

OPERATING MANUAL

FULLY AUTOMATIC BALING PRESS

VK 12 / 600

VK 12 / 1000

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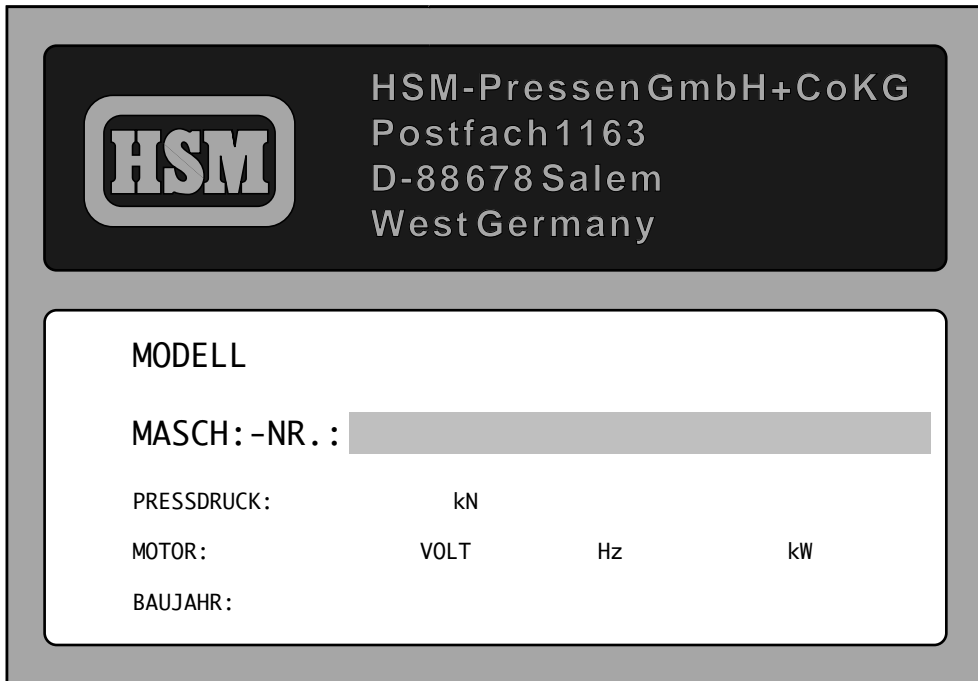
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Name plate



The machine number is specified on the nameplate of the baling press, shown above. Guarantee claims and inquiries cannot be processed if you do not quote the machine number.

Please therefore enter this number into the grey field of the nameplate immediately after receipt of the baling press.

Foreword

The purpose of this Operating Manual is to assist you in the operation of the baling press in accordance with the intended use. It contains important information for the safe, expert and economical operation of the baling press. Observing this Operating Manual helps to prevent danger, to reduce repair costs and downtime and to improve the reliability and service life of the baling press.

The Operating Manual must always be available to the personnel.

The Operating Manual must be read and used by all persons who work with and on the baling press, e.g. with the following:

- Operation, including set-up, troubleshooting, disposal of production waste, disposal of operating and auxiliary materials
- Maintenance (maintenance, inspection, repair)
- Transport

In addition to this Operating Manual and the compulsory accident prevention regulations in the user country and at the installation location, the recognised technical rules for operation according to safety and technical practices must be observed.

Please contact your local dealer if you still have questions after reading this Operating Manual.

HSM Pressen GmbH & Co. KG permanently aspire to improve their products. They reserve the right to perform any changes and modifications which are deemed necessary. However, this does not imply the obligation for a subsequent modification of already delivered machines.

Design and technical modifications as compared to the representations and statements in this Operating Manual are reserved.

This Operating Manual was established with consideration of the EC directives.



Please inquire missing documents at:

HSM Pressen GmbH + Co.KG

Bahnhofstraße 115

D-88682 Salem

Telefon: ++49-7553-822-0

Telefax: ++49-7553-822-160

1 Safety

1.1 Notes on safety

1.1.1 "Work safety" symbol



*This symbol marks all work safety notes in this Operating Manual which **endanger the health or life of people**. Please pay attention to this symbol and exercise particular care in such cases. Please also forward all work safety notes to other users.*

Apart from the instructions in this manual, you must also follow generally applicable safety and accident prevention regulations.

1.1.2 "Notice" symbol



This symbol marks information in this manual which requires particular attention so that guidelines, regulations, instructions and correct working procedures are followed and damage to or ruin of the machine and/or other equipment prevented.

1.2 Classification of hazards

1.2.1 Danger



*identifies an immediate danger. If not avoided, it **will** result in death or severe injuries (crippling).*

1.2.2 Warning



*identifies a possibly dangerous situation. If not avoided, it **could** result in death or severe injuries.*

1.2.3 Caution



*identifies a possibly dangerous situation. If not avoided, it **could** result in light or minor injuries.*

Is also used for warnings concerning damage to material.

1.3 Selection and qualification of staff

The baling press employs state-of-the-art technology. However, this machine can become hazardous if used incorrectly or for purposes other than those for which it was designed.

- The baling press may only be operated, serviced and repaired by authorized, trained and instructed personnel.
- Each person given duties of assembling, dismantling and reassembling and maintenance (inspection, servicing, repair) of the baling press must have read and fully understood the entire Operating Manual, in particular the "Safety" section before starting to work. We suggest the management obtains written confirmation in particular from personnel only working occasionally with the baling press.
- The management has the obligation to instruct the personnel in handling the baling press and to create binding instructions. The operating and maintenance personnel must receive regular training on safety regulations.
- The responsibilities of the staff for assembly, dismantling and reassembling, start-up, operation and maintenance must be clearly delegated and observed.
- Persons to be trained or instructed may operate the baling press only under the permanent supervision of an experienced person.
- The baling press may not be operated by persons under 16 years of age.
- Work on the electrical system of the baling press may only be performed by a qualified electrician or by instructed persons under instruction and supervision of a qualified electrician according to the electro-technical rules.
- Only persons with specialist knowledge and experience with hydraulics may work on the hydraulic equipment

1.4 Organisational measures

- The Operating Manual must always be available to the personnel.
- All safety and danger information on the baling press must be kept complete and legible.
- In addition to the Operating Manual the generally recognised legal and other binding regulations concerning accident prevention and environmental protection must be observed.
- The baling press must not be modified or converted without prior approval from the manufacturer.
- Only use original spare parts.

1.5 Handling the baling press

- Always work according to the instructions.
- Before switching on and starting the baling press, ensure that nobody is jeopardized by the operation of the baling press.
- Operate the baling press only when all protective devices and safety-technical equipment have been installed and are operative. Do not make any conversions or modifications on your own initiative.
- In normal operation, open the loading flap and the bale ejection door only when the hydraulic cylinder is idle.
- Check the baling press at least once per shift for externally visible damage and defects.
- Ensure that the baling press workplace is always clean and safe.
- Immediately shut down and secure the baling press when malfunctions occur.
- Immediately report any changes in the the operational behaviour to the competent person. Shut the machine down and secure it, if necessary.
- Wear your personal safety clothes during operation.
- Observe the relevant safety and environmental regulations (e.g. hazardous material act, waste act, water act) when handling hazardous materials.

1.6 Environmental protection

- Observe the applicable environmental legislation for all work on and with the baling press.
- Dispose of waste oil and residual fluids from the compressed material in a correct manner. These substances may neither be disposed of via the drainage system nor be allowed to permeate into the ground.
- Observe the safety data sheet according to DIN 52 900 when using cleaning agents and solvents. This data sheet contains the physical, safety-technical, toxicological and ecological data which are essential when handling chemical substances. In addition it contains recommendations for the safe storage, handling and transport of these substances.

1.7 Use according to instructions

The horizontal baling press **VK 12** is intended only for compacting **empty cartons** as well as any other materials specified in the contract.

Any other use beyond the scope described here is regarded as **not being in accordance with the instructions**. The manufacturer will not be made liable for damage resulting from incorrect use.

The assembly, dismantling, re-assembly, start-up, operation and maintenance work specified by the manufacturer must be observed.

Irrespective of the laws and regulations mentioned in this Operating Manual, the appropriate national laws and regulations which are valid for the operator must be observed.

The customer service of HSM must be consulted before the baling press is used outside its contractually agreed and intended scope of application otherwise the manufacturer's warranty will become void.

The baling press has been inspected for safety by the Berufsgenossenschaft Druck und Papier (mutual indemnity association print and paper processing).

However, improper operation and misuse endanger:

- the health and life of the user
- the baling press and other valuable equipment of the operator
- the efficient performance of the baling press.



Danger!

*The baling press may not be operated in hazardous locations.
Explosion hazard!*

1.8 Checking the safety devices

Check the safety devices:

- at the start of every work shift (when operation was interrupted)
- at least once a week when the operation is interrupted
- after each maintenance or repair

Check the safety devices for:

- specified condition
- specified position
- safe attachment
- specified function

Perform a check using the following checklist. Eliminate the faults before putting the machine into operation!

If faults occur during operation the machine must be stopped immediately and the faults eliminated.

Do not change or remove protective devices. Do not hinder protective devices by modifications of the machine.

The machine must not be modified, for safety reasons!

1.8.1 Checklist for the safety devices


Photocopy this checklist for the regular inspections.

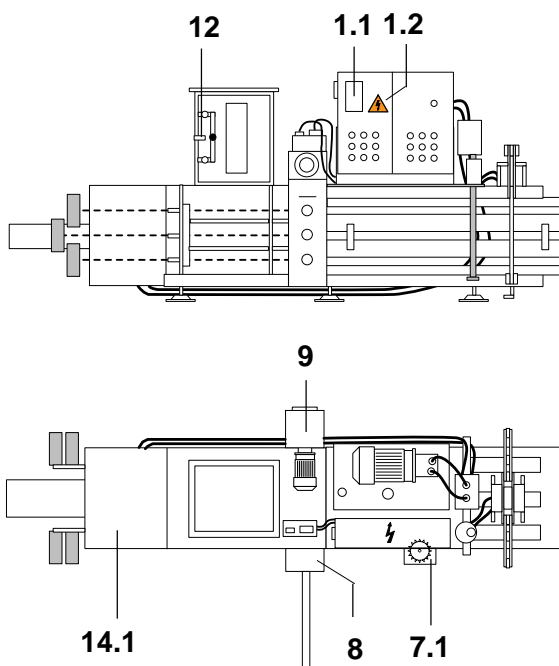
Check off the individual points when they are in order.

Operate the baling press only when all points have been checked and are in order.

1. The **protective covers** (7.1, 14.1) must be mounted and screwed firmly in place.
2. Check the safety switch on the **inspection door** (12).
The safety switch switches the machine off immediately or prevents it from being switched on again, when the door is open.
Try it out to make sure it works!
3. Check the safety switch on protection cap of the **twisting unit** (9).

Check the safety switch on protection cap of the **wire insertion unit** (8).

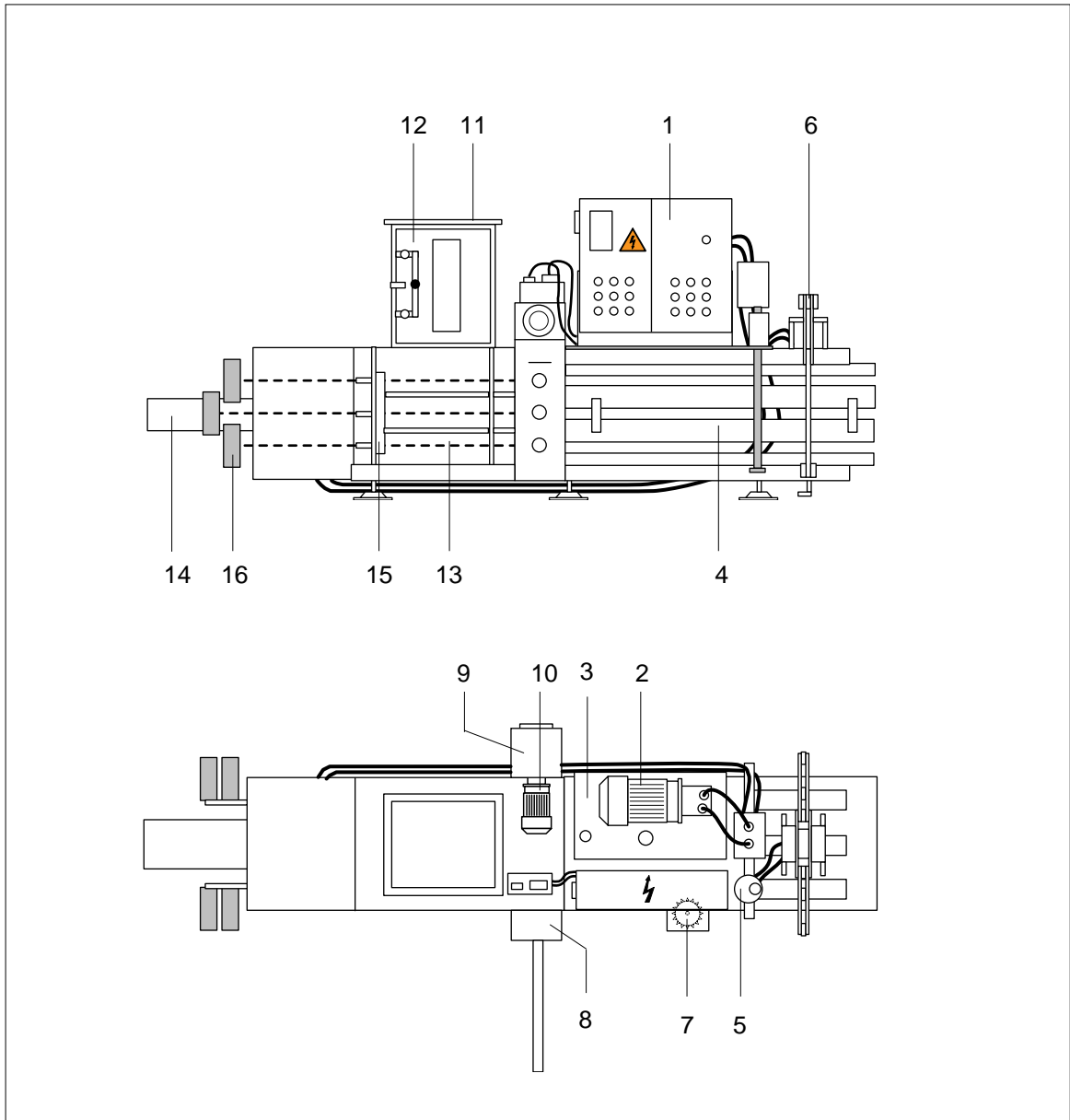
The safety switch switches the machine off immediately or prevents it from being switched on again, when one of the protection covers is removed.
Try it out to make sure it works!
4. The warning sign  **Warning of electric shock!** (1.2) must be attached at the door of the switch cabinet.
5. The **safety label** (1.1) "*Safety and maintenance information!* / *Attention!*" (Art.-No.: 6.661.999.020) must be attached at the indicated position.



<p>checked</p> <p>Date</p> <p>Signature</p>
--

2 Technical data

2.1 Machine overview



- | | | | |
|---|------------------------------------|----|---------------------------------------|
| 1 | Switch and control cabinet | 9 | Twisting unit |
| 2 | Motor with pump | 10 | Twisting motor |
| 3 | Oil tank | 11 | Hopper |
| 4 | Press channel | 12 | Inspection door |
| 5 | High pressure power unit | 13 | Press unit (press chamber, press ram) |
| 6 | Automatic press channel adjustment | 14 | Press cylinder |
| 7 | Counting wheel | 15 | Wire brake |
| 8 | Wire insertion unit | 16 | Wire station |

2.2 Machine characteristics

Machine designation	:	Channel baling press
Machine type	:	HSM VK 12/1000 (HSM VK 12/600)
Total machine weight	:	approx. 3500 kg (ca. 3000 kg)
Strapping	:	3-fold horizontally - wire

2.3 Press data

Pressing power	:	160 kN
Specific pressing power	:	45 N/cm ²
Compression time with return stroke	:	approx. 16,5 sec (12 sec)
Pressing capacity	:	76 m ³ /h (64 m ³ /h)
Output per hour	:	1500 kg/m ³ (1300 kg/m ³)
Bale size	:	700 x 500 x 600 - 1200 mm
Bale weight	:	60 – 230 kg (depending on material)

2.4 Motor data

2.4.1 Motor main drive

Type	:	Three-phase asynchronous motor
Rated power P_n	:	7,5 kW
Operating voltage U	:	400 V
Frequency f	:	50 Hz
Rated current I_n	:	15,5 A
Nominal speed n	:	1450 min ⁻¹
Protection mode	:	IP 54

2.4.2 Twisting motor

Type	:	Transmission brake motor
Rated power P_n	:	2,0 kW
Operating voltage U	:	400 V
Frequency f	:	50 Hz
Rated current I_n	:	4,8 A
Nominal speed n	:	1350 min ⁻¹
Output speed n_2	:	194 min ⁻¹
Protection mode	:	IP 54
Oil volume	:	0,45 l

2.4.3 High pressure power unit - press channel adjustment

Rated power P_n	:	0,7 kW
Operating voltage U	:	400 V
Frequency f	:	50 Hz
Rated current I_n	:	2,6 A
Nominal speed n	:	1290 min ⁻¹
Protection mode	:	IP 54

2.5 Hydraulic system

2.5.1 Main drive

Type	:	Axial piston pump
Discharge Q	:	39 l/min
Max. system pressure p	:	250 bar

2.5.2 Press channel adjustment

Discharge Q	:	1,95l/min
Operating pressure p	:	200 bar
Oil volume	:	2,4 l
Oil type	:	Multigrade oil to DIN 51524, HVLP 46

2.5.3 Cylinders

2.5.3.1 Press cylinder

Dimensions	:	∅ 90/65 x 1400 stroke - VK 12/1000 ∅ 90/65 x 1000 stroke - VK 12/600
Operating pressure p	:	250 bar

2.5.3.2 Wire insertion cylinders

Dimensions	:	∅ 63/45 x 960 Hub
Operating pressure p	:	130 bar

2.5.3.3 Press channel adjustment cylinder

Dimensions	:	∅ 80/45 x 120 Hub
Operating pressure p	:	200 bar
Max. pressure p _{max}	:	250 bar

2.5.4 Oil tank

Oil volume	:	280 l
Oil type	:	Multigrade oil to DIN 51524, HVLP 46

2.5.5 Oil-Air-Cooler unit (Option)

Cooling performance	:	5 kW
Discharg Q	:	12 l/min
Rated power P _n	:	0,37 kW
Operating voltage U	:	400 V
Frequency f	:	50 Hz
Rated current I _n	:	1,2 A
Nominal speed n	:	1500 min ⁻¹

2.6 Dimensions

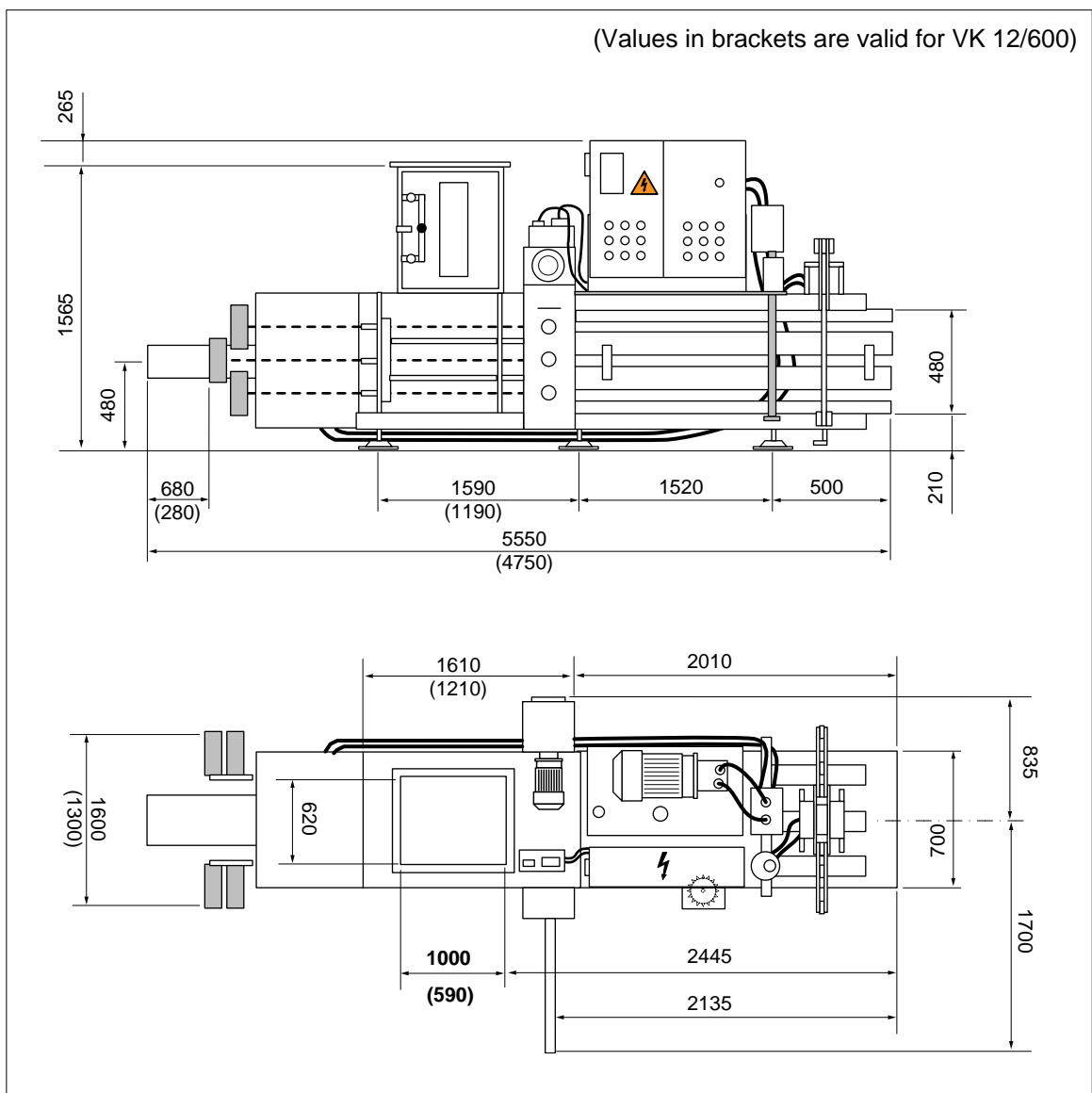
2.6.1 Machine dimensions

		VK 12/600	VK 12/1000
Width	:	2535 mm	2535 mm
Length	:	4750 mm	5550 mm
Height	:	1830 mm	1830 mm

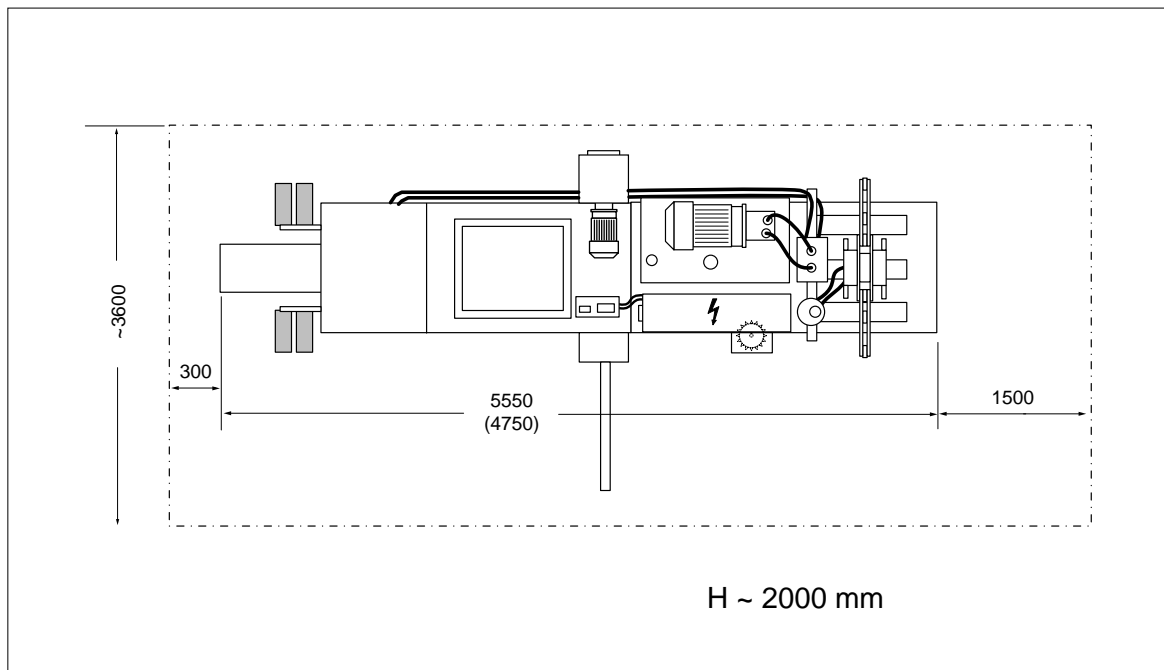
2.6.2 Feed opening

Width	:	620 mm	620 mm
Length	:	600 mm	1000 mm

2.6.3 Machine drawing



2.7 Space requirements



2.8 Total energy consumption and fuse protection (3 x 400 V / 50 Hz)

Total rated power P_n	:	10,57 kW
Total rated current I_n	:	24,1 A
Total fuse protection	:	35 A
Connector	:	CEE 63

(Values with oil cooler)

2.9 Noise emission values

The baling press HSM VK 12 has the following values for the sound pressure level according to DIN 45635 Part 27:

Idle running 1 m / 7 m *)	:	68 / 64 dB (A)
Full load 1 m / 7 m *)	:	76 / 72 dB (A)

*) The specified measuring distance is between measuring instrument and machine surface at the hopper.

3 Transport and installation

3.1 General information

We urgently recommend to have the installation work on the baling press performed by trained HSM staff.

We assume no responsibility for damage arising from incorrect installation work.

Do not start the installation work before having fully read and understood the Operating Manual.

3.2 Installation conditions

When planning the installation site (i. e. planning performed by the customer) it must be ensured that there is enough room around the baling press. This makes the installation and repair work easier. Machines connected to the baling press must be positioned accordingly.

The installation on the prepared foundation must be such that the baling press stands evenly. Level off the floor as necessary.

3.2.1 Operation outdoors



Warning!

Put into operation only under supervision.

The operator must ensure that unauthorized persons do not have access to the baling press.

When the baling press is not operated it must be shut down and secured against unauthorized use.

- the baling press must not be directly exposed to rain.
- the maintenance intervals must be reduced
- if the temperatures drop below 0°, use hydraulic oil with a suitable viscosity, if required.

3.3 Supply connections

The electric power is supplied via the central control cabinet with the electric cable with a CEE plug.

A suitable socket and electric power supply must be present at the installation site.

Attach a protection against rain water when the baling press is operated outdoors. The power supply must fulfill the requirements for installation outdoors. (additional FI protection)

3.4 Adjustments

The electrical and hydraulic adjustment of the various components is performed by HSM.



Caution!

Unauthorized modifications of the set values are not allowed and can result in severe damage to the machine.

In general, the first-time compression of the VK 12 has not been performed. A wooden frame in the press channel creates the counter pressure during the first-time compression. The wooden frame is pushed out of the press channel by the compressed material and must not be removed prematurely.

If not all assemblies have been installed, the respective assemblies must be assembled and connected before the final installation. In addition, the electrical and hydraulic values must be re-adjusted.

3.5 Degree of disassembly

The degree of disassembly of the channel baling press depends on the transport conditions, the local conditions and the available hoists. In general it is possible to disassemble the baling press into several assemblies. We recommend to transport the baling press as complete as possible.

The insertion cylinders are swivelled to the press chamber and secured in this position on the press chamber with fixing tapes. The press ram itself is fixed in its foremost position by its guides.

3.5.1 Loading weights

Complete baling press VK 12 /1000:	approx.	3500 kg
Complete baling press VK 12/600:	approx.	3000 kg
Press unit:	approx.	1750 kg (13)
Hydraulic aggregate with switch cabinet:	approx.	680 kg (1, 2, 3)
Press channel:	approx.	630 kg (4)

3.6 Transport

Proceed with particular care during the transport of the channel baling press to prevent damage caused by the application of force or careless loading and unloading. For loading and unloading, the whole channel baling press may be lifted with a hoist (crane or fork-lift) only at the pick-up points.



Warning!

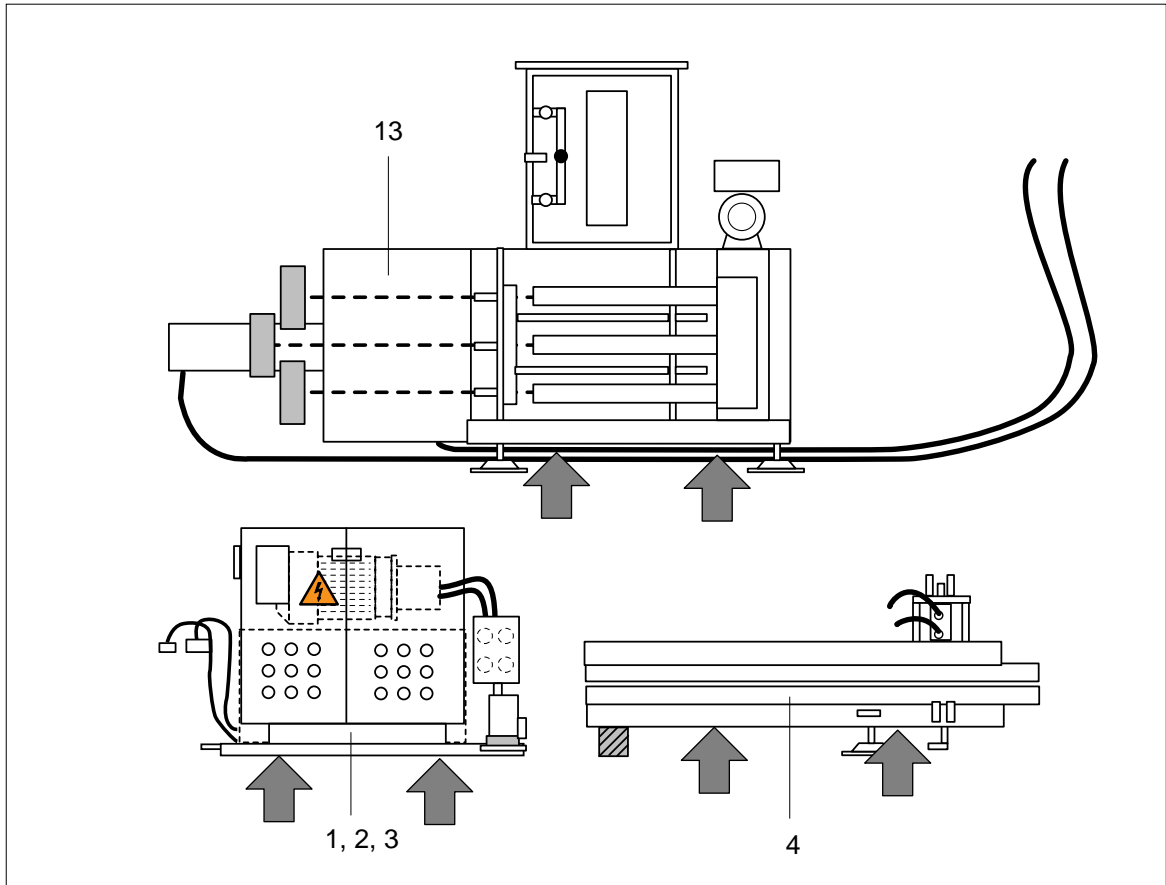
The allowed load of the hoist must be higher than the weight of the baling press resp. the particular components of the press.

By unloading from a lorry by means of a crane or a fork-lift observe balance!

If the baling press had been run-in already, the weight of the compressed material must be additionally considered.

The centre of gravity of the channel baling press or assembly must always be in the middle of the two pick-up points. If the two pick-up points are not on the same level, a spacer block must be placed below the higher pick-up point.

Check whether the connection from press chamber and press channel is stable. It must be impossible to fold down the press channel.



3.7 Assembly of the baling press

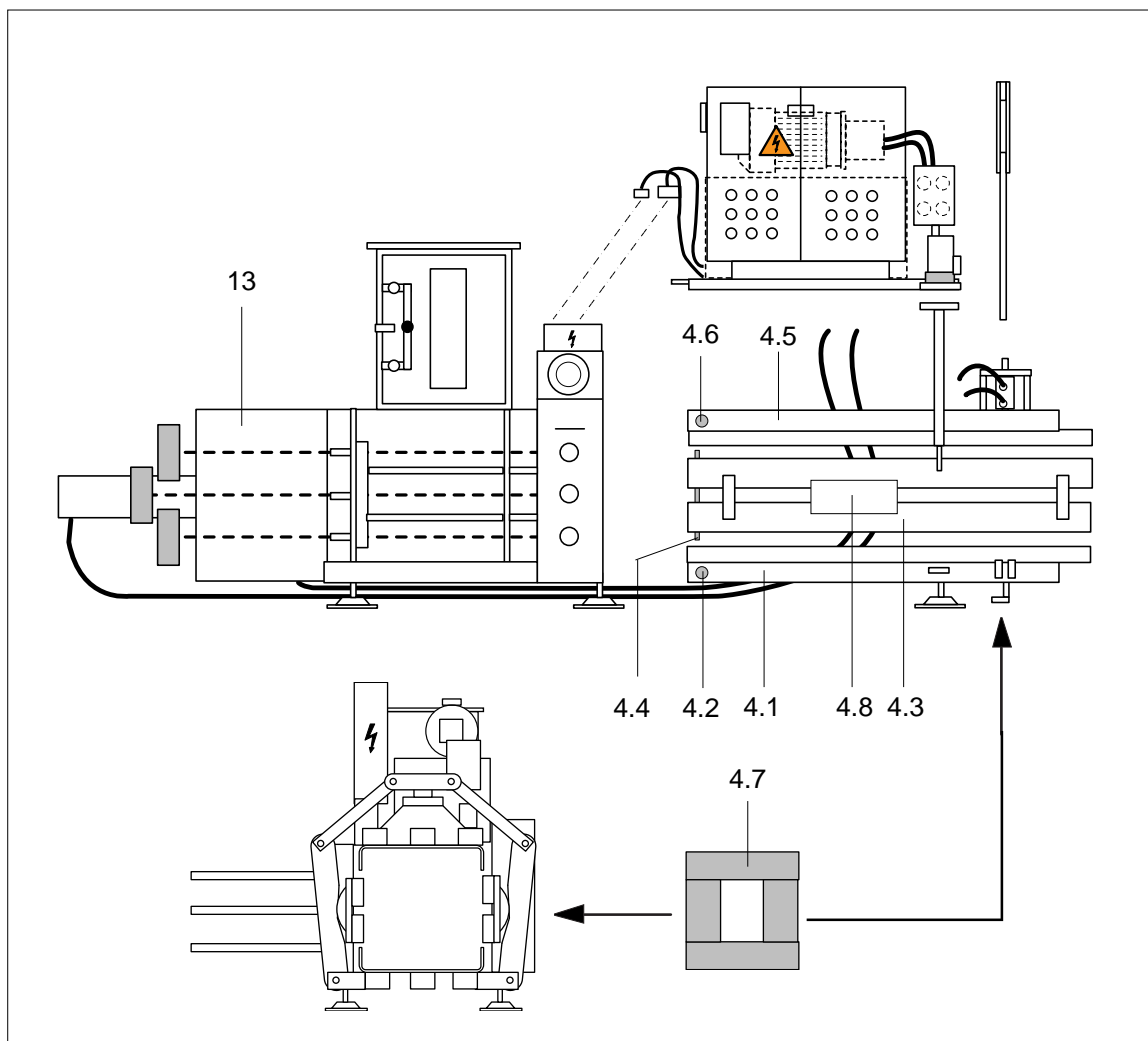


Notice

Remove the packaging material from the baling press and dispose of it in an environmentally friendly manner.

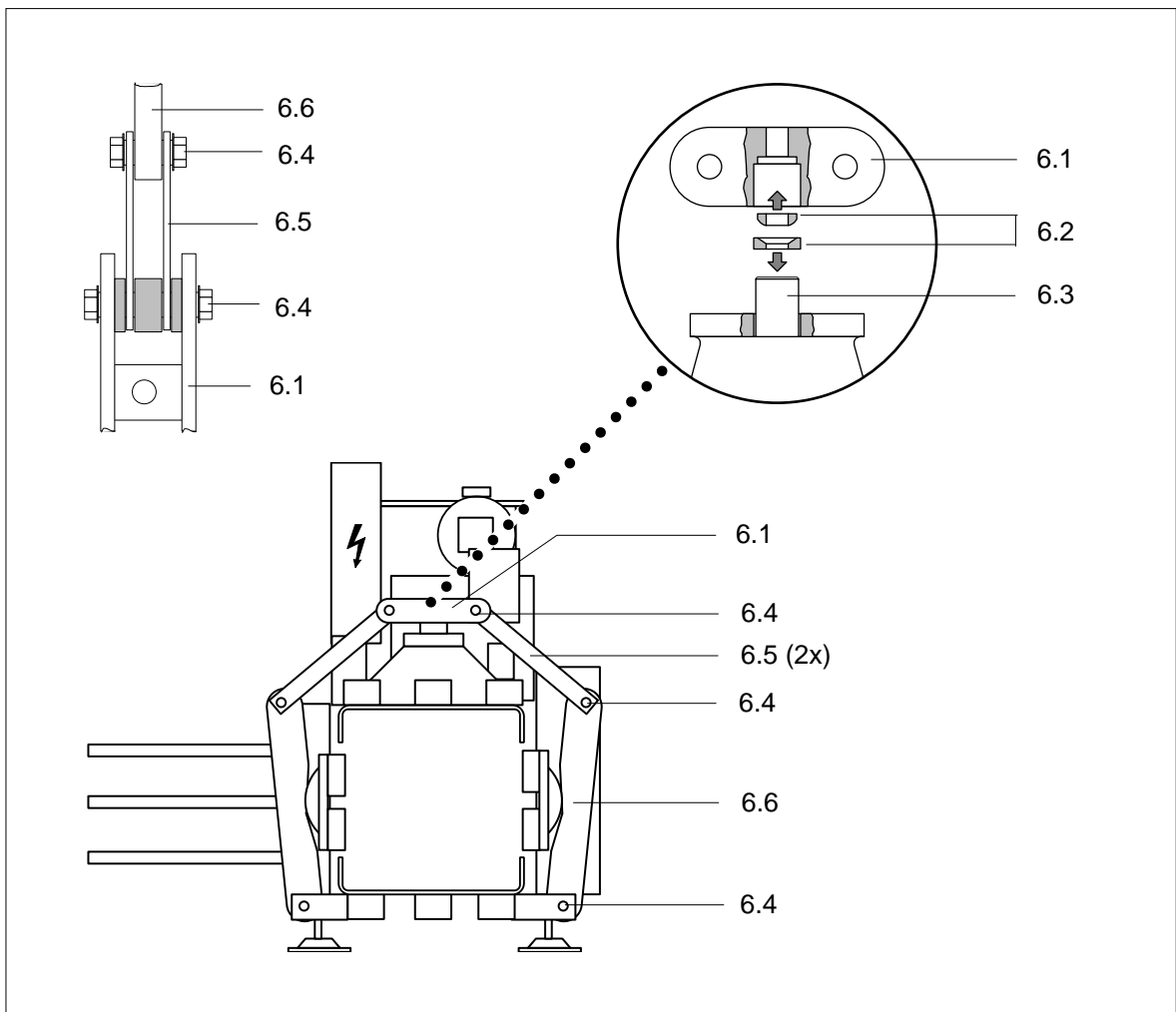
3.7.1 Assembling the press channel

- Position the press unit (13) on the foundation
- Level off the press unit horizontally (Machine legs are adjustable)
- Position the base (4.1) against the press chamber (13)
- Level off the base horizontally
- The lower press ram guides of press unit and press channel must be *parallel and horizontal*
- Push the bolt (4.2) through and secure it with screw and washer
- Position the side panels (4.3) against the left and right of the press chamber
- Push each a bolt (4.4) through and secure it with screw and washer
- Insert the wooden frame (4.7 - 640 x 480 mm) on the base of the press channel
- Carefully position the top section (4.5) on the press chamber using a fork-lift or crane
- Push the bolt (4.6) through and secure it with screw and washer
- Attach the protective cover for the counting wheel (4.8)



3.7.2 Assembling the press channel adjustment

- Insert spacers (6.2) for floating mounting between cross member (6.1) and piston rod (6.3)
- Put the cross member up on
- Mount the upper compacting bars (6.5), distance bushes and the cross member (6.1) and connect it with the bolt (6.4). Secure it with screw and washer.
- Mount the lateral compacting bars (6.6) and connect them with the bolt (6.4). Secure it with screw and washer.
- Put the lateral compacting bars (6.6) into the holder at the base of the press channel and connect them with the bolt (6.4). Secure it with screw and washer.



3.7.3 Assembling the wire insertion cylinders

For transport reasons the insertion cylinders are swivelled to the press chamber and secured in this position on the press chamber with fixing tapes.

- Loosen fixing tapes
- Swivel the insertion cylinders by 90° into working position and screw the frame to which the cylinders are fixed to the compression unit (tightening torque 100 Nm).
- Attach the safety cover

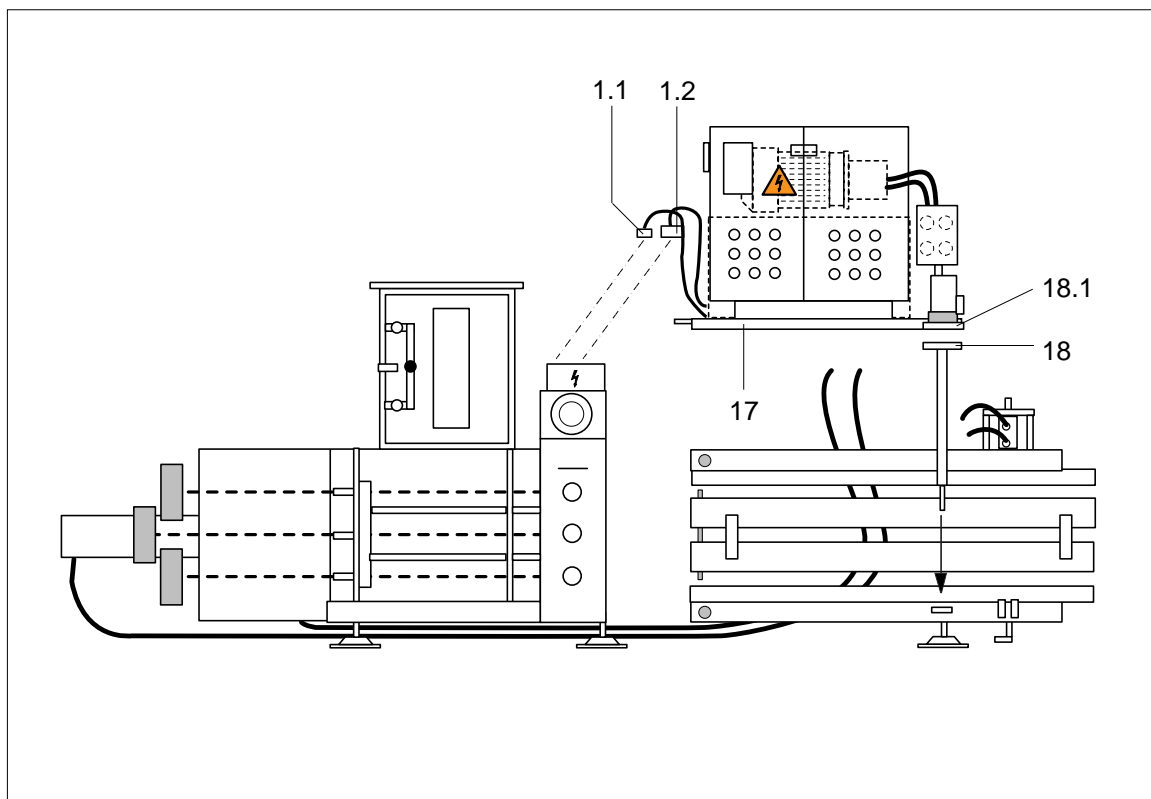
3.7.4 Assembling the driving carrier

- Lift the driving carrier (17) with a fork lift or a crane over the press channel
- Screw on the stays (18) to the cross bar (18.1) on both sides the driving carrier
- Lower the driving carrier and screw it to the press chamber (6 x M8)
- Level off the driving carrier with the adjusting screws at the stays
- Insert both plug-type connections (1.1, 1.2)



Warning!

Works on the electrical system and power supply must be carried out by trained electricians.



3.7.5 Assembling the hydraulic connections



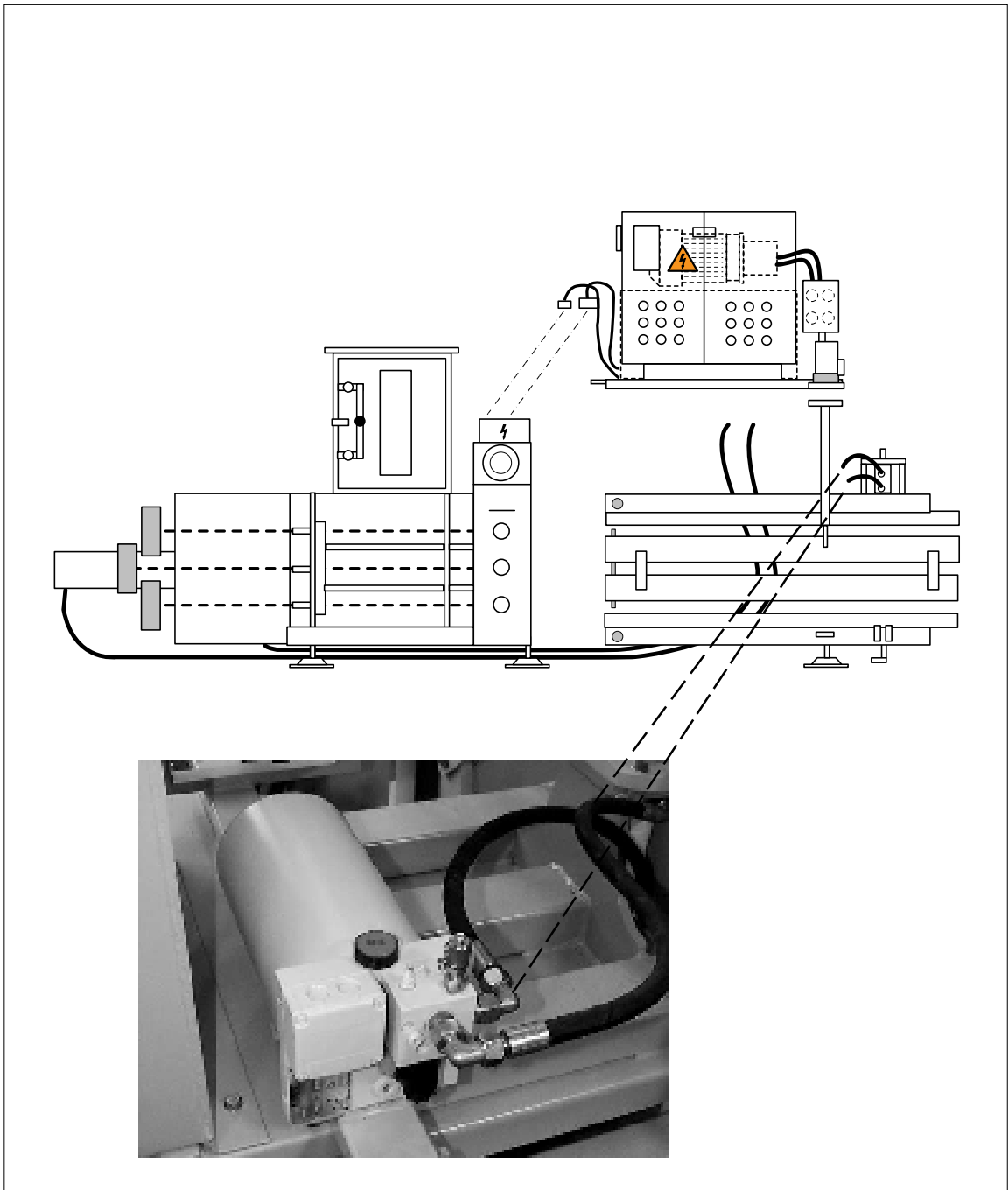
Notice

Observe hydraulic diagram.

3.7.5.1 Adjustment aggregate - Adjustment cylinder

ConnectionA - piston head side

ConnectionT - piston rod side



3.7.5.2 Valve block - Press cylinder

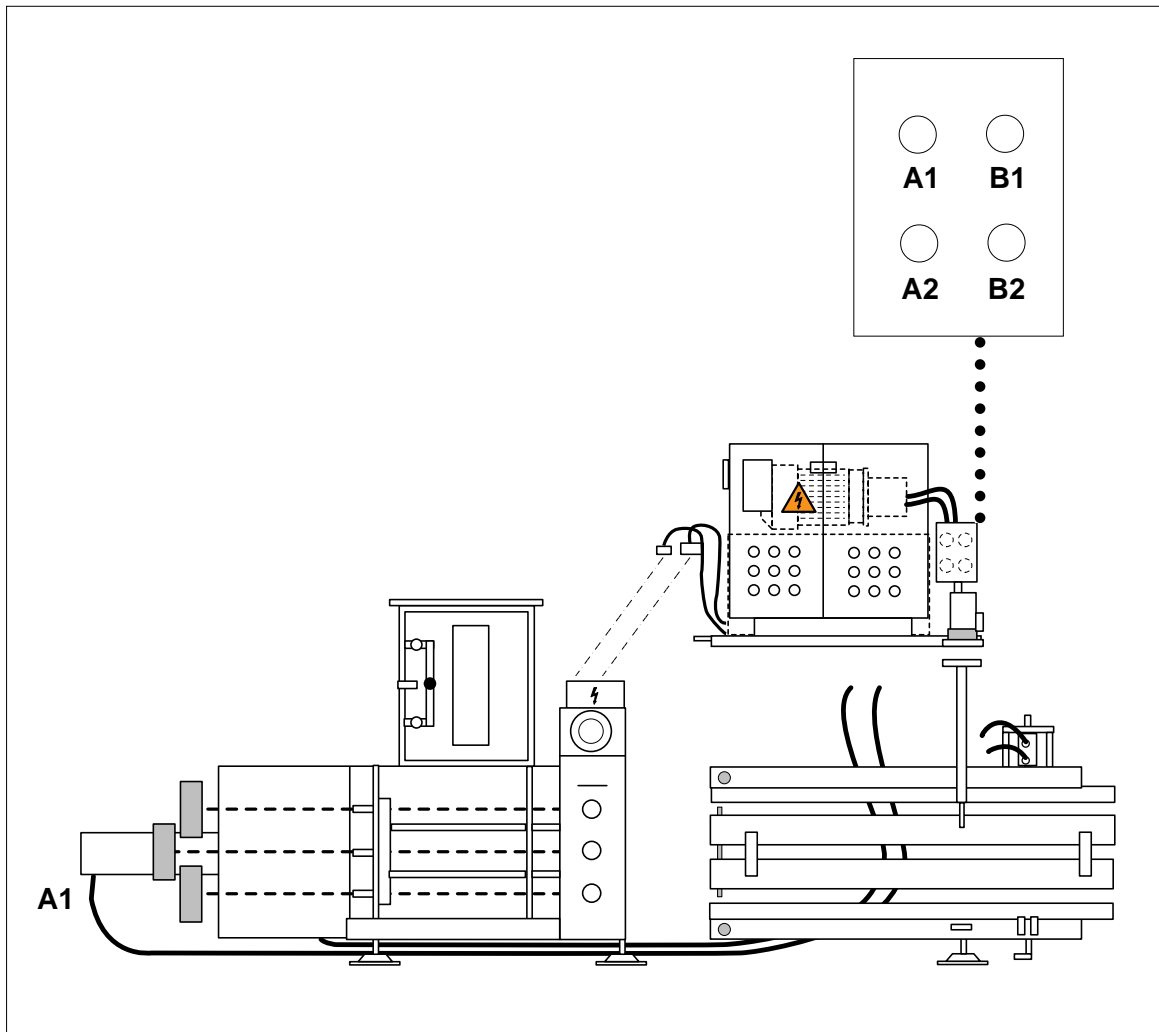
Connection A1 - piston head side

Connection B1 - piston rod side

3.7.5.3 Valve block - Wire insertion cylinders

Connection A2 - piston head side

Connection B2 - piston rod side



3.8 Checking after the assembly

- Check whether all hydraulic connections have been correctly connected.
- Make sure that no parts (accessories, spare parts, etc.) are in the baling press hopper.
- Check all screw connections for firm seat.

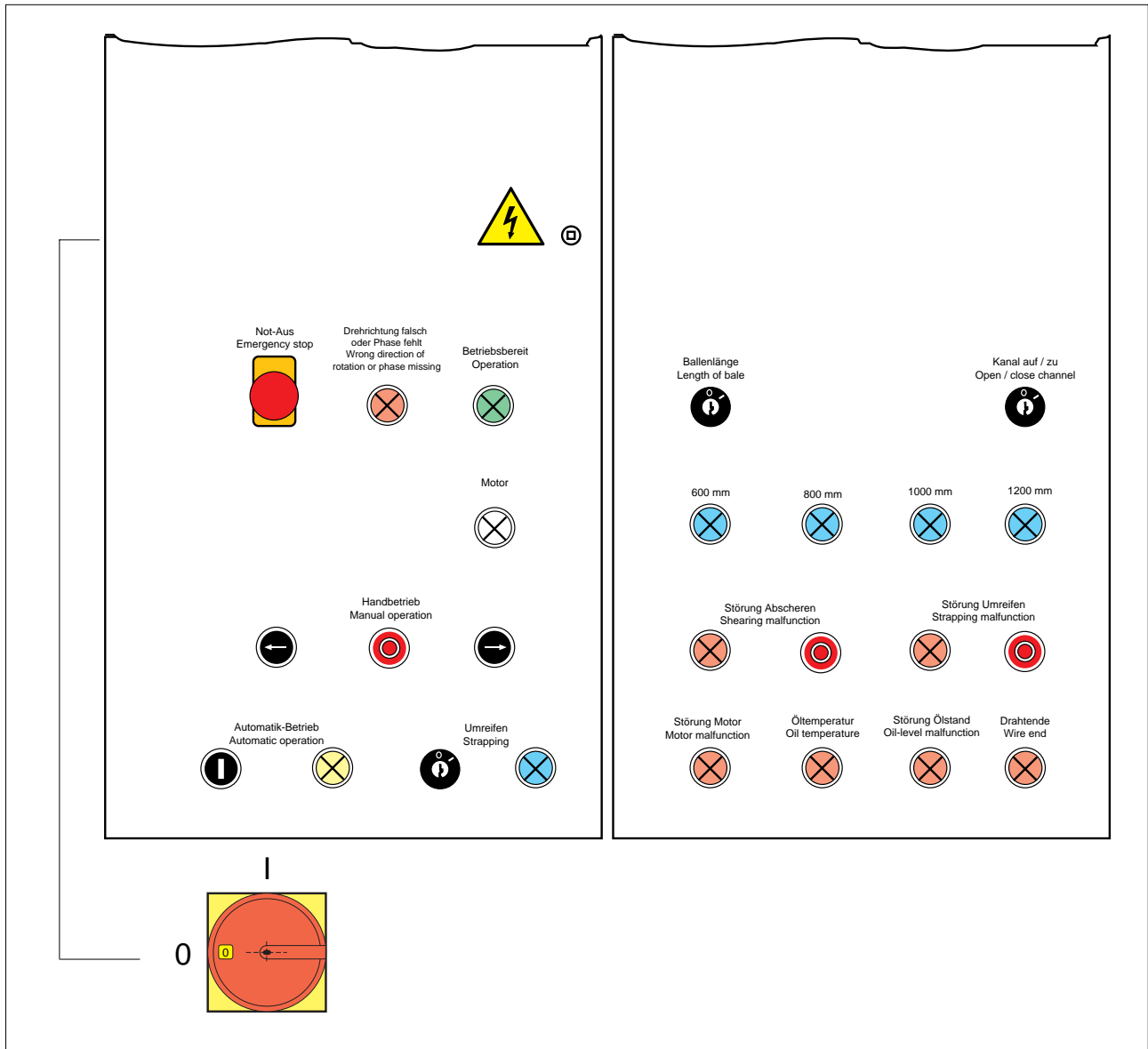


Warning!

Check whether all protective covers have been attached. Otherwise the machine may not be put into operation!

4 Operation

4.1 Description of operating and indicating elements



4.1.1 Main switch

- The main switch is switched on by turning it 90° to the right.
- The main switch can be locked in the "OFF" position with a padlock.

4.1.2 Emergency stop

- The "Emergency stop" button is released by pulling it out.
- Pressing the "Emergency stop" button causes the power circuit to be interrupted.
 - the baling press is switched off.

4.1.3 "Ready for operation" indicator light

The green indicator light lights up when the baling press is ready for operation.

- > The "Emergency stop" is not actuated
- > No interrupts of the safety circuit (protective covers, doors)
- > No faults are indicated

4.1.4 "Motor" indicator light

The white indicator light lights up when the motor is running.

4.1.5 "Strapping" indicator light

The blue indicator light lights, when the set bale length has been reached.

- the pressram stops in its foremost position
- the bale is strapped automatically.

4.1.6 Manual operation

- Press "*Forwards*" push-button (arrow *in* compression direction)
- Press ram moves forwards, automatically reverses and stops in its start position.
- Pressing the middle red push-button stops the movement of the press ram at any position; the movement can be continued by pressing the "*Forwards*" or "*Reverse*" push-buttons. In addition, the middle red push-button serves to switch from "*Automatic operation*" to "*Manual operation*".

4.1.7 Automatic operation

For the fully automatic operation of the baling press the "*Automatic*" on button must be pressed. Thereby the yellow indicator light "*Automatic operation*" comes up.

That means: the compression process runs automatically as long as the light barrier inside the hopper of the baling press are interrupted by compression material.

After the set bale length has been reached, the blue indicator light "*Strapping*" comes up.

4.1.8 Key-operated switch "Bale length"

The bale length indication comprises a key-operated switch and the four blue indicator lights for the four bale lengths. The respectively set bale length is optically indicated by the blue indicator light. Each time the key switch is turned, a different bale length is optically indicated (turn key switch to the right).

4.1.9 Key-operated switch "Open / close channel"

With the key-operated switch "*Open / close channel*" the cylinder of the press channel adjustment can be triggered manually.

Open channel -> cylinder will be retracted and the press channel is relieved (for maintenance or for emptying the press)

Close channel -> cylinder will be extended and the press channel is closed (to brace the wooden cross for reloading the press)

4.1.10 Key-operated switch "Strapping"

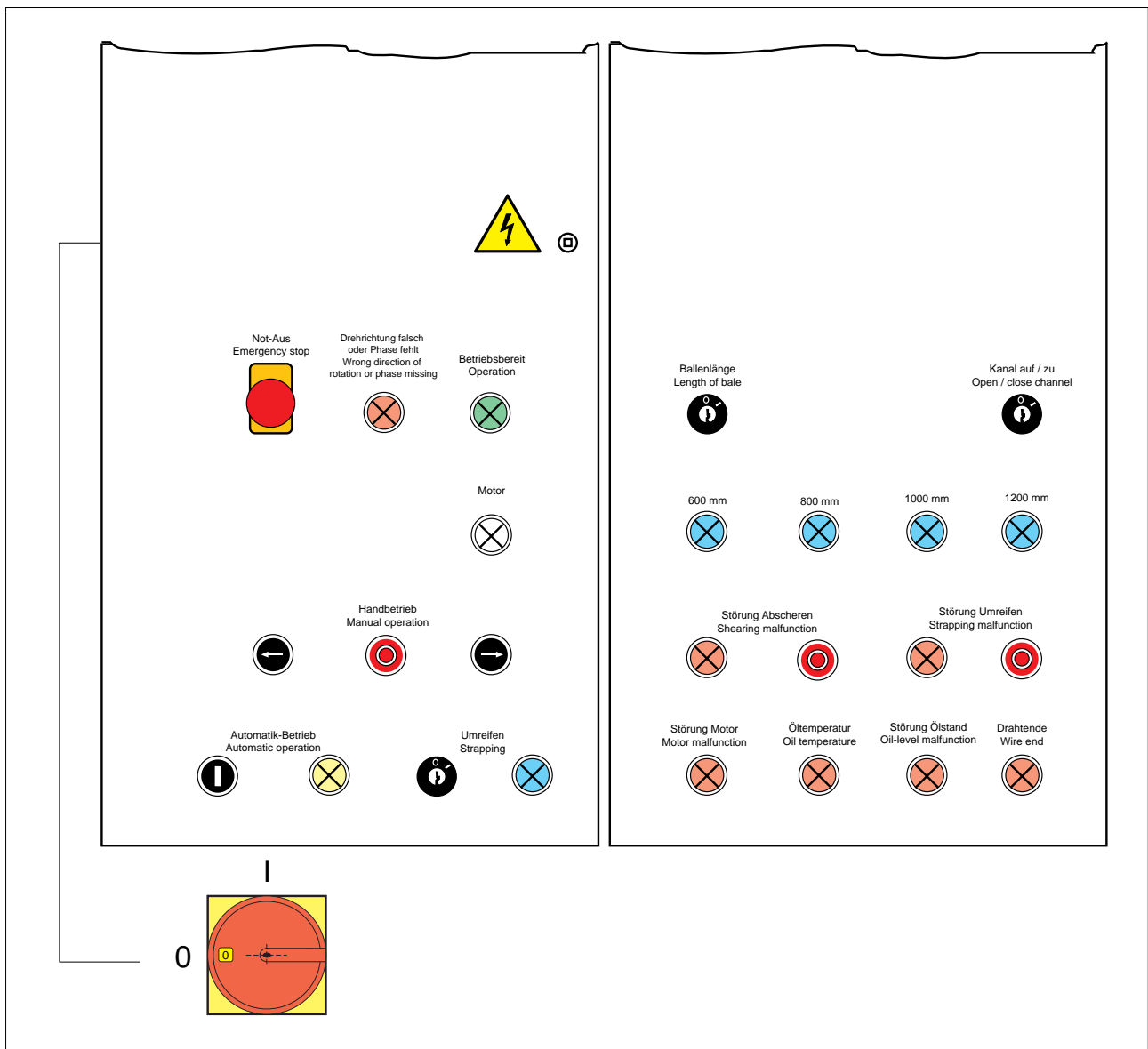
Even when the bale length has not yet been reached, the strapping process can be initiated with the "Strapping" key switch. Turn the "Strapping" key switch to the right.

- The blue indicator light "Strapping" lights. The strapping process can be cancelled by turning the "Strapping" switch again.

1. Press "Forwards" in manual operation.
2. The bale is strapped fully automatically, when the press ram is fully extended.
3. After strapping, the blue "Strapping" indicator light goes off again.

4.1.11 Malfunction messages

see chapter "Derangements / Trouble shooting"



4.2 Start-up

4.2.1 Check direction of rotation

- Insert the mains plug in the onsite socket
- Switch on the main switch
- If the phases of the electrical connection on site are not correct, this will be indicated by the indicator lights "*Wrong direction of rotation*" or "*Phase missing*".
- the baling press does not start.

1.) When the indicator light lights up **during start-up**:

- incorrect connection of phases
- Set the main switch to "0" and pull mains plug
- Two of the three phases marked L₁, L₂ and L₃ must be swapped by competent specialist staff (see wiring diagram)



Warning!

Failures on the electrical system and the power supply cables must be eliminated only by trained electricians or the HSM customer service.

- Insert the mains plug in the socket and switch on main switch

2.) When the indicator light lights up **after start-up**:

- the on-site fuse is defective
- Set the main switch to "0" and pull the mains plug
- Replace the fuse
- Switch on the main switch



Notice

The first-time operation of the baling press is made in "Manual operation".

- Press the "*Reverse*" pushbutton (arrow points **against** the compression direction)
- The press ram reverses and stops in its start position
- Press the "*Forwards*" pushbutton (arrow points **in** compression direction)
- The press ram moves forwards, automatically reverses and stops in its start position
- This b rances the wooden frame in the press channel

4.2.2 Running in the baling press



Notice:

We recommend to have the first-time compression performed by authorized HSM staff.

- Move the press ram into start position
- Unscrew the plug of the proximity switch at the counting wheel
- This deactivates the bale measuring system
- Fill hopper with compression material up to the shearing blades and start the baling press in "Manual operation"
- Continue to compress material until the allowed pressing power of approx. 120 - 130 bar is reached (see manometer on the valve block)
- the wooden frame is also inside the press channel
- Draw in the strapping wires (as described in chapter "Drawing in the strapping wires")
- Repeat this process until the wooden frame is ejected at the end of the press channel



Caution!

The wooden frame may be ejected suddenly from the press channel. It is therefore necessary to maintain a safety distance and isolate the danger zone.



Notice:

The first bales produced after reloading the baling press are not yet perfectly compressed and shaped. This material should be re-fed to the press and be pressed again.

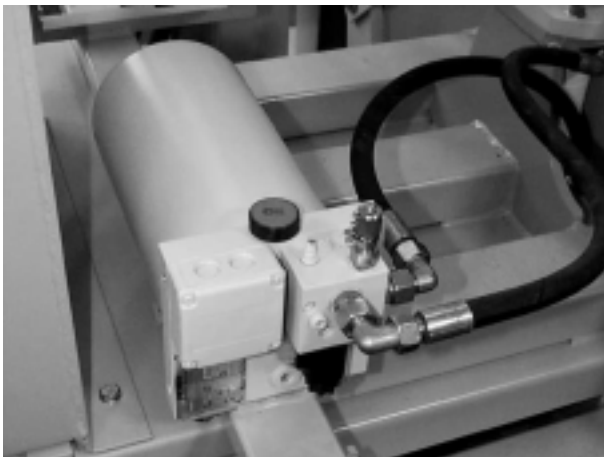
4.2.3 High pressure power unit

After shearing the press material is compacted and pressed into the conical press channel. The pressure of the press cylinder is controlled by pressure switches on the hydraulic control block. Opening and closing of the press channel depends on the pressing power.

Ex. for pressing cardboard:

Pressing power less than 190 bar - the high pressure power unit is triggered and the press channel closes.

Pressing power higher than 230 bar - the control valve at the power unit is activated and the press channel opens under the expansion pressure of the bale.



Basical adjustment

- Loosen the locking nuts
- Screw the throttle screws N and DR in all the way and then only unscrew the **DR**-screw for **1/8 - 1/4** of a turn.
- Tighten the locking nuts again.

The pressure control valve (screw DB) is set to 200 bar by the manufacturer. Depending on the type of material being compressed (friction) the opening speed of the press channel can be changed.

Screw in the DR-screw - press channel opens **more slowly**

Screw out the DR-screw - press channel opens **faster**

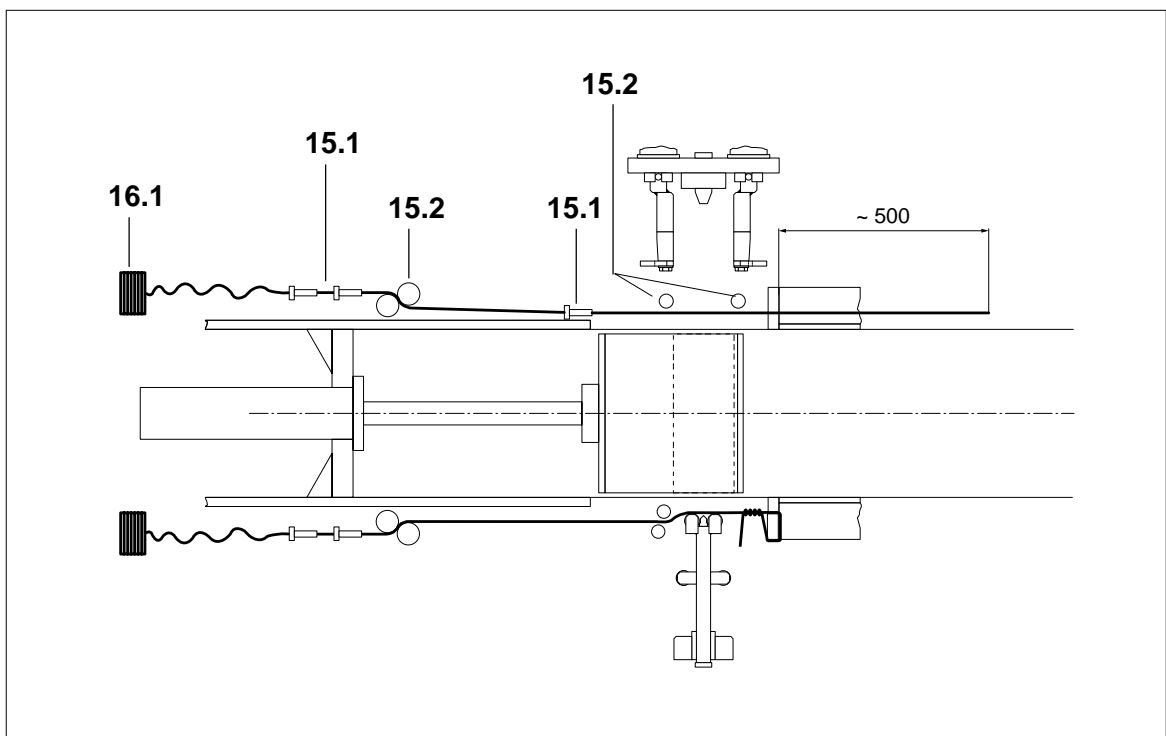
The press channel must open smoothly - not with a jolt!

There are two possibilities to relieve the conical press channel.

1. Actuate the key operated switch "**Open** / close channel" (Adjustment cylinder lowers)
2. Loosen the locking nuts and unscrew the throttle screws N and DR for approx. 1 turn. (Adjustment cylinder lowers)

4.3 Drawing in the strapping wires

- Make sure that the press channel is filled with compressed material
- Move the press ram into its start position and switch off the main switch
- Remove the safety covers on the twist and insertion side
- Loosen the wires which hold the wire rolls in the wire stations (16.1) together and pull out the wire end in the roll core
- Pull the wire end on both sides through the guiding devices (Guide bushes 15.1, guide rollers 15.2)
- Attach the wire end at the twisting side on the press, e.g. on the bolts which connect the press channel with the press chamber
- Let project the wire end at the opposite side approx. 500 mm
- Install the safety covers and switch on the main switch
- Connect the proximity switch of the counting wheel again
- Turn the "Strapping" key switch to the right and press the "Forwards" pushbutton to initiate the first twisting of the wires
 - The blue "Strapping" indicator light must light (if not, lift the counting wheel on the press channel and turn it by hand until the "Strapping" indicator light lights)
- Loosen and remove the wire ends which are attached on the press channel



4.4 Automatic compression

- Set the desired bale length with the key switch "Bale length"
- Press the "Automatic operation" pushbutton
 - The yellow indicator light lights

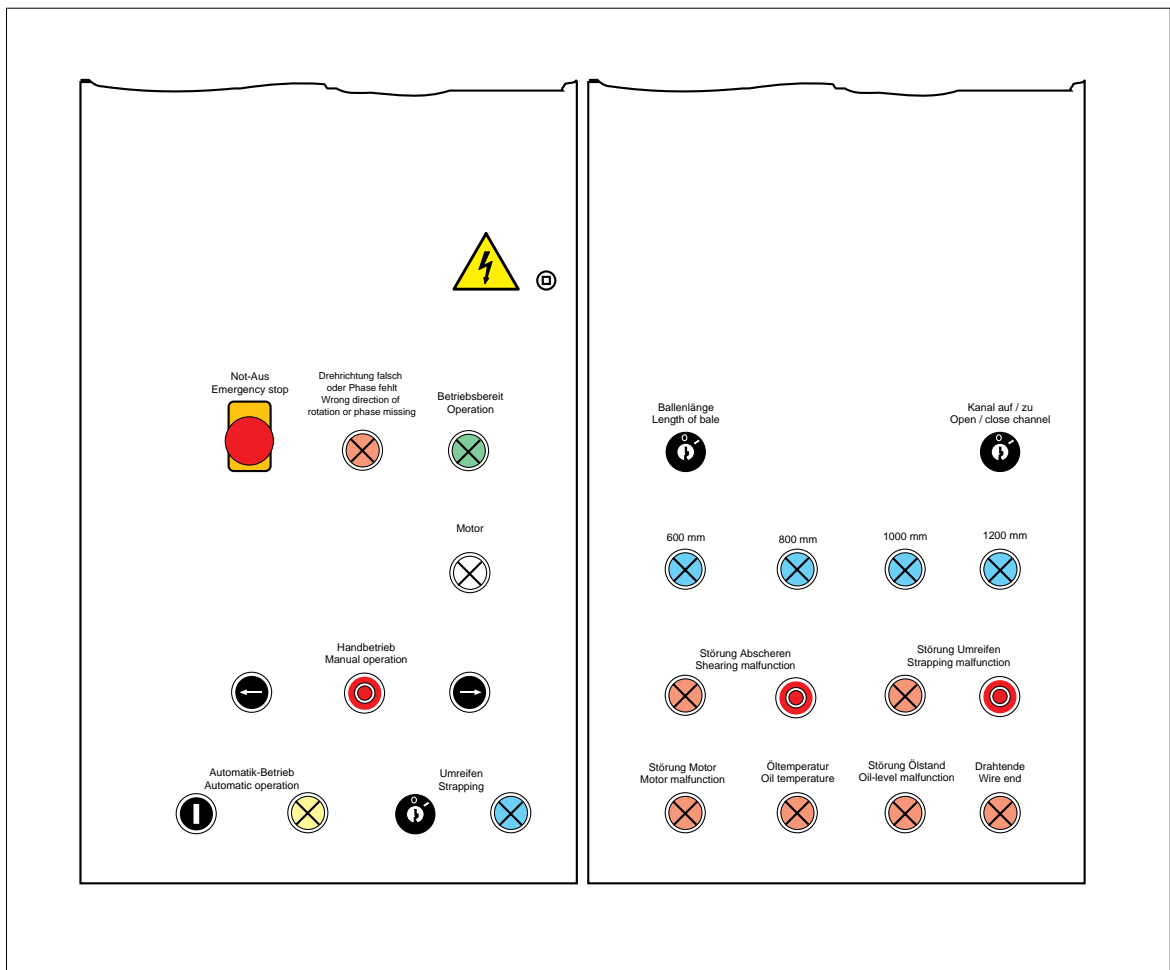


Notice:

If also the blue indicator light ("Strapping" signal) also lights, the signal can be reset with the middle red pushbutton "Manual operation"

- You can now start the continuous loading of the baling press

The press ram automatically moves forwards and backwards as long as the beam of the light barrier is interrupted by compression material. After the selected bale length has been reached, the blue indicator light "Strapping" lights, the press ram stops in its foremost position and the bale is strapped fully automatically.

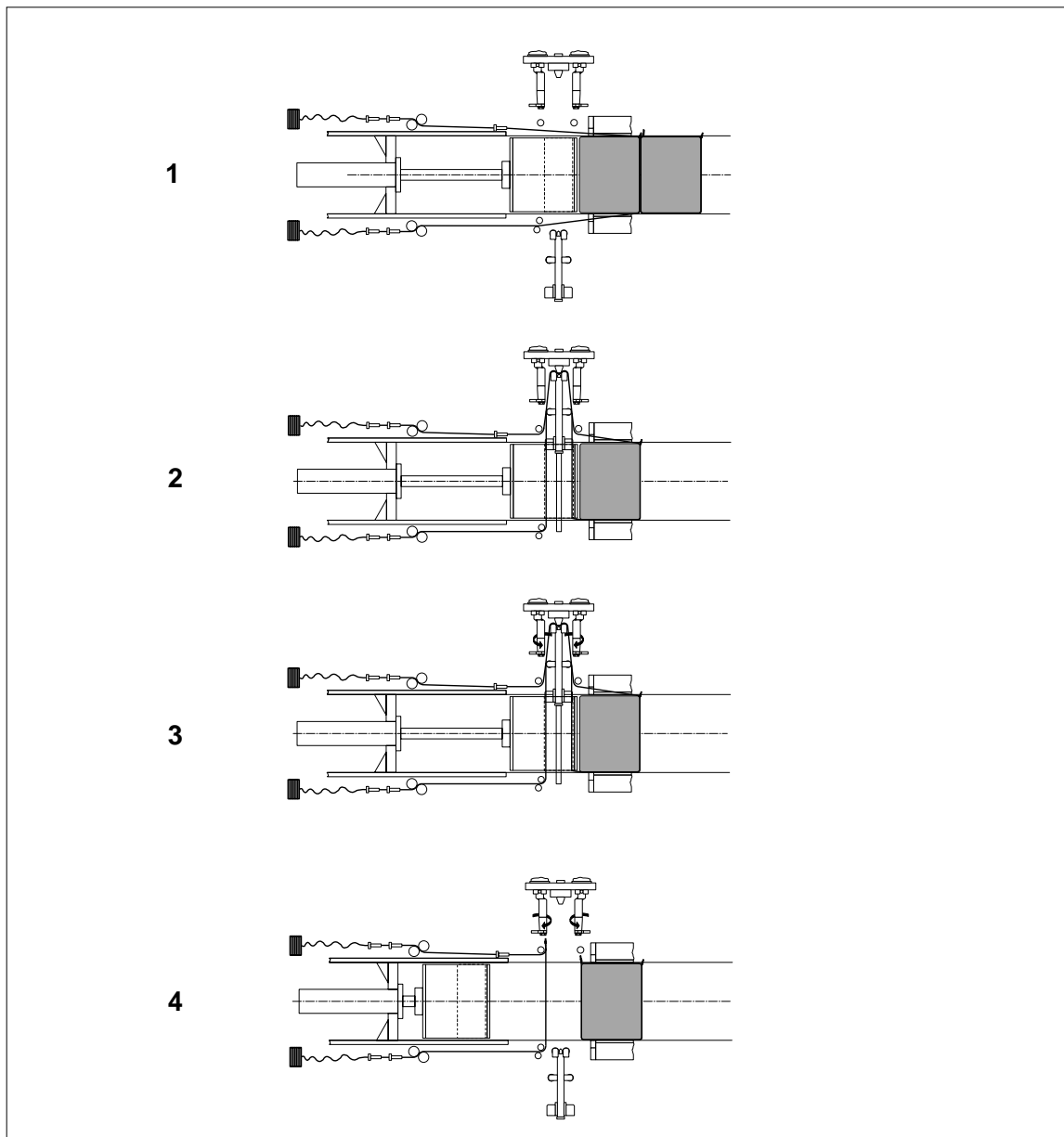


4.5 Strapping procedure

The strapping is initiated by the counting wheel both in manual and fully automatic operation. In manual operation, e.g. for the first-time compression or during maintenance, strapping is initiated via the "Strapping" key switch.

When the blue "Strapping" indicator light lights, the bale is strapped fully automatically when the press ram stops in its foremost position:

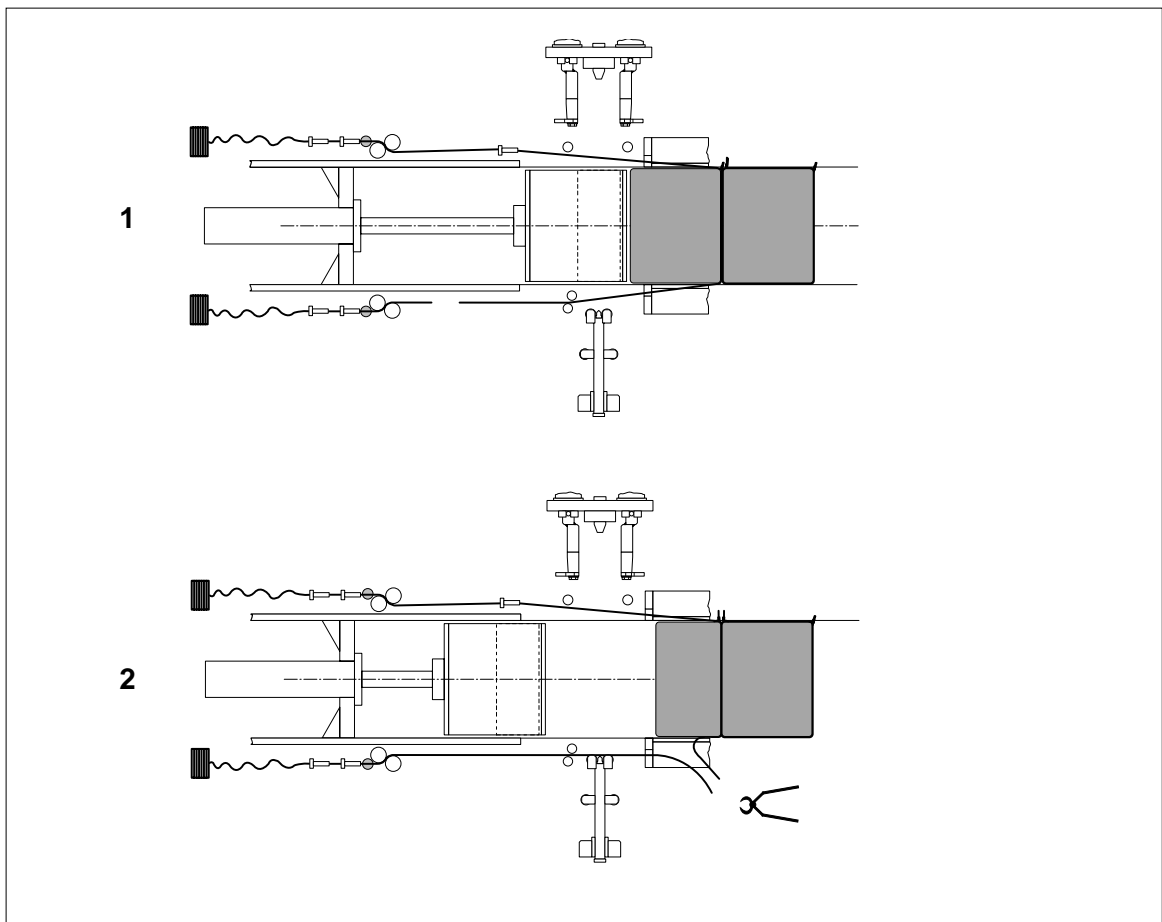
- 1.) The needle heads push the wire from one side to the other, i.e. the wires to be connected move towards each other
- 2.) The wires are then automatically cut and twisted immediately
- 3.) The needle heads and the press ram move back into their start position
- 4.) The twisting fingers turn back a few times and eject the twisted wire ends



4.6 Wire end

When the baling press is equipped with an electrical "Wire end function" the red indicator light "Wire end" lights up if there is no wire sensed by the relevant proximity switch in the wire brake.

- The press stops in the starting position and switches to "Manual mode".
 - Switch off main switch
 - Insert new wire coil and pull the beginning of the wire through the wire brake
 - Remove the protection caps
 - Pull the new wire through the guides to the beginning of the press channel
 - Twist the ends of the wire using pliers
 - Reinstall the protection caps
 - Switch on main switch
 - Press "Automatic ON" push-button



4.6.1 Accessories

Strapping wire \varnothing 2,8 mm

Art.-No.: 6 240 993 500

4.7 Shutdown



Caution!

Never shut down the baling press **during** the strapping process !

Exception: emergency -> switch off via "Emergency stop"

Before switching off the baling press, always return it to the starting position in order to allow the piston rods of the wire insertion cylinders to retract into the cylinders. Otherwise there is a risk that the piston rods will be damaged by the compression material as it re-expands.

Starting position:

- Move press ram into rearmost position
- Switch off main switch by turning it 90° counter-clockwise and secure it with a padlock, if necessary

4.8 Derangements / trouble-shooting

The listed malfunction messages and causes describe malfunctions which could occur during the general operation of the channel baling press with fully automatic strapping. They depend, however, on the version of the channel baling press.



Notice

We urgently recommend a lockable local switch which prevents the unintentional switching on of the machine during maintenance or malfunctions. In addition, reference is made to the relevant accident prevention regulations of the vocational cooperative society.

4.8.1 Wrong direction of rotation / phase missing

- Insert the mains plug in the onsite socket
- Switch on the main switch
- If the phases of the electrical connection on site are not correct, this will be indicated by the indicator lights "Wrong direction of rotation" or "Phase missing".
 - the baling press does not start.

1.) When the indicator light lights up **during start-up**:

- incorrect connection of phases
 - Set the main switch to "0" and pull mains plug
 - Two of the three phases marked L₁, L₂ and L₃ must be swapped (see wiring diagram)



Warning!

Failures on the electrical system and the power supply cables must be eliminated only by trained electricians or the HSM customer service.

- Insert the mains plug in the socket and switch on main switch

2.) When the indicator light lights up **after start-up**:

- the on-site fuse is defective
 - Set the main switch to "0" and pull the mains plug
 - Replace the fuse
 - Switch on the main switch

4.8.2 "Operation" indicator light does not light

Cause

- Inspection door/loading flap open
- Main switch not switched on
- Emergency-off pressed
- Protective cover with safety switch not attached correctly or defective
- Oil temperature too high
- Motor temperature too high
- Motor protection relay jumped out
- (• Rip cord pulled

Action

- Close inspection door/loading flap
- Switch on main switch
- Pull out Emergency stop
- Attach correctly or repair protective covers
- Allow to cool down
- Allow to cool down, inform customer service, if required
- Consult qualified electrician
- Press switch)

4.8.3 "Motor" malfunction

This malfunction occurs e.g. when the oil temperature is too high or the cooler is defective.

- The red indicator light lights (motor protection relay or protective motor switch were initiated automatically)
- Set main switch to "0"
- Press the unlocking pushbutton (see wiring diagram, pump motor, hydraulic unit, press channel adjustment or twisting unit motor)
- The protective motor switches are in the upper section of the control cabinet (consult electrician, if necessary)
- Close control cabinet, switch on the main switch and press "*Automatic operation*" pushbutton

Consult an electrician or call for our customer service when this malfunction occurs frequently.

4.8.4 "Strapping" malfunction

Malfunction message: red indicator light "*Strapping malfunction*" lights
(strapping was not terminated or took too long)

Causes:

- Guide of insertion cylinders in press ram is jammed by material
 - Switch the main switch off
 - Remove jammed material
- The mechanical actuation of the limit switches on the twisting side is soiled
 - Switch the main switch off
 - Remove protective cover
 - Clean the soiled points

Malfunction message: red indicator light "*Strapping malfunction*" blinks

Cause:

- Proximity switch of the insertion cylinder on the cylinder side is defective
 - Make sure that the cylinders are in their start position
 - Switch the main switch off
 - Screw off the proximity switch (if the red indicator light does not go off, the proximity switch is defective: distance between proximity switch and metal approx. 1 mm)
 - Replace the proximity switch (observe the same distance)
 - Cancel the malfunction signal with the red pushbutton "*Strapping malfunction*"
 - Press *the "Automatic operation" pushbutton*

4.8.5 "Shearing" malfunction

If the shearing pressure is not sufficient, the press ram will automatically reverse after some time.

- "Automatic operation" is switched off
- The red indicator light "Shearing malfunction" lights up
- Set the main switch to "0"
- Open the inspection door and remove excessive compression material in the hopper
- Reset the malfunction signal with the red "Shearing malfunction" push-button
- Switch on the main switch and press "Automatic operation"
- If this malfunction occurs frequently, the light barrier in the hopper must be set to a lower position (i.e. pressing starts earlier and the shearing pressure is reduced).



Note

A malfunction signal causes the automatic switch-over from "Automatic operation" to "Manual operation" (orange indicator light goes off). Switch to "Automatic operation" when the malfunction has been eliminated.

4.8.6 "Oil level" malfunction

If the oil level is too low this will be signalled by the red "Oil level" indicator light (the green "Operation" indicator light goes off).

- Check whether oil leaks and repair damage, if required
- Top up with sufficient oil
- The baling press is ready for operation again when the red "Oil level" indicator light goes off
- Continue operation of the baling press after having pressed the "Automatic operation" pushbutton

4.8.7 "Oil temperature" malfunction

If the red indicator light "Oil temperature malfunction" lights when the oil temperature is too high (approx. 80°C) this may be caused by the following:

- Ambient temperature too high (install oil cooler, if necessary)
- Too many shearing malfunctions (check material feeding)
- Extreme disregard of oil change intervals (perform oil change)

5 Inspection and maintenance work

5.1 General information

- Observe the "Safety" section when performing maintenance and control work.
- Breakdowns caused by inadequate or improper maintenance can cause high repair costs and long standstill periods of the channel baling press. Regular maintenance is therefore indispensable.
- In addition to other factors, proper maintenance is also decisive for the operational safety and the service life of the channel baling press.
- As a result of the different operational conditions it cannot be determined in advance how often wear check, inspection, maintenance and repair must be performed. An appropriate inspection routine must be determined on the basis of your operational conditions.
- Our customer service specialists will be glad to assist you with further advice.
- Maintenance work may be performed only by our specialist staff or by specially instructed personnel.
- All inspection and maintenance tasks refer to single-shift operation (the intervals must be reduced in multi-shift operation). A complete overhaul of the channel baling press must be performed at least every two years.
- Check all mechanical wearing parts (rollers, shearing blades, etc.) for correct function every *3 months*
- Check all lines, hoses and connections for leakage and visual evidence of damage before starting to work

***Danger!***

*Repair any damage without delay!
Spurting oil can cause injuries and fires!*

Caution!

Repair and maintenance work on the electrical installations or the control cabinet may only be carried out by a qualified electrician or by our customer service!

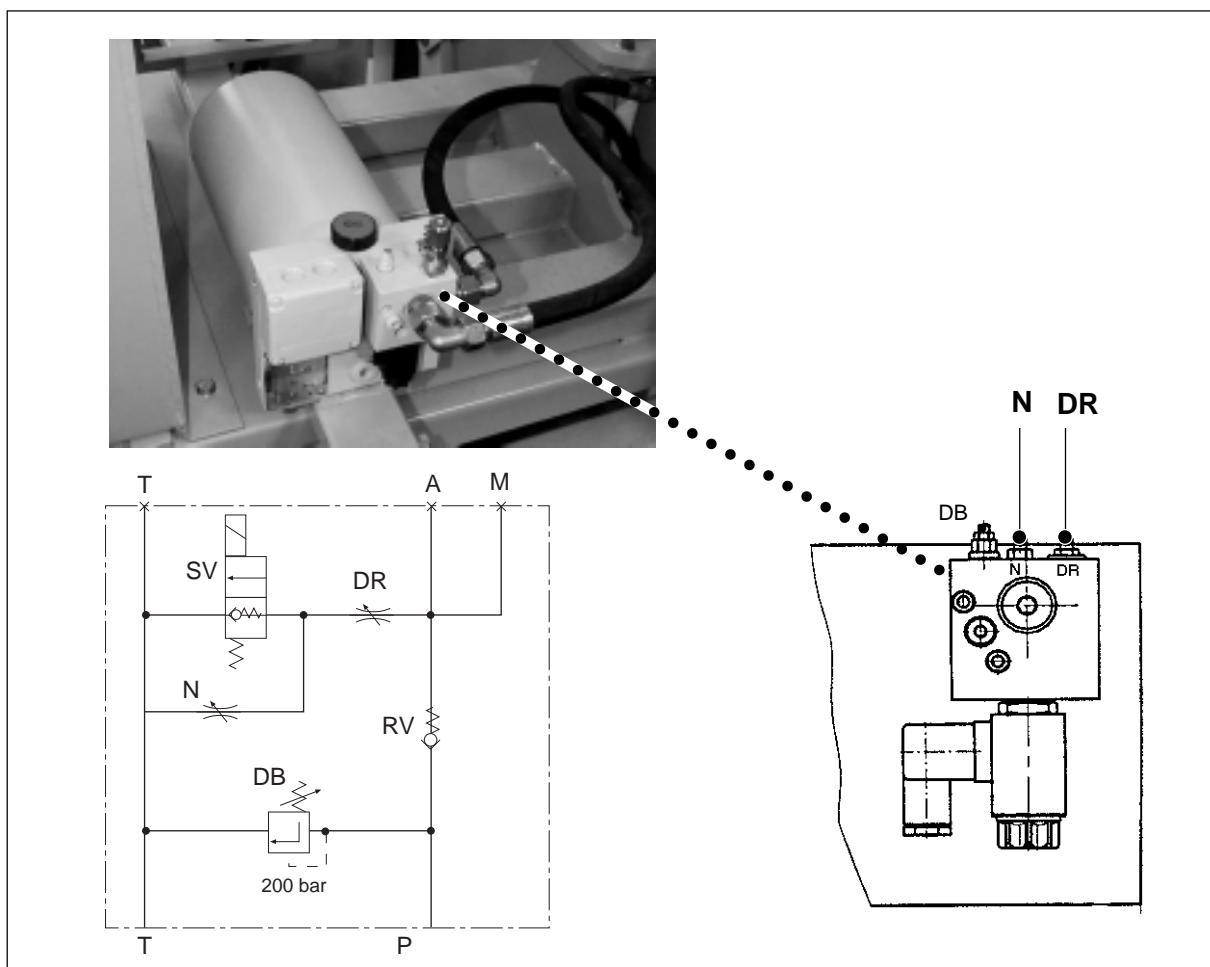
5.2 High pressure power unit

After shearing the press material is compacted and pressed into the conical press channel. The pressure of the press cylinder is controlled by pressure switches on the hydraulic control block. Opening and closing of the press channel depends on the pressing power.

Ex. for pressing cardboard:

Pressing power less than 190 bar - the high pressure power unit is triggered and the press channel closes.

Pressing power higher than 230 bar - the control valve at the power unit is activated and the press channel opens under the expansion pressure of the bale.



Basical adjustment

- Loosen the locking nuts
- Screw the throttle screws N and DR in all the way and then only unscrew the DR-screw for 1/8 - 1/4 of a turn.
- Tighten the locking nuts again.

The pressure control valve (screw DB) ist set to 200 bar by the manufacturer.

Depending on the type of material being compressed (friction) the opening speed of the press channel can be changed.

Screw in the DR-screw - press channel opens **more slowly**

Screw out the DR-screw - press channel opens **faster**

The press channel must open smoothly - not with a jolt!

5.2.1 Relieving the press channel

There are two possibilities to relieve the conical press channel.

1. Actuate the key operated switch "**Open** / close channel" (Adjustment cylinder lowers)
2. Loosen the locking nuts and unscrew the throttle screws N and DR for approx. 1 turn. (Adjustment cylinder lowers)

5.2.2 Oil change (high pressure power unit)

Checking interval: every six months (oil dip rod)

Changing interval: every 2 years



Notice

Observe the environmental protection regulations when disposing of waste oil.

Never mix hydraulic oil and cleaning agent mixtures with waste oil

Always collect these substances in separate containers and dispose of them according to the regulations.

Observe the accident prevention regulations of the German employers' liability insurance association when handling cleaning agents and solvents.

Relieve the press channel adjustment cylinder before you begin an oil change or repair works.

- Lower adjustment cylinder completely -> actuate the key operated switch "**Open** / close channel"
- Drain pressure fluid completely via oil drain
- Top up new pressure fluid until the required oil level is reached (dip rod)
(Filling volume approx. 3 l)



Notice

Fill only with unused and clean hydraulic oil of the same make and same type.

Oil type: Hydraulic oil according to DIN 51524-T3
Multigrade oil HVLP 46 (DIN 51502)
ISO viscosity class ISO VG 46 (DIN 51519)

5.3 Main hydraulic unit

The hydraulic oil level is monitored automatically via a float switch in the oil level gauge. If the oil level becomes too low, the red indicator light "*Oil level malfunction*" comes on.

5.3.1 Checking the oil level

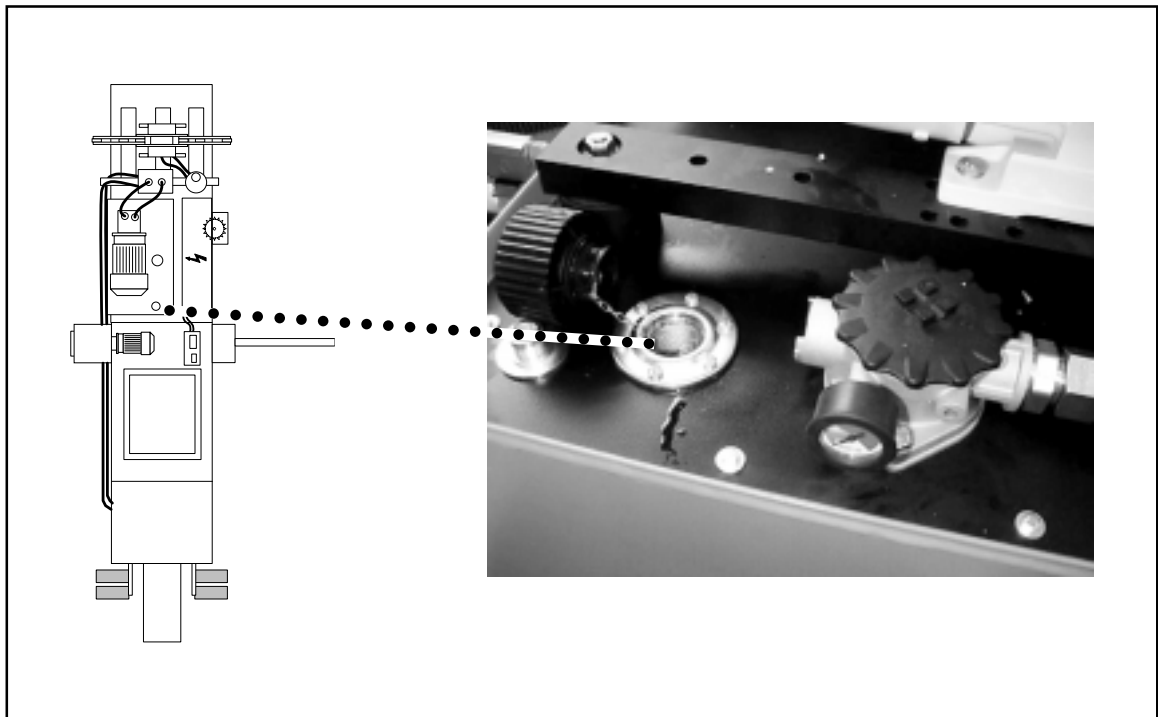
- Advance the press ram into its foremost position
- in this position, the float should be right at the top of the oil gauge

5.3.2 Topping up the oil

- Switch main switch to "0" and lock
- Unscrew the venting filter lid
- Top up oil

Oil type: Multigrade oil HVLP 46 according DIN 51524-T3

- Screw the venting filter lid back on again
- Check the oil level again



5.3.3 Oil change

**Notice**

Observe the environmental protection regulations when disposing of waste oil.

Observe the accident prevention regulations of the German employers' liability insurance association when handling cleaning agents and solvents.

*Never mix hydraulic oil and cleaning agent mixtures with waste oil
Always collect these substances in separate containers and dispose of them according to the regulations.*

Change the hydraulic oil **at least every 2 years!**

- Move the press ram backwards
- Switch off the main switch
- Position a suitable container to collect the hydraulic oil below the oil drainage screw or use an oil suction aggregate
- The tank contents of the hydraulic oil tank is 280 l
- Screw off the oil drainage screw on the side of the oil tank with an Allen wrench and collect the oil with the container
- Screw off the venting filter lid
- Clean the hydraulic oil tank if it is severely soiled
- Screw the oil drainage screw back on again
- Fill the tank with oil until the float is right at the top of the oil gauge.
- Move the press ram forwards and backwards several times and check the oil level again with the press ram in foremost position
- Check the venting filter lid once a month for contamination and permeability of air
- Screw the venting filter lid back on again
- Switch on the baling press
- indicator light "Oil level malfunction" may not light

5.3.4 Cleaning the hydraulic oil tank

- Screw off the hexagon screws on the tank and remove the seal
- Clean the inside of the hydraulic oil tank and remove any oil sludge
- Re-install the oil drainage screw, replace the tank cover seal and install the tank cover

5.5 Changing the hydraulic oil filter element

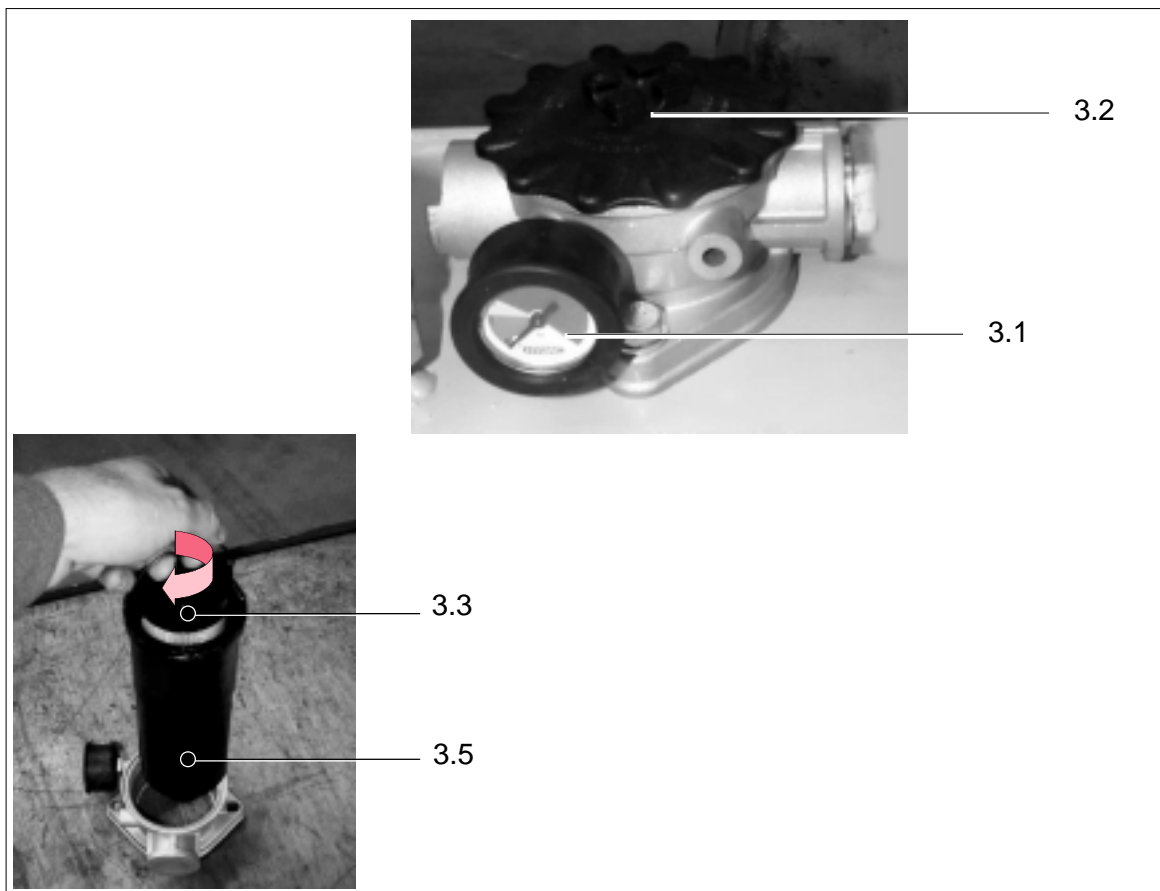
The return filter is mounted on the hydraulic oil tank. The contamination of the filter element is indicated via a pressure gauge (3.1) on the hydraulic filter.



Notice:

If the indicator needle moves into the red area, the filter element must be replaced.

- Switch off the main switch
- Unscrew the star-shaped filter lid (3.2)
- First press down the filter cartridge (3.3) and turn it in clockwise direction until the bayonet catch at the bottom of the filter cartridge has caught the filter cup (3.5)!!
- Then: Pull out filter cartridge together with the filter cup, otherwise the dirt will drop into the tank.
- Turn the filter cartridge (3.3) approx. 1/4 turn counter-clockwise and pull it out of the filter cup (3.5).
- Clean the filter cup and screw in a new filter cartridge until the bayonet catch has locked into place.
- Subsequently remount the complete filter cup and tighten the filter lid.



Only use filter elements **0165/3R020 BN-2** !

5.4 Shearing blades

5.4.1 Checking the blade clearance

- Move press ram forward in manual mode until the shearing blades of the press chamber and the press ram are positioned one above the other.
- Switch off main switch and open the inspection door
- Check the shearing blades for damage and replace them if necessary
- Check the blade clearance with a feeler gauge

Tolerance for blade clearance: 1 - 1.5 mm

- If the blade clearance exceeds the permitted tolerance, it must be readjusted.



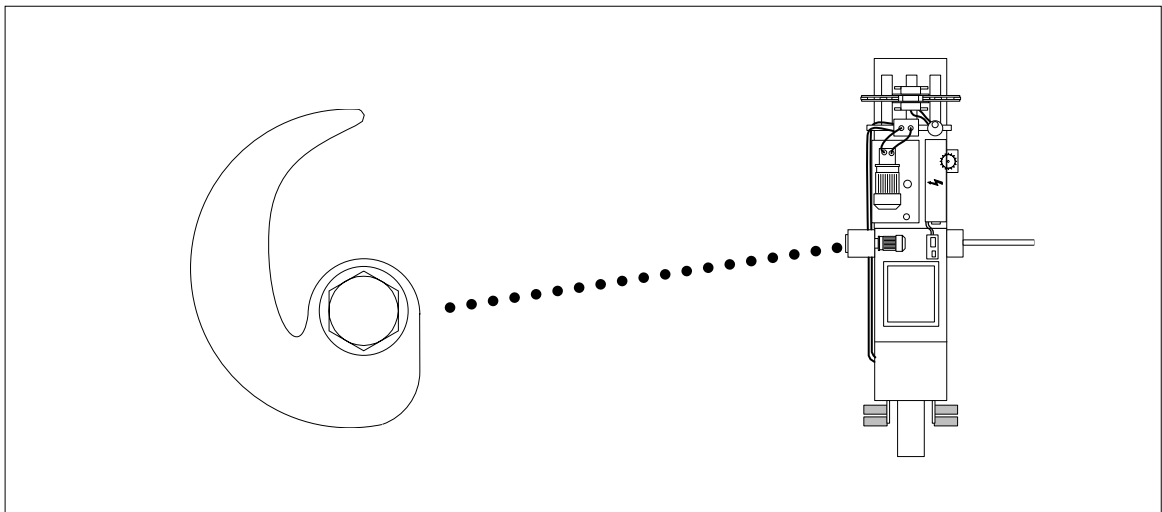
Notice

We recommend HSM staff for performing adjustments, replacing wearing parts or making repairs.

5.5 Twisting unit

5.5.1 Changing the twisting disks

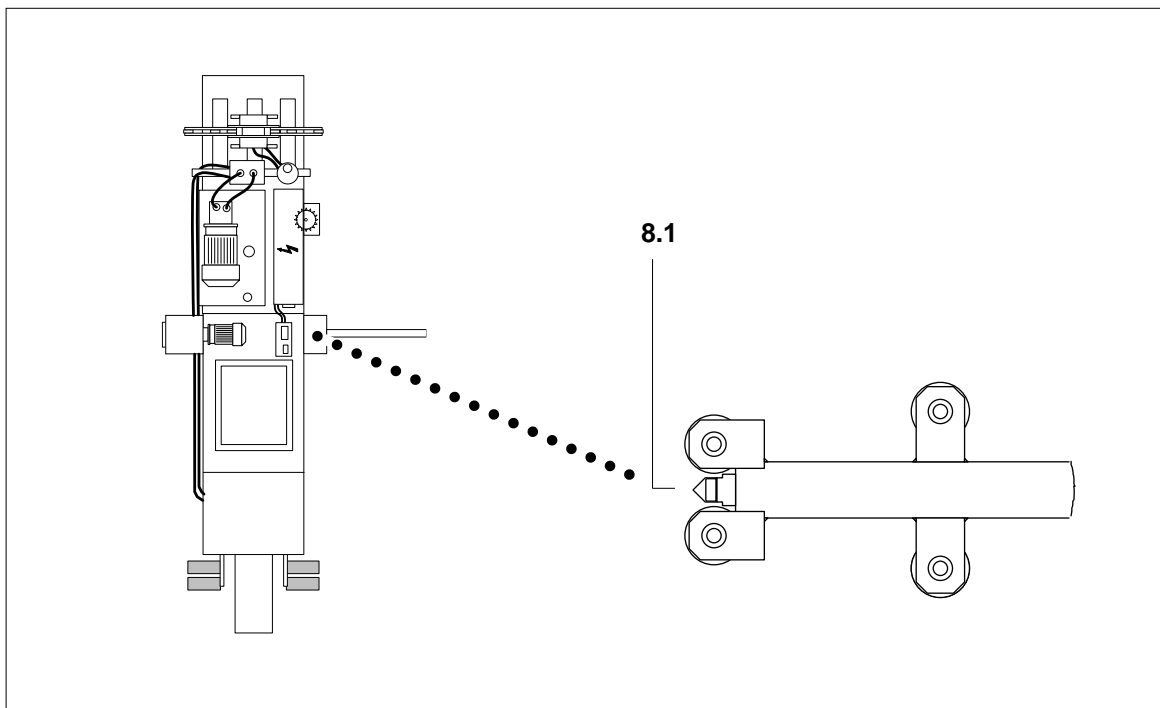
- Move press ram into its rearmost position
- Switch off the main switch
- Remove cover over twisting unit
- Replace any woreed out or damaged twisting disks
- Observe the correct installing position of the new twisting disks
- Attach cover over twisting unit



5.6 Wire insertion unit

5.6.1 Changing the wire cutting chisels

- Move press ram into its rearmost position
- Switch off the main switch
- Remove cover over wire insertion unit
- Loosen the screws of the wire insertion unit at the press frame
- Swivel the wire insertion unit through 90° towards the machine
- Replace any chipped or blunt wire cutting chisels (8.1)
- Swivel the wire insertion into working position again
- Reinstall wire insertion unit - Tightening torque **80 Nm**
- Attach cover over wire insertion unit



5.7 Lubricating and greasing

The channel baling press is filled with the required quantities of grease in the factory. (multi purpose grease)

The careful lubrication is required for the troublefree operation of the channel baling press and prevents expensive repairs. This applies in particular to the proper lubrication of all rolling bearings and guide bushes.

A negligent lubrication reduces the service life of the rolling bearings and guide bushes and causes failures.

The lubrication and all work required for lubrication may be performed only when the channel baling press is idle.

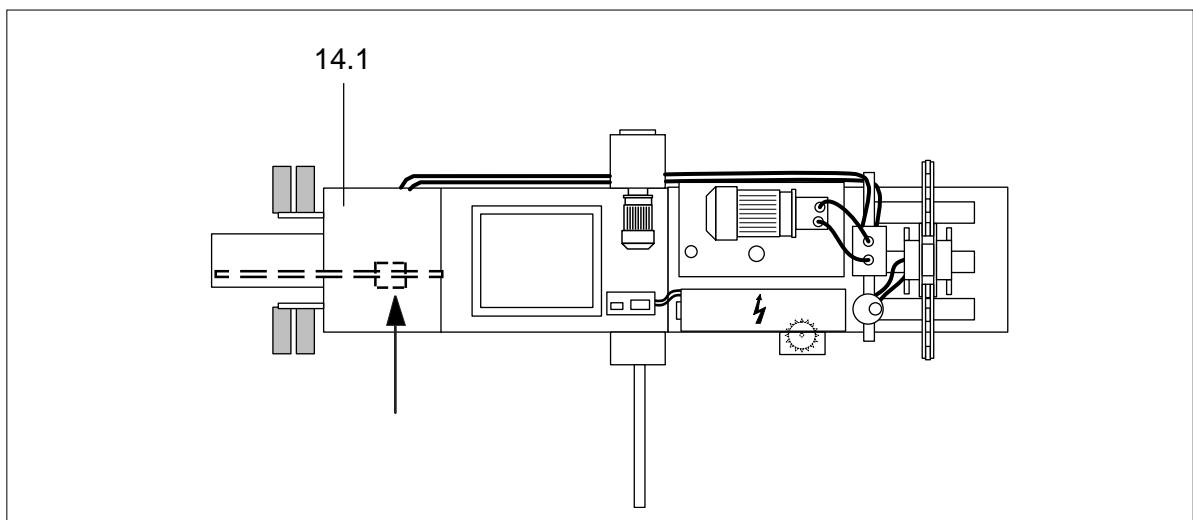
5.7.1 Switch rod guiding

- Move press ram into its rearmost position
- Switch off the main switch
- Remove the protection cover (14.1)
 - the switch rod guiding is now visible
- Use a grease-gun to inject grease into the lateral lubrication nipple



Notice
Use pointed press nozzle.

- grease must emerge from the guiding



5.7.2 Press ram

- Move press ram into its rearmost position
- Switch off the main switch
- Remove the protection cover (14.1)
- Unscrew the press ram table (14.2)
- the guide rollers are now visible
- Use a grease-gun to inject grease into the lubrication nipples of the guide rollers



Notice

Use pointed press nozzle.

- grease must emerge from the corresponding guide roller

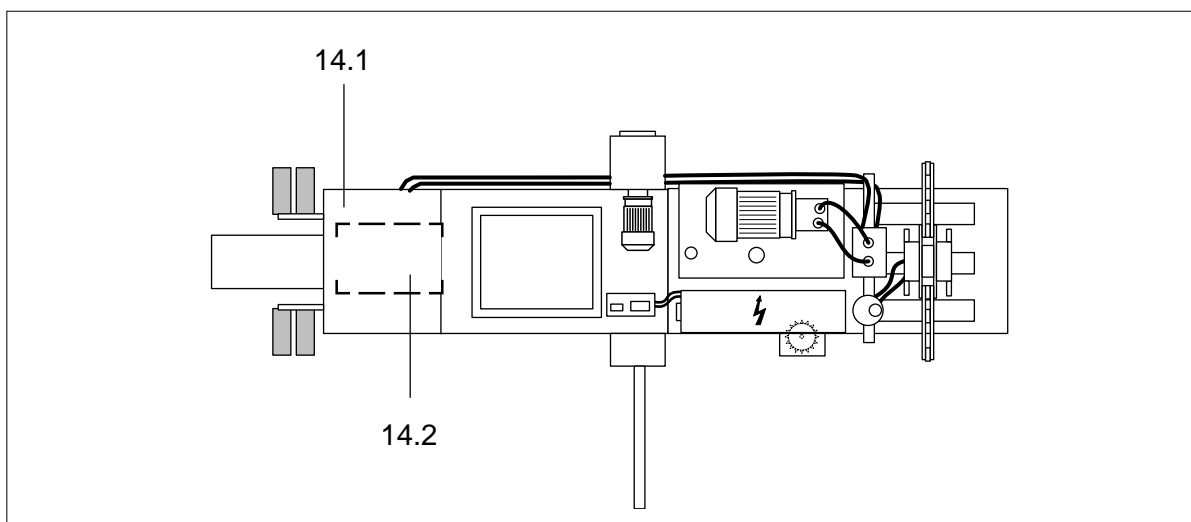
5.7.3 Press ram with central lubrication (Option)

Only use grease up to consistency class **NLGI-2**.

- Move press ram into its rearmost position
- Switch off the main switch
- Grease the press ram via the central lubrication nipple
- the central lubrication nipple is accessible through a hole in the cover and in the drive carrier
- Use a grease-gun to inject approx. **20 - 30 cm³** of grease

5.7.3.1 Checking the central lubrication

- Check the central lubrication **every 6 months**
- Move press ram into its rearmost position
- Switch off the main switch
- Remove the protection cover (14.1)
- Unscrew the press ram table (14.2)
- the central lubrication and the guide rollers are now visible
- Use a grease-gun to inject grease into the lubrication nipple
- grease must emerge from all guide rollers



5.7.4 Lubricating chart



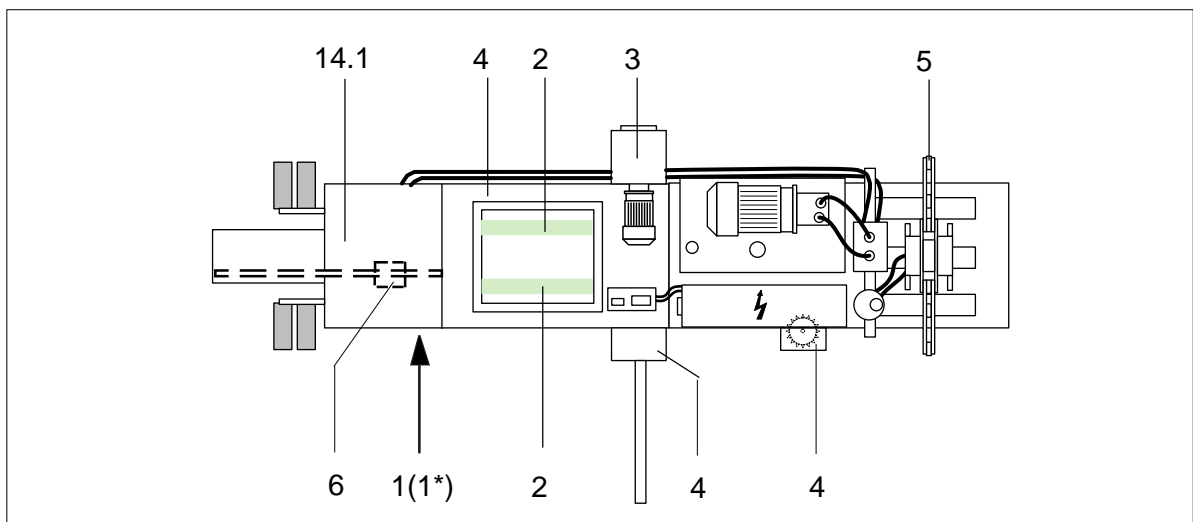
Notice

The lubricating intervals refer to the operation of the baling press under the following working conditions:

- Single-shift operation
- Baling press **not** operated outdoors
- Press material dry
- Temperature range: approx. 10 - 40° C

The lubrication intervals must be shorter for extremely working conditions! (high humidity, aggressive surrounding, high variation of temperature)

Pos.	Description of lubrication position	Action	Intervals
1	Guide rollers of the press ram and cylinder bearings	greasing	once a week
1*	Central lubrication of the press ram and cylinder bearings	greasing	once a week
2	Sliding rails for the press ram	greasing	once a week
3	Driving wheels and chains of the twisting unit	greasing	once a month
4	Counting wheel, hinges, lockings	oiling	every 3 months
5	Bearing of the press channel adjustment	greasing	every 6 months
6	Switch rod guiding	greasing	every 6 months



6 Waste disposal information

HSM baling presses have a high life expectancy. However, the time when a revision or repair is no longer economical comes for every machine. Then the operator must ask how he can properly dispose of the baling press?

The following regulations and laws must be observed at the present time:

- Hazardous waste act
- Waste disposal proof regulation
- Water act
- Waste act

We would be pleased to inform you in due course about the legal stipulations with regards to disposal when the problem arises.

Please fill in the "Proof of disposal" on the following page and send it to our company.

6.1 Proof of disposal

HSM - Pressen GmbH + Co. KG

Postfach 1163

D-88678 Salem

The machine specified below

Designation: Baling press
Model: _____
Machine number: _____
Year of construction: _____

was disposed of in compliance with the applicable regulations.

**Address of last
company**

Address of waste
disposal company

.....
Date and signature
of last operator

.....
Date and signature
of waste disposal company

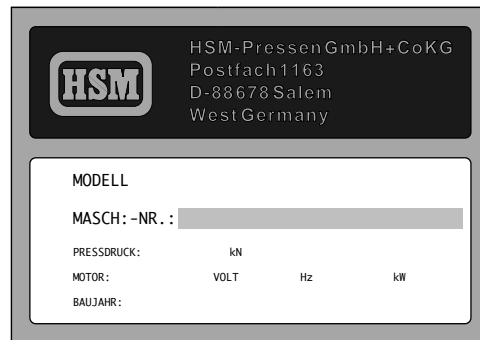
7 Electrical diagrams and hydraulic diagrams



Notice

Missing documents please order at:
HSM Pressen GmbH + Co.KG
Bahnhofstraße 115
D-88682 Salem
Telefon: +49-7553-822-0
Telefax: +49-7553-822160

The machine number is specified on the nameplate of the baling press. Inquiries can badly be processed if you do not quote the machine number.



7.1 Electrical documents

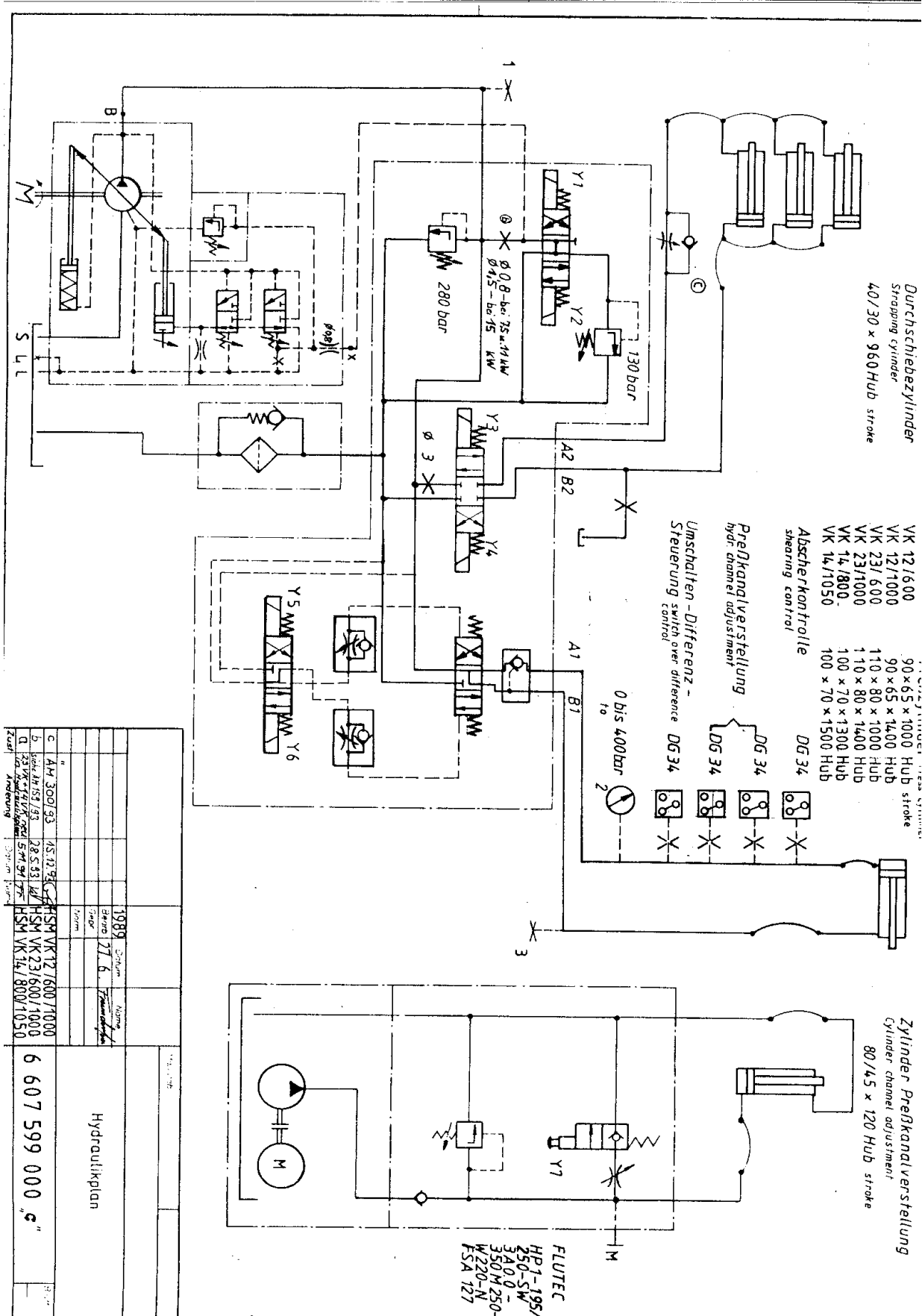


Notice

*Electrical documents for the baling press are not included in this manual!
They are supplied separately with the machine. (inside control cabinet)*

- 7.1.1 Layout of control cabinet
- 7.1.2 Wiring diagram
- 7.1.3 Terminal connections

7.2 Hydraulikplan



1989		Name	
77.6		Hydraulikplan	
Zust. Änderung			
c	AM 300/93	15.12.94	HSM VK 12/600/1000
b	10/14/15/1/93	28.5.93	HSM VK 23/600/1000
d	23 VK 14/1800	5.11.94	HSM VK 14/800/1050
6 607 599 000		g	

8 Using and ordering spare parts

Use HSM original spare parts only. We can guarantee their quality and safety.

Spare parts and working parts can be ordered from HSM customer service.

Optionally you receive a special working and spare parts bundle for your baling press

8.1 After-sales service address

HSM Pressen GmbH+Co KG
Bahnhofstraße 115
D-88 682 Salem
Tel. ++49 (0)7 55 3 / 822 - 0
Fax. ++49 (0)7 55 3 / 822 - 160

