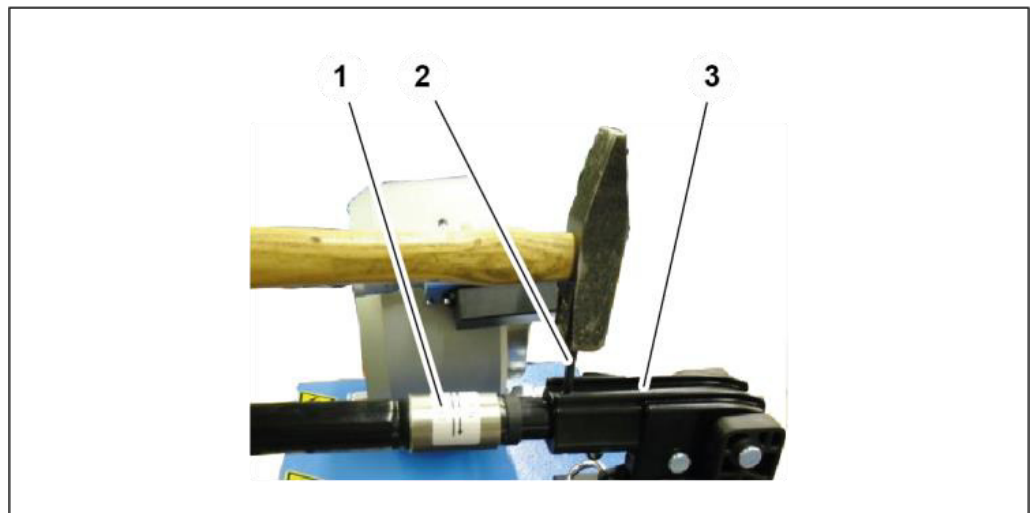


Risk of injuries!

Machine components might loosen during transport. Such components might be flung out during to the forming process. There is a risk of being injured.

- Open and close the machine several times without any work-piece.
- Check the machine for atypical noise.

4.4 Mounting the telescopic handle



1. Insert the telescopic handle (1) in the handle adapter (1).
2. Adjust the hole on the telescopic handle to the hole on the handle adapter.
3. Secure the telescopic handle (1) with the clamping pin (2).

4 Transport and commissioning

4.4 Mounting the telescopic handle

4.4.1 Filling hydraulic oil

The UNIFLEX forming machine is delivered with hydraulic oil filling. Check the oil level.

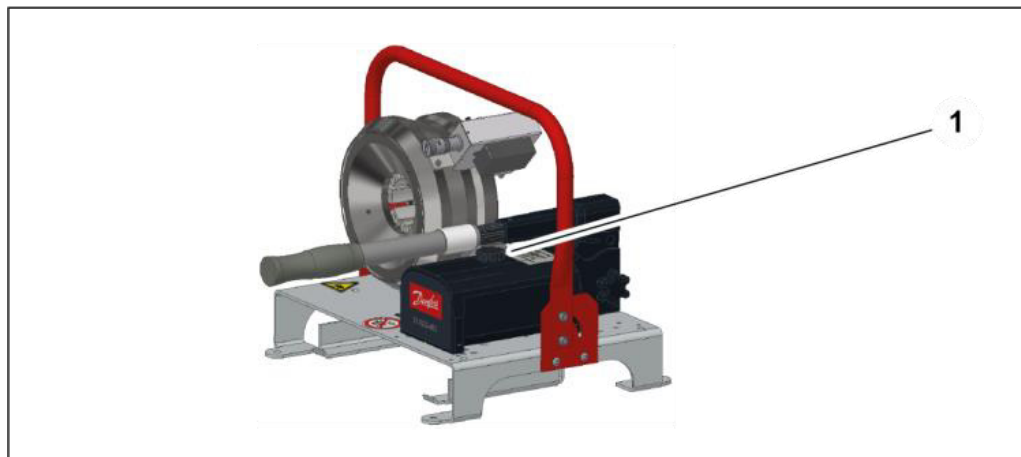
CAUTION!



Risk of injuries!

A spare capacity of 25 % in the pump tank must be considered.

- Refill oil with completely extended cylinder.



CAUTION!



Risk of injuries!

Contact with hydraulic oil and other consumables imposes a risk of injuries for the skin, eyes, respiratory and intestinal tracts! Hydraulic liquid spills impose a danger of slipping and falling!

- Observe supplier's protection and safety instructions (see data sheet).
- Wear personal protection equipment.
- Do not eat, drink or smoke in the working area and when handling consumables.
- Ensure good ventilation.
- Avoid floor contamination.

4 Transport and commissioning

4.4 Mounting the telescopic handle

ATTENTION!



Risk of fire!

Hydraulic liquid spray or spills impose a risk of fire.

- Avoid ignition sources (welding, cutting and soldering work) near the hydraulic oil filling.

1. Open the oil filling screw / bleed screw (1).
2. Add hydraulic oil; for quantity and type, please refer to "Technical data" in Section 3.
3. Close the oil filling screw / bleed screw (1).
4. Do not operate the machine for a minimum of four hours so that the dirt particles in the system may settle.

5 Operation

5.1 What you have to observe

5 Operation

5.1 What you have to observe

The operator has received the Operation Manual from the owner, has read and understood it and will observe it.

Before starting and/or re-starting

- Ensure sufficient illumination of the working area of the machine.

During operation

- Observe the safety instructions on the machine.
- Make sure that no other persons stay in the working area.
- Use appropriate aids to handle heavy workpiece.
- Each movement of the hand must be observed.
- Eating, drinking and smoking at the workplace is prohibited.
- Wear close-fitting clothes.
- Do not wear watches or jewellery.

5.2 Forming the workpiece

5.2.1 Prerequisites

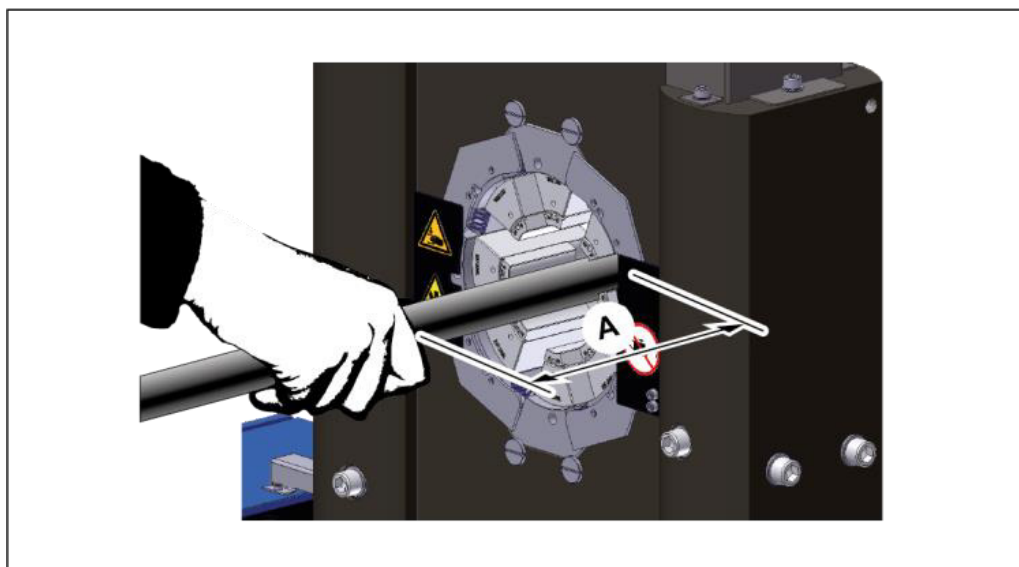
Prerequisites for a correct forming process:

- The die system and the workpiece are compatible.
- The proper jaw system is correctly mounted in the tool.
- The forming dimension is set correctly, please also refer to "Setting the forming dimension", Section 5.
- Preferably form the workpiece in the centre of the crimping die length. Eccentric forming will result in a conical forming result and increased lopsided wear on the die system and the bearing plates.

5 Operation

5.2 Forming the workpiece

5.2.2 Hand pump operation mode



WARNING!



Risk of squeezing!

When the die system closes, there is a risk of getting squeezed between the die and the work piece.

- Keep the feed opening for the workpiece as small as possible.
- Keep a minimum distance of 120 mm (A) to the die system.

The pumps provide for a two-stage flow. Without load, the pump operates in the first stage with a high flow for rapid extension. As soon as there is load contact, the pump automatically changes to the second stage to build up pressure.

As soon as the pump pressure reaches about 280 bar, pumping must be stopped briefly, and the handle must be lifted to change to the second stage (high pressure). When the pump has switched, less power is needed for pumping.



Do not move the handle to the end stop.

5 Operation

5.2 Forming the workpiece

Hand pump 262.3013

The drainage valve hand wheel (1) must be closed for forming.



1. Open the oil filling screw / bleed screw (2) by a quarter turn to balance the air pressure in the oil tank.
2. Manually position the pre-mounted work piece in the tool.
3. Hold the work piece with one hand during the forming process.
4. Operate the pump handle (3) until the signal lamp lights up. The crimping dimension is reached.
5. Adjust pumps.



Keep the drainage valve hand wheel closed longer for large fittings (manual holding time).
Holding time = time interval in which the plastic forming of the work piece is completed.

6. Open the drainage valve hand wheel.
7. Remove the work piece from the tool.
8. Check the forming dimension after the first forming process. Correct the forming dimension if there are any deviations between the actual dimension and the specified dimension (see "Setting the forming dimension" in Section 5).

5 Operation

5.3 Changing the crimping dies

WARNING!

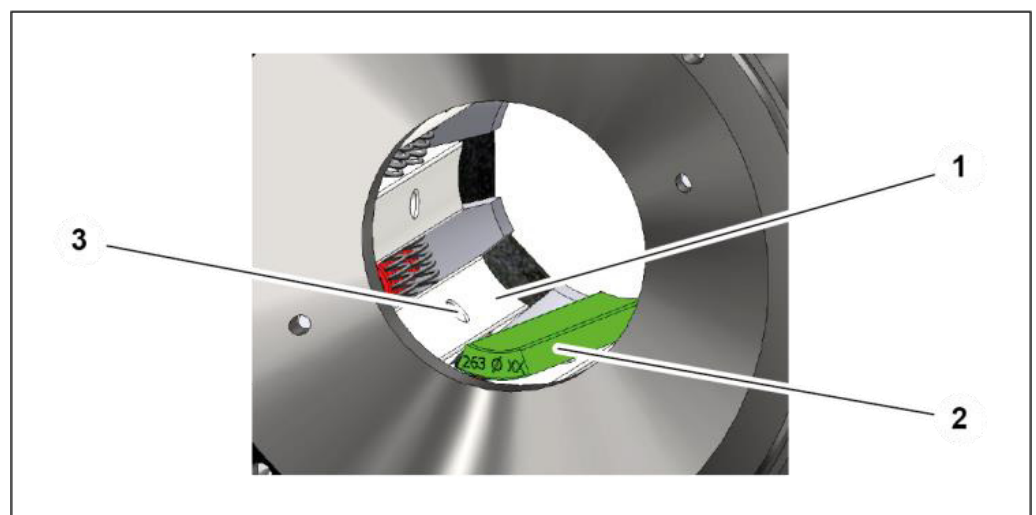


Risk of squeezing!

When the die system closes, there is a risk of getting squeezed between the die and the work piece.

- Open the crimping tool only so much that the hose may be inserted and/or removed easily.

5.3 Changing the crimping dies



Positioning the crimping dies

1. Completely open the crimping tool.
Slowly open the drainage valve hand wheel.

WARNING!



Risk of squeezing!

When the die system closes, there is a risk of getting squeezed between the dies.

- Only replace the crimping dies when the machine is switched off.
2. Using the retaining bolt, insert the crimping die (2) into the mounting hole (3) of the base die (1).
 3. Insert all eight crimping dies (2) one after the other.

5 Operation

5.4 Setting the forming dimension



Always use a complete set of equal crimping dies with the same identification and diameter. One set comprises eight crimping dies or seven crimping dies and one matching marking die.

Removing the crimping dies

1. Completely open the crimping tool.
Slowly open the drainage valve hand wheel.

WARNING!

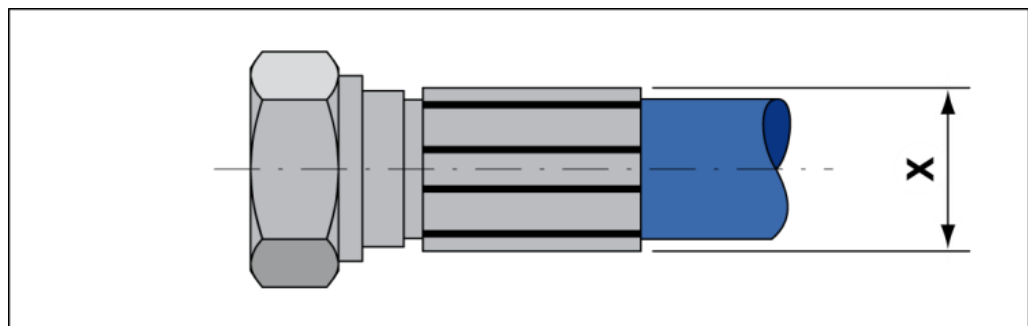


Risk of squeezing!

When the die system closes, there is a risk of getting squeezed between the dies.

- Only replace the crimping dies when the machine is switched off.
2. Manually turn the crimping die to be moved (2) by 30°. This loosens the retaining bolt in the mounting hole.
 3. Remove the crimping die concerned.
A flat-head screwdriver can be used for assistance. For this purpose, position the flat-head screwdriver between the base die and crimping die and carefully extract the crimping die.
 4. Remove all eight crimping dies (2) one after the other.

5.4 Setting the forming dimension



The forming dimension (X) must be set specifically for the work-piece.

1. Read the forming dimension in the forming dimension table of the system supplier, e.g. Ø 17.4 mm.

5 Operation

5.5 Completing the forming process

2. Select crimping dies with a smaller or the same diameter, e.g. Ø 17 mm,
3. Place the crimping dies in the tool.
4. Set the control and/or micrometer to the requested dimension:
Control system: Forming dimension diameter
Micrometer: Workpiece forming dimension less crimping die diameter
5. Form the workpiece.
6. Check the workpiece.
7. If the dimension is reached: manufacture other identical workpieces.
8. If the dimension is not reached: Adjust difference on control and/or in the micrometer, repeat the forming process and check the workpiece.

5.5 Completing the forming process

1. Complete the forming process.
2. Deposit the work piece outside the machine.
3. Check signal lamp function by pressing the pushbutton.
4. Check the machine for contamination, leaks and external damage.
5. Check the crimping tool and retaining bolts for contamination, damage and secure fitting.
6. Check the oil level.
7. Remove contamination, dust and chips using a vacuum.



Inform the fitter in case of damage or other irregularities.



Close the oil filling / bleed screw for transport.

5.6 Emergency stop

In case of an emergency

Immediately open the drainage valve hand wheel in cases of emergency.

Restart after an emergency

1. Remedy the cause of the emergency stop.

5.7 Cleaning

ATTENTION!



Risk of damage to machinery!

If the machine is cleaned with a steam jet or compressed air, dirt and water may ingress in the machine and cause serious damage.

- Do not use a steam jet to clean the machine.
- Do not use compressed air to clean the machine.

1. Vacuum the machine from metal abrasion (crimping scale) in the opened crimping tool, or use a soft cloth to clean it. For this purpose, remove the crimping dies and the intermediate dies.

6 Maintenance

6.1 What you have to observe

6 Maintenance

Regular maintenance will ensure the continuous operation reliability of the machine.

6.1 What you have to observe

This section describes activities to be performed by you as the operator at regular intervals to ensure smooth operation of the machine.

- Maintenance work may only be performed by qualified maintenance staff (fitter).
- Repair work on the machine or components may only be performed by appropriately qualified expert staff!
- Welding, flame-cutting and grinding work on and in the machine and its environment must be approved in advance. There is a risk of fire. The machine must be cleaned from dust and inflammable substances. Adequate ventilation must be ensured.

6.2 Maintenance schedule

If not specified otherwise, inspections listed in the maintenance schedule are visual inspection. Replace defective parts immediately.

If you work in 2 shifts, the check frequency has to be doubled. If you work in 3 shifts, you proceed as with 2-shift operation.

Record maintenance work performed in the maintenance log.

Maintenance item	Daily	Weekly	Monthly	Every 6 months	Number of years
Hydraulic system					
Hydraulic energy lines – hoses: Check for porosity and leaks.			X		
Hydraulic energy lines - bolted connections of hoses and pipes: Check for leaks.			X		

6 Maintenance

6.2 Maintenance schedule

Maintenance item	Daily	Weekly	Monthly	Every 6 months	Number of years
Hydraulic oil: Check oil level, add oil if required (see "Replacing hydraulic oil" in Section 6).			X		
Hydraulic oil: Replace					1
Hydraulic hoses: Have replaced (DIN 20066) no later than six years after manufacture (see label). Make sure that replacement hoses are of equivalent quality (high-pressure hoses).					6
Crimping tool					
Crimping tool: Check for damage and wear.			X		
Retaining bolt: Check for damage.			X		
Slide bearing plates: Check for wear (see "Checking and replacing slide bearing plates" in Section 6). Replace the slide bearing plates below the basic dies after 5 years or 100,000 crimping operations, respectively, at the latest. Replace the slide bearing plate on the front plate after 10 years or 200,000 crimping operations, respectively.				X	
Pressure springs between base dies: Check for damage.				X	
Check all bolted connections for secure fitting and retighten if necessary.					1
Safety equipment					
Signal lamp: Check function	X				
Emergency-stop button/Emergency stop device: Check function		X			
Fixed guards and covers: Check for completeness and correct installation.			X		
Warning signs on the machine: Check legibility (see "Warning signs on the machine" in Section 2).				X	

6 Maintenance

6.3 Hydraulic oil change



Hydraulic oil changes and wear part replacements must be recorded in the maintenance log!

6.3 Hydraulic oil change

CAUTION!



Risk of injuries!

Contact with hydraulic oil and other consumables imposes a risk of injuries for the skin, eyes, respiratory and intestinal tracts! Hydraulic liquid spills impose danger of slipping and falling!

- Observe supplier's protection and safety instructions (see data sheet).
- Wear personal protection equipment.
- Do not eat, drink or smoke in the working area and when handling consumables.
- Ensure good ventilation.
- Avoid floor contamination.

ATTENTION!



Risk of fire!

Hydraulic liquid spray or spills imposes a risk of fire.

- Avoid ignition sources (welding, cutting and soldering work) near the hydraulic oil filling.

6 Maintenance

6.3 Hydraulic oil change



1. Let the hydraulic oil cool down until the tank enclosure is warm to the touch.
2. Open the oil filling screw (1).
3. Pump out hydraulic oil using an external pump.
4. Add new hydraulic oil (see “Technical Data” in Section 3).
5. Close the oil filling screw (1).
6. Do not operate the machine for a minimum of four hours so that the dirt particles in the system can settle.
7. Operate the machine in the idle mode for two minutes.
8. Run the tool several times to bleed the hydraulic oil system.



Dispose of the oil in compliance with the applicable local environmental protection regulations.

6 Maintenance

6.4 Checking and replacing slide bearing plates

6.4 Checking and replacing slide bearing plates

Checking slide bearing plates



Check slide bearing plates for wear, replace defective parts. The slide bearing plate (1) is new, the slide bearing plate (2) is worn.

ATTENTION!

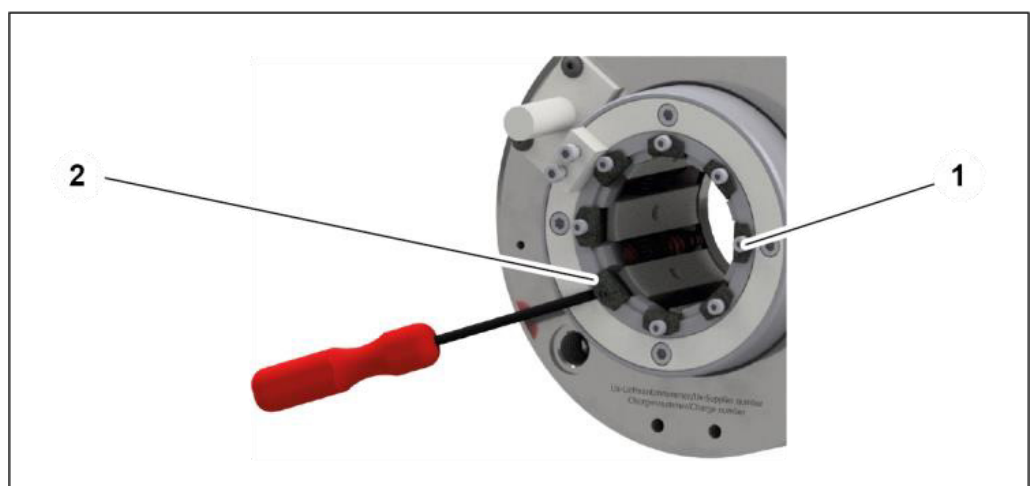


Risk of damage to machinery!

Worn slide bearing plates may cause damage to the machine and result in forming dimension inaccuracies.

- Replace worn slide bearing plates in good time.

Replacing slide bearing plates



1. Open the crimping tool fully.
2. Slowly open the drainage valve hand wheel.
3. Loosen bolts (1) on bearing plate (2).

6 Maintenance

6.5 Micrometer adjustment

4. Remove the worn bearing plate (2).
5. Insert the new bearing plate (2).
Replace all eight bearing plates in this manner.
6. Tighten screws (1).



Shims, if present, have to be inserted at the same position as before.



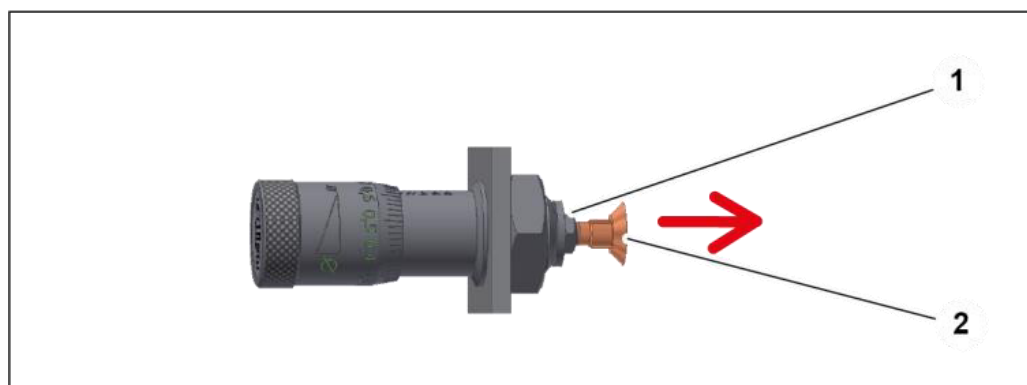
Check the machine zero point after each bearing plate replacement and readjust the micrometre if necessary.



The bearing plate on the front plate can only be replaced by the UNIFLEX Service.

6.5 Micrometer adjustment

If the measured forming dimensions of the workpiece deviate from the forming dimensions of the crimping die when the micrometer is set to zero, the micrometer must be readjusted.



1. Release the screws on the cover.
2. Remove the cover (see “Annex” in Section 9).
3. Loosen the counter-nut (1) of the contact screw (2).
4. Adjust the contact screw (2).

6 Maintenance

6.6 Replacing the battery



1.6 revolutions of the contact screw correspond to 1 mm change in the forming dimension.

5. Remount the enclosure/front panel.
6. Test the crimping process and readjust if necessary.




6.6 Replacing the battery

1. Loosen the two bolts on the lateral battery box.
2. Replace the battery.
3. Remount the battery box.

7 Troubleshooting

Error	Cause	Remedy
Machine does not close/open	Insufficient amount of hydraulic oil	Refill oil
	Drainage valve hand wheel not closed completely	Close drainage valve hand wheel
	Hand pump defective	Check hand pump
Hand pump cannot hold pressure	Hydraulic bolted connections leak	Check hydraulic bolted connections for leakage,
	cylinder seals may leak	Contact Service desk
	Drainage valve hand wheel not closed completely	Close drainage valve hand wheel
Machine forms unevenly/conically	Bearing plates worn	Check bearing plates for wear and replace if necessary
	Base dies damaged	Check base dies for damage and replace if necessary
	Crimping dies damaged	Check crimping dies for damage and replace if necessary
	Crimping are not centred	Form workpiece preferably in the centre of the crimping die length
Crimping dimension not achieved	Bearing plates worn	Check bearing plates for wear and replace if necessary
	Oil pressure too low	Check oil pressure at the MP measuring point, pump or pipe may be leaking or defective, repair or replace
	Incorrect crimping dies used	Check crimping die diameter and crimping die section and replace, if required (for crimping die section, please refer to "Technical data" in Section 3)

8 Decommissioning, disposal

CAUTION!	
	<p>Risk of injuries!</p> <p>Contact with hydraulic oil and other consumables imposes a risk of injuries for the skin, eyes, respiratory and intestinal tracts! Hydraulic liquid spills impose a danger of slipping and falling!</p> <ul style="list-style-type: none">• Observe supplier's protection and safety instructions (see data sheet).• Wear personal protection equipment.• Do not eat, drink or smoke in the working area and when handling consumables.• Ensure good ventilation.• Avoid floor contamination.
ATTENTION!	
	<p>Risk of fire!</p> <p>Hydraulic liquid spray or spills impose a risk of fire.</p> <ul style="list-style-type: none">• Avoid ignition sources (welding, cutting and soldering work) near the hydraulic oil filling.
CAUTION!	
	<p>Risk of injuries!</p> <p>Parts of the machine/unit may be under pressure and/or tension. Loosening components may impose a risk of injuries!</p> <ul style="list-style-type: none">• De-pressurize the machine/unit before performing any work and check for potential sources of hazard.

8.1 Dismantling

This section describes activities to be performed by you as the operator to ensure the safe dismantling of the machine/unit.

- The device may only be dismantled by entrusted and qualified staff.
- Open the machine/unit completely.

8 Decommissioning, disposal

8.2 Recycling

- Disconnect the machine/unit from the compressed air supply.
- Depressurise the machine/unit before dismantling it (deactivate the hydraulic pump and secure it against restart; operate valve manually, if any; open bolted hydraulic connections slowly and carefully).
- Check the device for mechanical tension and consider it during dismantling.
- Empty the machine/unit of all consumables, see “Maintenance”, Section 6.

8.2 Recycling

The machine/unit contains metal, hydraulic hoses, electric cables and electronic components, depending on the type.

As regards disposal, the applicable national environmental protection and waste disposal regulations have to be complied with.

8.3 Consumables and waste

Observe applicable national environmental protection and waste disposal regulations.

Return consumables, e.g. oils, greases, test media, to supplier - they are hazardous waste. Also observe the information given on the safety data sheet.

9 Annex



Individual machine/unit components may deviate in their features. Please indicate the serial number of the machine for spare part orders.

9 Annex

9.2 Accessories (retrofittable)

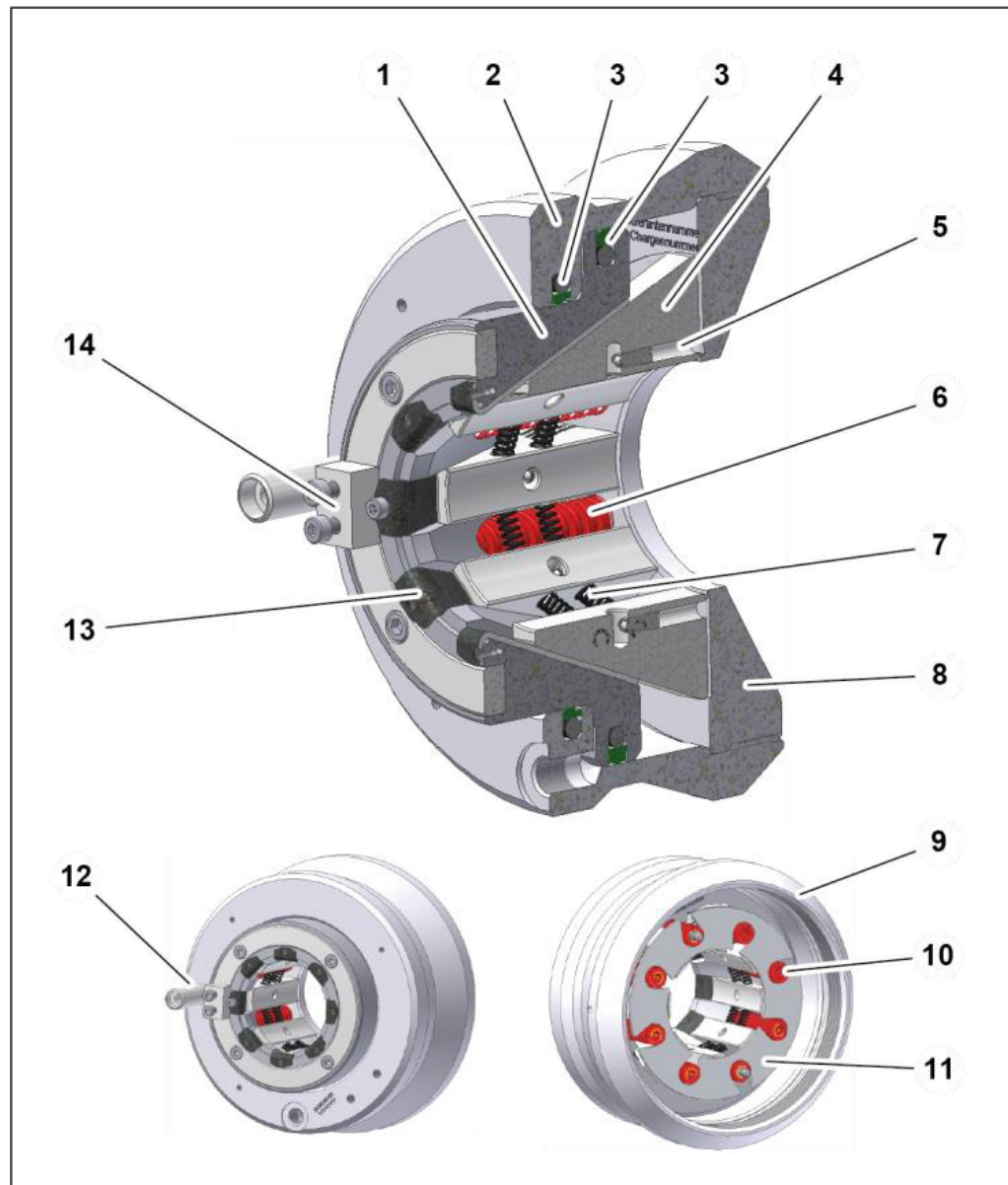
9.2 Accessories (retrofittable)

Accessories	Part code
Camera set	OCS 10.3 retro
Lamp with magnetic base	LUS
Universal table	TU
QDS 26x B	Crimping die case
PB 263	Crimping dies

Please contact our Sales department for ordering accessories.

9.3 Spare parts list

9.3.1 Tool



Item	Quantity	Part code	Designation
1	1	262.010.1	Piston
2	1	262.212.2	Cylinder case
3	1	262.2	Gasket set S2
4	1	262.8	Base jaw set
5	8	262.130	Pressure spring

9 Annex

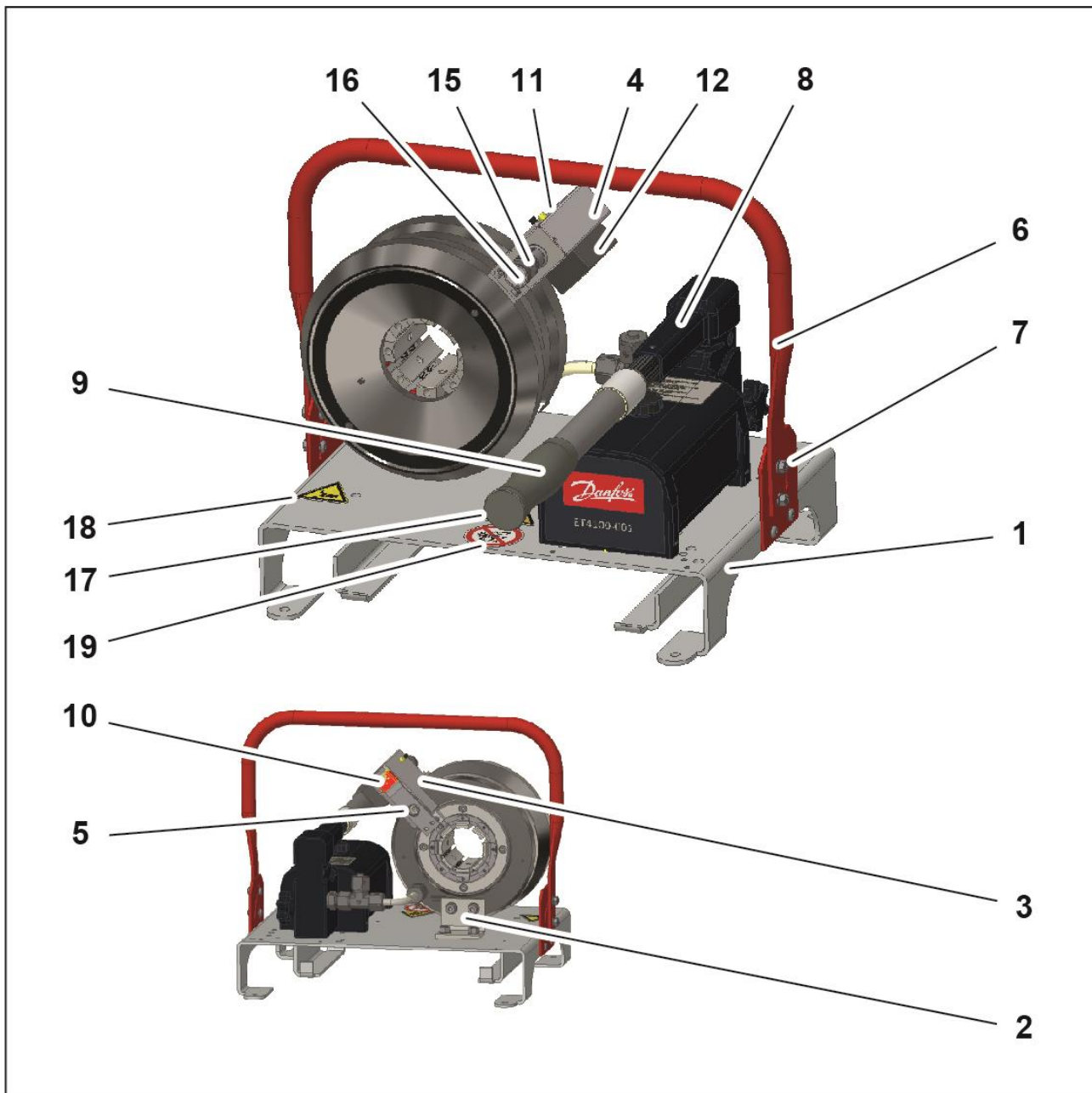
9.3 Spare parts list

Item	Quantity	Part code	Designation
6	8	262.036	Pressure spring screw
7	16	262.034	Pressure spring
8	1	262.015.2	Front plate
9	1	262.1015	Hollow piston tool
10	2	262.023.4	Guide pin
11	1	262.180	Bearing plate, front plate
12	1	262.371.4	Rotation lock holder
13	8	262.1	Piston bearing plate
14	1	262.025.4	Spacer plate

9 Annex

9.3 Spare parts list

9.3.2 Mechanics and Pneumatics



Item	Quantity	Part code	Designation
1	1	262.063.2 RAL 7035	Base plate
2	1	262.264.4	Mounting bracket
3	1	262.226.4	Bracket
4	1	262.232.3 RAL 7047	Protective cover
5	1	262.221.4	Limit switch holder
6	1	262.067.3	Clamp

9 Annex

9.4 Spare parts kit

Item	Quantity	Part code	Designation
7	2	262.066.4	Retaining plate
8	1	262.3013	Hand pump kit
9	1	262.510	Telescopic handle
10	1	T 113	Pushbutton
11	1	888.428	Electroluminescent diode
12		173259	Block battery, 9 Volt
No figure		213.410.01	Limit switch
No figure	1	8.12.022	Battery clip
15	1	266.400.3	Crimping micrometer
16	1	211.502.3	Uniflex round closing blank
17	1	578.4	Oil prohibition sign
18	1	715.4	Squeezing risk warning sign
19	1	716.4	Warning of hand injuries sign









9.4 Spare parts kit

Quantity	Part code	Designation
1	262.1015	Hollow piston tool
1 set	262.1	Spare parts kit S2 bearing plates
1 set	262.2	Gasket set S2
8 per set	262.129.3	Retaining bolt
1	262.9	Spare parts kit, base dies for PB 263
1	173259	Block battery, 9 Volt

9 Annex

9.5 Retaining bolt for standard crimping dies (depending on crimping die)

9.5 Retaining bolt for standard crimping dies (depending on crimping die)

Retaining bolt	Crimping die profile									
	262	263	239	266	232	237	554	245	246	247
 262.104.4	x									
 262.129.3		x								
 239.041.4			x							
 239.041.4 (sw)			x							
 232.504.4				x	x	x				
 232.505.4					Ø96 / Ø103					
 220.502.4							x			
 245.114.4								x	x	x

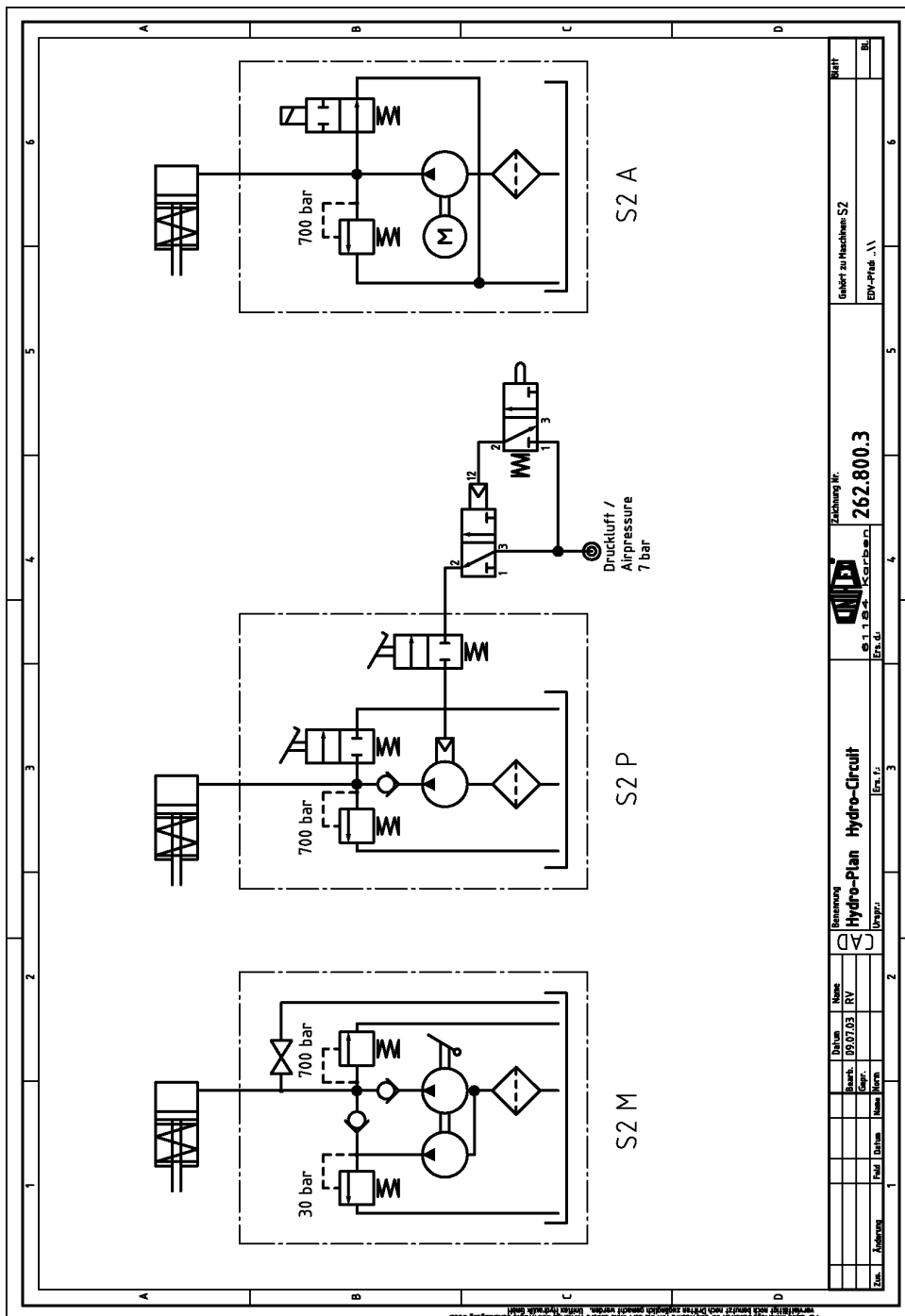
9 Annex

9.5 Retaining bolt for standard crimping dies (depending on crimping die)

9 Annex

9.6 Hydraulic diagram

9.6 Hydraulic diagram



Rev.	1	2	3	4	5	6
Author						
Check						
Drawn						
Notes						
Revision						
Design						
Hydro-Plan						
Hydro-Circuit						
Order No.						
262.800.3						
Machine No.						
S2						

9 Annex

9.8 Declaration of qualified staff

9.8 Declaration of qualified staff

I herewith declare that I have attended an internal training for the operation of the machine and have been informed on all safety-related details. In addition I declare that I have read and understood this Operation Manual completely.

City	Date	Name	Signature

City	Date	Name	Signature

City	Date	Name	Signature

City	Date	Name	Signature

City	Date	Name	Signature

City	Date	Name	Signature

9 Annex

9.8 Declaration of qualified staff

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