PNEUMATIC TOGGLE PRESSES
WITH ADJUSTABLE GUIDE UNIT

20 KHKP
60 KHKP

The original language of this document is German.

This is a translation of the original operation manual.

Document history:

Version	Date	Author	Amendment/Reason for modification
1.0	02/09/2009	pfi	Original version
1.5	05.2009	pfi	Extended safety hints; notes; formatting; no actual figures!
1.6	08.2009	oge	Actual figures, correct machine identification

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Dear customer,

Congratulations to your new press from our company. You decided in favor of quality, precision and service.

To describe operation and maintenance as transparent as possible we prepared this Operation Manual with utmost diligence. We would be pleased to receive any suggestions that you may have.

To always keep you informed about our innovative press program we would like to recommend you to take a look at our Internet website or to send your e-Mail address to verkauf@gechter.com to enable us to keep you up-to-date.

We wish you great success and all the best for your company.

Your ***GECHTER*** team

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Contents

1 About this manual

1.1 Target group

This manual is addressed to qualified specialized staff having the technical skills and expertise for mounting and commissioning as well as setting and installing of presses.

1.2 Validity

This manual is valid for the following products:

- Pneumatic toggle presses 20 KHKP and 60 KHKP,

with a series no. 301xxx (20 KHKP) or 81xxx (60 KHKP), and a year of manufacture 2009;

each with extended throat and/or extended daylight and/or stroke extension as well;

each with a press safety control ES06 or ZS06 (ZS06, -F, M, -FM) *(→ page 47, Accessories)* as well.

The controls are described in their own Operation Manuals each. For presses equipped with a control, the Operation Manual is an integral part of the Operation Manual of the complete machine.

An additionally mounted MS00 measuring system *(→ page 47, Accessories)* in the ZS06M or ZS06FM controls is described in the Operation Manual of the MS00 Measuring System. For presses equipped with a MS00 measuring system, the operation manual of the MS00 measuring system is an integral part of the operating manual of the complete machine.

1.3 Warning notes and symbols

In this manual the following marks for safety instructions will be used:

WARNING!

TYPE OF RISK will be named

Warning refers to a danger, which in case of non-observance can lead to severe injuries or in extreme cases to death.

▶ Please adhere to the measures stated to avoid hazardous situations.

CAUTION!

TYPE OF RISK will be named

Caution refers to a danger, which in case of non-observance can lead to slight or medium injuries.

▶ Please adhere to the measures stated to avoid hazardous situations.

NOTE

Note refers to a danger to property damage, without any danger to health or life.

1.4 Other marks and symbols

Depending on the textual content the following marks will be used:

▶ Identification of instructions on how to act

• Identification of numerations

→ *Page xy* cross reference to other text passages in the manual

Additional information for optimum use and setting of devices as well as other useful notes.

1.5 Trademarks

All designations labeled with a trademark note ® are registered trademarks of the respective owners. All other designations in this document may be trademarks whose use by other parties for their purposes might violate the rights of the owners.

1.6 Disclaimer

We checked the contents of this document for consistence with the described hardware and software. Nevertheless discrepancies cannot be excluded. Therefore we do not accept any liability for the correctness. The information given in this document is regularly checked, necessary correction can be found in the following editions.

This Operation Manual contains a description of the product (→ *Validity*) valid at print date. It is exclusively meant for descriptive purposes to support commissioning and operation of the product. Guaranteed characteristics of the product, particularly the suitability for a specific intended use, cannot be derived herefrom.

The specifications in this manual can change at any time without prior notification. ***GECHTER*** *GmbH* reserves the right to improve and to change the product for the purpose of technical progress without the obligation to inform persons and organizations as the result of such changes.

1.7 Repository

Please keep this manual always easily accessible in the close environment of your device. The manual must be available for the operator during operation of the machine at any time.

At transfer, sale, rental, etc. of the press, this operation manual must always be delivered with the press.

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2 Product description

2.1 Overview

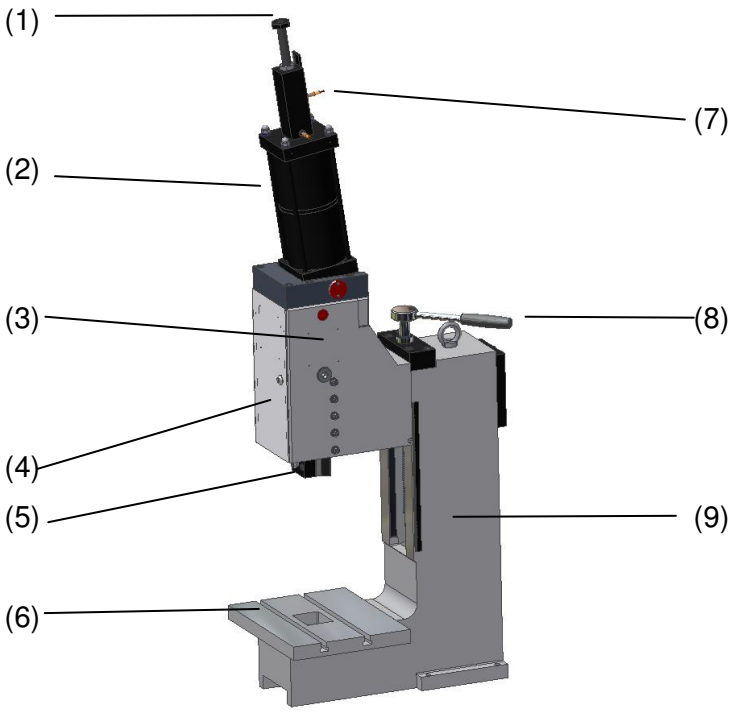

Fig. 1 Overview linear acting pneumatic presses

(1)	Stroke adjustment	(4)	Door with key	(7)	Position switch
(2)	Press cylinder	(5)	Tool fitting	(8)	Height adjustment
(3)	Guide unit	(6)	Press table	(9)	Press stand

2.2 Design and intended use

Pneumatic toggle presses are by design especially suited for works that need high forces shortly before the end of the stroke. They are therefore mainly suited for embossing, riveting, punching, cutting, mounting, and bending works. The advantage of the toggle principle is the fast execution of the approach stroke and the slow execution of the power stroke. By this, the material is allowed to adapt to the tool. This is particularly important for materials as aluminium or brass.

As opposed to the linear acting pneumatic presses which have a constant force over the complete stroke, the pneumatic toggle presses have a typical force curve, where high forces only occur at the lower range of the stroke. Neverthe-

less, a high force is effective, the final pressure builds up continuously and precise works can be executed with these presses. This helps with working of thin materials especially.

At the toggle presses, approach and force stroke are accomplished by means of the toggle link, which is actuated by a pneumatic cylinder according to the transmission. The main advantage of this design is the achievement of high forces at a relatively low compressed air consumption.

The presses are exclusively intended for cold working of metal or other sheet material (e.g. cardboard, plastic, rubber, leather) and metal powder. They are especially not suited for the use of material that can generate splinters at application of pressure or cutting (composite material, acrylic glass etc.).

NOTE

The presses are exclusively intended to be used as technical working equipment to accomplish the said types of work in the commercial or industrial area by trained and skilled staff.

Any other use, especially by private consumers, or use exceeding that specified is an infringement of use for intended purpose.

The long stroke force of 60 mm of these machines requires appropriate safety devices to eliminate risks of injury (e.g. the use of a safety control).

With the appropriate controls the presses can be used starting at the single-user workstation (inserting operations) to the fully automatic machine (rotary table with feed and take stations). They can be used for almost every use of operation within the technical limits of the machine.

Due to the little physical use of force even large-scale mass productions can be carried out with these presses, demanding only a constant work strain for the operator.

With a maximum operating pressure of 6 bar the presses reach their nominal power, but they can also be operated with correspondingly lesser pressure down to approx. 3 bar with a proportionally decreasing force. They can optimally be adapted to the operating procedure due to manifold adjustability and positioning possibilities.

2.3 Scope of delivery

Before mounting/commissioning please check delivery for completeness and intactness. In case of parts missing or showing visible damages please inform *GECHTER* GmbH.

Quantity	Art. No.	Description
1	D3***.001 or D7***.001	Pneumatic toggle press, mounted ready for use
Optionally 1	X****.***	ES, ZS, or SEM control as ordered, complete with two-hand control box, safety valve block and service unit
1		This Operation Manual (for EU countries national language additionally)

Tab. 1 Scope of delivery

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3 Safety

Before mounting/commissioning and the use of this product this manual must be read carefully.

Special attention must be paid to the following notes of this chapter as well as to the safety notes of the manual. Compliance with these notes is a premise for a safe workflow.

3.1 Person-related safety

WARNING!

Basic safety measures

- Only trained and skilled staff is allowed to work on the machine!
- Except for the operator no other person is allowed to work on the machine!
- The door at the front of the guide unit (→ Fig1, (4)) must always remain closed when operating the press!
- Before opening the control box always switch off the main switch and disconnect the device from the electric current (disconnect mains plug)!
- When working on the press, e.g. tool change, the press must be disconnected from the compressed air supply if possible (using manual slide valve, → *page 25, Pneumatic connection of press*).

CAUTION!

Avoidance of crushing dangers

The predominant part of press accidents is caused by the movement of press tools or parts of press tools. This leads to finger and hand injuries. To avoid these dangers the following measures must be taken:

- For operations in the operating modes with foot switch exclusively "safe tools" according Table 4 of EN ISO 13857:2008 and Table 1 of EN 349:1993 may be used!
- Pay attention that no parts of the body enter the tool area during operation! The tool area is the main hazardous area of the press.
- When setting the press observe the minimum distances to avoid crushing of body parts (EN ISO 13857:2008 and EN 349:1993)! The safety distance indicated on the type plate must be observed.
- When using the press for manual feeding operations a two-hand safety control must be used!

Behavior in case of emergency

- In case of a hazardous situation immediately press the red emergency stop button of the press control!

If a person is stuck in a tool and at the same time the emergency stop button at the bottom dead center of the press is activated it can happen that the person is captured. To release the captured person, proceed as follows:

- Release red emergency stop button.
- Switch on control voltage (green illuminated pushbutton "On").

The ram moves back and the captured person can be released.

In an extreme emergency the press tool must be opened with a crowbar.

Instruction/training of operating personnel

The operators must be instructed about the dangers that can occur regarding their activities as well as about measures of prevention before taking up their activities and after this in appropriate intervals but at least once a year. It is recommended to keep records on these instructions and to store these records in a suitable place.

For presses delivered with a control a check list for check of safety must be available that can be signed by the inspector (→ *Operation Manual of the control).*

3.2 Device-related safety

The press requires a safe stand and rugged mounting *(→ page 24, Installation of press).*

The operating pressure of the press may not exceed the permissible maximum (maximum operating pressure → *page 43, Technical data*)!
Otherwise increased wear or demolition of components might result.

3.3 Inspection and maintenance

Before use of the device the user must assure that all safety-relevant parts of the device are working properly and that the device is ready for use.

To maintain operational safety and functional capability of the product a regular inspection and maintenance depending on the degree of utilization is necessary. Please observe the relevant explanations (→ *page 37, Inspection and maintenance*).

When parts are exchanged within the scope of repair works, for safety reasons only original parts must be used. Repair works must be carried out by appropriately qualified ***GECHTER*** *GmbH* personnel.

3.4 ZS control

When operating the press with a ZS control, the observation of the following is mandatory (see also Operating Manual of the ZS control):

3.4.1 Two-hand operation with muting

Two-hand operation with muting of the ZS06 and ZS06M controls, that is the operation mode in which the press remains in bottom dead centre wihout two-hand buttons being pressed any longer, and the press returns to top dead centre after an adjustable holding time has elapsed, is allowed only under the following preconditions:

- Additionally to the sensor "press in b.d.c." the sensor "tool closed" must be present and installed with expertise. This sensor is used for safe muting. It has to be mounted at or in the tool by the customer in such a way that it is actuated depending on the displacement when the tool is closed resp. when the opening gap of the tool is less than 6 mm. The sensor is monitored dynamically, i.e. it ts checked if the sensor signal changes on each press stroke.
- The return stroke is "safe", i.e. that during the return of the press ram from b.d.c. to t.d.c. (return stroke) no danger areas may exist or be generated. This has to be assured by the dimensions of the tool (→ *page 43, Technical data*) or by an appropriate cover.

3.4.2 Foot mode

The foot switch operation mode with the ZS06F and ZS06FM is only allowed with "closed tools" with an opening gap of < 6 mm all around.

The other prerequisites are the same as with operation mode "two-hand operation with muting", i.e. the sensor "tool closed" must be present and installed with expertise and the return stroke must be "safe" as well.

3.5 Residual risks

Even when adhering to the safety measures mentioned there are residual risks when using the device:

- During maintenance and servicing with switched off air supply the ram can fall. Therefore, before start of work an appropriate support has to be inserted into the tool which will be able to carry the maximum press force of the press. Because the tool will be designed by the customer it is not possible for the manufacturer to provide a fixture.
- Due to longer switch off of the air and power supply it can happen that the ram falls. When switching on the air and power supply the press moves back to the top dead center. Therefore, increased caution is necessary when switching on the control voltage!
- The maximum allowable area for mounting tools is defined by the dimensions of the press ram. In this case, the return stroke is safe, i.e. no danger areas are present during the upward movement of the ram. Tools with bigger dimensions are only allowable if additional covers (not included in the scope of delivery) that ensure a safe return stroke are used.
- If tools are used that exceed the dimensions of the press stand table, increased caution is necessary and the operator has to make sure that no crushing hazard is generated between the tool and the C-stand of the press. This is necessary especially for presses with extended throat stand. Here, no constructive measure by the manufacturer is possible.
- Additional safety measures may be necessary to minimize the exposure of the operator to hazardous materials which might originate during processing. Since these materials are not defined the necessary measures cannot be dealt with in this manual.
- Depending on the use of the press additional measures to reduce fire and explosion hazards as much as possible might be necessary. When using flammable matters EN 1127-1 indicates guidelines.

4 Rules and regulations

4.1 Use for intended purpose

The linear acting pneumatic presses may exclusively be used for pressing, assembling, mounting, riveting, punching, bending, embossing and cutting operations.

NOTE

The presses are exclusively intended to be used as technical working equipment to accomplish the said types of work in the commercial or industrial area by trained and skilled staff.

Any other use, especially by private consumers, or use exceeding that specified is an infringement of use for intended purpose.

The presses are exclusively intended for cold working of metal or other sheet material (e.g. cardboard, plastic, rubber, leather) and metal powder. They are especially not suited for the use of material that can generate splinters at application of pressure or cutting (composite material, acrylic glass etc.).

The presses are not intended for use in areas where the danger of explosions exists or in areas with increased hygienic demands (e.g. pharmaceutical areas, groceries) and therefore must not be used in such areas.

4.2 CE marking

The EU machinery directive harmonizes the demanded characteristics and implements a conformity process for machines. Among others this means a standardization of the basic safety and health requirements for the design and construction of machines.

CE

The presses for which this manual is valid *(→ page 7*, Validity) comply with the requirements of the appropriate European directives.

Conformity was proven. The necessary documentation for this is left with the manufacturer.

A copy of the conformity declaration will be delivered with each individual press.

4.3 Standards and directives

The following, possibly harmonized standards and directives have been applied during development and construction of the presses:

Standard	Version	Title
98/37/EG	1998	Machinery directive
2006/95/EG	2006	Low voltage directive (only for presses with a control)
2004/108/EG	2004	EMC directive (only for presses with a control)
9. GPSGV	2008-06	9. Verordnung zum Geräte- und Produktsicherheitsgesetz (Maschinenverordnung) (for Germany only)
EN 349	2008-09	Safety of machinery. Minimum gaps to avoid crushing of parts of the human body
EN 574	1997-02	Safety of machinery - Two-hand control devices – Functional aspects – Principles for design (only for presses with a two-hand control)
EN 983	1996-09	Safety of machinery. Safety requirements for fluid power systems and their components. Pneumatics
EN ISO 12100-1	2004-04	Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology
EN ISO 12100-2	2004-04	Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles
EN 13736	2003-07	Safety of machine tools – Pneumatic presses
EN ISO 13849-1	2007-07	Safety of machine tools – Safety-related parts of controls – Part 1: General design guidelines (only for presses with a control)
EN ISO 13857	2008-06	Safety of machinery -- Safety distances to prevent hazard zones being reached by upper and lower limbs
EN 14121-1	2007-12	Safety of machinery. Risk assessment. Principles
EN 60204-1	1998-11	Safety of machine tools – Electrical equipment of machines – Part 1: General requirements
EN 61062	2005-10	Safety of machinery - Functional safety of safety related electrical, electronic and programmable electronic control systems

Tab. 2 Directives and standards

As an operating company of the press you are responsible to observe all safety measures and instructions which can, among others, be found in the following standards and directives:

Standard	Version	Title
BGV A1	2000-08	Grundlagen der Prävention (for Germany only)
BGR 500	2004-10	Betreiben von Arbeitsmitteln (for Germany only)
EN 1837	1999-03	Safety of machinery. Integral lighting of machines

Tab. 3 Directives and standards

Further instructions and/or standards may apply depending on use case or location. In the instructions and standards mentioned there may to some extent be reference to other instructions or standards that might also have to be taken into consideration if need be.

4.4 Disposal

If the product will finally be put out of operation, requirements and laws regulated by public law regarding disposal can exist. Therefore, we recommend that you contact your ***GECHTER*** service to safely meet with the legal requirements and to eliminate potential environmental hazards.

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5 Mounting and commissioning

The press will be delivered mounted ready for use. Mounting of accessories may be necessary in special cases (pay attention to separate manuals of accessories).

NOTE

Should the presses or press controls have visible damages they must not be put into operation. In this case, please contact ***GECHTER*** GmbH.

5.1 Place of location

The following requirements to the place of location must be taken into consideration:

Overall size	**20 kN KHKP**		**60 kN KHKP**
Environmental conditions	Operating range must be sufficiently illuminated (see EN 1837)		
Required space Basic machine with ZS or SEM press control	Length approx. 745mm Width approx. 480mm Height max. 1700mm (Height with optional understructure approx. 700mm)		Length approx. 875mm Width approx. 545mm Height approx. 2300mm (Height with optional understructure approx. 700mm)
Mains supply of control	Shockproof socket with 230 VAC; 50 Hz; 10 A		
Recommended dimensioning of air supply	¼“ cross section		½“ cross section
Permissible operating pressure of compressed air supply	6 bar max.		6 bar max.

Tab. 4 Requirements for place of location

NOTE

If the permissible operating pressure (→ *Tab. 4*) is exceeded by the compressed air supply the pressure control valve of the service unit will limit it to the maximum allowed pressure (→ *page 25, Pneumatic connection of press*).

Additionally, there is an overpressure valve that limits the pressure to the pressure maximum allowable on the cylinder.

5.2 Transport of press

WARNING!

DANGER OF CRUSHING

when lifting or relocating the press!

▶ Do not lift by the pushbutton housing or the control box!

▶ Unpack and degrease the press.

▶ Use eye bolt for transport (**Fig. 2**). Regarding transport media, mind weight of press incl. control (→ *page 43, Technical data*).

▶ When lifting the press balance out the incline to the front by holding on press table.

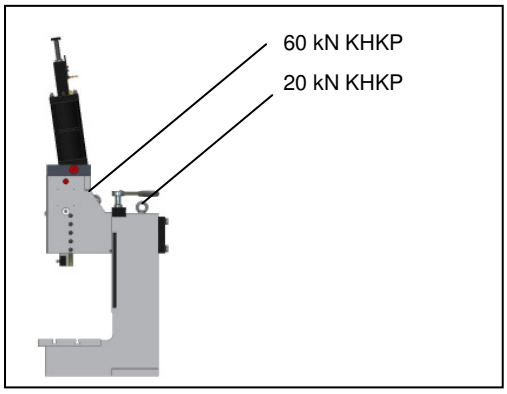

Fig. 2 Eye bolt for transport

5.3 Installation of press

A solid work bench or the additionally available understructure are suited for installation (→ *page 47, Accessories*).

▶ Place the base frame on machine shoes or fix it on the ground to prevent the press from moving around.

▶ Before commissioning you must fix the press by means of the four bores on the press stand (**Fig. 3**).

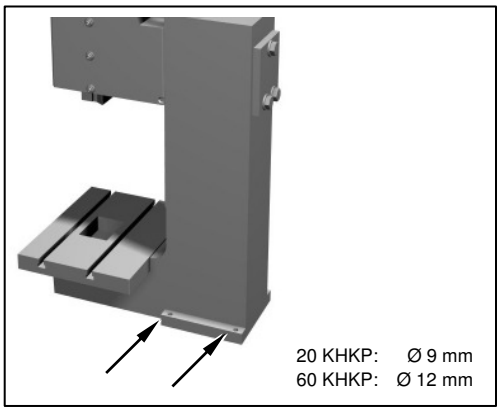

Fig. 3 Bores on foot of press stand

5.4 Pneumatic connection of press

According to EN 13736 a service unit for pneumatic presses is mandatory. For this reason *GECHTER*- presses will always be delivered with the appropriate service unit.

The pneumatic connection will be carried out on the manual slide valve of the service unit.

NOTE

When setting the service unit please follow the relevant descriptions in the separate Operation Manual of the service unit.

Depending on the type of press the feed hose should be dimensioned as follows:

Overall size	**20 kN KHKP**		**60 kN KHKP**
Inner width of the connecting hose	Ø 9 mm (equiv. ¼“)		Ø 12 mm (equiv. ½“)

Tab. 5 Dimensioning of feed hose

- ▶ Push the feed hose over the hose fitting on the manual slide valve of the service unit (**Fig. 4**).
- ▶ Fasten feed hose with the hose binder.

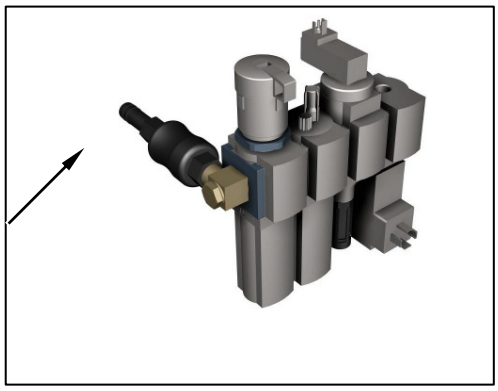

Fig. 4 Hose fitting on the manual slide valve of the service unit

- ▶ Move manual slide valve in forward direction (P → A) (**Fig. 5**).

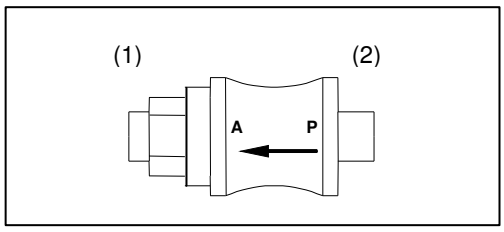

Fig. 5 Manual slide valve in forward direction

Pos. 1 Junction side of service unit
Pos. 2 Junction side of air grid

- ▶ Adjust operating pressure via the pressure reducing valve of the service unit. In doing so, observe the maximum permissible operating pressure of the press (→*page 43, Technical data*).
- ▶ The pneumatic pressure that is available from the grid is shown on the digital display of the pressure switch on the pressure reducing valve. The pressure switch is adjusted to switch on from 3 to 6 bar. Outside of this range, the main valve is switched off. The pressure range adjustment is protected by a password which is: The password should be kept as secret as possible, e.g. it should not be noted on the press.
- ▶ Adjust the lubricator to one drop per 80 strokes.

Life cycle of sealings, cylinder parts and valves will be increased many times over when greasing the air via the lubricator.

- ▶ At the factory, the lubricator is filled with **Shell Molina Oil 5.** At refilling, the same oil or one with identical characteristics must be used.

5.5 Electrical connection of press

Electrical connection of the press is only necessary if it is equipped with a control. The necessary procedure is described in the Operation Manual of the control.

5.6 Switching on the press/acceptance test

Before switching on the press, various safety checks have to be performed to ensure a safe operation of the press.

The presses can be equipped with different controls. Operation of the press control is therefore described in the respective Operation Manual. The following chapters have to be observed particularly:

Control	ES06	ES06M	ZS06	ZS06 F	ZS06 M	ZS06 FM
Turn-on procedure	6.1	6.1	6.1	6.1	6.1	6.1
Setup mode	--	--	6.2	6.2	6.2	6.2
Two-hand mode	6.2	6.2	6.3	6.3	6.3	6.3
Testing the function of the two-hand control	7.2	7.2	7.2	7.2	7.2	7.2
Testing the muting function	--	--	7.3	7.3	7.3	7.3
Testing the valve monitoring	--	--	7.4	7.4	7.4	7.4
Overrun monitoring	7.3	7.3	7.5	7.5	7.5	7.5

Tab. 6 Tests to be performed before switching on

The overrun monitoring test was performed already in the factory for new presses. Therefore it doesn't have to be performed again when switching on the press for the first time, but only in the intervals given in the Operation Manual of the control.

The performed tests must be documented if required.

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6 Installation

WARNING!

RISKS OF INJURY

due to maloperation!

- Installing of the press and setting of the tool may only be carried out by skilled personnel with the relevant technical qualification and expertise..
- During maintenance and servicing with switched off air supply the ram can fall. Therefore, before start of work an appropriate support has to be inserted into the tool which will be able to carry the maximum press force of the press. Because the tool will be designed by the customer it is not possible for the manufacturer to provide a fixture.
- The door at the front of the guide unit (→ *Fig1, (4))* must always remain closed when operating the press!
- Before opening the control box always switch off the main switch and disconnect the device from the electric current (disconnect mains plug)!
- When working on the press, e.g. tool change, the press must be disconnected from the compressed air supply if possible (using manual slide valve, → *page 25, Pneumatic connection of press*).

The following tools are required for installation of the press:

Tools	**20 kN KHKP**		**60 kN KHKP**
Box wrench	SW 19		SW 24
Torque wrench	SW 19 tightening torque 90 Nm		SW 24 tightening torque 170 Nm
Flat wrench	SW 17, SW 22		SW 30, SW 36
Hexagon socket wrench	sizes 4 and 5	sizes 4 and 6	
Key for door of guide unit	included		

Tab. 7 Tools for installation of the press

6.1 Place ram in basic position

- Follow instructions of section "Setting operation" in the Operation Manual of the press control.
  Ram of press will then be in top basic position.

6.2 Remove clamping piece

There is a clamping piece at the bottom side of the press ram holding the clamping pivot of the tool.

- ▶ Move press ram in operating mode "Setup" into bottom dead center (→ *Operation Manual of press control*).
- ▶ For later clamping of the tool unscrew dog-point locking screw (**Fig. 6**, Pos. 1) in clamping piece approx. 5 mm.
- ▶ Remove the two stretching screws (**Fig. 6**, Pos. 2).
- ▶ Unhinge clamping piece (**Fig. 6**, Pos. 3) to the front.

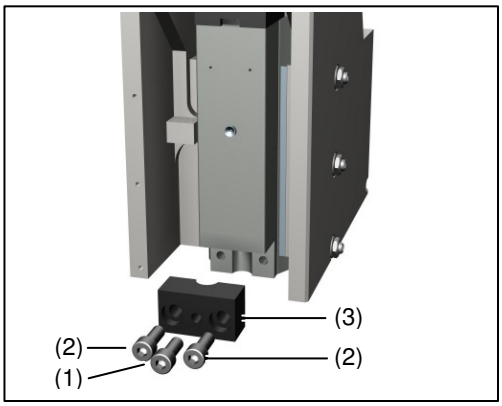

Fig. 6 Take off clamping piece

Pos. 1 Dog-point locking screw
Pos. 2 Stretching screw
Pos. 3 Clamping piece

6.3 Adjust height

Press ram should be in the bottom dead center so that the required operating height can be adjusted (Setting operation, → *Operation Manual of press control*).

- ▶ Place tool on press table (**Fig. 7**).

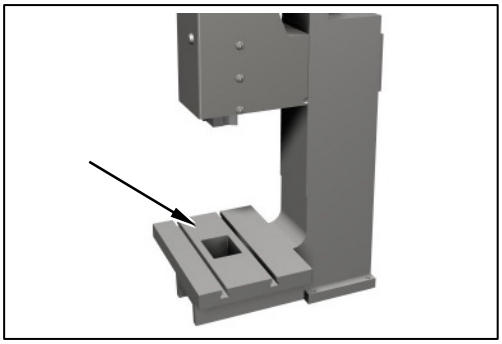

Fig. 7 Press table

- Remove the three or four clamping screws of the clamping of the guide unit (**Fig. 8**, Pos. 1) with a box wrench but do not completely remove.
- Loosen the clamping screw on the threaded spindle (**Fig. 8**, Pos. 2) with a hexagon socket wrench but do not completely remove.

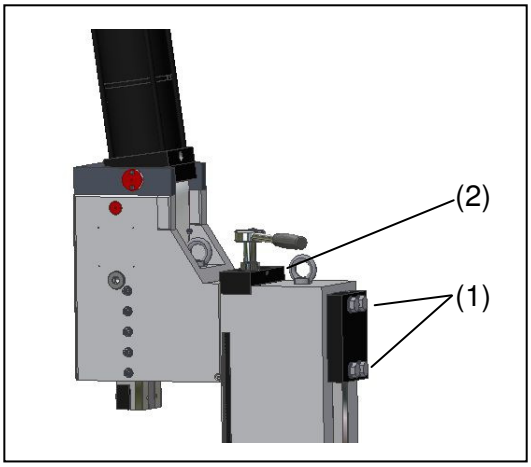

Fig. 8 Loosen clamping screws

Pos. 1 Clamping screws of guide unit
Pos. 2 Clamping screws of threaded spindle

- Set the guide unit (**Fig. 9**, Pos. 2) with the crank handle, the hand wheel or the ratchet (**Fig. 9**, Pos. 1) up or down to the required height.
- Tighten the clamping screws of the clamping of the guide unit (**Fig. 8**, Pos. 1) properly. Pay attention to the preset tightening torque (→ *page 29, Tab. 7*) when doing so.
- Remove the thread play from the threaded spindle. Protect the threaded spindle with the clamping screw (**Fig. 8**, Pos. 2) against twist.

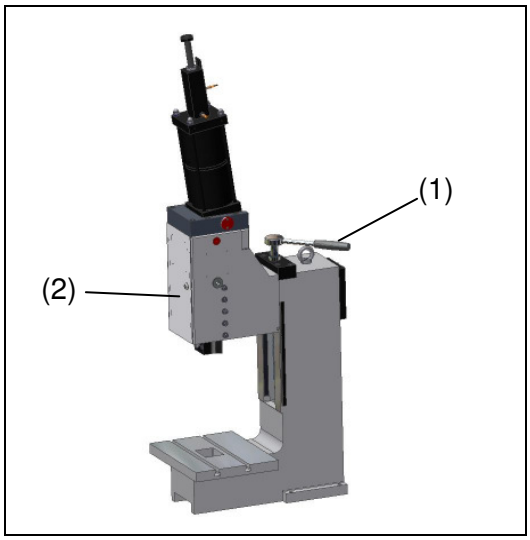

Fig. 9 Adjust height

Pos. 1 Crank handle. Hand wheel or ratchet
Pos. 2 Guide unit

6.4 Clamp tool

The following dimensions for the tool must be kept in mind:

Measured variable	20 kN KHKP		60 kN KHKP
Length of clamping pivot	21 mm max.		49 mm max.
Clamping bore	Ø 10 mm H7		Ø 25 mm H7

Tab. 8 Tool specifications

All other specifications must not exceed the dimensions of the press ram, → page *43, Technical data* and → *page 18*, *Residual risks*.

- ▶ Insert the clamping pin of the tool into the half-shell of the clamping bore (**Fig. 10**, Pos. 1). When doing so, firmly press upper part of tool fest against bottom side of the ram.
- ▶ Insert clamping piece (**Fig. 10**, Pos. 2) and tighten both stretching screws (**Fig. 10**, Pos. 3) firmly again.
- ▶ Screw the dog-point locking screw (**Fig. 10**, Pos. 4) against the clamping pivot to avoid that the tool can be pulled out.

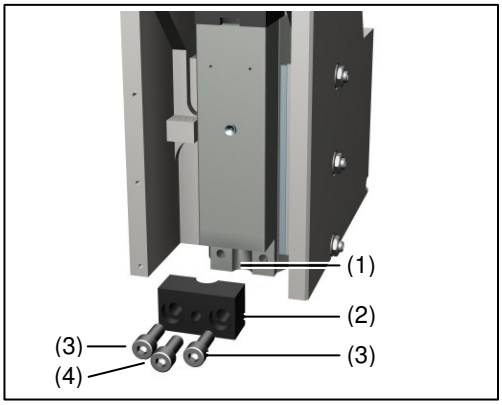

Fig. 10 Clamping of tool

Pos. 1 Clamping bore
Pos. 2 Clamping piece
Pos. 3 Stretching screws
Pos. 4 Dog-point locking screw

- ▶ Subsequently attach the tool to the press table.
- ▶ Lock the door, remove the key and store it in a safe place.

WARNING!

DANGER OF CRUSHING!

The front door must remain closed during all press operations!

To clamp the tool to the press table, T slots according to DIN 650 are available:
1x M8 x 10 centric at the 20 KHKP
2x M10 x 12 center symmetric at the 60 KHKP

NOTE

To avoid [Verschneiden und Verspannen] of the tool, first the upper tool must be clamped to the ram, and after that the lower tool must be clamped to the press table.

NOTE

The clamping pin of the upper tool must in no way have contact with the ground of the clamping bore in the ram. Otherwise, when working the press, the clamping pin can get locked [verklemmt] in the clamping bore.

6.5 Adjust stroke

The stroke will be adjusted with the adjusting screw on the upper part of the cylinder of the press.

With the adjusting screw the top dead center of the press will be changed and the press stroke will be changed correspondingly. The bottom dead center is determined by the design of the press.

- Move press ram in operating mode "Setup" to the bottom dead center (→ *Operation Manual of press control*).
- Loosen the counternut (**Fig. 11**, Pos. 1) at the adjusting screw using the flat wrench.
- Adjust the stroke as required by screwing in and out of the adjusting screw (**Fig. 11**, Pos. 2).

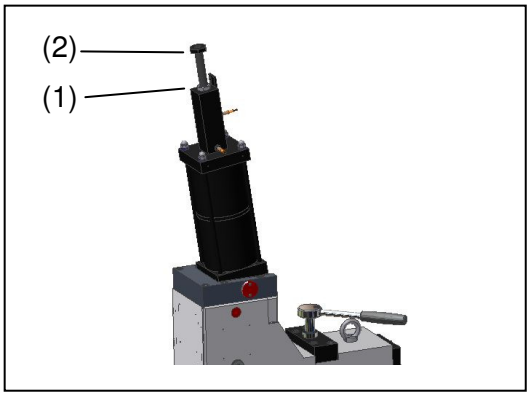

Fig. 11 Adjust stroke
Pos. 1 Counternut
Pos. 2 Adjusting screw for stroke

- Move press ram , only by LP Press, (**Fig. 12**) up and check the position.
- Tighten the counternut again (**Fig. 11**, Pos. 1) using a flat wrench.
- Move the press ram up again and check the length of the stroke.
- Test the tool function with a no-load stroke.

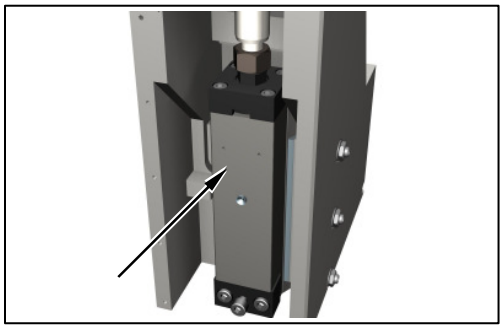

Fig. 12 Press ram (LP press only)

NOTE

For presses with a SEM controls the position of the position switch for the top dead center must be tested and, if needed, readjusted after finishing the adjustment work (→ *page 35, Adjust end position switch in top dead* center).

6.6 Fine tuning of height

Optionally, the 60 kN KHKP press is equipped with a fine-tuning device for the press ram (not available for 20 kN KHKP). With this device, the press ram can be adjusted continuously with an accuracy of 0.05 mm. The maximum adjustment travel is 12 mm.

- ▶ Open the door (**Fig. 1**, Pos. 4) at the guide unit (**Fig. 1**, Pos. 3).
- ▶ Unlock the two hexagon screws from the countering (**Fig. 3**, Pos. 1), but do ot turn out completely.
- ▶ Now the fine-adjustment device (**Fig. 3**, Pos. 2) can be turned continuously by help of the included lever up to max. 12 mm adjustment travel. With the shorter, bent side of the lever (ø 8 mm) the adjustment travel can be tested. With the turned-off side (ø 4 mm), the fine-adjustment device can be adjusted (Offset ø 4 mm not shown in **Fig. 3**). One scale line determines 0.05 mm of adjustment travel.

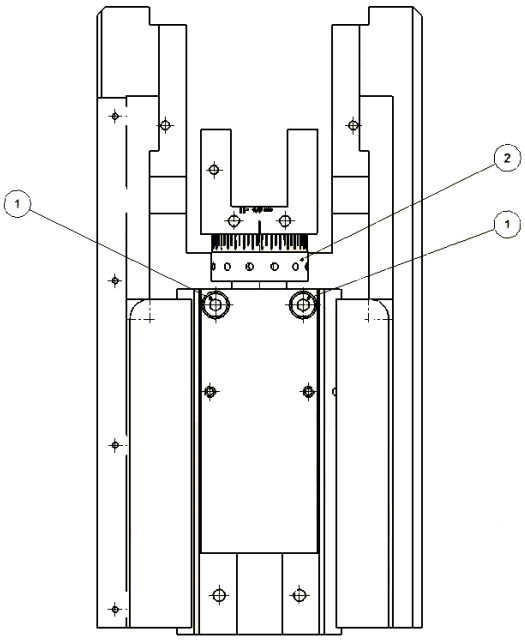

Abb. 13 Fine adjustment of the press ram

- ▶ After the adjustment process the two hexagon screws must be countered.
- ▶ Close the door again and keep the key in a safe place.

WARNING!

DANGER OF CRUSHING!

The front door must remain closed during all press operations!

6.7 Adjust end position switch in top dead center (SEM control)

If the press stroke for presses with a SEM control was changed, the position of the position switch for the top dead center must be newly adjusted after finishing the positioning works.

NOTE

To avoid damages to the press, tool or take-up system for the work pieces a new adjustment of the position switch after change of the press stroke must be carried out. This avoids a possible collision of the press tool e.g. with stretched press fixture or on switch movements of the rotary table.

Requirements

- The length of the press stroke for the tool is determined and the adjusting screw for the stroke is countered (→ *page 33, Adjust stroke*).
- The press ram is in the top dead center (→ *Operation Manual of press control*).

Realization

▶ Loosen the two hexagon socket screws (**Fig. 13**, Pos. 1) of LS bracket with the hexagon socket wrench.

▶ Shift the end position switch (**Fig. 13**, Pos. 2) to the top.
(LED control display of end position switch is off).

▶ Shift end position switch down until the LED control display at the end position switch is safely on.

▶ Tighten the two hexagon socket screws again.

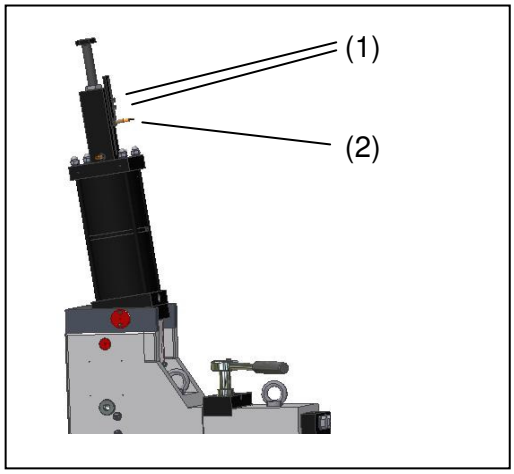

Fig. 13 Adjust end position switch
Pos. 1 Hexagon socket screws end position switch
Pos. 2 End position switch

The display for basic position at the operating side of the control box (signal lamp green) must light up.

6.8 Setting pressure

With the pressure regulator of the service unit the pressure for the required force can be adjusted (→ *Operation Manual of service unit*). The press force increases or decreases proportionally with the pressure. It is not always necessary to work under maximum operating pressure. The pressure range of the presses depends on the design with/without rotary table:

Design	**20 / 60 kN KHKP**
Press with rotary table	4 – 6 bar
Press without rotary table	3 – 6 bar

Tab. 9 Pressure range of presses

NOTE

If the maximum permissible pressure is exceeded a higher wear of single parts, destruction of pivot parts or breach of the machine stand cannot be excluded. For this reason a pressure control valve is in the supply air circuit. It opens when overshooting the limit value and relieves pressure until normal pressure has been reached again.

▶ If air leaks out of the press during standstill, check the mains pressure if there is more than the maximum permissible pressure.

7 Inspection and maintenance

WARNUNG!

RISKS OF INJURY

due to maloperation!

- Installing of the press and setting of the tool may only be carried out by skilled personnel with the relevant technical qualification and expertise..
- During maintenance and servicing with switched off air supply the ram can fall. Therefore, before start of work an appropriate support has to be inserted into the tool which will be able to carry the maximum press force of the press. Because the tool will be designed by the customer it is not possible for the manufacturer to provide a fixture.
- The door at the front of the guide unit (→ *Fig1, (4)*) must always remain closed when operating the press!
- Before opening the control box always switch off the main switch and disconnect the device from the electric current (disconnect mains plug)!
- When working on the press, e.g. tool change, the press must be disconnected from the compressed air supply if possible (using manual slide valve, → *page 25, Pneumatic connection of press*).

7.1 Inspection/maintenance plan

The following time intervals for inspection and maintenance must be observed.

Component	Activity	Procedure	Deadline
Press ram	Grease inverted V guide	→ *page 38, Greasing points*	- daily during high load - otherwise if necessary
Pneumatic	Check tightness	→ *page 38, Pneumatic*	weekly
Pneumatic	Check sound absorber	→ *page 38, Pneumatic*	weekly
Service unit	Check level of condensate (maximum scale); empty condensate if necessary	→ Operation Manual of service unit	monthly
Service unit	Check oil level (minimum and maximum scale); refill oil if necessary	→ Operation Manual of service unit	monthly

Tab. 10 Inspection/maintenance plan

NOTE

Where more frequent checks and/or maintenances of the device are regulated by national laws or regulations they must be observed.

7.2 Greasing points

The grease nipple for the inverted V guide is on the front side of the press ram (**Fig. 14**).

▶ The inverted V guide must be oiled daily with contact surface oil (e.g. **Shell T 68**) during high load; otherwise if necessary.
An oil press is needed for this.

ATTENTION! Do not use grease, because it cannot distribute through the channels inside the ram!

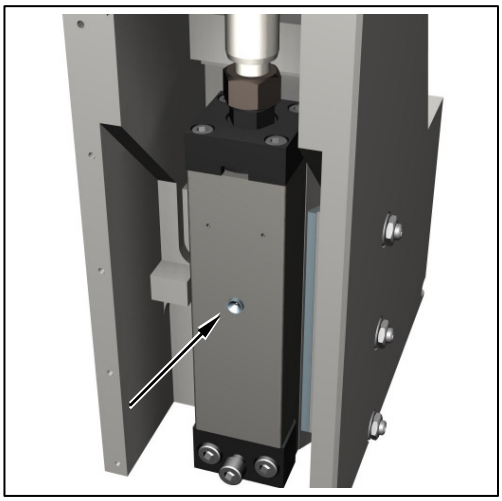

Fig. 14 Grease nipple for inverted V guide

7.3 Pneumatic

Pneumatic needs no special maintenance.

But it needs to be controlled whether fittings might have loosened and caused untight or leaky points. In this case the fittings must be retightend.

The mufflers must also be checked. During operating grease and rubber abrasion may accrue. You will notice that when the cylinder movements of the press slow down.

At the service unit, the oil level must be checked according to the inspection plan above (min. – max. marking) and be refilled if necessary. At the factory, the lubricator is filled with **Shell Molina Oil 5.** At refilling, the same oil or one with identical characteristics must be used.

7.4 Control

According to the type of control mounted to the press, the required maintenance works described in the Operation Manual of the control must be executed as well.

Particularly the works

- Testing the function of the two-hand control
- Testing the muting function (if available; not with ES06)
- Testing the valve monitoring (if available) and
- Overrun monitoring

must be performed and, if necessary, documented according to the required procedures and time intervals.

7.5 Readjust adjustment gib

If the press ram has insufficient or too much play, i.e. is either jammed or cannot move sideways the adjustment gib must be readjusted.

- Loosen the three nuts on the right side of the guide unit (**Fig. 15**, Pos. 1), but do not completely remove.
- By turning in of the threaded pins straighten adjustment gib evenly, to ensure that it has the same play at the top and at the bottom (**Fig. 15**, Pos. 2).
- Retighten the three nuts (**Fig. 15**, Pos. 1).

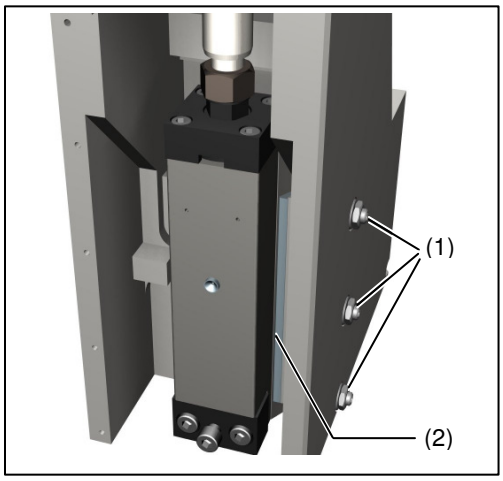

Fig. 15 Readjust adjustment gib

Pos. 1 Adjustment gib of screws
Pos. 2 Adjustment gib

NOTE

The adjustment gib must not be adjusted too close because otherwise the press will no longer reach its specific press force and increased wear will happen!

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8 Troubleshooting

The following table contains a summary of possible device errors, their causes and recommended corrective measures.

Symptom	Possible cause	Corrective measure
Nominal press force will not be reached	Seal kit is worn out	Change seal kit*; if applicable, have it overhauled at the manufacturer's†
	Compressed air has not the correct operating pressure	Adjust compressed air via pressure controller or service unit (correct operating pressure → *page 43, Technical data*)
	Ram has not enough play	→ *page 39, Readjust adjustment gib*
Air leaks out of the press on standstill	Leakages	Have press overhauled at the manufacturer's†
	Air pressure too high at the inlet	Check adjustment of the service unit (→ *page 36, Setting pressure*)
Press ram moves sideways or is jammed	Ram has too much or insufficient play	→ *page 39, Readjust adjustment gib*
After normal stroke press moves up only very slowly	Pneumatic unlatchable check valve (HGL) defective	Change HGL*
Press moves down too slow / too fast	Wrong adjustment of exhaust throttle	Adjust exhaust throttle (if available) correctly
Press does not stop in the bottom dead center (BDC)	Stop time set too short	Adjust stop time of time relay correctly (-K9)
	Sensor for BDC (-S9) wrongly set or defect	Set sensor for BDC (-S9) correctly or replace
	Sensor for BDC is not reached	Only use appropriate tools and workpieces according to press specification

Tab. 11 Troubleshooting

NOTE

For troubles at the control please read the corresponding chapter in the Operation Manual of the control.

* May only be carried out by appropriately qualified personnel!

† Please contact ***GECHTER*** GmbH.

WARNING!

RISKS OF INJURY!

When parts are exchanged within the scope of repair works, for safety reasons only original parts must be used. Repair works must be carried out by appropriately qualified ***GECHTER*** *GmbH* personnel.

9 Technical data

9.1 Pneumatic toggle presses 20 / 60 kN KHKP

Measured variable	20 kN KHKP	60 kN KHKP
Operating pressure min. – max.	3 – 6 bar	
Press force at 7 bar	ca. 20 kN	ca. 60 kN
Return stroke force at 7 bar	ca. 10 kN	ca. 30 kN
Max. air consumption / stroke		
Connecting hose	1/4“ (9 mm)	1/2“ (12 mm)
Stroke force adjustable	0 – 60 mm	
Sound pressure level / sound power level without tool with tool under full load, sheet steel 1.0 mm		
Number of strokes in full double stroke	ca. 66 min^{-1}	ca. 40 min^{-1}
Overtravel time*	typ. 45 ms	
Safety distance*	typ. 70 mm	
Allowable ambient temperature during operation	5 – 40 °C	
Allowable storage temperature	0 – 50 °C	
Allowable sea level	0 – 1.200 m	
Width (with SEM control)	481 mm	545 mm
Depth (with SEM control)	755 mm	790 mm
Height	950 mm	1492 mm
Mass (with SEM control)	ca. 85 kg	ca. 265 kg
Clamping pivot – clamping bore	Ø 15 mm H7	Ø 25 mm H7
Daylight	75 – 235 mm	110 – 370 mm
Throat	120 mm	200 mm
Max. upper tool weight without fall protection	4 kg	10 kg
Max. dimensions of upper tool without return stroke protection		

* Depending on used control

Max. dimensions of upper tool with return stroke protection		
Max. dimensions of lower tool		
Tightening torque of clamping screw of guide unit	90 Nm	170
Only for electric control:		
Mains voltage	110-230V AC, 50 – 60 Hz, ca. 1 A	
Max. pre-fuse	10 A	
Control voltage	ES06: 24 V DC / 30 W	ZS06: 24 V DC / 2,5 A

Tab. 12 Technical data for 20 / 60 kN KHKP presses

9.2 Dimensional drawings

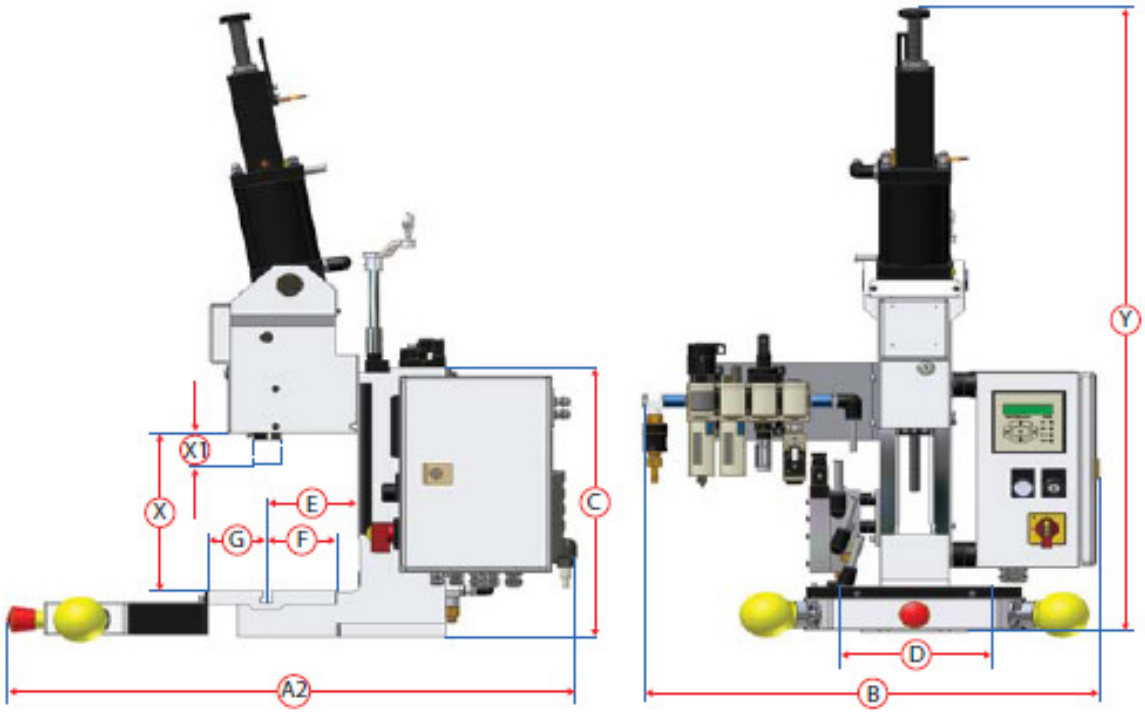

Fig. KHKP with ZS control

Dimension	KHKP 20 kN	KHKP 60 kN
A2*	800	820
B*	580	760
C	415	715
D	200	340
E	120	200
F	92	150
G	75	120
U	21	49
V	Ø 10 H7	Ø 25 H7
X	60-225	115-370
X1	0-60	0-60
Ymax	890	1492

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10 Available models, spare parts and accessories

10.1 Available models

The following variants of presses are available with the order numbers indicated below:

Type	**Pneumatic toggle press,** without control, without valve	**Order No.**
20 kN KHKP	Press force 20 kN in b.d.c., stroke 60 mm, throat 120 mm, Daylight standard	D3001.001
20 kN KHKP	Press force 20 kN in b.d.c., stroke 60 mm, throat 300 mm, Daylight standard	D3101.001
20 kN KHKP	Press force 20 kN in b.d.c., stroke 60 mm, throat 120 mm, daylight + 100 mm	D3201.001
60 kN KHKP	Press force 60 kN in b.d.c., stroke 60 mm, throat 200 mm, Daylight standard	D7001.001
60 kN KHKP	Press force 60 kN in b.d.c., stroke 60 mm, throat 300 mm, Daylight standard	D7101.001
60 kN KHKP	Press force 60 kN in b.d.c., stroke 60 mm, throat 200 mm, daylight + 100 mm	D7201.001

Tab. 13 List of available press variants

10.2 Accessories

The following accessories are available with the order numbers indicated below:

Accessory	**Type**	**for press**	**Order No.**
Understructure, height = approx.800 mm Understructure, height = approx.700 mm adjustable with elements for machine bearing		all	Z0006A.001 Z0006B.001
Deposit table, left Deposit table, right laterally mounted to the press foundation		all	Z0006.002 Z0006.003
ES control	ES06	20 kN KHKP	X1000.001
		60 kN KHKP	X1000.002
ZS control	ZS06	20 kN KHKP	X2000.001
		60 kN KHKP	X2000.002
ZS control with foot switch instead of two-hand panel	ZS06F	20 kN KHKP	X2002.001
		60 kN KHKP	X2002.002

Accessory	Type	for press	Order No.
ZS control with MS measuring system integrated with text display, with force and displacement sensor	ZS06M	20 kN KHKP	X2010.001
		60 kN KHKP	X2010.002
ZS control with foot switch instead of two-hand panel with MS measuring system integrated with text display, with force and displacement sensor	ZS06FM	20 kN KHKP	X2012.001
		60 kN KHKP	X2012.002
SEM control	SEM5	20 kN KHKP	X0001.003
		60 kN KHKP	X0001.004
Force-displacement measuring system with graphic display for SEM control	MS00	all	on request
Rotary table 4-24 partition incl. two spacing strips for rotary table mounting suitable for presses with SEM control	R340	20 kN KHKP	R1001.001
		60 kN KHKP	R1003.001
Rotary table changing plate with bores		all	R1000.E101
Stretching block for stand with extended throat		20 kN KHKP	Z3029.001
		60 kN KHKP	Z7029.001
Highly stressable sliding table mechanical, manually operated	HST 150	all	Z0040.001
Highly stressable sliding table mechanical, manually operated with locking bolt	HST 150 RB	all	Z0041.001
Highly stressable sliding table pneumatic, with pneumatic locking bolts, with pneumatic control block with proximity switches suitable for presses with SEM control	HST 150 PPR	all	Z0044.001

Tab. 14 List of accessories

For further accessories please refer to catalog and price list.

10.3 Spare parts

We positively need the machine number and, if known, the year of construction and the type of press in addition to supply you with the exact matching spare part for your machine. You will find this information on the type plate usually attached to the door or side of the guide unit.

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