metallkraft
Metallbearbeitungsmaschinen

Operating Instructions

Hydraulic Notching Machine

- AKM 220-4 H
- AKM 220-6 H

AKM 220-4 H

AKM 220-6 H

AKM-SERIES

Imprint

Product identification

Hydraulic Notching Machine	Item number
AKM 220-4 H	3834200
AKM 220-6 H	3836200

Manufacturer

Stürmer Maschinen GmbH
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Indications regarding the operating instructions

Original instructions

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Author: RL

Indications regarding the copyright

Content

1 Introduction

You have made a good choice by purchasing the notching machine made by METALLKRAFT.

Thoroughly read the operating instructions before commissioning the machine.

It informs you about the proper commissioning, the intended use as well as the safe and efficient operation and maintenance of your notching machine.

The operating instructions are part the notching machine. Always keep it at the place of use the notching machine. Furthermore, the local accident prevention regulations and the general safety notes are applicable for the field of application the notching machine.

The illustrations in these operating instructions serve the general comprehension and may deviate from the actual type.

1.1 Copyright

The contents of these instructions are copyright. Their application is admissible in the frame the notching machine utilisation. An application beyond the described application is not allowed without written approval of the manufacturer. For the protection of our products, we shall register trademark, patent and design rights, as this is possible in individual cases. We strongly oppose any infringement of our intellectual property.

1.2 Customer service

Please contact your dealer if you have questions concerning your notching machine or if you need technical advice. They will help you with specialist information and expert advice.

Germany:
Stürmer Maschinen GmbH
Dr.-Robert-Pfleger-Str. 26
D-96103 Hallstadt

Repair service :
Fax: 0049 (0) 951 96555-111
E-Mail: service@stuermer-maschinen.de

Spare part orders:
Fax: 0049 (0) 951 96555-119
E-Mail: ersatzteile@stuermer-maschinen.de

We are always interested in valuable experience and knowledge gained from using the application-which then could be shared and be valuable to develop our products even further.

1.3 Limitation of liability

All information and notes in these operating instructions were summarised taking the applicable standards and rules, the state-of-the-art and our long-term knowledge and experiences into consideration.

In the following cases the manufacturer is not liable for damages:

- Non-observance of the operating instructions,
- Inappropriate use,
- Use of untrained staff,
- Unauthorised modifications,
- Technical changes,
- Use of not allowed spare parts.

The actual scope of delivery may deviate from the explanations and presentations described here in case of special models, when using additional ordering options or due to latest technical modifications.

The obligations agreed in the delivery contract, the general terms and conditions as well as the delivery conditions of the manufacturer and the legal regulations at the time of the conclusion of the contract are applicable.

2 Safety

This paragraph will give you an overview of all important safety packages for the protection of persons as well as for the safe and undisturbed operation. Other task-based safety notes are included in the individual chapters.

2.1 Symbol explanation

Safety instructions

The safety notes in these operating instructions are highlighted by symbols. The safety notes are introduced by signal words which express the concern of the risk.

DANGER!

This combination of symbol and signal words indicates an imminently dangerous situation which may lead to death or severe injuries if they are not avoided.

WARNING!

This combination of symbols and signal words indicates a possibly dangerous situation which may lead to death or severe injuries if they are not avoided.

CAUTION!

This combination of symbol and signal words indicates a possibly dangerous situation which may lead to minor or light injuries if they are not avoided

ATTENTION!

This combination of symbol and signal words indicates a possibly dangerous situation which may lead to property and environmental damages if they are not avoided.

NOTE!

This combination of symbol and signal words indicates a possibly dangerous situation which may lead to property and environmental damages if they are not avoided.

Tips and recommendation

Tips and recommendation

This symbol highlights useful tips and recommendation as well as information for all efficient and trouble-free operation.

It is necessary to observe the safety notes written in these operating instructions in order to reduce the risk of personal injuries and damages to property.

2.2 Obligations of the operating company

The operating company is the person who operates the the notching machine for business or commercial reasons by herself, or leaves it to a third party for use or application, and who bears the legal product responsibility for the protection of the user, the staff or for third parties.

Obligations of the operating company

If the the notching machine is used for commercial purposes, the operating company of the notching machine must comply with the legal working safety regulations.

Therefore, the safety notes in this operating manual, as well as the safety, accident prevention and environment protection regulations applying for the area of application of the notching machine must be met. The following applies in particular:

- The operating company must be informed about the applying industrial safety regulations and further analyse hazards resulting from the special working conditions at the place of use of the notching machine. She must implement these in form of operating manuals for the operation of the notching machine.
- During the entire lifetime the notching machine, the operating company must verify whether the operating manuals prepared by her correspond to the current status of the regulations, and must adapt these if necessary.
- The operating company must unambiguously regu-late and determine the responsibilities for installa-tion, operation, troubleshooting, maintenance and cleaning.
- The operating company must ensure that all per-sons who work with the notching machine, have read and understood this manual. Furthermore she must instruct the staff in regular intervals and in-form them about the hazards.
- The operator must provide the necessary protec-tive equipment to the staff and order the use of the necessary protective equipment in a binding way.

Furthermore the operating company is responsible to keep the notching machine always in a technically flawless state. Thus, the following applies:

- The operator must ensure that the maintenance intervals described in this manual are kept.
- The operator must have all safety devices checked regularly for their good working order and their integrity.

2.3 Requirements to staff

Qualifications

The different tasks described in this manual represent different requirements to the qualification of the persons entrusted with these tasks.

WARNING!
Danger in case of insufficient qualification of the staff!

Insufficiently qualified persons cannot estimate the risks while using the notching machine and expose themselves and others to the danger of severe or lethal injuries.

- Have all works only performed by qualified persons.
- Keep insufficiently qualified persons out of the working area.

Only persons reliable working procedures can be expected from, are allowed to perform all works. Persons the responsiveness of which is affected by e. g. drugs, alcohol or medication, are not allowed to work with the machine.

The qualifications of the personnel for the different tasks are mentioned below:

Operator

The operator is instructed by the operating company about the assigned tasks and possible risks in case of improper behaviour. Any tasks which need to be performed beyond the operation in the standard mode must only be performed by the operator if it is indicated in these instructions and if the operating company expressively commissioned the operator.

Electrically qualified person

Electrically qualified person is due to their professional training, knowledge and experience as well as knowledge of the relevant standards and regulations, in a position to carry out work on the electrical systems and to independently recognize and avoid possible dangers.

Qualified personnel

Due to their professional training, knowledge and experience as well as their knowledge of relevant regulations the specialist staff is able to perform the assigned tasks and to recognise and avoid any possible dangers them-selves.

Manufacturer

Certain works may only be performed by specialist personnel of the manufacturer. Other personnel is not authorized to perform these works. Please contact our customer service for the execution of all arising work.

2.4 Personal protective equipment

The personal protective equipment serves to protect persons against impairments of safety and health while working. The staff has to wear personal protective equipment while performing different works on and with the notching machine which are indicated in the individual paragraphs of these instructions.

The personal protective equipment is explained in the following paragraph:

Protective goggles

The goggles protect the eyes from flying parts and liquid splashes

Hearing protection

The hearing protection protect the ears from hearing damage caused by noise..

Breathing protection

Breathing protection serve to protect the respiratory tract and lungs from the absorption of dust particles.

Protective gloves

The protective gloves serve to protect the hands against sharp components as well as against friction, abrasions or deep injuries.

Safety boots

Safety boots protect the feet from being crushed, falling parts and slipping over on slippery ground.

Protective clothes

Protective clothes are made of a tightly fitted fabric without the protruding parts of low tear strength.

2.5 General safety regulations

Please observe the following points:

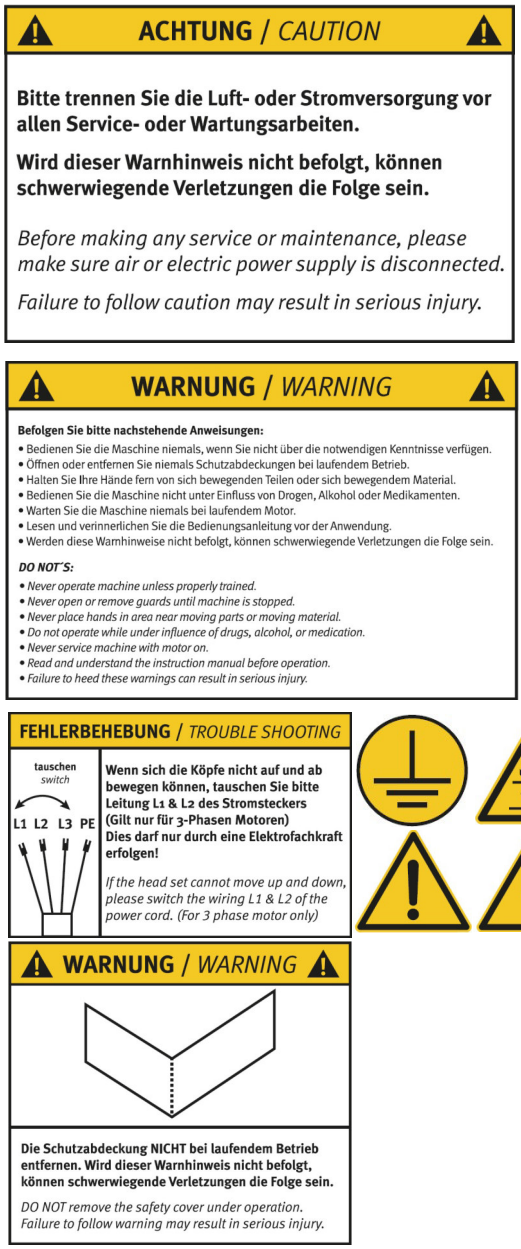
- Use the guards and secure them securely. Never work without guards and keep them functional.
- Always keep the machine and its working environment clean. Provide adequate lighting.
- Always secure your workpiece when working with suitable clamping devices. Ensure a sufficient contact surface.
- Check that the fixed hand guards are correctly installed.
- The design of the notching machine must not be changed and it must not be used for purposes other than those foreseen by the manufacturer.
- Never work under the influence of illnesses that impair concentration, drugs, alcohol or medication.
- Keep children and persons unfamiliar with the notching machine away from their work environment.
- Do not pull the power cord to unplug the plug from the outlet. Protect the cable from heat, oil and sharp edges.
- Immediately eliminate malfunctions that reduce safety.
- Protect the notching machine against humidity (short-circuit hazard!)
- Before each use of the notching machine, make sure that no parts are damaged. Damaged parts must be replaced immediately to avoid sources of danger.
- Before starting the machine, make sure that there are no dangerous environmental conditions for the operator which could pose a danger during operation.
- Make sure that there are no tools or objects inside or on the machine before starting the machine.
- Do not overload the notching machine! You will work better and safer in the specified performance range.
- Only use original spare parts and accessories in order to avoid possible dangers and accident risks.

2.6 Safety labels on the machine

Safety labels and instructions are attached to the notching machine (Fig. 1) which must be observed and followed.

Damaged or missing safety symbols on the machine can lead to incorrect actions with personal injury and damage to property. The safety symbols attached to the machine must not be removed. Damaged safety symbols must be replaced immediately.

The machine must be taken out of operation until the new labels are attached as soon as the labels are not immediately recognisable and comprehensible at first sight.



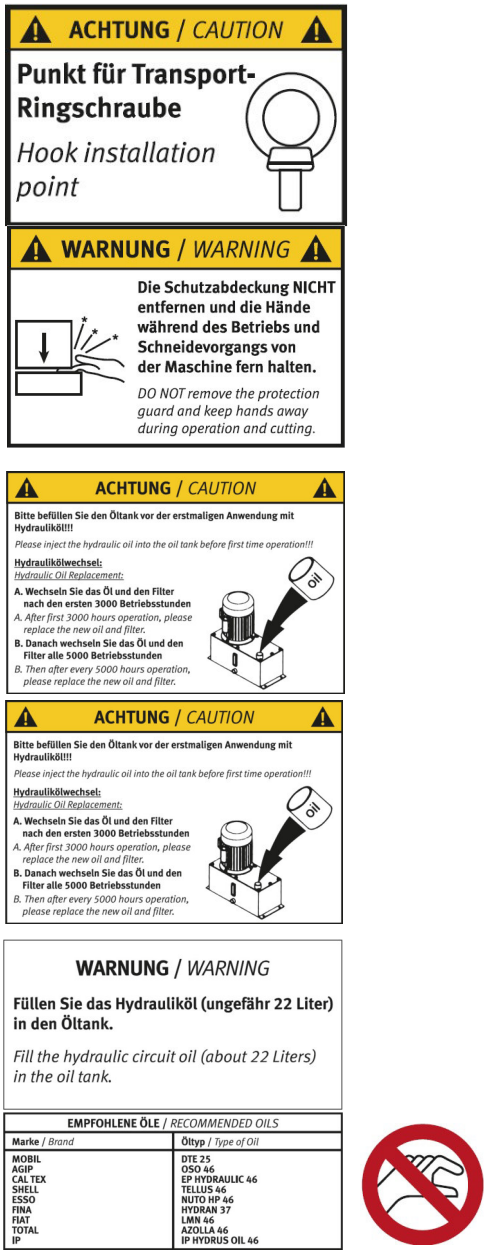


Fig. 1: Safety labels

2.7 Safety devices

WARNING!

Danger to life due to non-functioning safety devices!

If the safety devices are not functioning or have been rendered inoperative, there is a risk of serious injury or even death.

- Before starting work, check that all safety devices are functional and correctly installed.
- Never bypass or disable the safety devices.
- Ensure that all safety devices are always accessible.

Emergency stop button

Press the emergency stop button (Fig. 2) located on the control panel and the notching machine will stop immediately. The power supply is switched off or the drives are disconnected mechanically. After the emergency stop button has been pressed, it must be unlocked by turning it so that it can be switched on again.

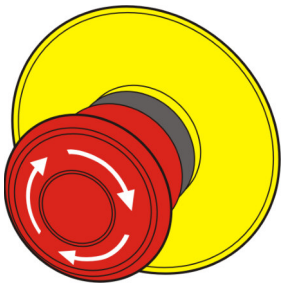


Fig. 2: Emergency stop button

WARNING!

Risk of uncontrolled restart!

The uncontrolled restart of the machine can lead to serious injuries.

- Before restarting, ensure that the cause of the emergency stop has been eliminated and that all safety devices have been fitted and are fully functional.
- Only unlock the emergency stop button when there is no longer any danger.

Safety covers and switch

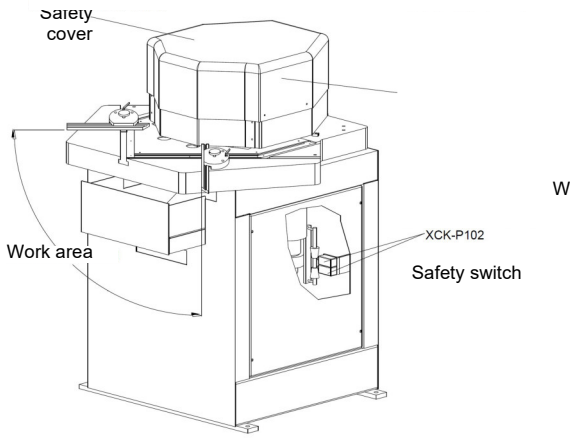


Fig. 3: Safety devices

3 Intended Use

The notching machine is designed exclusively for notching steel or stainless steel sheets. Notching is done with a fixed angle (90°). The machine is intended and suitable for commercial use. The machine must not be used in explosive environments.

The proper use also includes observing all indications in these operating instructions. Any use beyond the proper use or any other use is regarded as misuse.

For structural and technical changes to the notching machine the company Stürmer Maschinen GmbH assumes no liability Claims of any kind due to damage due to improper use are excluded.

3.1 Improper use

WARNING!

Danger in case of misuse!

Misuse of the notching machine can lead to dangerous situations.

- Only operate the notching machine in the power rangelisted in the technical data.
- Never bypass or override the safety devices.
- Only operate the notching machine in a technically perfect condition.

The notching machine must not be used for notching materials made of light metals (e.g. aluminium or similar).

3.2 Residual risks

Even if all safety instructions are observed, and the machine is put to its intended use, there are still residual risks, which are listed below:

- Risk of injury of upper limbs while equipment is operating.
- Danger from the falling workpieces.

4 Technical Data

4.1 Table

Technical Data	Model AKM 220-4 H
Dimensions (LxBxH, max.)	1030x900x1050mm
Working pressure	100 bar
Motor output	2,25 kW
Total power consumption	6,4 A
Electrical voltage	400 V
Phase (s)	3 Ph
Mains frequency	50 Hz
Max. cutting pressure	22 t
Cutting area LxB	200x200 mm
Working table dimensions LxB	700x600 mm
Notching angle	90°
Strokes	50 1/min
Hubverstellung	4 mm
Cutting capacity 90° (400 N/mm²)	4 mm
Cutting capacity 90° (600 N/mm²)	2 mm
Oil tank capacity	22l
Sound pressure level operation (1m distance)	70 dB
Sound pressure level no-load (1m distance)	62 dB
Weight	375 kg

Technical Data	Model AKM 220-6 H
Dimensions (LxBxH, max.)	860x860x1100mm
Working pressure	145 bar
Motor output	3 kW
Total power consumption	8 A
Electrical voltage	400 V
Phase (s)	3 Ph
Mains frequency	50 Hz
Max. cutting pressure	24 t
Cutting area LxB	220mmx220mm
Working table dimensions LxB	650mmx650mm
Notching angle	90°
Strokes	15 1/min
Hubverstellung	6 mm
Cutting capacity 90° (400 N/mm²)	6 mm
Cutting capacity 90° (600 N/mm²)	3 mm
Oil tank capacity	35 l
Sound pressure level operation (1m distance)	70 dB
Sound pressure level no-load (1m distance)	62 dB
Weight	495 kg

4.2 Type plates

Fig. 4: Type plates AKM 220

5 Transport, Packaging, Storage

5.1 Delivery and transport

Delivery

Check the notching machine on delivery for any visible transportation damage. If you notice any damage to the device please report this immediately to the carrier or dealer.

Transport

Improper transport is accident-prone and can cause damage or malfunctions for which we do not grant any liability or guarantee.

Transport the scope of delivery secured against shifting or tilting with a sufficiently dimensioned industrial truck to the installation site.

WARNING!

Severe or fatal injuries may occur if parts of the machine tumble or fall down from the forklift truck, pallet truck or from the transport vehicle. Follow the instructions and information on the transport box.

Note the total weight of the machine. The weight of the machine is indicated in the "Technical data" of the machine. When the machine is unpacked, the weight of the machine can also be read on the rating plate.

Only use transport devices and load suspension gear that can hold the total weight of the machine.

WARNING!

The use of unstable lifting and load suspension equipment that might break under load can cause severe injuries or even death. Check that the lifting and load suspension gear has sufficient load-bearing capacity and that it is in perfect condition.

Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other competent supervisory authority, responsible for your company.

Fasten the loads properly.

NOTE!

Oil may leak during transport of the notching machine. Secure the machine accordingly and take precautions against possible environmental pollution.

The notching machine may only be transported standing up and with the motor switched off.

NOTE!

The notching machine should be protected from humidity.

Transport by a forklift/lift truck:

Always use a forklift with suitable lifting characteristics for lifting the packaging, taking into account the weight, when transporting the product in its packaged state:

- Adjust the forks so that the crate is properly balanced (Fig.5).
- Place the crate on the floor.
- Remove the packaging from the machine.

For shipping,the notching machine is firmly mounted on a pallet so that it can be transported by a forklift truck.

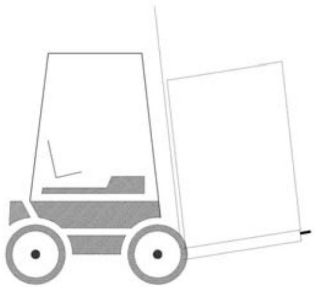


Fig. 5: Transport by a forklift/lift truck:

Transport by a crane:

WARNING!

Danger to life due to falling load!

If the weight of the notching machine and the permissible load capacity of the lifting equipment are not observed during transport or lifting work, the machine may tilt or fall.

- Transport with a crane may only be carried out by specialists!
- When transporting and lifting, observe the weight of the notching machine and also the permissible load capacity of the lifting equipment.
- Use the intended attachment points for transport.
- The notching machine must not be rocked.

- Remove the screws that secure the machine to the pallet.
- Remove the reject container located on the machine worktable to prevent it from falling to the floor while moving. The container must be positioned on the left side of the machine.

The machine may only be loaded and unloaded using a rope. This rope must be attached to the eyebolt, which must be placed on the top of the machine.

Never move the machine by hand or by any other means of transport not specified to avoid injury to persons and damage to the machine.

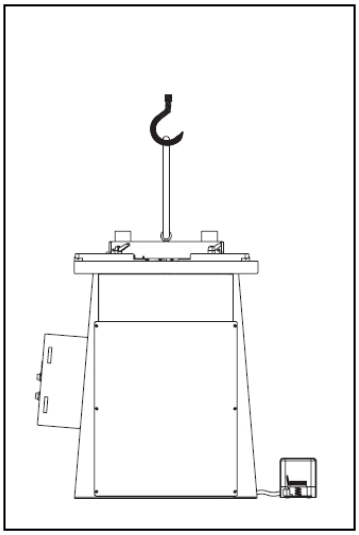


Fig. 6: Transport by a crane:

On the top side of the notching machine a transport eye can be attached in which the transport rope can be inserted (Fig. 6).

5.2 Packaging

All used packaging materials and packaging aids are recyclable and should be taken to a materials recycling depot to be disposed of.

The delivery packaging is made of cardboard, so please dispose carefully by having it chopped up and given to the recycling collection.

The film is made of polyethylene (PE) and the cushioned parts of polystyrene (PS). Deliver these substances to a collection point for recyclable materials or to the waste disposal company which looks after your region.

5.3 Storage

Store the notching machine thoroughly cleaned in a dry, clean and frost-free environment.

Apply protective oil to the upper and lower tools to prevent rusting.

Protect the machine from sunlight.

Keep the machine packed in a suitable place, e.g. protected and not exposed to bad weather. If the machine is to be taken out of operation for a short period of time, clean it thoroughly and cover it with a cloth.

General risks during internal transport

WARNING: DANGER OF TIPPING

The device may be lifted unsecured by a maximum of 2cm.
Employees must be outside the danger zone, the reach of loads.
Warn employees and, if necessary, advise employees of the hazard.

Devices may only be transported by authorized and qualified persons. Act responsibly during transport and always consider the consequences. Refrain from daring and risky actions.

Gradients and descents (e.g. driveways, ramps and the like) are particularly dangerous. If such passages are unavoidable, special caution is required.

Before starting the transport check the transport route for possible danger points, unevenness and disturban-ces as well as for sufficient strength and load capacity.

Danger points, unevenness and disturbance points must be inspected before transport. The removal of danger spots, disturbances and unevenness at the time of transport by other employees leads to considerable dangers.

Careful planning of internal transport is therefore essential.

6 Description of Device

6.1 Representation

Illustrations in these operating instructions are for basic understanding only and may differ from the actual version.

Fig. 7: Description of device AKM 220-4

1 Punching tool
2 Angle gauge
3 Emergency stop button
4 Selector switch „Operating mode“
5 Hydraulic ON
6 Hydraulic OFF
7 Foot control pedal
8 Control lamp
9 Main switch
10 Emergency stop button
11 Work table
12 Safety cover

6.2 Scope of delivery

- Hydraulic Notching Machine
- Foot pedal
- 2 adjustable angle stops
- Internal stop
- Operating instructions
- Bottom knife set for steel
- Top knife set for steel

6.3 Accessories

- Spare knife for steel (1 set)

ATTENTION!

The machine is delivered unfilled. Before commissioning, hydraulic oil must be filled into the tank.
Only use suitable hydraulic oil for refilling.

7 Setting Up

7.1 Place of installation

ATTENTION!

Check the load-bearing capacity of the ground before you install the machine. The installation place must be capatable of bearing the weight of the machine and the workpieces.

In order to ensure good functioning of the notching machine and a long service life, the installation site should meet the following criteria.

- The notching machine may only be installed and operated in dry, frost-free, well-ventilated rooms.
- Avoid places near machines that cause chips or dust.
- The place of installation must be vibration-free, i.e. away from presses, planing machines, etc.
- The ground must be suitable for the work. Pay attention to the bearing capacity and evenness of the ground.
- If necessary, protruding parts, such as support tables, etc., must be secured by on-site measures so that persons are not endangered.
- Provide sufficient space for set-up and operating personnel and material transport.
- Also consider accessibility for adjustment and maintenance work.
- Provide adequate lighting (minimum value: 300 lux).
- The humidity should be in the range of 10% to 90% and the measured room temperature should be between max. 0°C - 50°C.

Setting up the machine:

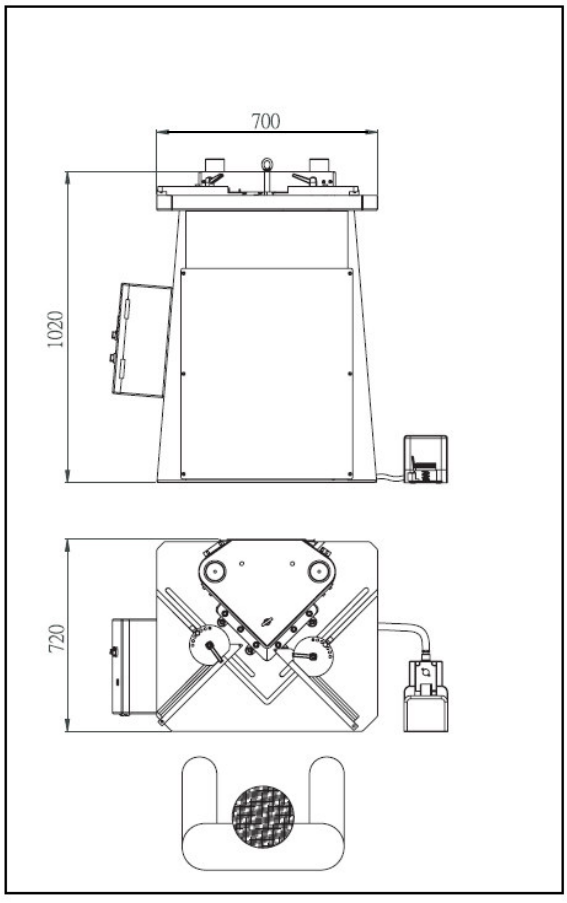
Step 1: Make sure that the space around the machine is sufficient for the application (Fig. 8). There must be sufficient space for the operator and material transport.

Step 2: Check each part of the machine for proper condition before starting to set it up.

Step 3: Place the control foot pedal in the best position for the application in front of the work area.

ATTENTION!

The machine is delivered unfilled. Before commissioning, hydraulic oil must be filled into the tank.
Only use suitable hydraulic oil for refilling.



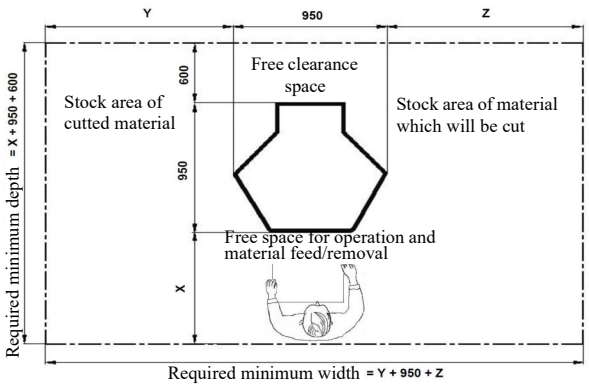


Fig. 8: Setup plan

Step 4: Remove the hexagonal head cap screws 85 (Fig.9).

Step 5: Use a crane to lift the machine from the pallet and move it to the working position (Fig.10).

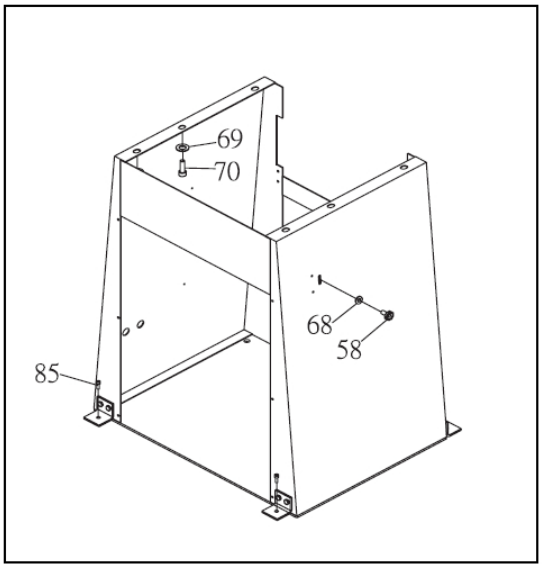


Fig. 9: Removing the fixing screws

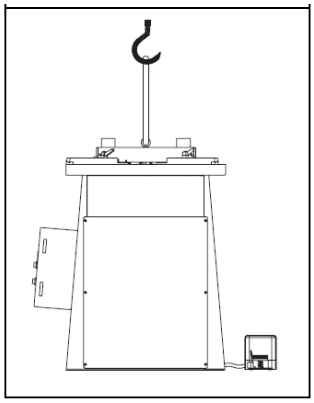


Fig. 10: Positioning with the crane

Step 6: Remove the front cover screws and front cover (Fig.11).

Step 7: Remove the plug 3 (Fig.11).

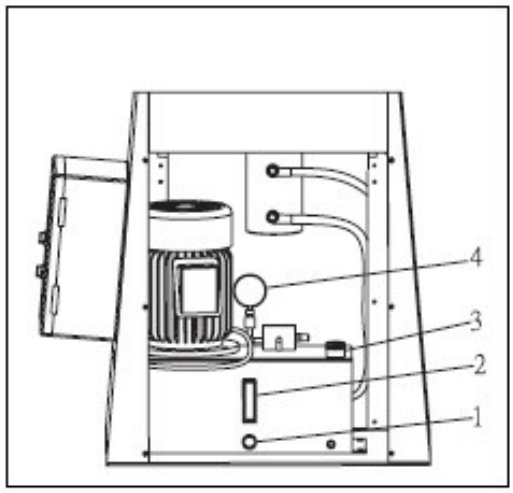


Fig. 11: Filling the oil tank

Step 8: Fill the hydraulic oil into the hydraulic oil circuit (approx. 20 litres) until the oil level reaches the 4/5 position of the oil level indicator 2 (Fig. 11).

Step 9: Check that the pressure gauge 4 (Fig. 11) is 150 kg/cm^2(2100 psi).

ATTENTION!

The machine is delivered unfilled. Before commissioning, hydraulic oil must be filled into the tank.

Only use suitable hydraulic oil for refilling.

ATTENTION!

When starting up the machine, only use the feet to operate the foot pedal!

Never use your hands or any available aids to operate the machine via the foot pedal.

This will prevent injuries to persons and damage to the machine.

NOTE!

After installation, remove the grease from the blank metal parts which has been applied for protection.

- Use common solvent for this purpose, e.g. petroleum.
- Do not use water, nitro solvents, etc.!

After the machine has been thoroughly cleaned, all blank parts must be lightly oiled. Only use resin- and acid-free machine oil!

Tips and recommendations

For a safe stand, it is recommended that the machine is fastened to a firm, stable and level ground via the holes provided in the machine base.

7.2 Electrical connection

Danger!

Risk of fatal electric shock!

Contact with live components may result in fatal injury. Switched-on electrical components can make uncontrolled movements and lead to serious injuries.

ATTENTION!

Never operate the foot pedal when:

- The electrical supply or air pressure supply is not yet connected.
- Carry out maintenance.

ATTENTION!

All operations on the electrical installation and on the electrical equipment may only be carried out by qualified electricians!

With the 3-phase 400 Volt / 50 Hz motor, the notching machine should be connected to a standard 400V mains supply.

Mains connection cable and extension cable must have 5 wires = 3P + N + PE (3/N/PE) with a cross-section of 1.5 mm² mm each.

Make sure that

- the power connection has the same characteristics (voltage, mains frequency, phase position) as the motor,
- the mains voltage of 400 V is used,
- a cable cross-section of at least 1.5 mm² is used for the supply cable,
- the direction of rotation of the motor is correct (see direction arrow on the motor).
- The unit must be earthed before operation so that in the event of a malfunction or malfunction, the current through the earthing goes the way of least resistance. This reduces the risk of electric shock.

WARNING!

This device is equipped with a protective conductor and an earthing cable.

The plug may only be connected to a suitable output that is properly installed and earthed in accordance with local laws and regulations!

WARNING!

An unsuitable connection of the earth conductor can result in an electric shock!

Never make any changes to the grounding plug on the device!

Only have modifications to the grounding plug carried out by qualified personnel!

ATTENTION!

Danger of collision due to incorrectly set upper and lower knives.

- Ensure that the upper or lower knives cannot collide when the machine is switched on for the first time. Have the upper knives dismantled by a specialist or have the cutting gap on the lower knives increased accordingly.

Wired grounded devices:

This device is factory equipped with a specific electrical cable and plug to prevent the device from being connected to an inappropriate circuit for use in an ordinary power circuit.

WARNING!

Make sure that the socket has the same configuration as the grounding plug!

Never use an adapter between the grounding plug and the socket!

Have modifications to the grounding plug carried out by qualified personnel only!

Permanently connected devices:

In this case, the device must be connected to an earthed metal, via a hard-wired wiring system.

Check motor direction of rotation:

Step 1: Check that the notching machine is switched off.

Step 2: Set the cutting gap setting to maximum manually.

Step 3: Connect the notching machine to the mains.

Step 4: Briefly switch the motor on and off again.

Step 5: Check the direction of rotation when the motor runs out, see direction of rotation arrow.

ATTENTION!

An incorrect direction of motor rotation will result in a hydraulic fault!

Set the cutting gap to maximum before commissioning.

If the motor is rotating in the wrong direction:

Step 1: When equipped with a phase inverter:

Use a screwdriver to push in the washer in the plug and turn it by 180°.

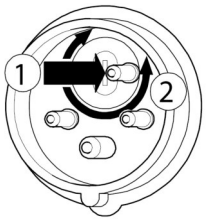


Fig. 12: Change motor direction of rotation

Without phase inverter:

Have two phases at the electrical connection replaced by a qualified electrician.

Step 2: Check the direction of rotation of the motor.

8 Settings

ATTENTION!

Settings on mechanically acting machine elements may only be carried out on the machine by trained specialists or specially trained and instructed persons.

DANGER!

Incorrect mechanical settings can influence the safety of the machine to such an extent that it causes a permanent danger. Careless behaviour can put the personnel and the machine at risk when switching-on again.

- Before making any mechanical adjustments, always switch off the machine at the main switch and secure the main switch against accidental restarting, e.g. by attaching a warning sign.
- After carrying out the adjustment activities, make sure that all covers and protective devices have been properly mounted on the machine again.
- Do not leave any tools accidentally inserted during setting activities. Before switching on the machine again, make sure that all setting tools have actually been removed. Make sure that no tools are left inside the machine, especially in the working area of the machine mechanics.

8.1 Setting the cutting gap tolerance

The cutting gap is adjusted after initial commissioning and after each knife change.

ATTENTION!

There is a risk that the machine will be damaged if the cutting gap is set incorrectly.

Use protective gloves!

- If the cutting gap is set too large, the notching process may result in burr and chip formation. If the cutting gap is set too small, the knives may be damaged and the stroke may block.
- Perform a few test cuts after adjusting the cutting gap.

Step 1: Disconnect the power supply.

Step 2: Unscrew the screws (Pos. 2, Fig. 13) then remove the safety cover (Pos. 1, Fig. 13).

Step 3: Loose the bias screws (Pos. 4, Fig. 13) and blade screws (Pos. 5, Fig. 13).

Step 4: Measure the tolerance by 0.25 mm thickness gauge (Pos. 6, Fig. 13).

Step 5: Adjust the upper and lower blades against to the thickness gauge. The thickness gauge should be nower removed smoothly.

Step 6: Tight all the screws.

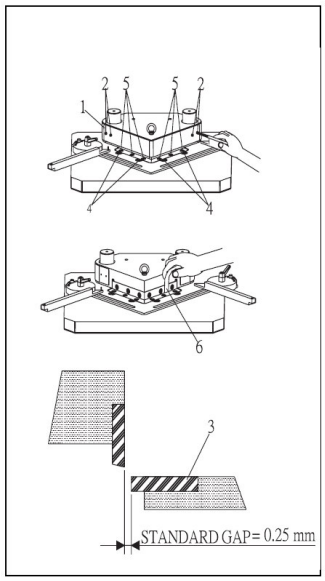


Fig. 13: Disassemble the safety cover

Tools for adjusting the cutting gap width (Fig. 14):

A - Allen wrench for blade screw

B - 0.25 mm thickness gauge.

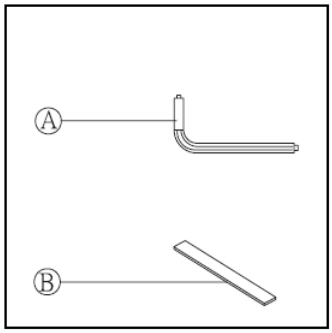


Fig. 14: Tools for cutting gap adjustment

ATTENTION!

No adjustment of the cutting gap is required for different sheet thicknesses. There are spring plates in the system which automatically adjust the cutting gap.

8.2 Changing the knife

Replace the knives in time. Blunt knives lead to poorer cutting performance.

Use protective gloves!

CAUTION!

Use only the recommended original spare blades. There is a risk that poorer material properties will lead to knife breakage and cause injury and damage to the machine.

- Poor knife quality reduces the service life of the knives.
- There is a danger that after a knife change the cutting gap is incorrectly set and the machine is damaged.
- Use protective gloves when changing the knives.
- After each knife change, make sure that the cutting gap is within the permissible setting range of 0.25 mm.
- If necessary, readjust the cutting gap.

Replacing the upper knives:

Step 1: Move the knife bar to the upper end position and switch off the machine by actuating the main switch. Now secure the main switch against being accidentally switched on again.

Step 2: For removing the protective cover 1, you must first unscrew the three screws 2 (Fig.15).

Step 3: Dismount the protective cover now. Lift the protective cover off the cutter bar and store it in a safe place.

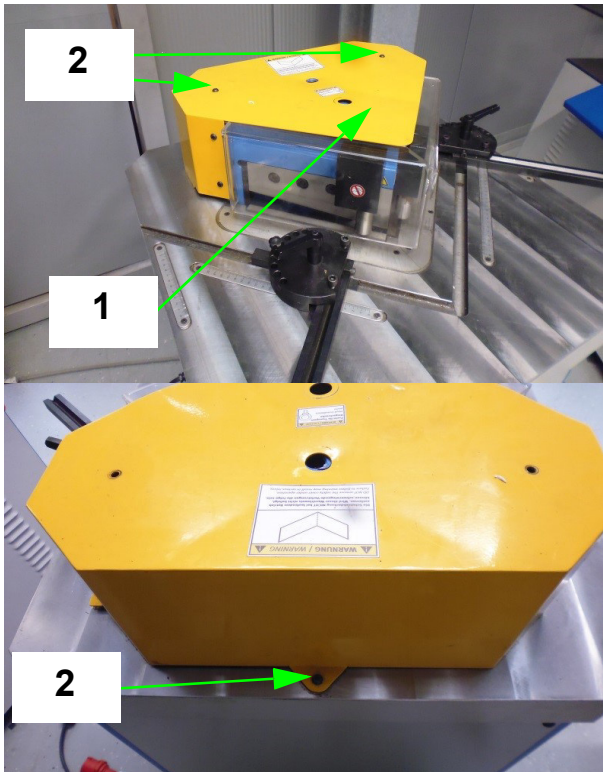


Fig. 15: Disassembling of the protective cover

Step 4: For disassembling the downholder device 3, unscrew the corresponding fastening screw 4 (Fig.16).

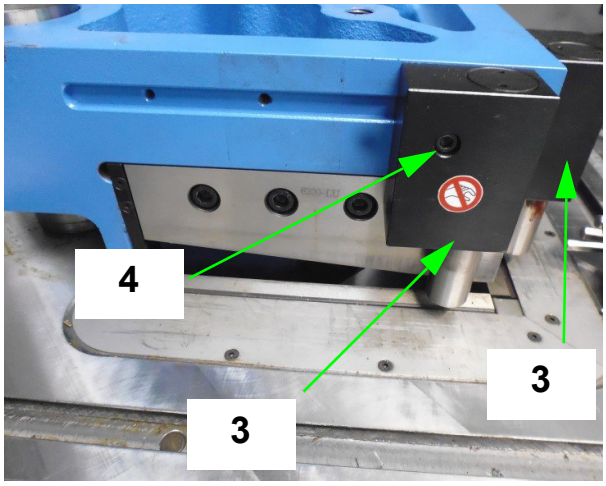


Fig. 16: Change upper knife

Step 5: Remove the respective downholder and place it at a sufficient distance to be able to disassemble the upper knife (Fig.17) without any problem.

Step 6: First unscrew the three screws (5, Fig.17).

Step 7: Finally unscrew the fourth screw (6, Fig.17).

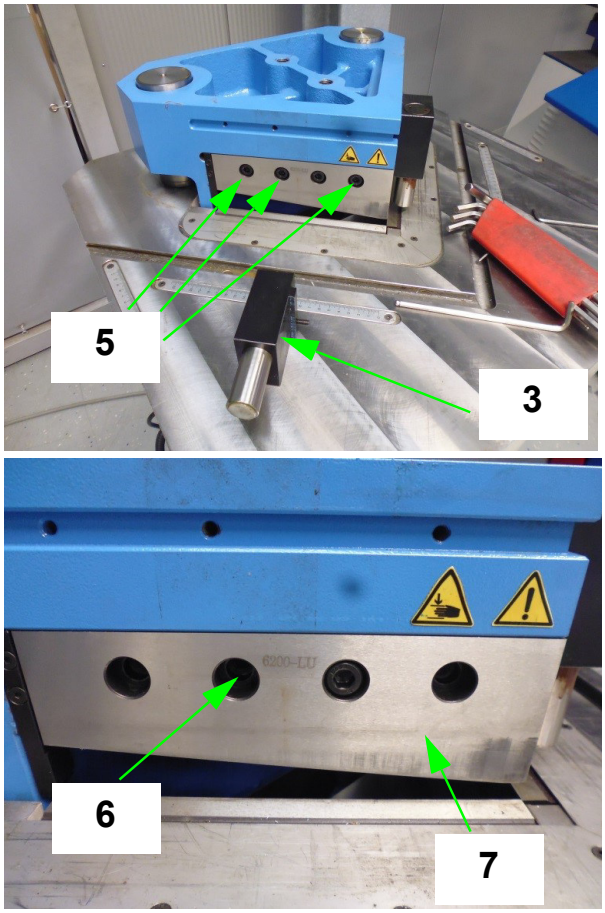


Fig. 17: Dissembling of the upper knife

Step 8: Carefully remove the upper blade (7, Figs. 17 and 18) and store it in a safe place.

Step 9: Take the new upper blade and fasten it by first screwing in the screw 6 (Fig.17).

Step 10: Then screw in the three screws 5 (Fig. 17).

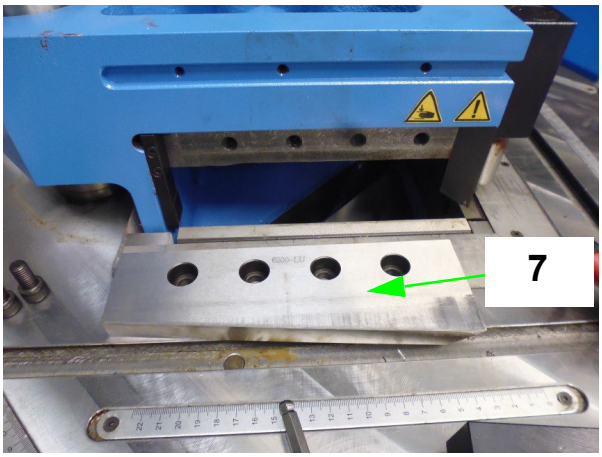


Fig. 18: Removing of the upper knife

When tightening all screws, make sure that there is no gap at the points where the knives are in contact with each other.

Replacing the lower knives:

NOTE!

In order to enable the replacement of the lower knives, first the adjacent upper knife must be dismantled!

First, perform steps 1 to 8 of the section „Replacing the upper knives“. First disassemble only one upper knife.

Then continue with step 9 in the „Replacing the lower knives“ section.

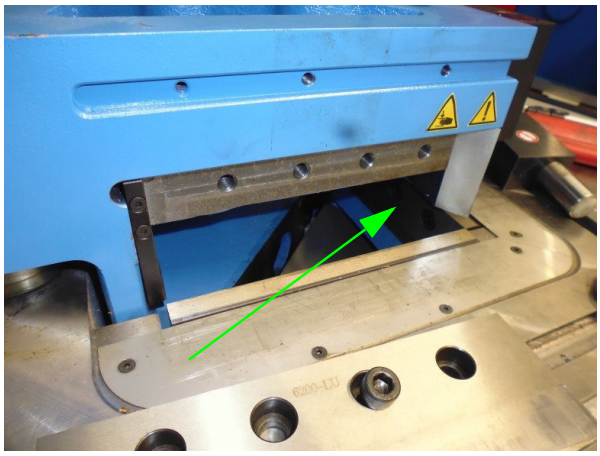


Fig. 19: Access to the fixing screws of the lower knife.

Step 9: After the upper knife has been removed, you can use an Allen key to reach the screws of the adjacent lower knife (Fig.19 or 20).

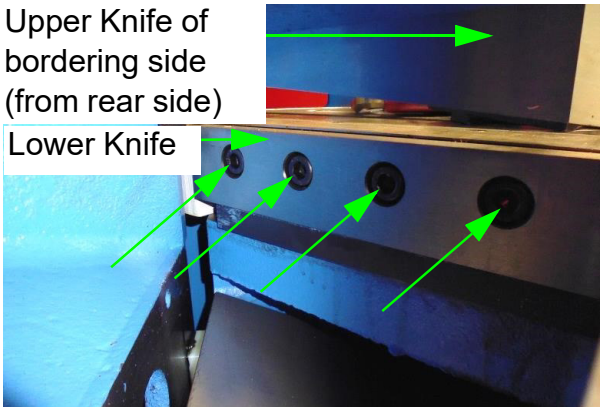


Fig. 20: Fixing screws of the lower blade

Step 10: Use a suitable Allen key (Fig.21) to unscrew the screws and change the lower knife.

Step 11: Mount the new lower knife.

Step 12: Check the cutting gap. If necessary, reset it immediately.

Step 13: Mount the upper knife back again.

Step 14: Carry out all necessary steps to change the second lower knife as well. (Fig. 21)

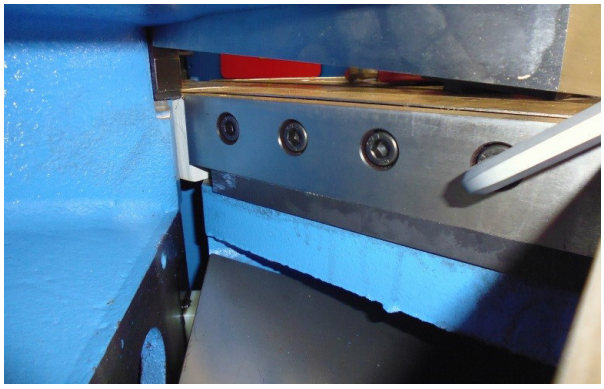


Fig. 21: Unscrewing of the screws of the lower knife

Step 15: If there are no further activities in the area of the knives, replace the protective cover 1 (Fig.15) and screw it tight.

8.3 Cutter bar - Stroke limit

Setting of working head

The setting of the cutting depth, cutting speed and cutting time is determined by the position of knob (Pos. 1, Fig. 22).

ATTENTION!

- There is a risk that the machine will be damaged if the knife bar stroke is set incorrectly.
- Improper adjustment may void the warranty.
- Repairs to the cutter bar stroke limit, such as the replacement of defective parts, may only be carried out by qualified personnel!

The maximum travel of the cutter bar is 20 mm.

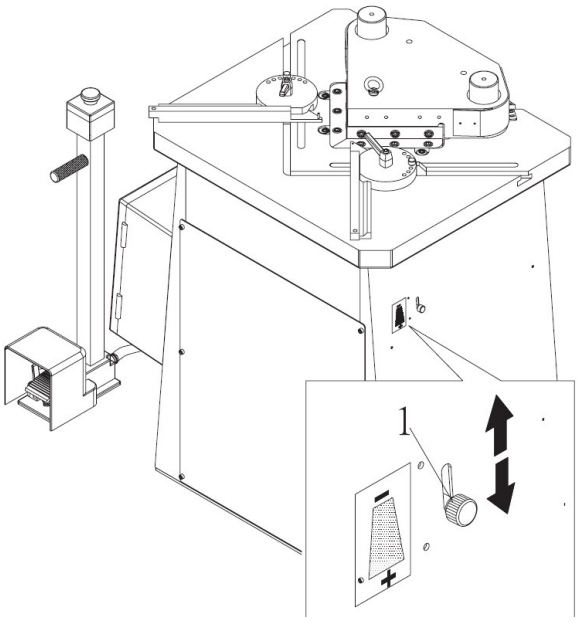


Fig. 22: Stroke limit

8.4 Setting the limit stops

Adjustable stops are used to limit or guide the processing of the sheets.

Step 1: Move the cutter bar to the upper end position and switch off the machine by pressing the main switch. Now secure the main switch against accidental restarting.

Step 2: Set the currently required stops according to the following information.

Use the setting examples as a basis for the currently required setting.

Step 3: Loosen the clamping handle (Pos. 5, Fig. 23) and push the stop out to the required workpiece length.

Step 4: Remove pin (Pos. 6, Fig. 23) and set the required number of degrees.

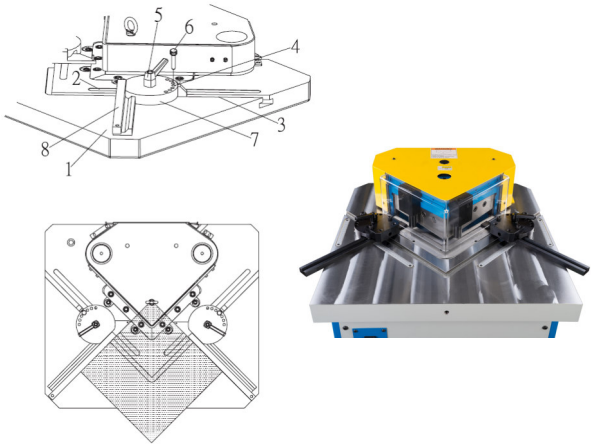


Fig. 23: Limit stops

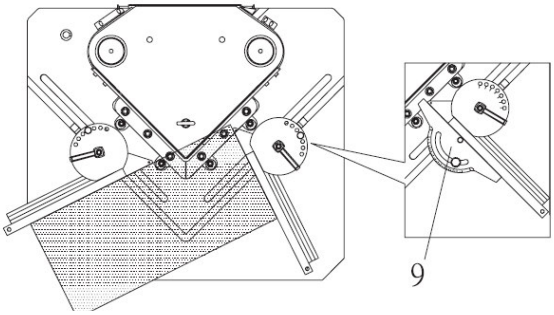


Fig. 24: Setting the limit stops

Step 5: Adjust the left and right stops (Pos. 8, Fig.23) to fit the workpiece to the working reference (Fig.24 and 25).

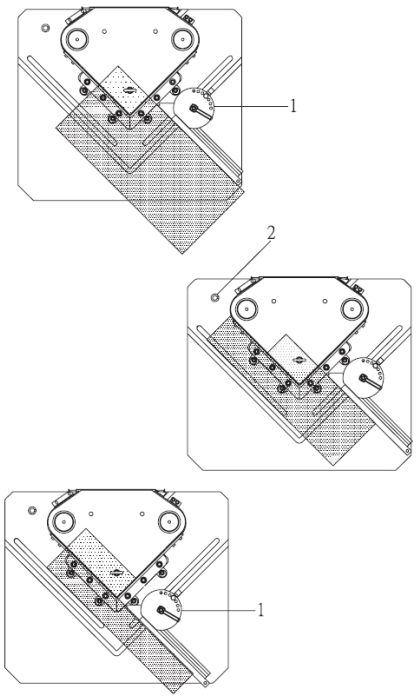


Fig. 25: Setting the limit stops

Adjustment elements

The stop bar A of the angle stops can be moved across the T-slot. The angle of the stop bar to the measuring tape is adjusted via the grid plate B (angle wheel).

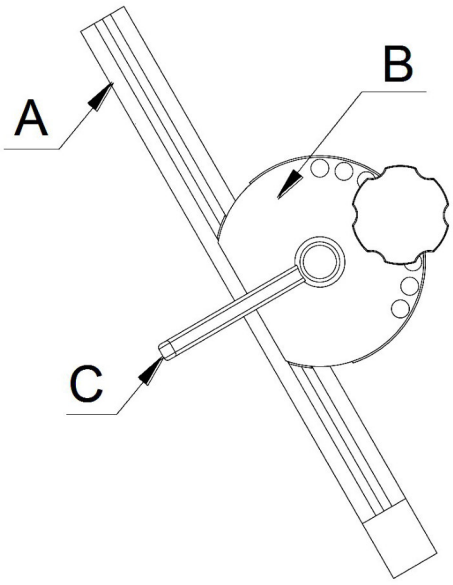


Fig. 26: Adjustment elements

The clamping lever C (Fig. 26) is used to fix the current setting. The measuring tapes embedded in the table are each provided with an outer and inner scale. The outer and inner scales are each inclined by 45° to allow precise adjustment of the stop bars. (Fig. 27)

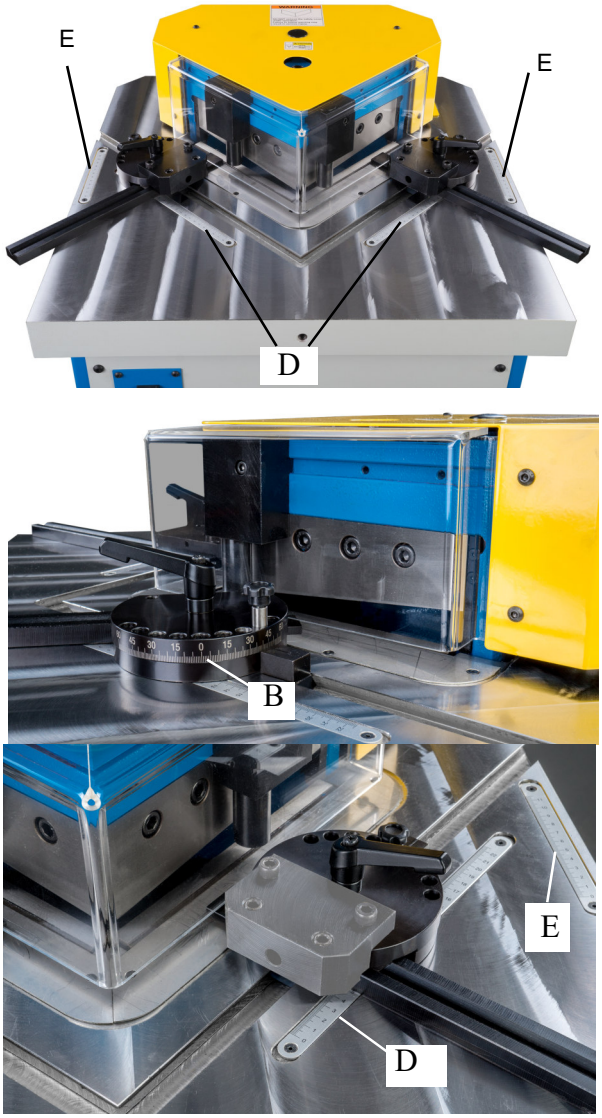


Fig. 27: Scales

B: Grid plate, angle wheel

D: Inner scale

E: Outer scale

ATTENTION!

If the setting of the knife position is changed, the position of the outer stop must be adjusted.

The two reference display groups can both be set to the left and to the right within a range of up to 45°.

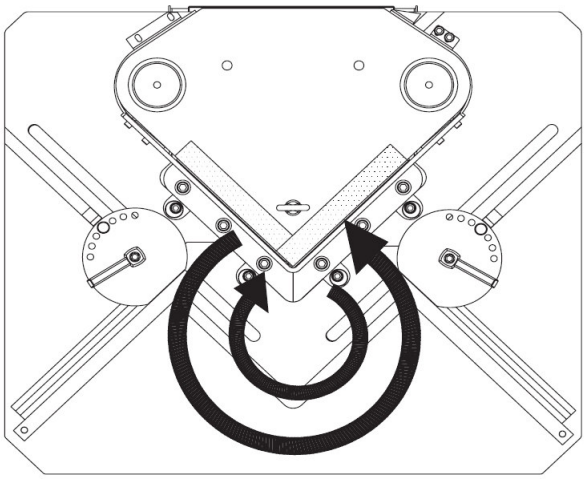


Fig. 28: Angle adjustment directions of the reference display groups

9 Operation

WARNING!

Danger to life!

Failure to observe the following rules entails a risk of fatal injury for the operator and other persons.

- The operator must not work under the influence of drugs, alcohol or medication.
- The operator must not work in case of tiredness or if suffering from an illness that impairs concentration.
- Die Ausklinkmaschine must be operated by one person only. Additional persons must keep out of the work area during operation.

DANGER!

Risk of injury!

While working on the notching machine:

- tight clothing must be worn.
- No jewellery may be worn.
- No shawls, ties or the similar must be worn.
- A hair net must be worn for long hair.

DANGER!

Risk of injury!!

There is a risk of injury to the upper limbs (e.g. hands, fingers).

ATTENTION!

Never step on the foot pedal if:

- You have connected the electrical supply and the air pressure supply.
- You want to start the application during operation.
- You have completed a started maintenance.

ATTENTION!

- Never change the settings for the hydraulic system. This is especially true for valves present there.
- Never change the setting of the cutter bar stroke limit.
- Only operate the machine from the front.
- Ensure that the workpieces are fixed when working. Use the stops for this purpose.
- Adjust the stops only when the machine is switched off (main switch in the position "OFF").
- When setting the stops, observe the minimum and maximum cutting length.
- When adjusting the inner stop, make sure that no collision with the upper knives can occur.
- When cutting metal strips to length, make sure that the cutting line is not longer than the knife length.
- Always place the metal sheets over their entire surface on the worktable. If necessary, support laterally protruding material with stable and stable material stands.

Wear hearing protection!

Use protective goggles!

Use protective gloves!

Safety boots

Use protective clothes!

9.1 Control panel

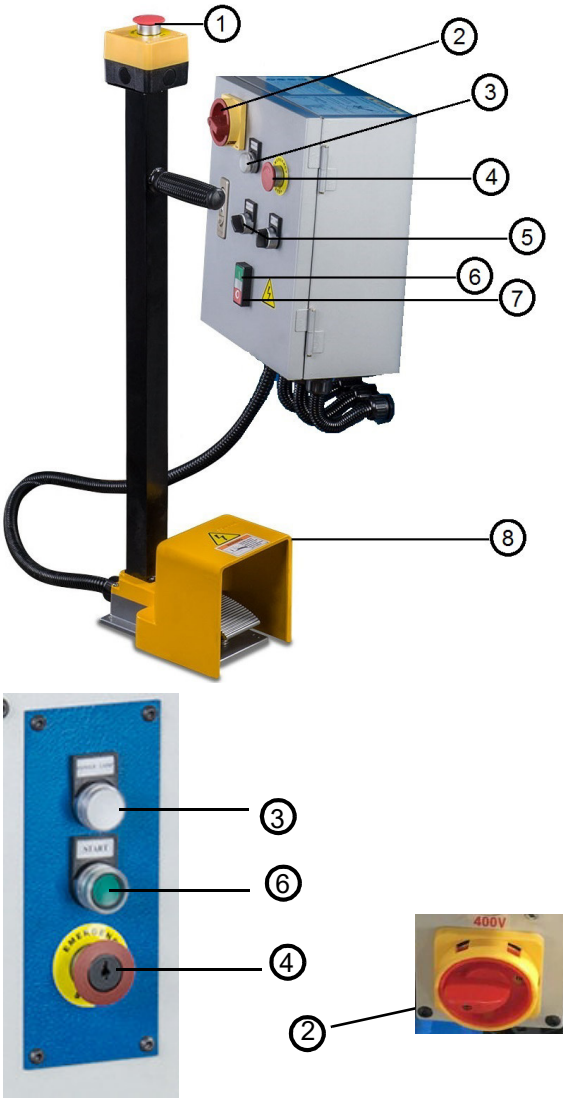


Fig. 29: Control panels AKM 220-4 (top), AKM 220-6 (bottom)

1 Emergency stop button
2 Main switch
3 Control lamp
4 Emergency stop button
5 Toggle switch „Operating mode“
6 Hydraulics ON
7 Hydraulics OFF
8 Foot pedal

9.2 Functional description:

Main switch
Switches the machine on or off when actuated.

Emergency-stop button (pushbutton)

Used in a hazardous situation to switch off the machine quickly.

The emergency-stop button may only be operated in an emergency!

Selector switch for operator with signal lamp

Switches the operating mode mode on or off depending on the switch position.

Selector switch for manual/foot operation with signal lamps

Activates manual or foot opetating mode depending on switch position.

Button for manual upward movement of the cutter bar with signal lamp

Moves the upper cutter bar upwards when manual operation is switched on. Releasing the button stops the upward movement (jog mode).

Foot pedal (freely adjustable)
When actuated, a working stroke is performed when foot operation is switched on.

Button for angle adjustment with signal lamp

By turning the switch to the right while pressing the pedal, you can adjust the angle by moving the angle stops. To cut, turn the switch to the left.

9.3 Initial commissioning

Before you start the machine for the first time, make sure that the following points are fulfilled:

- The machine is anchored to the ground at the installation site,
- The direction of rotation of the motor has been successfully checked after connection to the mains,
- Enough hydraulic oil has been filled into the oil tank to reach the upper level at the oil sight glass,
- The hydraulic system has been checked for proper installation and safe functioning before initial operation in accordance with the German Ordinance on Industrial Safety and Health (BetrSichV) - any defects have been rectified,
- Upper and lower knives cannot (accidentally) collide.

First familiarise yourself with all switching functions as described in Chapter 7. Do not omit any switching function to ensure that you can operate all electrical controls correctly during subsequent operation:

- Ensure that all protective devices are installed. The side maintenance protection covers must be firmly screwed to the machine.
- Make sure that the foot pedal is connected and can be operated with the foot in front of the machine.
- Now switch on the main switch. The machine is ready for operation.
- Test all the functions of the controls. Note that some functions are only available if another function is switched on at the same time.
- If possible, check the emergency stop function now. If everything is working correctly, then switch off the machine again with the main switch.

9.4 Workflow

Tips and recommendations

Before starting the production, make a few test cuts!

Step 1: Check the mains plug, the cable and the pedal connection. The machine must be switched off.

Step 2: Check the hydraulic oil level.

Step 3: Check all fuses in the control cabinet.

Step 4: Adjust the cutting gap.

Step 5: Adjust the angled stops to the notch dimension.

Step 6: Set the main switch on the switch cabinet from position 0 to position 1.

Step 7: Press button (Pos. 6, Fig. 29). The hydraulics are in operation.

Step 8: **For manual operation:**

Set the switch (Pos. 5, Fig. 29) to the right position, the lamp lights up.

As long as the foot pedal (Pos. 8, Fig. 29) is pressed, the top bar moves down and stops when the bottom limit switch is touched. The lamp goes out.

Step 8: **For pedal operation:**

Set the switch (Pos. 5, Fig. 29) to the left position, the lamp lights up. As long as pedal (Pos. 8, Fig. 29) is pressed, the top bar moves down and stops as soon as the bottom limit switch is touched. The machine stops cutting and the top bar returns to the top position. .

Step 9: Place the workpiece on the work surface and against the stops.

Step 10: Press the pedal for the cut depending on the setting.

Step 11: Remove the workpiece.

Important: Press the EMERGENCY OFF button (Pos. 1, Fig. 29) in case of the danger. The movement of the top beam stops and the top beam automatically returns to the top position.

9.5 Shut down the machine

Step 1: Turn off the main switch.

Step 2: Disconnect the power plug.

10 Maintenance and Repair

Tips and recommendations

To keep the notching machine in a good operating condition, regular care and maintenance work must be carried out.

WARNING!
Danger from the insufficient qualification of persons!

Insufficiently qualified persons cannot assess the risks involved in repair work on the notching machine and expose themselves and others to the risk of serious injury.

Have all maintenance work carried out by qualified personnel only.

DANGER!

Before starting any maintenance work, make sure that you do the following:

- The MAIN switch is set to OFF and locked against unintentional power-up.
- The compressed air supply is disconnected.

DANGER!

Never operate the foot pedal control before you have connected the electrical and pneumatic supply!

DANGER!
Risk of death due to electric shock!

Contact with live components may result in fatal injury.

- Always disconnect the mains plug before starting cleaning and maintenance work.
- Connections and repairs to the electrical equipment may only be carried out by a qualified electrician.

NOTE!

After cleaning, maintenance and repairs, make sure that all panels and protective guards are once again correctly in place on the machine and that there are no tools on the inside or outside of the machine.

Damaged protective guards and machine parts must be professionally repaired by an approved workshop, or replaced.

DANGER!

When carrying out care, maintenance and repair work, pay attention to protruding parts in order to avoid injuries!

DANGER!

When carrying out maintenance and repair work, ensure that the compressed air supply hose is disconnected and that the safety device is connected to the air filter/reducer/lubricator unit.

10.1 Cleaning and lubricating the machine

ATTENTION!

- Before starting cleaning and lubrication, switch off the machine and pull out the mains plug!
- Never use solvents to clean plastic parts or painted surfaces. Loosening of the surface and resulting consequential damage can occur.
- Never use water nozzles for cleaning!

The notching machine should always be cleaned after each use.

Clean the worktable regularly to prevent material fragments from damaging the machine, impairing the operation or injuring the operator.

Sweep or wipe all open machine parts with a broom or cloth at regular intervals.

Treat bare metal work surfaces with anti-rust spray.

Lubricate all moving parts and bearings once a month.

10.2 Maintenance of the machine

ATTENTION!

- Maintenance and repair work may only be carried out by qualified personnel.
- Only use original spare parts.
- All protective and safety devices must be mounted again immediately after completion of repair and maintenance work.

If the notching machine does not function properly, contact a specialist dealer or our customer service. The contact details can be found in chapter 1.2 Customer service.

10.2.1 Hydraulic system

Maintenance and repair work on the hydraulic system may only be carried out by specialists with special hydraulic knowledge.

DANGER!

- There is a risk of injury from hydraulic oil splashing out under high pressure.
- Pay particular attention to the fact that parts of the hydraulic system are under high pressure after adjusting the cutting gap and changing the blades.
- Switching off the drive motor does not ensure that the entire hydraulic system is depressurised.
- Do not open any screw connections until you are absolutely sure that the hydraulic system is completely depressurised!
- There is a risk of injury from hot surfaces. Allow the hydraulic system to cool down before working on it.

Before starting any maintenance work, make sure that the hydraulic system is pressureless. To do this, manually lower the cutter bar and switch off the machine immediately at the main switch.

Change oil filter

A clean oil filter is a precondition for trouble-free operation of the hydraulic system. Replace the oil filter after the first 3000 operating hours. In the further operating process it is necessary to replace the filter in an interval of 5000 operating hours. This work may only be carried out by a specialist with special hydraulic knowledge.

Check filling level in hydraulic oil tank

Regularly check the level on the sight glass of the hydraulic oil tank. Carry out the check daily during the first week after initial commissioning. A weekly check is then required.

ATTENTION!

An incorrect filling level can cause damage to the machine.

- Top up the hydraulic oil in good time.
- Do not mix different types of oil.
- Only use oil from the same manufacturer.

Fig. 30: Check oil level

Refill or replace hydraulic oil.

When refilling, always use the same type of hydraulic oil that has already been filled. Do not mix hydraulic oils from different manufacturers. Only use hydraulic oil specified in accordance with DIN 51524-2 when refilling.

WARNING!

There is a risk of injury from oil splashing out under pressure. Damage to health caused by incorrect handling of hydraulic oil is possible.

- Always wear safety glasses, gloves and protective clothing.
- Avoid direct contact with hands, skin and eyes.
- First switch off the machine at the main switch and take suitable measures to prevent it from being switched on again accidentally. A suitable measure is, for example, the attachment of a warning sign.

ATTENTION!

- When refilling, always make sure that the oil drain plug is properly inserted and tightened before filling the hydraulic oil.
- If the hydraulic oil is to be replaced, place an oil tray under the oil drain plug. When selecting the oil tray, ensure that there is a maximum of 36 litres of oil in the oil tank.
- When filling, make sure that the hydraulic oil does not run to the ground and that there is a danger point. Use a funnel as a preventive measure.
- If the oil temperature is high, allow the entire hydraulic system to cool down before refilling or changing.
- Observe the danger area.

ATTENTION!

- Slowly open the cap of the oil tank to balance the pressure!
- Observe the level gauge when filling with oil. Fill the oil only up to the upper mark.
- Hydraulic oil is flammable. Do not use an open fire while refilling or replacing hydraulic oil.
- Do not inhale vapours that may escape from the hydraulic system.
- Dispose of used oil in accordance with the currently valid legal regulations.

Oil specification according to DIN 51524-2

Depending on the model, the empty hydraulic oil tank has a volume of 22 or 35 litres. Only use hydraulic oil specified according to DIN 51524-2 in the hydraulic system. Select the viscosity class according to the local ambient temperature. Observe the following list.

Standard	Ambient temperature below 20°C	Ambient temperature above 20°C
DIN 51524-2	ISO-VG class 32	ISO-VG class 46

The corresponding hydraulic oils are available under the following manufacturer specifications:

Manufacturer	Ambient temperature below 20°C	Ambient temperature above 20°C
ARAL	VITAM GF 32	VITAM GF 46
BP	ENERGOL HLP-HM 32	ENERGOL HLP-HM 46
ESSO	NUTO H 32	NUTO H 46
SHELL	TELLUS 32	TELLUS 46
CASTROL	HYSPIN AWS 32	HYSPIN AWS 46

10.2.2 Lubrication diagram

Nr	Lubrication point	Lubricating interval	Oil type
1	Guide spindle, Nipple	monthly	Grease
2	Hydraulic tank	if necessary	ISO VG 32 - ISO VG 46

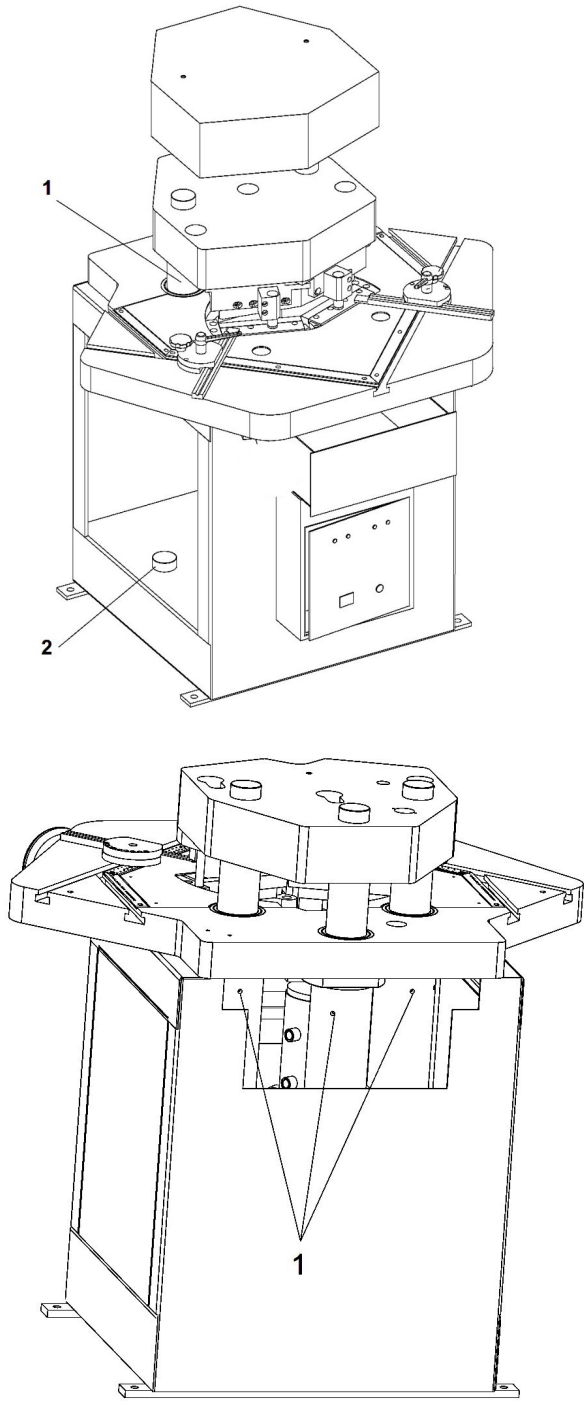


Fig. 31: Lubrication points

10.2.3 Maintenance and inspection intervals

Activities to be carried out regularly after initial commissioning:

	Interval	Activity
Hydrauc oil	weekly	check the fill level
Hydrauc oil	yearly	exchange
Oil filter	yearly	clean/change
Oil temperature	weekly	check
Hoses lines	weekly	check
Fan cover	quarterly	ckeck/clean
Electric kable	daily	check for the damage
Emergency stop switch	daily	Check the function
Cutter bar/ sliding guides	monthly	lubrication
Machine	daily	clean

11 Disposal, recycling of used Device

Please take care in your own interest and in the interest of the environment that all component parts of the machine are only disposed of in the intended and permitted way.

11.1 Decommissioning

Immediately decommission disused machines in order to avoid later misuse and endangering of the environment or personal safety.

- Eliminate all environmentally hazardous operating materials from the used device.
- If required, disassemble the machine into easy-to-handle and usable components and parts.
- Dispose of machine components and operating materials by the disposal channels provided.

11.2 Waste disposal of electric equipment

Please note that electrical devices contain a variety of recyclable materials as well as environmentally harmful components.

You contributes to that these components are disposed of separately and properly. In case of doubt, please contact your municipal waste disposal. As necessary, a specialized waste disposal company can help be used for the treatment.

11.3 Disposal of lubricants

Please pay attention to an environmentally friendly disposal of the used coolants and lubricants.

Observe the disposal instructions of your municipal disposal companies.

Disposal notes for used lubricants are available from the manufacturer of the lubricants. If necessary, request the product-specific data sheets.

12 Disturbances, possible Causes and Solutions

ATTENTION!

If one of the following errors occurs, immediately stop working with the notching machine

Before you begin troubleshooting, turn off the notching machine and unplug the power card. Otherwise it could lead to serious injuries.

All repairs or replacement work may only be carried out by qualified and trained specialist personnel.

NOTE!

If you can not solve the problems with the your notching machine yourself, then please contact your nearest METALLKRAFT dealer. Please write down following information from the notching machine or the operating instructions in advance to help you your problem in the best possible way.

- Model name of the device
- Serial number of the device
- Constructions year
- Exact error description

Malfunction	Possible Cause	Solutions
Control elements on the control panel are functionless / Start light is off	1. Emergency stop button has been actuated. 2. The motor protection switch was triggered.	1. Unlock the emergency stop button. 2. Have check by a qualified electrician.
Upper knife does not react to a buttons actuations in the manual mode.	1. Selector switch for manual/foot operation on the control panel is defect.	1. Have check by a qualified electrician.
Upper knife does not react to pedal actuations in pedal mode.	1. Switch for upper/lower limit is defect	1. Have check by a qualified electrician.
Upper knife is not responding - Electrical compartment has not detected any electrical fault.	1. Check the direction of rotation of the motor - note the direction of the arrow on the motor. 2. Relief pressure valve is dirty or defect. 3. The oil level is not correct. 4. Oil filter is blocked.	1. If the direction of rotation is incorrect, have the polarity changed by a qualified electrician. 2. Have checked and repaired by a qualified hydraulic technician. 3. Have checked and filled by a specialist. 4. Check, clean or have exchanged by a qualified hydraulic technician.

13 Spare Parts

13.1 Ordering spare parts

NOTE!

The manufacturer warranty shall be rendered void in the event of a use of unauthorised spare parts.

DANGER!

Risk of injury due to use of incorrect spare parts!

The use of incorrect or faulty spare parts may cause risks for operating staff and damage as well as malfunctions.

- Exclusively genuine spare parts made by the manufacturer or spare parts authorised by the manufacturer shall be used.
- Always contact the manufacturer if you are unsure.

Spare parts are available from authorised retailers or directly from the manufacturer.

Contact details:

Fax: 0049 (0) 951 96555-119
email: ersatzteile@stuermer-maschinen.de

Always quote the following key data with your spare parts orders:

- Device type
- Article number
- Position number
- Year of manufacture
- Quantity
- Desired shipping type (post, freight, sea, air, express)
- Shipping address

Spare parts orders without the aforementioned data cannot be taken into account. The supplier shall determine the shipping type if no relevant data was provided. Information about the device type, article number and year of manufacture can be found on the type plate. The type plate is mounted on the device.

Example

The guide pillar for the AKM 220-4 H must be ordered. The guide pillar has the number 31 in the spare parts drawing.

By ordering spare parts, send a copy of spare parts drawing with marked part (guide pillar) and marked position number (31) to the dealer or spare parts department and provide the following information:

Type of device: **Hydraulic Notching Machine AKM 220-4 H**

Item number: **3834200**

Drawing: -

Position number: **31**

13.2 Spare parts drawings

In case of the service, the following drawings shall help to identify the necessary spare parts. If necessary, send a copy of the parts drawing with the marked components to your dealer.

Spare parts drawing AKM 220-4 H

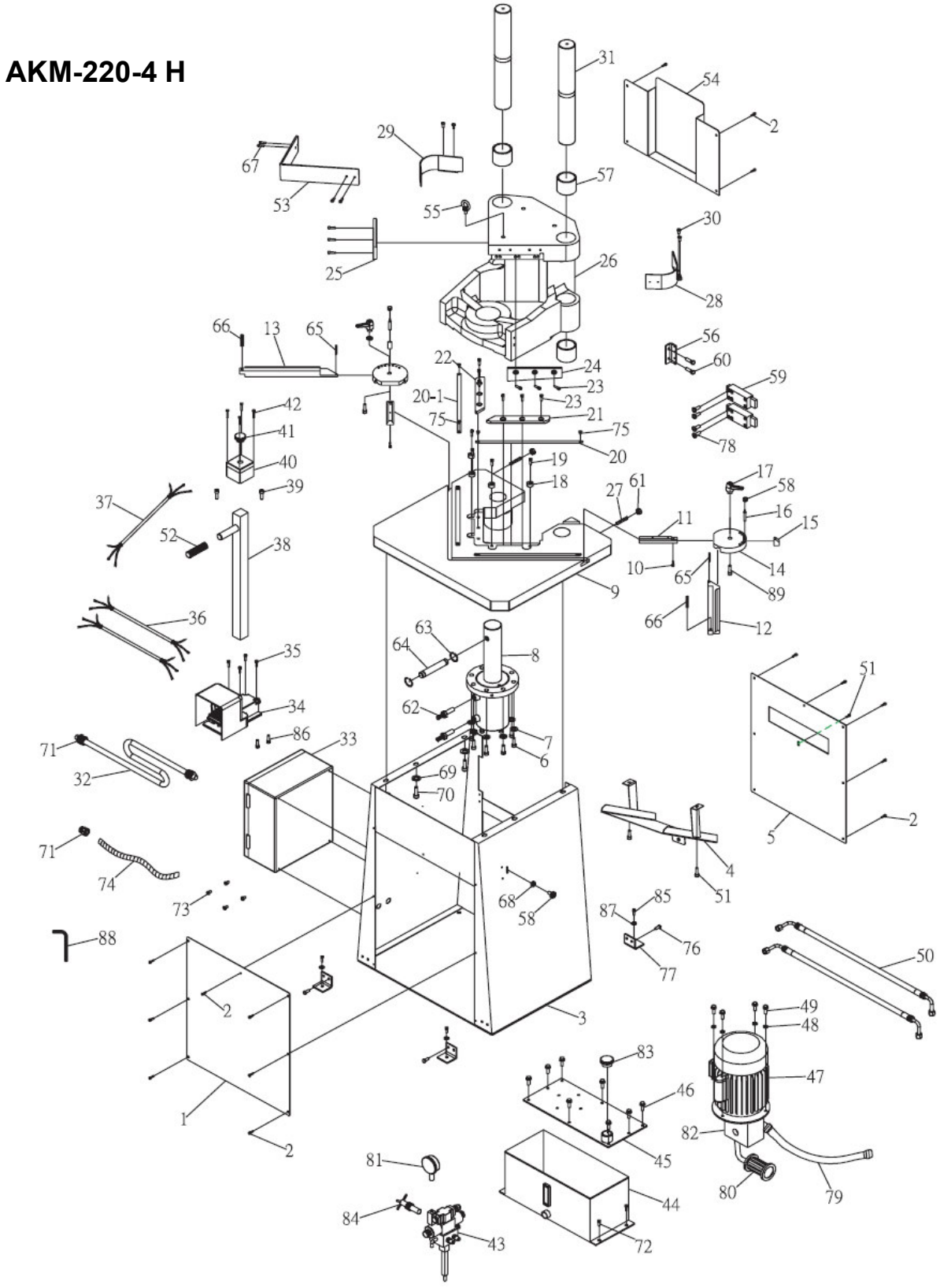


Fig. 32: Spare parts drawing AKM 220-4 H

Spare parts drawing AKM 220-6 H

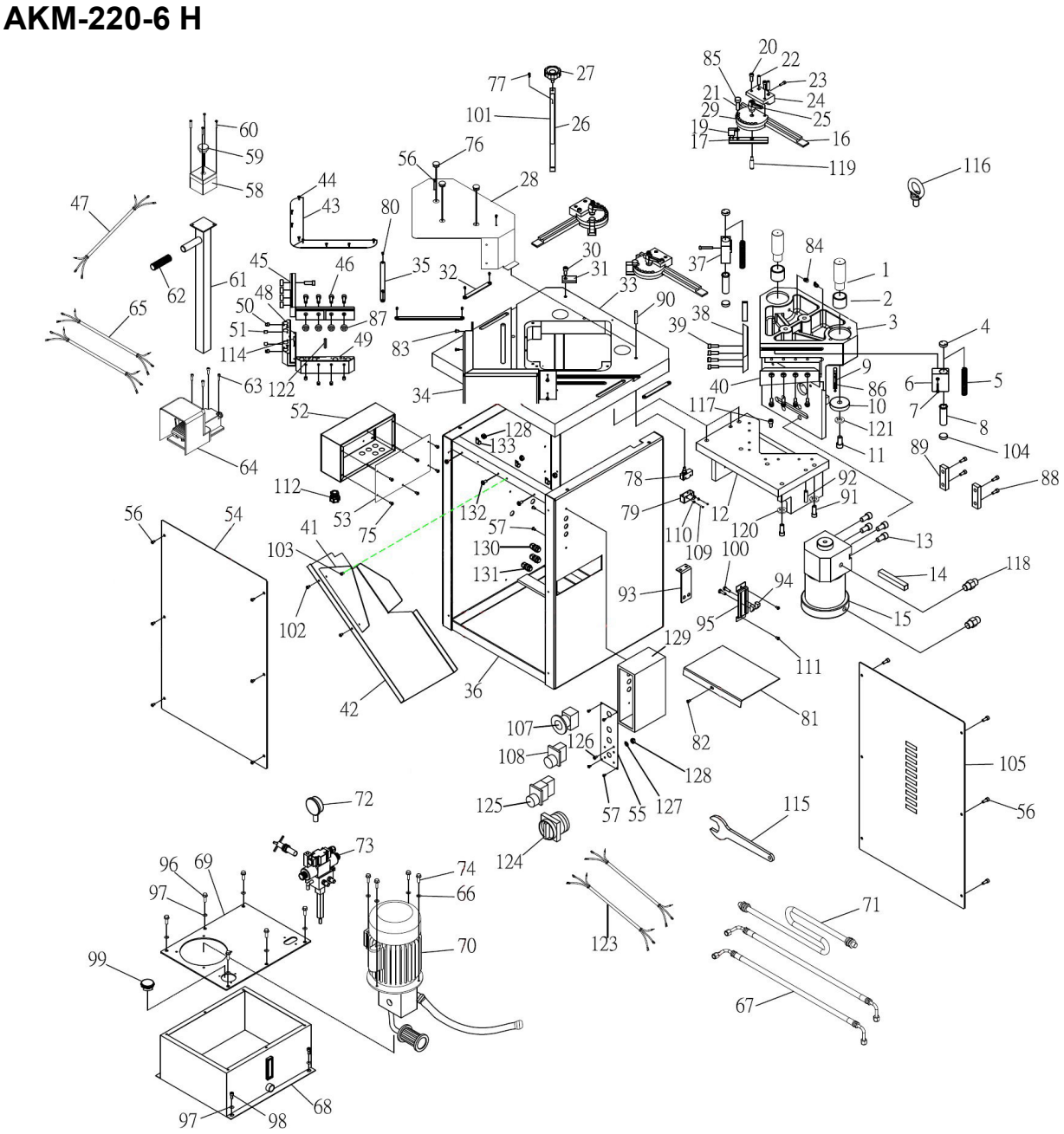


Fig. 33: Spare parts drawing AKM 220-6 H

14 Wiring Diagrams

14.1 Electrical circuit diagrams

AKM 220-4 H

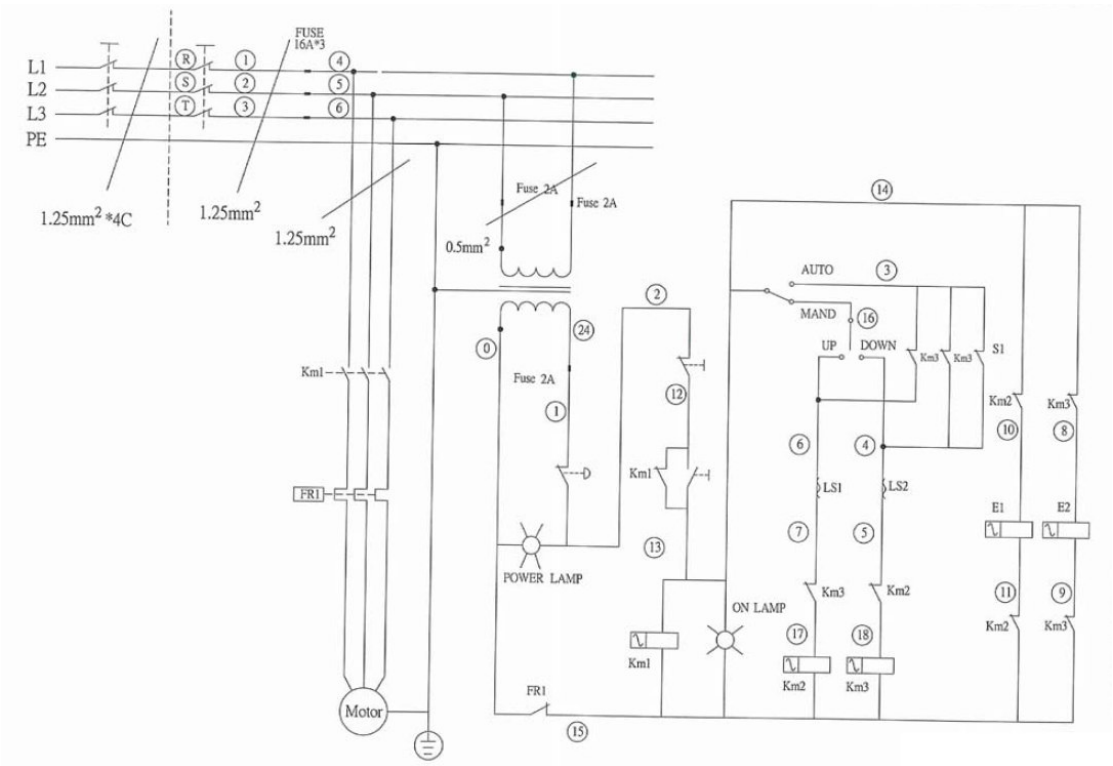


Fig. 34: Electrical circuit diagram AKM 220-4 H

AKM 220-6 H

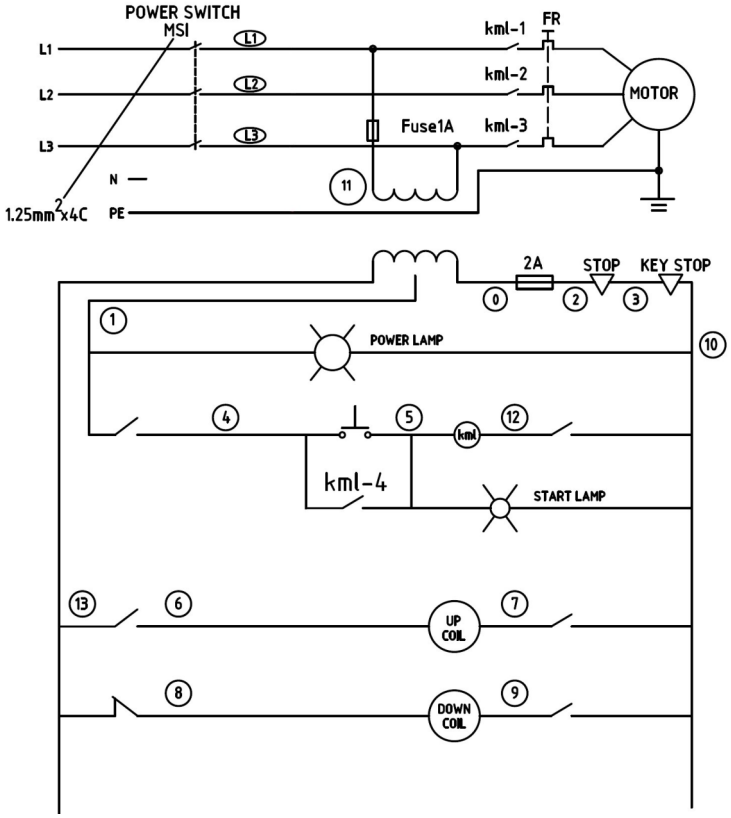


Fig. 35: Electrical circuit diagram AKM 220-6 H

14.2 Hydraulic circuit diagram

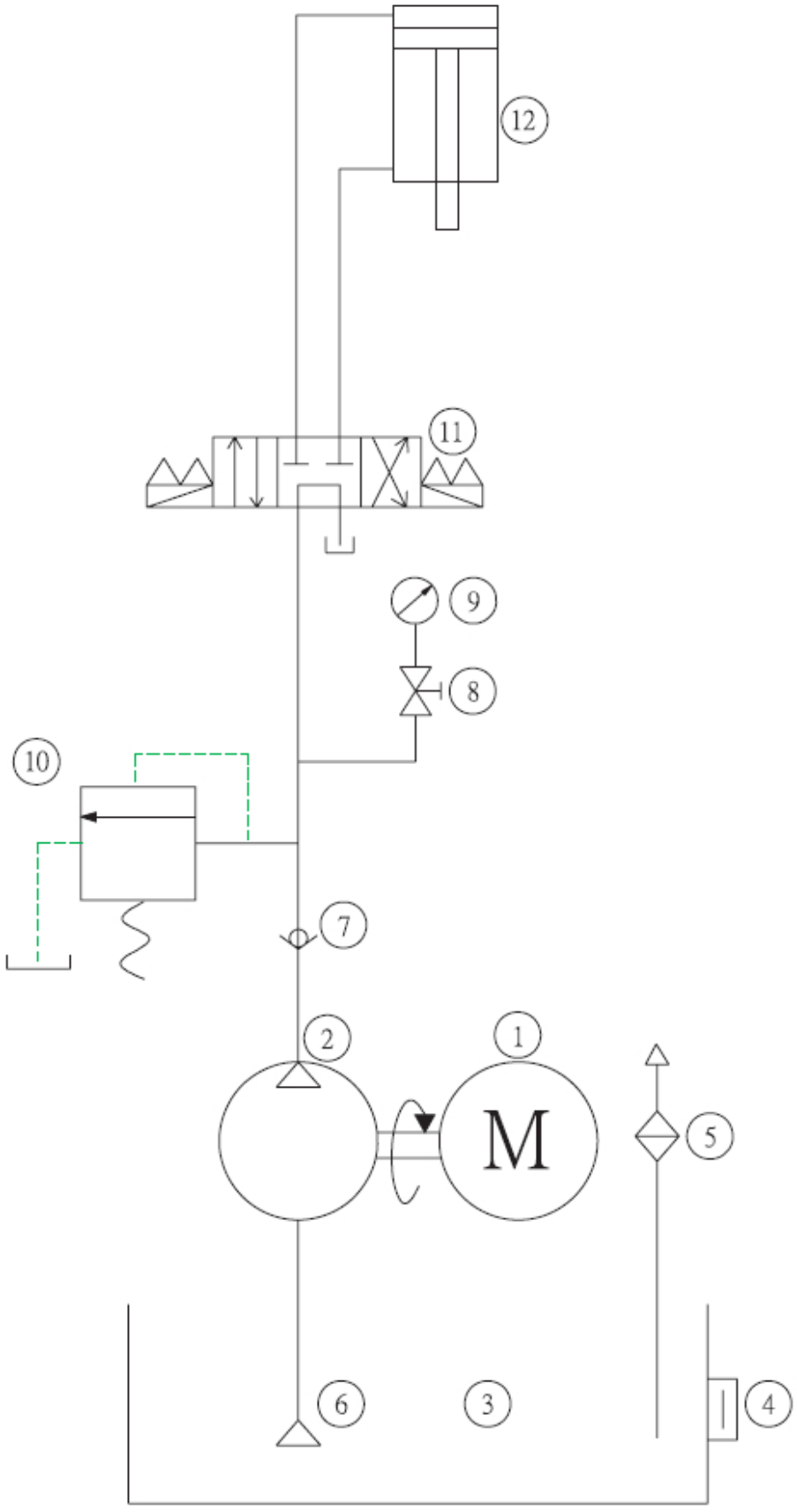


Fig. 36: Hydraulic circuit diagram AKM 220-4 H and AKM 220-6 H

15 EC Declaration of Conformity

According to Machinery Directive 2006/42/EC, Annex II 1.A

Manufacturer / distributor: Stürmer Maschinen GmbH
Dr.-Robert-Pfleger-Str. 26
D-96103 Hallstadt

hereby declares that the following product

Product group: METALLKRAFT® Metal Working Machines

Machine type: Hydraulic Notching Machine

Designation of the machine:
☐ AKM 220-4
☐ AKM 220-6

Item number:
☐ 3834200
☐ 3836200

Serial number: _____

Year of manufacture: 20____
* please fill in according to the information on the type plate

complies with all relevant provisions of the above mentioned directive as well as the other applied directives (below) - including their applicable modifications at the time of the declaration.

Relevant EU Directives 2014/30/EU EMC Directive

The following harmonised standards have been applied:

DIN EN ISO 12100:2010 — Safety of machinery - General principles for design - Risk assessment and risk reduction

DIN EN 60204-1:2014-10 — Safety of machinery - Electrical equipment of machines - Part 1: General requirement

Responsible for documentation: Kilian Stürmer, Stürmer Maschinen GmbH
Dr.-Robert-Pfleger-Str. 26, D-96103 Hallstadt

Hallstadt, 11.10.2017

_____
Kilian Stürmer
General Manager

CE


stürmer
OPTIMUM